



# ibaPDA-Request-S7

Applications of the Request data interface for  
SIMATIC S7 TIA Portal/S7-1500

Manual part 1  
Issue 1.0

Measurement Systems for Industry and Energy

[www.iba-ag.com](http://www.iba-ag.com)

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| Version | Date    | Revision                                                                                            | Author | Version SW |
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# 1 About this documentation

This manual describes the use of the Request data interface to SIMATIC S7.

The product *ibaPDA-Request-S7* is an extension of *ibaPDA* for the direct access to S7 symbols and S7 operands when recording data from SIMATIC S7-CPU's. This documentation describes only the extensions and deviations. You can find further information on all other functions and operating functions in the documentation of the devices, interfaces and *ibaPDA*.

---

## Other documentation



This documentation provides supplementary information to the *ibaPDA* documentation.

---

## 1.1 Target group and previous knowledge

This documentation is aimed at qualified professionals who are familiar with handling electrical and electronic modules as well as communication and measurement technology. A person is regarded as professional if they are capable of assessing safety and recognizing possible consequences and risks on the basis of their specialist training, knowledge and experience and knowledge of the standard regulations.

This documentation in particular addresses persons who are concerned with the configuration, test, commissioning or maintenance of Programmable Logic Controllers of the supported products. For the handling *ibaPDA-Request-S7* the following basic knowledge is required and/or useful:

- Windows operating system
- Basic knowledge *ibaPDA*
- Basic knowledge network technology
- Knowledge of configuration and operation of SIMATIC S7 PLCs

## 1.2 Notations

In this manual, the following notations are used:

| Action                        | Notation                                                                                                                  |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------|
| Menu command                  | Menu <i>Logic diagram</i>                                                                                                 |
| Calling the menu command      | <i>Step 1 – Step 2 – Step 3 – Step x</i><br>Example:<br>Select the menu <i>Logic diagram – Add – New function block</i> . |
| Keys                          | <Key name><br>Example: <Alt>; <F1>                                                                                        |
| Press the keys simultaneously | <Key name> + <Key name><br>Example: <Alt> + <Ctrl>                                                                        |
| Buttons                       | <Key name><br>Example: <OK>; <Cancel>                                                                                     |
| Filenames, paths              | <i>Filename, Path</i><br>Example: <i>Test.docx</i>                                                                        |

## 1.3 Used symbols

If safety instructions or other notes are used in this manual, they mean:

---

### Danger!



**The non-observance of this safety information may result in an imminent risk of death or severe injury!**

Observe the specified measures.

---

### Warning!



**The non-observance of this safety information may result in a potential risk of death or severe injury!**

Observe the specified measures.

---

### Caution!



**The non-observance of this safety information may result in a potential risk of injury or material damage!**

Observe the specified measures.

---

### Note



A note specifies special requirements or actions to be observed.

---

### Tip



Tip or example as a helpful note or insider tip to make the work a little bit easier.

---

### Other documentation



Reference to additional documentation or further reading.

---

## 1.4 Documentation structure

The documentation for the *ibaPDA-Request-S7* interface (PDF edition) is divided into two separate parts. Each part has its own chapter and page numbering beginning at 1 and is independently updated.

| Part   | Title                                                                        | Content                                                                                                                                  |
|--------|------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| Part 1 | Applications of the Request data interface for SIMATIC S7 TIA Portal/S7-1500 | Features, settings, and Request blocks for the Request interface in conjunction with SIMATIC TIA Portal and S7-1500 S7 controller        |
| Part 2 | Applications of the Request data interface for SIMATIC S7-300/S7-400         | Features, settings, and Request blocks for the Request interface in conjunction with SIMATIC STEP 7 and S7-300 and S7-400 S7 controllers |

## 2 System requirements

The following system requirements apply for use of the *ibaPDA-Request-S7* data interface:

- *ibaPDA* v8.13.0 or higher
- Base license for *ibaPDA* + license for *ibaPDA-Request-S7*  
+ license for *ibaBM-PN*, *ibaBM-DP*, *ibaBM-DPM-S*, *ibaCom-L2B*,  
*ibaPDA-Interface-S7-TCP/UDP*, or *ibaPDA-Interface-ibaNet-E*
- *ibaFOB-D* card in the *ibaPDA* computer when using *ibaBM-PN*, *ibaBM-DP*, or *ibaBM-DPM-S* for coupling using fiber optics
- SIMATIC S7 controller S7-300, S7-400, S7-400H, S7-1500, WinAC (not all Request S7 variants are available for all controller types), for access to optimized data blocks S7-1500 firmware V3 or later
- If using PC/CP connections:
  - SIMATIC STEP 7/SIMATIC NET, or
  - SIMATIC TIA Portal
- SIMATIC CFC (from V6.0, not for TIA Portal), if signals are to be selected using drag & drop

For integration of Request blocks into S7 program:

- SIMATIC STEP 7 V5.4 SP5 or higher, or
- SIMATIC STEP 7 (TIA Portal) V18 or higher for access to optimized data blocks (function block libraries for older versions may be available on request)

For further requirements for the used computer hardware and the supported operating systems, refer to the *ibaPDA* documentation.

### System constraints

- Access to S7-1200 controllers is not supported.
- Connectors for STEP 7 CFC blocks that have constant values assigned have no operand address. They are marked as constant in the address book and cannot be selected as signals.
- If function blocks (FBs) are used in STEP 7 CFC, the internal static variables for the FB also appear in the address book because they are handled in exactly the same way as connectors by the compiler. These are to be ignored.
- *ibaPDA* supports the following data types for acquisition:  
BOOL, BYTE, WORD, DWORD, INT, DINT, REAL, TIME, CHAR  
All other data types appear in the address book but cannot be entered in the signal list.
- For functions (FCs) with connections of STRING, POINTER, STRUCT or ANY data types under STEP 7 CFC, the interpretation of the SCL code does not work, as the source does not contain any references to the data types.

**ibaREQsym block family**

- Firmware V3.0 or higher
- Supported items: E, A, M and items from data blocks, only elementary data types and individual items from structured data types
- Variables must have the attribute "Accessible from HMI/OPC UA/Web API" or "Writable from HMI/OPC UA/Web API".
- Max. length of symbolic variable name (fully qualified name including namespace): 254 UTF-16 characters
- Max. 10 Request instances can be simultaneously active per S7 CPU.
- Max. 2000 symbols can be simultaneously requested per S7 CPU.

Further information about the "ResolveSymbols" and "MoveResolvedSymbolsToBuffer" functions can be found in the Siemens documentation.

**ibaREQ3sym block family**

- TIA Portal V19 or higher
- Firmware V3.0 or higher
- Supported items: E, A, M and items from data blocks, only elementary data types and individual items from structured data types
- Variables must have the attribute "Accessible from HMI/OPC UA/Web API" or "Writable from HMI/OPC UA/Web API".
- Max. length of symbolic variable name (fully qualified name including namespace): 254 UTF-16 characters
- Max. 10 Request instances can be simultaneously active per S7 CPU.
- Max. 2000 symbols can be simultaneously requested per S7 CPU.

**License information**

| Order no. | Product name      | Description                                                                                                                                                                                                                    |
|-----------|-------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 31.001310 | ibaPDA-Request-S7 | Extension license for an <i>ibaPDA</i> system for use of Request-S7 with <i>ibaBM-PN</i> , <i>ibaBM-DP</i> , <i>ibaBM-DPM-S</i> , <i>ibaCom-L2B</i> , <i>ibaPDA-Interface-S7-TCP/UDP</i> , or <i>ibaPDA-interface-ibaNet-E</i> |

## 3 ibaPDA-Request-S7

This documentation is divided into three main sections:

- General section, valid for all communication channels:  
Chapter ↗ *ibaPDA-Request-S7, page 13*
- Variant-specific section with special information for each variant:  
Chapter ↗ *Request-S7 variants, page 39*  
Variants for S7-300 and S7-400 are described in Part 2 of the manual.
- Description of individual S7 function blocks:  
Chapter ↗ *Description of Request blocks, page 93*

---

### Other documentation



For further details, refer to the respective documentation:

- ibaCom-L2B-x-8 card
  - ibaBM-DP
  - ibaBM-DPM-S
  - ibaBM-PN
  - ibaPDA-Interface-ibaNet-E
  - ibaPDA-Interface-S7-TCP/UDP
- 

### 3.1 General information

When acquiring measurement data with *ibaPDA-Request-S7*, the measurement data is actively sent from the controller. Depending on the connection type, this is done via PROFIBUS slaves or PROFINET devices integrated into the device being used (e.g., ibaBM-DP), via the ibaNet-E protocol (UDP), or directly via UDP. For this purpose, one or more Request blocks (FB/FC + DBs) have to be integrated for each slave/device/connection in the S7-CPU program. These Request blocks are used to send the S7 operands/symbols selected by the user within *ibaPDA* to *ibaPDA*. If the signal selection is changed, no changes to the S7 program are needed.

The signals to be measured can be selected either using the absolute operand address or using the symbolic name with support from the *ibaPDA* address book browser. This browser allows access to all defined symbols in the connected STEP 7 project.

For S7-1500 you can use optimized data blocks. Signals within these data blocks can only be accessed using their symbolic names and not using the address or the operand. For CPUs with firmware V3 or higher, it is also possible to access this data using special Request blocks.

| Block family | S7 CPU firmware | TIA portal                                                                         | Access to optimized data blocks |
|--------------|-----------------|------------------------------------------------------------------------------------|---------------------------------|
| ibaREQ       | Unlimited       | From V18 (function block libraries for older versions may be available on request) | No                              |
| ibaREQsym    | From V3         | From V18                                                                           | Yes                             |
| ibaREQ3sym   | From V3         | From V19                                                                           | Yes                             |

For acquisition of data from SIMATIC S7 CPUs with *ibaPDA*, either different hardware devices from iba AG are available, or there is a facility for transferring the data using ibaNET-E (UDP) or using UDP directly.

#### Via PROFIBUS

- *ibaBM-DP* or the predecessor *ibaBM-DPM-S*
- *ibaCom-L2B* PCI card

#### Via PROFINET

- *ibaBM-PN*

#### Via ibaNet-E or UDP

- Default network adapter

Request blocks for *ibaPDA-Request-S7* are available for the following system configuration:

| SIMATIC STEP 7 V5.x (SIMATIC Manager)                  |          |             |            |          |          |     |
|--------------------------------------------------------|----------|-------------|------------|----------|----------|-----|
| SIMATIC S7 CPU                                         | ibaBM-DP | ibaBM-DPM-S | ibaCom-L2B | ibaBM-PN | ibaNet-E | UDP |
| S7-300 integrated DP interface                         | X        | X           | X          | -        | -        | -   |
| S7-300 CP342-5 (PROFIBUS)                              | -        | -           | X          | -        | -        | -   |
| S7-400 integrated DP interface and CP443-5             | X        | X           | X          | -        | -        | -   |
| S7-400H Integrated DP interface and CP443-5 (PROFIBUS) | X        | X           | -          | -        | -        | -   |
| S7-300 integrated PN interface                         | -        | -           | -          | X        | -        | X   |
| S7-400 integrated PN interface and CP443-1 (PROFINET)  | -        | -           | -          | X        | -        | X   |

Table 1: Available Request blocks SIMATIC Manager

| SIMATIC STEP 7 V1x Professional (TIA Portal)                                       |          |             |          |          |     |
|------------------------------------------------------------------------------------|----------|-------------|----------|----------|-----|
| SIMATIC S7 CPU                                                                     | ibaBM-DP | ibaBM-DPM-S | ibaBM-PN | ibaNet-E | UDP |
| S7-300<br>integrated DP interface                                                  | X        | X           | -        | -        | -   |
| S7-300<br>integrated PN interface                                                  | -        | -           | X        | -        | X   |
| S7-400<br>integrated DP interface and CP443-5                                      | X        | X           | -        | -        | -   |
| S7-400<br>integrated PN interface and CP443-1 (PROFINET)                           | -        | -           | X        | -        | X   |
| S7-1500<br>integrated DP interface and CM1542-5 or CP1542-5 (PROFIBUS)             | X        | X           | -        | -        | -   |
| S7-1500<br>integrated PN interface and CM1542-1 (PROFINET)                         | -        | -           | X        | -        | X   |
| S7-1500<br>Integrated PN interface and communication processor with UDP capability | -        | -           | -        | X        | X   |

Table 2: Available Request blocks SIMATIC TIA portal

**Note**

You can find the Request blocks in the iba S7 library, see [iba S7 library, page 151](#). Always use the latest version of this library.

## 3.2 Configuration and engineering SIMATIC S7

Independent of the used communication interface, carry out the following configuration steps on the SIMATIC side:

- Hardware configuration:  
Integration of the devices in the device configuration, HW Config or NetPro.
- Software configuration (STEP 7):  
Integration of the Request blocks in the S7 program

For detailed information about this subject, see the respective sections in chapter [Request-S7 variants](#), page 39.

## 3.3 Configuration and engineering ibaPDA

The following section describes the configuration aspects of the request modules that apply to all request interfaces.

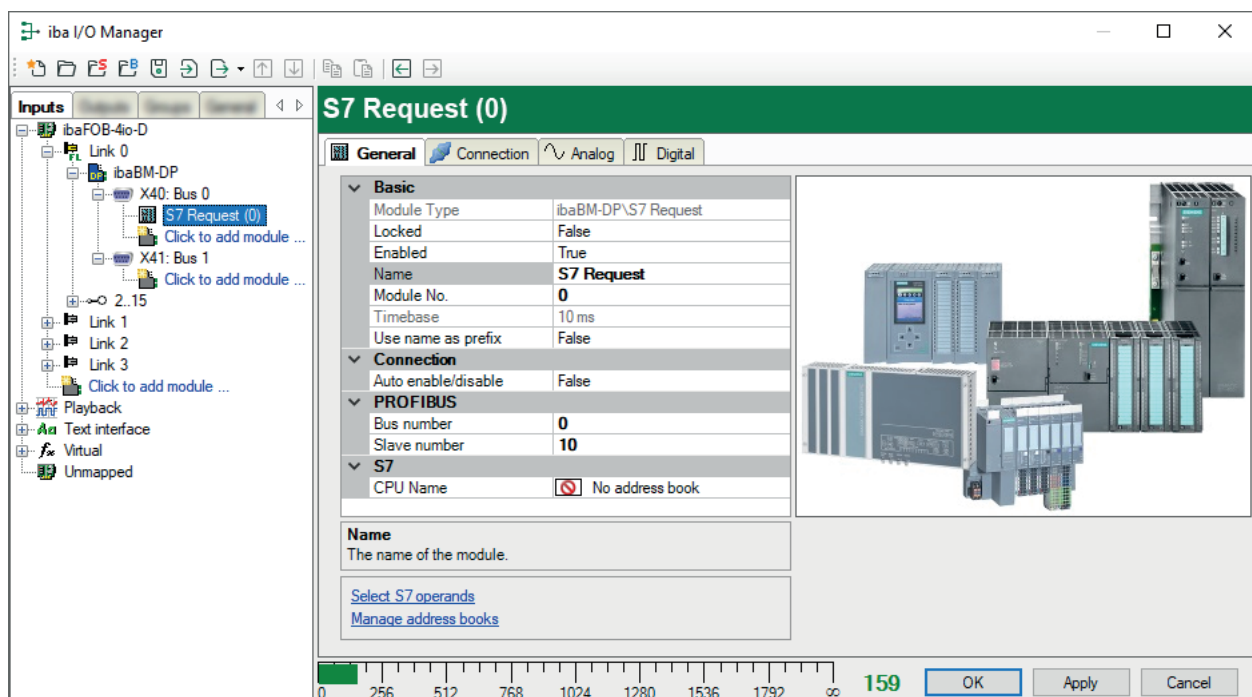
### 3.3.1 General interface settings

For the configuration of the device-specific settings, please see chapter [Request-S7 variants](#), page 39.

### 3.3.2 General module settings

To configure a module, select it in the tree structure.

All modules have the following setting options.



---

**Note**

General settings that are not described here are module-specific settings. These settings are described in chapter [Request-S7 variants, page 39](#) under the respective module version.

---

**Basic settings****Module Type (information only)**

Indicates the type of the current module.

**Locked**

You can lock a module to avoid unintentional or unauthorized changing of the module settings.

**Enabled**

Enable the module to record signals.

**Name**

You can enter a name for the module here.

**Comment**

You can enter a comment or description of the module here. This will be displayed as a tooltip in the signal tree.

**Module No.**

This internal reference number of the module determines the order of the modules in the signal tree of *ibaPDA* client and *ibaAnalyzer*.

**Timebase**

All signals of the module are sampled on this timebase.

**Use module name as prefix**

This option puts the module name in front of the signal names.

**S7****CPU Name**

Select the S7-CPU that is connected to this module. When selecting a S7-CPU (incl. the address book), you can select the signals symbolically. Otherwise, you select the signals via the S7 operand.

This requires that address books have already been generated. Otherwise, the selection list is empty. Using *Create address book* in the selection list, you get directly to the address book generator, see [Creating address books offline from S7 project, page 36](#).

### 3.3.3 Connection settings

Configure the connection of the module to the controller in the *Connection* tab.

*ibaPDA* supports the following controllers, connection modes and selection methods:

| Controller | Connection mode |       |                |
|------------|-----------------|-------|----------------|
|            | TCP/IP          | PC/CP | TCP/IP S7-1x00 |
| S7-300     | X               | X     | -              |
| S7-400     | X               | X     | -              |
| S7-1500    | X               | -     | X              |

Configure different settings depending on the connection mode.

#### 3.3.3.1 Connection mode PC/CP

This mode activates a connection over the interface cards of the computer that are configured using SIMATIC Net.

You can use the interfaces configured in SIMATIC Net, e.g.:

- MPI adapter (COM)
- MPI adapter (USB)
- PROFIBUS (CP5611, CP5622)
- TCP/IP (RFC1005)
- ...

#### Note



If you want to use this connection type, the Siemens software SIMATIC Net (e.g. SIMATIC Manager or Softnet) has to be installed. When using the modules CP55..., CP56... and the MPI adapter, the installation of the device drivers is sufficient.

#### Connection mode

Selection of the PC/CP connection mode

### Connection type

Selection of the connection type PG, OP, or other connections (determines which type of connection resource is occupied on the CPU).

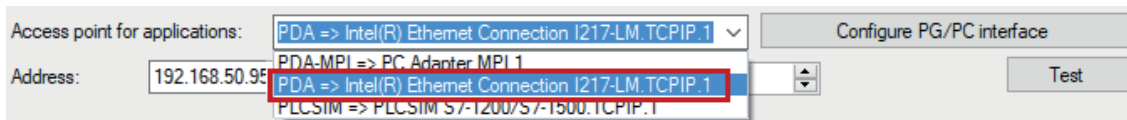
### Timeout

Specify a value for the timeout in seconds for establishing the connection and for read access. If the time set here is exceeded, *ibaPDA* declares the controller as not accessible or not responsive.

### Access point for applications

Selection of the access point to be used

For more information on creating and configuring an access point, see [➤ Setting PG/PC interface/defining new access point, page 157](#).



### Note



Configure available access points in SIMATIC Net with the "PG/PC interface settings" tool by Siemens.

For the connection of *ibaPDA-Request-S7* to SIMATIC S7 via PC/CP connections, iba generally recommends setting a specific access point for *ibaPDA* when *ibaPDA-Request-S7* and SIMATIC Manager run on the same computer. With an own access point, there is no longer the risk that the access for *ibaPDA-Request-S7* will be disturbed in case the standard access point is changed in the SIMATIC Manager.

### <Configure PG/PC interface>

This button opens the dialog box for setting the PG/PC interface of SIMATIC STEP 7.

### Address

Address of the controller (MPI, PROFIBUS or IP address depending on the configured access point)

### Rack

Rack number of the controller (default: 0)

### Slot

Slot number of the controller in the rack  
(Use "0" for S7-1500 CPUs.)

### Local port

By default, Windows assigns the local TCP port for S7 connections dynamically. Here, you can specify a static port if required.

**Activate S7 routing**

Activate this option if the S7-CPU and the *ibaPDA* computer are not in the same network, but only communicate over a gateway that supports S7 routing. Such a gateway can be e.g. an IE/PB link, over which a S7-CPU can be reached without an Ethernet connection.

Two additional input fields appear:

- Address of device acting as gateway: Enter the IP address of the gateway.
- S7 subnet ID of target net: Enter subnet ID from STEP 7 NetPro or TIA Portal.

For more information on S7 routing, see ➔ *S7 routing, page 160*.

**DB**

Number of the data block used as *ibaPDA* communication interface (ibaREQ\_DB)

**PROFINET Device Slot or PROFIBUS slave number (not for ibaNet-E)**

- PROFINET: Number of the used slot of the *ibaBM-PN*
- PROFIBUS: PROFIBUS slave address assigned to the module. If you change the entry in the *Connection* tab, the entry in the *General* tab changes accordingly and vice versa.

**CPU Name**

Selection of the linked address book

**Detect S7 restart**

The current request configuration is stored in a data block on the CPU. In case the *Detect S7 restart* option is enabled, *ibaPDA* can detect if this data block has been deleted or overwritten, e.g. as a result of loading the offline program or due to a cold restart. *ibaPDA* then restarts the data acquisition. The configuration data are transferred again. This does not affect a warm restart of the CPU.

**<Test>**

*ibaPDA* tests the connection to the CPU and displays available diagnostic data.

**S7 Request (2)**

General Connection Analog I/O Digital S7 request info

Connection mode: PC/CP Connection type: PG connection Timeout (s): 15

Access point for applications: ibaTCP => TCP/IP -> Intel(R) PRO/1000 PL N... Configure PG/PC interface

Address: 192.168.123.1 Rack: 0 Slot: 0 Test

☐ Local port: Dynamic

☐ Activate S7 routing

DB: 15 PROFINET device slot: 1

CPU Name: No address book Detect S7 restart (This applies to all S7 request modules)

Connection established  
MLFBNr of PLC is: **6ES7 412-2EK06-0AB0**  
PLC status: **RUN**  
Cycle times: Actual 1 ms Min 1 ms Max 2 ms  
Reading **DB15**  
DB id: **ibaREQ-S7-M**  
DB version: **1.0.0.0**  
FB version: **1.0.0.0**  
DB length: **5280**  
Max. pointers: **128**  
Max. data bytes: **252**  
HW version: **0**  
Total memory size: **1072432**  
DB memory size: **528384**  
DB used size: **11762**  
Code memory size: **544048**  
Code used size: **26580**  
No. inputs: **128**  
No. outputs: **128**  
No. markers: **4096**  
No. timers: **2048**  
No. counters: **2048**  
I/O space: **4096**  
Local datasize: **4096**

| Device slot | Length | Status    |
|-------------|--------|-----------|
| 1           | 252    | available |

**Tip**

Error message "DB is not a valid request DB ..."

Check the following:

- The Request block has been loaded into the CPU.
- The right DB number has been configured on the Request block.
- The Request block is called in the program.
- Possibly, the DB is written from another source.

### 3.3.3.2 Connection mode TCP/IP

This mode activates a connection via the standard network interface of the computer.

**S7 Request (2)**

General Connection Analog J1 Digital S7 request info

Connection

Connection mode: TCP/IP Connection type: PG connection Timeout (s): 15

Address: 192.168.123.1 Port: 102 Rack: 0 Slot: 0 Test

☐ Local port: Dynamic

☐ Activate S7 routing

DB: 15 PROFINET device slot: 1

CPU Name: No address book ☒ Detect S7 restart (This applies to all S7 request modules)

#### Connection mode

Selection of the TCP/IP connection mode

#### Connection type

Selection of the connection type PG, OP, or other connections (determines which type of connection resource is occupied on the CPU).

#### Timeout

Specify a value for the timeout in seconds for establishing the connection and for read access. If the time set here is exceeded, *ibaPDA* declares the controller as not accessible or not responsive.

#### Address

IP address of the controller

#### Port

Number of destination port on the controller

#### Note



For the communication with the CPU, the port that is specified here must be allowed in the target system. If data traffic passes through an external firewall, you must also allow the specified port in this firewall.

#### Rack

Rack number of the controller (default: 0)

#### Slot

Slot number of the controller in the rack  
(Use "0" for S7-1500 CPUs.)

#### Local port

By default, Windows assigns the local TCP port for S7 connections dynamically. Here, you can specify a static port if required.

**Activate S7 routing**

Activate this option if the S7-CPU and the *ibaPDA* computer are not in the same network, but only communicate over a gateway that supports S7 routing. Such a gateway can be e.g. an IE/PB link, over which a S7-CPU can be reached without an Ethernet connection.

Two additional input fields appear:

- Address of device acting as gateway: Enter the IP address of the gateway.
- S7 subnet ID of target net: Enter subnet ID from STEP 7 NetPro or TIA Portal.

For more information on S7 routing, see ➤ *S7 routing*, page 160.

**DB**

Number of the data block used as *ibaPDA* communication interface (ibaREQ\_DB)

**PROFINET Device Slot or PROFIBUS slave number (not for ibaNet-E)**

- PROFINET: Number of the used slot of the *ibaBM-PN*
- PROFIBUS: PROFIBUS slave address assigned to the module. If you change the entry in the *Connection* tab, the entry in the *General* tab changes accordingly and vice versa.

**CPU Name**

Selection of the linked address book

**Detect S7 restart**

The current request configuration is stored in a data block on the CPU. In case the *Detect S7 restart* option is enabled, *ibaPDA* can detect if this data block has been deleted or overwritten, e.g. as a result of loading the offline program or due to a cold restart. *ibaPDA* then restarts the data acquisition. The configuration data are transferred again. This does not affect a warm restart of the CPU.

**<Test>**

*ibaPDA* tests the connection to the CPU and displays available diagnostic data.

**S7 Request (2)**

General Connection Analog I/O Digital S7 request info

Connection mode: TCP/IP Connection type: PG connection Timeout (s): 15

Address: 192.168.123.1 Port: 102 Rack: 0 Slot: 0 Test

☐ Local port: Dynamic

☐ Activate S7 routing

DB: 15 PROFINET device slot: 1

CPU Name: No address book ☒ Detect S7 restart (This applies to all S7 request modules)

Connection established  
MLFBNr of PLC is: **6ES7 412-2EK06-0AB0**  
PLC status: **RUN**  
Cycle times: Actual 1 ms Min 1 ms Max 2 ms  
Reading **DB15**  
DB id: **ibaREQ-S7-M**  
DB version: **1.0.0.0**  
FB version: **1.0.0.0**  
DB length: **5280**  
Max. pointers: **128**  
Max. data bytes: **252**  
HW version: **0**  
Total memory size: **1072432**  
DB memory size: **528384**  
DB used size: **11762**  
Code memory size: **544048**  
Code used size: **26580**  
No. inputs: **128**  
No. outputs: **128**  
No. markers: **4096**  
No. timers: **2048**  
No. counters: **2048**  
I/O space: **4096**  
Local datasize: **4096**

| Device slot | Length | Status    |
|-------------|--------|-----------|
| 1           | 252    | available |

**Tip**

Error message "DB is not a valid request DB ..."

Check the following:

- The Request block has been loaded into the CPU.
- The right DB number has been configured on the Request block.
- The Request block is called in the program.
- Possibly, the DB is written from another source.

### 3.3.3.3 Connection mode TCP/IP S7-1x00

This mode activates a connection via the standard network interface of the computer. You can only use this mode in combination with S7-1500 CPUs.

#### Connection mode

Selection of the TCP/IP S7-1x00 connection mode

#### Connection type

Selection of the connection type PG, OP, or other connections (determines which type of connection resource is occupied on the CPU).

#### Timeout

Specify a value for the timeout in seconds for establishing the connection and for read access. If the time set here is exceeded, *ibaPDA* declares the controller as not accessible or not responsive.

#### Address

IP address of the controller

#### Port

Number of destination port on the controller

#### Note



For the communication with the CPU, the port that is specified here must be allowed in the target system. If data traffic passes through an external firewall, you must also allow the specified port in this firewall.

#### Local port

By default, Windows assigns the local TCP port for S7 connections dynamically. Here, you can specify a static port if required.

#### Use secure communication

The S7-1x00 controllers support secure communication via TLS encryption. In TIA Portal, you can set secure PG/PC and HMI communication.

If you have activated this option in the controller, you must also activate secure communication in *ibaPDA*.

## User

If user management is enabled in TIA Portal, enter the username and password here.

If user management is not enabled and only certain access levels for the controller require a password, leave this field blank.

## Password

Depending on the configuration in the controller, access to the PLC may be protected by a password. Enter this password here.

## DB

Number of the data block used as *ibaPDA* communication interface (ibaREQ\_DB)

## PROFINET Device Slot or PROFIBUS slave number (not for ibaNet-E)

- PROFINET: Number of the used slot of the *ibaBM-PN*
- PROFIBUS: PROFIBUS slave address assigned to the module. If you change the entry in the *Connection* tab, the entry in the *General* tab changes accordingly and vice versa.

## CPU Name

Selection of the linked address book (only TIA Portal address books available).

## Detect S7 restart

The current request configuration is stored in a data block on the CPU. In case the *Detect S7 restart* option is enabled, *ibaPDA* can detect if this data block has been deleted or overwritten, e.g. as a result of loading the offline program or due to a cold restart. *ibaPDA* then restarts the data acquisition. The configuration data are transferred again. This does not affect a warm restart of the CPU.

## <Test>

*ibaPDA* tests the connection to the CPU and displays available diagnostic data.

**S7 Request (2)**

General Connection Analog Digital S7 request info

Connection mode: TCP/IP S7-1x00 Connection type: PG connection Timeout (s): 15

Address: 192.168.80.90 Port: 102 Test

☐ Local port: Dynamic

☐ Use secure communication User: Password:

DB: ibaREQ\_DB\_PN (DB17) PROFINET device slot: 1 Load address book from S7

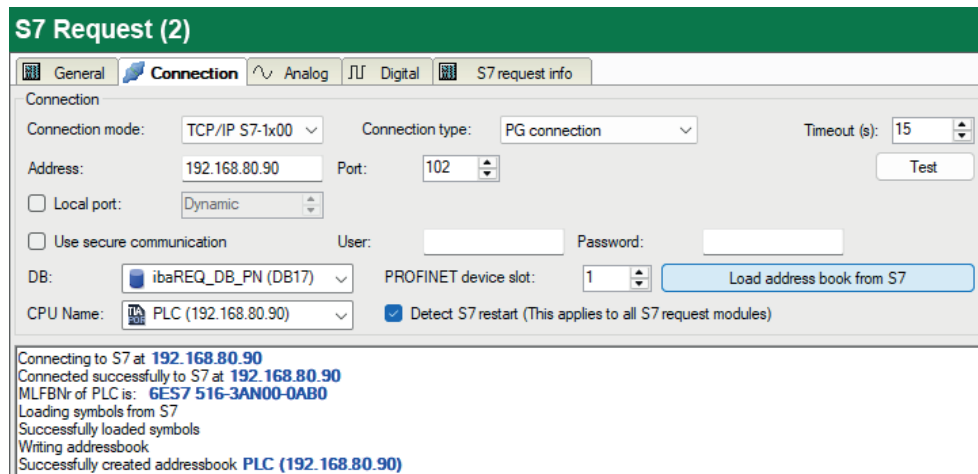
CPU Name: PLC (192.168.80.90) ☒ Detect S7 restart (This applies to all S7 request modules)

Connection established  
MLFBNr of PLC is: 6ES7 516-3AN00-0AB0  
Reading ibaREQ\_DB\_PN (DB17)  
DB id: ibaREQ-S7-M  
DB version: 1.0.0.0  
FB version: 1.3:1.3  
DB length: 9120  
Max. pointers: 512  
Max. data bytes: 252  
HW version: 0  
Total memory size: 0  
DB memory size: 0  
DB used size: 0  
Code memory size: 0  
Code used size: 0  
No. inputs: 32768  
No. outputs: 32768  
No. markers: 16384  
No. timers: 2048  
No. counters: 2048  
I/O space: 0  
Local datasize: 0

| Device slot | Length | Status    |
|-------------|--------|-----------|
| 1           | 252    | available |

### <Load address book from S7>

By clicking on this button *ibaPDA* reads the list of symbols directly from the PLC and stores it in an address book for further use in the symbol browser.



**S7 Request (2)**

General Connection Analog I/O Digital S7 request info

Connection mode: TCP/IP S7-1x00 Connection type: PG connection Timeout (s): 15

Address: 192.168.80.90 Port: 102 Test

☐ Local port: Dynamic

☐ Use secure communication User: Password:

DB: ibaREQ\_DB\_PN (DB17) PROFINET device slot: 1 Load address book from S7

CPU Name: PLC (192.168.80.90) ☒ Detect S7 restart (This applies to all S7 request modules)

Connecting to S7 at 192.168.80.90  
 Connected successfully to S7 at 192.168.80.90  
 MLFBNr of PLC is: 6ES7 516-3AN00-0AB0  
 Loading symbols from S7  
 Successfully loaded symbols  
 Writing addressbook  
 Successfully created addressbook PLC (192.168.80.90)

### Tip



Error message "DB is not a valid request DB ..."

Check the following:

- The Request block has been loaded into the CPU.
- The right DB number has been configured on the Request block.
- The Request block is called in the program.
- Possibly, the DB is written from another source.

In this context, also note the access protection of an S7-1500 CPU.

For more information, see [↗ Device configuration, page 94](#)

<sup>1)</sup> The prerequisite for this is use of the optional S7-CFC SIMATIC STEP 7 package. For TIA portal, SIMATIC CFC is not supported.

### 3.3.4 Signal configuration

In the I/O Manager, you select the signals to be acquired. There are 3 ways of selecting measured values:

- Selection using the absolute address of the S7 operands, see [↗ Selection via the absolute address of the operands, page 29](#)
- Selection using the S7 symbol addresses (symbol table and symbols from DBs) using a symbol browser, see [↗ Selection via the symbolic operand addresses, page 30](#)
- Selection using the CFC connectors (when programming the CPU with SIMATIC CFC), see [↗ Selection of CFC connectors, page 33](#)

| SIMATIC CPU | Access using absolute address | Access using symbol | Access using CFC connectors <sup>1)</sup> |
|-------------|-------------------------------|---------------------|-------------------------------------------|
| S7-300      | X                             | X                   | X                                         |
| S7-400      | X                             | X                   | X                                         |
| WinAC       | X                             | X                   | X                                         |
| S7-1500     | X                             | X                   | -                                         |

Supported operand ranges:

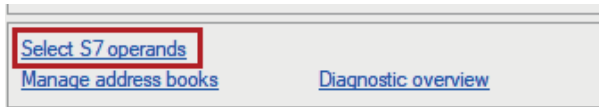
| Operand range          | SIMATIC CPUs S7-300/400 | SIMATIC CPUs S7-1500 |
|------------------------|-------------------------|----------------------|
| Inputs (I)             | X                       | X                    |
| Peripheral inputs (PI) | X                       | -                    |
| Outputs (O)            | X                       | X                    |
| Markers (M)            | X                       | X                    |
| Data blocks (DB)       | X                       | X                    |

For S7-1500 you can use optimized data blocks. Signals within these data blocks can only be accessed using their symbolic names and not using the address or the operand. To access these data ranges, you must use the Request blocks from the ibaREQsym family, see [↗ ibaREQsym iba block family, page 111](#).

### 3.3.4.1 Selection via the absolute address of the operands

You have two options to select the measurement values via the operand address:

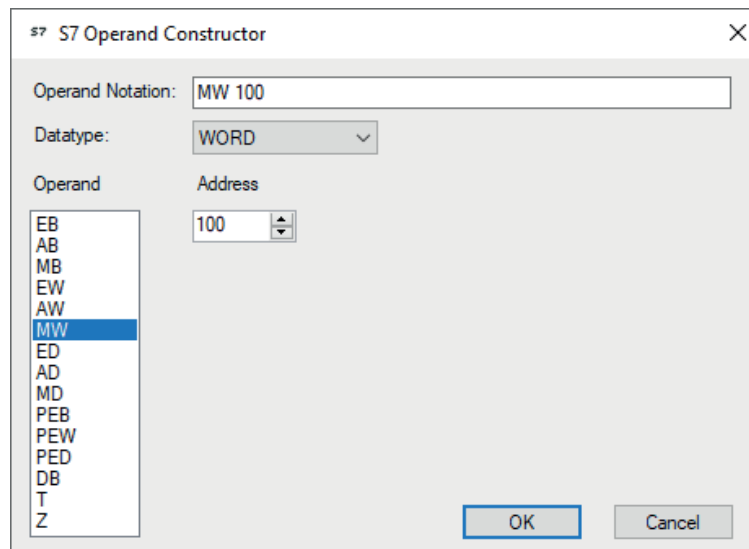
- In the module's *General* tab, click on the *Select S7 operands* link.



The S7 operand editor opens.

- In the *Analog* or *Digital* tab, click in a cell in the *S7 operand* column.

The button <...> appears. Click the button to open the S7 operand editor.



After you have set the desired operand address, click <OK> to exit the dialog.

Thereafter, you can enter the signal name in the *Name* column.

| S7 General Connection Analog Digital Diagnostics |               |                                                                                     |      |        |            |             |                                     |
|--------------------------------------------------|---------------|-------------------------------------------------------------------------------------|------|--------|------------|-------------|-------------------------------------|
|                                                  | Name          | Unit                                                                                | Gain | Offset | S7 Operand | S7 DataType | Active                              |
| 0                                                | counter 16bit |  | 1    | 0      | MW 100     | WORD        | <input checked="" type="checkbox"/> |
| 1                                                | counter 32bit |                                                                                     | 1    | 0      | MD 104     | DWORD       | <input checked="" type="checkbox"/> |
| 2                                                | sinus         |                                                                                     | 1    | 0      | MD 112     | REAL        | <input checked="" type="checkbox"/> |
| 3                                                | cosinus       |                                                                                     | 1    | 0      | MD 116     | REAL        | <input checked="" type="checkbox"/> |
| 4                                                |               |                                                                                     | 1    | 0      |            | INT         | <input type="checkbox"/>            |

You can enter the desired operand address also directly in the *S7 Operand* column without using the S7 operand editor.

### 3.3.4.2 Selection via the symbolic operand addresses

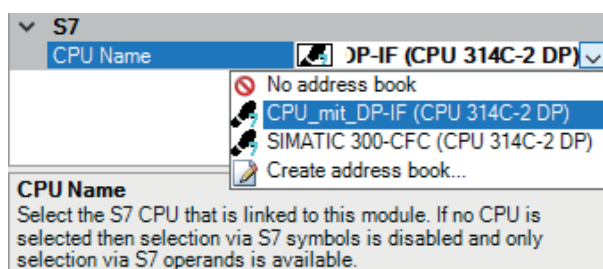
An advantage of this way of access is that the symbol addresses are applied automatically in *ibaPDA* as signal names.

Requirements for this method of access:

- The signals to be measured already have an entry in the S7 symbol table, the PLC variable list or in a data block.
- An address book has been created (see chapter [Address books](#), page 35).

#### Integrating an address book into a module

- In the module's *General* tab under *CPU Name*, select the S7-CPU you want to assign this module to.



- In the *Analog* and *Digital* tabs, an additional column *S7 Symbol* is displayed.

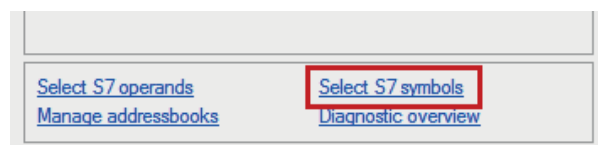
| S7 General Connection Analog Digital Diagnostics |      |      |      |        |            |             |                          |
|--------------------------------------------------|------|------|------|--------|------------|-------------|--------------------------|
|                                                  | Name | Unit | Gain | Offset | S7 Operand | S7 DataType | Active                   |
| 0                                                |      |      | 1    | 0      |            | INT         | <input type="checkbox"/> |
| 1                                                |      |      | 1    | 0      |            | INT         | <input type="checkbox"/> |
| 2                                                |      |      | 1    | 0      |            | INT         | <input type="checkbox"/> |
| 3                                                |      |      | 1    | 0      |            | INT         | <input type="checkbox"/> |
| 4                                                |      |      | 1    | 0      |            | INT         | <input type="checkbox"/> |

- Now you can access symbol addresses using the S7 CFC- and Symbol Browser (in short: symbol browser).

#### Selecting signals via the symbol browser

You have two options to select the signals to be measured:

- In the module's *General* tab, click on the *Select S7 symbols* link.



The symbol browser opens.

In the symbol browser, you can select all symbols of the address book. *ibaPDA* enters the selected signals automatically in the appropriate table *Analog* or *Digital*. You can add several signals successively.

- On the *Analog* or *Digital* tab, click in a cell of the *S7 Symbol* column.

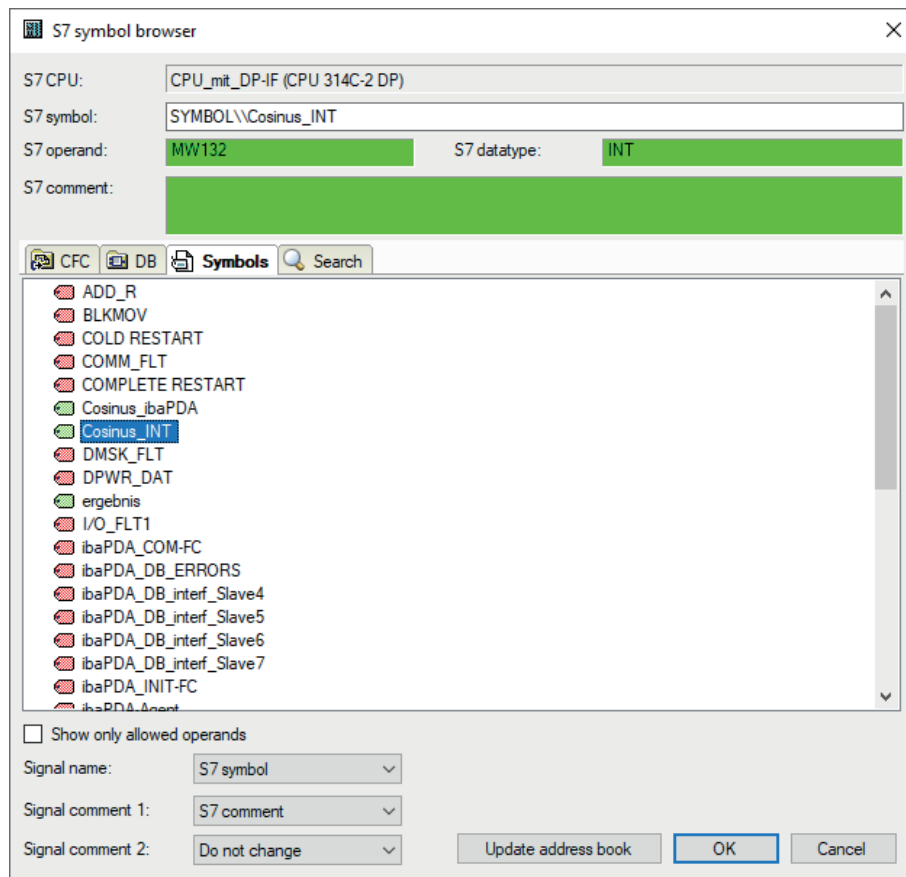
The button <...> appears. Click this button to open the symbol browser.

In the symbol browser, you can only select symbols with the data type matching the table. *ibaPDA* enters the symbol in the previously selected row of the signal table. After every selection, the symbol browser closes.

### User interface of the symbol browser

In the symbol browser, you have the following options:

- **CFC variables:**  
On the *CFC* tab, you can select the configured CFC variables consisting of the configured names of chart, block and connector.
- **DB variables:**  
On the *DB* tab, you can select the individual data blocks and their variables.
- **Symbol table:**  
On the *Symbols* tab, you can select the entries of the S7 symbol table.
- **Search tab:**  
You can search the variables with a part of their name.



After selecting the variable, the symbol browser shows the operand address, the data type and a comment.

The variables have the following colors:

|        |                                                                                                                                                                                     |
|--------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Green  | The operand is valid. You can transfer it to the signal table with <Add> or <OK>.                                                                                                   |
| Yellow | The operand has a data type that does not match the selected row or table, e. g. in case you have selected a Boolean variable as analog value or an integer value as digital value. |
| Red    | The operand has a data type that is not supported by <i>ibaPDA</i> , or the operand is a constant.                                                                                  |

### Show only allowed operands

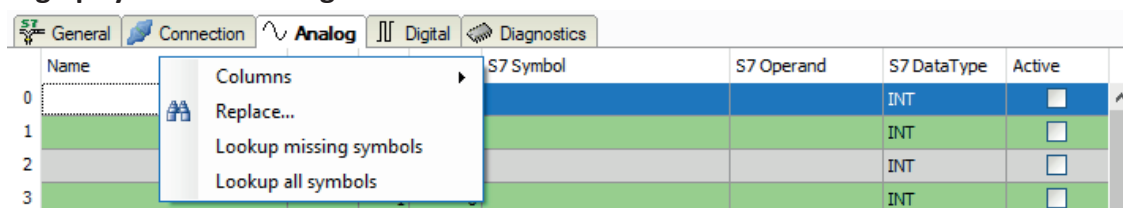
If you activate this option, the symbol browser shows only operands and symbols that *ibaPDA* supports or that match the signal table from which you opened the browser (i.e. no red and yellows ones).

### Signal name, signal comment 1 and 2

Usually, *ibaPDA* adopts the symbolic signals name from STEP 7 as signal name in the I/O Manager. Using these three drop-down menus, you can change the signal name and both comments.

Please select an option from the alternatives offered. If a signal name or comment in the signal table should not be changed, select *Do not change*.

### Looking up symbols in the signal table



*ibaPDA* can look up the symbol that corresponds with an operand.

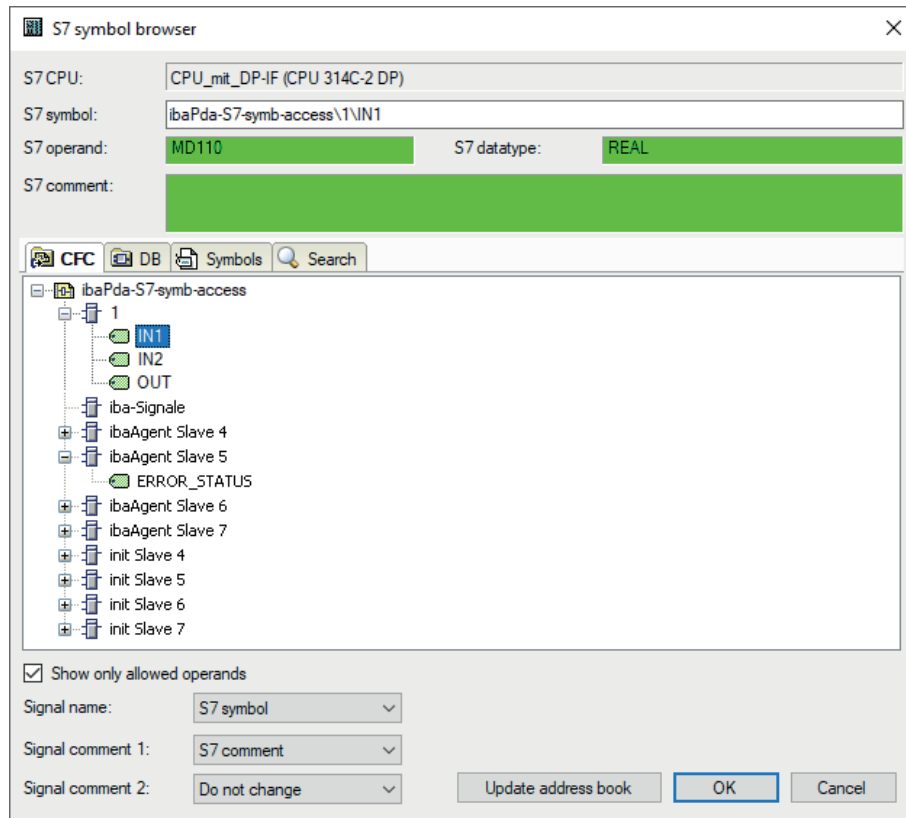
Right-click on the table header of the signal table.

- Select *Lookup missing symbols* to search only for the missing symbols.
- Select *Lookup all symbols* to search and replace all symbols that have changed on the controller and in the address book. Modified comments from the address book are transferred to the signal table and overwrite the existing entries.  
The command executes a backward resolution of the S7 symbols out of the S7 operands. *ibaPDA* searches the symbol table first, then CFC and finally the DBs for the operands.

### 3.3.4.3 Selection of CFC connectors

In order to select CFC connectors for the measurement, open the symbol browser first, see [➤ Selection via the symbolic operand addresses, page 30](#).

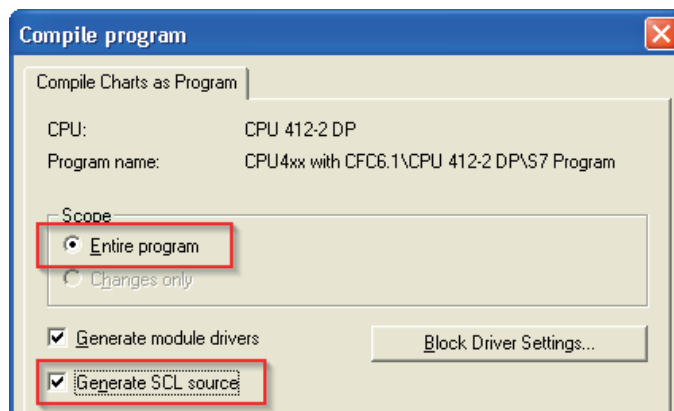
In the symbol browser, you open the *CFC* tab and select the signal. The connectors are listed hierarchically by chart name, module name and connector name:



#### Note



If no connectors are shown in the *CFC* tab, the SCL sources might not have been translated in the STEP 7 project. Activate the following options in the dialog for compiling the program in the SIMATIC software:



Afterwards, generate the address books again.

## Note



When compiling a CFC program, DB addresses are assigned automatically in STEP 7 to the connectors. It may happen that other DB addresses are assigned to connectors, depending on the scope of the program changes that have been made between two compilation runs.

In this case, also the address book for *ibaPDA* has to be generated again. The symbolically configured signals are automatically checked in the I/O Manager whereas the related absolute S7 operands are updated.

## Special function Drag & Drop

A convenient way to select signals is to drag & drop them from the CFC chart into the I/O Manager of *ibaPDA*.

1. Open the I/O Manager of *ibaPDA* and the signal table of the required module.
  2. Start the CFC editor on the same computer as the *ibaPDA* client.
  3. Drag the connector from the CFC editor into the desired line of the signal table in the I/O Manager of *ibaPDA*.
- The CFC connector is now a measured signal in the signal table of the module.

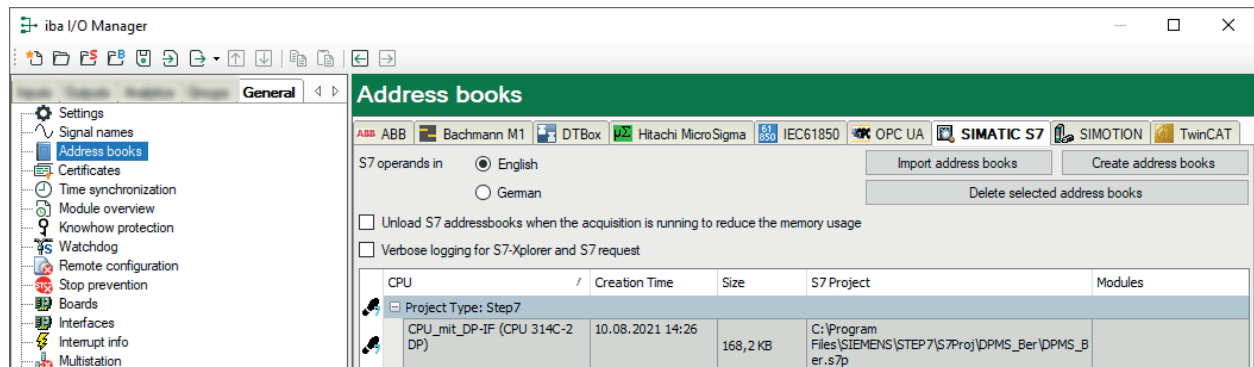
The screenshot shows the 'iba I/O-Manager' window with the 'S7-Xplorer (0)' tab active. The 'General' sub-tab displays a table of S7 symbols and operands. A red arrow indicates a connector from the CFC chart being dragged into the table.

| Name                      | Unit | Gain | Offset | S7 Symbol                 | S7 Operand | S7 DataType | Active                   |
|---------------------------|------|------|--------|---------------------------|------------|-------------|--------------------------|
| Signalgenerator\CMP_R\IN1 |      | 1    | 0      | Signalgenerator\CMP_R\IN1 |            | REAL        | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |
|                           |      | 1    | 0      |                           |            | INT         | <input type="checkbox"/> |

The CFC chart below shows a connector labeled 'IN1' being dragged from the 'IN - REAL' section to the 'Signalgenerator\CMP\_R\IN1' row in the table.

### 3.3.5 Address books

The address books for SIMATIC S7 controllers are created and managed across modules. You can use one address book in more than one module.



There are different types of address books for the different S7 project types:

- STEP 7: SIMATIC Manager project  
(not for S7-Xplorer modules with connection mode TCP/IP S7-1x00)
- TIA Portal: TIA Portal Project

#### S7 operands in English/German

Here you can choose the language in which the S7 operands will later be available when browsing through the signal tables.

#### <Create address books>

This button opens the "S7 address book generator" dialog. You can select the source directory of an S7 project for creating the S7 address book. This can be a local or network drive.

#### <Import address books>

Import address books which are already available as ZIP files.

#### <Delete selected address books>

Delete address books from the *ibaPDA* server's directory.

#### Unload S7 address book when the acquisition is running to reduce the memory usage

By enabling this option, the address book is outsourced to the hard disk during the acquisition in order to free up the main memory for the acquisition.

#### Table

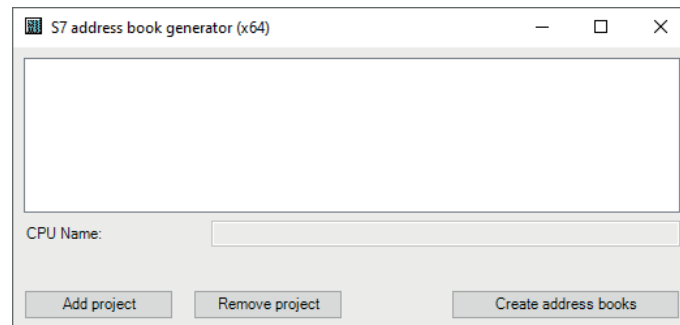
List of all address books that are currently available in the system with name, creation date, path of STEP 7 project or IP address of the CPU in case of online generated address books and location where the address book is used.

### 3.3.5.1 Creating address books offline from S7 project

For creating an address book, the S7 project has to be available. For the subsequent use, this is not necessary.

You create an address book using the S7 address book generator.

#### S7 address book generator



#### CPU Name

Name of the CPU

#### Step 7 HW Config export

A HW config export file can be selected as an option (useful when using an iba bus monitor in sniffer mode)

#### Comment language

Selection of the language that is to be imported for comment texts (only available for SIMATIC TIA portal projects)

#### <Add project>

Adds a new project to the list

#### Remove project>

Removes the marked project from the list

#### <Create address books>

Creates address books from the selected projects

---

#### Note



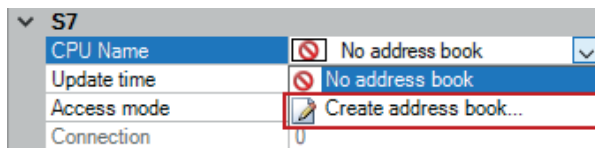
You can overwrite the entry in the *CPU Name* field. Thus, you can assign a unique name for the CPU that differs from that in the STEP 7 project. This is especially interesting when you use several STEP 7 projects in which the CPUs have the same name.

---

## Creating address books via the S7 address book generator

1. Open the S7 address book generator by one of the following ways:

- On the *General* tab *Address books* node via the <Create address books> button
- In the module configuration on the *General* tab under *S7 – CPU Name*: Select *Create address book* in the drop-down menu.

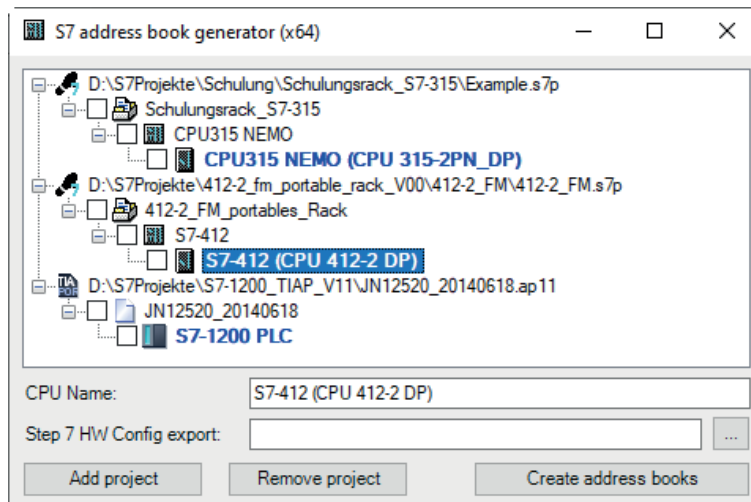


2. Click on the <Add project>.

3. Select a project file in the file browser

→ Now, the STEP 7 project with all configured CPUs is displayed.

4. Mark the CPUs you want to create the address books from and click on <Create address books>.



### Note



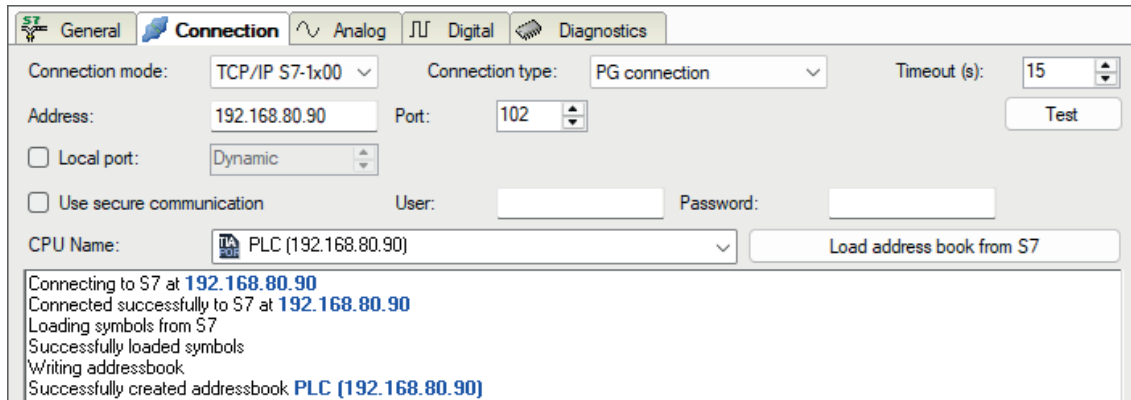
When address books of these projects are generated, TIA Portal projects must be compiled, saved and closed.

### 3.3.5.2 Creating address books online from S7-1200/1500 CPU

You can create online address books out of an S7-1200 or S7-1500 CPU if connection mode *TCP/IP S7-1x00* has been selected. The address data are read directly from the CPU. Accessing the S7 project is not necessary.

Click on <Load address book from S7> to load the address book.

The CPU name of the address book is given automatically.



Address books that have been created online also contain operand type address information and hence can be used in connection mode TCP/IP as well. Just change the connection mode after creating the address book.

## 4 Request-S7 variants

This chapter describes the Request-S7 variants for applications with S7-1500 controllers. For applications with S7-300 and S7-400 controllers, refer to the manual Part 2.

| S7 family | Firmware  | Addressing type | Access to optimized data blocks | iba block family      | iba data paths        |
|-----------|-----------|-----------------|---------------------------------|-----------------------|-----------------------|
| S7-1500   | Unlimited | Operands        | No                              | ibaREQ                | DP, PN, UDP, ibaNet-E |
|           | From V3   | Purely symbolic | Yes                             | ibaREQsym, ibaREQ3sym | PN, UDP, ibaNet-E     |

### 4.1 Request-S7 using ibaNet-E

The Request-S7 variant for *ibaNet-E* is described below.

#### 4.1.1 General information

You can configure Request-S7 for ibaNet-E in the following system configurations.

| SIMATIC S7 CPU                                  | SIMATIC STEP 7 V5.x (SIMATIC Manager) | SIMATIC STEP 7 V1x Professional (TIA Portal) |
|-------------------------------------------------|---------------------------------------|----------------------------------------------|
| S7-1500<br>Integrated PN interface and CM1542-1 | -                                     | X                                            |

The prerequisite for use of Request-S7 using ibaNet-E is a license for *ibaPDA-Interface-ibaNet-E* (item no. 31.001006).

With the ibaNet-E Request, the measured values (Request Handshake) are requested via a separate TCP/IP connection.

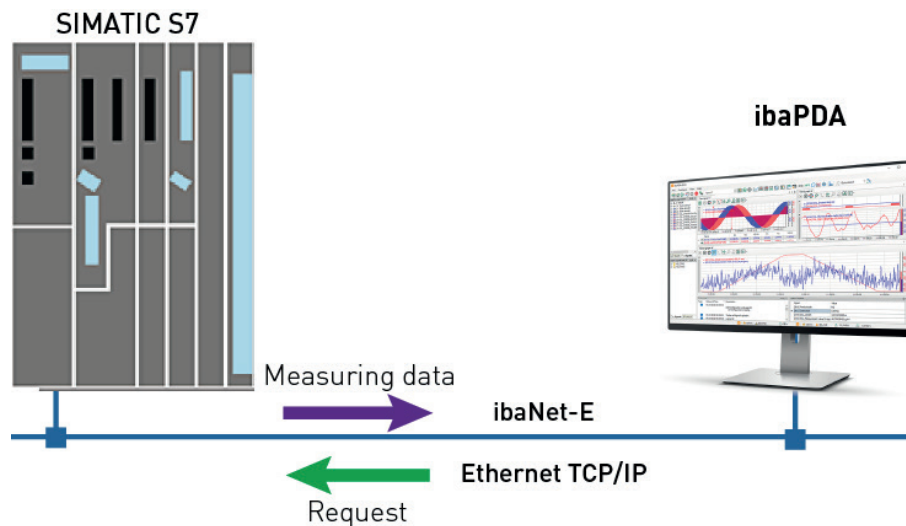
Depending on the hardware and software, different access points can be selected for the Request:

- **TCP/IP:** The connection to the SIMATIC S7 is established using an integrated PN interface of the S7 CPU or the respective CP modules in the PLC and the standard network interface of the computer. No additional Siemens software is required for the connection.
- **PC/CP:** This is the designation for different SIMATIC specific access points. In contrast to the TCP/IP connection, for the PC/CP group the SIMATIC communication software must be installed on the computer with the corresponding functions enabled.
  - **MPI, PROFIBUS:** The connection to the SIMATIC S7 is established using the MPI or PROFIBUS interface of the computer; e.g. with the CP5611 PCI card or the MPI adapter for USB interface or serial PC interfaces.
  - **TCP/IP, ISO:** Here, either the standard network interface of the computer or a suitable interface card is used for the connection to the S7.

- **TCP/IP S7-1x00:** The connection to a SIMATIC S7-1500 is established using an integrated PN interface of the S7 CPU or respective CP modules in the PLC and the standard network interface of the computer. No additional Siemens software is required for the connection.

Up to 1446 bytes of data can be transmitted per configured module. The number of available modules depends on the number of licenses.

The following figure shows the system topology for an S7 Request using ibaNet-E.



#### Other documentation



Detailed information about *ibaPDA-Interface-ibaNet-E* can be found in the interface manual.

### 4.1.2 SIMATIC S7-1500 configuration and engineering

This section describes the configuration and engineering on the SIMATIC S7 side with the SIMATIC TIA Portal for ibaNet-E.

Carry out the following configuration and engineering steps on the SIMATIC TIA Portal side:

- **Software engineering:**  
Integration of the Request blocks into the S7 program
- **Device configuration and engineering:**  
Setting the CPU protection properties

#### 4.1.2.1 Configuration in STEP 7 using the ibaREQ iba block family

This section describes how to configure the Request blocks in TIA Portal STEP 7 for ibaNet-E.

##### For each Request module

- Copy the following blocks from the iba S7 library to the blocks folder of your STEP 7 project, see [↗ iba S7 library, page 151](#). One set of Request blocks has to be called for each Request module (connection) in *ibaPDA*.
  - ibaREQ\_M (FB1400), see [↗ ibaREQ\\_M \(FB1400\), page 96](#)
  - ibaREQ\_NetE-Buffer (FB1408), see [↗ ibaREQ\\_NetE-Buffer \(FB1408\), page 105](#)
  - ibaREQ\_NetE-Send (FB1409), see [↗ ibaREQ\\_NetE-Send \(FB1409\), page 106](#)
  - ibaREQ\_UDPact (FB1410), see [↗ ibaREQ\\_UDPact \(FB1410\), page 109](#)
  - ibaREQ\_DB\_NetE, ibaREQ\_DB-Interface (PLC data type)
  - ibaREQ\_NetE-Bufferdata (PLC data type)

##### Note



Only use Request blocks from the latest iba S7 library!

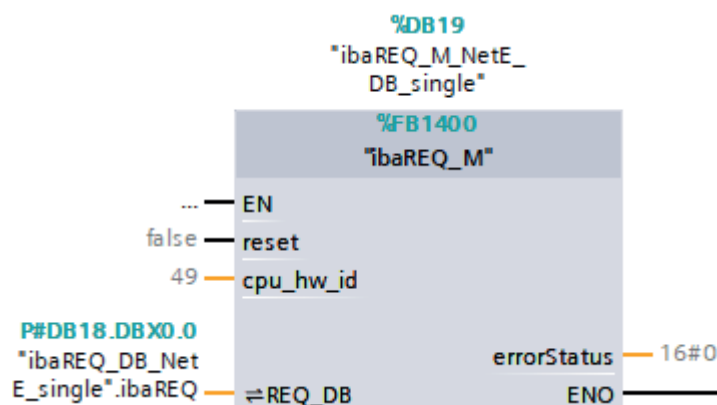
Request blocks in application examples can be outdated and, thus, cause errors.

##### Note



The request blocks do not support multi-instance calls.

- Call ibaREQ\_M (FB1400) preferably within OB1.



3. Enable the *Retain* option for the entire instance data block you have just created.

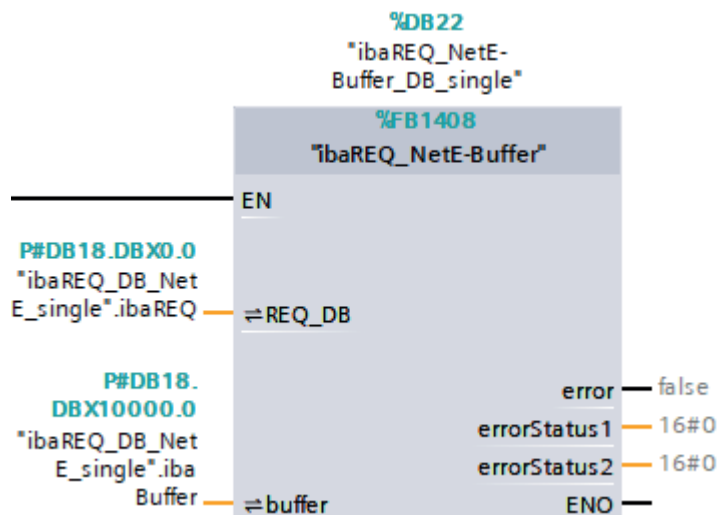
workTIARequestV18 ▶ 20\_testTIAReqSym [CPU 1518-4 PN/DP] ▶ Program blocks ▶ ibaREQ ▶ ibaREQ\_M\_NetE\_DB\_single [DB19]

Keep actual values Snapshot Copy snapshots to start values Load start values as actual values

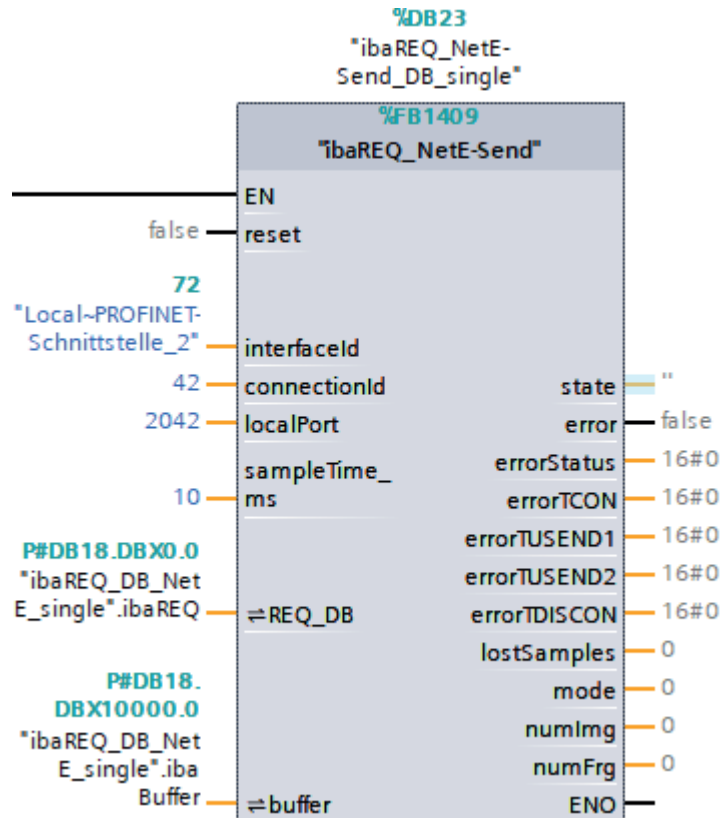
**ibaREQ\_M\_NetE\_DB\_single**

|    | Name                  | Data type             | Offset | Start value | Retain                              | Accessible f...                     | Writa...                            | Visible in ...                      | Setpoint                            | Supervision |
|----|-----------------------|-----------------------|--------|-------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------|
| 1  | Input                 |                       |        |             |                                     |                                     |                                     |                                     |                                     |             |
| 2  | reset                 | Bool                  | 0.0    | false       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 3  | cpu_hw_id             | HW_IO                 | 2.0    | 49          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 4  | Output                |                       |        |             |                                     |                                     |                                     |                                     |                                     |             |
| 5  | errorStatus           | Word                  | 4.0    | 16#0        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 6  | InOut                 |                       |        |             |                                     |                                     |                                     |                                     |                                     |             |
| 7  | REQ_DB                | *ibaREQ_DB-Interfa... | 6.0    |             | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            | <input type="checkbox"/>            |             |
| 8  | Static                |                       |        |             |                                     |                                     |                                     |                                     |                                     |             |
| 9  | EXPERT                | Struct                | 12.0   |             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 10 | sIDBinitialized       | Bool                  | 14.0   | false       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 11 | sOperandsInvalid      | Bool                  | 14.1   | false       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 12 | sIMDataValid          | Bool                  | 14.2   | false       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 13 | sOk                   | Bool                  | 14.3   | false       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 14 | sGET_IM_DATA          | Get_IM_Data           |        |             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |             |
| 15 | sIM_DATA              | Array[0..53] of Byte  | 16.0   |             | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 16 | sAdrOPList            | DInt                  | 70.0   | 0           | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 17 | cDBAddr_PDA2S7        | Int                   | 74.0   | 64          | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 18 | cDBAddr_S72PDA        | Int                   | 76.0   | 1440        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 19 | cDBAddr_Xchange       | Int                   | 78.0   | 2464        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 20 | cDBAddr_Ops           | Int                   | 80.0   | 2528        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 21 | cDBAddr_actVal        | Int                   | 82.0   | 12768       | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 22 | cMaxDataLength        | UInt                  | 84.0   | 1472        | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 23 | sREQ_AnzOperandenI... | Int                   | 86.0   | 0           | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |
| 24 | sREQ_AnzOperandenI... | Int                   | 88.0   | 0           | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |             |

4. Call ibaREQ\_NetE-Buffer (FB1408) within a cyclic interrupt OB (OB3x).



5. Call ibaREQ\_NetE-Send (FB1409) preferably within OB1.



#### For each additional Request module

- In the blocks folder, an ibaREQ\_DB data block has to be available for each Request module. Copy the data block and assign a new unique DB number.
- Within OB1, ibaREQ\_M (FB1400) has to be called once more with the new DB number for each Request module.
- Within a cyclic interrupt OB (Ob3x), ibaREQ\_NetE-Buffer (FB1408) has to be called once more with the new DB number for each Request module.
- Within OB1, ibaREQ\_NetE-Send (FB1409) has to be called once more with the new DB number for each Request module.
- Make sure that all instance data blocks are unique and that unique values are assigned for the connectionId parameters.

#### Final

- Load all blocks to the S7 CPU and restart the S7 CPU.

#### 4.1.2.2 Configuration in STEP 7 using the ibaREQsym iba block family

This section describes how to configure the Request blocks in TIA Portal STEP 7 for ibaNet-E.

##### For each Request module

- Copy the following blocks from the iba S7 library to the blocks folder of your STEP 7 project, see [iba S7 library, page 151](#). One set of Request blocks has to be called for each Request module (connection) in *ibaPDA*.
  - ibaREQsym\_M, see [ibaREQsym\\_M, page 112](#)
  - ibaREQsym\_NetE, see [ibaREQsym\\_NetE, page 115](#)
  - ibaREQsym\_DB\_PDA
  - ibaREQsym-Interface (PLC data type)

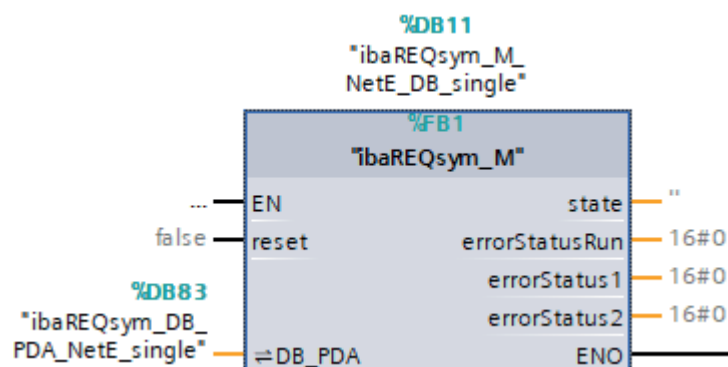
##### Note



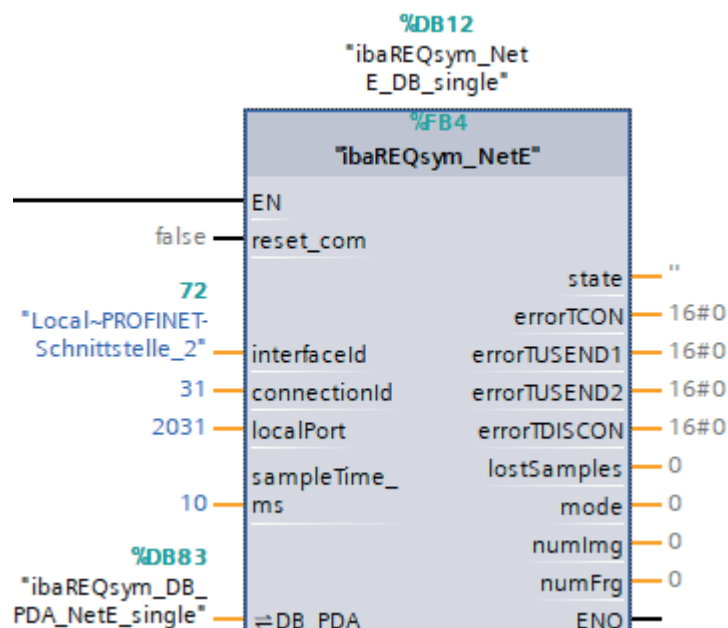
Only use Request blocks from the latest iba S7 library!

Request blocks in application examples can be outdated and, thus, cause errors.

- Call ibaREQsym\_M.



- Call ibaREQsym\_NetE within a cyclic interrupt OB (OB3x).



### For each additional Request module

- In the blocks folder, an ibaREQsym\_DB\_PDA data block has to be available for each Request module. Copy the data block and assign a new unique DB number.
- Within a cyclic interrupt OB (OB3x), ibaREQsym\_M and ibaREQsym\_NetE have to be called once more with the new DB number for each Request module.
- Make sure that all instance data blocks are unique and that unique values are assigned for the connectionId parameters.

### Final

- Load all blocks to the S7 CPU and restart the S7 CPU.

### 4.1.2.3 Configuration in STEP 7 using the ibaREQ3sym iba block family

This section describes how to configure the Request blocks in TIA Portal STEP 7 for ibaNet-E.

#### For each Request module

- Copy the following blocks from the iba S7 library to the blocks folder of your STEP 7 project, see [iba S7 library, page 151](#). One set of Request blocks has to be called for each Request module (connection) in *ibaPDA*.
  - ibaREQ3sym\_M, see [ibaREQ3sym\\_M, page 127](#)
  - ibaREQ3sym\_NetE\_dc, see [ibaREQ3sym\\_NetE\\_dc, page 128](#)
  - ibaREQ3sym\_NetE\_send, see [ibaREQ3sym\\_NetE\\_send, page 129](#)
  - ibaREQsym\_DB\_PDA
  - ibaREQsym-Interface (PLC data type)

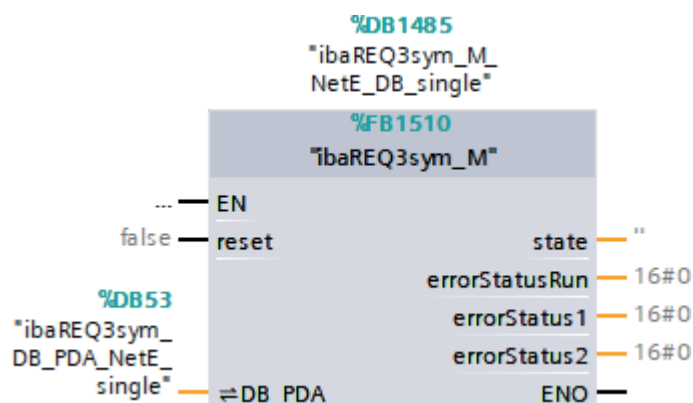
#### Note



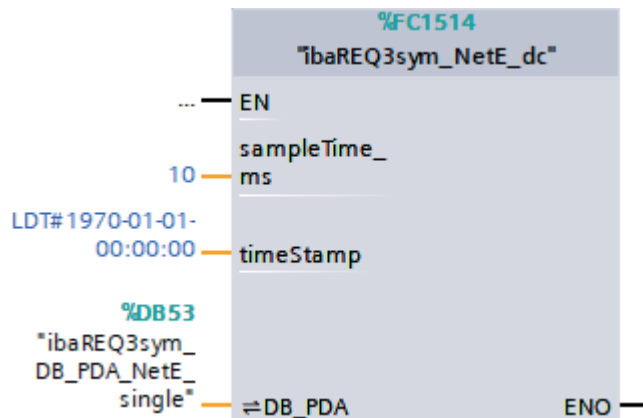
Only use Request blocks from the latest iba S7 library!

Request blocks in application examples can be outdated and, thus, cause errors.

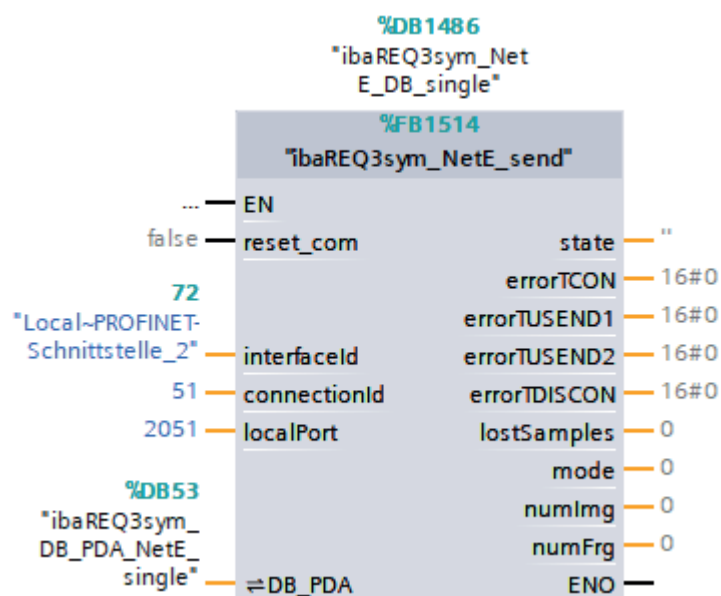
- Call ibaREQ3sym\_M.



3. Call ibaREQ3sym\_NetE\_dc within the OB where the data is updated.



4. Call ibaREQ3sym\_NetE\_dc within OB1 or a cyclic interrupt OB at the required send interval.



#### For each additional Request module

- In the blocks folder, an ibaREQ3sym\_DB\_PDA data block has to be available for each Request module. Copy the data block and assign a new unique DB number.
- ibaREQ3sym\_M and ibaREQ3sym\_NetE\_send have to be called once more with the new DB number for each Request module.
- Make sure that all instance data blocks are unique and that unique values are assigned for the connectionId parameters.

#### Final

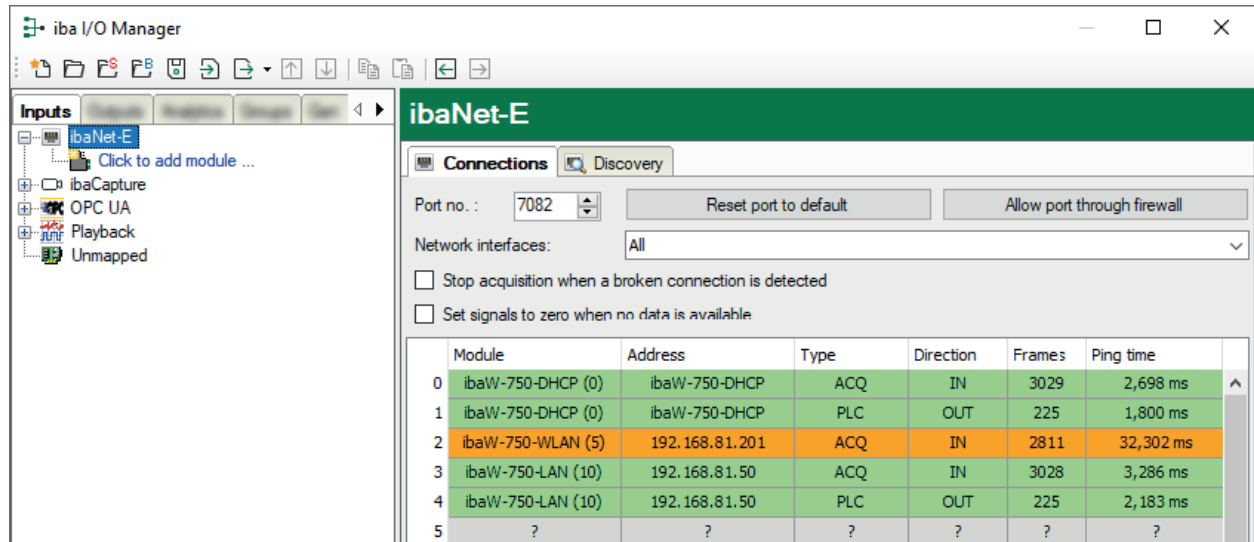
- Load all blocks to the S7 CPU and restart the S7 CPU.

### 4.1.3 Configuration and engineering ibaPDA

This section describes the configuration of the Request modules in *ibaPDA* for ibaNet-E.

#### 4.1.3.1 General interface settings

If all system requirements are fulfilled, *ibaPDA* displays the *ibaNet-E* interface in the interface tree of the I/O Manager.



#### Other documentation



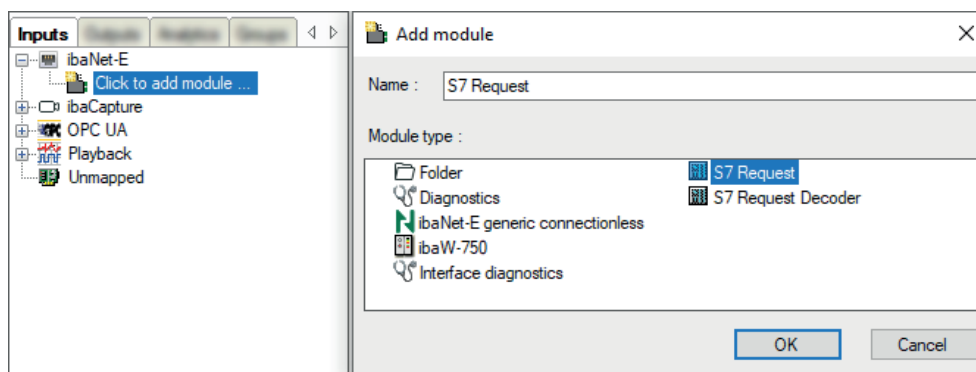
Detailed information about the *ibaNet-E* interface can be found in the respective manual.

#### Configuring ibaNet-E for Request

1. Start the *ibaPDA* client and open the I/O Manager.
2. Click on the blue command *Click to add module ...* under the interface.

Select a *Request S7* module in the dialog box and assign a name via the input field if required. Confirm the selection with <OK>.

- S7 Request (for acquiring analog signals and digital signals)
- S7 Request Decoder (for acquiring up to 32000 digital signals)



3. Configure the required module settings and signals as described in the following chapters. The *General* and *Connection* tabs are identical for all Request modules. The Request modules only differ in the *Analog* and *Digital* tabs.
4. After you have finished the configuration, click <Apply> or <OK> to transfer the new configuration to the device and start data acquisition with *ibaPDA*.

### 4.1.3.2 General module settings

You can find the description of all general settings that are identical for all Request-S7 modules in chapter [General module settings](#), page 16.

Information about the connection settings on the *Connection* tab can be found in chapter [Connection settings](#), page 18.

The *S7 Request* module for ibaNet-E has the following specific setting options in the *General* tab.

**S7 Request (1)**

General | Connection | Analog | Digital | Diagnostics

**Basic**

|                           |            |
|---------------------------|------------|
| Module Type               | S7 Request |
| Locked                    | None       |
| Enabled                   | True       |
| Name                      | S7 Request |
| Comment                   |            |
| Module No.                | 1          |
| Timebase                  | 1 ms       |
| Use module name as prefix | False      |

**Module Layout**

|                     |    |
|---------------------|----|
| No. analog signals  | 64 |
| No. digital signals | 64 |

**Connection**

|                     |       |
|---------------------|-------|
| Auto enable/disable | False |
|---------------------|-------|

**ibaNet-E**

|                    |      |
|--------------------|------|
| Sample time        | 1 ms |
| Images per frame   | 1    |
| Drift compensation | True |
| Time domain        | 0    |
| Preferred TD-Conn  | True |

**S7**

|          |                 |
|----------|-----------------|
| CPU Name | No address book |
|----------|-----------------|

**Name**  
The name of the module.

[Select S7 operands](#)  
[Manage address books](#)

### Module Layout

#### No. analog signals/No. digital signals

Define the number of configurable analog and digital signals in the signal tables. The default value is 32 for each. The maximum value is 1000. The signal tables are adjusted accordingly.

## Connection

### Auto enable/disable

If this option is enabled and *ibaPDA* is unable to establish a connection to the S7 at the start of acquisition, *ibaPDA* disables this module and starts acquisition without the module. During acquisition, *ibaPDA* tries to connect to the S7. If successful, acquisition is restarted with the module enabled. If this option is disabled and *ibaPDA* is unable to establish a connection to the S7 at the start of acquisition, *ibaPDA* does not start acquisition.

### ibaNet-E

#### Sample time

Sample time on the controller side, corresponding to the cycle time of the function block requests.

#### Images per frame

Number of ibaNet-E images in one frame

#### Drift compensation

Disable drift compensation if the data is sent less frequently than every 10 ms to improve processing of the received data.

#### Time domain

ibaNet time domain from which the data is to be recorded

Enter the number of the ibaNet time domain here if the data belonging to this time domain is to be synchronized. When this property is set to zero (default), no time domain is used.

When using a time domain, drift compensation needs to be enabled (drift compensation = True).

#### Reference connection

The reference connection of a time domain is the connection to which the other connections of the same time domain are synchronized.

## 4.1.3.3 S7 Request module

Configure a separate Request block call for each module.

For further information about module settings, see ↗ *General module settings*, page 16 and ↗ *General module settings*, page 48.

The request modules of *ibaNet-E* have the following specific option in the *Connection* tab.

### Connection configuration

#### ibaPDA IP address

If multiple network cards are installed in the computer, specify here the *ibaPDA* IP address to which the controller should send data.

When using the *Auto* option, the system automatically uses the card that can reach the controller based on its IP address.

#### 4.1.3.4 S7 Request Decoder module

The *S7 Request Decoder* module allows acquisition of up to 32000 digital signals sent as a maximum of 1000 double words (32 bit). This module type is well suited for applications where large numbers of digital signals have to be acquired and the max. 1024 directly addressable digital values are not sufficient.

Configure a separate Request block call for each module.

##### General tab

For further information about module settings, see ↗ *General module settings*, page 16 and ↗ *General module settings*, page 48.

##### Module-specific settings

###### Module structure – Number of decoders

Define the number of configurable decoders in the digital signal table. The default value is 32. The maximum value is 126. The signal table is adjusted accordingly.

##### Connection configuration

The connection for the *S7 Request Decoder* module is configured in the same way as the connection for an *S7 Request* module, see ↗ *Connection settings*, page 18.

The request modules of *ibaNet-E* have the following specific option in the *Connection* tab.

##### ibaPDA IP address

If multiple network cards are installed in the computer, specify here the *ibaPDA* IP address to which the controller should send data.

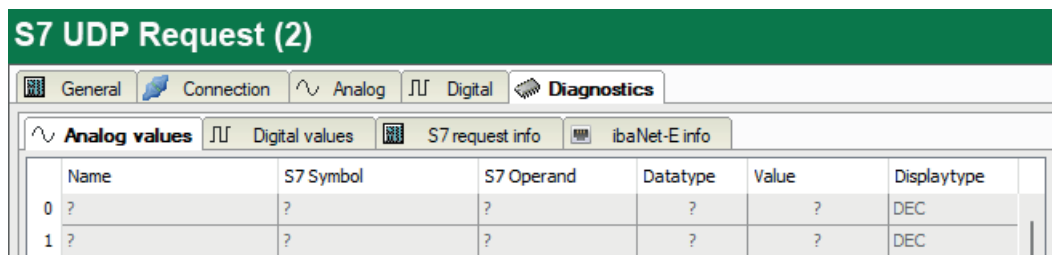
When using the *Auto* option, the system automatically uses the card that can reach the controller based on its IP address.

##### Digital tab

The signals are configured in the same way as for the *ibaBM-DP* device, see ↗ *Digital tab*, page 90.

#### 4.1.4 Modul diagnostics

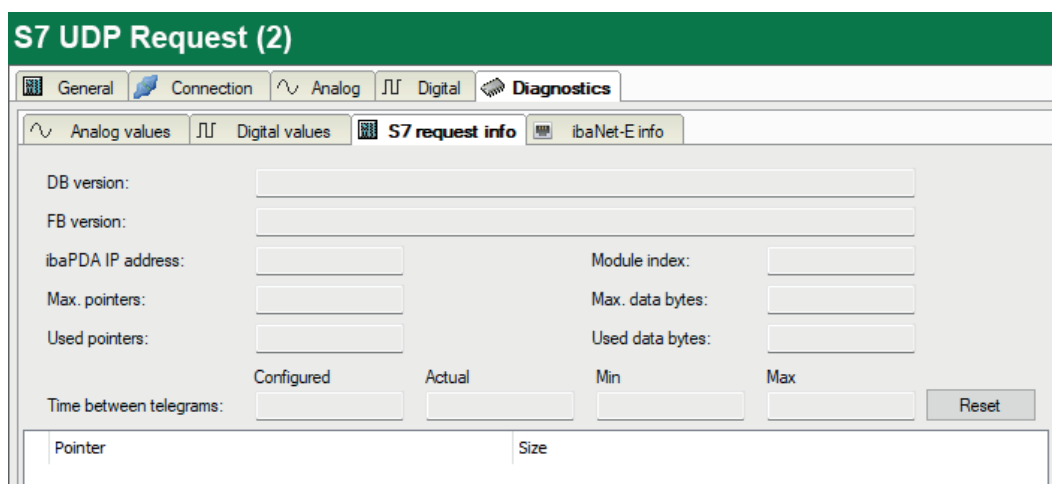
In the *Diagnostics* tab on the subtabs *Analog values* and *Digital values*, you can view all configured operands in tabular form with their data type and actual value.



| S7 UDP Request (2)                                         |      |           |            |          |       |             |
|------------------------------------------------------------|------|-----------|------------|----------|-------|-------------|
| General Connection Analog Digital Diagnostics              |      |           |            |          |       |             |
| Analog values Digital values S7 request info ibaNet-E info |      |           |            |          |       |             |
|                                                            | Name | S7 Symbol | S7 Operand | Datatype | Value | Displaytype |
| 0                                                          | ?    | ?         | ?          | ?        | ?     | DEC         |
| 1                                                          | ?    | ?         | ?          | ?        | ?     | DEC         |

##### Subtab S7 request info

On the *S7 request info* subtab, you can view the data sent to the S7-CPU, and the data that are reported back as well as the general diagnostics data.



**S7 UDP Request (2)**

General Connection Analog Digital Diagnostics

Analog values Digital values **S7 request info** ibaNet-E info

DB version:

FB version:

ibaPDA IP address:  Module index:

Max. pointers:  Max. data bytes:

Used pointers:  Used data bytes:

Time between telegrams:  Configured  Actual  Min  Max

Pointer  Size

##### DB version

Version of the data block used in the CPU

##### FB version

Version of the function block used in the CPU

##### ibaPDA IP address

IP address of the *ibaPDA* computer sent to the S7-CPU.

##### Module index

Module index sent to the S7-CPU (see also [General module settings, page 62](#))

##### Max. pointers

The max. number of used pointers (depends on the size of the data block *ibaREQ\_DB*).

##### Used pointers

Currently used number of pointers.

##### Max. data bytes

Max. size of the user data in the data telegrams to *ibaPDA*

**Used data bytes**

Currently used bytes in the user data of the data telegrams.

**Time between telegrams:**

- *Configured*: Corresponds to the setting *Timebase* on the *General* tab
- *Actual*: Time between the two last received telegrams
- *Min*: shortest time
- *Max*: longest time

The background color of the values *Actual*, *Min* and *Max* provides additional information:

| Color  | Meaning                                                                                     |
|--------|---------------------------------------------------------------------------------------------|
| Green  | The time span between two telegrams is shorter than the double of the defined timebase.     |
| Orange | The time span between two telegrams is higher or equals the double of the defined timebase. |

**<Reset>**

Resetting the Min and Max values

**Pointer table**

Currently required data pointer with address and length

For optimizing the communication performance, signals with consecutive addresses are requested and transferred as a block (pointer).

**Subtab ibaNet-E info**

In the subtab *ibaNet-E info*, you can find information on the ibaNet-E connection.

**Connection phase**

Each ibaNet e-connection can be in different connection phases.

| ibaNet-E connection phase | Color  | Meaning                                          |
|---------------------------|--------|--------------------------------------------------|
| ONLINE                    | green  | Connection; connection quality is OK             |
|                           | orange | Connection; connection quality is not optimal    |
| STOP_WAIT                 | red    | Connection timeout; waiting for reinitialization |
| SEND_TADJUST              | red    | Connection setup; time synchronization           |
| WAIT                      | red    | Connection setup                                 |
| WAIT_SYNCRESP             | red    | Connection interruption                          |

**Destination**

Communication partner (ANY: undefined)

**Connection type**

Type of the ibaNet-E connection.

- ACQ: Connection for receiving data; all values are received, acquired isochronously and also repeated if there are transmission errors.
- PLC: Connection for sending data; only the most recent value is sent without any repetitions if there are transmission errors.

**Direction**

Input or output direction

- IN: Receiving data from the ibaNet-E device.
- OUT: Sending data to the ibaNet-E device

**Message counter**

Number of messages for this connection

**Lost/duplicated/discarded images**

Number of the lost, duplicated and discarded images

**Ping time**

Current, maximum and minimum ping time for this connection

The ping time is a characteristic of the connection quality for the Ethernet network. The shorter this time is, the better the link quality and the more reliable the data transmission.

**Frame interval**

Time between two frames

The current, maximum, and minimum time between two frames is measured.

**Frame header**

Information in the frame header: Images per frame, fragments per image, image size

## 4.2 Request-S7 via UDP

The Request-S7 variant via UDP is described below.

### 4.2.1 General information

You can configure Request S7 for UDP in the following system configurations.

| SIMATIC S7 CPU                                     | SIMATIC STEP 7 V5.x<br>(SIMATIC Manager) | SIMATIC STEP 7 V1x Professional<br>(TIA Portal) |
|----------------------------------------------------|------------------------------------------|-------------------------------------------------|
| S7-1500<br>integrated PN interface and<br>CM1542-1 | -                                        | X                                               |

The prerequisite for use of Request S7 using ibaNet-E is a license for *ibaPDA-Interface-S7-TCP/UDP* (item no. 31.001040).

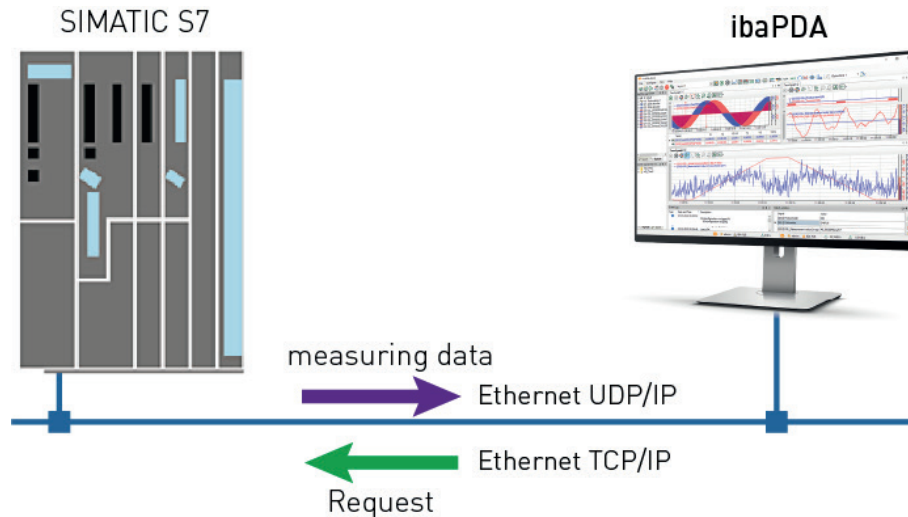
With the UDP Request, the measurement values (Request Handshake) are requested via a separate UDP connection.

Depending on the hardware and software, different access points can be selected for the Request:

- TCP/IP: The connection to the SIMATIC S7 is established using an integrated PN interface on the S7 CPU or corresponding CP modules in the PLC and the standard network interface on the computer. No additional Siemens software is required for the connection.
- PC/CP: This is the name of the various SIMATIC specific access points. In contrast to the TCP/IP connection, the common feature of all connection types in the PC/CP group is that the SIMATIC communication software has to be installed on the computer with the corresponding functions enabled.
  - MPI, PROFIBUS: The connection to the SIMATIC S7 is established using the MPI or PROFIBUS interface on the computer; e.g. using the CP5611 PCI card or the MPI adapter for USB or serial PC interfaces.
  - TCP/IP, ISO: Here, either the standard network interface on the computer or a suitable interface card is used for the connection to the S7.
- TCP/IP S7-1x00: The connection to a SIMATIC S7-1500 is established using an integrated PN interface on the S7 CPU or corresponding CP modules in the PLC and the standard network interface on the computer. No additional Siemens software is required for the connection.

A transfer rate of max. 1446 Byte is possible for each configured module. The number of available modules depends on the number of licenses.

The following figure shows the system topology for an S7 Request using UDP.



On side of the SIMATIC S7, you can use a PROFINET interface integrated on the CPU as well as an additional Ethernet capable communication processor (e.g. CP343-1, CPU343-1 LEAN, CP443-1, ...). The data volume that can be reached depends besides of many other factors significantly on the selected interface. Generally, interfaces integrated on the CPU are more powerful than communication processors, since the connection via the backplane bus represents a performance shortage. Especially for the modules of the S7-300 family, there are considerable shortages. For detailed information, please refer to the Siemens device and system manuals.

#### Other documentation



You can find detailed information about *ibaPDA-Interface-S7-TCP/UDP* in the interface manual.

## 4.2.2 Configuration and engineering SIMATIC S7-1500

Carry out the following configuration steps out on the SIMATIC TIA Portal side:

- Configuration software:  
Integration of the Request blocks in the S7 program
- Device configuration:  
Setting the CPU protection properties

### 4.2.2.1 Configuration in STEP 7 with the iba block family ibaREQ

The following describes the configuration of the Request blocks in STEP 7.

#### For each Request module

1. Copy the following blocks from the iba S7 library to the blocks folder of your STEP 7 project, see [iba S7 library, page 151](#).
  - ibaREQ\_M (FB1400), see [ibaREQ\\_M \(FB1400\), page 96](#)
  - ibaREQ\_UDP2 (FB1406), see [ibaREQ\\_UDP2 \(FB1406\), page 102](#)
  - ibaREQ\_UDPact (FB1410), see [ibaREQ\\_UDPact \(FB1410\), page 109](#)
  - ibaREQ\_DB (DB15)
  - ibaREQ\_DB-Interface (PLC data type)

#### Note



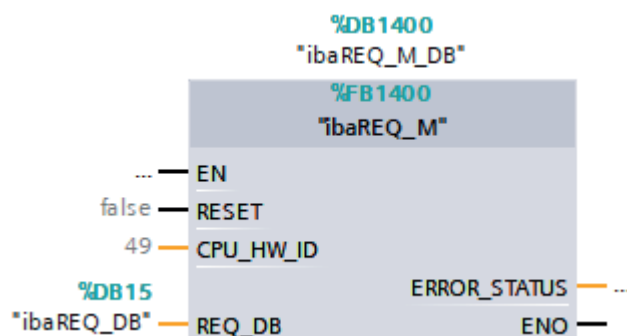
Only use Request blocks from the latest iba S7 library!  
Request blocks in application examples can be outdated and, thus, cause errors.

#### Note

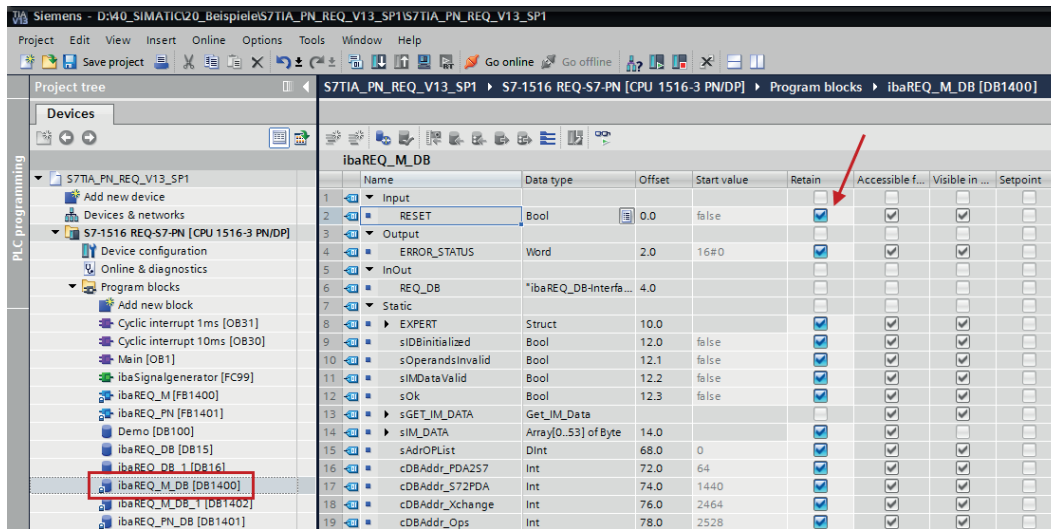


The request blocks do not support multi-instance calls.

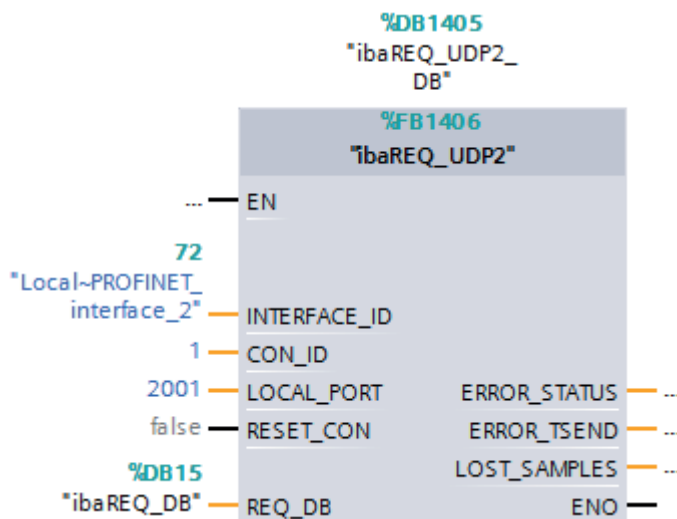
2. Call the ibaREQ\_M (FB1400) preferably within the OB1.



3. Enable the *Retain* option for the entire instance block that you have just created.



4. Call the ibaREQ\_UDP2 (FB1406) preferably within a cyclic interrupt OB (OB3x).



#### For each additional Request module

- In the blocks folder, a data block ibaREQ\_DB (DB15) has to be available for each Request module. Copy the data block and assign a new unique DB number.
- Within the OB1, the ibaREQ\_M (FB1400) has to be called once more with the new DB number for each Request module.
- Within the cyclic interrupt OB (OB3x), the ibaREQ\_UDP2 (FB1406) has to be called once more with the new DB numbers for each Request module.
- Make sure that all instance data blocks are unique and that unique values are assigned for the CON\_ID and LOCAL\_PORT.

#### Final

- Load all blocks into the S7 CPU and restart the S7 CPU.

#### 4.2.2.2 Configuration in STEP 7 using the ibaREQsym iba block family

This section describes how to configure the Request blocks in TIA Portal STEP 7.

##### For each Request module

- Copy the following blocks from the iba S7 library to the function block folder of your STEP 7 project, see [iba S7 library, page 151](#).
  - ibaREQsym\_M, see [ibaREQsym\\_M, page 112](#)
  - ibaREQsym\_UDP, see [ibaREQsym\\_UDP, page 119](#)
  - ibaREQsym\_DB\_PDA
  - ibaREQsym-Interface (PLC data type)

##### Note



Only use Request blocks from the latest iba S7 library!

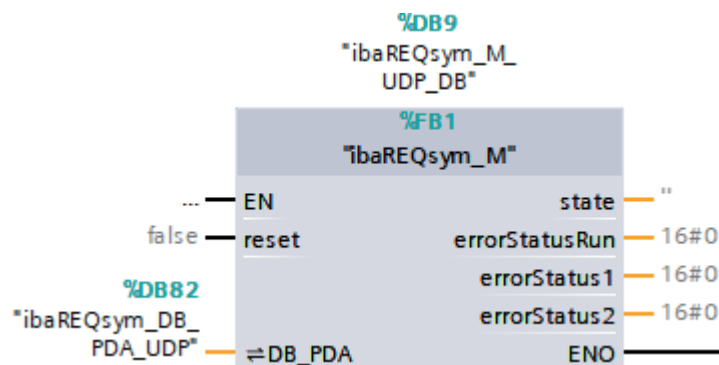
Request blocks in application examples can be outdated and, thus, cause errors.

##### Note

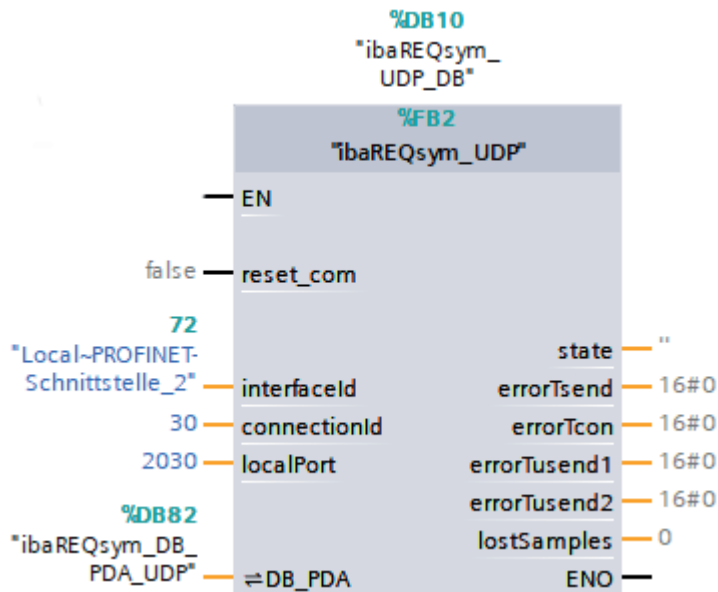


The request blocks do not support multi-instance calls.

- Call ibaREQsym\_M preferably within OB1.



3. Call ibaREQsym\_UDP preferably a cyclic interrupt OB (OB3x).



#### For each additional Request module

- An ibaREQsym\_DB\_PDA data block must be available in the function block folder for each Request module. Copy the data block and assign a new unique DB number.
- Within OB1 or a cyclic interrupt OB (OB3x), ibaREQsym\_M and ibaREQsym\_UDP have to be called once more with the new DB numbers for each Request module.
- Make sure that all instance data blocks are unique and that unique values are assigned for the connectionId and localPort parameters.

#### Completion

- Load all blocks to the S7 CPU and restart the S7 CPU.

### 4.2.2.3 Configuration in STEP 7 using the ibaREQ3sym iba block family

This section describes how to configure the Request blocks in TIA Portal STEP 7.

#### For each Request module

1. Copy the following blocks from the iba S7 library to the function block folder of your STEP 7 project, see [iba S7 library, page 151](#).
  - ibaREQ3sym\_M, see [ibaREQ3sym\\_M, page 127](#)
  - ibaREQ3sym\_UDP, see [ibaREQ3sym\\_UDP, page 133](#)
  - ibaREQ3sym\_DB\_PDA
  - ibaREQ3sym-Interface (PLC data type)

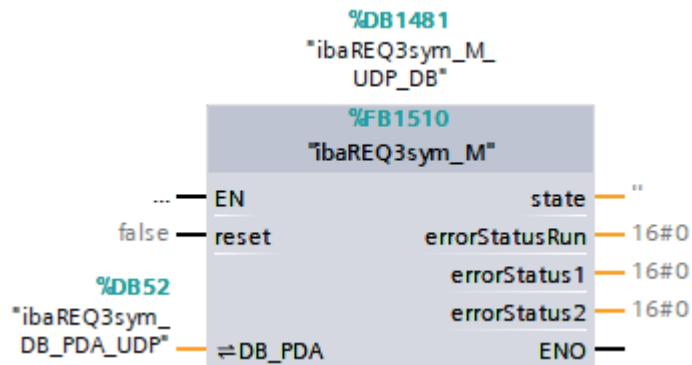
#### Note



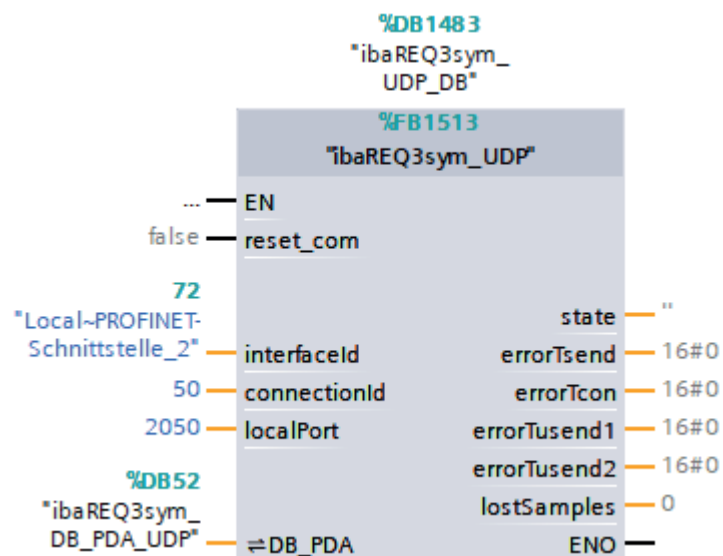
Only use Request blocks from the latest iba S7 library!

Request blocks in application examples can be outdated and, thus, cause errors.

2. Call ibaREQ3sym\_M preferably within OB1.



3. Call ibaREQ3sym\_UDP preferably a cyclic interrupt OB (OB3x).



#### For each additional Request module

- An `ibaREQ3sym_DB_PDA` data block must be available in the function block folder for each Request module. Copy the data block and assign a new unique DB number.
- `ibaREQ3sym_M` and `ibaREQ3sym_UDP` have to be called once more with the new DB numbers for each Request module.
- Make sure that all instance data blocks are unique and that unique values are assigned for the `connectionId` and `localPort` parameters.

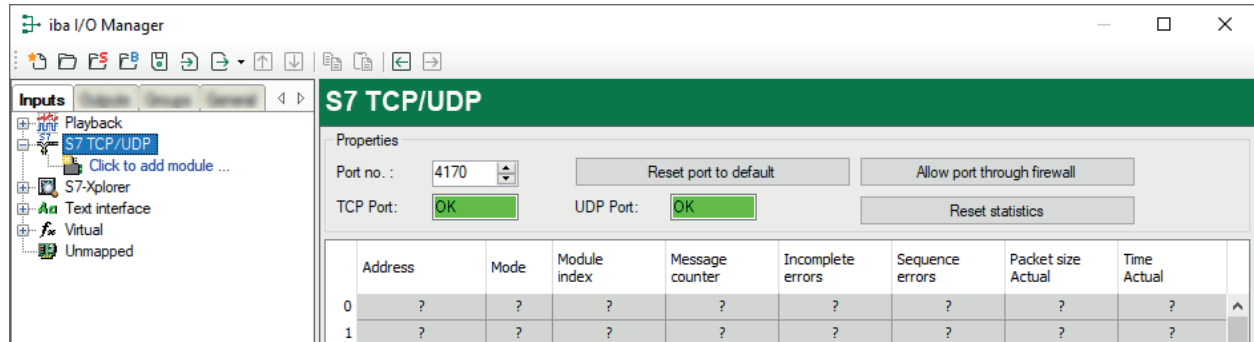
#### Completion

- Load all blocks to the S7 CPU and restart the S7 CPU.

## 4.2.3 Configuration and engineering ibaPDA

### 4.2.3.1 General interface settings

If all system requirements are fulfilled, *ibaPDA* displays the *S7 TCP/UDP* interface in the interface tree of the I/O Manager.



#### Other documentation



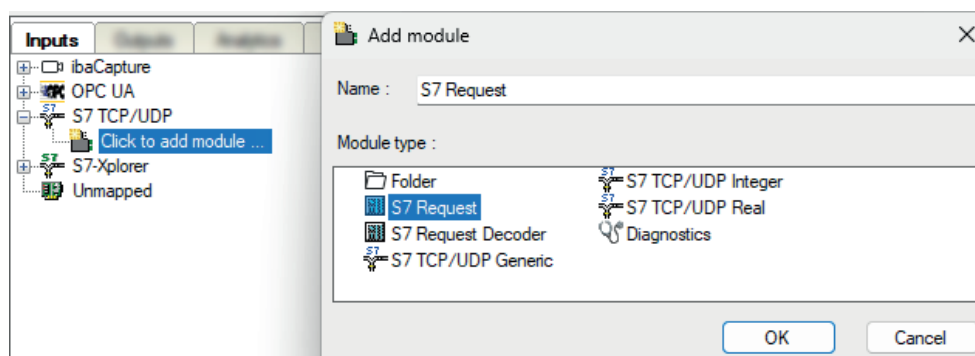
For more information about the interface *ibaPDA-Interface-S7-TCP/UDP*, see the corresponding manual.

### Configuring S7 TCP/UDP for Request

1. Start the *ibaPDA* client and open the I/O Manager.
2. Click on the blue command *Click to add module* under the interface.

Select a *Request S7* module in the dialog box and assign a name via the input field if required. Confirm the selection with <OK>.

- S7 Request (for acquiring analog signals and digital signals)
- S7 Request Decoder (for acquiring up to 11728 digital signals)



3. Configure the required module settings and signals as described in the following chapters.

The *General* and *Connection* tabs are identical for all Request modules. The Request modules only differ in the *Analog* and *Digital* tabs.

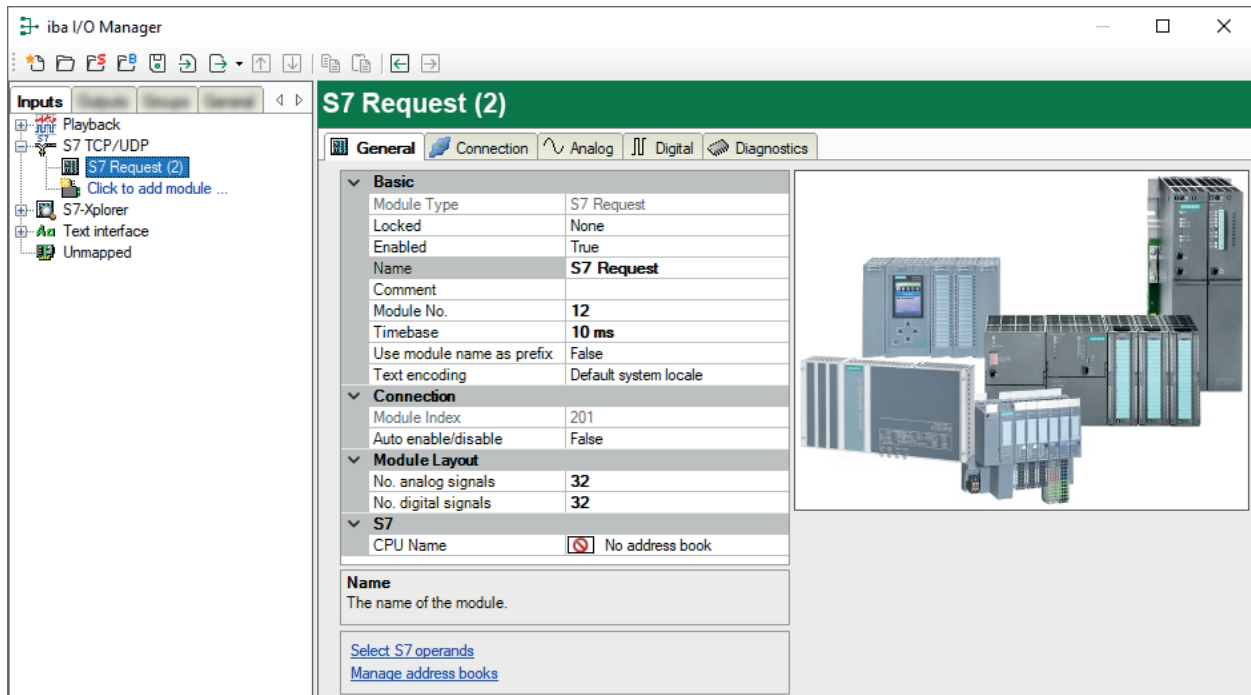
4. After you have finished the configuration, click <Apply> or <OK> to transfer the new configuration to the device and start data acquisition with *ibaPDA*.

### 4.2.3.2 General module settings

You can find the description of all settings that are identical for all Request-S7 modules in chapter ↗ *General module settings*, page 16.

You can find information on connection settings from the *Connection* tab in chapter ↗ *Connection settings*, page 18.

The *S7 Request* module for *S7 TCP/UDP* has the following specific setting options in the *General* tab:



## Connection

### Module index (information only)

Internal reference number of the module.

### Auto enable/disable

If TRUE, the acquisition is started, even if no connection can be established to the S7-CPU. The module is deactivated. During the acquisition, *ibaPDA* tries to reconnect to the S7-CPU. When it succeeds, the acquisition is restarted with this module enabled.

If FALSE, the acquisition is not started, if a connection to the configured S7-CPU cannot be established.

## Module Layout

### No of analog signals/digital signals

Define the number of configurable analog and digital signals in the signal tables. The default value is 32 for each. The maximum value is 1024. The signal tables are adjusted accordingly.

### 4.2.3.3 Module S7 Request

With the *S7 Request* module, you can acquire up to 1024 analog signals and 1024 digital signals. A maximum of 1466 Byte is possible (max. length of the user data of an UDP telegram).

Configure a separate Request block call for each module.

For more information about the module settings, see [General module settings, page 62](#).

The request modules of *S7 TCP/UDP* have the following specific option in the *Connection* tab.

#### Connection configuration

##### ibaPDA IP address

If multiple network cards are installed in the computer, specify here the *ibaPDA* IP address to which the controller should send data.

When using the *Auto* option, the system automatically uses the card that can reach the controller based on its IP address.

### 4.2.3.4 Module S7 Request Decoder

With the *S7 Request Decoder* module, you can acquire up to 11728 digital signals, which are sent in form of a max. of 733 words (1466 Byte).

#### General tab

For more information on the module settings, see [General module settings, page 16](#) and [General module settings, page 62](#).

#### Module specific settings

##### Module layout – No. of decoders

Define the number of configurable decoders in the table of digital signals. The default value is 32. The maximum value is 733. The signal tables are adjusted accordingly.

#### Connection configuration

Configure the connection of the *S7 Request Decoder* module in the same way as the connection for an *S7 Request* module, see [Connection settings, page 18](#).

The request modules of *S7 TCP/UDP* have the following specific option in the *Connection* tab.

##### ibaPDA IP address

If multiple network cards are installed in the computer, specify here the *ibaPDA* IP address to which the controller should send data.

When using the *Auto* option, the system automatically uses the card that can reach the controller based on its IP address.

#### Digital tab

The signals are configured in the same way as for the *ibaBM-DP* device, see [Digital tab, page 90](#).

4.2.4 Module diagnostics

In the *Diagnostics* tab on the subtabs *Analog values* and *Digital values*, you can view all configured operands in tabular form with their data type and actual value.

S7 UDP Request (2)

General

Connection

Analog

Digital

Diagnostics

Analog values

Digital values

S7 request info

ibaNet-E info

|   | Name | S7 Symbol | S7 Operand | Datatype | Value | Displaytype |
|---|------|-----------|------------|----------|-------|-------------|
| 0 | ?    | ?         | ?          | ?        | ?     | DEC         |
| 1 | ?    | ?         | ?          | ?        | ?     | DEC         |

Subtab S7 request info

On the *S7 request info* subtab, you can view the data sent to the S7-CPU, and the data that are reported back as well as the general diagnostics data.

S7 UDP Request (2)

General

Connection

Analog

Digital

Diagnostics

Analog values

Digital values

S7 request info

ibaNet-E info

DB version:

FB version:

ibaPDA IP address:

Max. pointers:

Used pointers:

Time between telegrams:

Module index:

Max. data bytes:

Used data bytes:

Min

Max

Reset

Pointer

Size

DB version

Version of the data block used in the CPU

FB version

Version of the function block used in the CPU

ibaPDA IP address

IP address of the *ibaPDA* computer sent to the S7-CPU

Module index

Module index sent to the S7-CPU (see also ↗ *General module settings, page 62*)

Max. pointers

The max. number of used pointers (depends on the size of the data block *ibaREQ\_DB*).

Used pointers

Currently used number of pointers.

Max. data bytes

Max. size of the user data in the data telegrams to *ibaPDA*

**Used data bytes**

Currently used bytes in the user data of the data telegrams.

**Time between telegrams**

- *Configured*: Corresponds to the setting *Timebase* on the *General* tab
- *Actual*: Time between the two last received telegrams
- *Min*: shortest time
- *Max*: longest time

The background color of the values *Actual*, *Min* and *Max* provides additional information:

| Color  | Meaning                                                                                     |
|--------|---------------------------------------------------------------------------------------------|
| Green  | The time span between two telegrams is shorter than the double of the defined timebase.     |
| Orange | The time span between two telegrams is higher or equals the double of the defined timebase. |

**<Reset>**

Resetting the minimum and maximum values

**Pointer table**

Currently required data pointer with address and length

For optimizing the communication performance, signals with consecutive addresses are requested and transferred as a block (pointer).

## 4.3 Request-S7 for ibaBM-PN

This section describes the Request-S7 variant for the PROFINET bus module *ibaBM-PN*.

### 4.3.1 General information

With the PN Request, the measurement values (Request Handshake) are requested via a separate TCP/IP connection.

| SIMATIC S7-CPU                                     | SIMATIC STEP 7 V5.x<br>(SIMATIC Manager) | SIMATIC STEP 7 V1x Professional<br>(TIA Portal) |
|----------------------------------------------------|------------------------------------------|-------------------------------------------------|
| S7-1500<br>integrated PN interface and<br>CM1542-1 | -                                        | X                                               |

Depending on the hardware and software, you can select different access points for the Request:

- TCP/IP: The connection to the SIMATIC S7 is established using an integrated PN interface of the S7 CPU or the respective CP modules in the PLC and the standard network interface of the computer. No additional Siemens software is required for the connection.
- PC/CP: This is the designation for different SIMATIC specific access points. In contrast to the TCP/IP connection, for the PC/CP group the SIMATIC communication software (and the corresponding licenses) must be installed on the computer with the corresponding functions enabled.
  - MPI, PROFIBUS: The connection to the SIMATIC S7 is established using the MPI or PROFIBUS interface of the computer; e.g. with the CP5611 PCI card or the MPI adapter for USB interface or serial PC interface.
  - TCP/IP, ISO: Here, either the standard network interface of the computer or a suitable interface card is used for the connection to the S7.
- TCP/IP S7-1x00: The connection to a SIMATIC S7-1500 is established using an integrated PN interface of the S7 CPU or respective CP modules in the PLC and the standard network interface of the computer. No additional Siemens software is required for the connection.

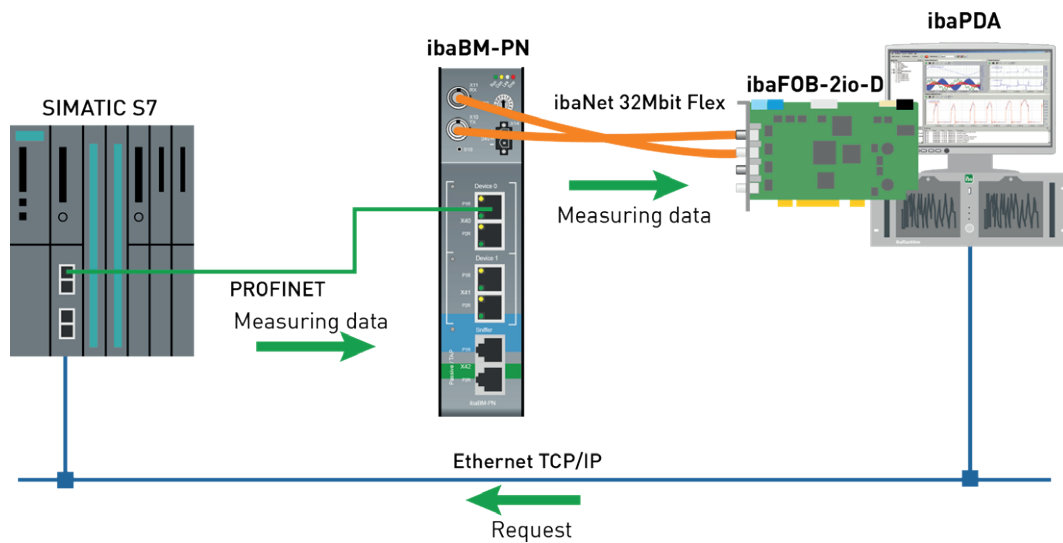
### System integration with ibaBM-PN

The measured data are transmitted to the *ibaBM-PN* device over PROFINET.

You need the following connections:

- Online connection between *ibaPDA* and S7-CPU (TCP/IP, MPI or DP)
- Fiber optic connection between *ibaPDA/ibaFOB-io-D* and *ibaBM-PN*
- PROFINET connection between *ibaBM-PN* and S7-CPU

The bus monitor offers two separate PROFINET devices. A transfer rate of max. 1440 Byte is possible for each device.



### Other documentation



Detailed information about *ibaBM-PN* can be found in the device manual.

For information about application examples, see chapter ↗ *Application examples, page 154*.

### 4.3.2 Configuration and engineering SIMATIC S7-1500

This section describes the configuration and engineering on the SIMATIC S7 side with the SIMATIC TIA Portal for *ibaBM-PN*.

On the SIMATIC TIA Portal side, carry out the following configuration steps:

- Network configuration:  
Integration of the PROFINET devices in the device configuration
- Configuration Software:  
Integration of the Request blocks in the S7 program
- Device configuration:  
Setting the CPU protection properties

### 4.3.2.1 Network configuration

For *ibaBM-PN*, configure a separate PROFINET device for each PROFINET device in use.

Use the GSDML file [GSDML-Vx.yy-ibaBM-PN-yyyymmdd.xml](#).

#### Note

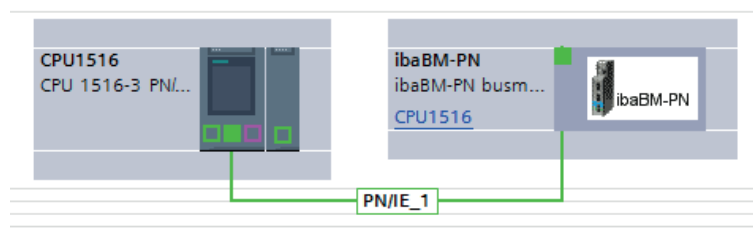


You find the latest version of the GSDML file on the data storage medium "iba Software & Manuals" in the following directory:

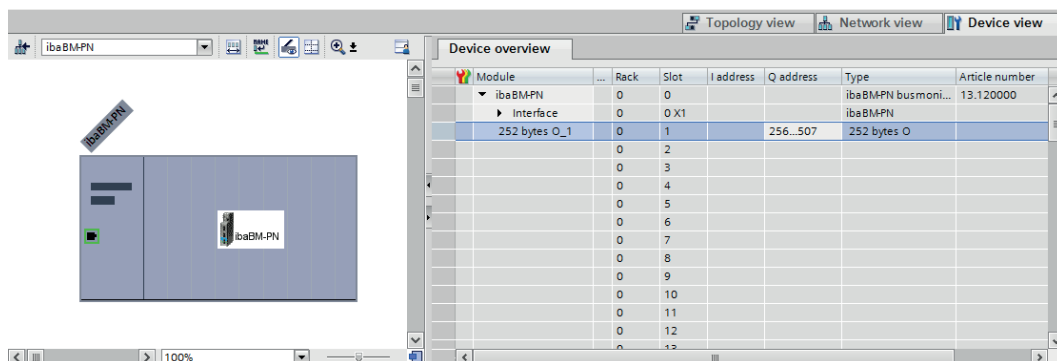
[\02\\_iba\\_Hardware\ibaBM-PN\01\\_GSD\\_Files\](#)

S7-CPU provides consistent slots with a max. of 252 Bytes. You need one slot for each Request block. You can also use slots with a smaller size.

The following figure shows the net view.



The following figure shows the device view.



### 4.3.2.2 Configuring in STEP 7 with the iba block family ibaREQ

This section describes how to configure the Request blocks in TIA Portal STEP 7 for *ibaBM-PN*.

#### For each Request module

- Copy the following blocks from the iba S7 library to the blocks folder of your STEP 7 project, see [↗ iba S7 library, page 151](#). One set of Request blocks has to be called for each Request module (connection) in *ibaPDA*.
  - ibaREQ\_M (FB1400), see [↗ ibaREQ\\_M \(FB1400\), page 96](#)
  - ibaREQ\_PN (FB1401), see [↗ ibaREQ\\_PN \(FB1401\), page 98](#)
  - ibaREQ\_DB (DB15)
  - ibaREQ\_DB-Interface (PLC data type)

#### Note



Only use Request blocks from the latest iba S7 library!

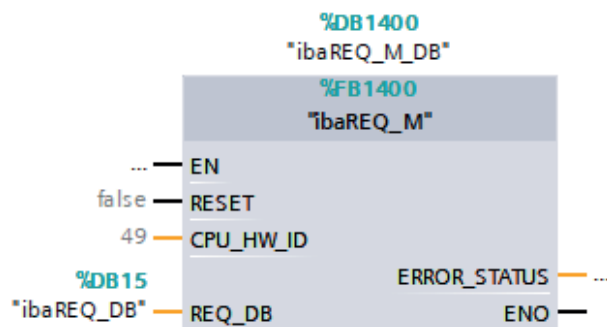
Request blocks in application examples can be outdated and, thus, cause errors.

#### Note

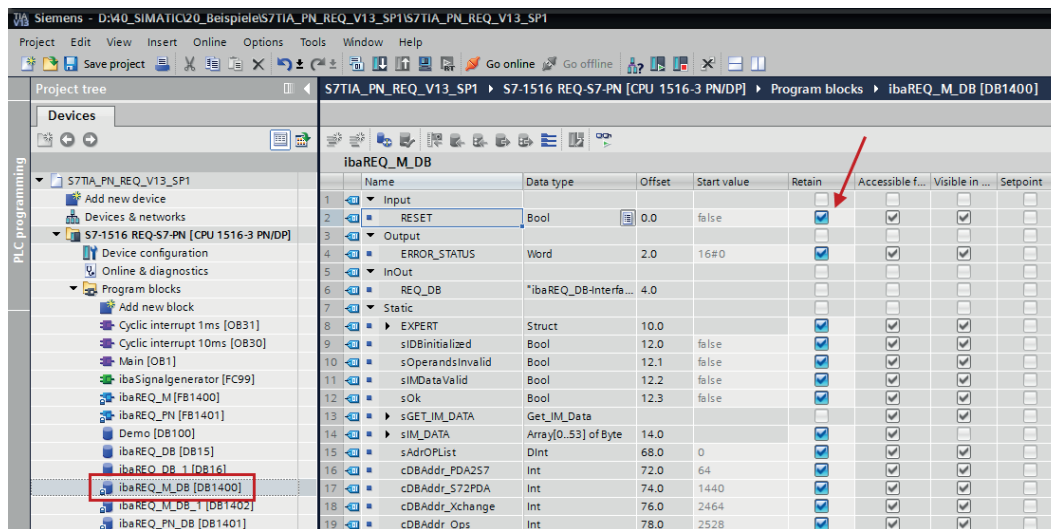


The request blocks do not support multi-instance calls.

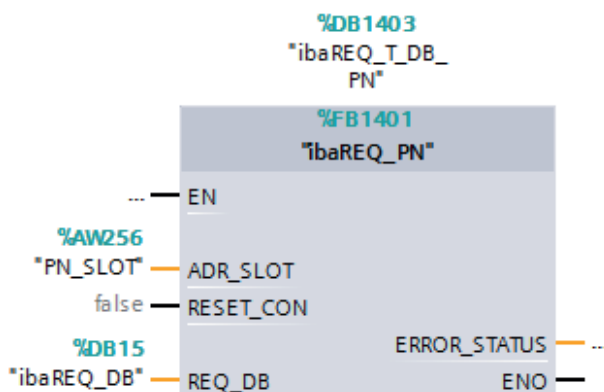
- Call the ibaREQ\_M (FB1400) preferably within the OB1.



3. Enable the option *Retain* for the entire instance data block you have just created.



4. Call the ibaREQ\_PN (FB1401) within the OB1 or a cyclic interrupt OB (OB3x).



### For each additional Request module

- In the blocks folder, an ibaREQ\_DB (DB15) data block has to be available for each Request module. Copy the data block and assign a new unique DB number.
- Within the OB1, ibaREQ\_M (FB1400) has to be called once more with the new DB number for each Request module.
- Within the OB1 or within a cyclic interrupt (OB3x), the ibaREQ\_PN (FB1401) has to be called once more with the new DB number for each Request module.
- Make sure that all instance data blocks are unique and that unique values are assigned for the ADR\_SLOT.

## Final

- Load all blocks into the S7 CPU and restart the S7 CPU.

### 4.3.2.3 Configuration in STEP 7 using the ibaREQsym iba block family

This section describes how to configure the Request blocks in TIA Portal STEP 7 for *ibaBM-PN*.

#### For each Request module

- Copy the following blocks from the iba S7 library to the blocks folder of your STEP 7 project, see [iba S7 library, page 151](#). One set of Request blocks has to be called for each Request module (connection) in *ibaPDA*.
  - ibaREQsym\_M, see [ibaREQsym\\_M, page 112](#)
  - ibaREQsym\_PN, see [ibaREQsym\\_PN, page 114](#), or alternatively ibaREQsym\_6PN, see [ibaREQ3sym\\_6PN, page 132](#)
  - ibaREQsym\_DB\_PDA
  - ibaREQsym\_Interface (PLC data type)

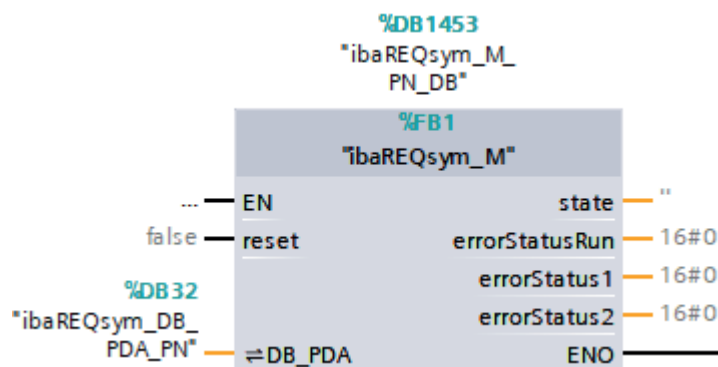
#### Note



Only use Request blocks from the latest iba S7 library!

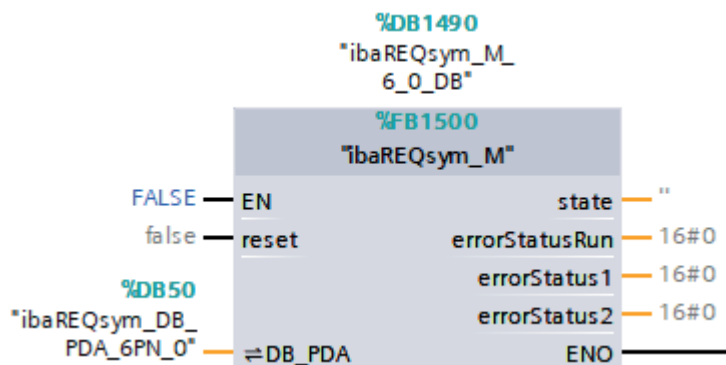
Request blocks in application examples can be outdated and, thus, cause errors.

- Call ibaREQsym\_M within a cyclic interrupt OB (OB3x).

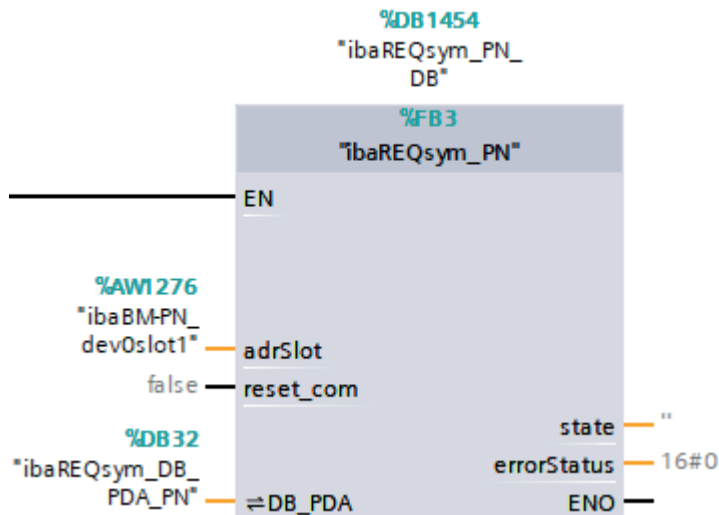


Alternatively when using ibaREQsym\_6PN:

Call ibaREQsym\_M within a cyclic interrupt OB (OB3x).



3. Call ibaREQsym\_PN within the OB1 or a cyclic interrupt OB (OB3x).



Alternatively when using ibaREQsym\_6PN:

Call ibaREQsym\_6PN within a cyclic interrupt OB (OB3x).



### For each additional Request module

- In the blocks folder, an ibaREQsym\_DB\_PDA data block has to be available for each Request module. Copy the data block and assign a new unambiguous DB number.
- Within OB1 or a cyclic interrupt OB (OB3x), ibaREQsym\_M and ibaREQsym\_PN (or ibaREQsym\_6PN) have to be called once more with the new DB number for each Request module.
- Make sure that all instance data blocks are unique and that unique values are assigned for the ADR\_SLOT parameters.

### Final

- Load all blocks to the S7 CPU and restart the S7 CPU.

### 4.3.2.4 Configuration in STEP 7 using the ibaREQ3sym iba block family

This section describes how to configure the Request blocks in TIA Portal STEP 7 for *ibaBM-PN*.

#### For each Request module

1. Copy the following blocks from the iba S7 library to the blocks folder of your STEP 7 project, see [iba S7 library, page 151](#). One set of Request blocks has to be called for each Request module (connection) in *ibaPDA*.
  - ibaREQ3sym\_M, see [ibaREQ3sym\\_M, page 127](#)
  - ibaREQ3sym\_6PN, see [ibaREQ3sym\\_6PN, page 132](#)
  - ibaREQ3sym\_DB\_PDA
  - ibaREQ3sym\_Interface (PLC data type)

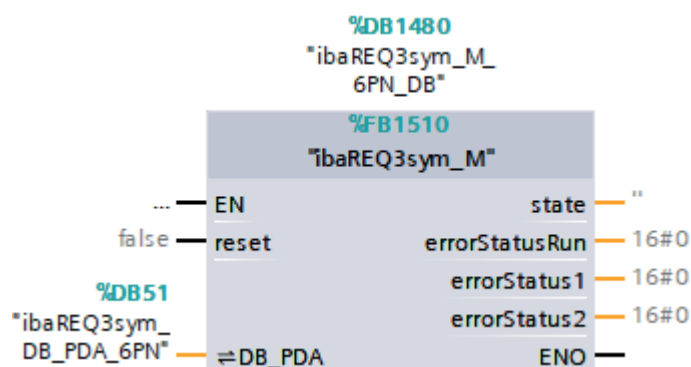
#### Note



Only use Request blocks from the latest iba S7 library!

Request blocks in application examples can be outdated and, thus, cause errors.

2. Call ibaREQ3sym\_M.



3. Call ibaREQsym\_PN preferably a cyclic interrupt OB at the required send interval.



#### For each additional Request module

- In the blocks folder, an `ibaREQ3sym_DB_PDA` data block has to be available for each Request module. Copy the data block and assign a new unambiguous DB number.
- `ibaREQ3sym_M` and `ibaREQ3sym_6PN` have to be called once more with the new DB number for each Request module.
- Make sure that all instance data blocks are unique and that unique values are assigned for the `adrSlotx` parameter.

#### Final

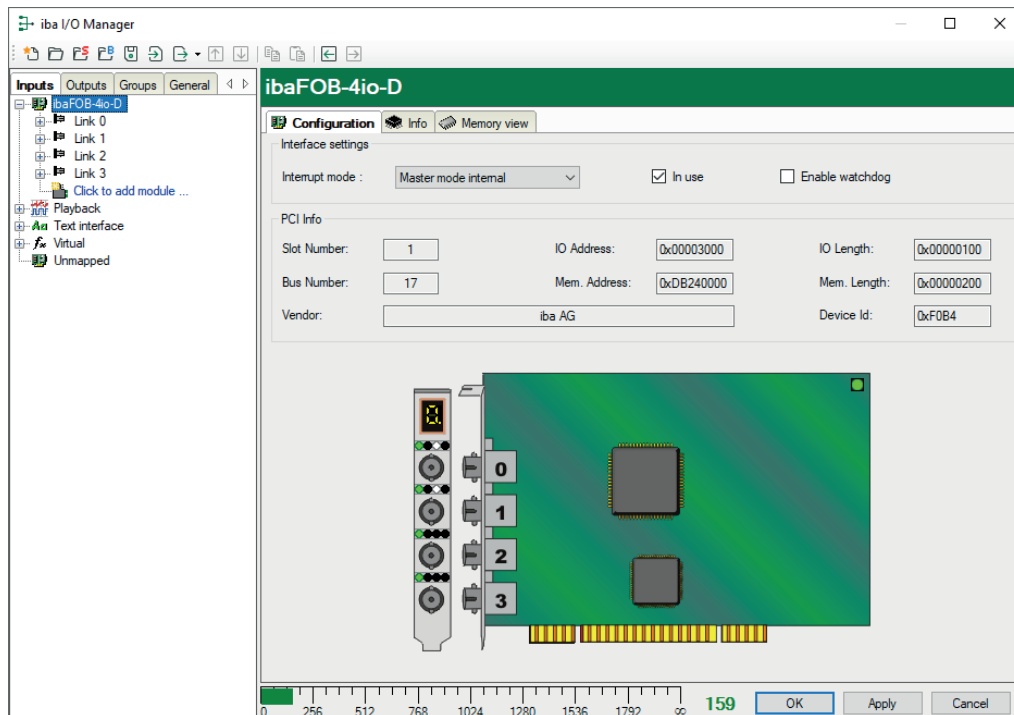
- Load all blocks to the S7 CPU and restart the S7 CPU.

### 4.3.3 Configuration and engineering ibaPDA

This section describes the configuration of the Request modules in *ibaPDA* for *ibaBM-PN*.

#### 4.3.3.1 General interface settings

If an *ibaFOB-D* card is installed in the *ibaPDA* computer, *ibaPDA* displays the interface of the *ibaFOB-D* card in the interface tree of the I/O Manager.



#### Other documentation

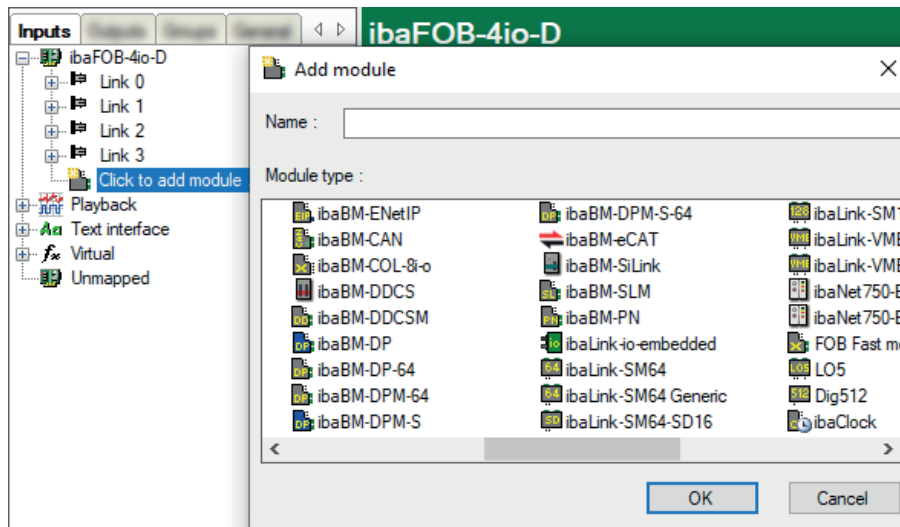


Detailed information about the *ibaFOB-D* card can be found in the respective manual.

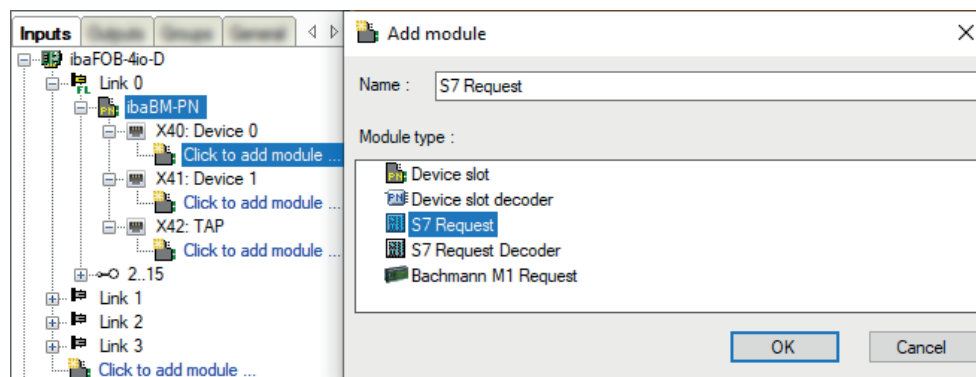
## Configuring ibaBM-PN

1. Start the *ibaPDA* client and open the I/O Manager.
2. In the interface tree (left), select the link of the *ibaFOB* card to which *ibaBM-PN* is connected.

Click on the blue command *Click to add module*. Select the *ibaBM-PN* module in the dialog box and assign a name via the input field if required. Confirm the selection with <OK>.



3. Add a Request module (or several modules, in case you need more connections to one or to different S7-CPU's) to the *ibaBM-PN* module on the respective PROFINET connection Device 0 or Device 1. Available modules are:
  - S7 Request (for acquiring analog signals and digital signals)
  - S7 Request Decoder (for acquiring up to 1024 digital signals)



4. Configure the required module settings and signals as described in the following chapters. The *General* and *Connection* tabs are identical for all Request modules. The Request modules only differ in the *Analog* and *Digital* tabs.
5. After you have finished the configuration, click <Apply> or <OK> to transfer the new configuration to the device and start data acquisition with *ibaPDA*.

### 4.3.3.2 General module settings

You can find the description of all settings that are identical for all Request-S7 modules in chapter [➤ General module settings](#), page 16.

You can find information on connection settings from the *Connection* tab in chapter [➤ Connection settings](#), page 18.

The *ibaBM-PN* modules have the following specific options in the *General* tab:

#### PROFINET

##### Device

Select the number of the PROFINET device to which the module is assigned.

##### Slot

Select the number of the slot to which the module is assigned.

##### Available slots

Shows the slots on the PROFINET device that can be used for the data of this module.

##### S2 Redundancy

FALSE: Redundancy mode disabled. For further information on the redundancy mode, see [➤ Request-S7 for ibaBM-PN in redundancy mode](#), page 80.

### 4.3.3.3 Module S7 Request

With the *S7 Request* module, you can acquire data according to the size of the PROFINET slots used. A maximum of 254 bytes is possible.

Configure a separate PROFINET slot and Request block call for each module.

For more information on the module settings, see [➤ General module settings](#), page 16 and [➤ General module settings](#), page 77.

### 4.3.3.4 Module S7 Request Decoder

The *S7 Request Decoder* module allows the acquisition of up to 16384 digital signals sent as a maximum of 128 words (16 Bit). This module type is suited for applications where large amounts of digital signals have to be acquired and for which the max. 1024 directly addressable digital values of the *ibaBM-PN* are not sufficient.

Configure a separate PROFINET slot and Request block call for each module.

#### General tab

For more information on the module settings, see [➤ General module settings](#), page 16 and [➤ General module settings](#), page 77.

#### Module specific settings

##### Module layout – No. of decoders

Define the number of configurable decoders in the digital signal table. The default value is 32. The maximum value is 126. The signal tables are adjusted accordingly.

Connection configuration

Configure the connection of the *S7 Request Decoder* module in the same way as the connection for an S7-Request module, see ➤ *Connection settings*, page 18.

Digital tab

Configure the signals in the same way as for an *ibaBM-DP* device, see ➤ *Digital tab*, page 90.

4.3.4 Diagnostics

When you select the bus module node in the signal tree and choose the *Analog* or *Digital* tab, you get a list of all operands that have been acquired in the bus module with data type and actual value.

Inputs

ibaDAQ-S

Fiber optic link

ibaBM-PN

X40: Device 0

Click to add module ...

X41: Device 1

1: S7 Req SINUMERIK PN (3)

Click to add module ...

X42: TAP

Click to add module ...

2.15

Link 1

Link 2

ibaBM-PN

General Analog Digital Diagnostics

| Name                            | Symbol                    | Device        | Slot | Address | DataType | Actual    |
|---------------------------------|---------------------------|---------------|------|---------|----------|-----------|
| Source: (3) S7 Req SINUMERIK PN |                           |               |      |         |          |           |
| [3:0]: Test-DB\INT_1            | BLOCKS\Blocks.Test-DB\... | X41: Device 1 | 1    | 0x0     | INT_B    | 25045     |
| [3:1]: Test-DB\AngularFreq0.1Hz | BLOCKS\Blocks.Test-DB\... | X41: Device 1 | 1    | 0x2     | FLOAT_B  | 995.379   |
| [3:2]: Test-DB\AngularFreq1Hz   | BLOCKS\Blocks.Test-DB\... | X41: Device 1 | 1    | 0x6     | FLOAT_B  | 47109.1   |
| [3:3]: Test-DB\AngularFreq10Hz  | BLOCKS\Blocks.Test-DB\... | X41: Device 1 | 1    | 0xA     | FLOAT_B  | 28498.3   |
| [3:4]: Test-DB\Sinus_0.1Hz      | BLOCKS\Blocks.Test-DB\... | X41: Device 1 | 1    | 0xE     | FLOAT_B  | 0.484618  |
| [3:5]: Test-DB\Cosinus_0.1Hz    | BLOCKS\Blocks.Test-DB\... | X41: Device 1 | 1    | 0x12    | FLOAT_B  | -0.874726 |

Other documentation



You find a detailed description of the device-specific diagnostic options of *ibaBM-PN* in the device manual.

Module diagnostics on the S7 request info tab

In addition to interface diagnostics, the request module provides the *S7 request info* tab.

Inputs

ibaFOB-4io-D

Link 0

ibaBM-PN

X40: Device 0

1: S7 Request (4)

Click to add module ...

X41: Device 1

X42: TAP

2.15

Link 1

Link 2

1: S7 Request (4)

General Connection Analog Digital S7 request info

DB version:

FB version:

Max. pointers:

Used pointers:

Max. data bytes:

Used data bytes:

| Pointer | Size |
|---------|------|
|---------|------|

DB version

Version of the data block used in the CPU

FB version

Version of the function block used in the CPU

Max. pointers

The max. number of used pointers (depends on the size of the data block *ibaREQ\_DB*).

**Used pointers**

Currently used number of pointers.

**Max. data bytes**

Max. size of the user data in the data telegrams to *ibaPDA*

**Used data bytes**

Currently used bytes in the user data of the data telegrams.

**Pointer table**

Currently required data pointer with address and length

For optimizing the communication performance, signals with consecutive addresses are requested and transferred as a block (pointer).

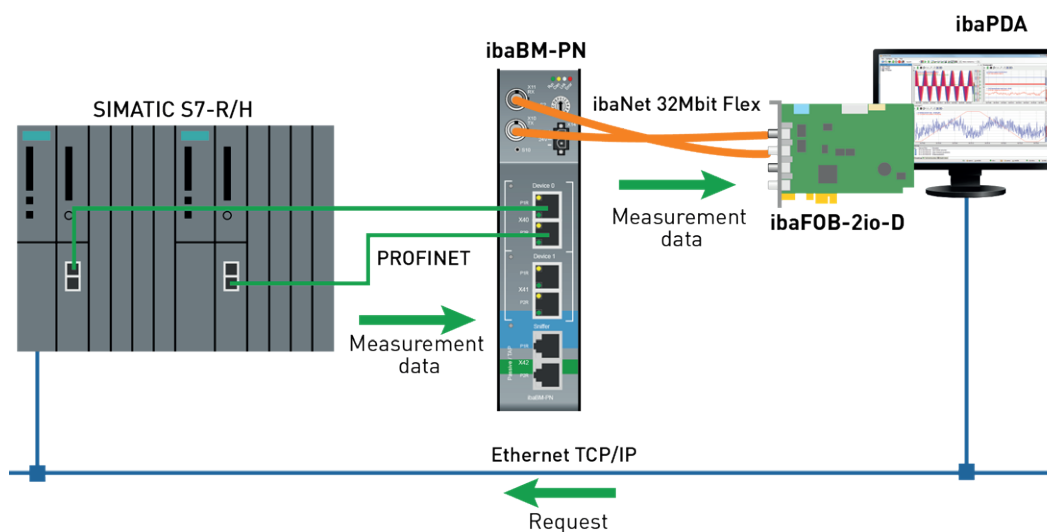
## 4.4 Request-S7 for ibaBM-PN in redundancy mode

This section describes the Request-S7 variant for the PROFINET bus module *ibaBM-PN* in S2 redundancy mode.

### 4.4.1 General information

With the S2 redundancy mode of *ibaBM-PN*, the device can be operated on redundant PROFINET systems (S2 system redundancy) in combination with SIMATIC S7-R/H controllers, whose measurement data is to be acquired. You need an additional license for the S2 redundancy mode. Contact the iba Support.

The following figure shows an exemplary integration of an *ibaBM-PN* in S2 redundancy mode:



### Other documentation



Detailed information about the S2 redundancy mode of the *ibaBM-PN* can be found in the device manual.

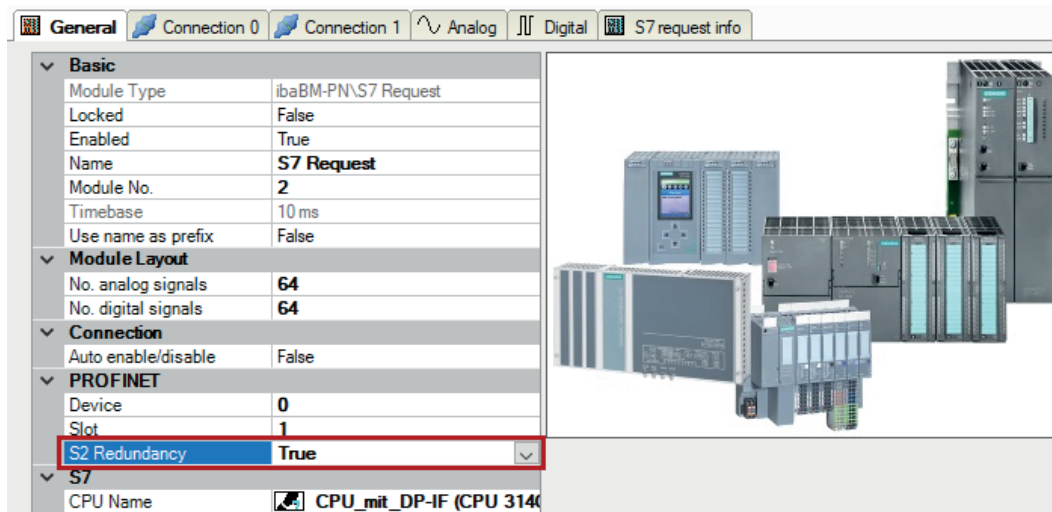
The functionality of the Request-S7 for *ibaBM-PN* in redundancy mode mostly corresponds to the functionality in standard mode (see chapter [Request-S7 for ibaBM-PN, page 66](#)). The differences and extensions are described in the following.

### 4.4.2 Configuration and engineering ibaPDA

First connect *ibaBM-PN* to a free link of an *ibaFOB-D* card. In the I/O Manager, add a device module *ibaBM-PN* to the corresponding link.

Then add a module *S7 Request*.

In the *General* tab, set the parameter *S2 Redundancy* to "True". The orange colored icon of the Request module indicates the redundancy mode.

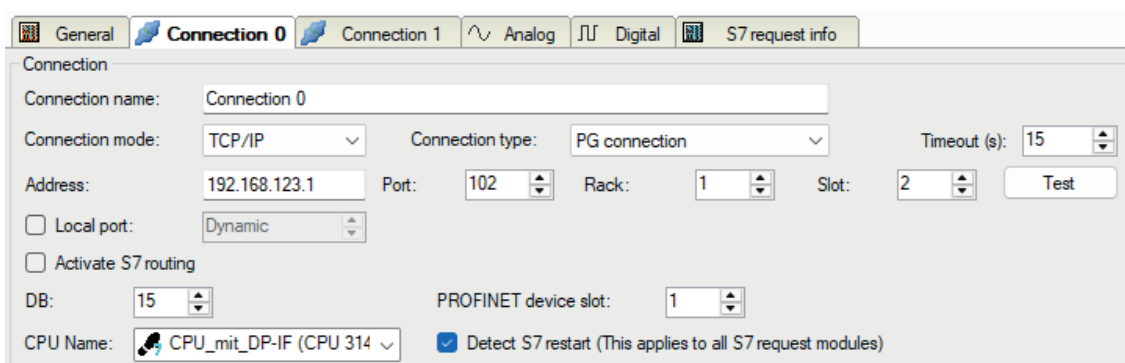


The configuration of the modules otherwise corresponds to the configuration in standard mode, see [General module settings, page 77](#).

### Connection settings

For transmitting the operand data to both CPUs of the SIMATIC S7-R/H, set up two different connections. *ibaPDA* switches between these connections depending on availability and requirements.

Configure both connections on the tabs *Connection 0* and *Connection 1*. You can change the name of the tabs in the *Connection name* fields.



The other settings are identical to the settings for operation without redundancy mode, see [Connection settings, page 18](#).

Note these special features:

- The rack numbers for an H system are 0 or 1 for the both redundant CPUs.
- Set the DB number, the PROFINET device slots and the CPU name for assigning an address book only once in the *Connection 0* tab.

## 4.5 Request-S7 for ibaBM-DP

This section describes the Request-S7 variant for the PROFIBUS bus module *ibaBM-DP*.

### 4.5.1 General information

Request-S7 for *ibaBM-DP* can be configured in the following system configurations:

| SIMATIC S7 CPU                                                 | SIMATIC STEP 7 V5.x<br>(SIMATIC Manager) | SIMATIC STEP 7 V1x<br>Professional (TIA Portal) |
|----------------------------------------------------------------|------------------------------------------|-------------------------------------------------|
| S7-1500<br>integrated DP interface and<br>CM1542-5 or CP1542-5 | -                                        | X                                               |

For DP Request, the measurement values (Request Handshake) are not requested via the PROFIBUS, but via a separate connection.

Depending on the hardware and software, different access points can be selected for the Request:

- TCP/IP: The connection to the SIMATIC S7 is established using an integrated PN interface of the S7 CPU or the respective CP modules in the PLC and the standard network interface of the computer. No additional Siemens software is required for the connection.
- PC/CP: This is the designation for different SIMATIC specific access points. In contrast to the TCP/IP connection, for the PC/CP group the SIMATIC communication software (and corresponding licenses) must be installed on the computer with the corresponding functions enabled.
  - MPI, PROFIBUS: The connection to the SIMATIC S7 is established using the MPI or PROFIBUS interface of the computer; e.g. with the CP5611 PCI card or the MPI adapter for USB interface or serial PC interface.
  - TCP/IP, ISO: Here, either the standard network interface of the computer or a suitable interface card is used for the connection to the S7.
- TCP/IP S7-1x00: The connection to a SIMATIC S7-1500 is established using an integrated PN interface of the S7 CPU or respective CP modules in the PLC and the standard network interface of the computer. No additional Siemens software is required for the connection.

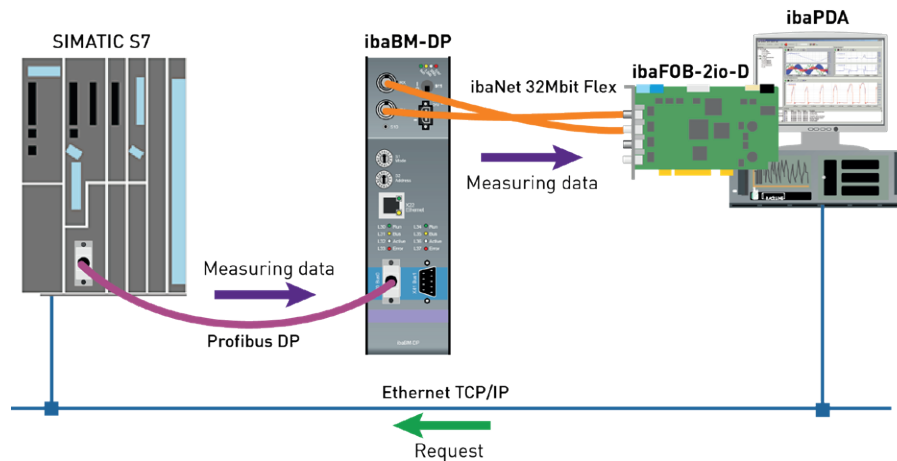
### System integration with ibaBM-DP

The measured data are transmitted to the *ibaBM-DP* device over PROFIBUS DP.

You need the following connections:

- Online connection between *ibaPDA* and S7-CPU (TCP/IP, MPI or DP)
- Fiber optic connection between *ibaPDA/ibaFOB-io-D* and *ibaBM-DP*
- PROFIBUS connection between *ibaBM-DP* and S7 PROFIBUS master
- A connection from *ibaBM-DP* to the network (TCP/IP over Ethernet) is only needed if the device is operated in compatibility mode, i.e. not with 32Mbit Flex (short: Flex). In this case the system integration is like with *ibaBM-DPM-S*, see Manual part 2.

In the standard version, you can configure a maximum of 8 connections per device, i.e. 8 PROFIBUS slaves. Up to 244 Byte data can be transmitted per slave.



### Note



The following description refers to the Request blocks V4.0 or higher. If you require information regarding older versions, contact the iba Support.

### Other documentation

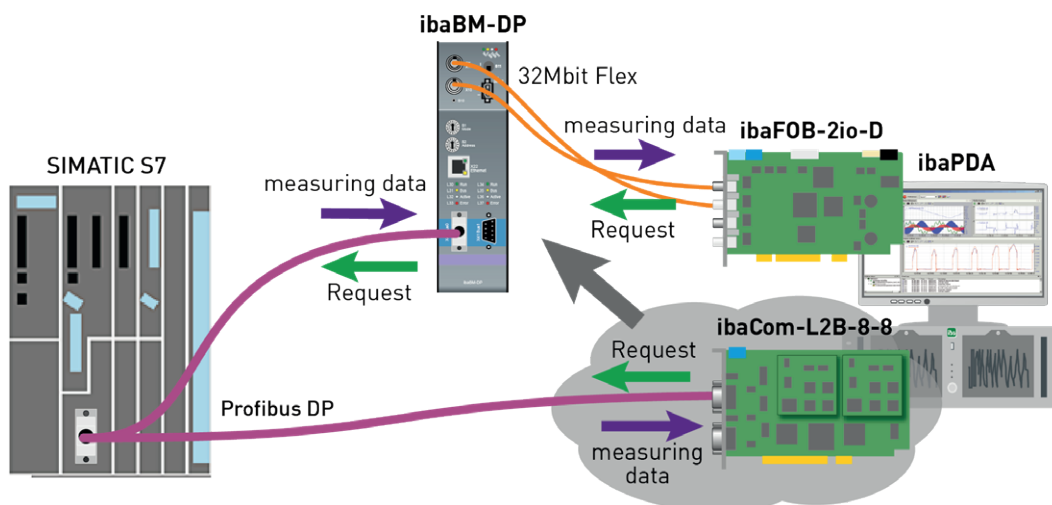


Detailed information about *ibaBM-DP* can be found in the device manual.

For information about application examples, see chapter ↗ *Application examples, page 154*.

#### 4.5.1.1 ibaCom-L2B compatibility mode

You can use *ibaBM-DP* for the Request-S7 functionality of the *ibaCom-L2B-PROFIBUS* card as a successor with full functional compatibility.



For this purpose, you can use the following modules:

- S7 Request (ibaCom-L2B compatible)
- S7 Request Dig512 (ibaCom-L2B compatible)

Compared to the original configuration on the basis of the *ibaCom-L2B* card, modifications in the S7 configuration are not necessary (Hardware or S7 program).

Detailed information about this subject can be found see Manual part 2.

#### Note



The *ibaCom-L2B* compatibility mode can only be used in the Flex-mode of *ibaBM-DP*.

## 4.5.2 Configuration and engineering SIMATIC S7-1500

This section describes the configuration and engineering on the SIMATIC S7 side with the SIMATIC TIA Portal for *ibaBM-DP*.

On the SIMATIC TIA Portal side, carry out the following configuration steps:

- Network configuration:  
Integration of the PROFIBUS slaves in the device configuration
- Configuration software:  
Integration of the Request blocks in the S7 program
- Device configuration:  
Setting the CPU protection properties

You cannot use the *S7 Request (ibaCom-L2B compatible)* and *S7 Request Dig512 (ibaCom-L2B compatible)* compatibility modules in combination with a CPU S7-1500.

### 4.5.2.1 Network configuration

For *ibaBM-DP*, specify an iba-PROFIBUS slave for each module.

Use the GSD file [ibaDPMSi.gsd](#) (version V2.2 and higher).

#### Note

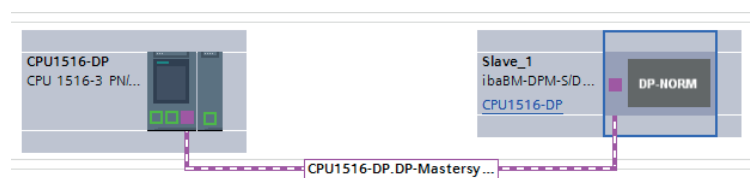


You find the GSD file [ibaDPMSi.gsd](#) on the data storage medium "iba Software & Manuals" in the following directory:

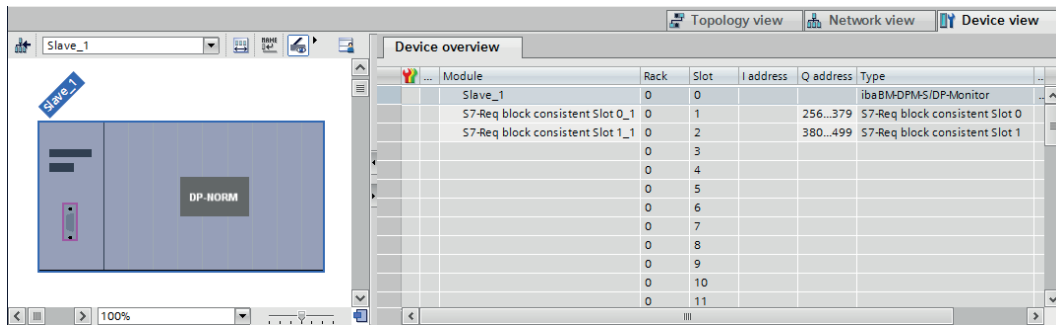
[\02\\_iba\\_Hardware\ibaBM-DP\02\\_GSD\\_Files\01\\_General\](#)

Use the elements "S7-Req **block consistent** Slot 0 / Slot 1".

The following figure shows the net view.



The following figure shows the device view.



#### 4.5.2.2 Configuration in STEP 7 using the ibaREQ iba block family

This section describes how to configure the Request blocks in TIA Portal STEP 7 for *ibaBM-DP*.

##### For each Request module

- Copy the following blocks from the iba S7 library to the blocks folder of your STEP 7 project, see [iba S7 library, page 151](#). One set of Request blocks has to be called for each Request module (connection) in *ibaPDA*.
  - ibaREQ\_M (FB1400), see [ibaREQ\\_M \(FB1400\), page 96](#)
  - ibaREQ\_DP (FB1402), see [ibaREQ\\_DP \(FB1402\), page 100](#)
  - ibaREQ\_DB (DB15)
  - ibaREQ\_DB-Interface (PLC data type)

##### Note



Only use Request blocks from the latest iba S7 library!

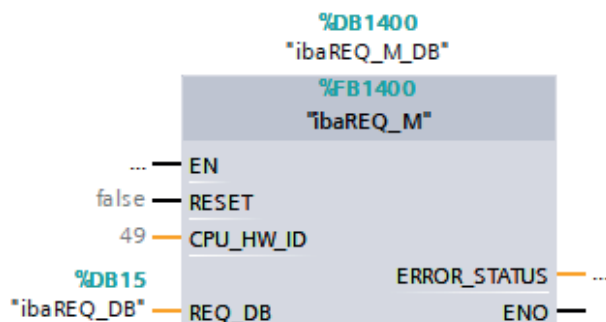
Request blocks in application examples can be outdated and, thus, cause errors.

##### Note

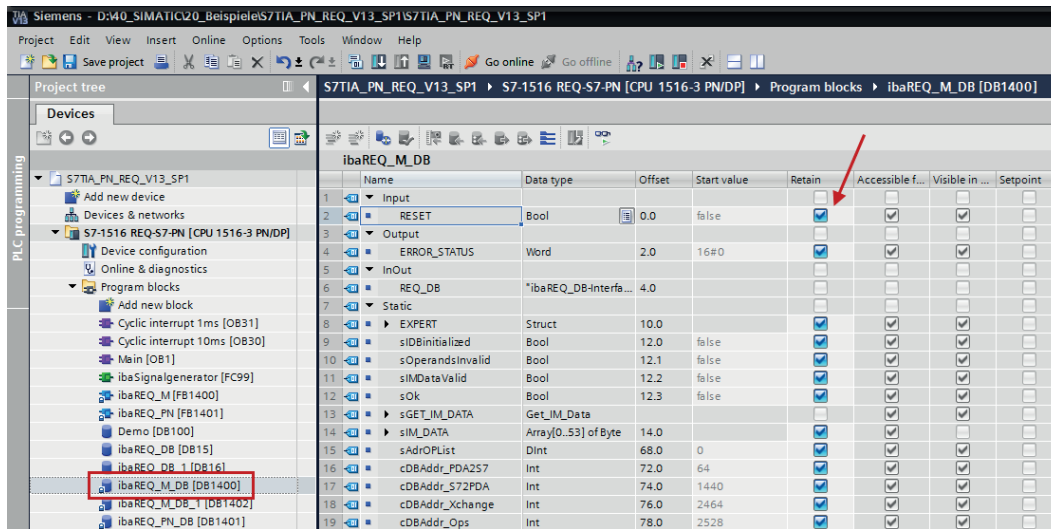


The request blocks do not support multi-instance calls.

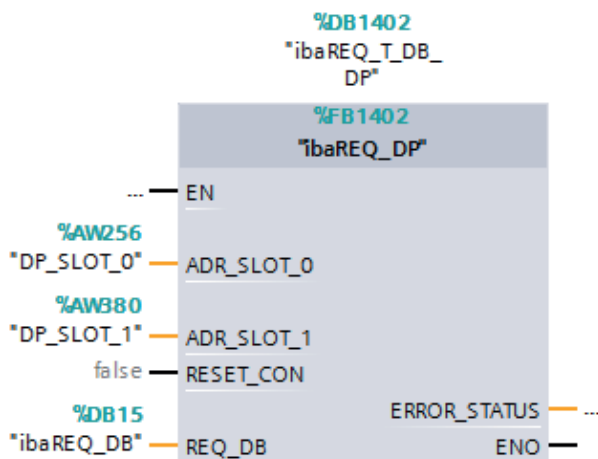
- Call ibaREQ\_M (FB1400) preferably within OB1.



3. Enable the *Retain* option for the entire instance data block you have just created.



4. Call ibaREQ\_DP (FB1402) within OB1 or a cyclic interrupt OB (OB3x).



#### For each additional Request module

- In the blocks folder, an ibaREQ\_DB (DB15) data block has to be available for each Request module. Copy the data block and assign a new unique DB number.
- Within OB1, ibaREQ\_M (FB1400) has to be called once more with the new DB numbers for each Request module.
- Within OB1 or a cyclic interrupt OB (OB3x), ibaREQ\_DP (FB1402) has to be called once more with the new DB numbers for each Request module.
- Make sure that all instance data blocks are unique and that unique values are assigned for the ADR\_SLOT\_0 and ADR\_SLOT\_1 parameters.

#### Final

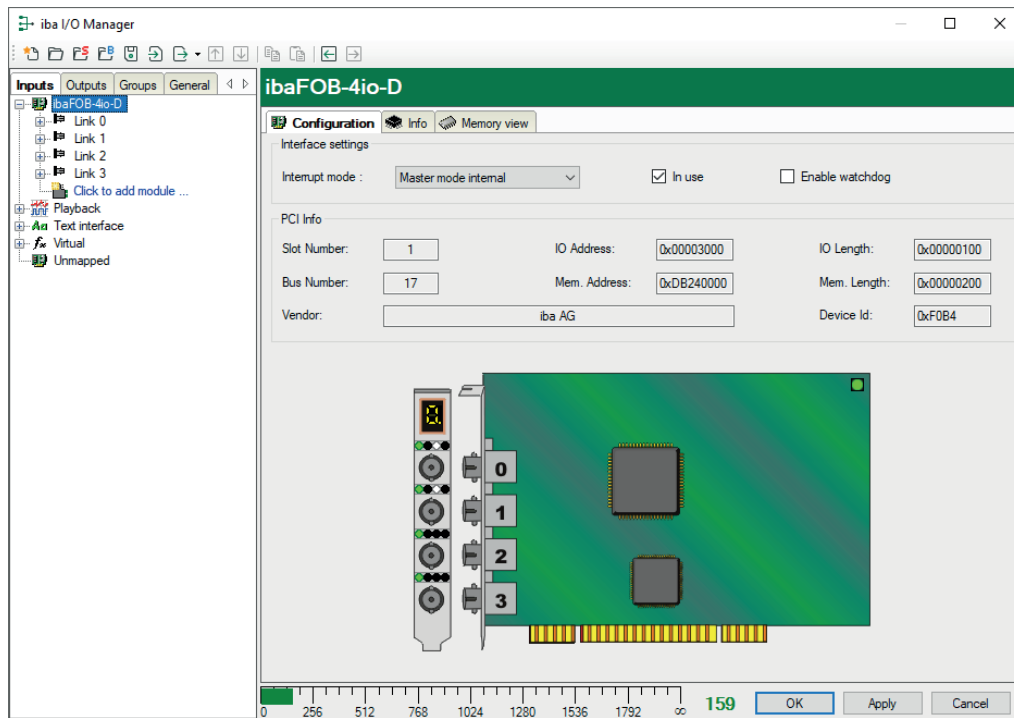
- Load all blocks to the S7 CPU and restart the S7 CPU.

### 4.5.3 Configuration and engineering ibaPDA

This section describes the configuration of the Request modules in *ibaPDA* for *ibaBM-DP*.

#### 4.5.3.1 General interface settings

If an *ibaFOB-D* card is installed in the *ibaPDA* computer, *ibaPDA* displays the interface of the *ibaFOB-D* card in the interface tree of the I/O Manager.



#### Other documentation

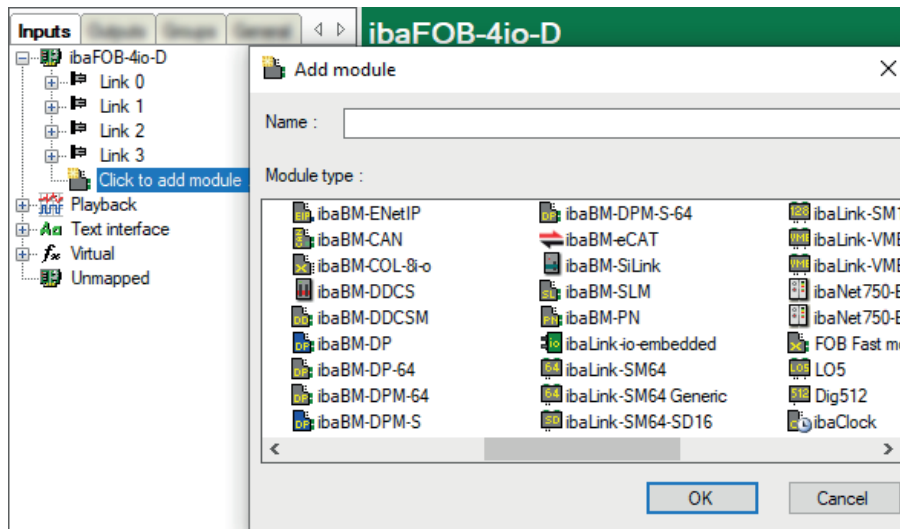


Detailed information about the *ibaFOB-D* card can be found in the respective manual.

## Configuring ibaBM-DP

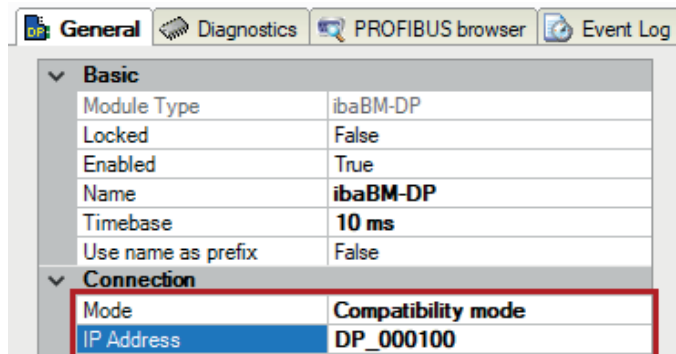
1. Start the *ibaPDA* client and open the I/O Manager.
2. In the interface tree (left), select the link of the *ibaFOB* card to which *ibaBM-DP* is connected.

Click on the blue command *Click to add module*. Select the *ibaBM-DP* module in the dialog box and assign a name via the input field if required. Confirm the selection with <OK>.



3. If you operate the device in Flex mode, *ibaPDA* sets the IP address of the device on the *General* tab under *Connection* automatically.

If you operate the device in compatibility mode, enter the IP address of the device on the *General* tab under *Connection*: either as name e.g. "DP\_000100" or as IP address e.g. "192.168.81.123".



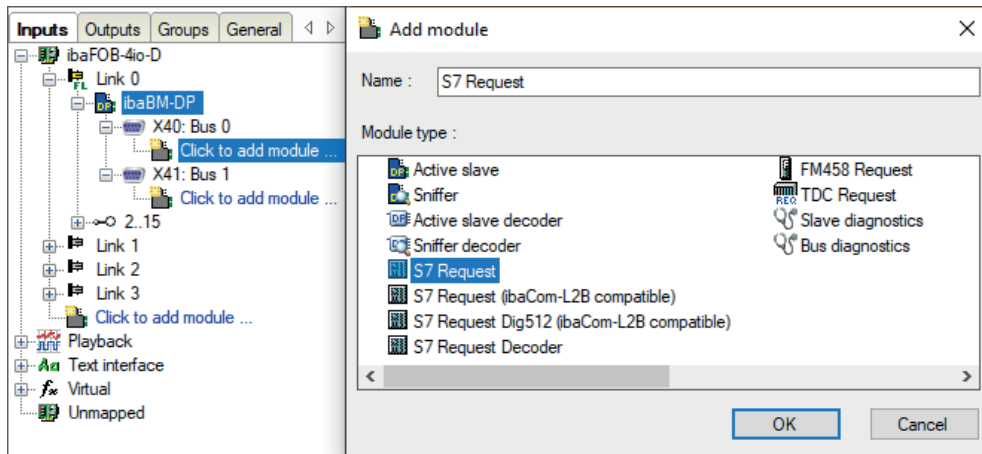
### Note



An online connection to the device via Ethernet or USB is mandatory in compatibility mode. The manual of the *ibaBM-DP* device explains how to establish and check this connection.

The device manual also describes differences between Flex mode and compatibility mode in detail.

4. Add a request module (or several modules, in case you need more connections to one or to different S7-CPU's) to the *ibaBM-DP* module on the respective PROFIBUS connection Bus 0 or Bus 1. Available modules are:
  - S7 request (for acquiring analog signals and digital signals)
  - S7 request decoder (for the acquisition of up to 1024 digital signals)



5. Configure the required module settings and signals as described in the following chapters.  
The *General* and *Connection* tabs are identical for all Request modules. The Request modules only differ in the *Analog* and *Digital* tabs.
6. After you have finished the configuration, click <Apply> or <OK> to transfer the new configuration to the device and start data acquisition with *ibaPDA*.

### 4.5.3.2 General module settings

You can find the description of all settings that are identical for all Request-S7 modules in chapter [➤ General module settings](#), page 16.

You can find information on connection settings from the *Connection* tab in chapter [➤ Connection settings](#), page 18.

The *ibaBM-DP* modules have the following specific options in the *General* tab:

#### PROFIBUS

##### Bus number

0 = connector X40 left, 1 = connector X41 right

##### Slave number

PROFIBUS slave address assigned to the module.

#### Connection

##### Auto enable/disable

If TRUE, the acquisition is started, even if no connection can be established to the S7-CPU. The module is deactivated. During the acquisition, *ibaPDA* tries to reconnect to the S7-CPU. If successful, the acquisition is restarted with this module enabled.

If FALSE, the acquisition is not started, if a connection to the configured S7-CPU cannot be established.

### 4.5.3.3 Module S7 Request

With the *S7 request* module, you can acquire up to 64 analog signals and 64 digital signals.

Configure a separate PROFIBUS slave and Request block call for each module.

For a description of the module settings, see chapter ↗ *General module settings*, page 16 and ↗ *General module settings*, page 89.

### 4.5.3.4 Module S7 Request Decoder

The *S7 Request Decoder* module allows the acquisition of up to 1024 digital signals sent as a maximum of 64 words (16 Bit). This module type is suited for applications where large amounts of digital signals have to be acquired and for which the max. 1024 directly addressable digital values of the *ibaBM-DP* are not sufficient.

Configure a separate PROFIBUS slave and Request block call for each module.

#### General tab

For more information on the module settings, see ↗ *General module settings*, page 16 and ↗ *General module settings*, page 89.

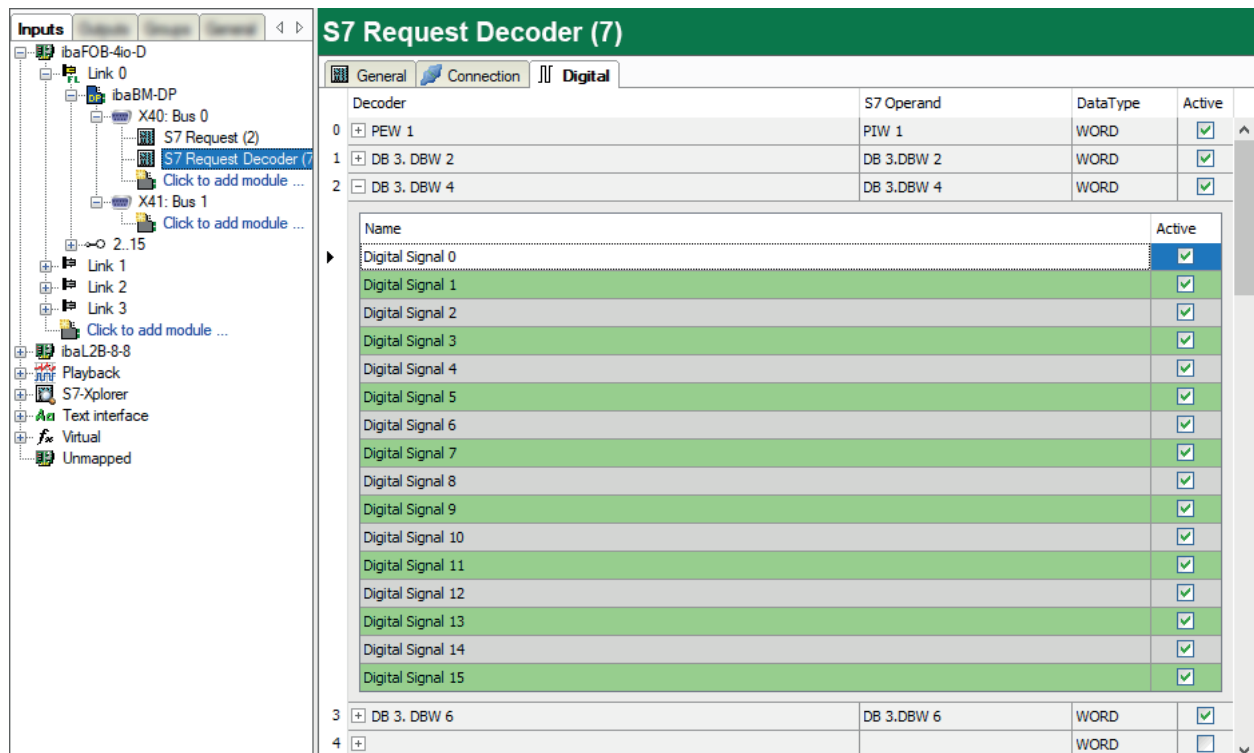
#### Connection configuration

Configure the connection of the *S7 Request Decoder* module in the same way as the connection for an S7-Request module, see ↗ *Connection settings*, page 18.

#### Digital tab

The declaration of the digital signals is done in two steps.

- First define the words (source signals), which are broken down for the digital signals (bits).  
You can directly enter the words as basic signals for decoding via the absolute S7 operands. Only word operands (e.g. PIW, MW, DBW) are allowed.  
You can also use S7 symbols by generating address books. For detailed information, see ↗ *Selection via the symbolic operand addresses*, page 30. The signals selected in S7 CFC and symbol browser are applied and the columns *Name*, *S7 symbol*, *S7 Operand* and *Data Type* are filled in automatically.
- You can open each word (source signal) via the <+> button to display the list of associated digital signals.  
Then define the individual digital signals (bits) of the source signal.



| Decoder                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | S7 Operand                          | DataType | Active                              |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------|----------|-------------------------------------|------|--------|------------------|-------------------------------------|------------------|-------------------------------------|------------------|-------------------------------------|------------------|-------------------------------------|------------------|-------------------------------------|------------------|-------------------------------------|------------------|-------------------------------------|------------------|-------------------------------------|------------------|-------------------------------------|------------------|-------------------------------------|-------------------|-------------------------------------|-------------------|-------------------------------------|-------------------|-------------------------------------|-------------------|-------------------------------------|-------------------|-------------------------------------|-------------------|-------------------------------------|
| 0 + PEW 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | PIW 1                               | WORD     | <input checked="" type="checkbox"/> |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| 1 + DB 3. DBW 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | DB 3.DBW 2                          | WORD     | <input checked="" type="checkbox"/> |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| 2 - DB 3. DBW 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | DB 3.DBW 4                          | WORD     | <input checked="" type="checkbox"/> |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| <table border="1"> <thead> <tr> <th>Name</th> <th>Active</th> </tr> </thead> <tbody> <tr><td>Digital Signal 0</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 1</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 2</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 3</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 4</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 5</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 6</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 7</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 8</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 9</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 10</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 11</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 12</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 13</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 14</td><td><input checked="" type="checkbox"/></td></tr> <tr><td>Digital Signal 15</td><td><input checked="" type="checkbox"/></td></tr> </tbody> </table> |                                     |          |                                     | Name | Active | Digital Signal 0 | <input checked="" type="checkbox"/> | Digital Signal 1 | <input checked="" type="checkbox"/> | Digital Signal 2 | <input checked="" type="checkbox"/> | Digital Signal 3 | <input checked="" type="checkbox"/> | Digital Signal 4 | <input checked="" type="checkbox"/> | Digital Signal 5 | <input checked="" type="checkbox"/> | Digital Signal 6 | <input checked="" type="checkbox"/> | Digital Signal 7 | <input checked="" type="checkbox"/> | Digital Signal 8 | <input checked="" type="checkbox"/> | Digital Signal 9 | <input checked="" type="checkbox"/> | Digital Signal 10 | <input checked="" type="checkbox"/> | Digital Signal 11 | <input checked="" type="checkbox"/> | Digital Signal 12 | <input checked="" type="checkbox"/> | Digital Signal 13 | <input checked="" type="checkbox"/> | Digital Signal 14 | <input checked="" type="checkbox"/> | Digital Signal 15 | <input checked="" type="checkbox"/> |
| Name                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Active                              |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 5                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 7                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 8                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 9                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 10                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 11                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 12                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 13                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 14                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| Digital Signal 15                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <input checked="" type="checkbox"/> |          |                                     |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| 3 + DB 3. DBW 6                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | DB 3.DBW 6                          | WORD     | <input checked="" type="checkbox"/> |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |
| 4 +                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                     | WORD     | <input type="checkbox"/>            |      |        |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                  |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |                   |                                     |

The individual columns of the signal table have the following meanings:

### Source signal

#### Decoder

Enter a name for the source signal.

#### S7 Operand/S7 Symbol

Enter the S7 operand to which the signal is assigned and, if applicable, the S7 symbol.

#### DataType

Enter the data type of the signal. The data type also determines the number of digital signals. *ibaPDA* automatically derives the possible data type from the S7 operand or S7 symbol.

#### Active

If you activate the source signal, it is acquired with all digital signals. You can deactivate individual digital signals.

### Individual digital signals (bits)

#### Name

Enter a name for the individual digital signals.

#### Active

If you activate the signal, the signal is acquired and is also considered when checking the number of licensed signals.

### Note



*ibaPDA* only takes the activated digital signals into account for the number of licensed signals, i.e. no additional signal for the source signal.

4.5.4 Diagnostics

When you select the bus module node in the signal tree and select the *Analog* or *Digital* tab, you get a list of all operands that are acquired in the bus module with data type and actual value.

Inputs

ibaDAQ-S

Fiber optic link

ibaBM-DP

X40: Bus 0

S7 Req SINUMERIK DP (2)

Click to add module ...

X41: Bus 1

Aktiver Slave (4)

Sniffer (5)

Click to add module ...

2..15

Link 1

Link 2

ibaBM-DP

General

Analog

Digital

Diagnostics

PROFIBUS browser

Event Log

| Name                            | Symbol                           | Bus                         | Slave | I/O | Address | Data Type  | Actual   |
|---------------------------------|----------------------------------|-----------------------------|-------|-----|---------|------------|----------|
| Source: (2) S7 Req SINUMERIK DP |                                  |                             |       |     |         |            |          |
| 0                               | [2:0]: Test-DB\INT_1             | BLOCKS\Blocks.Test-DB\IN... | 0     | 11  | Out     | 8 INT_B    | -30750   |
| 1                               | [2:1]: Test-DB\AngularFreq0.1Hz" | BLOCKS\Blocks.Test-DB\A...  | 0     | 11  | Out     | 10 FLOAT_B | 1056.3   |
| 2                               | [2:2]: Test-DB\AngularFreq1Hz    | BLOCKS\Blocks.Test-DB\An... | 0     | 11  | Out     | 14 FLOAT_B | 47717.9  |
| 3                               | [2:3]: Test-DB\AngularFreq10Hz   | BLOCKS\Blocks.Test-DB\An... | 0     | 11  | Out     | 18 FLOAT_B | 34624.4  |
| 4                               | [2:4]: Test-DB\Sinus_0.1Hz"      | BLOCKS\Blocks.Test-DB\Si... | 0     | 11  | Out     | 22 FLOAT_B | 0.663206 |
| 5                               | [2:5]: Test-DB\Cosinus_0.1Hz"    | BLOCKS\Blocks.Test-DB\C...  | 0     | 11  | Out     | 26 FLOAT_B | 0.748437 |

Other documentation



Detailed information about the device-specific diagnostic options of *ibaBM-DP* can be found in the device manual.

Module diagnostics on the S7 request info tab

In addition to interface diagnostics, the request module provides the *S7 request info* tab.

Inputs

ibaFOB-4io-D

Link 0

ibaBM-DP

X40: Bus 0

S7 DP Req (51)

Click to add module ...

X41: Bus 1

Click to add module ...

2..15

Link 1

Link 2

S7 DP Req (51)

General

Connection

Analog

Digital

S7 request info

DB version:

FB version:

Max. pointers:

Used pointers:

Max. data bytes:

Used data bytes:

| Pointer | Size |
|---------|------|
|---------|------|

DB version

Version of the data block used in the CPU

FB version

Version of the function block used in the CPU

Max. pointers

The max. number of used pointers (depends on the size of the data block *ibaREQ\_DB*).

Used pointers

Currently used number of pointers.

Max. data bytes

Max. size of the user data in the data telegrams to *ibaPDA*

Used data bytes

Currently used bytes in the user data of the data telegrams.

Pointer table

Currently required data pointer with address and length

For optimizing the communication performance, signals with consecutive addresses are requested and transferred as a block (pointer).

## 5 Description of Request blocks

### 5.1 ibaREQ iba block family

These blocks initialize and control communication between *ibaPDA* and the S7 controller.

The ibaREQ iba block family allows access exclusively to non-optimized data blocks. Addressing is carried out using the operand address.

One set of Request blocks has to be called for each Request module (connection) in *ibaPDA*. The blocks used are part of the iba S7 library, see ↗ *iba S7 library, page 151*.

#### Note



Only use Request blocks from the latest iba S7 library!

Request blocks in application examples can be outdated and, thus, cause errors.

Use different Request block combinations depending on the current system configuration:

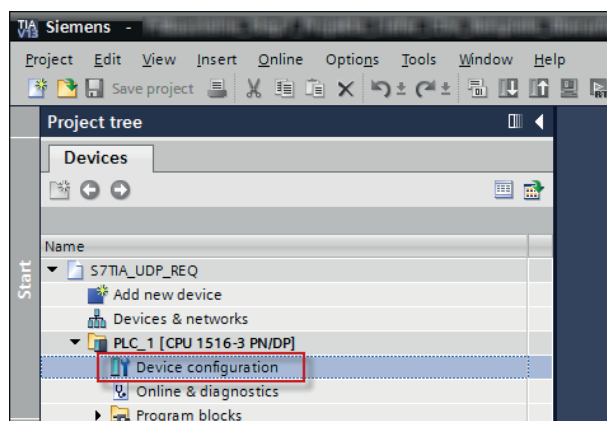
| Request block               | S7-1500 CPU with integrated PN interface | S7-1500 CPU with CM1542-1 | Recommended call level |
|-----------------------------|------------------------------------------|---------------------------|------------------------|
| ibaREQ_M (FB1400)           | X                                        | X                         | OB1                    |
| ibaREQ_PN (FB1401)          | X                                        | X                         | OB1 or OB3x            |
| ibaREQ_DP (FB1402)          | X                                        | X                         | OB1 or OB3x            |
| ibaREQ_UDP2 (FB1406)        | X                                        | X                         | OB3x                   |
| ibaREQ_NetE-Buffer (FB1408) | X                                        | X                         | OB1 or OB3x            |
| ibaREQ_NetE-Send (FB1409)   | X                                        | X                         | OB1 or OB3x            |
| ibaREQ_UDPact (FB 1410)     | X                                        | X                         | -                      |
| ibaREQ_DB (DB15)            | X                                        | X                         | -                      |
| ibaREQ_DB-Interface         | X                                        | X                         | -                      |

- **ibaREQ\_M (Management)**  
The block realizes the communication with *ibaPDA*. Ideally, the block is called in OB1.
- **ibaREQ\_PN/ibaREQ\_DP (provision and sending of current signal values)**  
The block provides the current signal values using the transmission cycle. Ideally, the block is called in a cyclic interrupt OB.
- **ibaREQ\_UDP2 (provision and sending of current signal values)**  
The block provides the current signal values using the transmission cycle. Ideally, the block is called in a cyclic interrupt OB.
- **ibaREQ\_NetE-Buffer**  
The block provides the current signal values using the transmission cycle and buffers them. Ideally, the block is called in a cyclic interrupt OB.

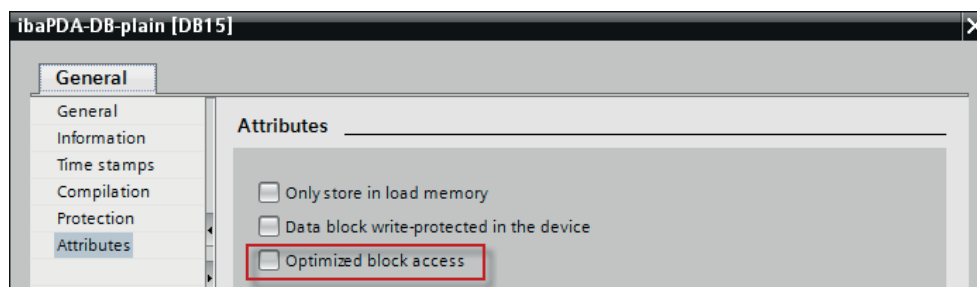
- **ibaREQ\_NetE-Send**  
The block sends the buffered signal values. Ideally, the block is called in a cyclic interrupt OB.
- **ibaREQ\_UDPact**  
The block is used internally by ibaREQ\_UDP2.
- **ibaREQ\_DB (interface DB)**  
This DB acts as an interface to *ibaPDA* and between the different Request blocks.

### 5.1.1 Device configuration

Make the following setting in CPU device configuration:



Under *ibaREQ\_DB (DB15) block properties – Attributes* disable the *Optimized block access* option.



#### Note

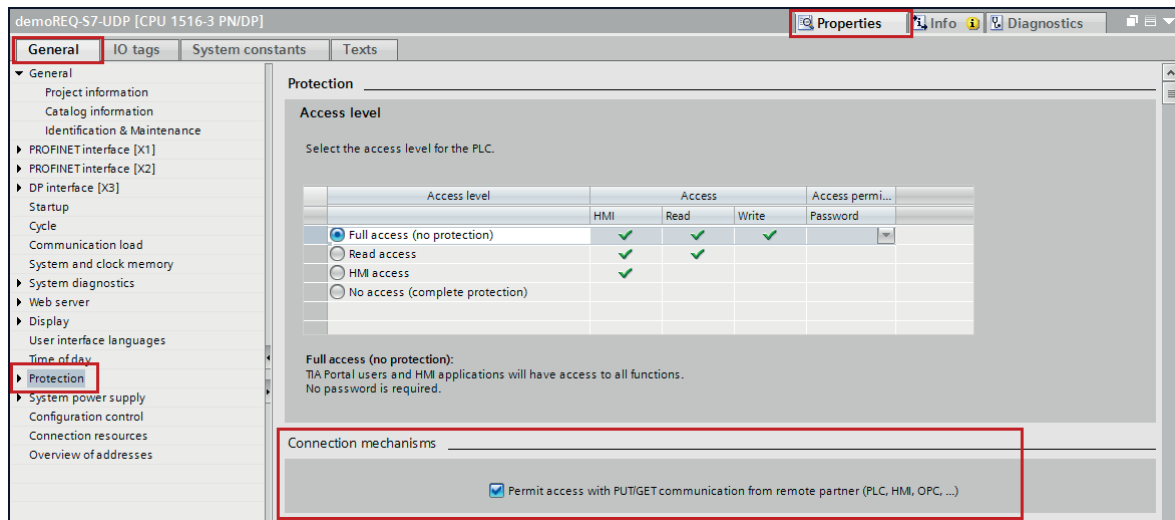


The configuration of the UDP connection is carried out program-controlled in the Request block. It is not allowed to configure manually a UDP connection and use it for this purpose.

## S7-1500 CPUs with TCP/IP connection mode (not TCP/IP S7-1x00)

Up to TIA Portal V18, make the following settings in the TIA Portal:

In the CPU properties (*Properties – General – Protection – Connection mechanisms*), activate the access via PUT/GET communication.



For the S7-1200, this option is only available firmware V4.0 or higher.

As of TIA Portal V19 and CPU firmware V3.1 (V4.7 for S7-1200), activate the PUT/GET access for S7-1500 and S7-1200 CPUs as follows:

1. In the project navigation, navigate to *Security settings – Users and roles – Roles* tab.
2. Add a new role and enter a name, e.g. "Put/Get".
3. In the *Runtime rights* tab, select your PLC under *Function rights categories*.
4. Under *Function rights*, activate the access level *HMI access*.
5. Under *Users and Roles*, go to the *Users* tab.
6. Activate the user "Anonymous".
7. Confirm the following message with <OK>.
8. Under *Assigned roles*, assign the newly created role to the anonymous user.
9. In the *Device view*, open the properties of the CPU.
10. In the section navigation, navigate to *Protection & Security – Connection mechanisms*.
11. Activate the option *Permit access with PUT/GET communication from remote partner*.
12. Save and compile the configuration and load the changes into the CPU.

You can find further information in the SiePortal under:

<https://support.industry.siemens.com/cs/de/en/view/109925755>

### S7-1500 access protection

You can enable access protection on S7-1500 CPUs. There is the following dependency with *ibaPDA*:

| Access level                    | CPU access       | ibaPDA reads symbolic from CPU | S7 access |
|---------------------------------|------------------|--------------------------------|-----------|
| Full access (no protection)     | HMI, read, write | OK                             | OK        |
| Read access                     | HMI, read        | OK                             | OK        |
| HMI access                      | HMI              | No                             | OK        |
| No access (complete protection) | -                | No                             | No        |

### 5.1.2 ibaREQ\_M (FB1400)

#### Description of formal parameters

| Name         | Type | Data Type | Description                                               |
|--------------|------|-----------|-----------------------------------------------------------|
| REQ_DB       | IN   | DB_ANY    | DB of the <i>ibaPDA</i> communication interface ibaREQ_DB |
| RESET        | IN   | BOOL      | FALSE: No reset (default)<br>TRUE: Block reset            |
| CPU_HW_ID    | IN   | HW_IO     | Hardware ID of local CPU                                  |
| ERROR_STATUS | OUT  | WORD      | Error code                                                |

The following SIMATIC standard block is used internally:

#### ■ GET\_IM\_DATA (FB801)

#### Detailed description

##### REQ\_DB

The DB is used for data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

The length of the data block is fixed.

##### RESET

Used to manually reset the Request blocks. All Request blocks of a combination are automatically reset together. Usually, the parameter does not have to be connected.

##### CPU\_HW\_ID

TIA Portal system constant, which refers to the corresponding CPU.

##### ERROR\_STATUS

Internal error of the block. If there is no error, the value 0 is output.

**Error codes**

| Value ERROR_STATUS |         | Description                                            |
|--------------------|---------|--------------------------------------------------------|
| Hexadecimal        | Decimal |                                                        |
| 0x01               |         | 1 datablock ibaREQ_DB is write protected               |
| 0x02               | 2       | datablock ibaREQ_DB invalid (DB = 0 or > limit of CPU) |
| 0x03               | 3       | datablock ibaREQ_DB does not exist                     |
| 0x04               | 4       | datablock ibaREQ_DB undefined error                    |
| 0x05               | 5       | datablock ibaREQ_DB too short                          |
| 0x09               | 9       | internal error (RD_SINFO)                              |
| 0x01A              | 0       | no access to datablock ibaREQ_DB (read)                |
| 0x0B               | 11      | no access to datablock ibaREQ_DB (write)               |
| 0x14               | 20      | initialization not finished                            |
| 0x15               | 21      | insufficient memory for SZL                            |
| 0x16               | 22      | wrong SZL_ID                                           |
| 0x17               | 23      | wrong or invalid index of SZL                          |
| 0x18               | 24      | error while reading I&M data from CPU                  |
| 0x19               | 25      | error while reading plc data                           |
| 0x1D               | 29      | reset not finished                                     |
| 0x1F               | 31      | initialization canceled with error                     |
| 0x20               | 32      | initialization not completed                           |
| 0x29               | 41      | too many pointers (>1024)                              |
| 0x30               | 42      | too many pointers in one command (>128)                |
| 0x31               | 44      | invalid command id                                     |
| 0x32               | 45      | operand invalid (not defined)                          |
| 0x33               | 46      | operand invalid (datatype)                             |
| 0x34               | 47      | operand invalid (memory area)                          |

### 5.1.3 ibaREQ\_PN (FB1401)

#### Description of formal parameters

| Name         | Type  | Data Type | Description                                                              |
|--------------|-------|-----------|--------------------------------------------------------------------------|
| ADR_SLOT     | IN    | VARIANT   | Start address of the output range                                        |
| RESET_CON    | IN    | BOOL      | FALSE: No reset (default)<br>TRUE: Reset of the communication connection |
| REQ_DB       | INOUT | UDT       | DB of the <i>ibaPDA</i> communication interface<br>ibaREQ_DB             |
| ERROR_STATUS | OUT   | WORD      | Internal error code                                                      |

#### Detailed description

##### ADR\_SLOT

Start address of the used slot in *ibaBM-PN* in the output range of the process image.

##### RESET\_CON

Used for manually resetting the communication connection.

##### REQ\_DB

The DB is used for data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

##### ERROR\_STATUS

Internal error of the block. If there is no error, the value 0 is output.

#### Error codes

| Decimal value<br>ERROR_STATUS | Description                                            |
|-------------------------------|--------------------------------------------------------|
| 1                             | datablock ibaREQ_DB is write protected                 |
| 2                             | datablock ibaREQ_DB invalid (DB = 0 or > limit of CPU) |
| 3                             | datablock ibaREQ_DB does not exist                     |
| 4                             | datablock ibaREQ_DB undefined error                    |
| 5                             | datablock ibaREQ_DB too short                          |
| 6                             | datablock ibaREQ_DB too short for ibaREQ_UDP           |
| 9                             | internal error (RD_SINFO)                              |
| 10                            | no access to datablock ibaREQ_DB (read)                |
| 11                            | no access to datablock ibaREQ_DB (write)               |
| 20                            | initialization not finished                            |
| 21                            | insufficient memory for SZL                            |
| 22                            | wrong SZL_ID                                           |
| 23                            | wrong or invalid index of SZL                          |
| 24                            | error while reading I&M data from CPU                  |
| 25                            | error while reading PLC data                           |

| Decimal value<br>ERROR_STATUS | Description                                                                         |
|-------------------------------|-------------------------------------------------------------------------------------|
| 31                            | initialization canceled with error                                                  |
| 32                            | initialization not completed                                                        |
| 41                            | too many pointers (ibaREQ_DB too small)                                             |
| 42                            | too many pointers in one command (>128)                                             |
| 44                            | invalid command id                                                                  |
| 45                            | operand invalid (not defined)                                                       |
| 46                            | operand invalid (datatype)                                                          |
| 47                            | operand invalid (memory area)                                                       |
| 200                           | no connection to PN device / DP slave                                               |
| 300                           | version of ibaREQ_UDPact does not match with ibaREQ_M (ID)                          |
| 301                           | version of ibaREQ_UDPact does not match with ibaREQ_M (FB)                          |
| 302                           | version of ibaREQ_UDPact does not match with ibaREQ_M (DB)                          |
| 303                           | type of transmit agent does not match with configured request type in <i>ibaPDA</i> |
| 305                           | PROFIBUS DP slave hardware configuration is invalid                                 |
| 306                           | configured peripheral address is invalid                                            |
| 310                           | no access to datablock ibaREQ_DB (read)                                             |
| 311                           | no access to datablock ibaREQ_DB (write)                                            |
| 315                           | error while masking of synchronous faults                                           |
| 316                           | error while demasking of synchronous faults                                         |
| 320                           | operand invalid (datatype)                                                          |
| 321                           | operand invalid (pointer)                                                           |
| 401                           | ADR_SLOT/ADR_SLOT_0 invalid hw-id                                                   |
| 402                           | ADR_SLOT/ADR_SLOT_0 invalid hw-id, no IO-Device or DP-Slave                         |
| 403                           | ADR_SLOT/ADR_SLOT_0 invalid hw-id, is no PROFIBUS or PROFINET                       |
| 406                           | ADR_SLOT/ADR_SLOT_0 invalid configuration slot (0)                                  |
| 407                           | ADR_SLOT/ADR_SLOT_0 invalid configuration slot (0)                                  |
| 409                           | ADR_SLOT_1 invalid configuration slot 1                                             |
| 410                           | no connection to PN device/DP-Slave or error                                        |
| 411                           | ADR_SLOT_1 invalid hw-id                                                            |
| 412                           | ADR_SLOT_1 invalid hw-id, no IO-Device or DP-Slave                                  |
| 413                           | ADR_SLOT_1 invalid hw-id, is no PROFIBUS                                            |
| 416                           | ADR_SLOT_1 invalid configuration slot 1                                             |
| 0x8yyy<br>(hexadecimal)       | error code of inner TUSEND/AG_SEND/AG_LSEND                                         |

### 5.1.4 ibaREQ\_DP (FB1402)

#### Description of formal parameters

| Name         | Type  | Data Type | Description                                                              |
|--------------|-------|-----------|--------------------------------------------------------------------------|
| ADR_SLOT_0   | IN    | VARIANT   | Start address of the output range of slot 0                              |
| ADR_SLOT_1   | IN    | VARIANT   | Start address of the output range of slot 1                              |
| RESET_CON    | IN    | BOOL      | FALSE: No reset (default)<br>TRUE: Reset of the communication connection |
| REQ_DB       | INOUT | UDT       | DB of the <i>ibaPDA</i> communication interface<br>ibaREQ_DB             |
| ERROR_STATUS | OUT   | WORD      | Internal error code                                                      |

#### Detailed description

##### ADR\_SLOT\_0

Start address of the used slot 0 in *ibaBM-DP* in the output range of the process image.

##### ADR\_SLOT\_1

Start address of the used slot 1 in *ibaBM-DP* in the output range of the process image.

##### RESET\_CON

Used for manually resetting the communication connection.

##### REQ\_DB

The DB is used for data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

##### ERROR\_STATUS

Internal error of the block. If there is no error, the value 0 is output.

#### Error codes

| Decimal value<br>ERROR_STATUS | Description                                            |
|-------------------------------|--------------------------------------------------------|
| 1                             | datablock ibaREQ_DB is write protected                 |
| 2                             | datablock ibaREQ_DB invalid (DB = 0 or > limit of CPU) |
| 3                             | datablock ibaREQ_DB does not exist                     |
| 4                             | datablock ibaREQ_DB undefined error                    |
| 5                             | datablock ibaREQ_DB too short                          |
| 6                             | datablock ibaREQ_DB too short for ibaREQ_UDP           |
| 9                             | internal error (RD_SINFO)                              |
| 10                            | no access to datablock ibaREQ_DB (read)                |
| 11                            | no access to datablock ibaREQ_DB (write)               |
| 20                            | initialization not finished                            |
| 21                            | insufficient memory for SZL                            |
| 22                            | wrong SZL_ID                                           |

| Decimal value<br>ERROR_STATUS | Description                                                                         |
|-------------------------------|-------------------------------------------------------------------------------------|
| 23                            | wrong or invalid index of SZL                                                       |
| 24                            | error while reading I&M data from CPU                                               |
| 25                            | error while reading PLC data                                                        |
| 31                            | initialization canceled with error                                                  |
| 32                            | initialization not completed                                                        |
| 41                            | too many pointers (ibaREQ_DB too small)                                             |
| 42                            | too many pointers in one command (>128)                                             |
| 44                            | invalid command id                                                                  |
| 45                            | operand invalid (not defined)                                                       |
| 46                            | operand invalid (datatype)                                                          |
| 47                            | operand invalid (memory area)                                                       |
| 200                           | no connection to PN device / DP slave                                               |
| 300                           | version of ibaREQ_UDPack does not match with ibaREQ_M (ID)                          |
| 301                           | version of ibaREQ_UDPack does not match with ibaREQ_M (FB)                          |
| 302                           | version of ibaREQ_UDPack does not match with ibaREQ_M (DB)                          |
| 303                           | type of transmit agent does not match with configured request type in <i>ibaPDA</i> |
| 305                           | PROFIBUS DP slave hardware configuration is invalid                                 |
| 306                           | configured peripheral address is invalid                                            |
| 310                           | no access to datablock ibaREQ_DB (read)                                             |
| 311                           | no access to datablock ibaREQ_DB (write)                                            |
| 315                           | error while masking of synchronous faults                                           |
| 316                           | error while demasking of synchronous faults                                         |
| 320                           | operand invalid (datatype)                                                          |
| 321                           | operand invalid (pointer)                                                           |
| 401                           | ADR_SLOT/ADR_SLOT_0 invalid hw-id                                                   |
| 402                           | ADR_SLOT/ADR_SLOT_0 invalid hw-id, no IO-Device or DP-Slave                         |
| 403                           | ADR_SLOT/ADR_SLOT_0 invalid hw-id, is no PROFIBUS or PROFINET                       |
| 406                           | ADR_SLOT/ADR_SLOT_0 invalid configuration slot (0)                                  |
| 407                           | ADR_SLOT/ADR_SLOT_0 invalid configuration slot (0)                                  |
| 409                           | ADR_SLOT_1 invalid configuration slot 1                                             |
| 410                           | no connection to PN device/DP-Slave or error                                        |
| 411                           | ADR_SLOT_1 invalid hw-id                                                            |
| 412                           | ADR_SLOT_1 invalid hw-id, no IO-Device or DP-Slave                                  |
| 413                           | ADR_SLOT_1 invalid hw-id, is no PROFIBUS                                            |
| 416                           | ADR_SLOT_1 invalid configuration slot 1                                             |
| 0x8yyy<br>(hexadecimal)       | error code of inner TUSEND/AG_SEND/AG_LSEND                                         |

### 5.1.5 ibaREQ\_UDP2 (FB1406)

#### Description of the formal parameters

| Name         | Type  | Data type | Description                                                              |
|--------------|-------|-----------|--------------------------------------------------------------------------|
| INTERFACE_ID | IN    | HW_ANY    | Hardware identifier of the used interface                                |
| CON_ID       | IN    | CONN_OUC  | Unique connection ID of the send block (TSEND_C)                         |
| LOCAL_PORT   | IN    | UINT      | Local port number                                                        |
| RESET_CON    | IN    | BOOL      | FALSE: no reset (default)<br>TRUE: reset of the communication connection |
| REQ_DB       | INOUT | DB_ANY    | DB of the <i>ibaPDA</i> communication interface<br>ibaREQ_DB             |
| ERROR_STATUS | OUT   | WORD      | Internal error code                                                      |
| LOST_SAMPLES | OUT   | UNIT      | Counter for lost measurement values                                      |

The following SIMATIC standard blocks are used internally:

- TCON
- TUSEND
- TDISCON

## Detailed description

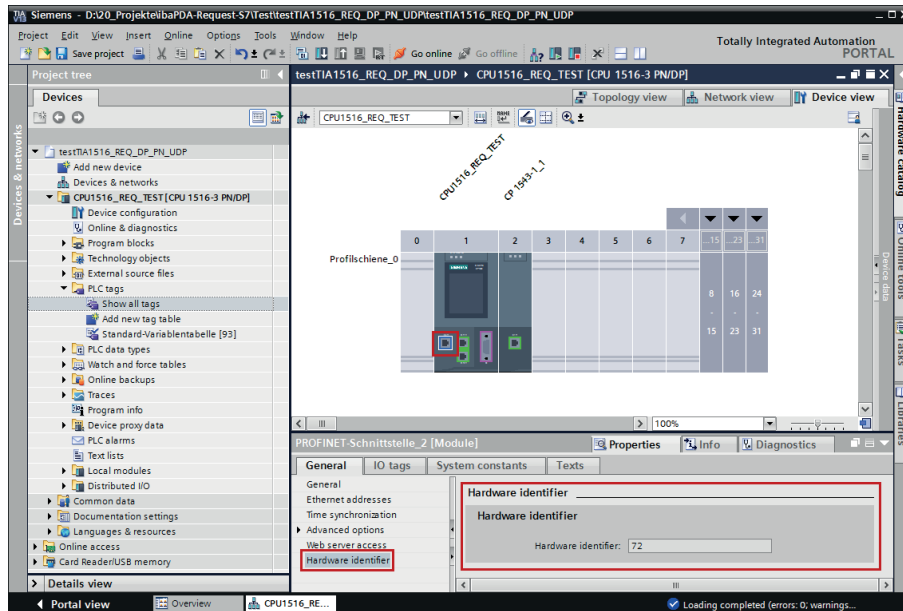
### INTERFACE\_ID

Hardware identifier of the used interface.

#### Tip



You find the hardware identifier of the marked interface under *Properties – General – Hardware identifier*.



The hardware identifier could be configured as a numerical value or as a system constant of the type Hw\_Interface. You find the system constant under *Properties – System constants*. Always use the system constant of the interface and not of a port, or of the IO system.

| PROFINET-Schnittstelle_2 [Module]     |              |                  |         |  |
|---------------------------------------|--------------|------------------|---------|--|
| Properties                            |              |                  |         |  |
| System constants                      |              |                  |         |  |
| Name                                  | Type         | Hardware identi. | Comment |  |
| Local-PROFINET-Schnittstelle_2        | Hw_Interface | 72               |         |  |
| Local-PROFINET-Schnittstelle_2-Port_1 | Hw_Interface | 73               |         |  |

### CON\_ID

Unique reference to the connection to be set up, value range: 1 to 4095.

### LOCAL\_PORT

Number of the locally used port

### RESET\_CON

Used for manually resetting the communication connection.

### REQ\_DB

The DB is used for data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

### ERROR\_STATUS

Internal error of the block. If there is no error, the value 0 is output.

**LOST\_SAMPLES**

The counter is incremented with every call of the block if no new UDP telegram can be sent to *ibaPDA*, as the previous send order has not been finished, yet. A continuously rising value indicates a shortage in the communication performance.

**Error codes**

| Hexadecimal value<br>ERROR_TSEND | Description                                                                                                                                                                                                                                                                                                                                                          |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#80A1                        | The specified connection or the port is already used by user.<br>Communication error: <ul style="list-style-type: none"> <li>■ The specified connection has not yet been established.</li> <li>■ The specified connection is being terminated.</li> <li>■ Transfer via this connection is not possible.</li> <li>■ The interface is being re-initialized.</li> </ul> |
| W#16#80A3                        | The nested T_DIAG instruction has reported that the connection has closed.                                                                                                                                                                                                                                                                                           |
| W#16#80A4                        | IP address of the remote connection endpoint is invalid, or it matches the IP address of the local partner.                                                                                                                                                                                                                                                          |
| W#16#80A7                        | Communication error: You called the instruction with COM_RST = 1 before the send job was complete.                                                                                                                                                                                                                                                                   |
| W#16#80AA                        | A connection is currently being established with the same connection ID by another block. Repeat the job with a new rising edge at the REQ parameter.                                                                                                                                                                                                                |
| W#16#80B6                        | Parameter assignment error in the connection_type parameter of the data block for connection description.                                                                                                                                                                                                                                                            |
| W#16#80B7                        | Error in one of the following parameters of the data block for connection description: block_length, local_tsap_id_len, rem_subnet_id_len, rem_staddr_len, rem_tsap_id_len, next_staddr_len.                                                                                                                                                                         |
| W#16#8085                        | The LEN parameter is greater than the highest valid value.                                                                                                                                                                                                                                                                                                           |
| W#16#8086                        | The ID parameter within the CONNECT parameter is outside the valid range.                                                                                                                                                                                                                                                                                            |
| W#16#8087                        | Maximum number of connections reached; no additional connection possible.                                                                                                                                                                                                                                                                                            |
| W#16#8088                        | The value at the LEN parameter does not correspond to the receive area set at the DATA parameter.                                                                                                                                                                                                                                                                    |
| W#16#8091                        | Maximum nesting depth exceeded.                                                                                                                                                                                                                                                                                                                                      |
| W#16#809A                        | The CONNECT parameter points to a field that does not match the length of the connection description.                                                                                                                                                                                                                                                                |
| W#16#809B                        | InterfaceID is invalid. It does not point to a local CPU interface or a CP or has the value "0".                                                                                                                                                                                                                                                                     |
| W#16#80C3                        | <ul style="list-style-type: none"> <li>■ All connection resources are in use.</li> <li>■ A block with this ID is already being processed in a different priority group.</li> </ul>                                                                                                                                                                                   |

| Hexadecimal value<br>ERROR_TSEND | Description                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#80C4                        | Temporary communication error: <ul style="list-style-type: none"> <li>■ The connection cannot be established at this time.</li> <li>■ The interface is receiving new parameters or the connection is being established.</li> <li>■ The configured connection is being removed by a TDISCON instruction.</li> <li>■ The used connection is being terminated by a call with COM_RST = 1.</li> </ul> |
| W#16#80C6                        | Remote network error: The remote partner cannot be reached.                                                                                                                                                                                                                                                                                                                                       |

#### Other documentation



For more information, refer the Siemens documentation about the TSEND\_C block.

### 5.1.6 ibaREQ\_NetE-Buffer (FB1408)

#### Description of formal parameters

| Name         | Type  | Data Type | Description                                                              |
|--------------|-------|-----------|--------------------------------------------------------------------------|
| REQ_DB       | INOUT | UDT       | Pointer to the communication data range ibaREQ_DB-Interface in ibaREQ_DB |
| buffer       | INOUT | UDT       | Pointer to the buffer data range ibaREQ_NetE-Bufferdata in ibaREQ_DB     |
| error        | OUT   | BOOL      | Internal error indicator                                                 |
| errorStatus1 | OUT   | WORD      | Internal error code                                                      |
| errorStatus2 | OUT   | WORD      | Internal error code                                                      |

#### Detailed description

##### REQ\_DB

The DB is used for data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

##### buffer

Pointer to the buffer data range. This range is used to temporarily store the buffered signal values. For all related Request blocks, configure the identical DB.

##### error

Internal error indicator for the block. If there is no error, the value FALSE is output.

##### errorStatus1

Internal error code for the block. If there is no error, the value 0 is output.

**errorStatus2**

Internal error code for the block. If there is no error, the value 0 is output.

**Error codes**

| Decimal value<br>errorStatus | Description                                                                         |
|------------------------------|-------------------------------------------------------------------------------------|
| 300                          | version of ibaREQ_UDPack does not match with ibaREQ_M (ID)                          |
| 303                          | type of transmit agent does not match with configured request type in <i>ibaPDA</i> |
| 315                          | error while masking of synchronous faults                                           |
| 316                          | error while demasking of synchronous faults                                         |
| 320                          | operand invalid (datatype)                                                          |
| 321                          | operand invalid (pointer)                                                           |

**5.1.7 ibaREQ\_NetE-Send (FB1409)****Description of formal parameters**

| Name               | Type  | Data Type  | Description                                                              |
|--------------------|-------|------------|--------------------------------------------------------------------------|
| reset              | IN    | BOOL       | FALSE: No reset (default)<br>TRUE: Block reset                           |
| interfaceld        | IN    | HW_ANY     | HW ID of the interface used                                              |
| connectionId       | IN    | CONN_OUC   | Unique connection ID of the send block (TSEND_C)                         |
| localPort          | IN    | UINT       | Local port number                                                        |
| sampleTime_ms      | IN    | UINT       | Signal sample time in milliseconds                                       |
| REQ_DB             | INOUT | UDT        | Pointer to the communication data range ibaREQ_DB-Interface in ibaREQ_DB |
| buffer             | INOUT | UDT        | Pointer to the buffer data range ibaREQ_NetE-Bufferdata in ibaREQ_DB     |
| state              | OUT   | STRING[16] | Block status                                                             |
| error              | OUT   | BOOL       | Internal error indicator                                                 |
| errorStatus        | OUT   | WORD       | Internal error code                                                      |
| errorStatusTCON    | OUT   | WORD       | Error code for the internally called TCON block                          |
| errorStatusTUSEND1 | OUT   | WORD       | Error code for the internally called 1st TUSEND block                    |
| errorStatusTUSEND2 | OUT   | WORD       | Error code for the internally called 2nd TUSEND block                    |
| errorStatusTDISCON | OUT   | WORD       | Error code for the internally called TDISCON block                       |
| lostSamples        | OUT   | UNIT       | Counter for lost measured values                                         |
| mode               | OUT   | UNIT       | Detected ibaNet-E mode                                                   |
| numImg             | OUT   | UNIT       | Detected number of images per frame                                      |
| numFrg             | OUT   | UNIT       | Detected number of fragments per frame                                   |

## Detailed description

### reset

Used to manually reset the Request block.

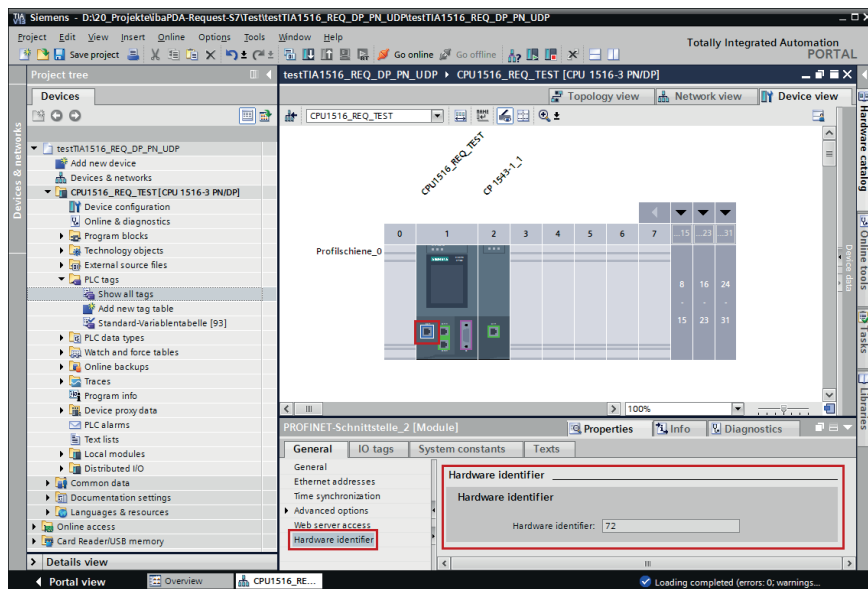
### interfaceId

The HW ID of the used interface is a constant in TIA Portal and dependent on the configured hardware.

### Tip



You find the hardware identifier of the marked interface under *Properties – General – Hardware identifier*



You can configure the hardware identifier as a numerical value or as a system constant of the type `Hw_Interface`. You can find the system constant under *Properties – System constants*. Always use the system constant of the interface and not of a port, or of the IO system.

| PROFINET-Schnittstelle_2 [Module]     |              |                  |                  |       |  |
|---------------------------------------|--------------|------------------|------------------|-------|--|
| General                               |              | IO tags          | System constants | Texts |  |
| Name                                  | Type         | Hardware identi. | Comment          |       |  |
| Local-PROFINET-Schnittstelle_2        | Hw_Interface | 72               |                  |       |  |
| Local-PROFINET-Schnittstelle_2-Port_1 | Hw_Interface | 73               |                  |       |  |

### connectionId

Unambiguous reference to the connection to be established, value range: 1 to 4095.

### localPort

Number of the local port used

### sampleTime\_ms

Signal sample time in milliseconds

### REQ\_DB

Pointer to the communication data range. This range is used for the data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

**buffer**

Pointer to the buffer data range. This range is used to temporarily store the buffered signal values. For all related Request blocks, configure the identical DB.

**state**

Block status in plain text

**error**

Internal error indicator for the block. If there is no error, the value FALSE is output.

**errorStatus**

Internal error code for the block. If there is no error, the value 0 is output.

**errorStatusTCON**

Error code for the internally called TCON block.

**errorStatusTUSEND1**

Error code for the internally called 1st TUSEND block.

**errorStatusTUSEND2**

Error code for the internally called 2nd TUSEND block.

**errorStatusTDISCON**

Error code for the internally called TDISCON block.

A list of all possible error codes for the TCON, TUSEND, TDISCON system blocks can be found in the Siemens documentation.

**lostSamples**

The counter is incremented each time a block is called if a new UDP telegram cannot be sent to *ibaPDA* because the preceding send job has not yet been completed. A constantly increasing value indicates a bottleneck in communication performance.

**mode**

Detected ibanet-E mode.

0: invalid, 1: single image, 2: multi image, 3: fragmented image

**numImg**

Detected number of images per frame

**numFrg**

Detected number of fragments per frame

**Error codes**

| Value errorStatus |         | Description               |
|-------------------|---------|---------------------------|
| Hexadecimal       | Decimal |                           |
| 0x09              | 9       | internal error (RD_SINFO) |

### 5.1.8 ibaREQ\_UDPact (FB1410)

This block is called internally by the blocks ibaREQ\_UDPint, ibaREQ\_UDPext3, and ibaREQ\_UDPext4, so you do not need to include it manually.

#### Description of the formal parameters

| Name         | Type  | Data type | Description                                               |
|--------------|-------|-----------|-----------------------------------------------------------|
| REQ_DB       | IN    | BLOCK_DB  | DB of the <i>ibaPDA</i> communication interface ibaREQ_DB |
| Xchange      | INOUT | UDT145    | Interface for the calling block                           |
| ERROR_STATUS | OUT   | WORD      | Internal error code                                       |

#### Detailed description

##### REQ\_DB

The DB is used for data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

##### Xchange

Via the parameterized data range, the data are exchanged with the calling block.

##### ERROR\_STATUS

Internal error of the block. If there is no error, the value 0 is output.

#### Error codes

| Decimal value<br>ERROR_STATUS | Description                                            |
|-------------------------------|--------------------------------------------------------|
| 1                             | datablock ibaREQ_DB is write protected                 |
| 2                             | datablock ibaREQ_DB invalid (DB = 0 or > limit of CPU) |
| 3                             | datablock ibaREQ_DB does not exist                     |
| 4                             | datablock ibaREQ_DB undefined error                    |
| 5                             | datablock ibaREQ_DB too short                          |
| 6                             | datablock ibaREQ_DB too short for ibaREQ_UDP           |
| 9                             | internal error (RD_SINFO)                              |
| 10                            | no access to datablock ibaREQ_DB (read)                |
| 11                            | no access to datablock ibaREQ_DB (write)               |
| 20                            | initialization not finished                            |
| 21                            | insufficient memory for SZL                            |
| 22                            | wrong SZL_ID                                           |
| 23                            | wrong or invalid index of SZL                          |
| 24                            | error while reading I&M data from CPU                  |
| 25                            | error while reading PLC data                           |
| 31                            | initialization canceled with error                     |
| 32                            | initialization not completed                           |

| Decimal value<br>ERROR_STATUS | Description                                                                         |
|-------------------------------|-------------------------------------------------------------------------------------|
| 41                            | too many pointers (ibaREQ_DB too small)                                             |
| 42                            | too many pointers in one command (>128)                                             |
| 44                            | invalid command id                                                                  |
| 45                            | operand invalid (not defined)                                                       |
| 46                            | operand invalid (datatype)                                                          |
| 47                            | operand invalid (memory area)                                                       |
| 200                           | no connection to PN device / DP slave                                               |
| 300                           | version of ibaREQ_UDPact does not match with ibaREQ_M (ID)                          |
| 301                           | version of ibaREQ_UDPact does not match with ibaREQ_M (FB)                          |
| 302                           | version of ibaREQ_UDPact does not match with ibaREQ_M (DB)                          |
| 303                           | type of transmit agent does not match with configured request type in <i>ibaPDA</i> |
| 305                           | PROFIBUS DP slave hardware configuration is invalid                                 |
| 306                           | configured peripheral address is invalid                                            |
| 310                           | no access to datablock ibaREQ_DB (read)                                             |
| 311                           | no access to datablock ibaREQ_DB (write)                                            |
| 315                           | error while masking of synchronous faults                                           |
| 316                           | error while demasking of synchronous faults                                         |
| 320                           | operand invalid (datatype)                                                          |
| 321                           | operand invalid (pointer)                                                           |
| 401                           | ADR_SLOT/ADR_SLOT_0 invalid hw-id                                                   |
| 402                           | ADR_SLOT/ADR_SLOT_0 invalid hw-id, no IO-Device or DP-Slave                         |
| 403                           | ADR_SLOT/ADR_SLOT_0 invalid hw-id, is no PROFIBUS or PROFINET                       |
| 406                           | ADR_SLOT/ADR_SLOT_0 invalid configuration slot (0)                                  |
| 407                           | ADR_SLOT/ADR_SLOT_0 invalid configuration slot (0)                                  |
| 409                           | ADR_SLOT_1 invalid configuration slot 1                                             |
| 410                           | no connection to PN device/DP-Slave or error                                        |
| 411                           | ADR_SLOT_1 invalid hw-id                                                            |
| 412                           | ADR_SLOT_1 invalid hw-id, no IO-Device or DP-Slave                                  |
| 413                           | ADR_SLOT_1 invalid hw-id, is no PROFIBUS                                            |
| 416                           | ADR_SLOT_1 invalid configuration slot 1                                             |
| 0x8yyy                        | error code of inner TUSEND/AG_SEND/AG_LSEND                                         |

## 5.2 ibaREQsym iba block family

These blocks initialize and control communication between *ibaPDA* and the S7 controller.

The ibaREQsym block family allows access to both optimized and non-optimized data blocks. Addressing is done by using only the symbol names.

One set of Request blocks has to be called for each Request module (connection) in *ibaPDA*. The blocks used are part of the iba S7 library, see ↗ *iba S7 library, page 151*.

### Note



Only use Request blocks from the latest iba S7 library!

Request blocks in application examples can be outdated and, thus, cause errors.

Use different Request block combinations depending on the current system configuration:

| Request block       | S7-1500 CPU with integrated PN interface | S7-1500 CPU with CM1542-1 | Recommended call level    |
|---------------------|------------------------------------------|---------------------------|---------------------------|
| ibaREQsym_M         | X                                        | X                         | OB1 or OB3x <sup>2)</sup> |
| ibaREQsym_NetE      | X                                        | X                         |                           |
| ibaREQsym_PN        | X                                        | X                         |                           |
| ibaREQsym_UDP       | X                                        | X                         |                           |
| ibaREQsym_DB_PDA    | X                                        | X                         | -                         |
| ibaREQsym-Interface | X                                        | X                         | -                         |

- ibaREQsym\_M (management)  
The block realizes the communication with *ibaPDA*. Ideally, the block is called in OB1.
- ibaREQsym\_NetE (buffering and sending of current signal values)  
The block buffers the current signal values and sends them to *ibaPDA*.
- ibaREQsym\_PN (provision and sending of current signal values)  
The block provides the current signal values using the transmission cycle. Ideally, the block is called in a cyclic interrupt OB.
- ibaREQsym\_UDP (sending of current signal values)  
The block sends the current signal values to *ibaPDA*.
- ibaREQsym\_DB\_PDA (DB interface)  
This DB acts as an interface to *ibaPDA* and between the different Request blocks.

<sup>2)</sup> You must use the blocks at the same call level.

### 5.2.1 ibaREQsym\_M

#### Description of formal parameters

| Name           | Type  | Data Type  | Description                                                       |
|----------------|-------|------------|-------------------------------------------------------------------|
| reset          | IN    | BOOL       | FALSE: No reset (default)<br>TRUE: Block reset                    |
| DB_PDA         | INOUT | UDT        | DB for the <i>ibaPDA</i> communication interface<br>ibaREQ_DB_PDA |
| state          | OUT   | STRING[16] | Block status                                                      |
| errorStatusRun | OUT   | WORD       | Internal error code                                               |
| errorStatus1   | OUT   | WORD       | Internal error code                                               |
| errorStatus2   | OUT   | WORD       | Error code for internally called blocks                           |

#### Detailed description

##### reset

Used to manually reset the block

##### DB\_PDA

Pointer to the communication data range. This range is used for the data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

##### state

Block status in plain text

##### errorStatusRun

Internal error code for the block. If there is no error, the value 0 is output.

##### errorStatus1

Internal error code for the block. If there is no error, the value 0 is output.

##### errorStatus2

Internal error code for the block. If there is no error, the value 0 is output.

#### Error codes

| Hexadecimal value<br>errorStatus | Description                                                      |
|----------------------------------|------------------------------------------------------------------|
| 01x8001                          | invalid command id                                               |
| 01x800F                          | internal error (error moving data - pdainfo)                     |
| 01x8010                          | internal error (error moving data - command)                     |
| 01x8011                          | internal error (error moving data - response reset)              |
| 01x8012                          | internal error (error moving data - response diag)               |
| 01x8014                          | internal error (error moving data - response request)            |
| 01x801F                          | internal error (error moving data - response unknown)            |
| 01x8101                          | internal error (error moving data - response invalid command ID) |
| 01x8202                          | internal error (error moving data - diag response data)          |

| Hexadecimal value<br>errorStatus | Description                                                |
|----------------------------------|------------------------------------------------------------|
| 01x8401                          | internal error (error moving data - request command data)  |
| 01x8402                          | internal error (error moving data - request response data) |
| 01x8410                          | too many requested symbols in total (>2000)                |
| 01x8411                          | too many requested symbols in one command (>100)           |
| 01x8412                          | requested data length is too long (<max)                   |
| 01x8413                          | requested data length is too short (<0)                    |
| 01x8422                          | error moving symbol offsets                                |
| 01x8423                          | error moving symbol names                                  |
| 01x8425                          | error resolving requested symbols                          |
| 01x8426                          | error moving resolved symbols data                         |
| 01x8512                          | no active symbols                                          |
| 01x8FFF                          | undefined internal error                                   |

## 5.2.2 ibaREQsym\_PN

### Description of formal parameters

| Name        | Type  | Data Type  | Description                                                              |
|-------------|-------|------------|--------------------------------------------------------------------------|
| adrSlot     | IN    | VARIANT    | Starting address of the output range                                     |
| reset_com   | IN    | BOOL       | FALSE: No reset (default)<br>TRUE: Reset of the communication connection |
| DB_PDA      | INOUT | UDT        | DB for the <i>ibaPDA</i> communication interface<br>ibaREQ_DB_PDA        |
| state       | OUT   | STRING[16] | Block status                                                             |
| errorStatus | OUT   | WORD       | Internal error code                                                      |

### Detailed description

#### adrSlot

Starting address of the slot used in the output range of the process image.

#### reset\_com

Used for manually resetting the communication connection.

#### DB\_PDA

Pointer to the communication data range. This range is used for the data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

#### state

Block status in plain text

#### errorStatus

Internal error of the block. If there is no error, the value 0 is output.

### Error codes

| Hexidecimal value<br>errorStatus | Description                                          |
|----------------------------------|------------------------------------------------------|
| 01x8001                          | no connection to PN device or error (error GET_DIAG) |
| 01x8010                          | internal error (error IO2MOD)                        |
| 01x8011                          | internal error (error LOG2GEO)                       |
| 01x8012                          | internal error (error LOG2GEO)                       |
| 01x8013                          | internal error (error LOG2GEO)                       |
| 01x8014                          | internal error (error RD_ADDR)                       |
| 01x8401                          | DPWR_DAT failed invalid hw-id                        |
| 01x8402                          | DPWR_DAT failed slot 1                               |

### 5.2.3 ibaREQsym\_NetE

#### Description of formal parameters

| Name               | Type  | Data Type  | Description                                                       |
|--------------------|-------|------------|-------------------------------------------------------------------|
| reset              | IN    | BOOL       | FALSE: No reset (default)<br>TRUE: Block reset                    |
| interfaceId        | IN    | HW_ANY     | HW ID of the interface used                                       |
| connectionId       | IN    | CONN_OUC   | Unique connection ID of the send block (TSEND_C)                  |
| localPort          | IN    | UINT       | Local port number                                                 |
| sampleTime_ms      | IN    | UINT       | Signal sample time in milliseconds                                |
| DB_PDA             | INOUT | UDT        | DB for the <i>ibaPDA</i> communication interface<br>ibaREQ_DB_PDA |
| state              | OUT   | STRING[16] | Block status                                                      |
| errorStatusTCON    | OUT   | WORD       | Error code for the internally called TCON block                   |
| errorStatusTUSEND1 | OUT   | WORD       | Error code for the internally called 1st TUSEND block             |
| errorStatusTUSEND2 | OUT   | WORD       | Error code for the internally called 2nd TUSEND block             |
| errorStatusTDISCON | OUT   | WORD       | Error code for the internally called TDISCON block                |
| lostSamples        | OUT   | UNIT       | Counter for lost measured values                                  |
| mode               | OUT   | UNIT       | Detected ibaNet-E mode                                            |
| numImg             | OUT   | UNIT       | Detected number of images per frame                               |
| numFrg             | OUT   | UNIT       | Detected number of fragments per frame                            |

#### Detailed description

##### reset

Used to manually reset the Request block.

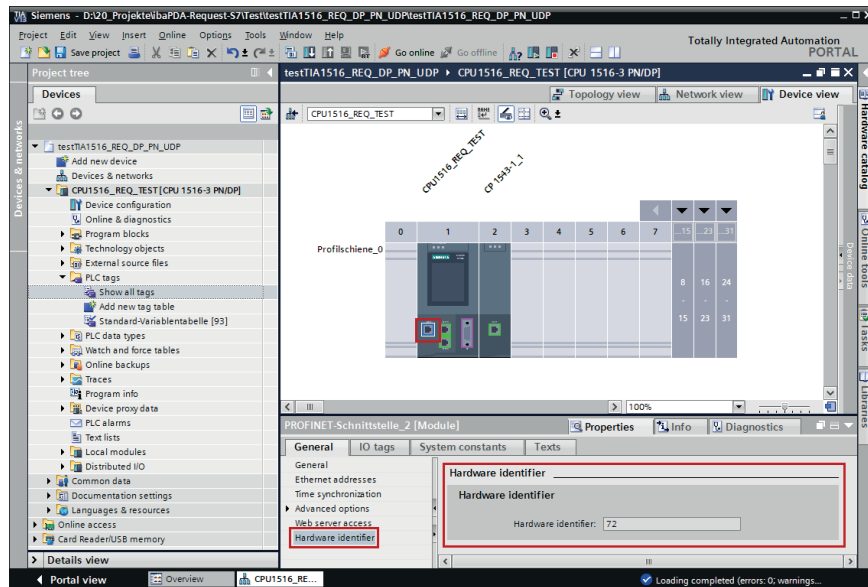
## interfaceld

The HW ID of the used interface is a constant in TIA Portal and dependent on the configured hardware.

### Tip



You find the hardware identifier of the marked interface under *Properties – General – Hardware identifier*



You can configure the hardware identifier as a numerical value or as a system constant of the type *Hw\_Interface*. You can find the system constant under *Properties – System constants*. Always use the system constant of the interface and not of a port, or of the IO system.

| PROFINET-Schnittstelle_2 [Module]     |              |                  |         |
|---------------------------------------|--------------|------------------|---------|
| Properties                            |              |                  |         |
| System constants                      |              |                  |         |
| Name                                  | Type         | Hardware identi. | Comment |
| Local-PROFINET-Schnittstelle_2        | Hw_Interface | 72               |         |
| Local-PROFINET-Schnittstelle_2-Port_1 | Hw_Interface | 73               |         |

## connectionId

Unambiguous reference to the connection to be established, value range: 1 to 4095.

## localPort

Number of the local port used

## sampleTime\_ms

Signal sample time in milliseconds

## DB\_PDA

Pointer to the communication data range. This range is used for the data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

## state

Block status in plain text

**errorStatusTCON**

Error code for the internally called TCON block.

**errorStatusTUSEND1**

Error code for the internally called 1st TUSEND block.

**errorStatusTUSEND2**

Error code for the internally called 2nd TUSEND block.

**errorStatusTDISCON**

Error code for the internally called TDISCON block.

A list of all possible error codes for the TCON, TUSEND, TDISCON system blocks can be found in the Siemens documentation.

**lostSamples**

The counter is incremented each time a block is called if a new UDP telegram cannot be sent to *ibaPDA* because the preceding send job has not yet been completed. A constantly increasing value indicates a bottleneck in communication performance.

**mode**

Detected ibaNet-E mode.

0: invalid, 1: single image, 2: multi image, 3: fragmented image

**numImg**

Detected number of images per frame

**numFrg**

Detected number of fragments per frame

## 5.2.4 ibaREQsym\_6PN

### Description of formal parameters

| Name                         | Type  | Data Type  | Description                                                              |
|------------------------------|-------|------------|--------------------------------------------------------------------------|
| adrSlot0 ... adrSlot5        | IN    | VARIANT    | Starting address of the output range                                     |
| reset_com                    | IN    | BOOL       | FALSE: No reset (default)<br>TRUE: Reset of the communication connection |
| DB_PDA                       | INOUT | UDT        | DB for the <i>ibaPDA</i> communication interface<br>ibaREQ_DB_PDA        |
| state                        | OUT   | STRING[16] | Block status                                                             |
| statusSlot0 ... status-Slot5 | OUT   | WORD       | Internal error code                                                      |

### Detailed description

#### adrSlotx

Starting address of the slot used in the output range of the process image.

You can configure up to 6 slots. For data consistency, the length of slots 0...4 must be a multiple of 8. If a slot is not to be used, configure any symbol that does not refer to an output address.

#### reset\_com

Used for manually resetting the communication connection.

#### DB\_PDA

Pointer to the communication data range. This range is used for the data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

#### state

Block status in plain text

#### statusSlotx

Internal error code of the block related to the slot with the same number. If no error is present, the value 0 is output.

### Error codes

| Hexadecimal value<br>errorStatus | Description                                          |
|----------------------------------|------------------------------------------------------|
| 01x8001                          | no connection to PN device or error (error GET_DIAG) |
| 01x8010                          | internal error (error IO2MOD)                        |
| 01x8011                          | internal error (error LOG2GEO)                       |
| 01x8012                          | internal error (error LOG2GEO)                       |
| 01x8013                          | internal error (error LOG2GEO)                       |
| 01x8014                          | internal error (error RD_ADDR)                       |
| 01x8020                          | slot size not a multiple of 8 and not the last slot  |
| 01x8401                          | DPWR_DAT failed invalid hw-id                        |
| 01x8402                          | DPWR_DAT failed slot 1                               |

## 5.2.5 ibaREQsym\_UDP

### Description of formal parameters

| Name         | Type  | Data Type  | Description                                                          |
|--------------|-------|------------|----------------------------------------------------------------------|
| interfaceld  | IN    | HW_ANY     | HW ID of the used interface                                          |
| connectionId | IN    | CONN_OUC   | Unique connection ID of the send block (TSEND_C)                     |
| localPort    | IN    | UINT       | Local port number                                                    |
| reset_com    | IN    | BOOL       | FALSE: No reset (default)<br>TRUE: Communication connection reset    |
| DB_PDA       | INOUT | DB_ANY     | DB for the <i>ibaPDA</i> communication interface<br>ibaREQsym_DB_PDA |
| state        | OUT   | STRING[16] | Block status                                                         |
| errorTsend   | OUT   | WORD       | Collective error code for the internally called Tsend blocks         |
| errorTcon    | OUT   | WORD       | Error code for the internally called Tcon block                      |
| errorTusend1 | OUT   | WORD       | Error code for the internally called Tusend1 block                   |
| errorTusend2 | OUT   | WORD       | Error code for the internally called Tusend2 block                   |
| lostSamples  | OUT   | UNIT       | Counter for lost measured values                                     |

The following SIMATIC standard blocks are used internally:

- TCON
- TUSEND
- TDISCON

## Detailed description

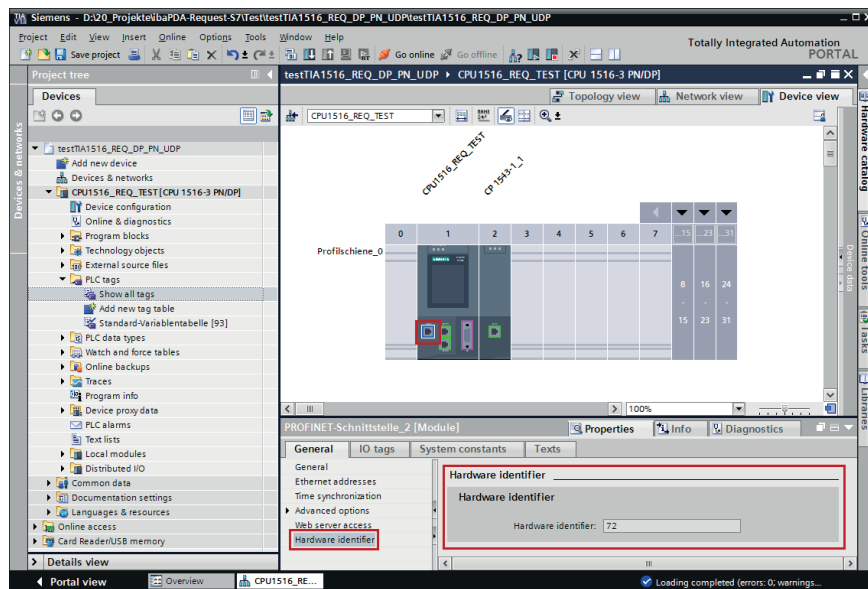
### interfaceld

The HW ID of the used interface is a constant in TIA Portal and dependent on the configured hardware.

### Tip



You find the hardware identifier of the marked interface under *Properties – General – Hardware identifier*



You can configure the hardware identifier as a numerical value or as a system constant of the type `Hw_Interface`. You can find the system constant under *Properties – System constants*. Always use the system constant of the interface and not of a port, or of the IO system.

| PROFINET-Schnittstelle_2 [Module]     |              |                  |         |  |
|---------------------------------------|--------------|------------------|---------|--|
| Properties                            |              |                  |         |  |
| System constants                      |              |                  |         |  |
| Name                                  | Type         | Hardware identi. | Comment |  |
| Local-PROFINET-Schnittstelle_2        | Hw_Interface | 72               |         |  |
| Local-PROFINET-Schnittstelle_2~Port_1 | Hw_Interface | 73               |         |  |

### connectionId

Unambiguous reference to the connection to be established, value range: 1 to 4095.

### localPort

Number of the local port used

### reset\_com

Used to manually reset the communication connection.

### DB\_PDA

Pointer to the communication data range. This range is used for the data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

### state

Block status in plain text

**errorTsend**

Collective error code for the internally called Tsend blocks

**errorTcon**

Error code for the internally called Tcon block

**errorTusend1**

Error code for the internally called 1st Tusend block

**errorTusend2**

Error code for the internally called 2nd Tusend block

A list of all possible error codes for the Tsend, Tusend, Tcon system blocks can be found in the Siemens documentation.

**lostSamples**

The counter is incremented each time a block is called if a new UDP telegram cannot be sent to *ibaPDA* because the preceding send job has not yet been completed. A constantly increasing value indicates a bottleneck in communication performance.

**Error codes****errorTcon**

| Hexadecimal value<br>Status info | Description                                       |
|----------------------------------|---------------------------------------------------|
| W#16#0000                        | Connection successfully established.              |
| W#16#7000                        | No job processing is active.                      |
| W#16#7001                        | Start job execution, establish connection.        |
| W#16#7002                        | Connection is being established (REQ irrelevant). |

| Hexadecimal value<br>Error | Description                                                                                                                                       |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#8085                  | Connection ID (ID parameter) is already used by a configured connection.                                                                          |
| W#16#8086                  | The ID parameter is outside the valid range.                                                                                                      |
| W#16#8087                  | Maximum number of connections reached; no additional connection possible.                                                                         |
| W#16#8089                  | The CONNECT parameter does not point to a connection description or the connection description was created manually.                              |
| W#16#809A                  | The structure at the CONNECT parameter is not supported on an integrated interface or the length is invalid.                                      |
| W#16#809B                  | The element interfacedId within the TCON_xxx structure does not reference a hardware identifier of a CPU or CM/CP interface or has the value "0". |
| W#16#80A1                  | The specified connection or the port is already used.                                                                                             |

| Hexadecimal value<br>Error | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#80A2                  | Local or remote port is used by the system. The following ports are reserved locally: 20, 21, 80, 102, 135, 161, 162, 443, 34962, 34963, 34964 as well as the area 49152 to 65535.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| W#16#80A3                  | ID is used by a connection created by the user program, which uses the same connection description at the CONNECT parameter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| W#16#80A4                  | IP address of the remote connection endpoint is invalid, or it matches the IP address of the local partner.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| W#16#80A7                  | Communication error: You executed TDISCON before TCON had completed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| W#16#80B4                  | Only with TCON_IP_RFC: The local T selector was not specified, or the first byte does not contain the value 0x0E (only with a length of T selector = 2) or the local T selector starts with "SIMATIC-".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| W#16#80B5                  | Only passive connection establishment is permitted for connection type 13 = UDP (parameter ActiveEstablished of the structure TCON_IP_v4/TCON_PARAM has the value TRUE).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| W#16#80B6                  | Parameter assignment error in the ConnectionType parameter of the data block for connection description. <ul style="list-style-type: none"> <li>■ Only valid with TCON_IP_v4: 0x11, 0x0B and 0x13</li> <li>■ Only valid with TCON_IP_RFC: 0x0C and 0x12</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| W#16#80B7                  | With TCON_IP_v4: <ul style="list-style-type: none"> <li>■ TCP (active connection establishment): Remote port is "0".</li> <li>■ CP (passive connection establishment): Local port is "0".</li> <li>■ UDP: Local port is "0".</li> <li>■ IP address of the partner endpoint is set to 0.0.0.0.</li> </ul> With TCON_IP_RFC: <ul style="list-style-type: none"> <li>■ For local {LocalTSelector} or remote {RemoteTSelector} T selector, a length greater than 32 bytes is specified.</li> <li>■ For TSelLength of the T selector (local or remote), a length greater than 32 is specified.</li> <li>■ Error in the length of the IP address of the specific connection partner.</li> <li>■ IP address of the partner endpoint is set to 0.0.0.0.</li> </ul> |
| W#16#80B8                  | Parameter ID in the local connection description (structure at CONNECT parameter) and parameter ID of the instruction are different.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| W#16#80C3                  | All connection resources are assigned, or ports are dynamically used by other applications or connections.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Hexadecimal value<br>Error | Description                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#80C4                  | Temporary communication error: <ul style="list-style-type: none"> <li>■ The connection cannot be established at this time.</li> <li>■ The connection cannot be established because the firewalls on the connection path are not open for the required ports.</li> <li>■ The interface is receiving new parameters.</li> <li>■ The configured connection is being removed by a TDISCON instruction.</li> </ul>     |
| W#16#80C5                  | The connection partner refuses to establish the connection, has terminated the connection or actively ended it.                                                                                                                                                                                                                                                                                                   |
| W#16#80C6                  | Network error: The connection partner cannot be reached.                                                                                                                                                                                                                                                                                                                                                          |
| W#16#80C7                  | Execution timeout.                                                                                                                                                                                                                                                                                                                                                                                                |
| W#16#80C8                  | Value at the ID parameter is already used by a connection that was created by the user program. The connection uses the identical ID, but different connection settings at the CONNECT parameter.                                                                                                                                                                                                                 |
| W#16#80C9                  | Validation of the connection partner failed. The connection partner that wants to establish the connection does not match the defined partner at the CONNECT parameter.                                                                                                                                                                                                                                           |
| W#16#80CE                  | The IP address of the local interface is 0.0.0.0.                                                                                                                                                                                                                                                                                                                                                                 |
| W#16#80D0                  | With TCP and active connection endpoint: The remote_qdn parameter is an empty string. A connection cannot be established.                                                                                                                                                                                                                                                                                         |
| W#16#80D1                  | The remote_qdn parameter is not a fully qualified domain name. The period at the end might be missing.                                                                                                                                                                                                                                                                                                            |
| W#16#80D2                  | No DNS server address is configured.                                                                                                                                                                                                                                                                                                                                                                              |
| W#16#80D3                  | The fully qualified domain name cannot be resolved. Possible causes: <ul style="list-style-type: none"> <li>■ The DNS server is not reachable, for example, because it has been shut down or the remote port is not reachable.</li> <li>■ An error occurred during communication with the DNS server.</li> <li>■ The DNS server returned a valid DNS answer, but the answer contained no IPv4 address.</li> </ul> |
| W#16#80E0                  | Unsuitable or poor message was received.                                                                                                                                                                                                                                                                                                                                                                          |
| W#16#80E1                  | Error during handshake. Possible causes: <ul style="list-style-type: none"> <li>■ Aborted by the user</li> <li>■ Security not high enough</li> <li>■ Renewed negotiation is not supported.</li> <li>■ SSL/TLS version is not supported.</li> <li>■ Validation of the host name failed.</li> </ul>                                                                                                                 |

| Hexadecimal value<br>Error | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#80E2                  | Certificate is not supported or invalid.<br>Possible cause: The time-of-day of the module concerned is not set or the module is not synchronized.<br><br>Example: The default setting for the date of the module is 1/1/2012 and it was not set during commissioning. The validity period of the certificate starts on 20 August 2016 and ends on 20 August 2024. In this case, the date of the module is outside the valid period of the certificate; the certificate is invalid for the module. |
| W#16#80E3                  | Certificate was discarded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| W#16#80E4                  | No valid certification authority found.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| W#16#80E5                  | Certificate expired.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| W#16#80E6                  | Integrity errors in the Transport Layer Security Protocol.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| W#16#80E7                  | Not supported extension in X.509-V3 certificate.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| W#16#80E9                  | TLS server without server certificate is not supported.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| W#16#80EA                  | DTLS (UDP) protocol is not supported.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| W#16#80EB                  | A client cannot request a client certificate.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| W#16#80EC                  | The server cannot perform validation based on subjectAlternateName (only clients can do this).                                                                                                                                                                                                                                                                                                                                                                                                    |
| W#16#80ED                  | TLSServerCertRef_m-ID is invalid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

**errorTusend**

| Hexadecimal value<br>Status info | Description                                                                                                                                                          |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#0000                        | Send job completed without error.                                                                                                                                    |
| W#16#7000                        | No job processing is active.                                                                                                                                         |
| W#16#7001                        | Start of job processing, data being sent.<br><br>Note: During this processing phase, the operating system accesses the data in the DATA send area.                   |
| W#16#7002                        | Intermediate call (REQ irrelevant), job is being processed.<br><br>Note: During this processing phase, the operating system accesses the data in the DATA send area. |

| Hexadecimal value<br>Error | Description                                                                                         |
|----------------------------|-----------------------------------------------------------------------------------------------------|
| W#16#8085                  | The LEN parameter has the value "0" or is greater than the highest valid value.                     |
| W#16#8086                  | The ID parameter is outside the valid range.                                                        |
| W#16#8088                  | The LEN parameter is greater than the memory area specified in DATA.                                |
| W#16#8089                  | The ADDR parameter does not point to a data block with the structure TADDR_Param or TADDR_SEND_QDN. |

| Hexadecimal value<br>Error | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#80A1                  | <p>Communication error:</p> <ul style="list-style-type: none"> <li>■ The specified connection between user program and communication layer of the operating system has not yet been established.</li> <li>■ The specified connection between the user program and the communication layer of the operating system is currently being terminated. Transfer over this connection is not possible.</li> <li>■ The interface is being re-initialized.</li> </ul> |
| W#16#80B1                  | You changed the DATA parameter before the current job finished.                                                                                                                                                                                                                                                                                                                                                                                              |
| W#16#80A4                  | IP address (at the ADDR parameter) of the remote connection endpoint is invalid, or it matches the IP address of the local partner.                                                                                                                                                                                                                                                                                                                          |
| W#16#80B3                  | <ul style="list-style-type: none"> <li>■ The protocol variant (connection_type parameter in the connection description) is not set to UDP. Please use TSEND.</li> <li>■ Parameter ADDR: Invalid settings for port number.</li> </ul>                                                                                                                                                                                                                         |
| W#16#80B7                  | The length of the structure referenced by the ADDR parameter is not 8 bytes.                                                                                                                                                                                                                                                                                                                                                                                 |
| W#16#80C3                  | <ul style="list-style-type: none"> <li>■ A block with this ID is already being processed in a different priority class.</li> <li>■ Internal lack of resources.</li> </ul>                                                                                                                                                                                                                                                                                    |

#### Other documentation



For more information, refer the Siemens documentation about the TCON and TSEND blocks.

### 5.3 ibaREQ3sym iba block family

These blocks initialize and control communication between *ibaPDA* and the S7-1500 controllers.

The ibaREQ3sym block family allows access to both optimized and non-optimized data blocks. Addressing is done by using only the symbol names.

The ibaREQ3sym module family is the recommended access variant as of TIA Portal V19. With this version, runtime optimizations are possible, such as the outsourcing of the cyclical reading of the actual values from the ibaREQ3sym\_M block. Therefore, the individual blocks can be specifically distributed across different call levels.

One set of Request blocks has to be called for each Request module (connection) in *ibaPDA*. The blocks used are part of the iba S7 library, see [🔗 iba S7 library, page 151](#).

#### Note



Only use Request blocks from the latest iba S7 library!

Request blocks in application examples can be outdated and, thus, cause errors.

Use different Request block combinations depending on the current system configuration:

| Request block        | Recommended call level                                     |
|----------------------|------------------------------------------------------------|
| ibaREQ3sym_M         | OB 1 or lower-priority OB                                  |
| ibaREQ3sym_NetE_dc   | OB where the data is updated                               |
| ibaREQ3sym_NetE_send | OB1 or a cyclic interrupt OB at the required send interval |
| ibaREQ3sym_6PN       | Cyclic interrupt OB at the required send interval          |
| ibaREQ3sym_UP        | OB where the data is updated                               |
| ibaREQ3sym_DB_PDA    | -                                                          |
| ibaREQ3sym-Interface | -                                                          |

- **ibaREQ3sym\_M (management)**  
The block realizes the communication with *ibaPDA*. Ideally, the block is called in OB1 or lower-priority OB.
- **ibaREQ3sym\_NetE\_dc (provision and buffering of current signal values)**  
The block provides the current signal values and buffers them. Ideally, the block is called in the OB in which the data is updated.
- **ibaREQ3sym\_NetE\_send (sending of current signal values)**  
The block buffers the current signal values and sends them to *ibaPDA*. The block is called in OB1 or a cyclic interrupt OB at the required send interval.
- **ibaREQ3sym\_PN (provision and sending of current signal values)**  
The block provides the current signal values using the transmission cycle. Ideally, the block is called in a cyclic interrupt OB at the required send interval.
- **ibaREQ3sym\_UDP (provision and buffering of current signal values)**  
The block provides the current signal values and buffers them. Ideally, the block is called in the OB in which the data is updated.
- **ibaREQ3sym\_DB\_PDA (DB interface)**  
This DB acts as an interface to *ibaPDA* and between the different Request blocks.

### 5.3.1 ibaREQ3sym\_M

#### Description of formal parameters

| Name           | Type  | Data Type  | Description                                                           |
|----------------|-------|------------|-----------------------------------------------------------------------|
| reset          | IN    | BOOL       | FALSE: No reset (default)<br>TRUE: Block reset                        |
| DB_PDA         | INOUT | UDT        | DB for the <i>ibaPDA</i> communication interface<br>ibaREQ3sym_DB_PDA |
| state          | OUT   | STRING[16] | Block status                                                          |
| errorStatusRun | OUT   | WORD       | Internal error code                                                   |
| errorStatus1   | OUT   | WORD       | Internal error code                                                   |
| errorStatus2   | OUT   | WORD       | Error code for internally called blocks                               |

#### Detailed description

##### reset

Used to manually reset the block

##### DB\_PDA

Pointer to the communication data range. This range is used for the data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

##### state

Block status in plain text

##### errorStatusRun

Internal error code for the block. If there is no error, the value 0 is output.

##### errorStatus1

Internal error code for the block. If there is no error, the value 0 is output.

##### errorStatus2

Internal error code for the block. If there is no error, the value 0 is output.

#### Error codes

| Hexadecimal value<br>errorStatus | Description                                                      |
|----------------------------------|------------------------------------------------------------------|
| 01x8001                          | invalid command id                                               |
| 01x800F                          | internal error (error moving data - pdainfo)                     |
| 01x8010                          | internal error (error moving data - command)                     |
| 01x8011                          | internal error (error moving data - response reset)              |
| 01x8012                          | internal error (error moving data - response diag)               |
| 01x8014                          | internal error (error moving data - response request)            |
| 01x801F                          | internal error (error moving data - response unknown)            |
| 01x8101                          | internal error (error moving data - response invalid command ID) |
| 01x8202                          | internal error (error moving data - diag response data)          |

| Hexadecimal value<br>errorStatus | Description                                                |
|----------------------------------|------------------------------------------------------------|
| 01x8401                          | internal error (error moving data - request command data)  |
| 01x8402                          | internal error (error moving data - request response data) |
| 01x8410                          | too many requested symbols in total (>2000)                |
| 01x8411                          | too many requested symbols in one command (>100)           |
| 01x8412                          | requested data length is too long (<max)                   |
| 01x8413                          | requested data length is too short (<0)                    |
| 01x8422                          | error moving symbol offsets                                |
| 01x8423                          | error moving symbol names                                  |
| 01x8425                          | error resolving requested symbols                          |
| 01x8426                          | error moving resolved symbols data                         |
| 01x8512                          | no active symbols                                          |
| 01x8FFF                          | undefined internal error                                   |

### 5.3.2 ibaREQ3sym\_NetE\_dc

#### Description of formal parameters

| Name          | Type  | Data Type | Description                                                           |
|---------------|-------|-----------|-----------------------------------------------------------------------|
| sampleTime_ms | IN    | UINT      | sample time in milliseconds                                           |
| timestamp     | IN    | LDT       | optional external time stamp for using time domains;<br>0 if not used |
| DB_PDA        | INOUT | UDT       | DB for the <i>ibaPDA</i> communication interface<br>ibaREQ3sym_DB_PDA |

#### Detailed description

##### sampleTime\_ms

Sample time of the block in milliseconds.

##### timestamp

Optional timestamp in case time domains are used.

##### DB\_PDA

Pointer to the communication data range. This range is used for the data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

#### Error codes

| Hexadecimal value<br>errorStatus | Description                                       |
|----------------------------------|---------------------------------------------------|
| 01x8512                          | internal error (symActiveNum=0) no symbols active |
| 01x8599                          | invalid block type                                |

### 5.3.3 ibaREQ3sym\_NetE\_send

#### Description of formal parameters

| Name               | Type  | Data Type  | Description                                                           |
|--------------------|-------|------------|-----------------------------------------------------------------------|
| reset              | IN    | BOOL       | FALSE: No reset (default)<br>TRUE: Block reset                        |
| interfaceId        | IN    | HW_ANY     | HW ID of the interface used                                           |
| connectionId       | IN    | CONN_OUC   | Unique connection ID of the send block (TSEND_C)                      |
| localPort          | IN    | UINT       | Local port number                                                     |
| DB_PDA             | INOUT | UDT        | DB for the <i>ibaPDA</i> communication interface<br>ibaREQ3sym_DB_PDA |
| state              | OUT   | STRING[16] | Block status                                                          |
| errorStatusTCON    | OUT   | WORD       | Error code for the internally called TCON block                       |
| errorStatusTUSEND1 | OUT   | WORD       | Error code for the internally called 1st TUSEND block                 |
| errorStatusTUSEND2 | OUT   | WORD       | Error code for the internally called 2nd TUSEND block                 |
| errorStatusTDISCON | OUT   | WORD       | Error code for the internally called TDISCON block                    |
| lostSamples        | OUT   | UNIT       | Counter for lost measured values                                      |
| mode               | OUT   | UNIT       | Detected ibaNet-E mode                                                |
| numImg             | OUT   | UNIT       | Detected number of images per frame                                   |
| numFrg             | OUT   | UNIT       | Detected number of fragments per frame                                |

#### Detailed description

##### reset

Used to manually reset the Request block.

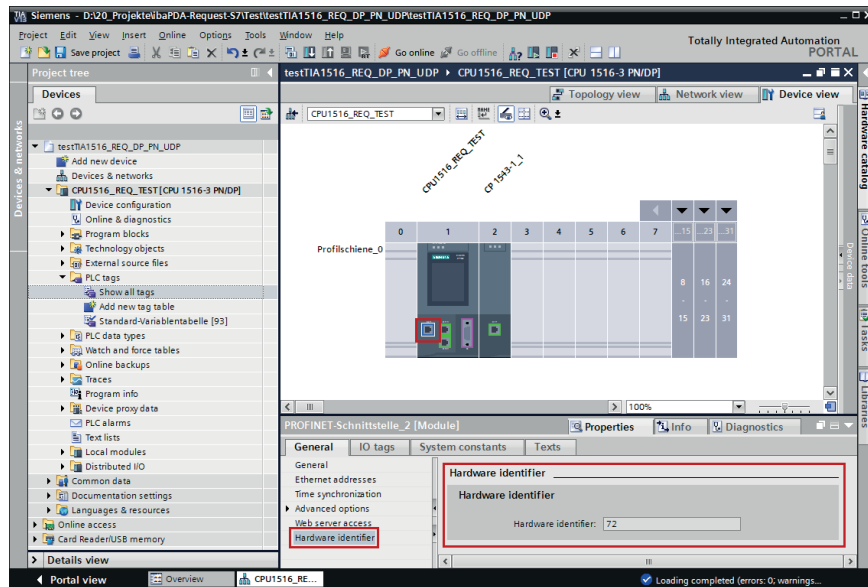
## interfaceld

The HW ID of the used interface is a constant in TIA Portal and dependent on the configured hardware.

### Tip



You find the hardware identifier of the marked interface under *Properties – General – Hardware identifier*



You can configure the hardware identifier as a numerical value or as a system constant of the type *Hw\_Interface*. You can find the system constant under *Properties – System constants*. Always use the system constant of the interface and not of a port, or of the IO system.

| PROFINET-Schnittstelle_2 [Module]     |              |                  |         |
|---------------------------------------|--------------|------------------|---------|
| Properties                            |              |                  |         |
| System constants                      |              |                  |         |
| Name                                  | Type         | Hardware identi. | Comment |
| Local-PROFINET-Schnittstelle_2        | Hw_Interface | 72               |         |
| Local-PROFINET-Schnittstelle_2-Port_1 | Hw_Interface | 73               |         |

## connectionId

Unambiguous reference to the connection to be established, value range: 1 to 4095.

## localPort

Number of the local port used

## DB\_PDA

Pointer to the communication data range. This range is used for the data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

## state

Block status in plain text

## errorStatusTCON

Error code for the internally called TCON block.

**errorStatusTUSEND1**

Error code for the internally called 1st TUSEND block.

**errorStatusTUSEND2**

Error code for the internally called 2nd TUSEND block.

**errorStatusTDISCON**

Error code for the internally called TDISCON block.

A list of all possible error codes for the TCON, TUSEND, TDISCON system blocks can be found in the Siemens documentation.

**lostSamples**

The counter is incremented each time a block is called if a new UDP telegram cannot be sent to *ibaPDA* because the preceding send job has not yet been completed. A constantly increasing value indicates a bottleneck in communication performance.

**mode**

Detected ibaNet-E mode.

0: invalid, 1: single image, 2: multi image, 3: fragmented image

**numImg**

Detected number of images per frame

**numFrg**

Detected number of fragments per frame

### 5.3.4 ibaREQ3sym\_6PN

#### Description of formal parameters

| Name                         | Type  | Data Type  | Description                                                              |
|------------------------------|-------|------------|--------------------------------------------------------------------------|
| adrSlot0 ... adrSlot5        | IN    | VARIANT    | Starting address of the output range                                     |
| reset_com                    | IN    | BOOL       | FALSE: No reset (default)<br>TRUE: Reset of the communication connection |
| DB_PDA                       | INOUT | UDT        | DB for the <i>ibaPDA</i> communication interface<br>ibaREQ3sym_DB_PDA    |
| state                        | OUT   | STRING[16] | Block status                                                             |
| statusSlot0 ... status-Slot5 | OUT   | WORD       | Internal error code                                                      |

#### Detailed description

##### adrSlotx

Starting address of the slot used in the output range of the process image.

You can configure up to 6 slots. For data consistency, the length of slots 0...4 must be a multiple of 8. If a slot is not to be used, configure any symbol that does not refer to an output address.

##### reset\_com

Used for manually resetting the communication connection.

##### DB\_PDA

Pointer to the communication data range. This range is used for the data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

##### state

Block status in plain text

##### statusSlotx

Internal error code of the block related to the slot with the same number. If no error is present, the value 0 is output.

#### Error codes

| Hexadecimal value<br>errorStatus | Description                                          |
|----------------------------------|------------------------------------------------------|
| 01x8001                          | no connection to PN device or error (error GET_DIAG) |
| 01x8010                          | internal error (error IO2MOD)                        |
| 01x8011                          | internal error (error LOG2GEO)                       |
| 01x8012                          | internal error (error LOG2GEO)                       |
| 01x8013                          | internal error (error LOG2GEO)                       |
| 01x8014                          | internal error (error RD_ADDR)                       |
| 01x8020                          | slot size not a multiple of 8 and not the last slot  |
| 01x8401                          | DPWR_DAT failed invalid hw-id                        |
| 01x8402                          | DPWR_DAT failed slot 1                               |

### 5.3.5 ibaREQ3sym\_UDP

#### Description of formal parameters

| Name         | Type  | Data Type  | Description                                                           |
|--------------|-------|------------|-----------------------------------------------------------------------|
| interfaceld  | IN    | HW_ANY     | HW ID of the used interface                                           |
| connectionId | IN    | CONN_OUC   | Unique connection ID of the send block (TSEND_C)                      |
| localPort    | IN    | UINT       | Local port number                                                     |
| reset_com    | IN    | BOOL       | FALSE: No reset (default)<br>TRUE: Communication connection reset     |
| DB_PDA       | INOUT | DB_ANY     | DB for the <i>ibaPDA</i> communication interface<br>ibaREQ3sym_DB_PDA |
| state        | OUT   | STRING[16] | Block status                                                          |
| errorTsend   | OUT   | WORD       | Collective error code for the internally called Tsend blocks          |
| errorTcon    | OUT   | WORD       | Error code for the internally called Tcon block                       |
| errorTusend1 | OUT   | WORD       | Error code for the internally called Tusend1 block                    |
| errorTusend2 | OUT   | WORD       | Error code for the internally called Tusend2 block                    |
| lostSamples  | OUT   | UNIT       | Counter for lost measured values                                      |

The following SIMATIC standard blocks are used internally:

- TCON
- TUSEND
- TDISCON

## Detailed description

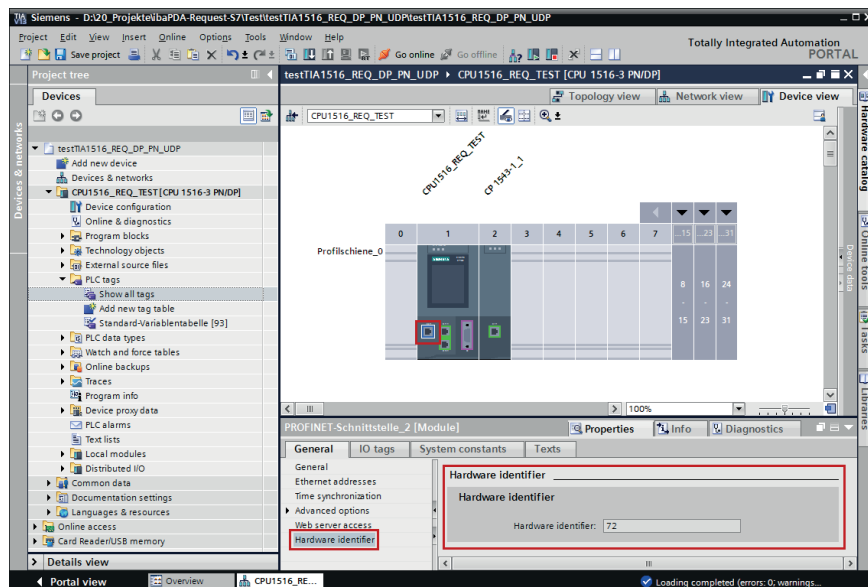
### interfaceld

The HW ID of the used interface is a constant in TIA Portal and dependent on the configured hardware.

### Tip



You find the hardware identifier of the marked interface under *Properties – General – Hardware identifier*



You can configure the hardware identifier as a numerical value or as a system constant of the type `Hw_Interface`. You can find the system constant under *Properties – System constants*. Always use the system constant of the interface and not of a port, or of the IO system.

| PROFINET-Schnittstelle_2 [Module]     |              |                  |         |  |
|---------------------------------------|--------------|------------------|---------|--|
| Properties                            |              |                  |         |  |
| System constants                      |              |                  |         |  |
| Name                                  | Type         | Hardware identi. | Comment |  |
| Local-PROFINET-Schnittstelle_2        | Hw_Interface | 72               |         |  |
| Local-PROFINET-Schnittstelle_2~Port_1 | Hw_Interface | 73               |         |  |

### connectionId

Unambiguous reference to the connection to be established, value range: 1 to 4095.

### localPort

Number of the local port used

### reset\_com

Used to manually reset the communication connection.

### DB\_PDA

Pointer to the communication data range. This range is used for the data exchange with *ibaPDA*. For all related Request blocks, configure the identical DB.

### state

Block status in plain text

**errorTsend**

Collective error code for the internally called Tsend blocks

**errorTcon**

Error code for the internally called Tcon block

**errorTusend1**

Error code for the internally called 1st Tusend block

**errorTusend2**

Error code for the internally called 2nd Tusend block

A list of all possible error codes for the Tsend, Tusend, Tcon system blocks can be found in the Siemens documentation.

**lostSamples**

The counter is incremented each time a block is called if a new UDP telegram cannot be sent to *ibaPDA* because the preceding send job has not yet been completed. A constantly increasing value indicates a bottleneck in communication performance.

**Error codes****errorTcon**

| Hexadecimal value<br>Status info | Description                                       |
|----------------------------------|---------------------------------------------------|
| W#16#0000                        | Connection successfully established.              |
| W#16#7000                        | No job processing is active.                      |
| W#16#7001                        | Start job execution, establish connection.        |
| W#16#7002                        | Connection is being established (REQ irrelevant). |

| Hexadecimal value<br>Error | Description                                                                                                                                       |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#8085                  | Connection ID (ID parameter) is already used by a configured connection.                                                                          |
| W#16#8086                  | The ID parameter is outside the valid range.                                                                                                      |
| W#16#8087                  | Maximum number of connections reached; no additional connection possible.                                                                         |
| W#16#8089                  | The CONNECT parameter does not point to a connection description or the connection description was created manually.                              |
| W#16#809A                  | The structure at the CONNECT parameter is not supported on an integrated interface or the length is invalid.                                      |
| W#16#809B                  | The element interfacedId within the TCON_xxx structure does not reference a hardware identifier of a CPU or CM/CP interface or has the value "0". |
| W#16#80A1                  | The specified connection or the port is already used.                                                                                             |

| Hexadecimal value<br>Error | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|----------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#80A2                  | Local or remote port is used by the system. The following ports are reserved locally: 20, 21, 80, 102, 135, 161, 162, 443, 34962, 34963, 34964 as well as the area 49152 to 65535.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| W#16#80A3                  | ID is used by a connection created by the user program, which uses the same connection description at the CONNECT parameter.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| W#16#80A4                  | IP address of the remote connection endpoint is invalid, or it matches the IP address of the local partner.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| W#16#80A7                  | Communication error: You executed TDISCON before TCON had completed.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| W#16#80B4                  | Only with TCON_IP_RFC: The local T selector was not specified, or the first byte does not contain the value 0x0E (only with a length of T selector = 2) or the local T selector starts with "SIMATIC-".                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| W#16#80B5                  | Only passive connection establishment is permitted for connection type 13 = UDP (parameter ActiveEstablished of the structure TCON_IP_v4/TCON_PARAM has the value TRUE).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| W#16#80B6                  | Parameter assignment error in the ConnectionType parameter of the data block for connection description. <ul style="list-style-type: none"> <li>■ Only valid with TCON_IP_v4: 0x11, 0x0B and 0x13</li> <li>■ Only valid with TCON_IP_RFC: 0x0C and 0x12</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| W#16#80B7                  | With TCON_IP_v4: <ul style="list-style-type: none"> <li>■ TCP (active connection establishment): Remote port is "0".</li> <li>■ CP (passive connection establishment): Local port is "0".</li> <li>■ UDP: Local port is "0".</li> <li>■ IP address of the partner endpoint is set to 0.0.0.0.</li> </ul> With TCON_IP_RFC: <ul style="list-style-type: none"> <li>■ For local {LocalTSelector} or remote {RemoteTSelector} T selector, a length greater than 32 bytes is specified.</li> <li>■ For TSelLength of the T selector (local or remote), a length greater than 32 is specified.</li> <li>■ Error in the length of the IP address of the specific connection partner.</li> <li>■ IP address of the partner endpoint is set to 0.0.0.0.</li> </ul> |
| W#16#80B8                  | Parameter ID in the local connection description (structure at CONNECT parameter) and parameter ID of the instruction are different.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| W#16#80C3                  | All connection resources are assigned, or ports are dynamically used by other applications or connections.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

| Hexadecimal value<br>Error | Description                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#80C4                  | Temporary communication error: <ul style="list-style-type: none"> <li>■ The connection cannot be established at this time.</li> <li>■ The connection cannot be established because the firewalls on the connection path are not open for the required ports.</li> <li>■ The interface is receiving new parameters.</li> <li>■ The configured connection is being removed by a TDISCON instruction.</li> </ul>     |
| W#16#80C5                  | The connection partner refuses to establish the connection, has terminated the connection or actively ended it.                                                                                                                                                                                                                                                                                                   |
| W#16#80C6                  | Network error: The connection partner cannot be reached.                                                                                                                                                                                                                                                                                                                                                          |
| W#16#80C7                  | Execution timeout.                                                                                                                                                                                                                                                                                                                                                                                                |
| W#16#80C8                  | Value at the ID parameter is already used by a connection that was created by the user program. The connection uses the identical ID, but different connection settings at the CONNECT parameter.                                                                                                                                                                                                                 |
| W#16#80C9                  | Validation of the connection partner failed. The connection partner that wants to establish the connection does not match the defined partner at the CONNECT parameter.                                                                                                                                                                                                                                           |
| W#16#80CE                  | The IP address of the local interface is 0.0.0.0.                                                                                                                                                                                                                                                                                                                                                                 |
| W#16#80D0                  | With TCP and active connection endpoint: The remote_qdn parameter is an empty string. A connection cannot be established.                                                                                                                                                                                                                                                                                         |
| W#16#80D1                  | The remote_qdn parameter is not a fully qualified domain name. The period at the end might be missing.                                                                                                                                                                                                                                                                                                            |
| W#16#80D2                  | No DNS server address is configured.                                                                                                                                                                                                                                                                                                                                                                              |
| W#16#80D3                  | The fully qualified domain name cannot be resolved. Possible causes: <ul style="list-style-type: none"> <li>■ The DNS server is not reachable, for example, because it has been shut down or the remote port is not reachable.</li> <li>■ An error occurred during communication with the DNS server.</li> <li>■ The DNS server returned a valid DNS answer, but the answer contained no IPv4 address.</li> </ul> |
| W#16#80E0                  | Unsuitable or poor message was received.                                                                                                                                                                                                                                                                                                                                                                          |
| W#16#80E1                  | Error during handshake. Possible causes: <ul style="list-style-type: none"> <li>■ Aborted by the user</li> <li>■ Security not high enough</li> <li>■ Renewed negotiation is not supported.</li> <li>■ SSL/TLS version is not supported.</li> <li>■ Validation of the host name failed.</li> </ul>                                                                                                                 |

| Hexadecimal value<br>Error | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|----------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#80E2                  | Certificate is not supported or invalid.<br>Possible cause: The time-of-day of the module concerned is not set or the module is not synchronized.<br><br>Example: The default setting for the date of the module is 1/1/2012 and it was not set during commissioning. The validity period of the certificate starts on 20 August 2016 and ends on 20 August 2024. In this case, the date of the module is outside the valid period of the certificate; the certificate is invalid for the module. |
| W#16#80E3                  | Certificate was discarded.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| W#16#80E4                  | No valid certification authority found.                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| W#16#80E5                  | Certificate expired.                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| W#16#80E6                  | Integrity errors in the Transport Layer Security Protocol.                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| W#16#80E7                  | Not supported extension in X.509-V3 certificate.                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| W#16#80E9                  | TLS server without server certificate is not supported.                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| W#16#80EA                  | DTLS (UDP) protocol is not supported.                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| W#16#80EB                  | A client cannot request a client certificate.                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| W#16#80EC                  | The server cannot perform validation based on subjectAlternateName (only clients can do this).                                                                                                                                                                                                                                                                                                                                                                                                    |
| W#16#80ED                  | TLSServerCertRef_m-ID is invalid.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

**errorTusend**

| Hexadecimal value<br>Status info | Description                                                                                                                                                          |
|----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#0000                        | Send job completed without error.                                                                                                                                    |
| W#16#7000                        | No job processing is active.                                                                                                                                         |
| W#16#7001                        | Start of job processing, data being sent.<br><br>Note: During this processing phase, the operating system accesses the data in the DATA send area.                   |
| W#16#7002                        | Intermediate call (REQ irrelevant), job is being processed.<br><br>Note: During this processing phase, the operating system accesses the data in the DATA send area. |

| Hexadecimal value<br>Error | Description                                                                                         |
|----------------------------|-----------------------------------------------------------------------------------------------------|
| W#16#8085                  | The LEN parameter has the value "0" or is greater than the highest valid value.                     |
| W#16#8086                  | The ID parameter is outside the valid range.                                                        |
| W#16#8088                  | The LEN parameter is greater than the memory area specified in DATA.                                |
| W#16#8089                  | The ADDR parameter does not point to a data block with the structure TADDR_Param or TADDR_SEND_QDN. |

| Hexadecimal value<br>Error | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| W#16#80A1                  | <p>Communication error:</p> <ul style="list-style-type: none"> <li>■ The specified connection between user program and communication layer of the operating system has not yet been established.</li> <li>■ The specified connection between the user program and the communication layer of the operating system is currently being terminated. Transfer over this connection is not possible.</li> <li>■ The interface is being re-initialized.</li> </ul> |
| W#16#80B1                  | You changed the DATA parameter before the current job finished.                                                                                                                                                                                                                                                                                                                                                                                              |
| W#16#80A4                  | IP address (at the ADDR parameter) of the remote connection endpoint is invalid, or it matches the IP address of the local partner.                                                                                                                                                                                                                                                                                                                          |
| W#16#80B3                  | <ul style="list-style-type: none"> <li>■ The protocol variant (connection_type parameter in the connection description) is not set to UDP. Please use TSEND.</li> <li>■ Parameter ADDR: Invalid settings for port number.</li> </ul>                                                                                                                                                                                                                         |
| W#16#80B7                  | The length of the structure referenced by the ADDR parameter is not 8 bytes.                                                                                                                                                                                                                                                                                                                                                                                 |
| W#16#80C3                  | <ul style="list-style-type: none"> <li>■ A block with this ID is already being processed in a different priority class.</li> <li>■ Internal lack of resources.</li> </ul>                                                                                                                                                                                                                                                                                    |

#### Other documentation



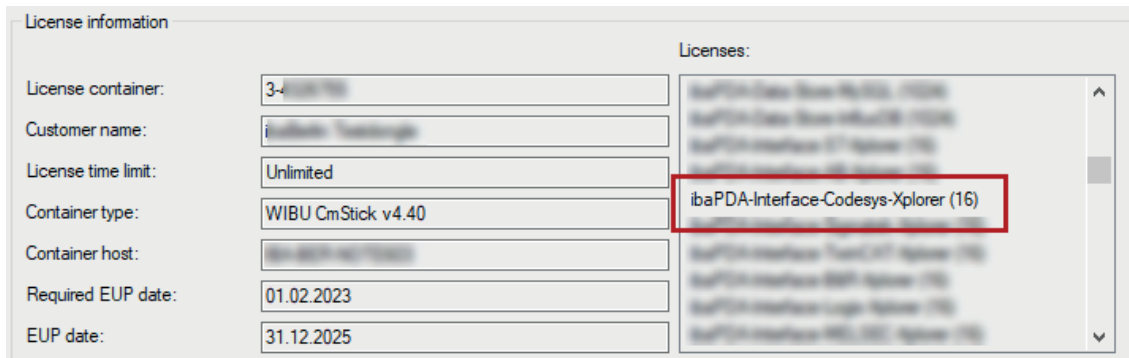
For more information, refer the Siemens documentation about the TCON, TDISCON and TSEND blocks.

## 6 Diagnostics

### 6.1 License

If the interface is not displayed in the signal tree, you can either check in *ibaPDA* in the I/O Manager under *General – Settings* or in the *ibaPDA* service status application whether your license for the interface *ibaPDA-Request-S7* has been properly recognized. The number of licensed connections is shown in brackets.

The figure below shows the license for the *Codesys Xplorer* interface as an example.



### 6.2 Visibility of the interface

If the interface is not visible despite a valid license, it may be hidden.

Check the settings in the *General* tab in the *Interfaces* node.

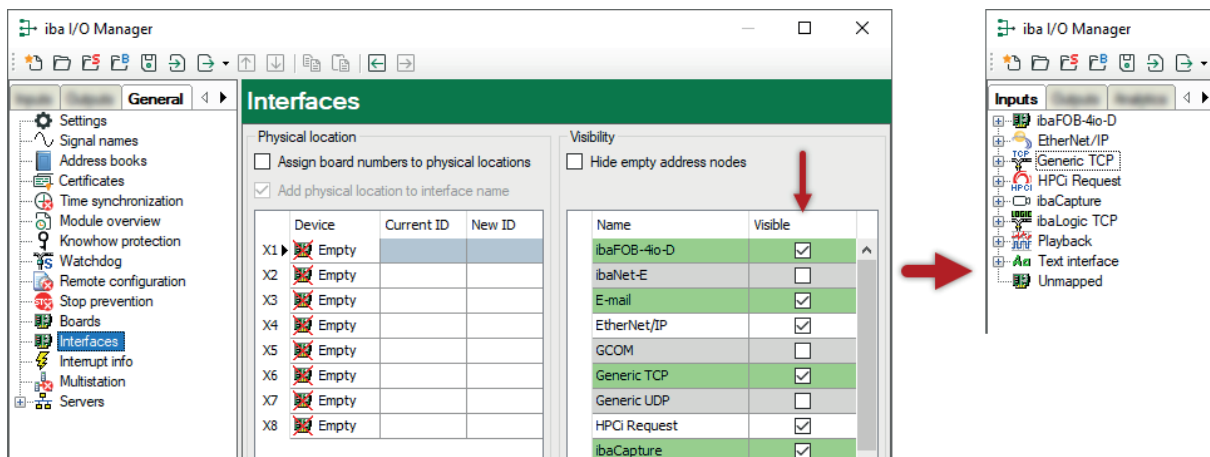
#### Visibility

The table *Visibility* lists all the interfaces that are available either through licenses or installed cards. These interfaces can also be viewed in the interface tree.

You can hide or display the interfaces not required in the interface tree by using the checkbox in the *Visible* column.

Interfaces with configured modules are highlighted in green and cannot be hidden.

Selected interfaces are visible, the others are hidden:



## 6.3 Log files

If connections to target systems or clients have been established, all connection-specific actions are logged in a text file. You can open this (current) file and, e.g., scan it for indications of possible connection problems.

You can open the log file via the button <Open log file>. The button is available in the I/O Manager:

- for many interfaces in the respective interface overview
- for integrated servers (e.g. OPC UA server) in the *Diagnostics* tab.

In the file system on the hard drive, you can find the log files of the *ibaPDA* server (...\\ProgramData\\iba\\ibaPDA\\Log). The file names of the log files include the name or abbreviation of the interface type.

Files named `interface.txt` are always the current log files. Files named `Interface_yyyy_mm_dd_hh_mm_ss.txt` are archived log files.

Examples:

- `ethernetipLog.txt` (log of EtherNet/IP connections)
- `AbEthLog.txt` (log of Allen-Bradley Ethernet connections)
- `OpcUAServerLog.txt` (log of OPC UA server connections)

## 6.4 Connection diagnostics with PING

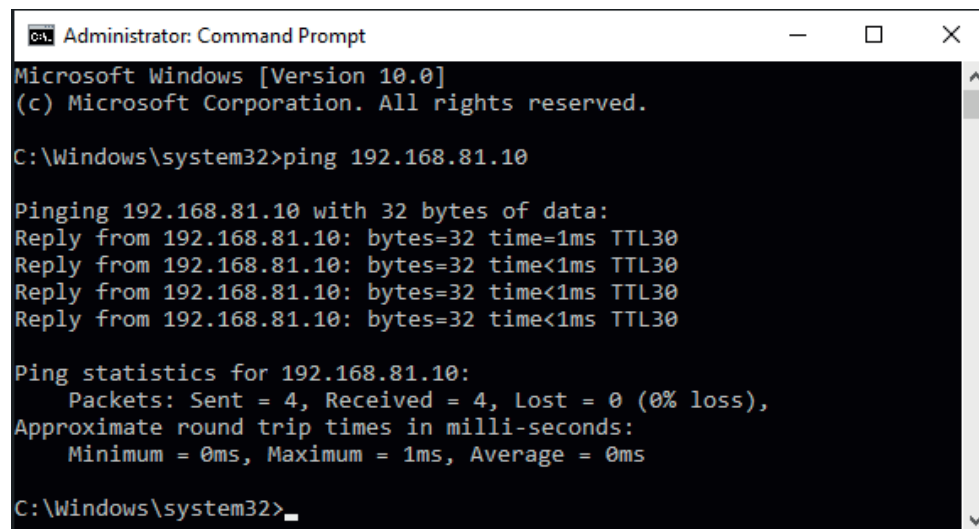
PING is a system command with which you can check if a certain communication partner can be reached in an IP network.

1. Open a Windows command prompt.



2. Enter the command "ping" followed by the IP address of the communication partner and press <ENTER>.

→ With an existing connection you receive several replies.

A screenshot of a Windows Command Prompt window titled 'Administrator: Command Prompt'. The window shows the output of the 'ping 192.168.81.10' command. The output indicates that the connection is successful, with four replies received from the destination IP address. The ping statistics show 0% loss and a round trip time of 0ms.

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0]
(c) Microsoft Corporation. All rights reserved.

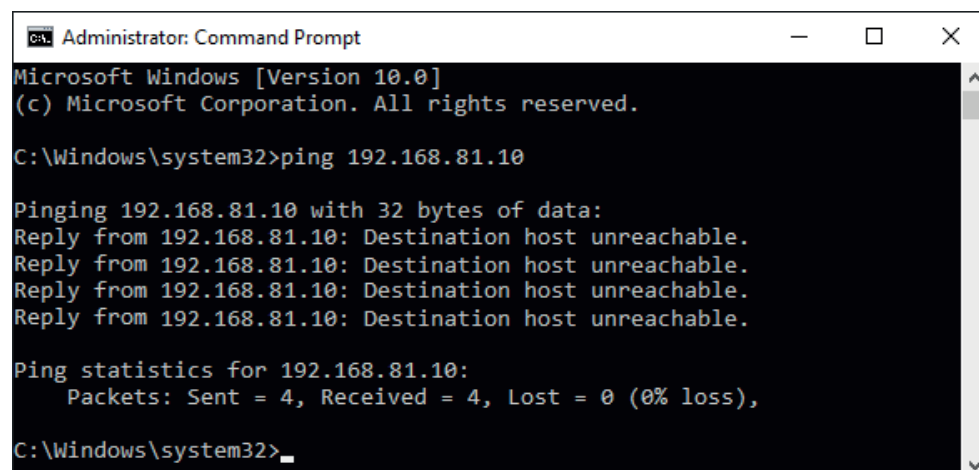
C:\Windows\system32>ping 192.168.81.10

Pinging 192.168.81.10 with 32 bytes of data:
Reply from 192.168.81.10: bytes=32 time=1ms TTL30
Reply from 192.168.81.10: bytes=32 time<1ms TTL30
Reply from 192.168.81.10: bytes=32 time<1ms TTL30
Reply from 192.168.81.10: bytes=32 time<1ms TTL30

Ping statistics for 192.168.81.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 0ms, Maximum = 1ms, Average = 0ms

C:\Windows\system32>
```

→ With no existing connection you receive error messages.

A screenshot of a Windows Command Prompt window titled 'Administrator: Command Prompt'. The window shows the output of the 'ping 192.168.81.10' command. The output indicates that the connection is failed, with four replies received from the destination IP address, all of which are 'Destination host unreachable'. The ping statistics show 0% loss and a round trip time of 0ms.

```
Administrator: Command Prompt
Microsoft Windows [Version 10.0]
(c) Microsoft Corporation. All rights reserved.

C:\Windows\system32>ping 192.168.81.10

Pinging 192.168.81.10 with 32 bytes of data:
Reply from 192.168.81.10: Destination host unreachable.
Reply from 192.168.81.10: Destination host unreachable.
Reply from 192.168.81.10: Destination host unreachable.
Reply from 192.168.81.10: Destination host unreachable.

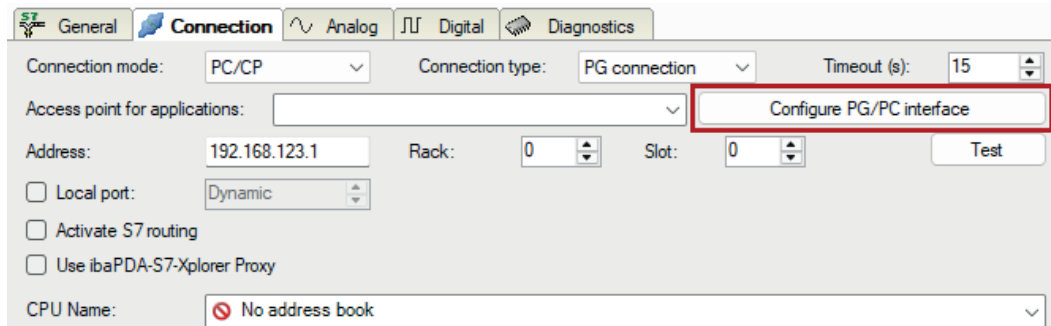
Ping statistics for 192.168.81.10:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),

C:\Windows\system32>
```

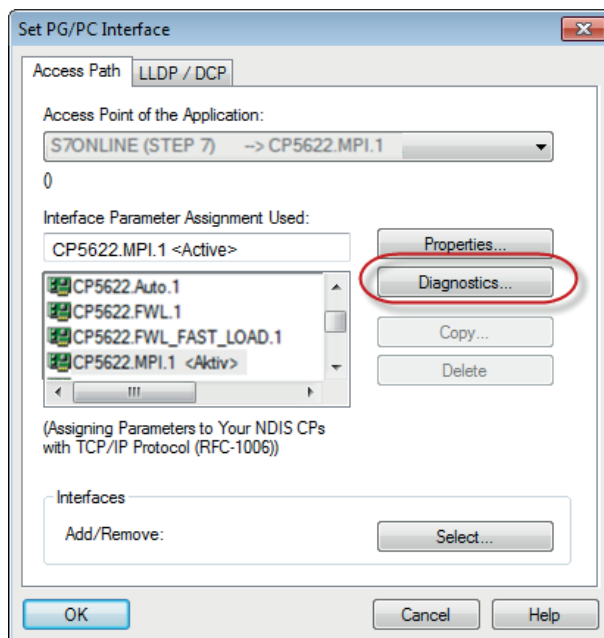
## 6.5 Connection diagnostics with PG/PC interface

Use the diagnostic function of the PG/PC interface to the functionality and connection configuration.

1. Open the dialog for configuring the PG/PC interface with the <Configure PG/PC interface> button.



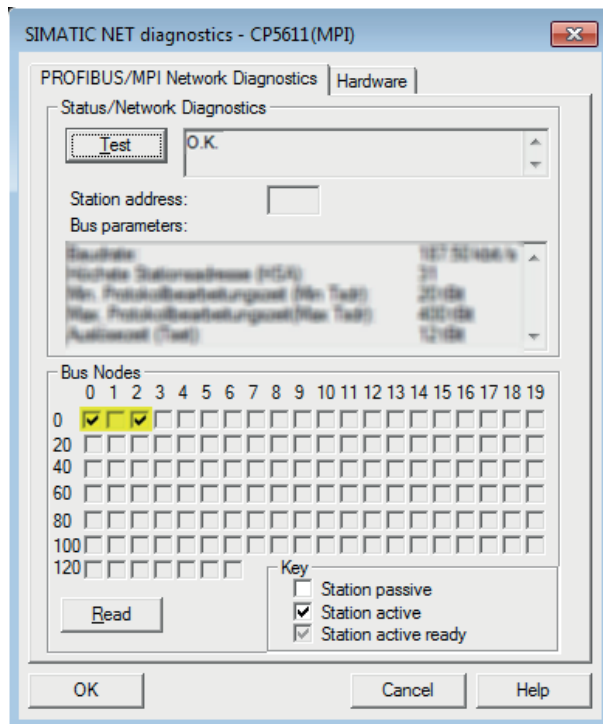
2. Open the diagnostics dialog with the <Diagnostics> button.



3. Start the network diagnostics with the <Test> button.  
Check the availability of the bus devices with the <Read> button.

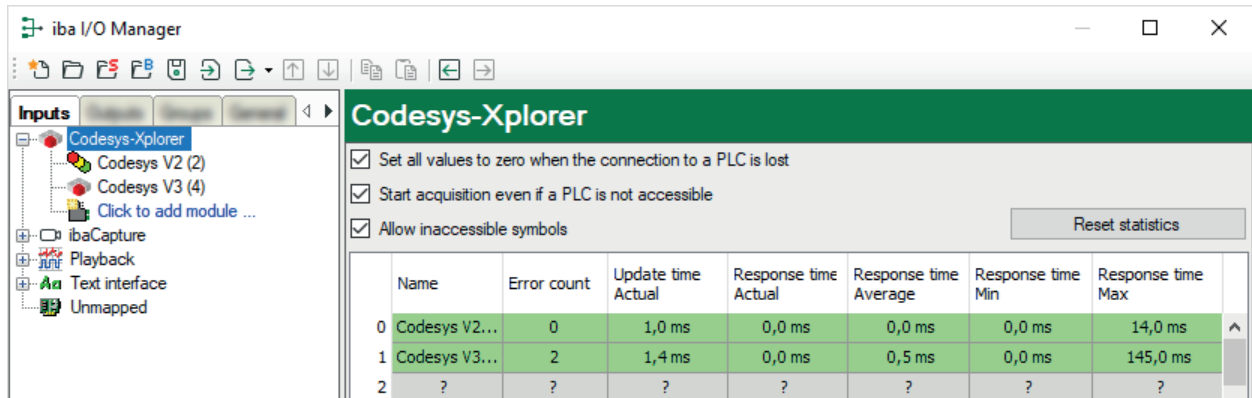
→ The following figure shows an example of a diagnostics of a SIMATIC Net CP5622 (PROFIBUS).

There is one active station at each of the addresses 0 and 2.



## 6.6 Connection table

For every Ethernet-based interface, there is a table available in the I/O Manager which shows the status of each connection. Each line represents one connection. The following figure shows, as an example, the connection table of the Codesys-Xplorer interface:



The connected target systems (controllers) are identified by their name or IP address in the first (left) column.

Depending on the interface type the table shows error counters, read counters and/or data sizes, as well as the cycle times, refresh times and/or update times of the different connections during the data acquisition.

Click the <Reset statistics> button to reset the error counters and the calculation of the response times.

Additional information is provided by the background color of the table rows:

| Color  | Meaning                                                                                  |
|--------|------------------------------------------------------------------------------------------|
| Green  | The connection is OK and the data are read.                                              |
| Yellow | The connection is OK, however the data update is slower than the configured update time. |
| Red    | The connection has failed.                                                               |
| Gray   | No connection configured.                                                                |

## 6.7 Diagnostic modules

### Other documentation



You can find a description of the diagnostic modules for the *ibaBM-DP* and *ibaBM-PN* in the respective device documentation.

Diagnostic modules are available for most Ethernet based interfaces and Xplorer interfaces. Using a diagnostic module, information from the diagnostic displays (e.g. diagnostic tabs and connection tables of an interface) can be acquired as signals.

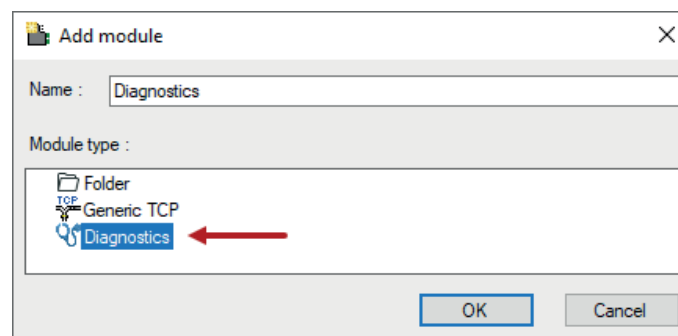
A diagnostic module is always assigned to a data acquisition module of the same interface and supplies its connection information. By using a diagnostic module, you can record and analyze the diagnostic information continuously in the *ibaPDA* system.

Diagnostic modules do not consume any license connections because they do not establish their own connection but refer to another module.

Example for the use of diagnostic modules:

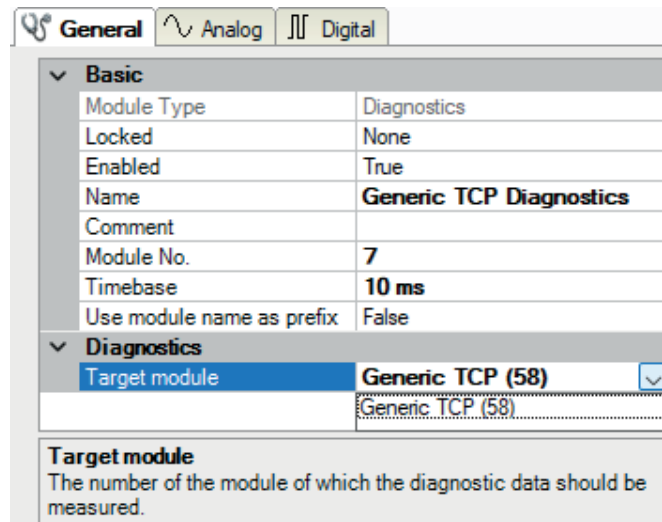
- A notification can be generated, whenever the error counter of a communication connection exceeds a certain value or the connection gets lost.
- In case of a disturbance, the current response times in the telegram traffic may be documented in an incident report.
- The connection status can be visualized in *ibaQPanel*.
- You can forward diagnostic information via the SNMP server integrated in *ibaPDA* or via OPC DA/UA server to superordinate monitoring systems like network management tools.

In case the diagnostic module is available for an interface, a "Diagnostics" module type is shown in the *Add module* dialog (example: Generic TCP).



## Module settings diagnostic module

For a diagnostic module, you can make the following settings (example: Generic TCP):



**General** Analog Digital

**Basic**

|                           |                         |
|---------------------------|-------------------------|
| Module Type               | Diagnostics             |
| Locked                    | None                    |
| Enabled                   | True                    |
| Name                      | Generic TCP Diagnostics |
| Comment                   |                         |
| Module No.                | 7                       |
| Timebase                  | 10 ms                   |
| Use module name as prefix | False                   |

**Diagnostics**

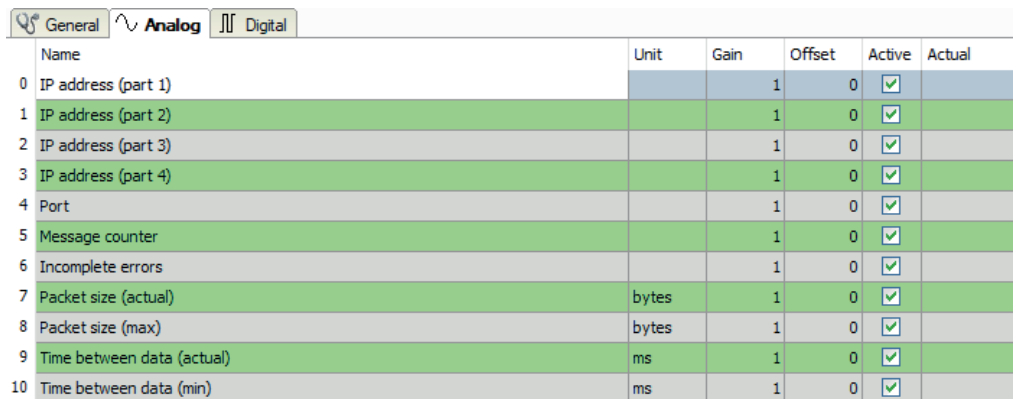
|               |                  |
|---------------|------------------|
| Target module | Generic TCP (58) |
|---------------|------------------|

**Target module**  
The number of the module of which the diagnostic data should be measured.

The basic settings of a diagnostic module equal those of other modules.

There is only one setting which is specific for the diagnostic module: the target module.

By selecting the target module, you assign the diagnostic module to the module on which you want to acquire information about the connection. You can select the supported modules of this interface in the drop-down list of the setting. You can assign exactly one data acquisition module to each diagnostic module. When having selected a module, the available diagnostic signals are immediately added to the *Analog* and *Digital* tabs. It depends on the type of interface, which signals exactly are added. The following example lists the analog values of a diagnostic module for a Generic TCP module.



|    | Name                       | Unit  | Gain | Offset | Active                              | Actual |
|----|----------------------------|-------|------|--------|-------------------------------------|--------|
| 0  | IP address (part 1)        |       | 1    | 0      | <input checked="" type="checkbox"/> |        |
| 1  | IP address (part 2)        |       | 1    | 0      | <input checked="" type="checkbox"/> |        |
| 2  | IP address (part 3)        |       | 1    | 0      | <input checked="" type="checkbox"/> |        |
| 3  | IP address (part 4)        |       | 1    | 0      | <input checked="" type="checkbox"/> |        |
| 4  | Port                       |       | 1    | 0      | <input checked="" type="checkbox"/> |        |
| 5  | Message counter            |       | 1    | 0      | <input checked="" type="checkbox"/> |        |
| 6  | Incomplete errors          |       | 1    | 0      | <input checked="" type="checkbox"/> |        |
| 7  | Packet size (actual)       | bytes | 1    | 0      | <input checked="" type="checkbox"/> |        |
| 8  | Packet size (max)          | bytes | 1    | 0      | <input checked="" type="checkbox"/> |        |
| 9  | Time between data (actual) | ms    | 1    | 0      | <input checked="" type="checkbox"/> |        |
| 10 | Time between data (min)    | ms    | 1    | 0      | <input checked="" type="checkbox"/> |        |

For example, the IP (v4) address of a Generic TCP module (see fig. above) will always be split into 4 parts derived from the dot-decimal notation, for better reading. Also other values are being determined, as there are port number, counters for telegrams and errors, data sizes and telegram cycle times. The following example lists the digital values of a diagnostic module for a Generic TCP module.



|   | Name                   | Active                              | Actual |
|---|------------------------|-------------------------------------|--------|
| 0 | Active connection mode | <input checked="" type="checkbox"/> |        |
| 1 | Invalid packet         | <input checked="" type="checkbox"/> |        |
| 2 | Connecting             | <input checked="" type="checkbox"/> |        |
| 3 | Connected              | <input checked="" type="checkbox"/> |        |

## Diagnostic signals

Depending on the interface type, the following signals are available:

| Signal name                            | Description                                                                                                                                                                                                               |
|----------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Active                                 | Only relevant for redundant connections. Active means that the connection is used to measure data, i.e. for redundant standby connections the value is 0.<br>For normal/non-redundant connections, the value is always 1. |
| Buffer file size (actual/avg/max)      | Size of the file for buffering statements                                                                                                                                                                                 |
| Buffer memory size (actual/avg/max)    | Size of the memory used by buffered statements                                                                                                                                                                            |
| Buffered statements                    | Number of unprocessed statements in the buffer                                                                                                                                                                            |
| Buffered statements lost               | Number of buffered but unprocessed and lost statements                                                                                                                                                                    |
| Connected                              | Connection is established                                                                                                                                                                                                 |
| Connected (in)                         | A valid data connection for the reception (in) is available                                                                                                                                                               |
| Connected (out)                        | A valid data connection for sending (out) is available                                                                                                                                                                    |
| Connecting                             | Connection being established                                                                                                                                                                                              |
| Connection attempts (in)               | Number of attempts to establish the receive connection (in)                                                                                                                                                               |
| Connection attempts (out)              | Number of attempts to establish the send connection (out)                                                                                                                                                                 |
| Connection ID O->T                     | ID of the connection for output data (from the target system to <i>ibaPDA</i> ). Corresponds to the assembly instance number                                                                                              |
| Connection ID T->O                     | ID of the connection for input data (from <i>ibaPDA</i> to target system). Corresponds to the assembly instance number                                                                                                    |
| Connection phase (in)                  | Status of the ibaNNet-E data connection for reception (in)                                                                                                                                                                |
| Connection phase (out)                 | Status of the ibaNNet-E data connection for sending (out)                                                                                                                                                                 |
| Connections established (in)           | Number of currently valid data connections for reception (in)                                                                                                                                                             |
| Connections established (out)          | Number of currently valid data connections for sending (out)                                                                                                                                                              |
| Data length                            | Length of the data message in bytes                                                                                                                                                                                       |
| Data length O->T                       | Size of the output message in byte                                                                                                                                                                                        |
| Data length T->O                       | Size of the input message in byte                                                                                                                                                                                         |
| Destination IP address (part 1-4) O->T | 4 octets of the IP address of the target system Output data (from target system to <i>ibaPDA</i> )                                                                                                                        |
| Destination IP address (part 1-4) T->O | 4 octets of the IP address of the target system Input data (from <i>ibaPDA</i> to target system)                                                                                                                          |
| Disconnects (in)                       | Number of currently interrupted data connections for reception (in)                                                                                                                                                       |
| Disconnects (out)                      | Number of currently interrupted data connections for sending (out)                                                                                                                                                        |
| Error counter                          | Communication error counter                                                                                                                                                                                               |
| Exchange ID                            | ID of the data exchange                                                                                                                                                                                                   |
| Incomplete errors                      | Number of incomplete messages                                                                                                                                                                                             |

| Signal name                              | Description                                                                                                                                                                                                                                                                                    |
|------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Incorrect message type                   | Number of received messages with wrong message type                                                                                                                                                                                                                                            |
| Input data length                        | Length of data messages with input signals in bytes ( <i>ibaPDA</i> receives)                                                                                                                                                                                                                  |
| Invalid data points                      | Number of received data points with missing configuration                                                                                                                                                                                                                                      |
| Invalid packet                           | Invalid data packet detected                                                                                                                                                                                                                                                                   |
| IP address (part 1-4)                    | 4 octets of the IP address of the target system                                                                                                                                                                                                                                                |
| Keepalive counter                        | Number of Keepalive messages received by the OPC UA Server                                                                                                                                                                                                                                     |
| Lost images                              | Number of lost images (in) that were not received even after a retransmission                                                                                                                                                                                                                  |
| Lost Profiles                            | Number of incomplete/incorrect profiles                                                                                                                                                                                                                                                        |
| Message counter                          | Number of messages received                                                                                                                                                                                                                                                                    |
| Messages per cycle                       | Number of messages in the cycle of the update time                                                                                                                                                                                                                                             |
| Messages received since configuration    | Number of received data telegrams (in) since start of acquisition                                                                                                                                                                                                                              |
| Messages received since connection start | Number of received data telegrams (in) since the start of the last connection setup. Reset with each connection loss.                                                                                                                                                                          |
| Messages sent since configuration        | Number of sent data telegrams (out) since start of acquisition                                                                                                                                                                                                                                 |
| Messages sent since connection start     | Number of sent data telegrams (out) since the start of the last connection setup. Reset with each connection loss.                                                                                                                                                                             |
| Multicast join error                     | Number of multicast login errors                                                                                                                                                                                                                                                               |
| Number of request commands               | Counter for request messages from <i>ibaPDA</i> to the PLC/CPU                                                                                                                                                                                                                                 |
| Output data length                       | Length of the data messages with output signals in bytes ( <i>ibaPDA</i> sends)                                                                                                                                                                                                                |
| Packet size (actual)                     | Size of the currently received message                                                                                                                                                                                                                                                         |
| Packet size (max)                        | Size of the largest received message                                                                                                                                                                                                                                                           |
| Ping time (actual)                       | Response time for a ping telegram                                                                                                                                                                                                                                                              |
| Port                                     | Port number for communication                                                                                                                                                                                                                                                                  |
| Producer ID (part 1-4)                   | Producer ID as 4-byte unsigned integer                                                                                                                                                                                                                                                         |
| Profile Count                            | Number of completely recorded profiles                                                                                                                                                                                                                                                         |
| Read counter                             | Number of read accesses/data requests                                                                                                                                                                                                                                                          |
| Receive counter                          | Number of messages received                                                                                                                                                                                                                                                                    |
| Response time (actual/average/max/min)   | <p>Response time is the time between measured value request from <i>ibaPDA</i> and response from the PLC or reception of the data.</p> <p>Actual: current value</p> <p>Average/max/min: static values of the update time since the last start of the acquisition or reset of the counters.</p> |
| Retransmission requests                  | Number of data messages requested again if lost or delayed                                                                                                                                                                                                                                     |

| Signal name                                         | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Rows (last)                                         | Number of resulting rows by the last SQL query (within the configured range of result rows)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| Rows (maximum)                                      | Maximum number of resulting rows by any SQL query since the last start of acquisition (possible maximum equals the configured number of result rows)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Send counter                                        | Number of send messages                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Sequence errors                                     | Number of sequence errors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Source IP address (part 1-4)<br>O->T                | 4 octets of the IP address of the target system Output data (from target system to <i>ibaPDA</i> )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Source IP address (part 1-4)<br>T->O                | 4 octets of the IP address of the target system Input data (from <i>ibaPDA</i> to target system)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Statements processed                                | Number of executed statements since last start of acquisition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Synchronization                                     | Device is synchronized for isochronous acquisition                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Time between data (actual/<br>max/min)              | Time between two correctly received messages<br><br>Actual: between the last two messages<br><br>Max/min: statistical values since start of acquisition or reset of counters                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| Time offset (actual)                                | Measured time difference of synchronicity between <i>ibaPDA</i> and the <i>ibaNet-E</i> device                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Topics Defined                                      | Number of defined topics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Topics Updated                                      | Number of updated topics                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| Unknown sensor                                      | Number of unknown sensors                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| Update time (actual/average/<br>configured/max/min) | Specifies the update time in which the data is to be retrieved from the PLC, the CPU or from the server (configured). Default is equal to the parameter "Timebase". During the measurement, the real actual update time can be higher than the set value if the PLC needs more time to transfer the data. How fast the data is really updated, you can check in the connection table. The minimum achievable update time is influenced by the number of signals. The more signals are acquired, the greater the update time becomes.<br><br>Average/max/min: static values of the update time since the last start of the acquisition or reset of the counters. |
| Write counter                                       | Number of successful write accesses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Write lost counter                                  | Number of failed write accesses                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

## 7 Appendix

### 7.1 iba S7 library

The iba S7 library is available in two versions:

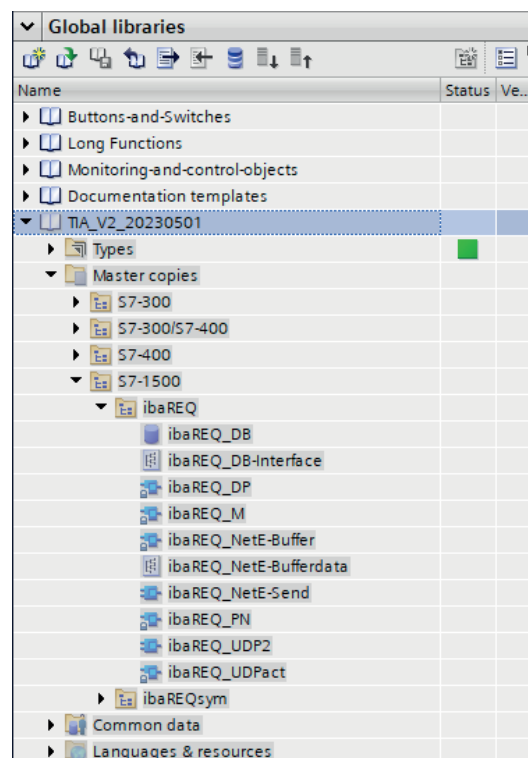
- SIMATIC Manager : STEP 7 ≥ V5.5
- SIMATIC TIA Portal STEP 7 ≥ V18

#### 7.1.1 iba S7 library for SIMATIC TIA portal

The iba S7 library for SIMATIC TIA Portal ("ibaS7LibTIA\_Vx\_y") is suitable for SIMATIC TIA Portal. It contains the Request blocks described in the manual, which are required for the use of *ibaPDA-Request-S7*.

You find the iba S7 library as an archived file on the data storage medium "iba Software & Manuals" in the following directory:

`\04_Libraries_and_Examples\10_Libraries\01_SIMATIC_S7\`



#### Note

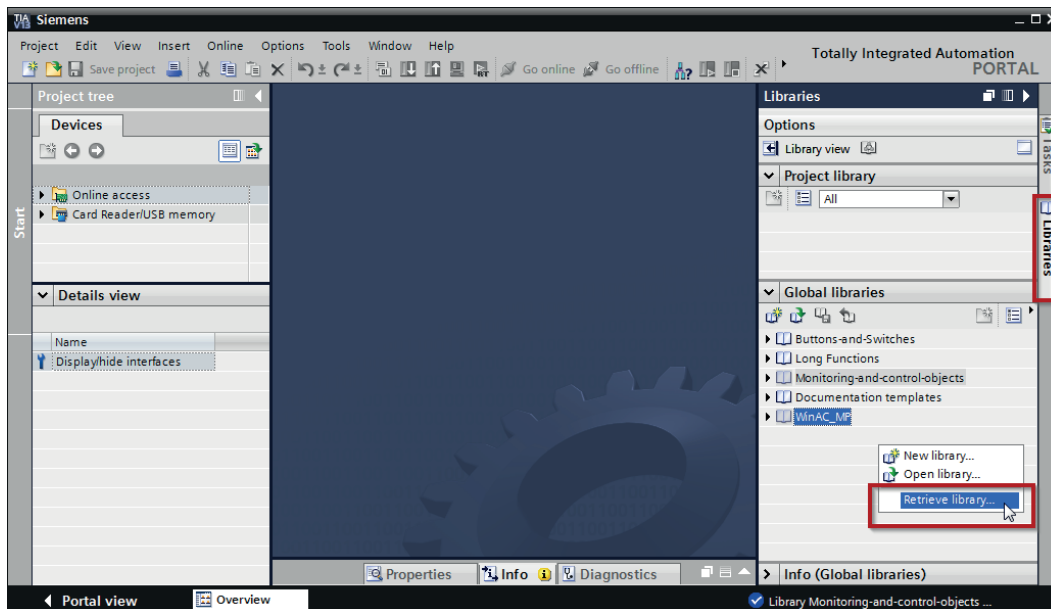


TIA portal libraries are version-dependent. There may be upward compatibility depending on the TIA portal version.

### 7.1.1.1 Integrating the library into TIA Portal

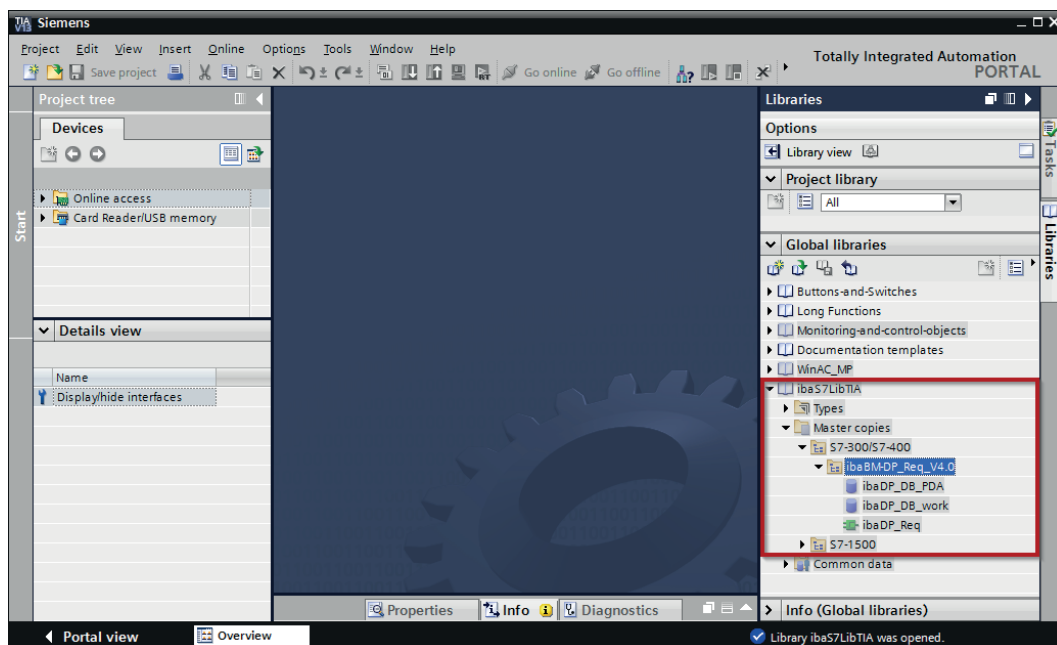
For integrating the library, you have to retrieve it in the TIA portal. Copy the iba S7 library to a local directory of your computer, where the TIA Portal is executed.

1. On the *Libraries* tab, select *Retrieve library* from the context menu.



2. Select the archive file of the iba S7 library and select a storage location for the extracted library in a next step.

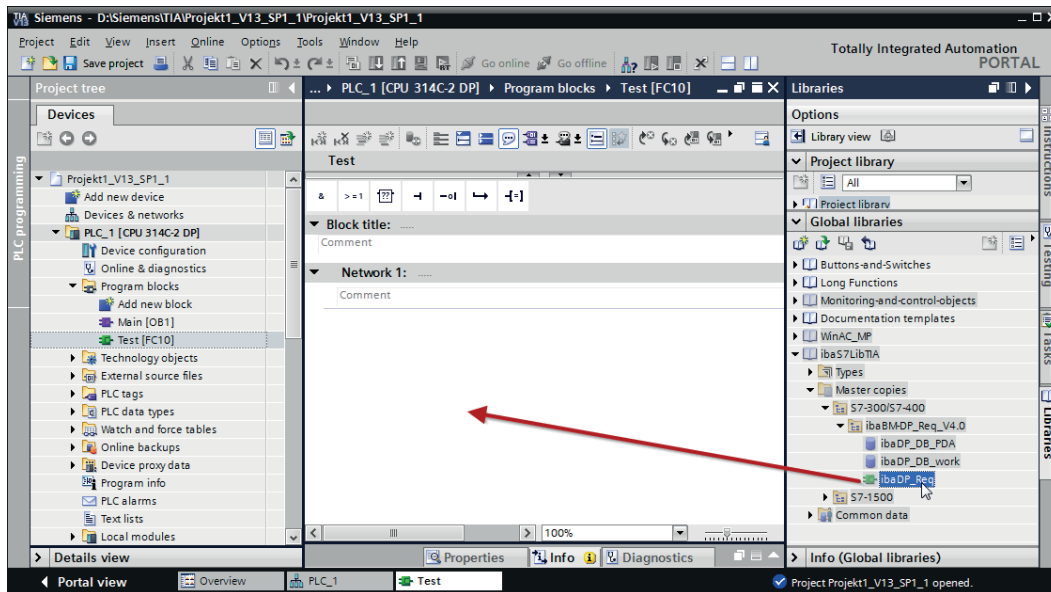
→ Now the library is integrated.



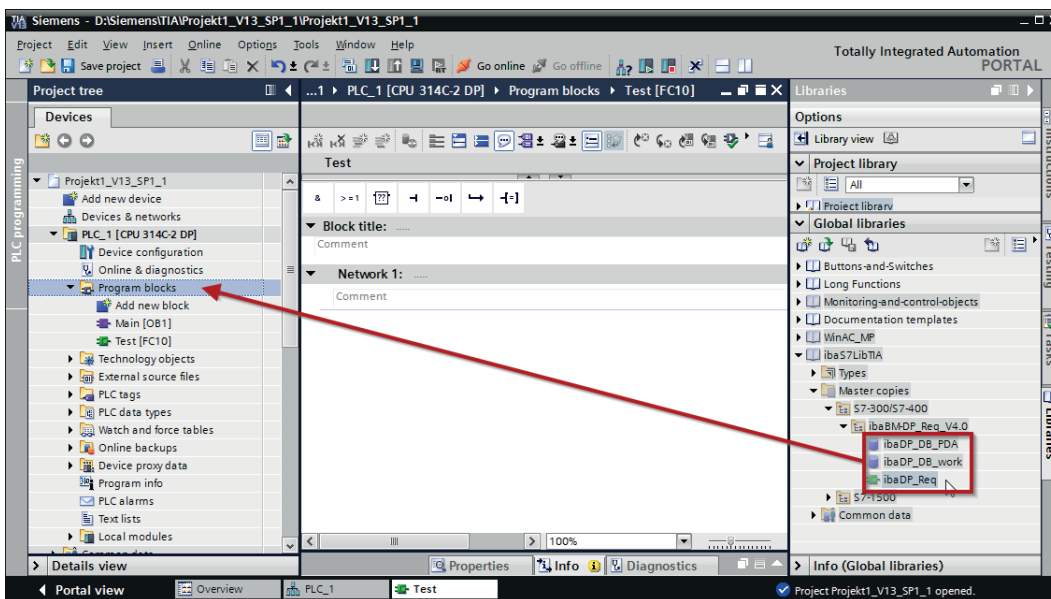
### 7.1.1.2 Using the blocks in TIA Portal

There are several options for using the blocks from the library.

- Display the block library and drag the required blocks to the opened destination block.

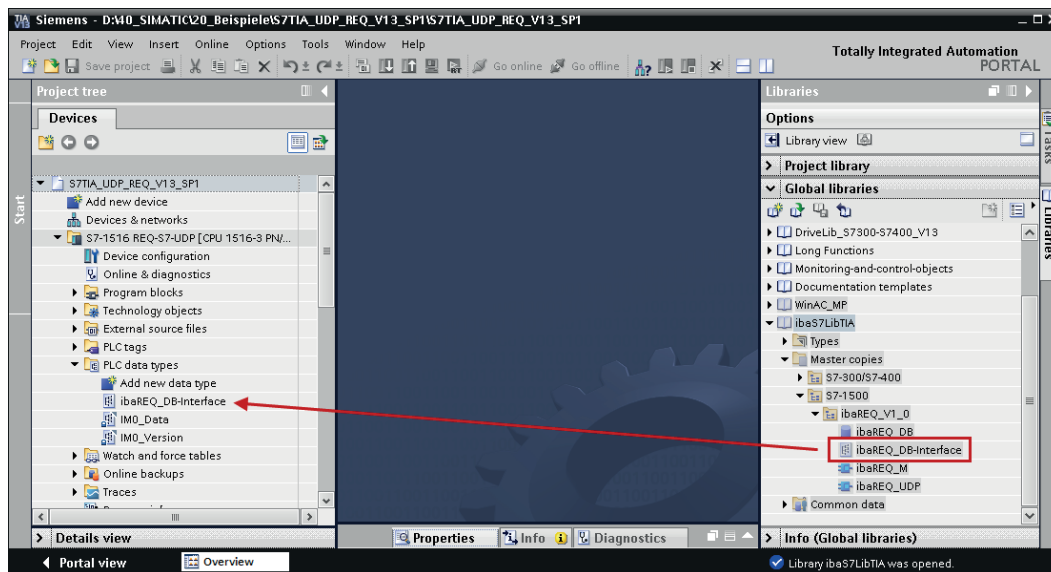


- Drag or copy the blocks to the program blocks directory in the project navigation.



→ You can call the blocks within a project block.

- Drag or copy the PLC data type to the PLC data type directory in the project navigation.



## 7.2 Application examples

You can find application examples for several different configurations on the data storage medium "iba Software & Manuals".

- For the *ibaBM-DPM-S* device in the directory  
[\04\\_Libraries\\_and\\_Examples\30\\_ibaBM-DPM-S\01\\_SIMATIC\\_S7\Request-S7\](#)
- For the *ibaBM-DP* device in the directory  
[\04\\_Libraries\\_and\\_Examples\31\\_ibaBM-DP\01\\_SIMATIC\\_S7\Request-S7\](#)
- For the *ibaBM-PN* device in the directory  
[\04\\_Libraries\\_and\\_Examples\32\\_ibaBM-PN\01\\_SIMATIC\\_S7\Request-S7\](#)
- For the *ibaCom-L2B* card in the directory  
[\04\\_Libraries\\_and\\_Examples\40\\_ibaCOM-L2B\01\\_SIMATIC\\_S7\Request-S7\](#)
- For the interface *ibaPDA-Interface-ibaNet-E*  
[\04\\_Libraries\\_and\\_Examples\53\\_ibaPDA-Interface-ibaNet-E\01\\_SIMATIC\\_S7\Request-S7\](#)
- For the interface *ibaPDA-Interface-S7-TCP/UDP*  
[\04\\_Libraries\\_and\\_examples\50\\_ibaPDA-Interface-S7-TCP\\_UDP\Request-S7\](#)

Examples are available for the following configurations:

| iba         | S7-CPU           | S7 project                        | ibaPDA project                                |
|-------------|------------------|-----------------------------------|-----------------------------------------------|
| ibaBM-PN    | S7-300 PN-IF     | S7CLASSIC_<br>PN_REQ_Vxx.zip      | ibaPDA_S7CLASSIC_<br>PN_REQ_Vxx.zip           |
|             | S7-400 PN-IF     |                                   |                                               |
|             | S7-1500 PN-IF    | S7TIA_<br>PN_REQ_Vxx.zip          | ibaPDA_S7TIA_<br>PN_REQ_Vxx.zip               |
|             |                  | ibaS7TIA_PN_REQsym_<br>Vxx.zap*   | ibaPDA_S7TIA_PN_REQsym                        |
|             |                  | ibaS7TIA_PN_<br>REQ3sym_V*.zap*   |                                               |
| ibaBM-DP    | S7-300 DP-IF     | S7CLASSIC_<br>DP_REQ_Vxx.zip      | ibaPDA_S7CLASSIC_<br>DP_REQ_CPU3xx_Vxx.zip    |
|             | S7-400 DP-IF     |                                   | ibaPDA_S7CLASSIC_<br>DP_REQ_CPU4xx_Vxx.zip    |
|             | S7-400 + CP443-5 |                                   | ibaPDA_S7CLASSIC_<br>DP_REQ_CPU4xx_Vxx.zip    |
|             | WinAC            |                                   | ibaPDA_S7CLASSIC_<br>DP_REQ_WinAC_Vxx.zip     |
|             | S7-400 with CFC  | S7CLASSIC_<br>DP_REQ_CFC_Vxx.zip  | ibaPDA_S7CLASSIC_<br>DP_REQ_CFC_Vxx.zip       |
|             | S7-400H          | S7CLASSIC_<br>DP_REQ_H_Vxx.zip    | ibaPDA_S7CLASSIC_<br>DP_REQ_CPU4xxH_Vxx.zip   |
|             | S7-300 DP-IF     | S7CLASSIC_<br>L2B_REQ_Vxx.zip     | ibaPDA_S7CLASSIC_<br>DP_L2Bcomp_REQ_Vxx.zip   |
|             | S7-1500 DP-IF    | S7TIA_<br>DP_REQ_Vxx.zip          | ibaPDA_S7TIA_<br>DP_REQ_Vxx.zip               |
|             |                  |                                   |                                               |
| ibaBM-DPM-S | S7-300 DP-IF     | S7CLASSIC_<br>DP_REQ_Vxx.zip      | ibaPDA_S7CLASSIC_<br>DPMS_REQ_CPU3xx_Vxx.zip  |
|             | S7-400 DP-IF     |                                   | ibaPDA_S7CLASSIC_<br>DPMS_REQ_CPU4xx_Vxx.zip  |
|             | WinAC            |                                   | ibaPDA_S7CLASSIC_<br>DPMS_REQ_WinAC_Vxx.zip   |
|             | S7-400 with CFC  | S7CLASSIC_<br>DP_REQ_CFC_Vxx.zip  | ibaPDA_S7CLASSIC_<br>DPMS_REQ_CFC_Vxx.zip     |
|             | S7-400H          | S7CLASSIC_<br>DP_REQ_H_Vxx.zip    | ibaPDA_S7CLASSIC_<br>DPMS_REQ_CPU4xxH_Vxx.zip |
| ibaCom-L2B  | S7-300 DP-IF     | S7CLASSIC_<br>L2B_REQ_Vxx.zip     | ibaPDA_S7CLASSIC_<br>L2B_REQ_Vxx.zip          |
|             | S7-300 + CP342-5 |                                   |                                               |
|             | S7-400 with CFC  | S7CLASSIC_<br>L2B_REQ_CFC_Vxx.zip | ibaPDA_S7CLASSIC_<br>L2B_REQ_CFC_Vxx.zip      |

| iba                         | S7-CPU                | S7 project                          | ibaPDA project                   |
|-----------------------------|-----------------------|-------------------------------------|----------------------------------|
| ibaPDA-Interface-ibaNet-E   | S7-1500               | ibaS7TIA_NetE_REQ_Vxx.zap*          | ibaPDA_S7TIA_NetE_REQ            |
|                             |                       | ibaS7TIA_NetE_REQsym_Vxx.zap*       | ibaPDA_S7TIA_NetE_REQsym         |
|                             |                       | ibaS7TIA_NetE_REQ3sym_V*.zap*       |                                  |
| ibaPDA-Interface-S7-TCP/UDP | S7-300 PN             | S7CLASSIC_UDP_REQ_Vxx.zip           | ibaPDA_S7CLASSIC_UDP_REQ_Vxx.zip |
|                             | S7-300 + CP343-1 LEAN |                                     |                                  |
|                             | S7-400 + CP443-1      |                                     |                                  |
|                             | S7-1500               | S7TIA_UDP_REQ_Vx_SPx_Vyy.zip        | ibaPDA_S7TIA_UDP_REQ_Vyy.zip     |
|                             |                       | ibaS7TIA_UDP_REQsym_Vx_SPx_Vyy.zip  | ibaPDA_S7TIA_UDP_REQsym_Vyy.zip  |
|                             |                       | ibaS7TIA_UDP_REQ3sym_Vx_SPx_Vyy.zip |                                  |

### 7.3 Setting PG/PC interface/defining new access point

*ibaPDA-Request-S7* cannot establish a connection to a S7-CPU if the parametrization "AUTO" for an access point (MPI-adapter or CP) has been set in the SIMATIC Manager.

There are 2 possible remedies:

#### Changing the interface with remaining access point name

Change interface in the SIMATIC Manager e.g. from "CP5622 (AUTO)" to "CP5622 (MPI)" or "CP5622 (PROFIBUS)".

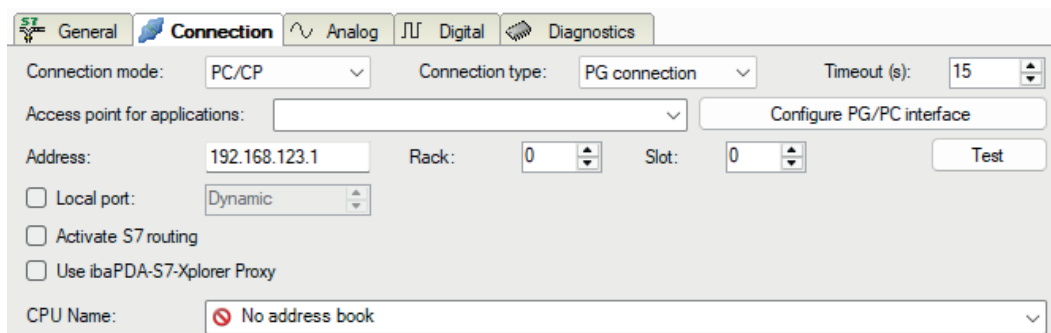
Disadvantage of this method: If the setting of the access point is changed again in the SIMATIC Manager, the measurement does no longer work because *ibaPDA* has no longer access.

#### Adding a special access point for ibaPDA

To avoid conflicts with the setting of SIMATIC Manager and *ibaPDA* when both programs run on the same computer, you can define a new access point.

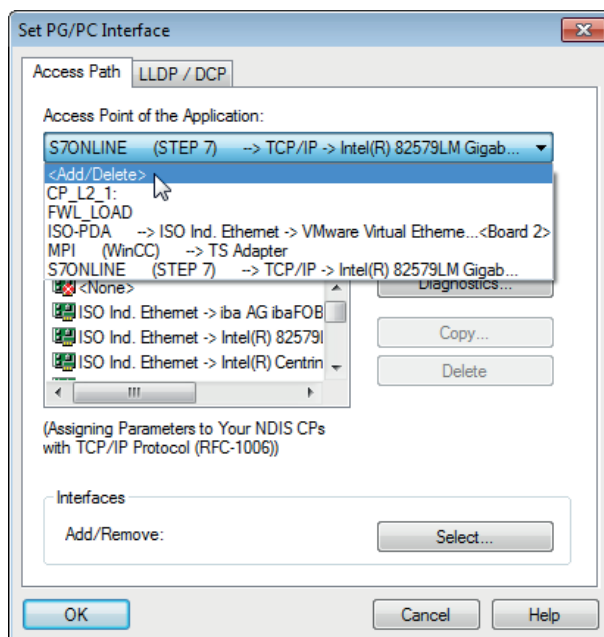
There is the <Configure PG/PC interface> button in the dialog window of the module. With this button, you can open the dialog for configuring the PG/PC interface.

The setting for the SIMATIC Manager is also changed.



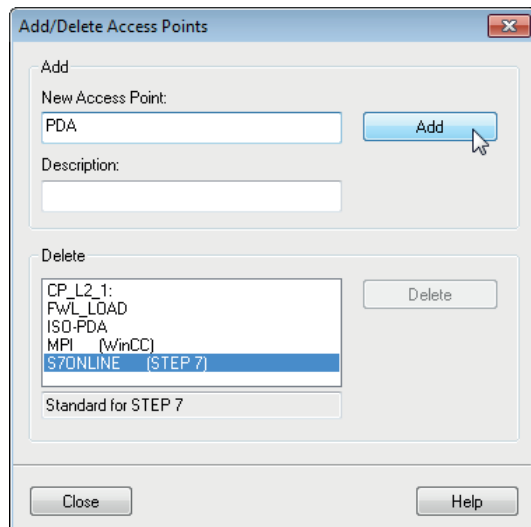
#### Procedure

1. Open the dialog for configuring the PG/PC interface with the <Configure PG/PC interface> button.
2. Under *Access Point of the Application* select the row <Add/Delete>.

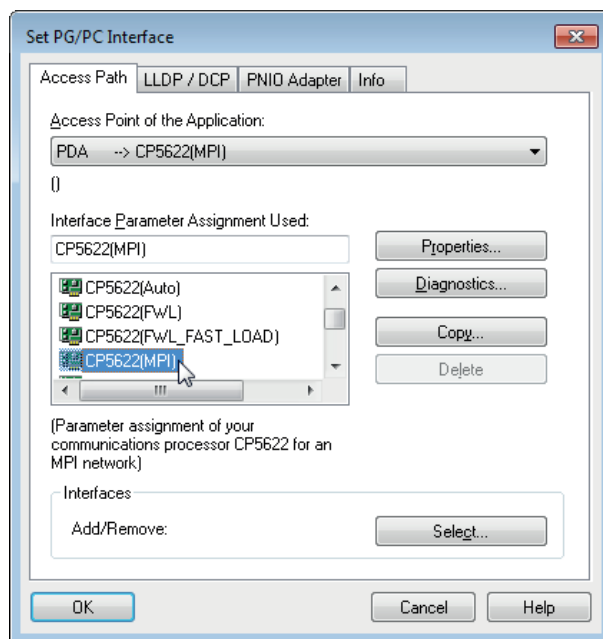


- Define a new access point: Enter a name, e.g. "PDA", and optionally a description for a better understanding.

Confirm your entries with <Add> and <Close>.

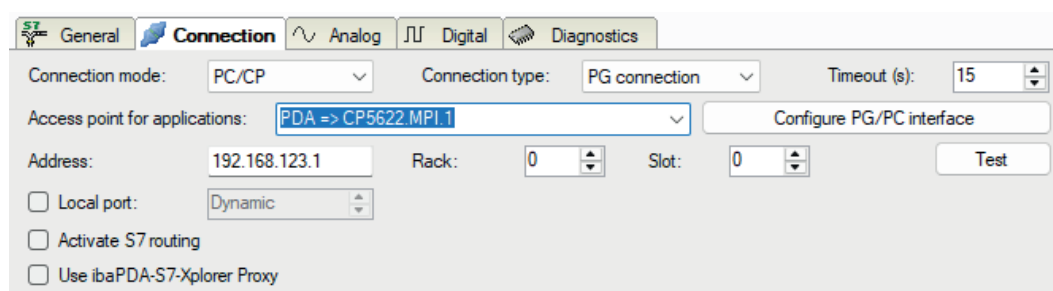


- Add an interface to the access point, e.g. "CP5622 (MPI)".



- Exit the configuration with <OK>.

→ *ibaPDA* subsequently displays the newly defined access (e.g. "PDA --> CP5622.MPI.1") in the connection dialog under *Access points for applications*.



**Notes on the different access points**

Depending on which access points have been configured in the engineering computer, there are different access points available for selection in the *ibaPDA* system.

Basically, there are 3 types of access points:

- TCP/IP
- ISO
- Bus system PROFIBUS or MPI

**TCP/IP**

If you select an access point using TCP/IP, you need to enter the IP address, rack number and slot number of the CP in the module configuration dialog. If you do not know the rack number or slot number, enter "0" for slot and click on the <Test> button.

**ISO**

If you select an access point using an ISO interface, you need to enter the MAC address, rack number and slot number. If you do not know the rack number or slot number, enter "0" for slot and click on the <Test> button.

**Bus system PROFIBUS or MPI**

If you select an access point using a bus interface, e.g. PROFIBUS or MPI, you need to enter the bus address, the rack number and slot number. You can also use the <Test> button and then click on one of the CPU links found to test the connection.

## 7.4 S7 routing

S7 routing is defined as the possibility to use S7 controls as router to access secondary target systems, i.e. controls or drives, which are in different subnets. This also includes changing the bus system (Ethernet, PROFIBUS, MPI).

### Reference



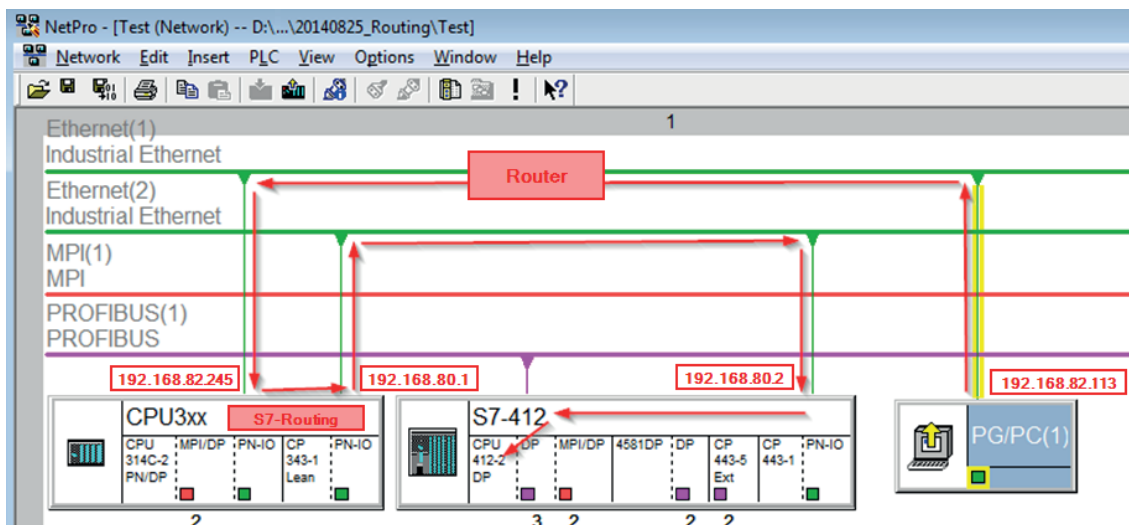
For more information about the S7 Routing, refer to:

- Which modules support the "S7 Routing" function in S7 subnets?  
<https://support.industry.siemens.com/cs/de/en/view/584459>
- Which requirements must be fulfilled and what do I have to observe if I want to execute routing?  
<https://support.industry.siemens.com/cs/de/en/view/2383206>
- How do you enable cross-project S7 Routing in the TIA Portal and in STEP 7 V5.x?  
<https://support.industry.siemens.com/cs/de/en/view/109474569>

### 7.4.1 Routing from Ethernet to Ethernet

Do not mix up the *S7 Routing* function with IP routing.

The example shows how to implement the following way of access via S7 Routing in NetPro.



The engineering computer (also with *ibaPDA*) is to access the CPU412 controller. The computer and the controller are not directly connected via a common network or bus. The connection has to run over the CPU314C controller.

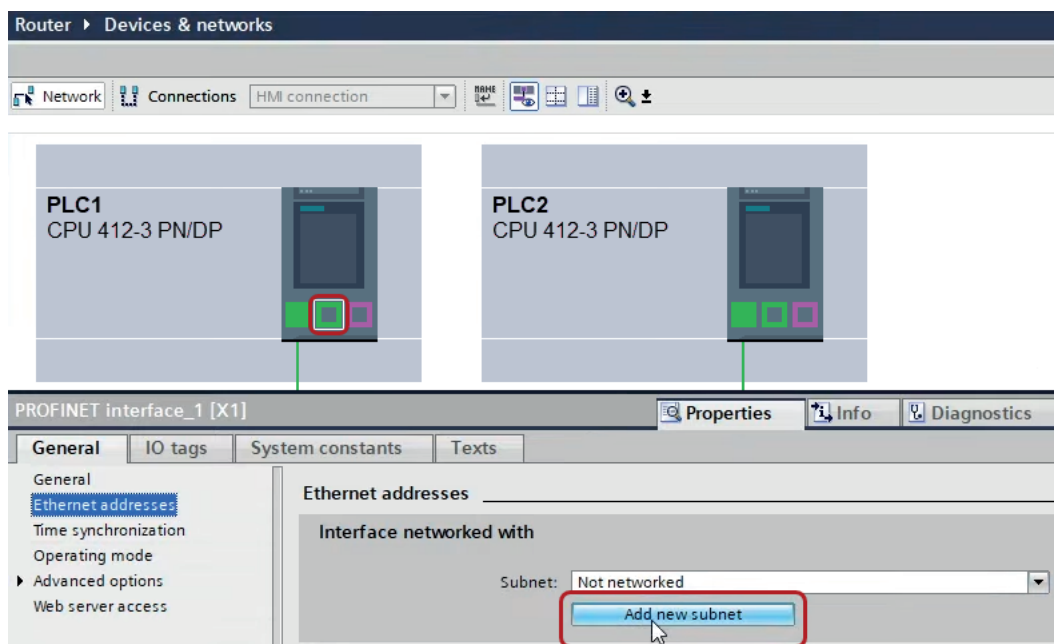
"Passing" the communication through this controller is called *S7 Routing*.

In our example, engineering computer and CPU314C are also located in two different (logic) subnets. You need an (IP) router for establishing a communication connection. This is completely independent of the S7 Routing function and should not be mixed up with it.

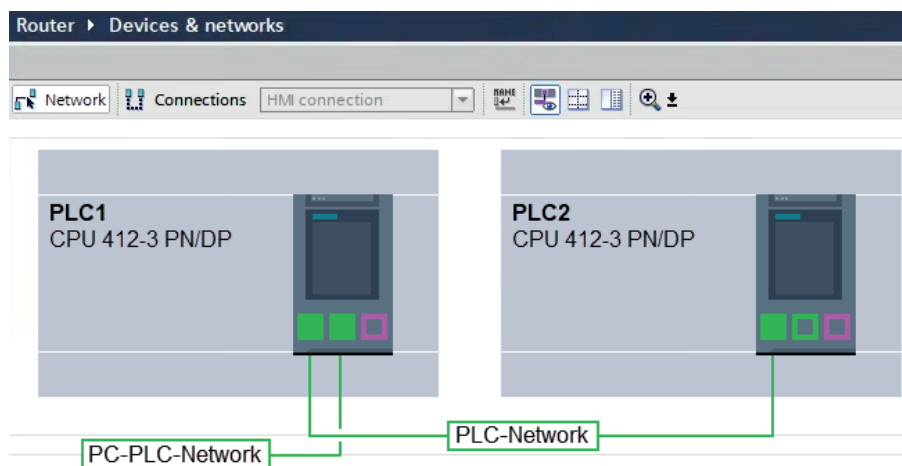
### 7.4.1.1 Configuration of TIA Portal

The following configuration steps are required exclusively for accessing the subordinate control "PLC2" by the programming software TIA 7. For SINUMERIK, SINAMICS, or SIMOTION, you can apply similar steps. For using *ibaPDA*, these steps are not required.

1. Connect both controllers in TIA Portal via the Ethernet ports.
2. Establish a connection with your computer and the first controller "PLC1" by adding a subnet.

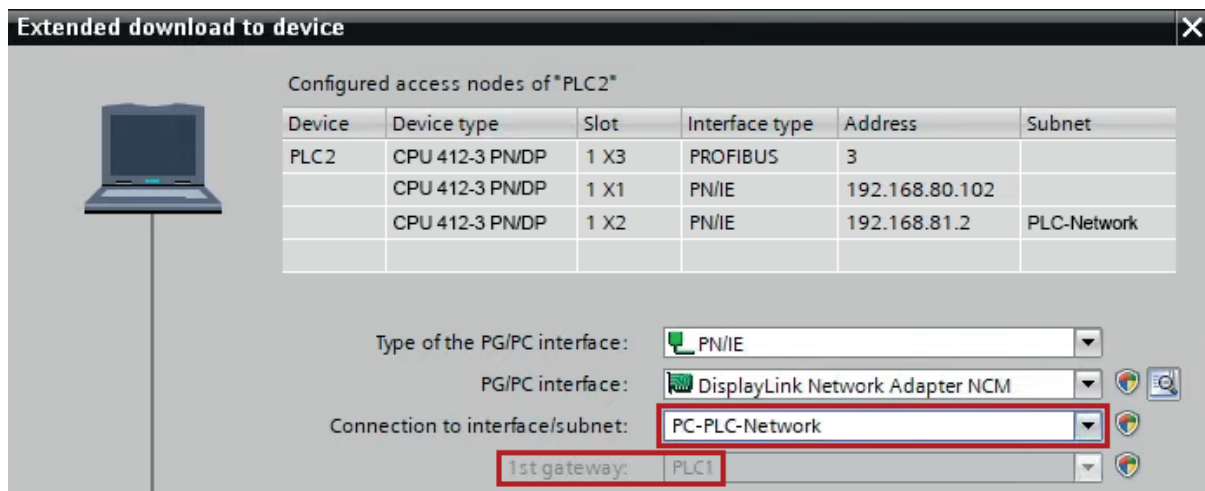


→ The connections between the controllers and to the computer are shown in TIA Portal.



3. Download the programming of the controller "PLC1" and then the programming of the controller "PLC2".

4. In the controller "PLC2", set the connection from "PLC1" to the computer as the connection to the interface/subnet.

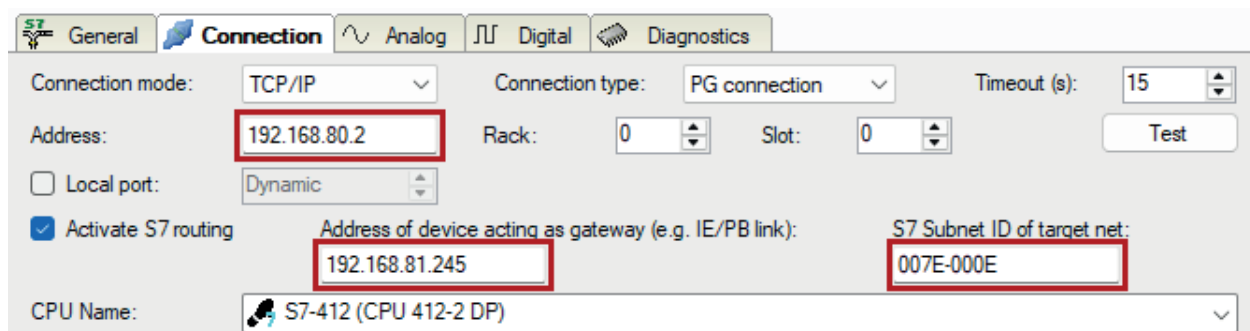


→ "PLC1" appears as the first gateway.

→ "PLC2" is now connected to the computer via S7 routing via "PLC1".

### 7.4.1.2 Configuration of ibaPDA

Configure the following settings.



#### Activate S7 routing

Enable this option to use S7 routing.

#### Address

Enter the address of the target control (here CPU412)

#### Address of device acting as gateway

Enter the address of the gateway (here CPU314C).

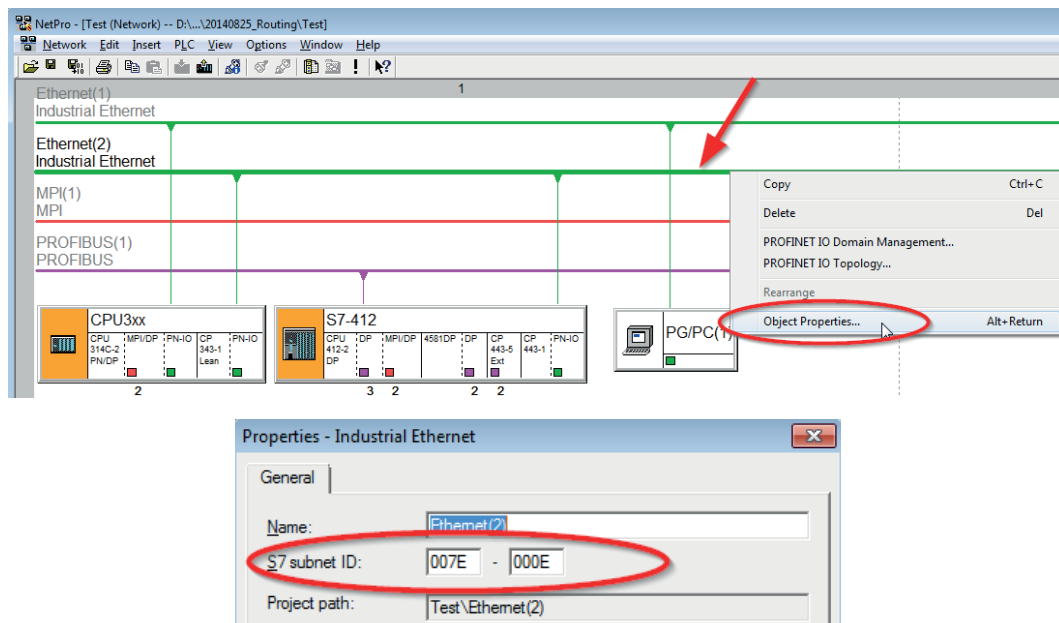
#### S7 subnet ID of target net

Enter the subnet ID from STEP 7 NetPro or TIA Portal.

## Identifying the S7 subnet ID in NetPro

You can identify the S7 subnet ID in NetPro.

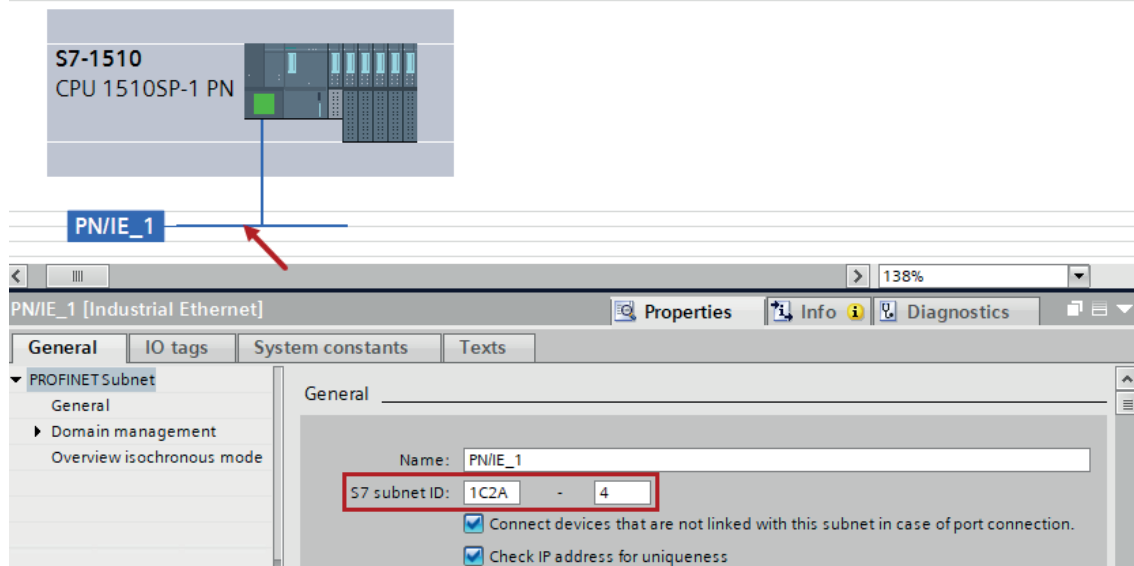
Right-click on the secondary bus system and open the *Object Properties*.



## Identifying the S7 subnet ID in TIA Portal

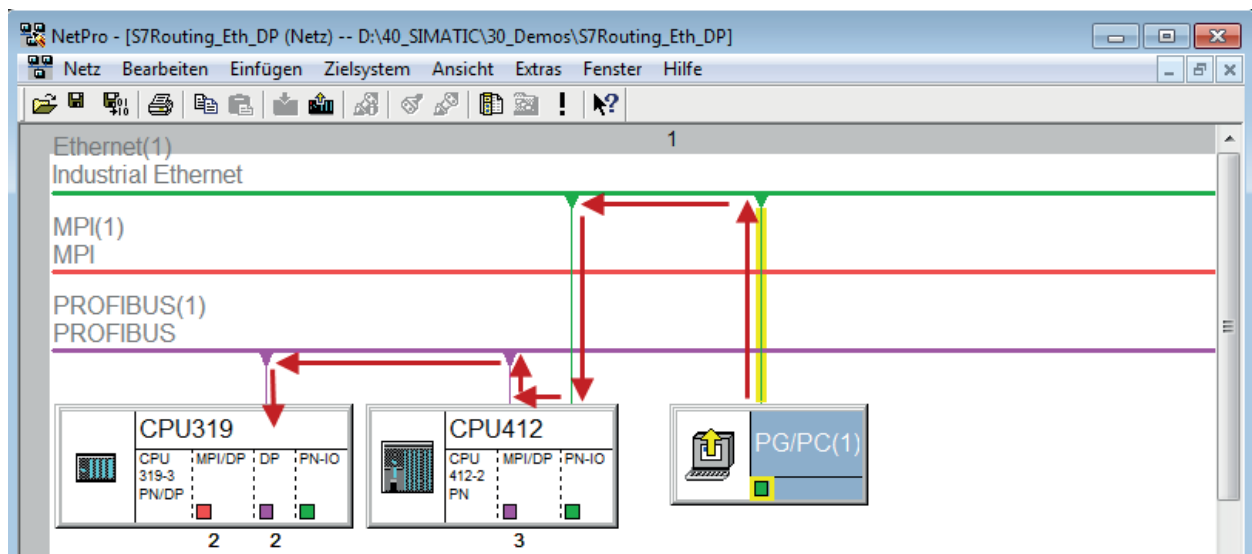
You can identify the S7 subnet ID in TIA Portal.

Click on the bus system and go to *Properties – General – General*.



## 7.4.2 Routing from Ethernet to PROFIBUS

The example shows how to implement the following way of access via S7 Routing and an example system topology for Ethernet PROFIBUS in NetPro.



The engineering computer (also with *ibaPDA*) is to access the CPU319 controller. The computer and the controller are not directly connected via a common network or bus. The connection has to run over the CPU412 controller.

"Passing" the communication through this controller is called *S7 Routing*.

### 7.4.2.1 Configuration of TIA Portal

The configuration steps are required exclusively for accessing the subordinate control "PLC2" by the programming software TIA Portal. For SINUMERIK, SINAMICS, or SIMOTION, you can apply similar steps.

For the configuration of PROFIBUS proceed as described for Ethernet, see ➤ *Configuration of TIA Portal*, page 161.

### 7.4.2.2 Configuration of ibaPDA

Configure the following settings.

Connection mode: TCP/IP Connection type: PG connection Timeout (s): 15

Address: 2 Rack: 0 Slot: 0 Test

☒ Activate S7 routing Address of device acting as gateway (e.g. IE/PB link): 192.168.80.95 S7 Subnet ID of target net: 02D6-000B

CPU Name: CPU\_mit\_DP-IF (CPU 314C-2 DP)

#### Activate S7 routing

Enable this option to use S7 routing.

#### Address

Enter the address of the target control (here CPU319).

#### Address of device acting as gateway

Enter the address of the gateway (here CPU412).

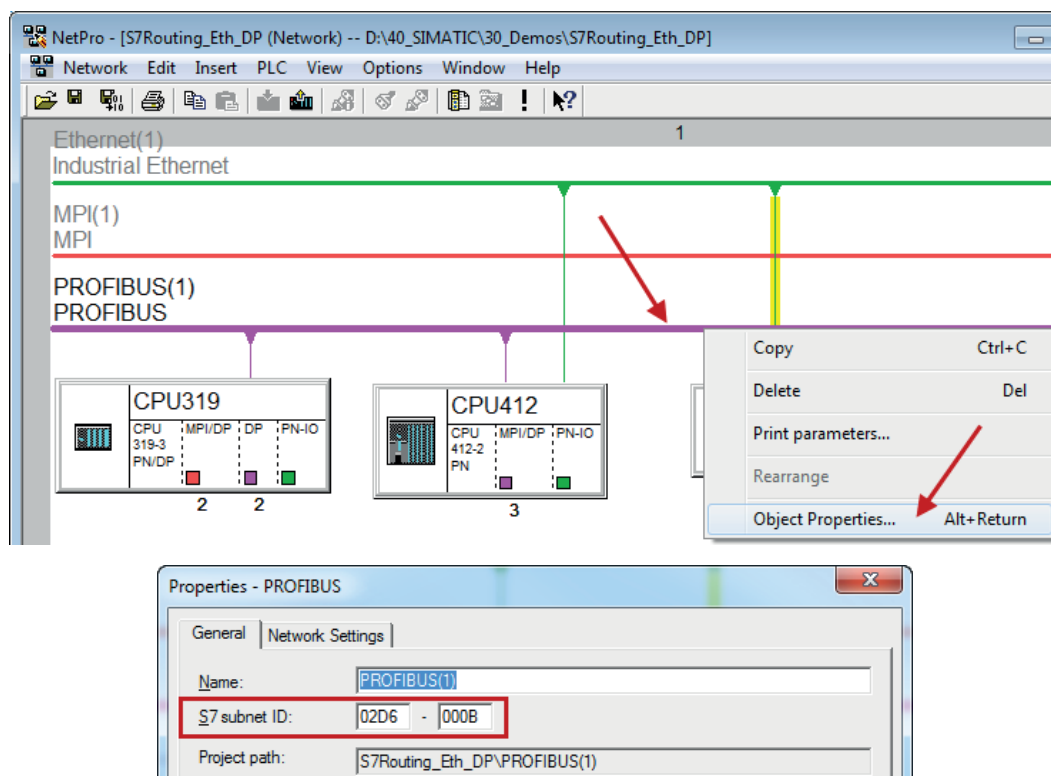
#### S7 subnet ID of target net

Enter the subnet ID from STEP 7 NetPro.

#### Identifying the S7 subnet ID in NetPro

You can identify the S7 subnet ID in NetPro.

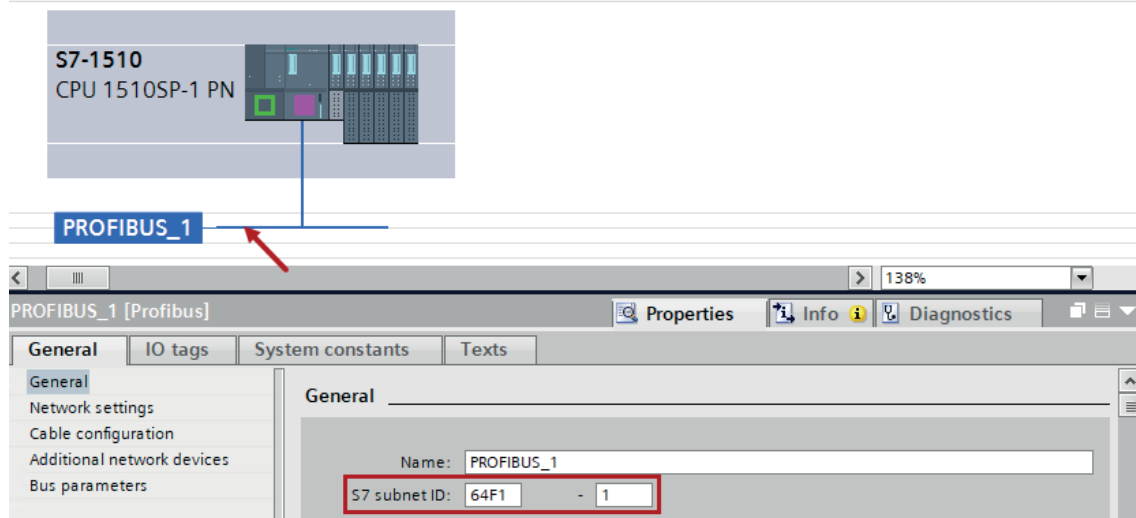
Right-click on the secondary bus system and open the *Object Properties*.



### Identifying the S7 subnet ID in TIA Portal

You can identify the S7 subnet ID in TIA Portal.

Click on the bus system and go to *Properties – General – General*.



## 8 Support and contact

### Support

Phone: +49 911 97282-14

Email: [support@iba-ag.com](mailto:support@iba-ag.com)

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#### Note



If you need support for software products, please state the number of the license container. For hardware products, please have the serial number of the device ready.

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### Product Security Incident Response Team (PSIRT) at iba

Current advisories: [www.iba-ag.com/en/security](http://www.iba-ag.com/en/security)

Email: [psirt@iba-ag.com](mailto:psirt@iba-ag.com)

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