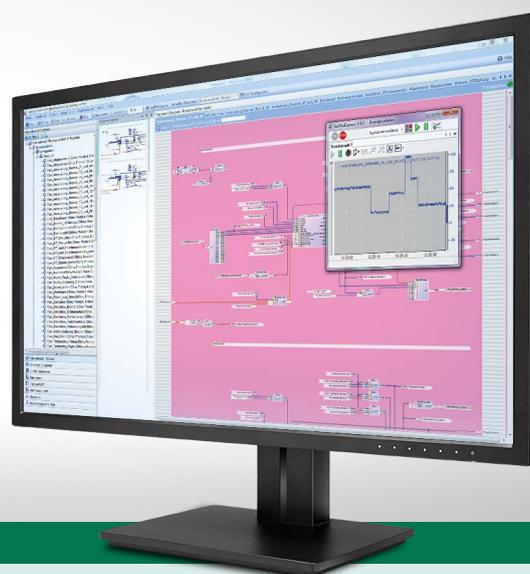




Measurement and Automation in one System

ibaLogic



ibaLogic
Signal Processing and Automation

Areas of Application

- › Signal manager in the measurement technology
- › Complex signal pre-processing (e. g. for vibration monitoring and measurement systems)
- › System coupling when modernizing automated systems
- › Full system automation
- › Process simulation
- › Energy management and facility engineering
- › Realization of process models for optimization

Acquiring and controlling process data simultaneously with only one system



Especially in measurement and control technology using fast and dynamic processes, ibaLogic is deployed as system for signal processing, controlling, simulating as well as communication gateway.

At a glance

- › PC-based system for signal processing, controlling and simulation
- › Graphical programming according to IEC 61131-3
- › Client/server principle, PAC architecture
- › Different runtime platforms
- › Easy program creation and intuitive operation
- › User-specific function blocks and data types
- › Embedding of existing C(++) algorithms
- › Embedded data recording
- › Integrated ibaPDA Express for measurement value indication
- › Event tasks
- › Tasks can be interrupted (according to their priority)

One system for many applications

ibaLogic is a system for signal processing and automation. The fifth generation of the ibaLogic system, which already functions reliably in many industrial applications, has been programmed in a new way and provided with an up-to-date interface.

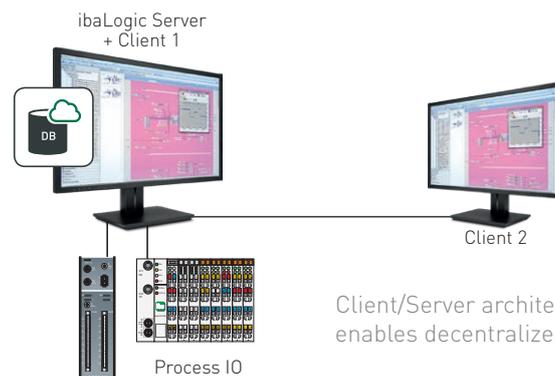
Based on the architecture of a Programmable Automation Controller (PAC) ibaLogic uses both powerful PCs and special runtime environments such as ibaPADU-S-IT-2x16 to solve the problems of a classical PLC. ibaLogic is mainly used in measurement and control technology for fast and dynamic processes. Short program cycle times of 1 ms and deterministic runtime enable this.

The program concept

To meet constantly changing demands to automation and measurement technology, we have developed a program concept which guarantees required flexibility for the future development. Among other things it is characterized by:

- › Client/server architecture
- › Based on a database (Microsoft SQL Server)
- › Program editor is connected to the runtime system via TCP/IP communication

These features allow that the application runs on an independent system (PC or ibaPADU-S-IT) and can be programmed and monitored by a development PC or notebook. The project data (e.g. programs and configurations) are stored centrally in a database.



Client/Server architecture enables decentralized operation.



Program designer and navigation area in ibaLogic

PAC architecture

ibaLogic has been programmed according to architecture of Programmable Automation Controller (PAC). A characteristic of the PAC architecture is the combination of PC-typical features and IT standards with the automation functions of the PLC technology. This allows to combine the functions of the process and system control with application of such standards as Windows XP/CE, HTML, SMTP, FTP and SQL as well as Ethernet, TCP/IP, USB, CAN-bus etc.

In case of ibaLogic the PAC architecture has been additionally extended with the measurement and data recording functions. Therefore, iba AG defines the system as „Programmable Measurement and Automation Controller“ (PMAC).

Easy program creation and intuitive operation

Simple graphical programming and user-friendly operation concept make it easy to start working with ibaLogic for beginners as well as experienced program-

mers. The control, configuration and operation of the program elements can be carried out intuitively and easily due to clear arrangement of the windows. All important functions are visible at a glance or can be found in the context menus. Settings and configurations can be selected by means of dialog boxes.

The user interface is divided into two main areas.

Program designer

The program designer is the main window of the programming interface. In this window the actual „programming work“ is performed, i.e. here you can place the function blocks and link them to each other. On the basis of the background colour you can directly determine if the program is functioning in the edit mode or if the process outputs are activated. If a calculation is running currently, the actual values of all block connectors are displayed alphanumerically. The false/true states for the binary signals are indicated using the colors blue/red of the connection lines.

Navigation area

In the navigation area you will find all elements and data required for the configuration and programming. Program elements can be either moved from the corresponding category to the program designer via drag & drop or configured using context menus.

These include:

- ▶ Project and program structure
- ▶ Input and output resources
- ▶ Function block library
- ▶ Data types

Furthermore, the navigation area offers further views with the used program elements as regards their entities, hierarchy and calculation sequence.

These views are helpful when debugging a program. For example it is possible to find and display blocks in the hierarchy view by means of a simple double-click. Thus, development as well as debugging can be carried out very efficiently.

Extendable function block library

The default library contains all standard function blocks (FBs) specified in the IEC standard as well as helpful supplements (mean value images, PID-controller, FFT-blocks etc.). The user can create and add his own function blocks and/or macros to the library by clicking once in the FB features-menu. Additionally, function blocks and programs can be exported and imported into other ibaLogic applications. For the programming the blocks can be moved from the navigation area and placed in the program designer simply by dragging & dropping.

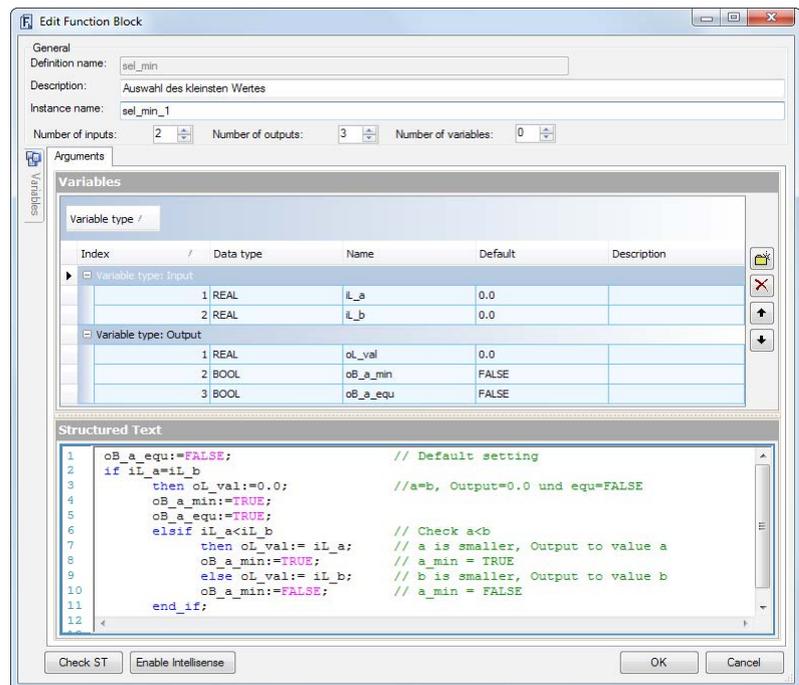
User-defined function blocks

Creation of user-defined function blocks with textual input method on the basis of IEEE structured text (ST) is an integral part of ibaLogic. For this purpose ibaLogic provides a convenient function block editor. In the function block editor you can define inputs, outputs and internal variables as well as the processing logic of the function block.

After generation of the function block it appears in the block library.

Integration of the existing C(++) algorithms

The use of available programs written in high-level programming languages is a valuable feature of ibaLogic. Technological know-how of ibaLogic can be protected from unauthorized access and consistency of approved technical solutions can be guaranteed even in case of modernization. For this purpose ibaLogic provides programming frameworks suitable for integration of existing code. The blocks generated in this way have the same features as the function blocks



Convenient editing of function blocks via function block editor

and are displayed on the graphical interface with all connectors and current signal values.

The ibaLogic-V5-DLL-SDK* allows users to create their own functions and execute user-specific processing and calculations in the ibaLogic runtime system. ibaLogic executes the functions in real time.

The ibaLogic V5-DLL-Run-time* license is required to enable user-specific DLLs.

Hierarchical design and macro technology

The clear arrangement of the entire program can be improved even more by combining the program parts created with discrete function blocks to superordinate function blocks, so-called macroblocks. Furthermore, it is possible to use these macroblocks in other ibaLogic projects. Macroblocks can be programmed from scratch or can be created using multiple selection from existing func-

tion blocks. The number of the hierarchies is not limited.

User-defined data types

In addition to the default data types according to the IEC standard there are also different user-defined data types available for the user. These data types can be defined freely by means of simple dialogs or can be derived from default or other data types. Enumerations (Enum), structures (Struct) and arrays (Array) belong to the typical user-defined data types. The data types are displayed in the navigation area and can be used directly in the program.

Program modifications during operation

Modifications of the program can be performed during operation because no separate compilation runs and loading procedures are required.

All changes can be accepted immediately automatically. The programs created and

started with an ibaLogic client are run in a compiled form as so-called runtime in the target system (e.g. ibaLogic computer). These runtimes can always be updated automatically and shock-free (recompiled) if any changes have been made in the ibaLogic system.

Different runtime environments (platforms)

The runtime can function independently from the ibaLogic programming system (server) as long as there is a suitable environment. ibaLogic server and client are required only during program creation or modification.

There are two platforms for ibaLogic at the moment:

- ▶ Windows-PC (no real-time extension required)
- ▶ ibaPADU-S-IT2x16

Process interfaces

ibaLogic offers the entire range of iba connectivity to process the input and output signals.

The ibaNet fibre optic can be used to connect all devices from the ibaPADU family, bus couplers and system interface connections. Additionally cou-

plings via field bus, Ethernet and special protocols are available.

Due to these features ibaLogic is especially suitable for embedding into existing heterogeneous automation structures for modernization.

Performance and system dynamics

The shortest cycle time of ibaLogic is 1 ms. When using the corresponding iba peripheral modules fast data recording with up to 40 kHz is possible, thus, enabling for example trouble-free vibration analysis. The number of possible tasks is not limited. Each task can be assigned an individual cycle time and priority.

Diagnosis of task calculations

With the additional tool ibaLogic Timing Diagnostics, the time behavior of the system can be recorded as a measurement file (*.dat) with μs accuracy by displaying the current task states. The measurement file can be analyzed in ibaAnalyzer.

Measurement value indication and data recording in ibaLogic

The measurement data recording is an integral part of ibaLogic. Using a special function block measurement data (*.dat) can be generated by means of an ibaPDA system and finally evaluated using ibaAnalyzer.

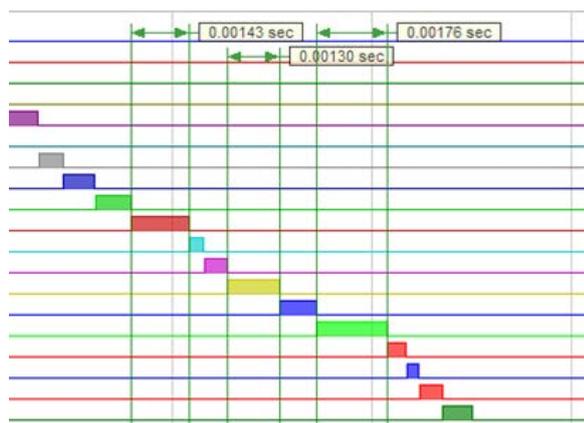
For testing and commissioning there is an integrated ibaPDA-Express available, which can be used to display the actual values from the program in a live mode.

ibaLogic as simulation system

ibaLogic is also suitable for simulation of processes. Due to OPC connectivity it is possible to simulate process cycles using ibaLogic and demonstrate the simulation results (e.g. movements of machine elements) using 3D-visualization ibaAnimation-3D. Of course other visualization systems can also be used for this purpose.

Database connection

The ODBC_ACCESS block can be used to exchange data with databases.



Example for timing diagnosis display in ibaAnalyzer

Technical data

	Runtime system with development environment	Only development environment (Runtime on a separate platform)
System requirements	Double Pentium 2 GHz Dual-Core ≥2 GByte RAM 500 MByte HDD storage unit Windows 2008 Server (32 bit), Windows 7 (32 bit/64 bit), Windows 2008 Server R2 (64 bit), Windows 8 (32 bit/64 bit), Windows 2012 Server (64 bit), Windows 8.1 (32 bit/64 bit), 2012 Server R2 (64 bit) and Windows 10 (32 bit/64 bit)	Pentium 2 GHz Single-Core 500 MByte HDD storage unit Microsoft Windows 7
General data	Programmable Measurement and Automation Controller (PMAC) Graphical programming according to IEC 1131-3 (IEEE 61131-3) Meta language Structured Text (ST) Unlimited number of cyclic or event-related tasks with individual cycles and priorities Tasks can be interrupted Unlimited number of hierarchies in a project Signal processing in cycles of up to 1 ms Export of the application program into a readable ASCII file	
Operating modes	Control mode: The latest measurement/input values are always used Buffered mode: For fast measurement/input values (up to 40 kHz/channel)	
Default data types	BOOL, BITSTRING, INT, DINT, UDINT, REAL, LREAL, ARRAY (4-dim), STRING, TIME	
User data types	Arrays, enums, structs and further derived data types	
Function blocks, Macros and dynamic libraries (DLL)	IEEE function blocks (entire set) Generation of user-specific function blocks with Structured Text (ST) Generation and expansion of macroblocks Application-specific libraries (on request at iba AG)	
I/O system	Entire range of iba I/Os (ibaNet components for discrete signals, e.g. ibaPADU, ibaNet750) Fieldbus connections (e.g. Profibus Master/Slave) Ethernet connections (e.g. ibaPDA, EtherNet/IP) OPC (e.g. for the HMI communication) Special protocols (e.g. Reflective Memory) Bidirectional connections to the most PLC and control systems (on request at iba AG)	
Diagnosis	Actual value indication of all signals and variables at the block connectors For binary signals: color marking of the connection lines depending on the status ibaPDA-Express integrated, for measurement value indication of any signals and variables Add-on ibaLogic Timing Diagnosis for analysis of task behavior with ibaAnalyzer	

License-free entry level version: ibaLogic Lite

- › Using the license-free entry level version you are able to realize simple automation solutions.
- › Download at www.iba.ag.com

ibaLogic (in comparison)	ibaLogic-V5-Lite	ibaLogic-V5	Embedded ibaPADU-S-IT ¹⁾
Unlimited number of IOs	✓	✓	✓
Cycle time	≥ 50 ms	≥ 1 ms	≥ 1 ms
ibaPDA Interface ²⁾	✓	✓	✓
Supported hardware ibaNet AVR-NET-IO	✓ ✓	✓ ✓	✓ ✓
Playback of measurement files	✓	✓	✓
TCP/IP	4 connections	✓	✓
Data storage in DatFileFormat DFW (signals)	-	64 ³⁾ /256 ³⁾ /1024 ³⁾	256
OPC DA Server or OPC UA Server	-	unlimited	128
Other interfaces (DLL/RFM/SST/Profibus/ ...)	-	Interfaces on request ³⁾	
Order no.	32.500002	32.500001	included in hardware

1) included in hardware price 2) a paid interface licence is required on the ibaPDA PC 3) add-on subject to costs

Order information ibaLogic add-ons

Order no.	Name	Description
32.500005	ibaLogic-V5 Timing Diagnostics	Extended Diagnostics
32.500009	ibaLogic-V5 upgrade with 64-DatFileWrite	Recording with DatFileWrite function block, license with 64 signals per runtime system
32.500010	ibaLogic-V5 upgrade 64 to 256-DatFileWrite	Recording with DatFileWrite function block, license extension to 256 signals per runtime system
32.500011	ibaLogic-V5 upgrade 256 to 1024-DatFile-Write	Recording with DatFileWrite function block, license extension to 1024 signals per runtime system
32.500020	ibaLogic-V5-Interface-RFM-Access	Interface for data exchange via Reflective Memory
32.500021	ibaLogic-V5-Interface-Profibus-DP-Master	Interface for Profibus DP master connection
32.500030	ibaLogic-V5-DB ACCESS	Function Block for DB Access
32.500035	ibaLogic-V5-DLL-SDK	OEM agreement required, incl. 3 days training at iba or via Teamviewer
32.500036	ibaLogic-V5-DLL-Runtime	DLL runtime license



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