



# IPERTU

Industrial Process Control Platform



IPERTU PLC

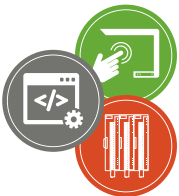



IPERTU Platform



Proop Professional Operator Panel



Ipertuide | Integrated Development Environment

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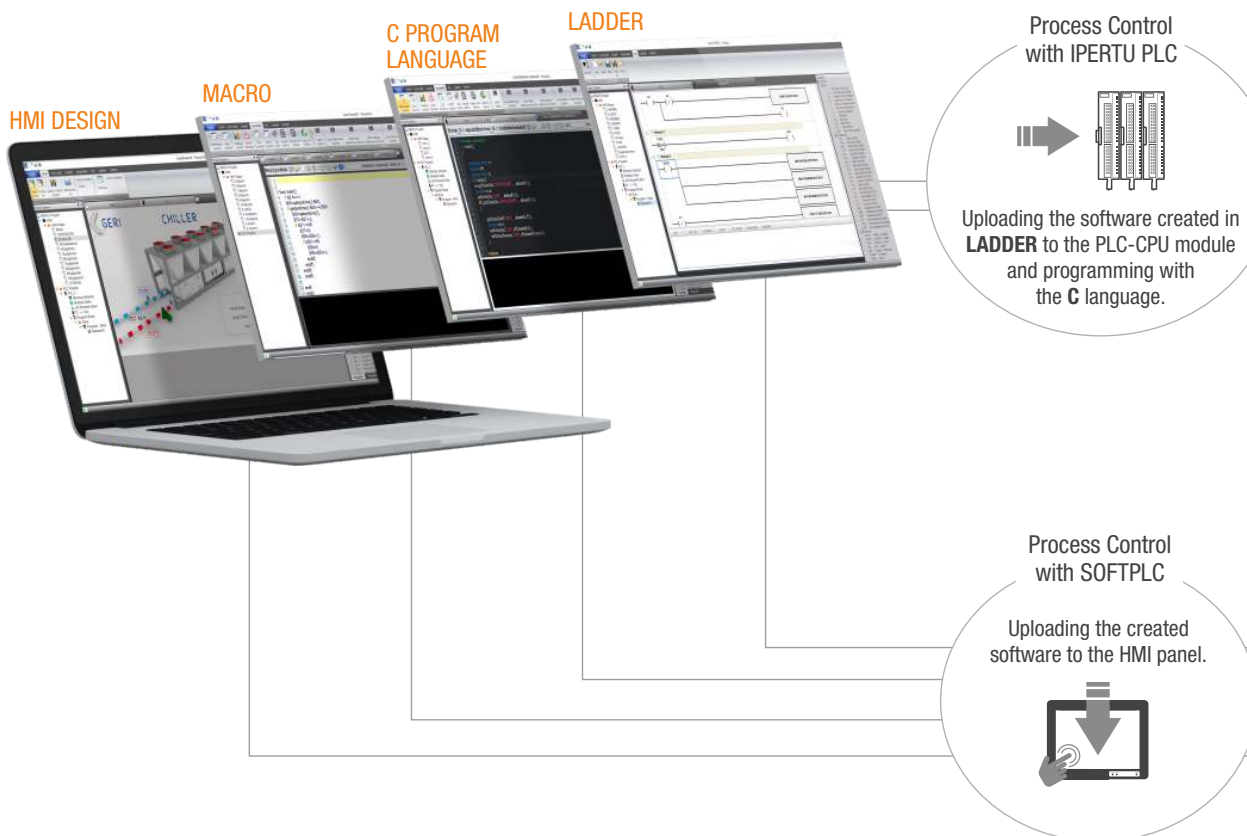
## What is the IPERTU ?

“EMKO Industrial Objects Platform” IPERTU was developed as a solution platform for industrial process control and monitoring. IPERTU Process control solution platform which consists of ;

- "Ipertu.ide" Integrated software development environment where Ladder, Macro, C language and HMI design programs are integrated,
- “IPERTU PLC” with PLC-CPU module and Analog/Digital Input I/O expansion modules,
- “Proop Professional HMI Panels” with Internal Analog/Digital Input-Output options.

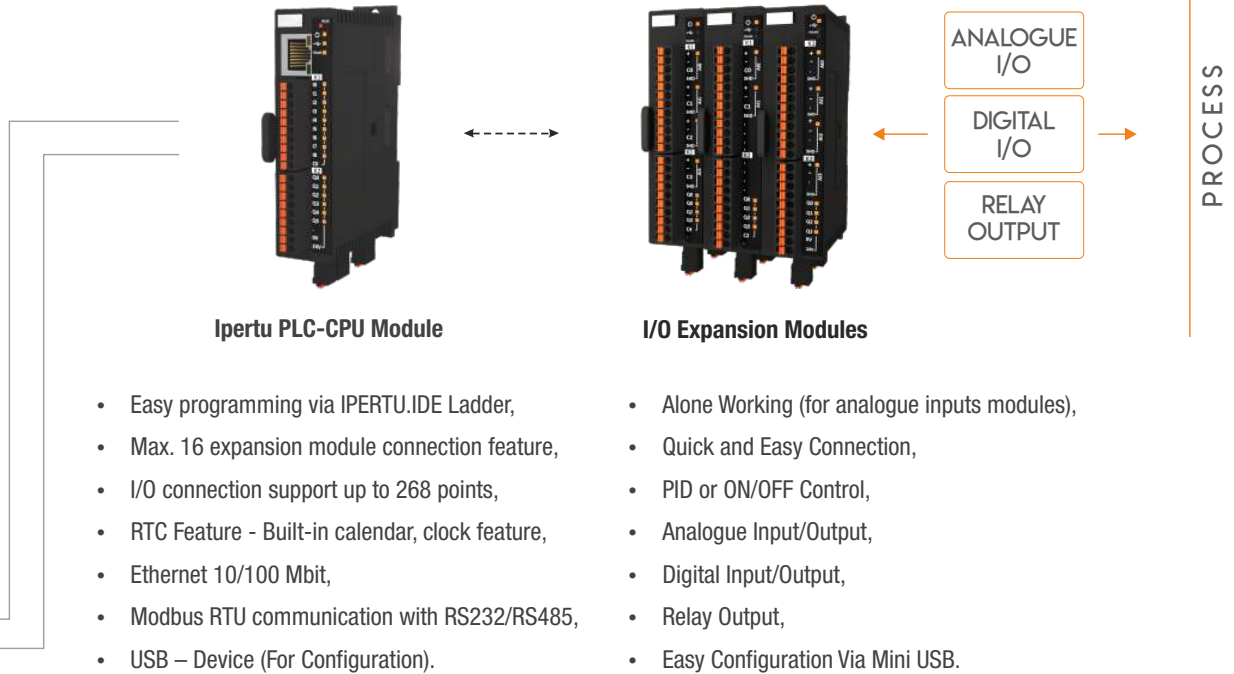
All components of the IPERTU platform can work alone or integrated, depending on the process. IPERTU platform, which performs data collection, remote access, control and monitoring processes under the leadership of Industry 4.0, offers fast, effective and flexible solutions that make your work easier in process control with its constantly evolving structure.

# Ipertu

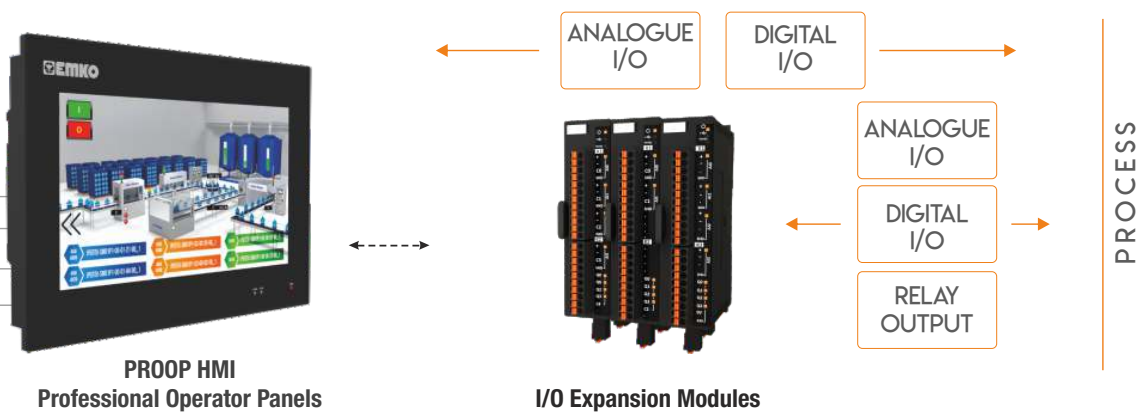


- **High visual** interface design with HMI Design,
- EASY application creation with **IPERTU Ladder**, performing many programming operations with blocks in ladder logic,
- **IPERTU Ladder, IPERTU Macro, C programming language, integrated work.**
- **SOFTPLC** running on HMI panel.

## Process Control with Ipertu PLC



## Process Control with SOFTPLC



### SOFTPLC

It is a software created by the user on the **Ipertu.ide** platform and running on the **Proop HMI**, converting the HMI panel into a PLC-CPU module. In this way, process control can be done with I/O expansion modules via Proop HMI without the need for a PLC-CPU module.

- Alone Working (for analogue inputs modules),
- Quick and Easy Connection,
- PID or ON/OFF Control,
- Analogue Input/Output,
- Digital Input/Output,
- Relay Output,
- Easy Configuration Via Mini USB.

## Ipertu PLC programming, Ipertu HMI screen design and SOFTPLC creation via Ipertu.ide

Programming with integrated **Ladder (IEC61131-3)**, **Macro** and **C code** with **FAST** and **USER-FRIENDLY INTERFACE**.

Saving **TIME** while designing a high visual HMI screen with the Design feature with an easy menu structure.

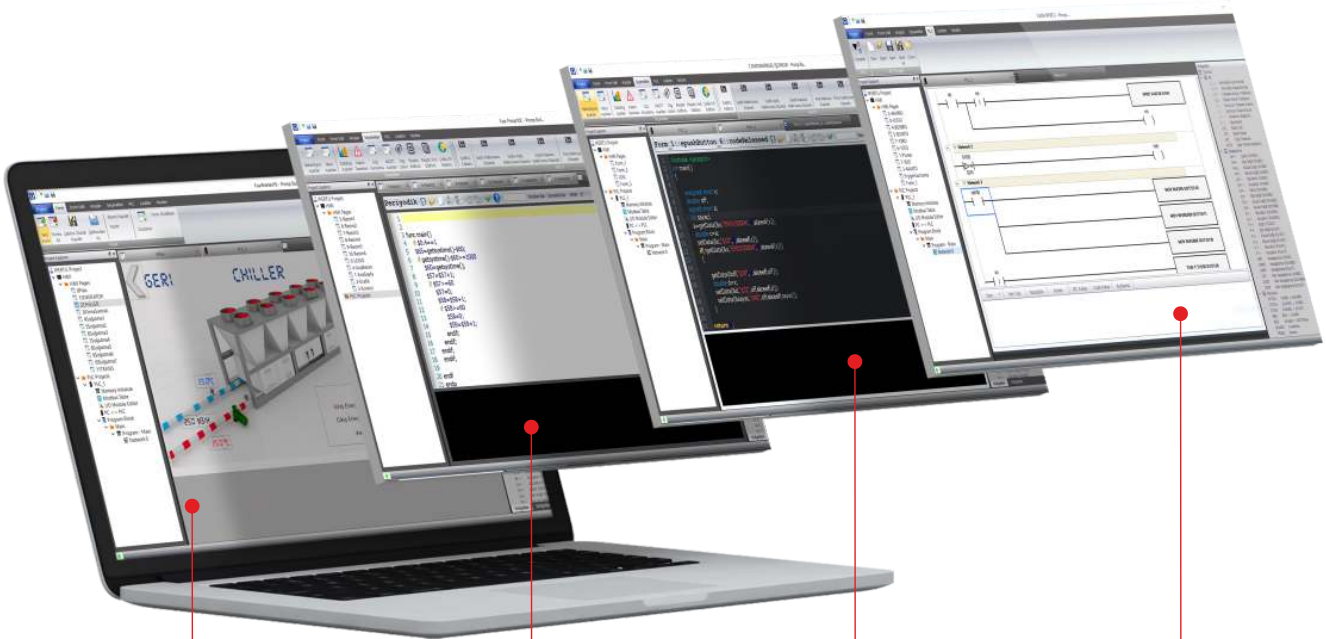
# Ipertu **ide** | Integrated Development Environment

Design

Macro

C Code

Ladder



### Design



Easy to use interface,  
Quick accessible menus,  
Wide font and image format support,  
Rapid development projects.

### Macro



Easier use of Proop HMI special functions thanks to ready-made Macro functions.

### C Code



The power of the C programming language and the use of library functions for program development.

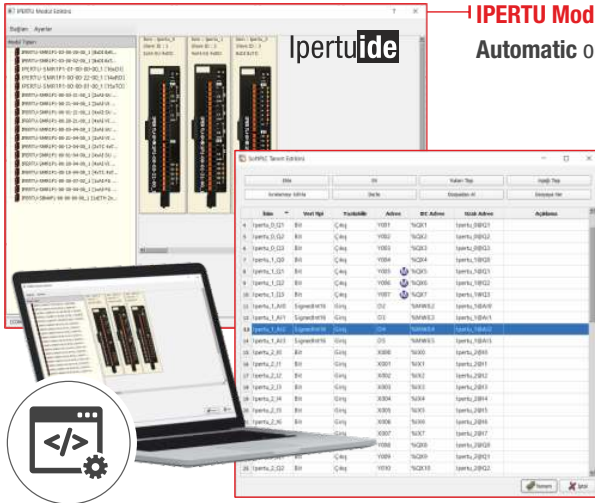
### Ladder



EASY application creation IEC61131 standard. Performing many programming operations with the blocks in "Ladder Logic".



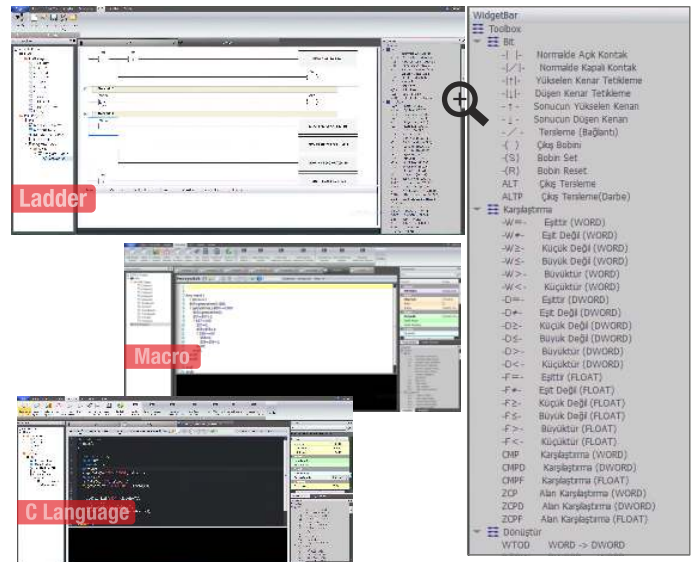
**PLC-CPU and SOFTPLC programming with *Ipertu.ide***













**IPERTU Module Editor;**  
Automatic or Manual identification of IPERTU expansion modules connected to Proop HMI.

**Definition Editor ;**  
QUICK and EASY automatic import of "IPERTU Module Definitions" and creation of new Definitions via Definition Editor


**FASTER, FLEXIBLE and STRONG** programming with *Ipertu.ide* Integrated Software Development Environment, integrated **Ladder, Macro, C Code.**



**IPERTU.IDE Rich Development Tools**

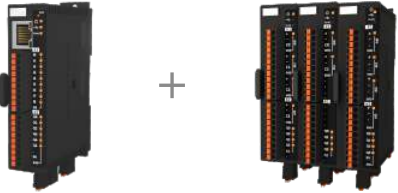
-  USB Bridge
-  online / offline Simulation
-  C Language
-  Online Debug
-  offline Simulation
-  *Ipertu.ide* Macro
-  Ladder (LD)
-  SoftPLC
-  C Language
-  Ladder (LD)

**Process control via SOFTPLC and *Ipertu* I/O Modules for Simple Applications**



IPERTU HMI Panel + IPERTU I/O Module

**Process control via PLC-CPU and *Ipertu* I/O Modules for Complex Applications**



IPERTU PLC-CPU Module + IPERTU I/O Module



- ARM Cortex-A Series
- 8GB eMMC
- 512 MB DDR3 SDRAM
- 50000 hours Backlight Life
- Datalogger
- Alarm Recording

Proop Eco Series



- ModBus RS-232
- ModBus RS-485
- DEVICE
- HOST

Proop Lite Series



- ModBus RS-232
- ModBus RS-485
- DEVICE
- HOST
- ModBus RS-232
- ETHERNET

Proop Control Series



- 5X Digital Input
- 4X Digital Input
- ModBus RS-232
- ModBus RS-485
- DEVICE
- HOST
- ModBus RS-232
- ETHERNET
- ETHERNET

Proop Process Series



- 2X 4...20mA Analogue Input
- 2X 4...20mA Analogue Input
- 5X Digital Input
- 4X Digital Input
- ModBus RS-232
- ModBus RS-485
- DEVICE
- HOST
- ModBus RS-232
- ETHERNET
- ETHERNET



### Interface and Process Connection Options for Proop HMI



### Process Control with PLC



Master Slave . . . . . Slave  
\* Mak.16 SLAVE module connection

- Process Control | IPERTU PLC CPU Module
- Analog Inputs/Outputs  
Digital Inputs/Outputs  
Relay Outputs | IPERTU PLC I/O Modules
- Process Monitoring  
Parameter Settings | Professional Operator Panel

### Process Control with SOFT PLC



Master  
Slave . . . . . Slave  
\* Mak.16 SLAVE module connection

- Process Control | Professional Operator Panel
- Process Monitoring  
Parameter Settings | Professional Operator Panel
- Analog Inputs/Outputs  
Digital Inputs/Outputs  
Relay Outputs | IPERTU PLC I/O Modules





## IPERTU PLC Module Types and Features

Ipertu PLC-CPU module, I/O expansion modules (Analog Input/Output Control modules, Digital Input/Output modules), Communication modules;

### IPERTU Slim PLC-CPU Module

Slim PLC CPU Module with Digital Input/Transistor Output

- PLC online debug feature,
- Configurable via mini USB 2.0 connection,
- Modbus RTU communication with RS485 or RS232,
- Ethernet 10/100 Mbit.

- Easy programming via IPERTU.IDE Ladder, Transactions;

Special purpose function blocks: PID and position control,

Standard PLC commands: Logic, mathematical, time and counting relays,

Hardware specific function blocks: Communication, fast counter and pulse outputs.

Via WQC "Web Quick Connect" feature ; Easy access via internet connection from all around the world



Accessing and monitoring Ipertu PLC modules without the need for any program via Web Browser with IPERTU Scada feature.

9 Digital input (NPN/PNP)



Max. 16 expansion module connections. I/O connection support up to 268 points.

6 Transistor output (PNP).



Built-in calendar, clock feature.

3 Channel 200kHz dual-phase, encoder or fast counter input.



Data Log feature via USB

Maximum frequency 100kHz for 6 channels.



Easy Supply and Communication connection via special BUS structure.

"Pulse-Width-Modulation" feature



"Pulse-Train-Output" feature





## IPERTU PLC Module Types and Features

### IPERTU Slim Plus PLC-CPU Module

#### CPU Speed / Command Times

CPU Speed 12ns/command	LD Command Speed 30ns/command	MOV Command Speed 80ns/command	I/O Module Renewal time ~300µs/module
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#### Memory

Program Capacity 196kB	Data Memory 27kB	Retain Memory 4kB	Retain Memory Lifetime 10 Year
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#### Application Memory

Decimal Operation Support VAR	Counter Relays 200 piece 16bit 56 piece 32bit	Signed Integer 16bit sign 8192 piece	Time Relay Resolution 56 piece 1ms, 100 piece 10ms, 100 piece 100ms
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#### Volatile Memory Area Map

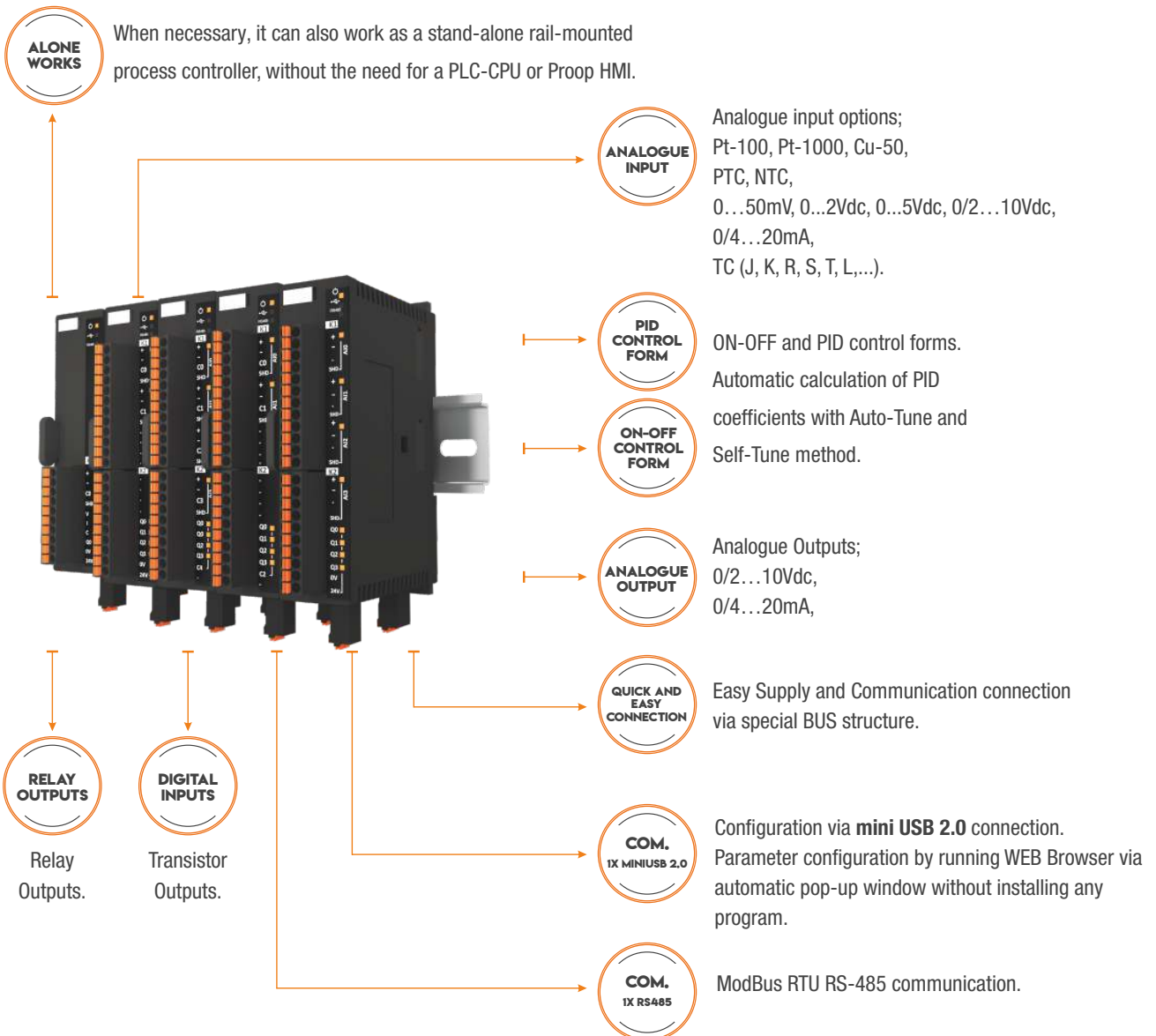
Address Name	Address Range	Address Type	Defination
X	0 - 127	BOOL	Logic Input Memory Area
Y	0 - 127	BOOL	Logic Output Memory Area
AI	0 - 31	WORD	Analog Input Memory Area
AO	0 - 31	WORD	Analog Output Memory Area
M	0 - 8191	BOOL	Bit Memory Area
D	0 - 8191	WORD	Data Memory Area
S	0 - 1023	BOOL	Status Bits
CV	0 - 199 200 - 255	WORD DWORD	Counter Memory Area
TV	0 - 255	WORD	Timer Memory Area
C	0 - 255	BOOL	Counter Bit Memory Area
T	0 - 255	BOOL	Timer Bit Memory Area



## IPERTU PLC Module Types and Features

### Analogue Input I/O Expansion Modules

I/O expansion modules with analog inputs can be configured with a Mini USB 2.0 connection. Depending on the process; It can work together with PLC-CPU module or Proop HMI. In addition, with its programmable parametric structure, it can work as a rail-mounted process control device without the need for any control unit.

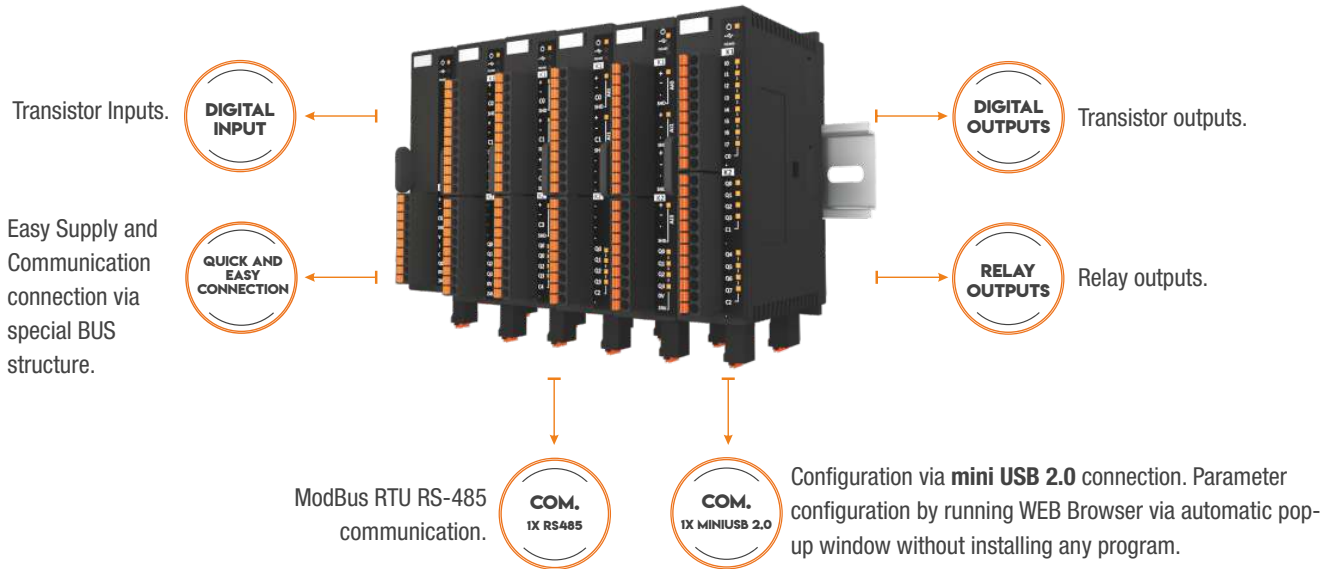




## IPERTU PLC Module Types and Features

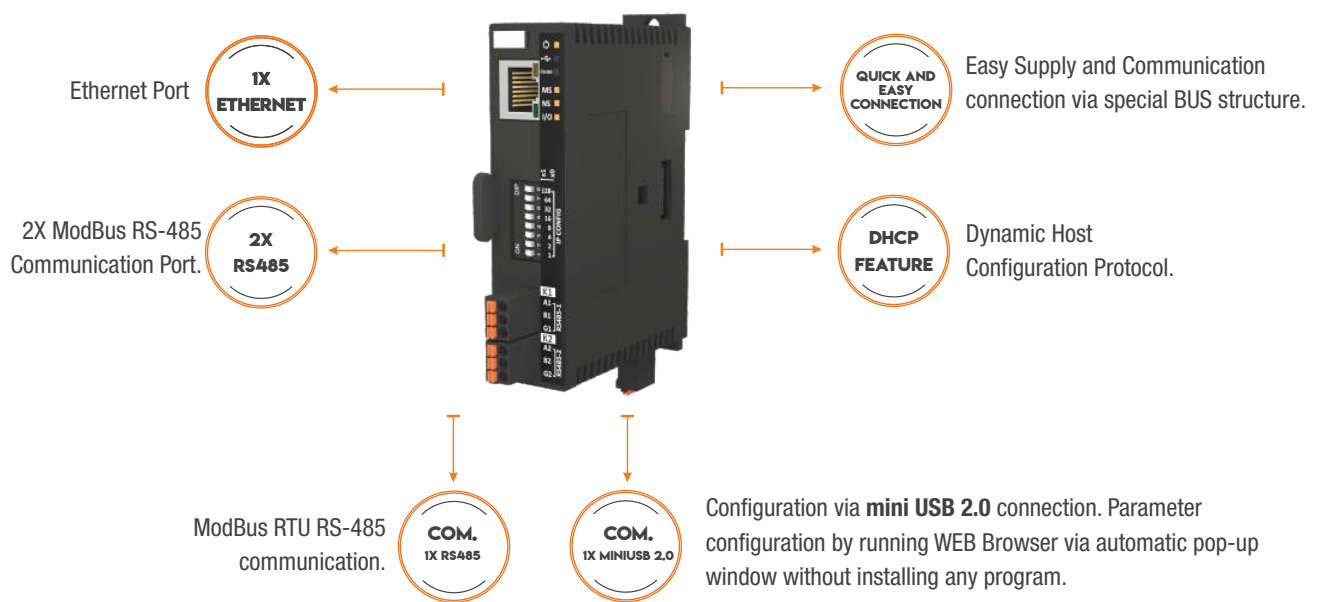
### Digital Input I/O Expansion Modules

IPERTU PLC-I/O expansion modules with digital inputs are expansion modules with digital input, relay or transistor output. In cases where extra digital input, transistor or relay output is needed, it works as an expansion module with PLC-CPU module and Proop HMI panel.



### Communication Modules

IPERTU Communication Modules provide communication with PLC, HMI panel with 1x Ethernet input, 2x ModBus RS485 communication port.



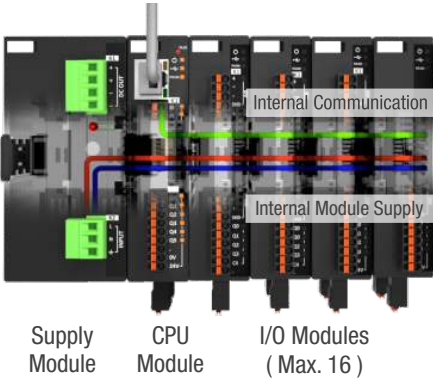


## Quick and Easy Connection

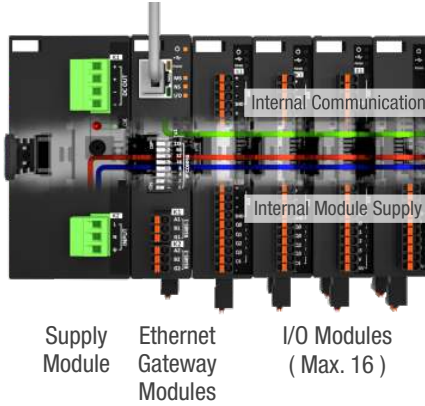


Thanks to the special BUS structure between the modules, fast and easy connection without the need for communication and supply cables.

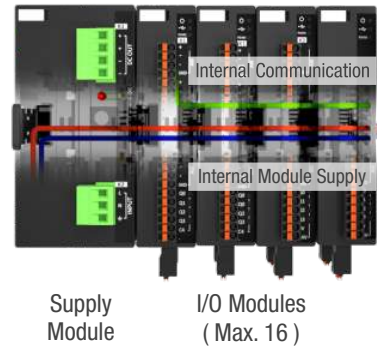
IPERTU CPU Module + I/O Module Connection



IPERTU Ethernet Module + I/O Module Connection



IPERTU I/O Module Connection



## Easy Configuration via USB



IPERTU modules are configured with Mini USB 2.0 connection. Without installing any program, parameter configuration and module software update can be done via the automatically opened window in WEB Browser. Uploading the LADDER code compiled from the PC to the PLC-CPU module or adjusting the Expansion modules depending on the process with its programmable parametric structure.

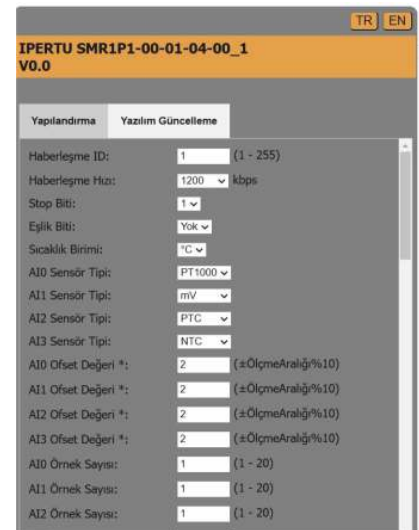


Mini USB 2.0  
Connection



**Quick Parameter Configuration via mini USB**  
connection;Parameter configuration by running WEB Browser via automatic pop-up window without installing any program.

**\* The software update is done with the latest version software downloaded from the WEB site.**







IPERTU PLC-CPU Modules

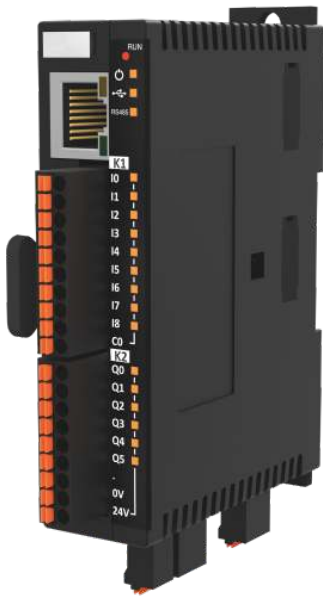
	Model	Inputs	(A,B,Z) Dual Phase Encoder or Fast Counter Input	Outputs	Output Speed
CPU Modules	Slim Basic	9x Digital Input (NPN-PNP)	3x 20kHz	6x Transistör Output (PNP)	20kHz
	Slim Plus		3x 200kHz		100kHz

IPERTU PLC - I/O Modules

	Inputs	Outputs	Communication/ Supply
Analogue Input (PID) Modules	2x Pt-100, Pt-1000, Cu-50, PTC, NTC, 4x 0...50mV	4x (NO) Relay 1,5A Transistor	Module Parameter Configuration via USB2.0  ModBus RS-485 Communication  24Vdc Supply  OR  <b>PLC BUS</b>  * Parameter Configuration, Communication, Module Supply to be done via PLC <b>BUS</b>
	2x 0/2...10Vdc, 0...2/5Vdc, 4x 0/4...20mA	4x (NO) Relay 1,5A Transistor	
	2x TC ( J, K, R, S, T, L, ... ) 4x	4x Transistor	
	1x RTD, PTC, NTC, Vdc, mVdc, Adc, TC (J, K, R, S, T, L, ...),	4x Transistor	
	1x RTD, PTC, NTC, Vdc, mVdc, Adc, TC (J, K, R, S, T, L, ...),	1x Transistor and (0...10Vdc, 0...20mA)	
Digital Input Modules	8x Digital Input	8x (NO) Relay 1,5A	
	8x Digital Input	8x Transistor	
	16x Digital Input	-	
	-	14x (NO) Relay 1,5A	
	-	15x Transistor	

IPERTU Communication Modules

	Communication Properties
Ethernet Gateway Modules	2x RS485 + 1x miniUSB 2.0 + 1x Ethernet 1x miniUSB 2.0 + 1x Ethernet



**WQC** WQC "Web Quick Connect" feature ; Easy access via internet connection from all around the world

**IPERTU SCADA** Accessing and monitoring IperTU PLC modules without the need for any program via Web Browser with IPERTU Scada feature.

<b>CPU Speed</b> 12ns/command	<b>LD Command Speed</b> 30ns/command	<b>MOV Command Speed</b> 80ns/command
<b>Program Capacity</b> 196kB	<b>Data Memory</b> 27kB	<b>Retain Memory/Lifetime</b> 4kB / 10 Year

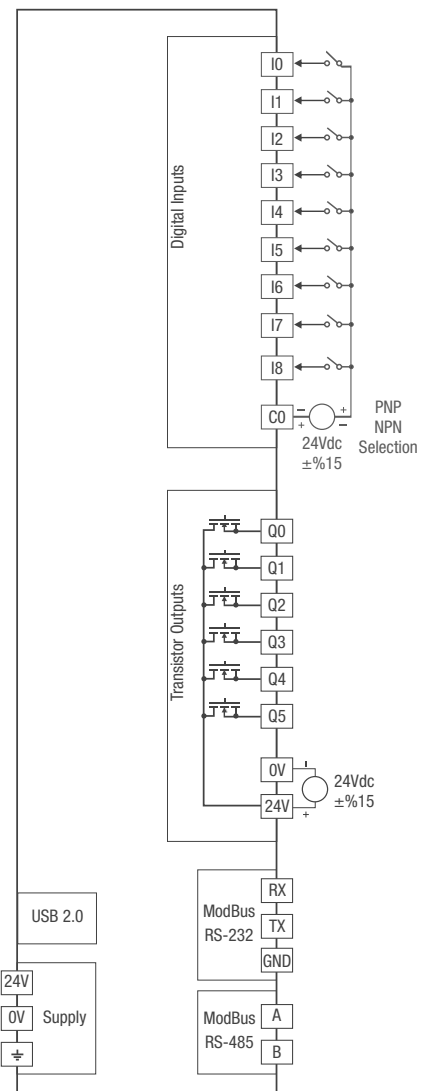
(A,B,Z) Dual Phase Encoder or Fast Counter Input

Slim Plus PLC-CPU Module IPERTU-SPP3P1-30-00-51-00_1	3 piece 200Khz
Slim Basic PLC-CPU Module IPERTU-SPL3P1-02-00-03-00_1	3 piece 20Khz

Easy programming with IPERTU.IDE Ladder (LD) language,  
9 Digital inputs (NPN / PNP),  
6 Digital Outputs (PNP),  
Modular connectivity (Max. 16 devices, 268 I/O ports),  
Built-in calendar-clock (RTC),  
Data logging via USB,  
Ethernet 10/100 Mbit,  
Modbus RTU communication with RS485 and RS232.

General Specifications

<b>Supply</b>	
Supply Voltage	24 VDC (±%20) (19,2 VDC - 28,8 VDC)
Power Consumption	2W
<b>Communication Ports</b>	
Communication Port	1x RS-232, 1x RS-485 Modbus RTU
Program Installation/Configuration	1x USB (Mini USB2.0)
<b>Inputs</b>	
Digital Inputs	9x Digital NPN /PNP inputs
Response Speed	2.5µs for 9 inputs
Max. Current	6 mA
<b>Outputs</b>	
Digital Outputs	6x PNP outputs
Reaction Time	5µsn
Digital Output Current	0.3 A (single channel), 1.8 A (total COM currents)
<b>Environmental Conditions</b>	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting



Product Codes

IPERTU PLC CPU Modules	Module Types	Digital Inputs	(A,B,Z) Dual Phase Encoder or Fast Counter Input	Digital Input (100KHz)	Digital Output (20KHz)	ETH	USB	RS232	RS485
IPERTU-SPP3P1-30-00-51-00_1	Slim Plus	9x NPN/PNP	3 pcs 200Khz	6x Transistor	-	+	+	+	+
IPERTU-SPL3P1-02-00-03-00_1	Slim Basic	9x NPN/PNP	3 pcs 20Khz	-	6x Transistor	+	+	+	+



## IPERTU Analog Input (PID) Modules

2x or 4x Analog Inputs (RTD,PTC,NTC,mVdc)  
4x Relay Output, PID Module



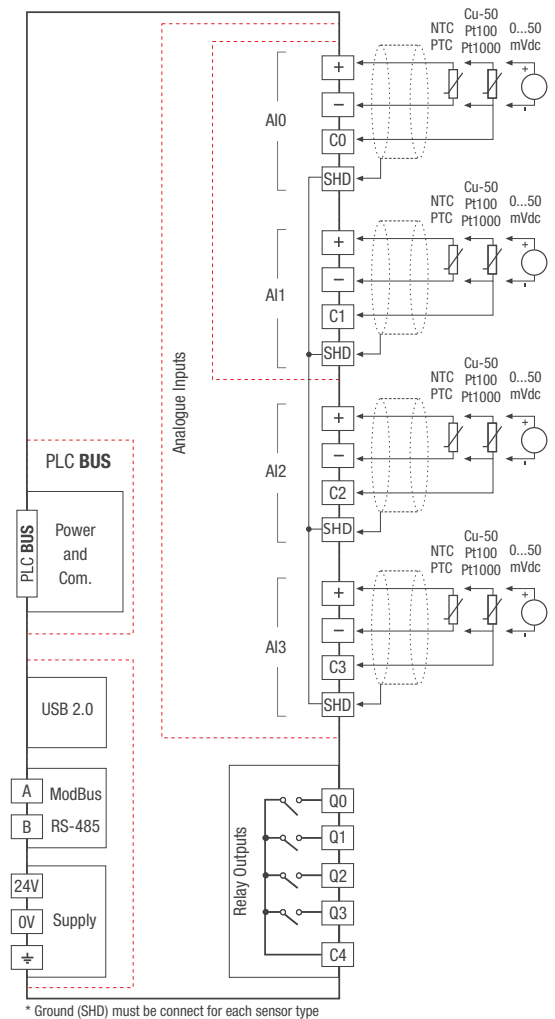
SMR1P1-00-01-21-00\_1

SMR1P1-00-03-21-00\_1

### General Specifications

Supply	
Supply Voltage	24Vdc ( $\pm 20\%$ ) or PLCBUS
Power Consumption	1,5W
Communication Ports	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
Inputs	
Analogue Inputs	2x or 4x (Pt-100, Pt-1000, PTC, NTC, 0...50mV)
ADC Resolution	15bit
Measuring Speed	Per Channel 160msn
Outputs	
Relay Outputs	4x (NO) Relay Output (1,5A)
Reaction time	10 msn
Environmental Conditions	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting

Compatible with ModbusRTU (RS-485) Master devices,  
2x Semi-Universal inputs (RTD,PTC,NTC,mVdc),  
4x Semi-Universal inputs (RTD,PTC,NTC,mVdc),  
4x NO 1.5A Relay output,  
Programmable PID and ON-OFF control forms,  
Automatic PID calculation with Self-Tune or Auto-Tune operations,  
Mini USB-USB2.0 (Software Download/Configuration),  
Modular Connection (Maximum 16 devices),  
Snap-in type terminal, 25mm wide.



### Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-00-03-21-00_1	-	2x	-	4x	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-01-21-00_1	-	4x	-	4x	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMROPO-00-03-21-00_1	-	2x	-	4x	-	PLC BUS	+
IPERTU-SMROPO-00-01-21-00_1	-	4x	-	4x	-	PLC BUS	+



## IPERTU Analog Input (PID) Modules

2x or 4x Analog Inputs (RTD,PTC,NTC,mVdc)  
4x Transistor Output, PID Module



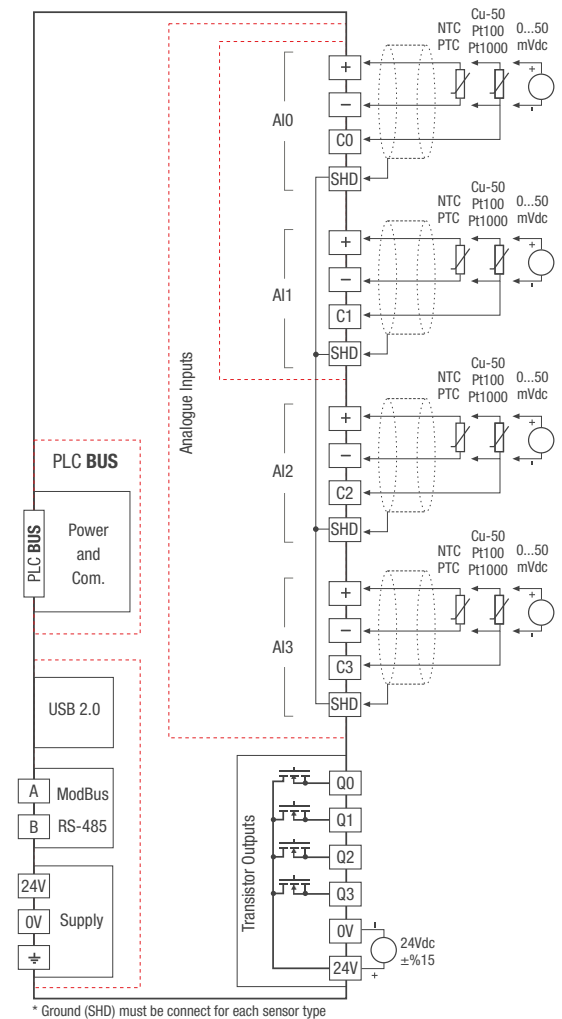
SMR1P1-00-01-04-00\_1

SMR1P1-00-03-04-00\_1

### General Specifications

Supply	
Supply Voltage	24Vdc ( $\pm 20\%$ ) or PLCBUS
Power Consumption	1W
Communication Ports	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
Inputs	
Analogue Inputs	2x or 4x (Pt-100, Pt-1000, PTC, NTC, 0...50mV)
ADC Resolution	15bit
Measuring Speed	Per Channel 160msn
Outputs	
Digital Outputs	4x Transistor (24Vdc@0,3A)
Reaction time	170 $\mu$ sn
Environmental Conditions	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting

Compatible with ModbusRTU (RS-485) Master devices,  
2x Semi-Universal inputs (RTD,PTC,NTC,mVdc),  
4x Semi-Universal inputs (RTD,PTC,NTC,mVdc),  
4x Transistor outputs,  
Programmable PID and ON-OFF control forms,  
Automatic PID calculation with Self-Tune or Auto-Tune operations,  
Mini USB-USB2.0 (Software Download/Configuration),  
Modular Connection (Maximum 16 devices),  
Snap-in type terminal, 25mm wide.



### Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-00-03-04-00_1	-	2x	4x	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-01-04-00_1	-	4x	4x	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMROP0-00-03-04-00_1	-	2x	4x	-	-	PLC BUS	+
IPERTU-SMROP0-00-01-04-00_1	-	4x	4x	-	-	PLC BUS	+



## IPERTU Analog Input (PID) Modules

2x or 4x Analog Inputs (Vdc, mA)  
4x Relay Outputs, PID Module



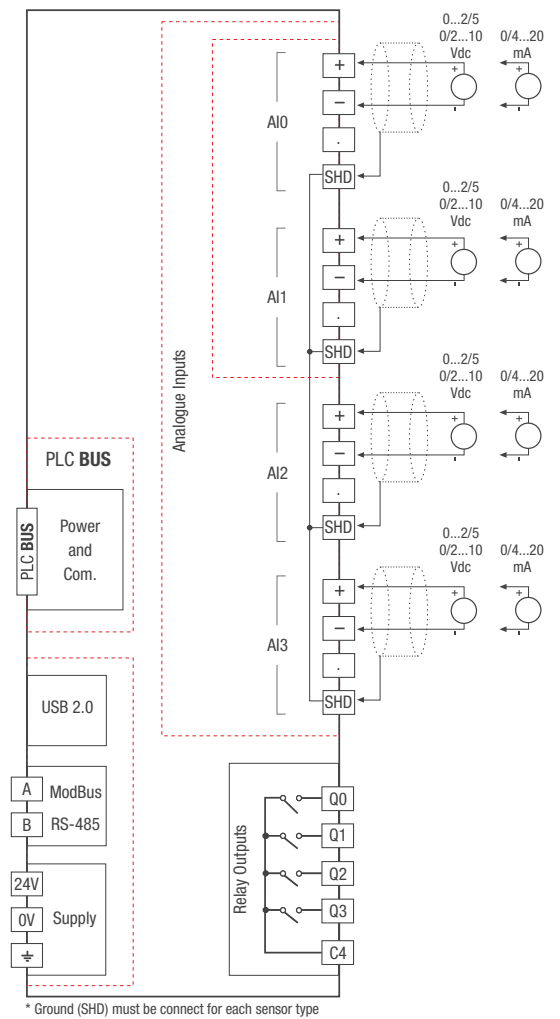
SMR1P1-00-20-21-00\_1

SMR1P1-00-21-21-00\_1

### General Specifications

Supply	
Supply Voltage	24Vdc ( $\pm\%20$ ) or PLCBUS
Power Consumption	1,5W
Communication Ports	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
Inputs	
Analogue Inputs	2x or 4x (0/2...10Vdc, 0/4...20mA)
ADC Resolution	15bit
Measuring Speed	Per Channel 160msn
Outputs	
Relay Outputs	4x (NO) Relay Output (1,5A)
Reaction time	10 msn
Environmental Conditions	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting

Compatible with Modbus RTU (RS-485) Master devices,  
2x Analog input (Vdc, mA),  
4x Analog inputs (Vdc, mA),  
4x NO 1.5A Relay output,  
Programmable PID and ON-OFF control forms,  
Automatic PID calculation with Self-Tune or Auto-Tune operations,  
Mini USB-USB2.0 (Software Download/Configuration),  
Modular Connection (Maximum 16 devices),  
Snap-in type terminal, 25mm wide.



### Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-00-21-21-00_1	-	2x	-	4x	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-20-21-00_1	-	4x	-	4x	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMROPO-00-21-21-00_1	-	2x	-	4x	-	PLC BUS	+
IPERTU-SMROPO-00-20-21-00_1	-	4x	-	4x	-	PLC BUS	+





## IPERTU Analog Input (PID) Modules

2x or 4x Analog Inputs (Vdc, mA)  
4x Transistor Output, PID Module



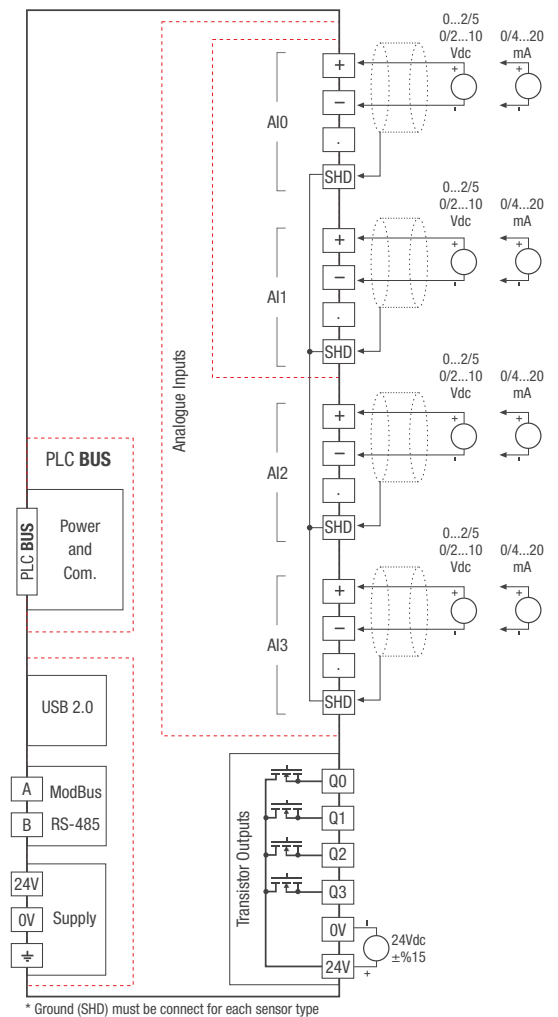
SMR1P1-00-20-04-00\_1

SMR1P1-00-21-04-00\_1

### General Specifications

Supply	
Supply Voltage	24Vdc ( $\pm\%20$ ) or PLCBUS
Power Consumption	1W
Communication Ports	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
Inputs	
Analogue Inputs	2x or 4x (0/2...10Vdc, 0/4...20mA)
ADC Resolution	15bit
Measuring Speed	Per Channel 160msn
Outputs	
Digital Outputs	4x Transistor (24Vdc@0,3A)
Reaction time	170 $\mu$ sn
Environmental Conditions	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting

Compatible with Modbus RTU (RS-485) Master devices,  
2x Analog input (Vdc, mA),  
4x Analog inputs (Vdc, mA),  
4x Transistor output,  
Programmable PID and ON-OFF control forms,  
Automatic PID calculation with Self-Tune or Auto-Tune operations,  
Mini USB-USB2.0 (Software Download/Configuration),  
Modular Connection (Maximum 16 devices),  
Snap-in type terminal, 25mm wide.



### Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-00-21-04-00_1	-	2x	4x	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-20-04-00_1	-	4x	4x	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMROPO-00-21-04-00_1	-	2x	4x	-	-	PLC BUS	+
IPERTU-SMROPO-00-20-04-00_1	-	4x	4x	-	-	PLC BUS	+



## IPERTU TC Input (PID) Modules

2x or 4x Analog Inputs (J, K, R, S, T, L, ...)  
4x Transistor Output, PID Module



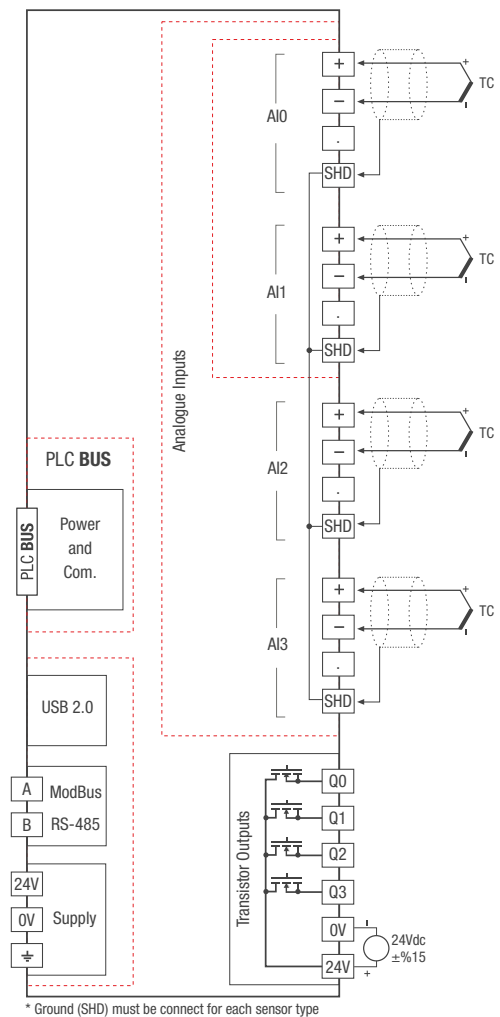
SMR1P1-00-10-04-00\_1

SMR1P1-00-12-04-00\_1

### General Specifications

Supply	
Supply Voltage	24Vdc ( $\pm\%20$ ) or PLCBUS
Power Consumption	1,5W
Communication Ports	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
Inputs	
Analogue Inputs	2x or 4x TC (J, K, R, S, T, L, ...)
ADC Resolution	15bit
Measuring Speed	Per Channel 160msn
Outputs	
Digital Outputs	4x Transistor (24Vdc@0,3A)
Reaction time	170 $\mu$ sn
Environmental Conditions	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting

Compatible with Modbus RTU (RS-485) Master devices,  
2x Thermocouple input TC (J, K, R, S, T, L, ...),  
4x Thermocouple input TC (J, K, R, S, T, L, ...),  
4x Transistor output,  
Programmable PID and ON-OFF control forms,  
Automatic PID calculation with Self-Tune or Auto-Tune operations,  
Mini USB-USB2.0 (Software Download/Configuration),  
Modular Connection (Maximum 16 devices),  
Snap-in type terminal, 25mm wide.



### Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-00-12-04-00_1	-	2x TC	4x	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-10-04-00_1	-	4x TC	4x	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMROPO-00-12-04-00_1	-	2x TC	4x	-	-	PLC BUS	+
IPERTU-SMROPO-00-10-04-00_1	-	4x TC	4x	-	-	PLC BUS	+



## IPERTU Universal Analog Input (PID) Modules

1x Universal Input (RTD,PTC,NTC, Vdc,mVdc,Adc,TC)  
4x Transistor Output PID Module

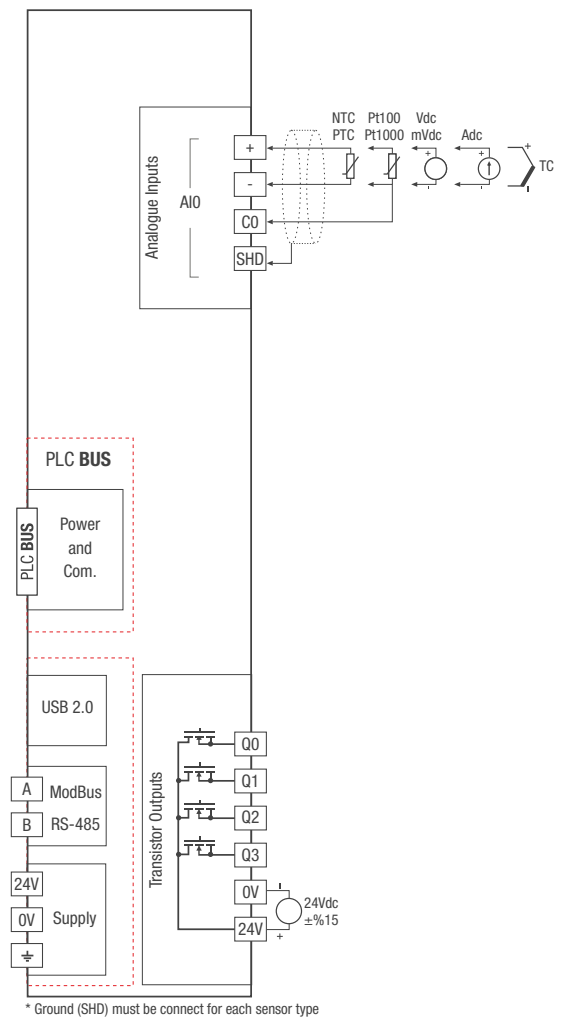


SMR1P1-00-30-04-00\_1

### General Specifications

Supply	
Supply Voltage	24Vdc ( $\pm\%20$ ) or PLCBUS
Power Consumption	1,5W
Communication Ports	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
Inputs	
Analogue Inputs	1x Universal analogue input
ADC Resolution	15 bit
Measuring Speed	Per Channel 160msn
Outputs	
Digital Outputs	4x Transistor (24Vdc@0,3A)
Reaction time	170 $\mu$ sn
Environmental Conditions	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting

Compatible with Modbus RTU (RS-485) Master devices,  
1x Universal Analog Input (RTD,PTC,NTC, Vdc,mVdc,Adc,TC),  
4x Transistor Digital Output (Active High),  
Programmable PID and ON-OFF control forms,  
Automatic PID calculation with Self-Tune or Auto-Tune operations,  
Mini USB-USB2.0 (Software Download/Configuration),  
Modular Connection (Maximum 16 devices),  
Snap-in type terminal, 25mm wide.



### Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-00-30-04-00_1	-	1x Universal Input	4x	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMROPO-00-30-04-00_1	-	1x Universal Input	4x	-	-	PLC BUS	+

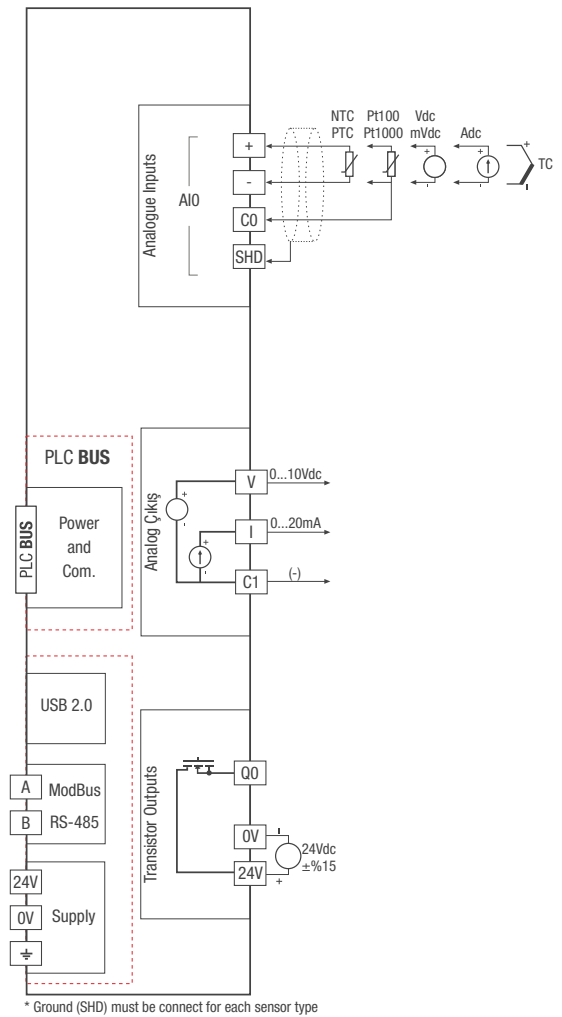


SMR1P1-00-30-07-02\_1

General Specifications

<b>Supply</b>	
Supply Voltage	24Vdc (±%20) or PLCBUS
Power Consumption	1,5W
<b>Communication Ports</b>	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
<b>Inputs</b>	
Analogue Inputs	1x Universal analogue input
ADC Resolution	15bit
Measuring Speed	Per Channel 160msn
<b>Outputs</b>	
Digital Outputs	1x Transistor (24Vdc@0,3A)
Reaction time	170 µsn
Analogue Output	1x (0...10Vdc, 0...20mA)
<b>Environmental Conditions</b>	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting

Modbus RTU (RS-485) haberleşmeli Master cihazlar ile uyumlu,  
 1x Üniversal analog giriş (RTD,PTC,NTC, Vdc,mVdc,Adc,TC),  
 1x Transistor çıkış (Aktif Yüksek),  
 1x Analog çıkış (0...10Vdc, 0...20mA),  
 Programlanabilir PID ve ON-OFF kontrol formları,  
 Self-Tune veya Auto-Tune işlemleri ile otomatik PID hesaplama,  
 Mini USB-USB2.0 (Yazılım Yükleme/Konfigürasyon),  
 Modüler Bağlantı (Maksimum 16 cihaz),  
 Snap-in tip terminal, 25mm genişlik.



Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-00-30-07-02_1	-	1x Universal Input	1x	-	1x	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMROPO-00-30-07-02_1	-	1x Universal Input	1x	-	1x	PLC BUS	+

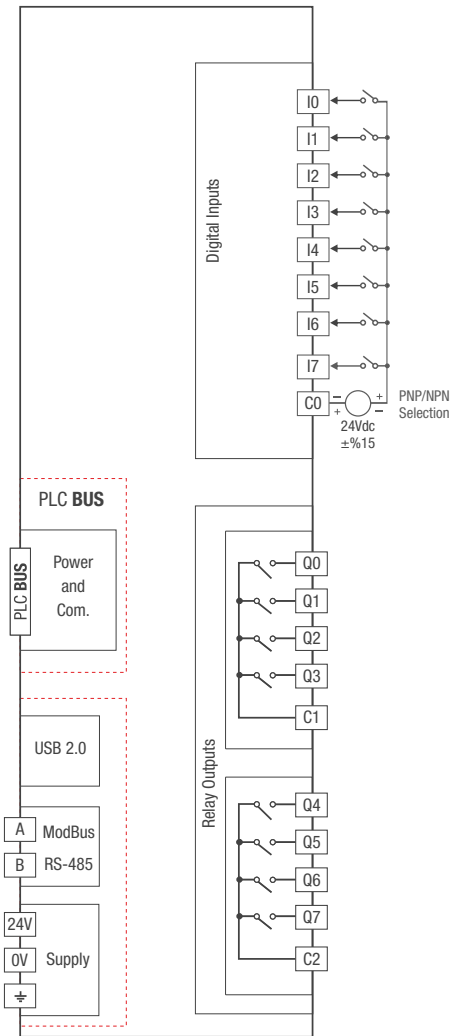


SMR1P1-03-00-20-00\_1

Compatible with Modbus RTU (RS-485) Master devices,  
8x Digital inputs,  
8x Relay output (1.5A),  
Mini USB-USB2.0 (Software Download/Configuration),  
Modular Connection (Maximum 16 devices),  
Snap-in type terminal,  
25mm width.

General Specifications

<b>Supply</b>	
Supply Voltage	24Vdc ( $\pm 20\%$ ) or PLCBUS
Power Consumption	2W
<b>Communication Ports</b>	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
<b>Inputs</b>	
Digital Inputs	8x Digital Input
Response Speed	20 $\mu$ sn
Maximum Current	6 mA
<b>Outputs</b>	
Relay Outputs	8x (NO) Relay Output (1,5A)
Reaction time	10msn
<b>Environmental Conditions</b>	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting



Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-03-00-20-00_1	8x	-	-	8x	-	1x RS485 + 1x miniUSB 2.0	-
IPERTU-SMROPO-03-00-20-00_1	8x	-	-	8x	-	PLC BUS	-



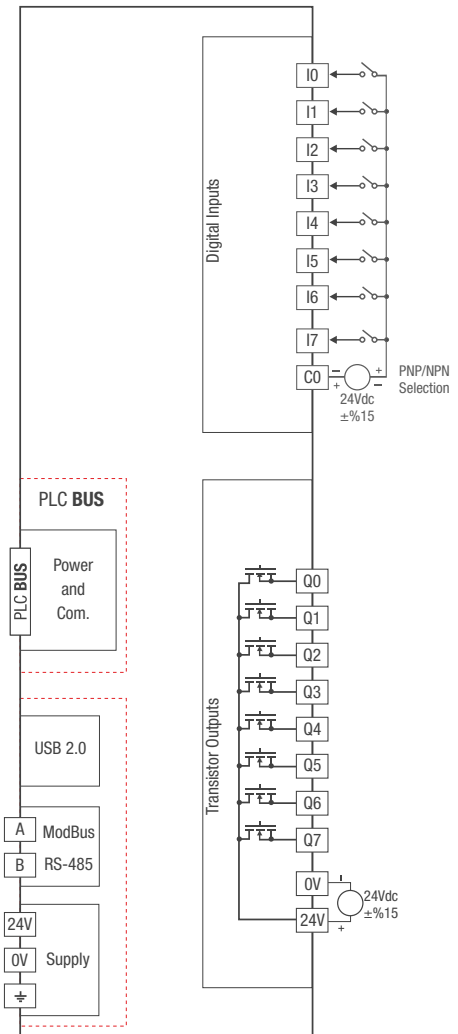


SMR1P1-03-00-02-00\_1

Compatible with Modbus RTU (RS-485) Master devices,  
8x Digital inputs,  
8x Transistor output,  
Mini USB-USB2.0 (Software Download/Configuration),  
Modular Connection (Maximum 16 devices),  
Snap-in type terminal,  
25mm width.

General Specifications

Supply	
Supply Voltage	24Vdc ( $\pm\%20$ ) or PLCBUS
Power Consumption	1,5W
Communication Ports	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
Inputs	
Digital Inputs	8x Digital Input
Response Speed	20 $\mu$ s
Maximum Current	6 mA
Outputs	
Digital Outputs	8x (24Vdc@0,3A)
Reaction time	170 $\mu$ s
Environmental Conditions	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting



Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-03-00-02-00_1	8x	-	8x	-	-	1x RS485 + 1x miniUSB 2.0	-
IPERTU-SMROPO-03-00-02-00_1	8x	-	8x	-	-	PLC BUS	-

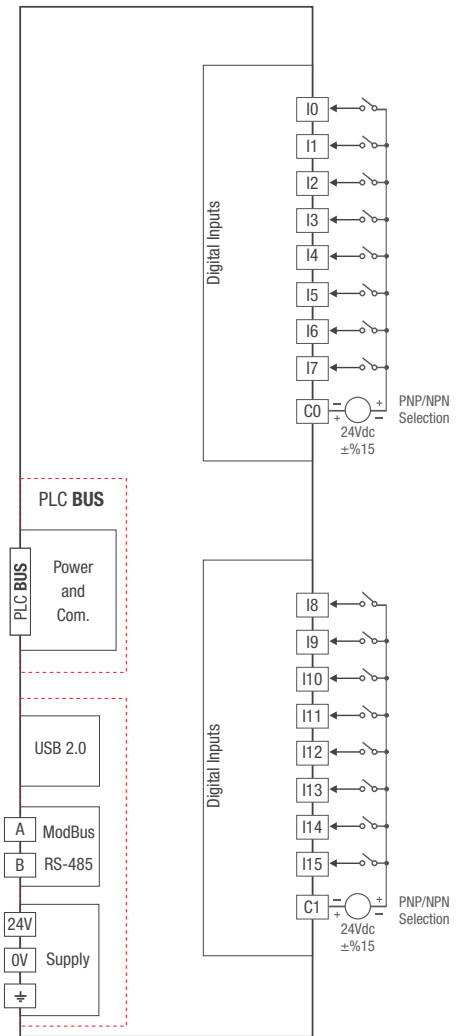


SMR1P1-01-00-00-00\_1

Compatible with Modbus RTU (RS-485) Master devices,  
 16x Digital inputs (PNP/NPN),  
 Mini USB-USB2.0 (Software Download/Configuration),  
 Modular Connection (Maximum 16 devices),  
 Snap-in type terminal,  
 25mm width.

General Specifications

<b>Supply</b>	
Supply Voltage	24Vdc ( $\pm\%20$ ) or PLCBUS
Power Consumption	1W
<b>Communication Ports</b>	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
<b>Inputs</b>	
Digital Inputs	16x Digital Inputs
<b>Outputs</b>	
Digital Outputs	-
Reaction time	-
<b>Environmental Conditions</b>	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting



Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-01-00-00-00_1	16x	-	-	-	-	1x RS485 + 1x miniUSB 2.0	-
IPERTU-SMROPO-01-00-00-00_1	16x	-	-	-	-	PLC BUS	-

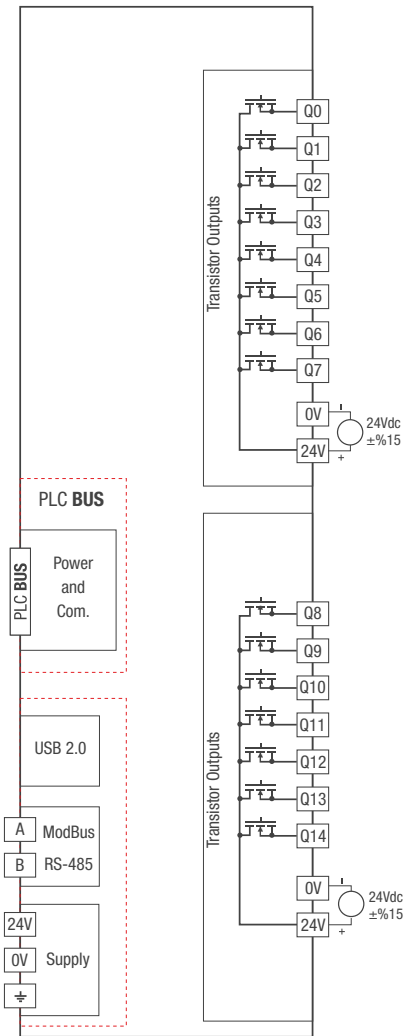


SMR1P1-00-00-01-00\_1

Compatible with Modbus RTU (RS-485) Master devices,  
 15x Transistor output,  
 PNP/NPN output selection,  
 Mini USB-USB2.0 (Software Download/Configuration),  
 Modular Connection (Maximum 16 devices),  
 Snap-in type terminal,  
 25mm width.

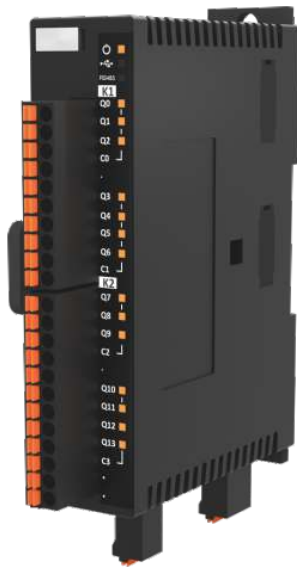
General Specifications

<b>Supply</b>	
Supply Voltage	24Vdc (±%20) or PLCBUS
Power Consumption	2W
<b>Communication Ports</b>	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
<b>Inputs</b>	
Digital Inputs	-
<b>Outputs</b>	
Digital Outputs	15x (24Vdc@0,3A)
Reaction time	170 µsn
<b>Environmental Conditions</b>	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting



Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-00-00-01-00_1	-	-	15x	-	-	1x RS485 + 1x miniUSB 2.0	-
IPERTU-SMROPO-00-00-01-00_1	-	-	15x	-	-	PLC BUS	-

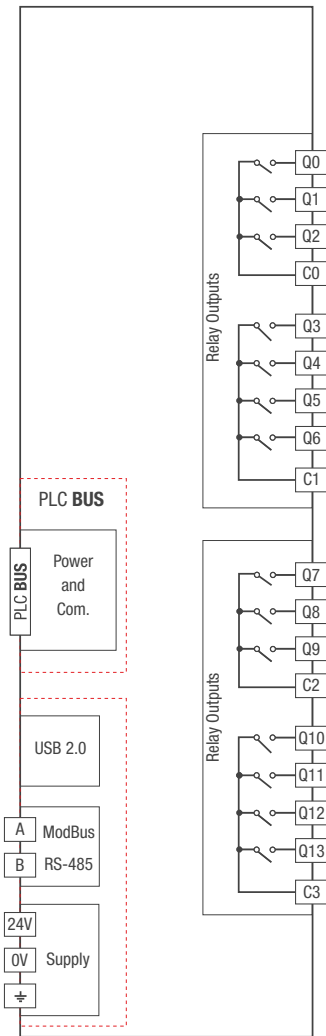


SMR1P1-00-00-22-00\_1

Compatible with Modbus RTU (RS-485) Master devices,  
 14x Relay (NO) output,  
 Mini USB-USB2.0 (Software Download/Configuration),  
 Modular Connection (Maximum 16 devices),  
 Snap-in type terminal,  
 25mm width.

General Specifications

Supply	
Supply Voltage	24Vdc ( $\pm\%20$ ) or PLCBUS
Power Consumption	2,5W
Communication Ports	
Communication Port	1x RS-485 or PLCBUS
Program Installation/Configuration	1x USB (Mini USB2.0) or PLCBUS
Inputs	
Digital Inputs	-
Outputs	
Digital Outputs	14x (1,5A)
Reaction time	10msn
Environmental Conditions	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting



Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
IPERTU-SMR1P1-00-00-22-00_1	-	-	-	14x	-	1x RS485 + 1x miniUSB 2.0	-
IPERTU-SMROPO-00-00-22-00_1	-	-	-	14x	-	PLC BUS	-



SGN4P1-00-00-00-00\_1



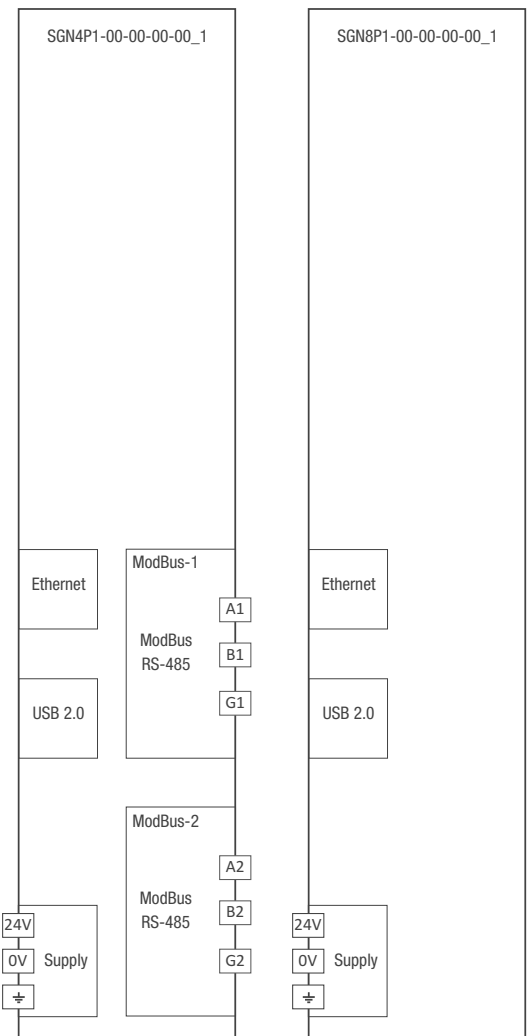
SGN8P1-00-00-00-00-00\_1

General Specifications

<b>Supply</b>	
Supply Voltage	24Vdc (±%20)
Power Consumption	2W
<b>Communication Ports</b>	
Communication Port	2x RS-485
Program Installation/Configuration	1x USB (Mini USB2.0)
Ethernet	1x Ethernet
<b>Environmental Conditions</b>	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting

Compatible with Modbus RTU (RS-485) Master devices, Mini USB-USB2.0 (Software Download/Configuration), Ethernet DHCP Feature (Dynamic Host Configuration Protocol), USB, RS-485, supply and communication status led indicators.

\* On the MODBUS-TCP side, 8 MASTER devices can be operated simultaneously ability to log in to query SLAVE devices.



Product Codes

IPERTU Communication Modules	Communication-1 ModBus RS-485	Communication-2 ModBus RS-485	Ethernet	Mini USB2.0
IPERTU-SGN4P1-00-00-00-00_1	1x	1x	1x	1x
IPERTU-SGN8P1-00-00-00-00_1	-	-	1x	1x





Universal Supply Input,  
 100-240Vac (-15%...+10%) 50/60Hz,  
 24Vdc ( $\pm 10\%$ ) adjustable output voltage,  
 2.5A / 60W@24Vdc,  
 Active output led indicator,  
 Output Load regulation < 1.5%,  
 Output Line regulation < 1.5%,

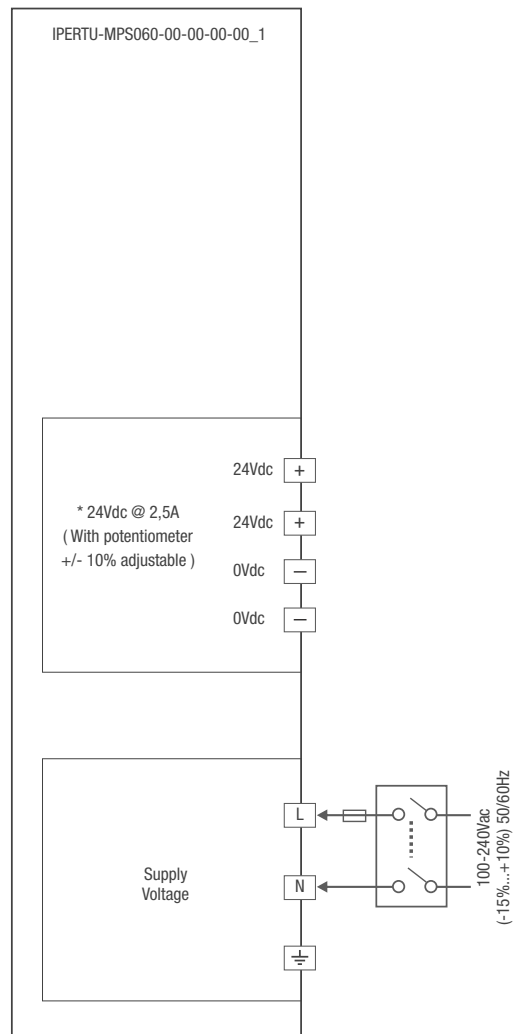
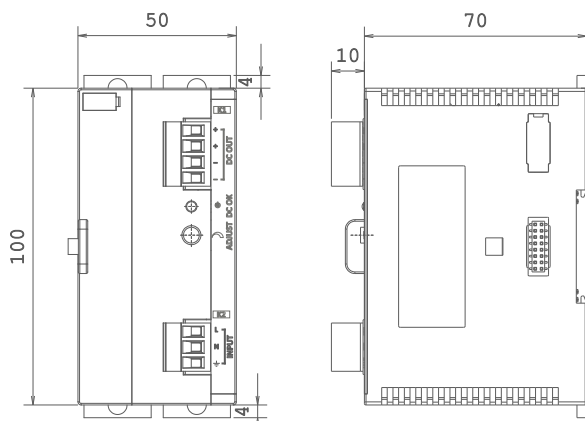
\* Internal supply to IPERTU PLC CPU and expansion modules  
 via IPERTU BUS structure.  
 (It should be installed on the far left of the devices)

IPERTU-MPS060-00-00-00-00\_1

General Specifications

<b>Supply</b>	
Efficiency	> 84%
Starting current	max 33A@230 Vac
<b>Output</b>	
Power	60W 2,5A@24Vdc
Ripple	300 mVpp max
<b>Environmental Conditions</b>	
Operating / Storage Temperature	-20°C...+50°C / -30°C...+75°C
Mounting Type	Rail Mounting

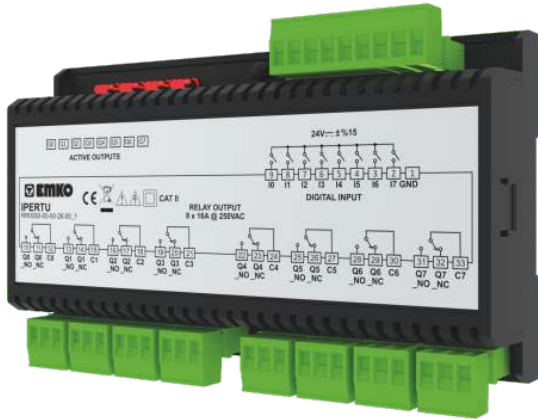
Dimensions





# IPERTU Relay Output Module

## 8x 16A-Relay Output Module



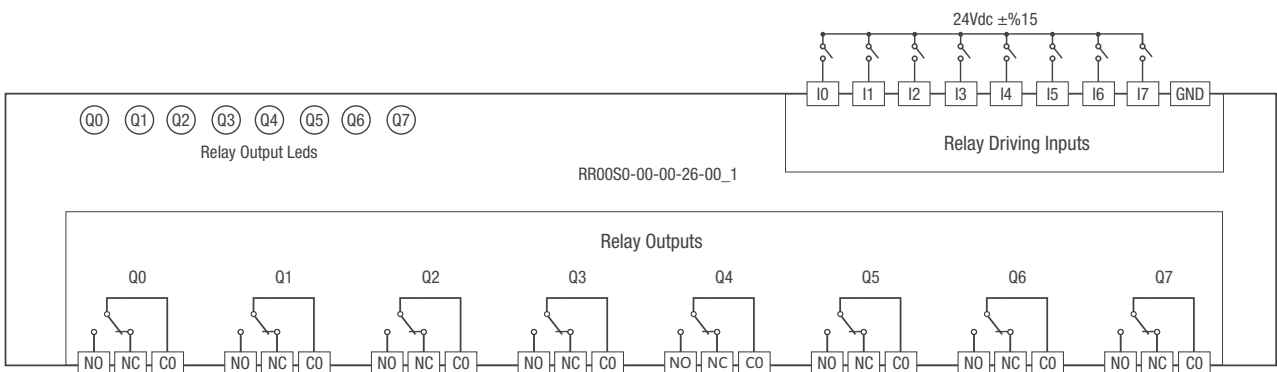
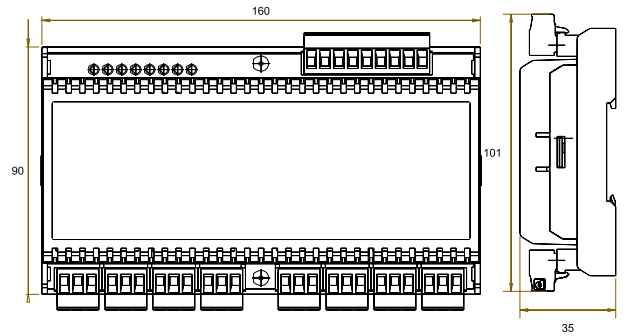
IPERTU-RR00S0-00-00-26-00\_1

- 8x Digital inputs,
- 8x NO/NC Relay output (16A@250Vac),
- 8x Relay active leds.

### General Specifications

<b>Inputs</b>	
Digital Inputs	8x Digital Inputs
<b>Outputs</b>	
Relay Outputs	8x (16A@250Vac)
<b>Environmental Conditions</b>	
Operating / Storage Temperature	-10°C...+60°C / -20°C...+70°C
Mounting Type	Rail Mounting

### Dimensions



### Product Codes

IPERTU Expansion Module	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication Port	PID - ON/OFF Control Form
RR00S0-00-00-26-00_1	8x Digital Inputs	-	-	8x	-	-	-



IPERTU I/O Modules Comparison Table

IPERTU Expansion Output Modules	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication	PID / ON-OFF Control Form
IPERTU-SMR1P1-00-01-21-00_1	-	4x Pt-100, Pt-1000, Cu-50, PTC, NTC, 0...50mV	-	4x (NO) 1,5A	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-03-21-00_1	-	2x Pt-100, Pt-1000, Cu-50, PTC, NTC, 0...50mV	-	4x (NO) 1,5A	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-01-04-00_1	-	4x Pt-100, Pt-1000, Cu-50, PTC, NTC, 0...50mV	4x Transistor	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-03-04-00_1	-	2x Pt-100, Pt-1000, Cu-50, PTC, NTC, 0...50mV	4x Transistor	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-20-21-00_1	-	4x 0/2...10Vdc, 0...2/5Vdc, 0/4...20mA	-	4x (NO) 1,5A	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-21-21-00_1	-	2x 0/2...10Vdc, 0...2/5Vdc, 0/4...20mA	-	4x (NO) 1,5A	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-20-04-00_1	-	4x 0/2...10Vdc, 0...2/5Vdc, 0/4...20mA	4x Transistor	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-21-04-00_1	-	2x 0/2...10Vdc, 0...2/5Vdc, 0/4...20mA	4x Transistor	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-10-04-00_1	-	4x TC (J, K, R, S, T, L,...)	4x Transistor	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-12-04-00_1	-	2x TC (J, K, R, S, T, L,...)	4x Transistor	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-30-04-00_1	-	1x Universal Input	4x Transistor	-	-	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-00-30-07-02_1	-	1x Universal Input	1x Transistor	-	1x (0...10Vdc, 0...20mA)	1x RS485 + 1x miniUSB 2.0	+
IPERTU-SMR1P1-03-00-20-00_1	8x	-	-	8x (NO) 1,5A	-	1x RS485 + 1x miniUSB 2.0	-
IPERTU-SMR1P1-03-00-02-00_1	8x	-	8x Transistor	-	-	1x RS485 + 1x miniUSB 2.0	-
IPERTU-SMR1P1-01-00-00-00_1	16x	-	-	-	-	1x RS485 + 1x miniUSB 2.0	-
IPERTU-SMR1P1-00-00-22-00_1	-	-	-	14x (NO) 1,5A	-	1x RS485 + 1x miniUSB 2.0	-
IPERTU-SMR1P1-00-00-01-00_1	-	-	15x Transistor	-	-	1x RS485 + 1x miniUSB 2.0	-



IPERTU I/O Modules Comparison Chart (with PLCBUS Communication)

IPERTU Expansion Output Modules	Digital Input	Analogue Input	Digital Output	Relay Output	Analogue Output	Communication	PID / ON-OFF Control Form
IPERTU-SMROPO-00-01-21-00_1	-	4x Pt-100, Pt-1000, Cu-50, PTC, NTC, 0...50mV	-	4x (NO) 1,5A	-	PLCBUS	+
IPERTU-SMROPO-00-03-21-00_1	-	2x Pt-100, Pt-1000, Cu-50, PTC, NTC, 0...50mV	-	4x (NO) 1,5A	-	PLCBUS	+
IPERTU-SMROPO-00-01-04-00_1	-	4x Pt-100, Pt-1000, Cu-50, PTC, NTC, 0...50mV	4x Transistor	-	-	PLCBUS	+
IPERTU-SMROPO-00-03-04-00_1	-	2x Pt-100, Pt-1000, Cu-50, PTC, NTC, 0...50mV	4x Transistor	-	-	PLCBUS	+
IPERTU-SMROPO-00-20-21-00_1	-	4x 0/2...10Vdc, 0...2/5Vdc, 0/4...20mA	-	4x (NO) 1,5A	-	PLCBUS	+
IPERTU-SMROPO-00-21-21-00_1	-	2x 0/2...10Vdc, 0...2/5Vdc, 0/4...20mA	-	4x (NO) 1,5A	-	PLCBUS	+
IPERTU-SMROPO-00-20-04-00_1	-	4x 0/2...10Vdc, 0...2/5Vdc, 0/4...20mA	4x Transistor	-	-	PLCBUS	+
IPERTU-SMROPO-00-21-04-00_1	-	2x 0/2...10Vdc, 0...2/5Vdc, 0/4...20mA	4x Transistor	-	-	PLCBUS	+
IPERTU-SMROPO-00-10-04-00_1	-	4x TC (J, K, R, S, T, L,...)	4x Transistor	-	-	PLCBUS	+
IPERTU-SMROPO-00-12-04-00_1	-	2x TC (J, K, R, S, T, L,...)	4x Transistor	-	-	PLCBUS	+
IPERTU-SMROPO-00-30-04-00_1	-	1x Universal Input	4x Transistor	-	-	PLCBUS	+
IPERTU-SMROPO-00-30-07-02_1	-	1x Universal Input	1x Transistor	-	1x (0...10Vdc, 0...20mA)	PLCBUS	+
IPERTU-SMROPO-03-00-20-00_1	8x	-	-	8x (NO) 1,5A	-	PLCBUS	-
IPERTU-SMROPO-03-00-02-00_1	8x	-	8x Transistor	-	-	PLCBUS	-
IPERTU-SMROPO-01-00-00-00_1	16x	-	-	-	-	PLCBUS	-
IPERTU-SMROPO-00-00-22-00_1	-	-	-	14x (NO) 1,5A	-	PLCBUS	-
IPERTU-SMROPO-00-00-01-00_1	-	-	15x Transistor	-	-	PLCBUS	-

Analogue Inputs					
Input Types	Scale (°C)	Scale (°F)	Input Types	Scale (°C)	Scale (°F)
Cu-50	-200...+200°C / 0,1°C	-328...+392°F / 0,1°F	V	0 ..... +10V/1mV	
PT-100	-200...+650°C / 0,1°C	-328...+1202°F / 0,1°F	V	2 ..... +10V/1mV	
PT-1000	-200...+650°C / 0,1°C	-328...+1202°F / 0,1°F	mA	0 ..... +20mA / $\mu$ A	
PTC	-50.....+150°C / 0,1°C	-58...+302°F / 0,1°F	mA	4 ..... +20mA / $\mu$ A	
NTC	-50.....+100°C / 0,1°C	-58...+212°F / 0,1°F	TC (J)	-200...+900°C / 0,1°C	-328...+1652°F / 0,1°F
mV	0 .....+50mV / 10 $\mu$ V		TC (K)	-200...+1300°C / 0,1°C	-328...+2372°F / 0,1°F
V	0 .....+2V / 1mV		TC (R)	0 .....+1700°C / 0,1°C	32 .....+3092°F / 0,1°F
V	0 .....+5V / 1mV		TC (S)	0 .....+1700°C / 0,1°C	32 .....+3092°F / 0,1°F
ADC Resolution			15 bit		
Input Impedance			V > 48 K $\Omega$	mA > 47 $\Omega$	Other ~ 15,4 M $\Omega$
Accuracy			% 0.2 (Full measuring range)		
Measuring Speed			Per channel 160msn		

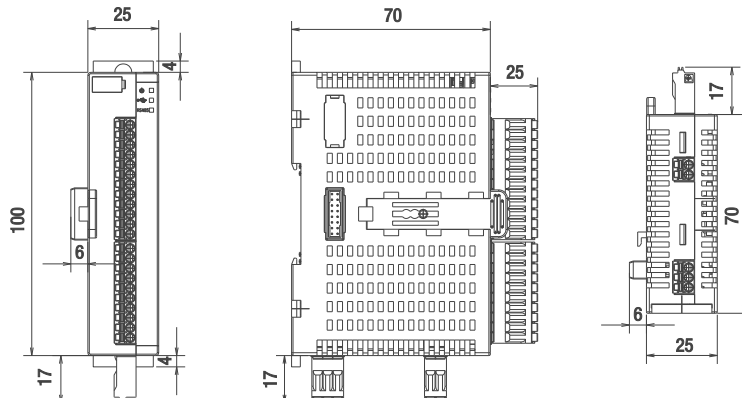
Digital Inputs	
Type / Rated Input Voltage	NPN-PNP / 24Vdc
Level	Low Level < 7Vdc, High Level > 10Vdc
Input Impedance	>5,9k $\Omega$
Maksimum Akım	6 mA
Response Time	20 $\mu$ sn
Measuring Speed	1-500msn filter option

Relay Outputs	
Relay Current	1,5A (Single channel)
Response Time	0'dan 1'e = 10 ms , 1'den 0'a = 5 ms

Digital Outputs	
Digital Output Current	0,3A (Single channel)
Transistor Supply	Externally 24Vdc supply
Response Time	~170 $\mu$ sn
Protection	Short circuit protection

Analogue Outputs	
Output Range	0-10V veya 0-20mA (Only one output caliber can be used at a time)
Accuracy	% 0.5 (Full measuring range)
Response Time	~ 200 ms

Dimensions





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