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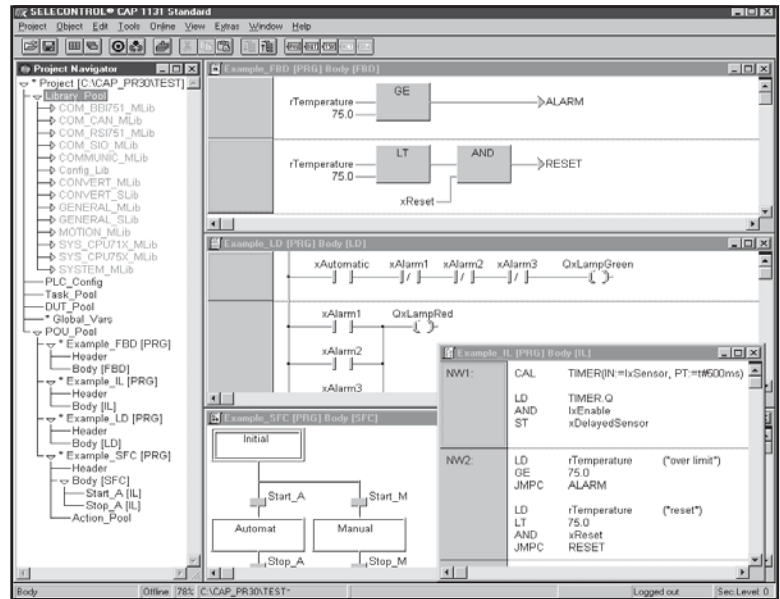
Programming and projecting

The powerful programming and projecting tool according to IEC 61131-3

The standard IEC 1131

Based on the needs and experiences of the automation technique the extensive standard IEC 1131 had been established. The advantages from PLC and high level language technique had been combined in this standard. The particular significations of an IEC conform tool are the following:

- Extensively defined graphic and textual programming languages.
- Structuring by means of the modules program, function and function block. The modules dispose of a data part (header) and a code part (body).
- Exact determined standard data types such as boolean (bit), word, integer, real, time, text string.
- Higher level data types such as fields and structures.
- Data enclosing with protected real local data.
- Standard library functions with definite notation.



Programming languages

All programming languages determined by the standard are available in the CAP 1131.

The graphic languages

- Sequential function chart (SFC)
- Function block language (FBD)
- Ladder diagram (LD)

The textual languages

- Instruction list (IL)
- Structurized text (ST)
- Additionally an editor for the programming is available in the high level language ANSI-C.

Libraries

IEC 61131-3 provides three different library groups:

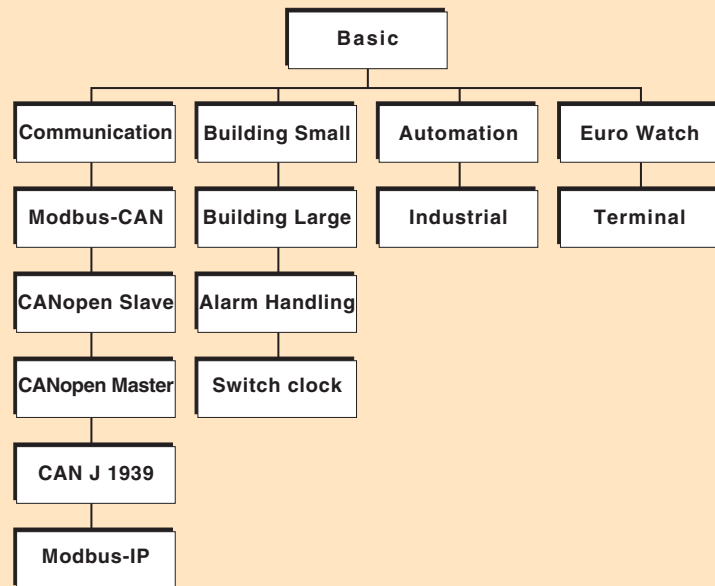
The standard libraries

Functions and function blocks, which are specified by the standard. Functions for the conversion and mathematics are e.g. part of it.

The manufacturer library

Manufacturer specific functions and function blocks contain specific hardware functionalities furthermore to address the SELECONTROL® MAS hardware.

CAP 1131 Libraries



The user libraries

The user libraries can be established by the user.

SIG Positec Selectron offers user libraries with predefined functionalities for motion control, communication etc. which can be extended by the user.

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Projecting

The project navigator of CAP 1131 supports you in an efficient manner in view of the structurizing of your project.

By the simple zoom mechanism (already known from Windows) only the components you really need are visible.

In this presentation all libraries, the tasks, the global variable list and the POU (program units) are clearly represented. Also in the project navigator the hardware configurator is integrated which allows the comfortable projecting of the SELECONTROL® MAS hardware. The modules can be parametrized directly in the configurator.

Commissioning

One of the most important phases of the program development is the commissioning. Mostly under a big time pressure the installation has to be brought to operation. Therefore the available online functionalities of a tool are absolutely decisive for its quality.

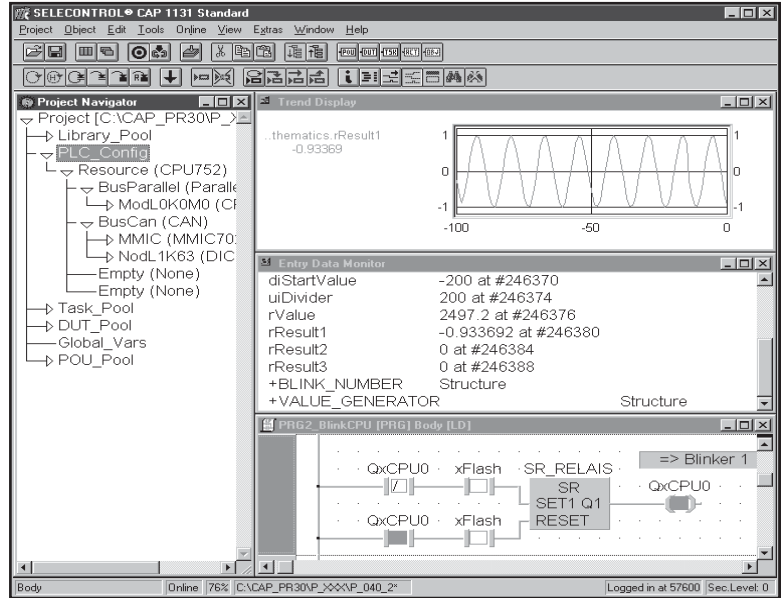
CAP 1131 allows the commissioning in two different operation modes:

- Standard mode: The modified program is translated (incrementally) and completely downloaded at the stopped installation of the controller. The variable values are again initialized when starting new.
- Online change mode: The modified program parts can be downloaded on the operating controller. The actual variable values remain existing at this process.

As important as the above for an efficient commissioning are the possibilities for display, supervision and online modification of variable values and inputs/outputs. CAP 1131 knows for this procedure ...

... the Monitoring

Directly in the program code the actual variable values are displayed. Boolean values



are filed in colour where possible.

... the entry data monitor

The actual variable values are displayed in tabular form. Fields and structures can be put up. The EDM allows the online modification of variables (entry).

... the trend display

Registering of a variable in temporal sequence.

With the aid of extended functionalities such as single cycle, Forcing, the user will be able to discover quickly errors in the program.

Programming and projecting

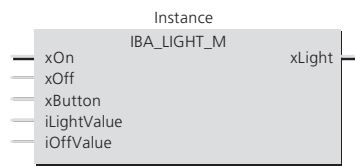
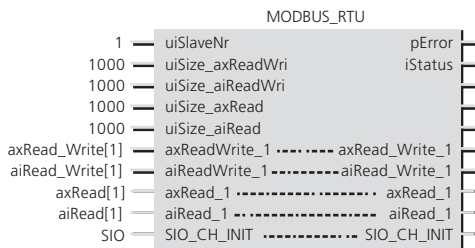
Library concept - library packages

Characteristics and benefits

The programming tool CAP 1131 can be extended with complex functionality. For the user are available: Extensive library packages for the realisation of complete systems for communication, drive technique, production automation and building automation applications. This shortens program development time and minimises maintenance and support of the software. The user only parameters his application, no extensive and costly programming is necessary. Various user functionality can be realised in a fast and secure way. For special application the user establishes his own library, specially adapted at the particular requirements.

Library concept

The libraries are distinguished in standard, manufacturer and user libraries. The standard and manufacturer libraries are included in the software package IEC 1131, user libraries are available as additional packages.



User library packages

LIB01 Basic

Description

Basic package with basic function blocks for the control of the programme, real time clock, conversion, CAN communication layer 2 and CANopen, CPU-CPU communication, data input/output (can be down loaded free of charge and licence free from the Internet. www.selectron.ch)

Article number 44210003

All the following library packages require the functions of LIB01 Basic

LIB11 Communication

Data exchange via serial interface and modem, communication with Modbus RTU, Siemens 3964R, Telepage, Natel SMS, Pager, Natel C, communication with installation bus Twinline, STX bus, communication via bitbus.

Article number 44210004

LIB12 Modbus-CAN

Communication using ModBus-RTU protocol, gateway for data exchange between superior operating system and CAN network

Article number 44210012

LIB13 CANopen Slave

The CANopen slave function block to CiA DS 301/V4.01 makes it possible to use a CPU as a CANopen slave.

Article number 44210018

LIB14 CANopen Master

CANopen master to CiA DS 301/V4.01. The decentralized modules can be integrated in the hardware configurator.

Article number 44210020

LIB15 CAN J1939

Receiving and sending standardized J1939 messages via the CAN network. The protocol is used for controlling motors and gear units.

Article number 44210021

LIB16 Modbus-IP

Communication with the I&C system or non-Selectron CPUs using the Modbus-IP protocol via Ethernet.

Article number 44210022

User library packages (continuation)	Description
LIB31 Building small	Time control computer, components for measurement, control and regulation, light and window blind management, door control, interference monitoring, recording of weather data. Article number 44210006
LIB32 Building Large	Functionality of the solution packages „Building Automation small“, communication, Modbus-CAN gateway, components for the construction of an alarm evaluation and notification system. Article number 44210007
LIB33 Alarm Handling	Function blocks for the construction of an alarm evaluation and message system and the protocolling of events. Article number 44210008
LIB34 Switch Clock	Time control computer for the control of time dependent of switch channels with daily, weekly and yearly programmes. Article number 44210009
LIB41 Automation	Contains User Library Motion (Non-Selectron drives) and function blocks for measurement control and regulation technique. Temperature measurement with Pt100, Ni100 and Ni1000 elements. Permanent and 3 point PID regulation. Article number 44210010
LIB42 Industrial	Contains User Library Automation and User Library Communication, function blocks for the construction of an alarm evaluation and message system as well as for the synchronization of the internal real time clock with the radio clock LX1-DCF77. Article number 44210011
LIB51 Euro Watch	Function blocks for the synchronization of the internal real time clock with the radio clock LX1-DCF77. Article number 44210016
LIB52 Terminal	Control of the Süttron terminal via CAN bus. Article number 44210017

Visit www.selectron.ch for detailed information about the user libraries

Programming and projecting

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General characteristics

Release	CAP 1131 R.4.x
Operation	According to Windows standard (task list in english)
Assistance	Online assistance in E/G/F
Manual	In Adobe Acrobat PDF format on CD-ROM in E/G/F or on our Homepage
Protection	8 password steps per object
Import/export	Windows copy / paste functions and ASCII import/export
Certification	Base level IL PLCopen

Projecting

Configuration	All modules SELECONTROL® MAS
Project topology	1 ressource (CPU), central modules and decentralized nodes
Task administration	1 task (cyclic or time controlled)

Programming

Languages	IL / FBD / LD / SFC / ST / high level language C
Addressing	Symbolic or absolute
Simple data types	Bool, byte, word, Dword, integer (signed and unsigned from 8 up to 32 bit), real, time, date and time, time of day, string (text)
Structurized data types	Array, structure
Structurizing	Program organization units (POUs) according to IEC 61131-3: PRG, FB, FUN. Data capsuling by local variables, multiple instance of function blocks.
Libraries	Standard IEC 61131-3 library, manufacturer libraries

Commissioning

Program handling	Compiling, program download, online modification at operating control (only CPU 7xx)
Test	Monitoring, overwriting of variable values, trend display

System requirements

Hardware	Pentium
Operating system	Windows 98, Windows NT
RAM	>128MB
Harddisk	>120MB
Interface	RS 232
Display	VGA

Ordering data

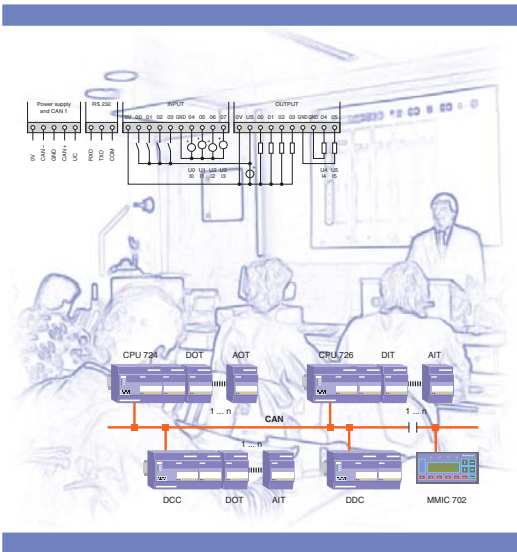
CAP 1131 versions:	
STANDARD	CD-ROM Article number 44210156
PROFESSIONAL	CD-ROM Article number. 44210157
DEMO/System manuals	CD-ROM Article number 44210171
Screen	CD-ROM Article number 44210194
CAP 1131 upgrade from STANDARD to PROFESSIONAL	CD-ROM Article number 44210187
OPC 1131	CD-ROM Article number 44210814

The CD-ROM versions contain all manuals of the SELECONTROL® MAS systems

Training and support

Practically oriented seminars

Selectron regularly holds practically oriented seminars which are structured to take account of varying requirements.



Seminar	Description
Base training (MAS seminar parts 1+2)	Introduction into the programming tool CAP1131 duration 2 days
Extensive training (MAS seminar part 3)	Control of terminals with interface RS 232 and CAN bus, real time clock, menu control duration 1 day
Motion control technique (MAS seminar part 4)	Simple and combined movements, linear and polygon interpolation duration 1 day
Communication (MAS seminar part 5)	Communication via CAN, RS 23, Ethernet and OPC server with function blocs from user libraries duration 2 days
Application Seminar	Common working of a possible solution for a specific allocation of tasks duration according to agreement
Project assistance	Training according to the realized project Training and introduction of the operating and servicing staff

Please request our detailed seminar program.