

Product Information

S7-Panel-PLC

PC351V

PC351P



(valid from version PC351x-xxx-**03**)

Changes to older versions of this document

Rev. 03 → **04**: Counter (available at PC351V/P from 3/2015 in combination with ConfigStage version 1.0.14.15)

Rev. 04 → **05**: new front foil, new images, new design line, connectors added

Rev. 05 → **06**: digital input threshold voltage and information for disposal of old equipment

Description

Panel-PLC with TFT-color touch display

- PC351V/P 3,5" TFT
(320x240 pixel / QVGA)

Standard configuration:

- 4 digital backreadable outputs 24V

INSEVIS-benefit DI/O:

Each single outputs can be switched off, so that you can realize different ratios of I/Os e.g. 1dI and 3dO or 3dI and 3dO. Only the total sum of I/Os must be ≤ 4 .

- 2 analog in- or outputs (software configurable)

Inputs:

- 0...10V, 0 (4)...20 mA
- 4...20 mA or +/- 20 mA for 4-wire-encoders

Outputs:

- 0...10V
- 0 (4)...20 mA

INSEVIS-benefit AI/O:

This module has an internal supply for the 2-wire encoders (4-20mA). So it is not necessary to care for external supply!

- **RS232 with**
 - free ASCII-protocol
 - **RS485 with**
 - free ASCII-protocol
 - Modbus RTU
 - with switchable terminate resistors for RS485
 - **Ethernet with**
 - RFC1006 (S7-connection with put/get)
 - Send/ Receive via TCP and UDP,
 - Modbus TCP
 - **CAN with**
 - protocol compatible to CANopen®
 - layer2-communication
 - with switchable terminate resistors for CAN
 - **Micro-SD-slot**
 - for SD-cards up to 8GByte
 - **Run/Stop-switch**
- Status LEDs** for Power, Battery, Error, Run
- Inserting stripes** for Logo and identification (thereby customized adaption possible easy)

optional configuration:

- (optional)
- Profibus DP-Master
- Profibus DP-Slave
- with switchable terminate resistors for Profibus

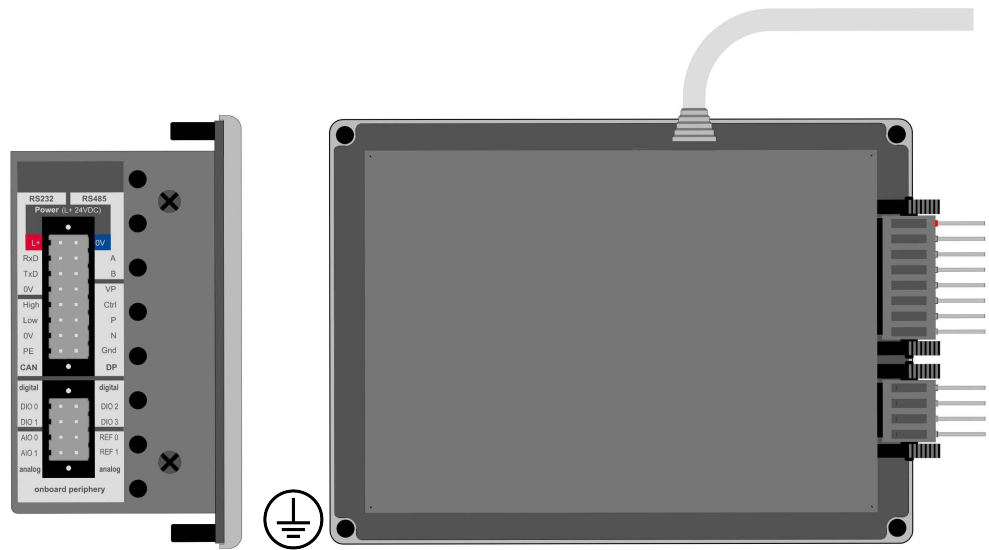
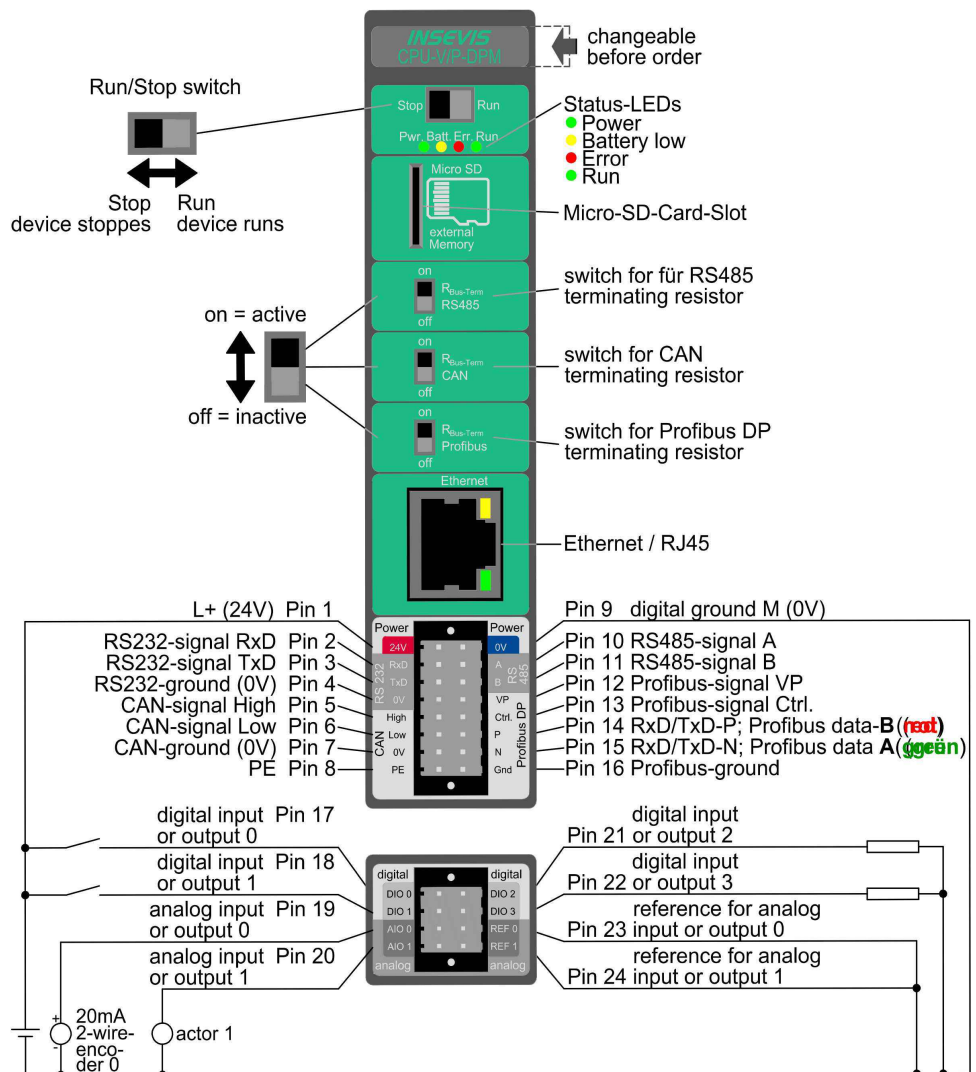


Figure above: Panel-PLC PC351V/P, rear view and view from the side



Sample: DIO 0+1 and AIO 0 as input, AIO 1 as output

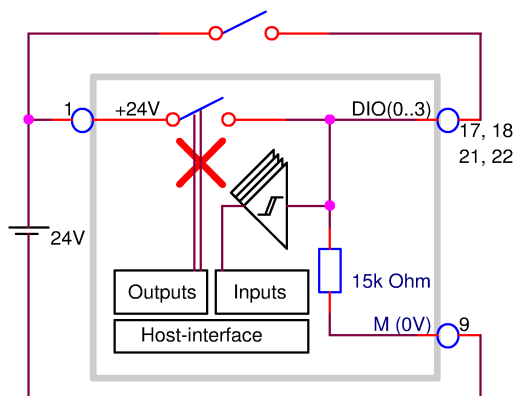
Sample: DIO2+3 as output

Figure above: Identification of CPU and onboard periphery of PC351V/P with Profibus DP Master

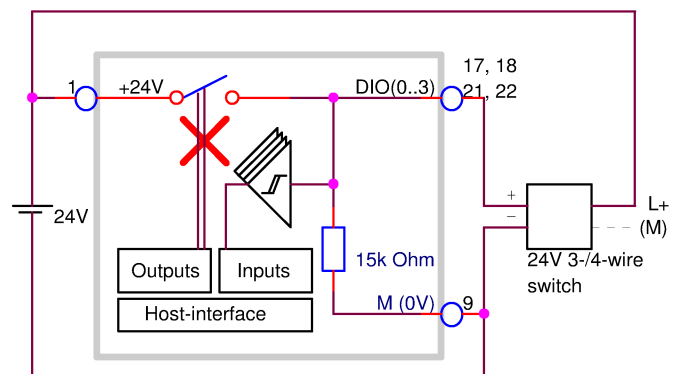
Technical data	Device	
Dimensions W x H x D (mm)	132 x 96 x 49	
Cut out W x H (mm)	118 x 89	
Weight	ca. 450 g	
Operating temperature range	-20°C ... +60°C (without condensation)	
Storage temperature range	-30°C ... +80°C	
IP-protection class	IP65	
front panel	IP41	
rear side		
Connection technology	connector with pin-marked pushers and 2 bolt flanges on side (cage clamp technology) for cross sections up to max. 1,5mm ²	
Load voltage L+	24V DC (11 V ... 30V DC)	
Current consumption	20 mA ... 350 mA	
Power dissipation	1,5 W (typ.), 4,2 W (max.)	
Start-up current	< 3A	
Diagonal of display (inch)	3,5" (89mm)	
Display resolution (pixel)	320x240 pixel (QVGA)	
Display unit	TFT display with 16Bit colours	
Operating unit	analog resistive touch screen	
Visualization software	VisuStage	
Reference unit	PC350	
Technical data	CPUs	
CPU-type	Type V (PC350V)	Type P (PC350P)
Working memory = battery backed load memory	512kB, thereof 256 kByte remanent data	640kB, thereof 384 kByte remanent data
Diagnostic buffer	100 messages (all remanent)	100 messages (all remanent)
Flash		
internal - for visualization	4 MByte	24 MByte
external memory	Micro SD, up to max. 8 GByte	Micro SD, up to max. 8 GByte
OB, FC, FB, DB	each 1.024	
Local data	32kByte (2kByte per block)	
Number of in- and outputs	in each case 2.048 Byte (16.384 Bit) adressable	
Process image	in each case 2.048 Byte (default set is 128 Byte)	
Number of Merkerbytes	2.048 (remanence adjustable, default set is 0..15)	
Number of Taktmerker	8 (1 Merkerbyte)	
Number of timer, counter	in each case 256 (each remanence adjustable, default set is 0)	
Depth of nesting	up to 16 code blocks	
Real-time clock	yes (accumulator-backed hardware clock)	
elapsed hour counter	1 (32Bit, resolution 1h)	
Program language	STEP 7® - AWL, KOP, FUP, S7-SCL, S7-Graph from SIEMENS	
Program system	SIMATIC® Manager from SIEMENS or compatible products	
Operating system	compatible to S7-300® from Siemens	
Program unit to reference	CPU 315-2DP/PN (6ES7 315-2EH14-0AB0 and firmware V3.1 Siemens)	
Serial interfaces (protocols)	COM1: RS 232 (free ASCII) COM2: RS 485 (free ASCII, Modbus-RTU)	
Ethernet (protocols)	Ethernet: 10/100 Mbit with CP343 functionality (RFC1006, TCP, UDP, Modbus-TCP)	
CAN (protocols)	CAN-Telegrams (Layer 2), compatible to CANopen® Master 10 kBaud ... 1 MBaud	
Profibus (protocols)	Profibus DP V0 master/ slave 9,6kBaud ... 12 MBaud	
Decentral periphery	- INSEVIS- Periphery (with automatic configuration via „ConfigStage“) - all CANopen® Slaves according to DS401 - all Profibus DP-V0-Slaves - diverse external periphery families	

Technical data	digital in-/ outputs		
Load voltage L+ Power dissipation	24V DC (10 V ... 30 V DC) internal limited	Wire length unshielded (max.) shielded (max.)	30 m 100 m
Digital in-/ outputs	4 outputs (each with backreadable input)	Outputs: Input delay Output delay Inputs: Input delay Output delay	50 μ s (typ.) 30 μ s (typ., without load) 25 μ s
Diagnostic LEDs	none		
Output current for signal 0 for signal 1	0,5 mA (max.) 0,5 A (max. to 60°C)	Max. switching frequency of outputs	100 Hz with ohmic load
Cumulated current	2 A (max. to 60°C)	Counter	2 counter with gate function or 2 incremental encoder
		Total frequency limit (Number of impulses of all 4 counting signals / s)	10 kHz
Broken wire detection Error diagnostic Potential separation to PLC	no no	Signal level of outputs for signal 0 for signal 1 Signal level of inputs for signal 0 for signal 1	1,0 V at 500 Ω (max.) L+ - 1,0 V at 0,5 A load (min.) 0V ... +5 V +10,5V ... +30 V

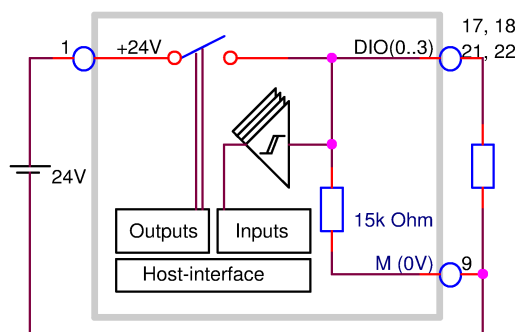
Block diagrams for digital in-/ outputs



Block diagram of digital I/Os as input for 2-wire-encoders



Block diagram of digital I/Os as input for 3/4-wire-encoders



Block diagram of digital I/Os as backreadable output

General	
Input start address:	0
Input end address:	31
Output start address:	0
Output end address:	31
Digital	
Input address:	8
Output address:	8
Disable the output	
Channel 0.0	<input type="checkbox"/>
Channel 0.1	<input type="checkbox"/>
Channel 0.2	<input type="checkbox"/>
Channel 0.3	<input type="checkbox"/>

Configuration block of start-/ end addresses
(in Byte) and I/O parameterizing in the ConfigStage

Configuration of the onboard counter inputs

Available at PC351V/P from 3/2015 in combination with ConfigStage version 1.0.14.15

Counter 1 (settings by ConfigStage)

Configuration „counting forward (up)“

→ rising edges will be counted at DI 0.0

Configuration „counting for- / backwards (down)“

→ rising edges will be counted at DI 0.0 and

→ DI 0.1 is used as direction bit (0=backwards, 1=forward)

Configuration „Encoder“

→ DI 0.0/ 0.1 with quadruple evaluation

Counter	
	Configuration
Channel 1:	Count up
Channel 2:	Disabled
	Count up
	Up/Down (Pulse/Dir)
	Encoder (x4)

Counter 2 (settings by ConfigStage)

Configuration „counting forward (up)“

→ rising edges will be counted at DI 0.2

Configuration „counting for- / backwards (down)“

→ rising edges will be counted at DI 0.2 and

→ DI 0.3 is used as direction bit (0=backwards, 1=forward)

Configuration „Encoder“

→ DI 0.2/ 0.3 with quadruple evaluation

Counter	
	Configuration
Channel 1:	Count up
Channel 2:	Disabled
	Count up
	Up/Down (Pulse/Dir)
	Encoder (x4)

Hints for usage of the onboard counter inputs

- read in counter by reading of ED16 / ED20 (synchronous to control point)
- set counter by writing to PAD16 / PAD20 (by direct periphery access only)
- this configuration can be modified in runtime with Step7 too:

Configuration word for counter 1 is PAW24

Configuration word for counter 2 is PAW28

“inactive”	0x00
“counting forward / up”	0x01
“for- / backward (pulse, direction)”	0x02
“encoder (x4)”	0x03

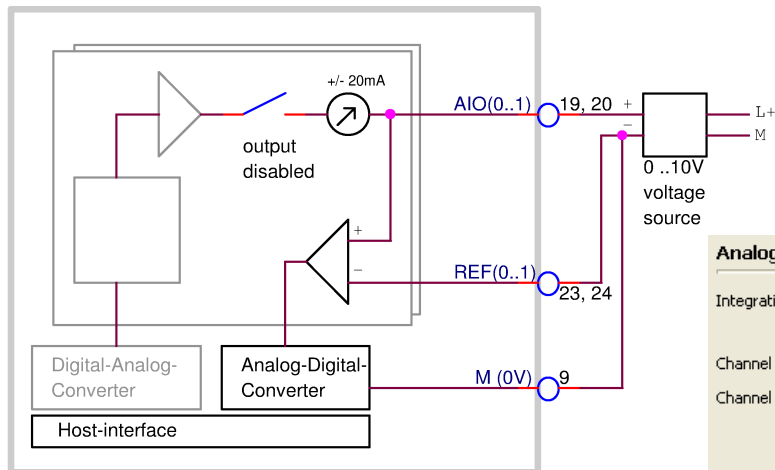
- all addresses are specified as offset relating to the configured start address

Technical data		analog in-/ outputs	
Load voltage L+	24V DC (17 V ... 30 V DC) connected by device supply	Wire length unshielded (max.) shielded (max.)	30 m 100 m
Analog inputs	2 (alternatively to outputs what is to be configured by software)	Valid voltage between inputs and A-GND (max.)	-1 V ... +24 V DC
Input areas	±20 mA, 4...20 mA, 0...10 V		
Diagnostic LEDs	4 green: signal in valid area 4 red: override or saturation no displaying broken wires and open inputs	Error message during override metering area	adjustable diagnosis- and limit value alert on request
Value number format	9400 ... 6C00 (hexadecimal) for range ± 20 mA all other 0000 ... 6C00 (hexadecimal)	Broken wire detection	by overrun / shortfall of metering area
Override area	20 mA ... 22 mA 10V ... 11,3 V	Access of sensor	unsymmetric against A-GND (single ended)
Input resistance	0Ω (typ.) for metering area current 1MΩ (typ.) for metering area voltage	Metering principle / conversion principle Resolution	successive approximation 12 Bit
Sampling cycle time = Integration time	adjustable 1ms ... 35767 ms default: 100 ms (=line frequency filter 50Hz and 60Hz)	Specifity (based on input area)	< 1%
Analog outputs	2 (alternatively to inputs what is to be configured by software)	Value number format	0000 ... 6C00 (hexadecimal)
Output area (nominal values)	0(4)...20mA, 0...10V		
Resolution	12 Bit	Short cut protection	yes
Diagnostic LEDs	none	Override area	20 ... 23 mA 10 ... 11,3 V
Setting time: response time τ (typ)	1,5 ms	Short cut current (typ.)	20 mA (at 10V) 32 mA (at mA)
Load resistance against A-GND	mA: 500 Ω (max.) V: 1 kΩ (min.)	Specifity (based on output area)	< 1%

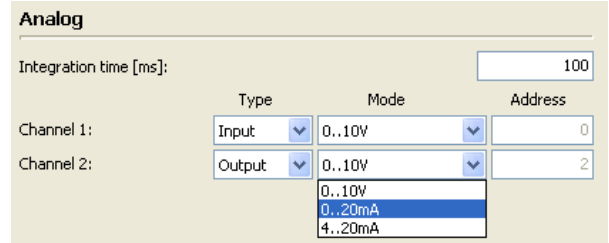
Configuration of the process image Module allocates 16 word process data input and output.

Offset	I/O	Function	Description
0,2	I	Input AI0..AI1	Measuring range according to configuration
4,6	I	Reserved	
0,2	O	Output AO0..AO1	Measuring range according to configuration
4,6	O	Reserved	
8	I	Digital inputs .0 to .3	(Byte-access)
8	O	Digital outputs .0 to .3	(Byte-access)
10, 12,14	I/O	reserved	
16, 20	<u>I/O</u>	Counter 0 and 1	Counter value (DINT, DWORD access)
24,...31	I/O	Counter parameter	Configured by ConfigStage or FC's

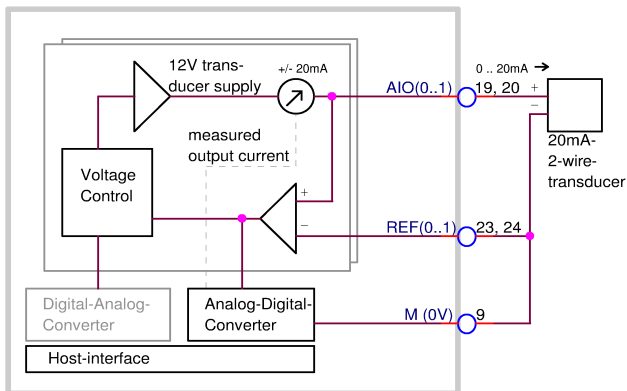
Block diagrams for analog in-/ outputs



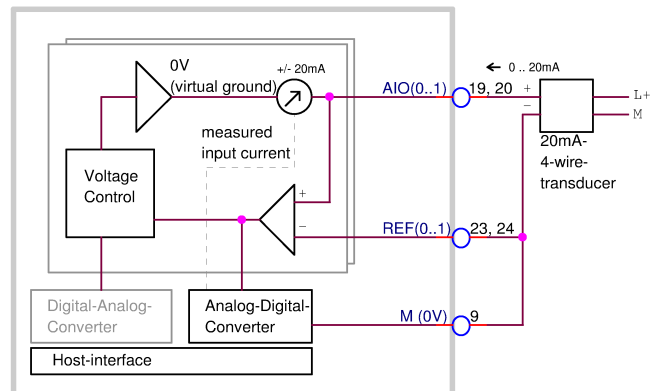
Block diagram for analog inputs for 0 .. 10 V



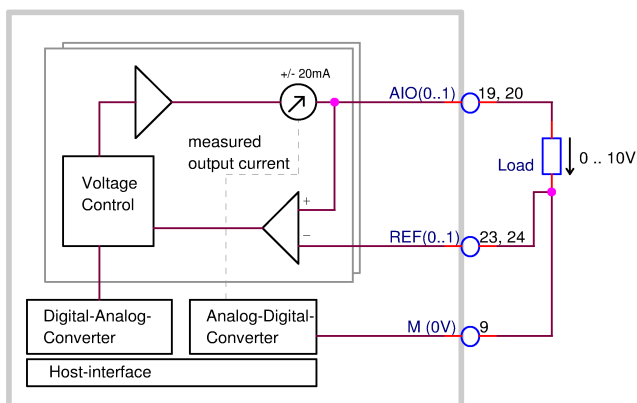
Configuration block of I/O-parameterizing in the ConfigStage



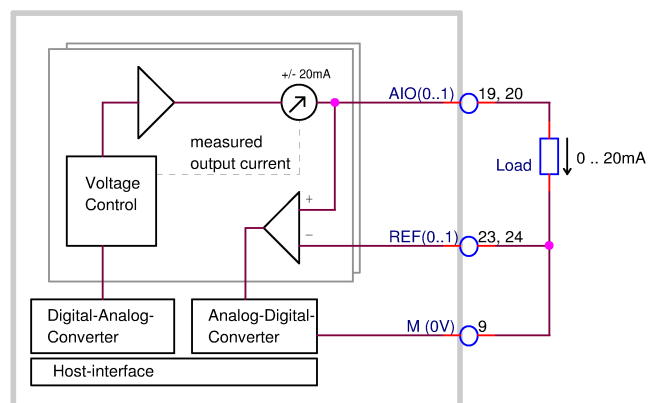
Block diagram for analog inputs for 20 mA with 2-wire-encoder



Block diagram for analog inputs for 20 mA with 3/4-wire-encoder



Block diagram for analog outputs for 10 V



Block diagram for analog outputs for 20 mA

Control panel cut out

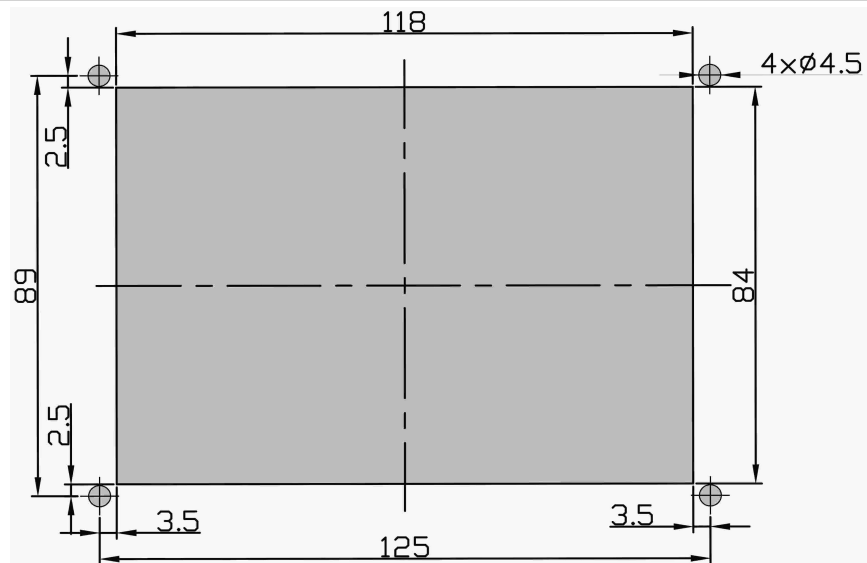
Dimensions

Cut out
W x H (mm) 118 x 84
4 holes with D 4,5mm

Mounting depth
ca. 49mm max.

Wiring outlet

- RJ45 to the top
- 2x16 connector to the right (rear view and horizontal mounting)
- RJ45 to the right
 - 2x16 connector to the bottom (rear view and vertical mounting)



Drill jig

An 1:1 pattern as drill jig is available as PDF at INSEVIS web site for this product
Print it 1:1 and use it for marking the cut out.

Ordering data devices

Identification	Standard	with Profibus DP Master	with Profibus DP Slave
S7-Panel-PLC PC351V	PC351V-0-03	PC351V-DPM-03	PC351V-DPS-03
S7-Panel-PLC PC351P	PC351P-0-03	PC351P-DPM-03	PC351P-DPS-03

Ordering data of accessoires

Identification / Order-No.	Identification / Order-No.
Connector 2x8pin (bolt flanges) / E-CONS16-00	Micro SD-card 2GB (external memory) / E-MSD2-00
Connector 2x4pin (for periphery) / E-CON09-00	Micro SD-card 4GB (external memory) / E-MSD4-00
Profibus-adapter for 12MBaud-nets / E-AD-DP12	Micro SD-card 8GB (external memory) / E-MSD8-00

Qualified personnel

All devices described in this manual may only be used, built up and operated together with this documentation. Installation, initiation and operation of these devices might only be done by instructed personnel with certified skills, who can prove their ability to install and initiate electrical and mechanical devices, systems and current circuits in a generally accepted and admitted standard.

Manuals, sample programs

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