

IPLC5xx

Process station MiniPLC Shark



Summary

The IPLC range is a family of digital process stations – communicative DDC controllers with Power PC processor and OS Linux, kernel version 2.6. All types contain one RS485 interface for connecting of I/O modules and one Ethernet port for communication with a management station for remote management, extended types provide two more RS232 ports and one RS485 port.

Application

- Free programmable control units for HVAC systems and other applications with local HMI
- Optional customized firmware – protocol converters with data presentation
- Data acquisition, processing, and presentation systems with advanced networking features
- Energy management systems, photovoltaic plants

Function

The controller contains an embedded operating system which boots up the runtime with the application. On the board there is a real time clock with battery backup, alarm buzzer, flash memory containing OS, runtime, application, and other data (time programs, setpoints etc.), NVRAM, and a watchdog. The RS485 communication is indicated by two LEDs at the bus end switch. SW1 set to ON at boot stops runtime and enables service access to the controller.

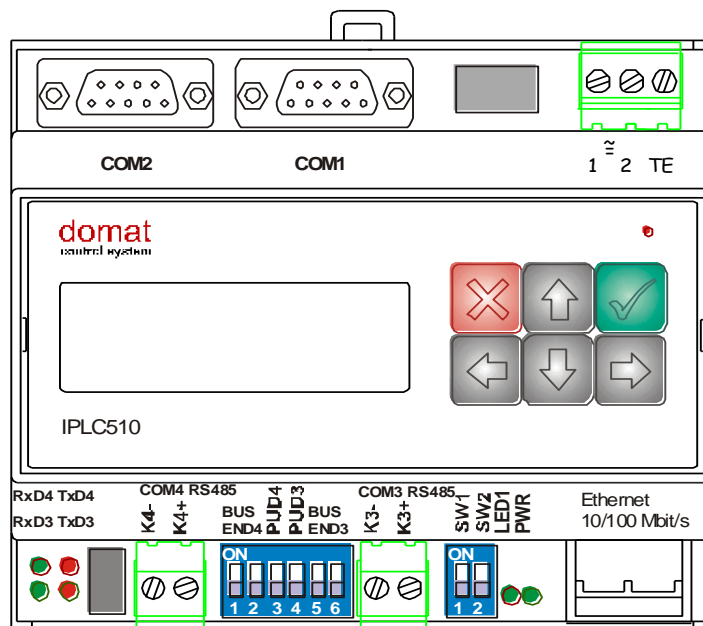
The application is downloaded over a SCP connection to the file system of the controller. A recommended client is WinSCP.

IPLC500 and IPLC510 provide a HMI: backlit 16 x 3 characters display and 6 pushbuttons. The user menu structure is configured in the LCD Menu Editor and contains actual values, setpoints, alarms, time schedules etc. in a tree structure. The branches are either freely accessible or protected by a PIN.

The module is 105 mm wide and mounts on a standard DIN rail.

Application examples: see *domat – Design and application guide*.

Technical data	Power	10 V ÷ 35 V DC, 14 V ÷ 24 V AC (terminals 1,2)
	Consumption	3.5 VA
	Ambient temperature	0 ÷ 60°C, used components are working in the range of –20...80 °C
	Processor	MPC5200, 400 MHz, 760 MIPS
	Memory	64MB RAM, 32 MB Flash, 128 kB NVRAM FRAM
	Operating system	ELinOS Industrial Grade Linux kernel V 2.6
	Communication	Ethernet 10/100BaseT, RJ45 COM1, COM2 (CANNON 9 M) RS232, 300 ... 115 200 bit/s COM3, COM4 RS485 (K+, K-), 300 ... 115 200 bit/s
	LCD disple	3 rows x 16 characters IPLC500 yellow backlight IPLC510 blue backlight adjustable backlight intensity
	Buttons	6 pushbuttons with backlight
	RS485	
	Max. bus length	1200m
	Integrated bus-end resistors	double DIL switch
	Dimensions	see below
	Dimensions hole in panel door	45 x 105 mm; deviation +1mm
	Accessories	optional – FRAME – mounting MiniPLC into panel door
Terminals	COM1	port COM1 – serial line RS232
	COM2	port COM2 - serial line RS232
	PWR	power, terminals 1, 2, TE
	PWR LED	green LED – power
	LED1	green LED – system cycle
	SW1	if ON at start, SoftPLC runtime is not running, only OS is booting
	SW2	if ON at start, IP settings are brought to defaults
	Ethernet	network interface



When powered by DC voltage the polarity is not relevant. All communication ports are optically separated (up to 3000 V) both from power part and from processor part.

Types and their properties

IPLC500	LCD display 3 rows x 16 characters, yellow backlight, buttons with backlight, Ethernet, COM4 I/O bus RS485
IPLC510	LCD display 3 rows x 16 characters, blue backlight, buttons with backlight, Ethernet, COM1 RS232, COM2 RS232, COM3 I/O bus RS485, COM4 I/O bus RS485
IPLC500B	no HMI, Ethernet, COM4 I/O bus RS485
IPLC510B	no HMI, Ethernet, COM1 RS232, COM2 RS232, COM3 I/O bus RS485, COM4 I/O bus RS485

The IPLC510 is suitable for more complex applications or where integration of 3rd party systems or serial communication with other devices than domat I/O modules is required.

The IPLC500 / IPLC510 may host up to about 400 physical I/O data points, depending on the complexity of the application software.

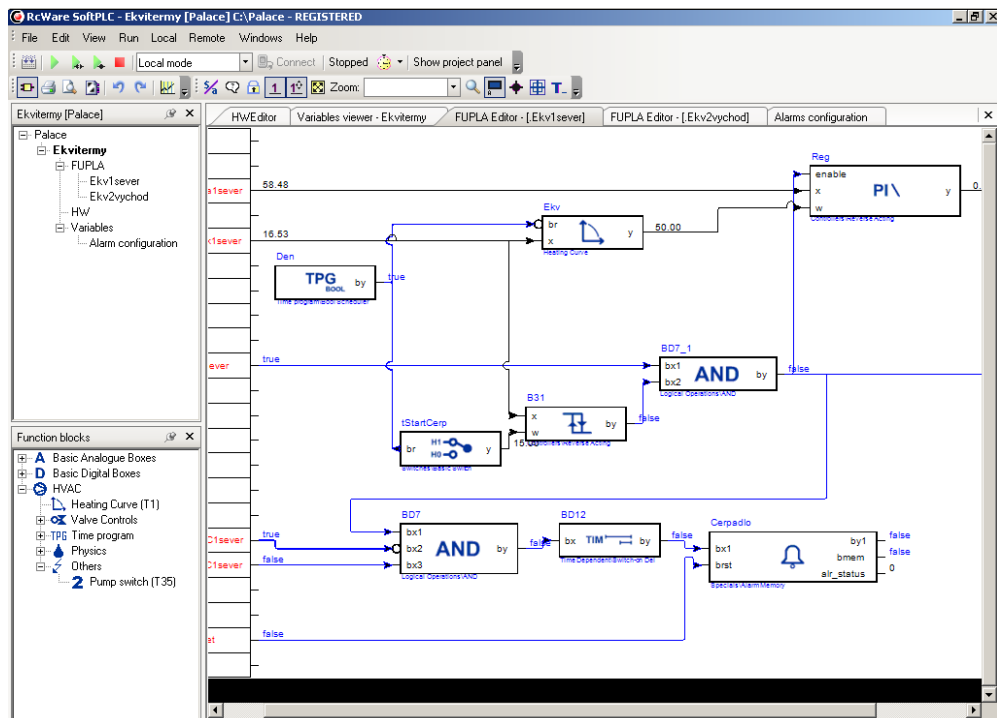
Programming

SoftPLC IDE

The main programming tool is the **RcWare SoftPLC** package which contains I/O editor, graphical editor of the function plan, compiler (**RcWare SoftPLC IDE**), and LCD menu editor as well as touchscreen editor (**RcWare SoftPLC HMI Editor**).

The application program consists of function blocks which are stored in libraries. Those contain analogue and digital functions, mathematical blocks including goniometric functions, time schedulers, alarm blocks, and HVAC specific blocks (heat recovery, dewpoint calculation, enthalpy, pump switch etc.)

The application (project) is uploaded into the process stations using RcWare SoftPLC IDE. The installation package RcWare SoftPLC, manual and videotutorials are available at www.domat.cz.



RcWare SoftPLC IDE

Limitations

Number of communication channels (on the serial lines and Ethernet) to I/O modules and subsystems: unlimited

Number of connections from clients: unlimited. This includes connections from RcWare Vision, IDE, Touchscreen application, LCD menu, browser to internal web server, connection from other PLCs over SoftPLC Link etc.

Communication drivers: find the updated list at <https://www.domat-int.com/en/technical-documentation> - List of supported protocols.

Program upload is only possible in a local network (LAN). If a remote program upload over the Internet is required, security rules must be observed to prevent the building control system from network attacks. A VPN or similar technology is recommended to access the PLC from the Internet.

Communication Default network settings are:

IP address	192.168.1.10
subnet mask	255.255.255.0
default gateway	192.168.1.1

SCP user / password: root / "code", the default password ("code") is written on the label on the side of the device.

To S / N 136558:

SCP user / password: root / sharkXXXX, where XXXX are the last 4 digits of the serial number (see device label).

Remember to note the new IP address after readdressing!

After these values have been changed (see RcWare MiniPLC IDE handbook), it is possible to bring the process station into default settings by DIP switch SW2: set SW2 to ON and restart the station. It will respond at the default address and it is possible to change the old address in the network config file.

The controllers can share variables over the Ethernet network (outside temperature, heat demands etc.) together with IPLC2../3.., IPCT, and other platforms.

In case of integration into a SCADA system the controller links over TCP/IP (default TCP port number is 12345) to an OPC server (**RcWare SoftPLC OPC server**). The server can acquire data from more than one controller. This is how the IPLC can be easily integrated into majority of SCADA systems.

The runtime provides drivers for communication with numerous subsystems, e.g. Modbus TCP / RTU, BACnet, M-Bus, meter readout according to IEC 61107 / EN 62056, EN 60870-5-104, Advantech, Refusol, PowerOne, Saia, Sauter 2400, Landis & Gyr, and much more. See the latest list of drivers in the SoftPLC IDE channel definition dialogue. New drivers may be developed on request, contact the Domat Control System support department for details.

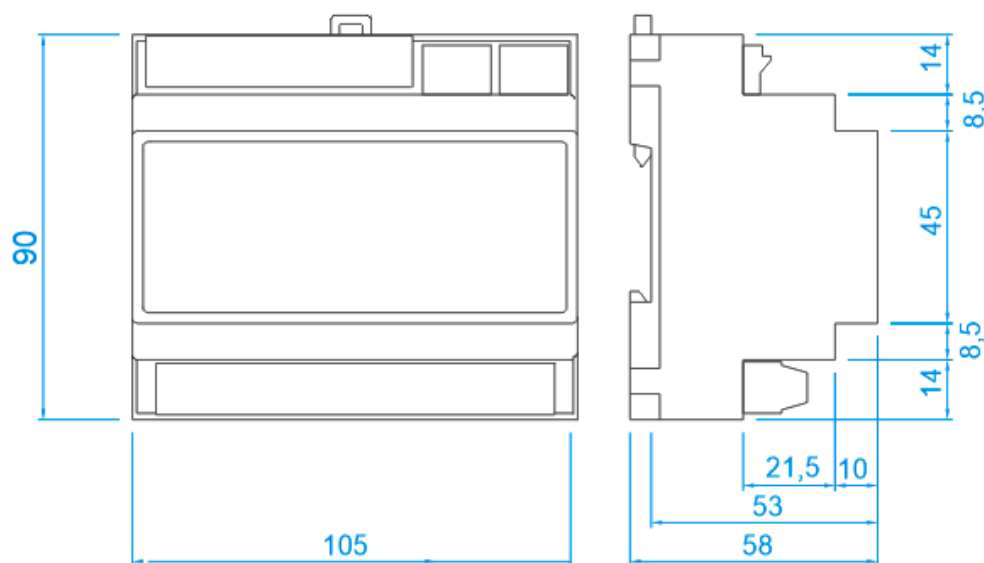
Others

The Linux OS allows to run any user program on the IPLC5xx platform. Details concerning I/O ports addressing etc. are provided by Domat Control System technical support.

The IP address, other network properties, and SoftPLC project location and runtime parameters are set up in configuration files. The steps are described in the RcWare SoftPLC MiniPLC Configuration manual in the *IPLC500* section.

Note that in the current version, the integrated web server functionality is NOT implemented. However, for web access, it is possible to use the SoftPLC WebPanel service, which runs on another computer.

Dimensions



All dimensions are in mm.

RoHS notice

The device contains a non-rechargeable battery which backups the real-time clock and part of the memory. After the device is not operable, please return it to the manufacturer or dispose of it in compliance with local regulations.

Safety note

The device is designed for monitoring and control of heating, ventilation, and air conditioning systems. It must not be used for protection of persons against health risks or death, as a safety element, or in applications where its failure could lead to physical or property damage or environmental damage. All risks related to device operation must be considered together with design, installation, and operation of the entire control system which the device is part of.

**Changes in
versions**

04/2015 — SW1 description specification, no change in functionality

02/2016 – Limitations added.

02/2018 — Added Safety note, added note about password change, change image.

03/2022 – Stylistic adjustments, change of logo.