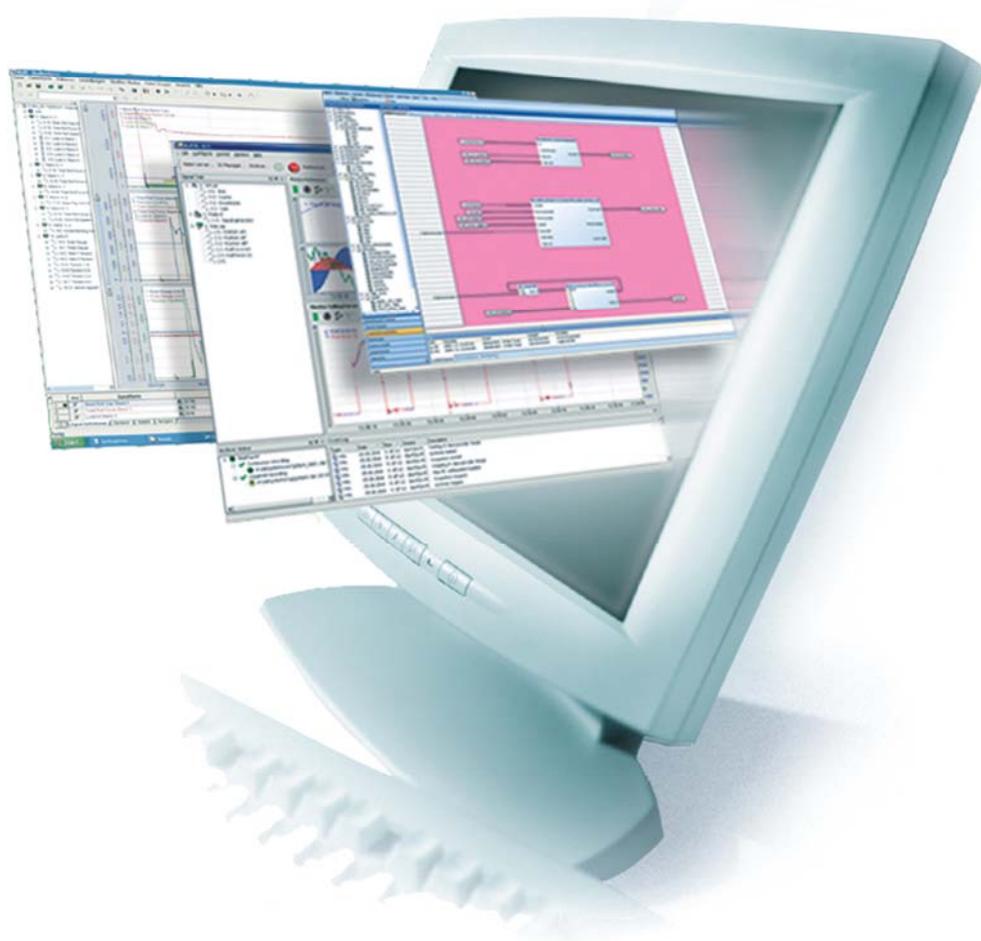


S7 Writer Plugin

Plugin for ibaDatCoordinator



Manual

Issue 1.0

Measurement and Automation Systems



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The current version is available for download on our web site <http://www.iba-ag.com>.

| Issue | Date | Revision | Author | Version SW |
|-------|------------|-----------------|--------|------------|
| 1.0 | 07-09-2017 | Initial version | ng | 1.0 |

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1 About this manual

This manual describes in detail the configuration and use of the software product ibaDatCoordinator S7 Writer Plugin. It serves both as a tutorial and a reference document.

1.1 Target group and previous knowledge

This manual addresses in particular the 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 he/she is capable of assessing safety and recognizing possible consequences and risks on the basis of his/her specialist training, knowledge and experience and knowledge of the standard regulations.

This documentation especially addresses persons who cope with analyzing measurement and process data. As the data are provided and processed using other iba products, the following prior knowledge is required or helpful for working with ibaDatCoordinator S7 Writer Plugin.

θ Windows operating system

θ *ibaDatCoordinator*

θ *ibaAnalyzer*

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> Example: Select the menu <i>Logic diagram - Add - New function block</i> . |
| Keys | <Key name> Example: <Alt>; <F1> |
| Press the keys simultaneously | <Key name> + <Key name> Example: <Alt> + <Ctrl> |
| Buttons | <Key name> Example: <OK>; <Cancel> |
| File names, paths | "Filename", "Path" Example: "Test.doc" |

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:

- From an electric shock!
 - Due to the improper handling of software products which are coupled to input and output procedures with control function!
-

 WARNING

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

 CAUTION

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



Note

A note specifies special requirements or actions to be observed.



Important note

Note if some special features must be observed, for example exceptions from the rule.



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.



Example

Configuration and application examples for a better understanding

2 System pre-requisites

Software

- θ Windows 7
- θ .NET- framework 4.5.2
- θ ibaAnalyzer 6.7.1 or later
- θ ibaDatCoordinator 2.0.0 or later

Hardware

- θ IBM-compatible PC, P4 1GHz, 512 MB RAM, 40GB HDD
- θ S7 PLC to write the data to.
- θ On the application PC the possibility to connect to an S7 PLC via TCP/IP.
- θ iba licensing dongle that has the necessary license bits set to enable this plugin in ibaDatCoordinator.

3 Introduction

3.1 General description

The ibaDatCoordinator S7 Writer Plugin is an extension for ibaDatCoordinator that allows ibaDatCoordinator to extract or calculate data from an iba data file (".dat file") and write that data to data blocks (DB) inside of an S7 PLC.

After installing the plugin, an additional task will be available in ibaDatCoordinator that will allow one to specify ibaAnalyzer expressions along with S7 operands. When running the parent job, these expressions will be evaluated and sent to the S7 (which also needs to be specified).

Additionally an optional ibaAnalyzer analysis can be specified. In the new task one can then refer to the expressions in the specified analysis (both grid expressions and "logicals"). IbaDatCoordinator will load the analysis before evaluating the expressions specified in the plugin, allowing for short and easy ibaAnalyzer expressions in the plugin.

4 Installation

4.1 Installing the plugin

The plugin installer can be found on the install DVD in the **01_iba_Software\ibaDatCoordinator\02_Plugins** directory.

Start the installation by opening the "S7 Writer" directory and execute the file ibaDatCoordinator-S7-Writer-PluginInstaller_v2.0.0.exe. Please follow the instructions of the installation wizard.



Note

The ibaDatCoordinator needs to be stopped and closed before installing the plugin. If you haven't closed the ibaDatCoordinator yourself (and its service when installed as a service), the installer will close ibaDatCoordinator for you. Do not install the plugin at a time when shutting down the ibaDatCoordinator is inconvenient for you.

You will need to restart ibaDatCoordinator after installing the plugin, the client can be started from the windows menu („Programs – iba – ibaDatCoordinator – ibaDatCoordinator Service Status”) while the service can be started from the client („Menu – Service – Start” or right click the system tray icon – “Start service”)

5 Configuring the S7 Writer Plugin

5.1 Adding and configuring a Job.

If no ibaDatCoordinator job has been configured yet, we recommend modifying the existing default job. If a new job that runs in parallel with already existing jobs is required the blue “Add job” link can be clicked. We recommend adding or modifying a job under the “Standard jobs” section in the job tree, however “Scheduled Jobs” (for executing the plugin against HD data) or “One time Job” (for executing the plugin against manually selected .dat files) should work also.

Since it probably is best that the S7 receives the most recent data we recommend the following options to be set in order to process new .dat files as soon as possible:

- ⊖ Enable “Automatically start on load”
- ⊖ Enable “Process .dat files instantly”
- ⊖ Disable “Do initial scan for .dat files unprocessed by previous session”
- ⊖ Disable “Rescan for unprocessed .dat files every ...”
- ⊖ Disable “Retry failed operations every ...”

Enabled
 Automatically start on load

Process .dat files instantly
 Do initial scan for .dat files unprocessed by previous session

Rescan for unprocessed .dat files every minutes

Retry failed operations every minutes

Retry failed operations maximum times

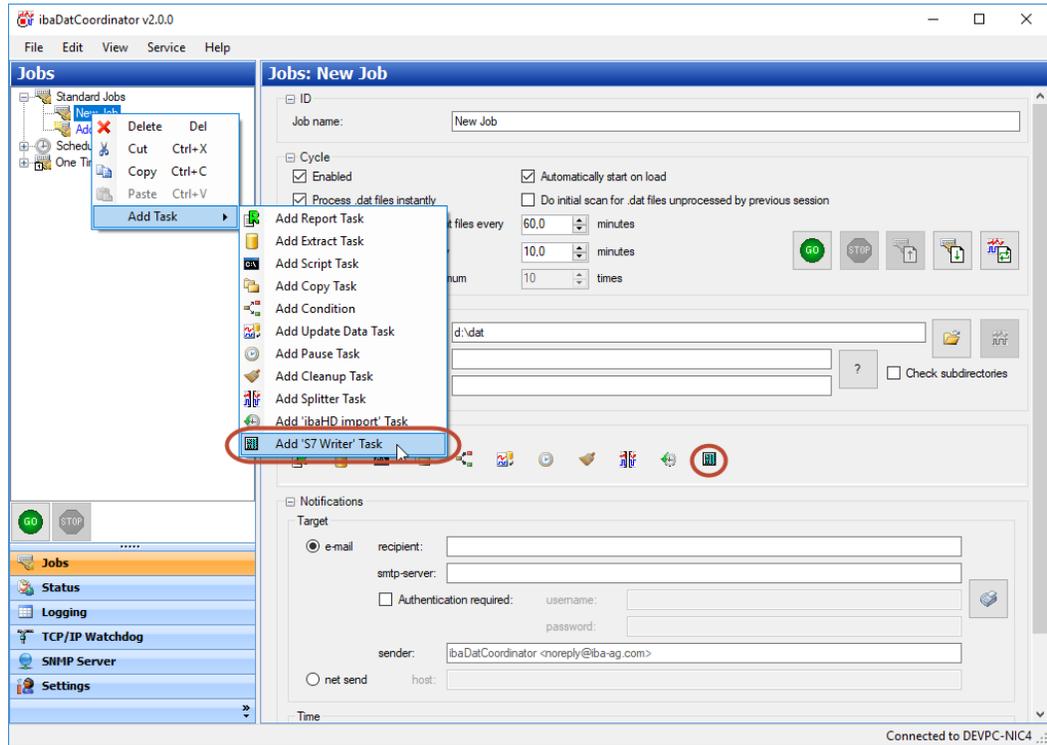


Other documentation

For further information on configuring ibaDatCoordinator Jobs we recommend consulting the ibaDatCoordinator manual.

5.2 Adding the S7 Writer task

If the plugin has been installed successfully; the next time you start ibaDatCoordinator you will be able to add an S7 writer task to a job. You can add the S7 writer task in the job pane. You do this by either clicking the button in the “New Task” button collection or by right clicking on the job in the job tree or selecting the task from the context menu under “Add task”.



5.3 Configuring the S7 Writer task

After adding an S7 writer task, you can select it in the job tree to open the corresponding task pane where you can configure the task. The task has three groups of options in common with any other task:

- θ **“ID”**: Here you can specify a name for the task other than the default “S7 Writer”. You can also specify here whether or not that the task is resource critical (you can specify in the global ibaDatCoordinator “Settings” how many resource critical tasks can be executed simultaneously.)
- θ **“Execute”**: Here you can specify when to execute the task.
- θ **“Notify”**: Here you can specify when ibaDatCoordinator should send notifications about the status of the task.

Near the bottom another groupbox is present that is common with ibaDatCoordinator tasks that require ibaAnalyzer:

- θ **“Monitor ibaAnalyzer”**: Here you can limit the amount of memory an ibaAnalyzer operation can take and/or the amount of time an individual ibaAnalyzer operation can take. If these limits are exceeded, the operations will be halted and the .dat file will be marked as failed for the S7 writer task.



Other documentation

These options are entirely identical to the same options in other tasks; we advise to consult the ibaDatCoordinator manual for additional information on how to configure them.

5.3.1 Specifying S7 connection parameters

Here you have to configure how you want to connect to the S7. The connection type can PG, OP or other. You can choose one that is available on your S7. Set the address to the IP address of the S7 CPU and also set the correct rack and slot numbers.

| | | | |
|------------------|-----------------|--------------|----|
| Connection type: | PG connection | Timeout (s): | 10 |
| Address: | 192.168.123.205 | Rack: | 0 |
| | | Slot: | 2 |

5.3.2 Specifying an optional analysis

Optionally, you can specify an ibaAnalyzer analysis file (.pdo file). When processing a .dat file, the S7 writer Plugin will first load this analysis before evaluating the expressions that need to be written to the S7. This way you can define more complex expressions in the analysis and you can refer to these expressions (both grid expressions and logicals) in the expressions for the S7 signals. This allows for simpler expressions for the S7 signals, often merely referring directly to the expressions in the analysis. This option is identical as the optional analysis you can specify for an ibaDatCoordinator conditional task.

| | | | |
|--------------------|------------------|---|---|
| Optional analysis: | D:\klad\Test.pdo |  |  |
|--------------------|------------------|---|---|

Next to the textbox where you can type the name of the analysis, there is a button to browse for an analysis. Next to it is another button which is grayed if the typed analysis

file does not exist. If it does exist and is accessible, you'll be able to click the button to open an ibaAnalyzer session with the selected analysis file loaded.

5.3.3 Specifying the S7 signals

Next is a grid where you can specify S7 signals. You can add as many signals as you want by entering new data in the last row.

| | ibaAnalyzer Expression | DB | Address | Bit | S7 Data Type | Test Value |
|-----|------------------------|-----|---------|-----|--------------|--------------------|
| ▶ 1 | max([2:0]) | 120 | 0 | 0 | REAL | 0,0290584564208984 |
| 2 | [2:1]*1000 | 120 | 4 | 0 | INT | 51.9863891601563 |
| 3 | [2:2]*1000 | 120 | 6 | 0 | WORD | 45.7315063476563 |
| 4 | [2:3]*1000000 | 120 | 8 | 0 | DINT | 62134.3994151042 |
| *5 | | | | | | |

The grid contains the following columns:

- θ *“ibaAnalyzer Expression”*: Here you must type a valid ibaAnalyzer expression. This expression will be evaluated when the job runs and the result will be written to the S7. Preferably, you should type an expression that evaluates to a constant value. However if the result of the expression is a varying signal, the signal will be averaged first before being used.
- θ *“DB”* The DB number that you want to write the data to.
- θ *“Address”* The address within the DB that you want to write data to.
- θ *“Bit”* In case it is a digital signal this is the bit number that you want to write data to.
- θ *“S7 Data Type”* The data type of the data you want to write. Use BOOL for digital signals.
- θ *“Test Value”*: This column is not editable, it is used to show the values of the expressions when evaluated against a test .dat file (see subchapter 0)

You can copy and paste texts in the grid, e.g. from ibaAnalyzer.

You can delete rows by marking them via the row header and then pressing the *Delete* key on the keyboard.

Ignore expressions that can't be evaluated

With the *„Ignore expressions that can't be evaluated“* checkbox you can decide how the plugin behaves when one of the expressions can't be evaluated. If it is unchecked then the task will fail when one of the expressions can't be evaluated. If it is checked then the task will just not write the signal whose expression can't be evaluated. It will write the other signals with valid expressions. If there are no expressions that can be evaluated then the task will still fail.

5.3.4 Testing the ibaAnalyzer expressions

One can test the ibaAnalyzer expressions in the S7 signals grid by providing a test iba data file (.dat file). You can specify the path to the data file in a text box, also a browse button is available to search for a .dat file in a “file open” dialog. If the specified .dat file exists and is accessible, you'll be able to click on the test button, otherwise the button is grayed.

Example .dat file  

After clicking the test button, the “Test Value” column in the value will be filled in for the valid expressions; for the invalid expressions, the Test Value column will be blank. A message box will appear with one of the following messages:

- ⊖ *“Analysis file not found”*, this means the specified analysis file (.pdo file) does not exist or is not accessible. The task would also fail when executed. Note that you are not required to specify an analysis, you can leave the textbox blank and then this error does not happen.
- ⊖ *“Class not registered”*, this means no ibaAnalyzer is installed or only a very old version (earlier than 5.0.0). The task would also fail when executed.
- ⊖ *“ibaAnalyzer version could not be determined”*, this means you are using an ibaAnalyzer version that the Plugin does not recognize, hence it does not know if the installed ibaAnalyzer has the required functionality implemented to execute the requests from it. The task would also fail when executed.
- ⊖ *“You have version x.y.z of ibaAnalyzer installed. The minimum required version is 6.5.0, 6.7.0 or later is recommended.”* with x.y.z replaced by your actual ibaAnalyzer version. This message is reported when the ibaAnalyzer version is lower than 6.7.0. If the version is lower than 6.5.0 this means the task would fail when executed. If the version is higher or equal than 6.5.0 but lower than 6.7.0 it means the task could be successfully executed but with possible loss of precision (only single precision floating numbers are used).
- ⊖ *“Could not evaluate expression for operand X”* where X is an S7 operand. This means that the ibaAnalyzer expression is invalid or the signals used by the expression have no data or are empty. Depending on the *„Ignore expressions that can't be evaluated“* option this will cause the task to fail or not. This message will be repeated for each operand for which the corresponding ibaAnalyzer expression could not be evaluated.
- ⊖ *“No valid fields are specified to write to the S7”*. This means that none of the operands have an ibaAnalyzer expression that can be evaluated (or no operands are specified at all). The task would also fail when executed.



Tip

When you have specified both an analysis file and test data file and both files exist and are accessible, starting an ibaAnalyzer session with the button next to the analysis file textbox will also load the test data file along with the analysis.

6 Executing the S7 Writer Plugin

The task can fail with the errors already mentioned in subchapter 5.3.4. Additionally it can fail with the following errors:

- ⊖ *“Error 0xFFF50004 (AGL40_TIMEOUT) when calling function AGLPLCConnect”*
This happens when the task can't connect to the S7. Make sure that you have entered the correct IP address. You can also try pinging the S7 to see if it is reachable.
- ⊖ *“Error 0xFFF5001C (AGL40_PLC_NOT_FOUND) when calling function AGLPLCConnect”* This happens when the task can connect to the IP address but it

isn't an S7 CPU. Make sure the IP address is correct. Also check that the rack and slot numbers are correct.

- θ “Writing operand X returned error Error 0xFFFF5000A (AGL40_NO_DATA_ERROR) when calling function AGL_WriteMixEx” This happens when the operand isn't available in the S7. Check that both the DB number and address are correct.

7 Support and contact

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Note

If you require support, indicate the serial number (iba-S/N) of the product.

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