INSEVIS
for independent minds

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 teminate 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 teminate resistors for CAN
- **Micro-SD-slot**
  - for SD-cards up to 8GByte
- **Run/Stop-switch**

Staus 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 teminate resistors for Profibus

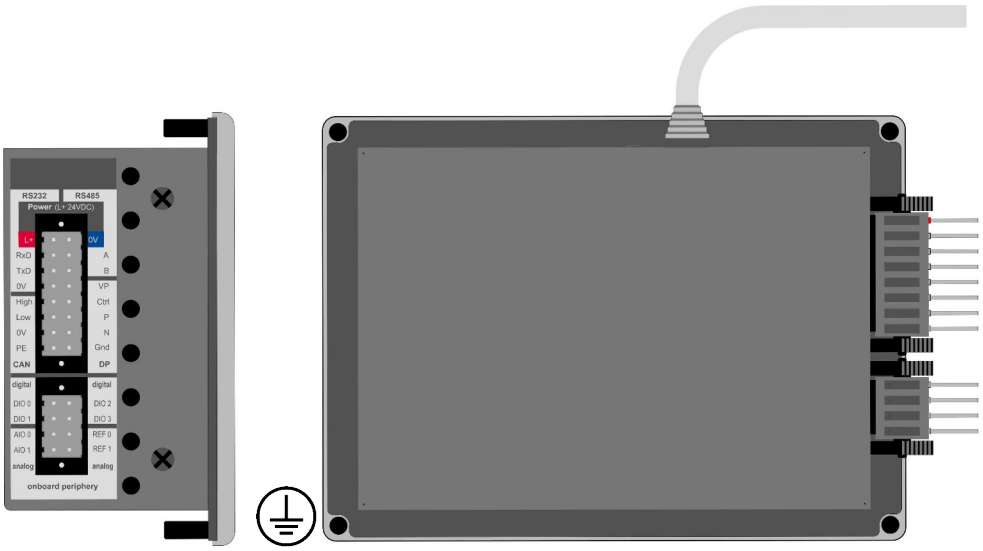


Figure above: Panel-PLC PC351V/P, rear view and view from the side

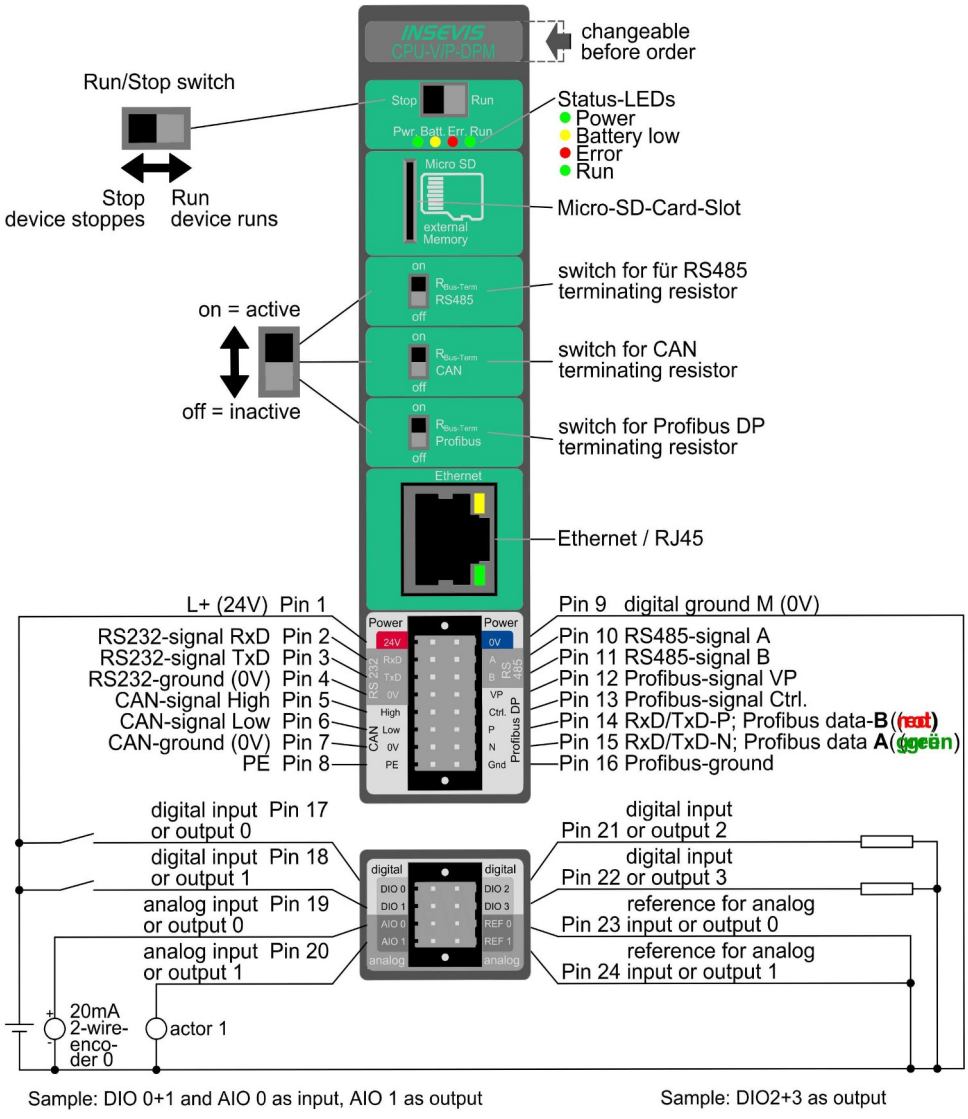


Figure above: Identification of CPU and onboard periphery of PC351V/P with Profibus DP Master

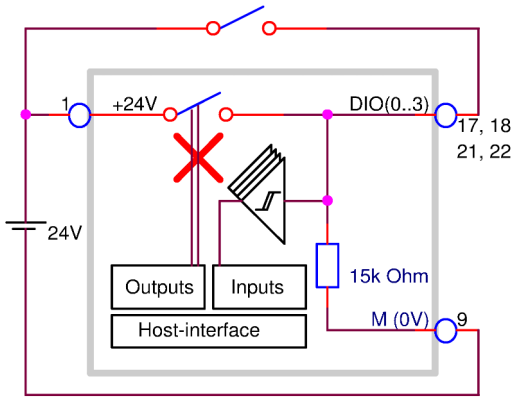
Technical data	Device
Dimensions W x H x D (mm) Cut out W x H (mm) Weight	132 x 96 x 49 118 x 89 ca. 450 g
Operating temperature range Storage temperature range	-20°C ... +60°C (without condensation) -30°C ... +80°C
IP-protection class front panel rear side	 IP65 IP41
Connection technology	connector 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 Power dissipation	20 mA ... 350 mA 1,5 W (typ.), 4,2 W (max.)
Start-up current	< 3A
Diagonal of display (inch) Display resolution (pixel)	3,5“ (89mm) 320x240 pixel (QVGA)
Display unit Operating unit	TFT display with 16Bit colours analog resisitive touch screen
Visualization software Reference unit	VisuStage PC350

Technical data	CPUs	
CPU-type	**Type V** (PC350**V**)	**Type P** (PC350**P**)
Working memory = battery backed load memory Diagnostic buffer	512kB, thereof 256 kByte remanent data 100 messages (all remanent)	640kB, thereof 384 kByte remanent data 100 messages (all remanent)
Flash internal - for visualization external memory	 4 MByte Micro SD, up to max. 8 GByte	 24 MByte Micro SD, up to max. 8 GByte
OB, FC, FB, DB Local data Number of in- and outputs Process image Number of Merkerbytes Number of Taktmerker Number of timer, counter Depth of nesting	each 1.024 32kByte (2kByte per block) in each case 2.048 Byte (16.384 Bit) adressable in each case 2.048 Byte (default set is 128 Byte) 2.048 (remanence adjustable, default set is 0..15) 8 (1 Merkerbyte) in each case 256 (each remanence adjustable, default set is 0) up to 16 code blocks	
Real-time clock elapsed hour counter	yes (accumulator-backed hardware clock) 1 (32Bit, resolution 1h)	
Program language Program system	STEP 7® - AWL, KOP, FUP, S7-SCL, S7-Graph from SIEMENS SIMATIC® Manager from SIEMENS or compatible products	
Operating system Program unit to reference	compatible to S7-300® from Siemens 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	

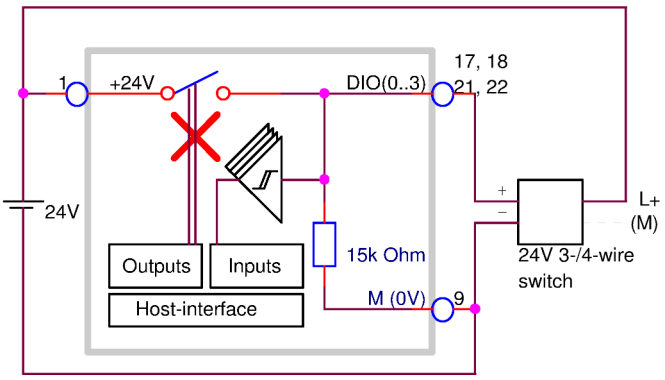
Decentral periphery	- INSEVIS- Periphery (with automatic configuration via „ConfigStage“) - all CANopen® Slaves according to DS401 - all Profibus DP-V0-Slaves - diverse external periphery families

Technical data	digital in-/ outputs		
Load voltage L+ Power dissapation	24V DC (10 V ... 30 V DC) internal limited	Wire length unshielded (max.) shielded (max.)	 30 m 100 m
Digital in-/ outputs Diagnostic LEDs	4 outputs (each with backreadable input) none	Outputs: Input delay Output delay Inputs: Input delay Output delay	 50 µs (typ.) 30 µs (typ., without load) 25µs
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 Total frequency limit (Number of impulses of all 4 counting signals / s)	2 counter with gate function or 2 incremental encoder 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

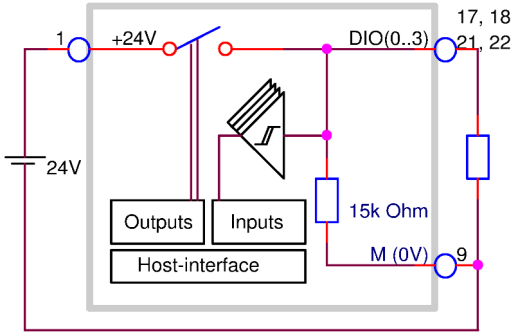
Block diagrams for digital in-/ outputs



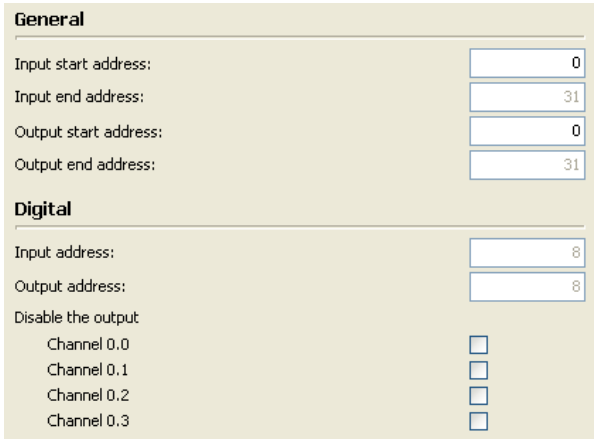
Block diagram of digital I/Os as input for 2-wire-encoders



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



Block diagram of digital I/Os as backreadable output



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

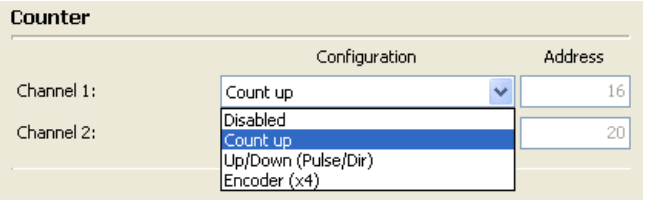
Counter 1 (settings by ConfigStage)

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



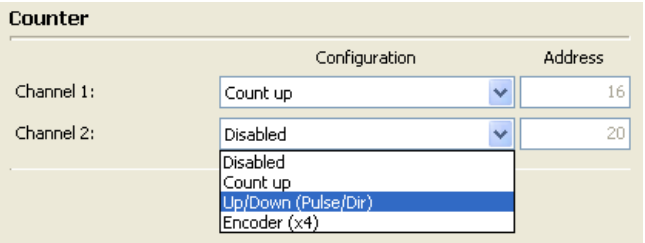
Counter 2 (settings by ConfigStage)

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



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 modyfied in runtime with Step7 too:

Configuration word for counter 1 is PAW24
Configuration word for counter 2 is PAW28

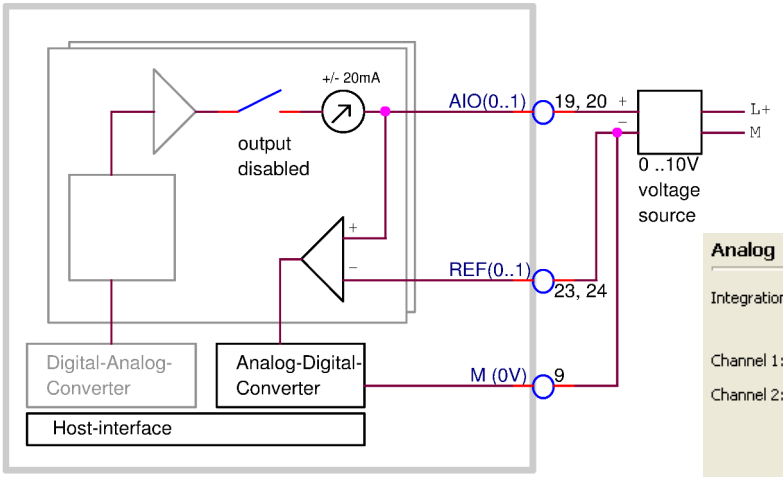
“inactive”	0x00
“counting forward / up”	0x01
“for- / backward (pulse, direction)”	0x02
“encoder (x4)”	0x03

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

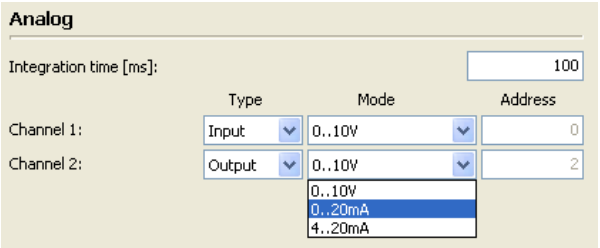
Technical data	analog in-/ outputs		
Load voltage L+	24V DC (17 V ... 30 V DC) connected by device supply	Wire length unshielded (max.) shielded (max.)	 30 m 100 m
Analog inputs Input areas	2 (alternatively to outputs what is to be configured by software) ±20 mA, 4...20 mA, 0..10 V	Valid voltage between inputs and A-GND (max.)	-1 V ... +24 V DC
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 Output area (nominal values)	2 (alternatively to inputs what is to be configured by software) 0(4)...20mA, 0...10V	Value number format	0000 ... 6C00 (hexadecimal)
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	I/O	Counter 0 and 1	Counter value (DINT, DWORD access)
24,..31	I/O	Counter parameter	Configured by ConfigStage or FC's

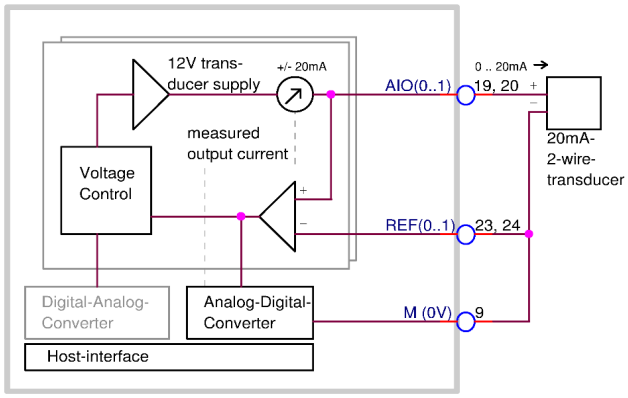
Block diagrams for analog in-/ outputs



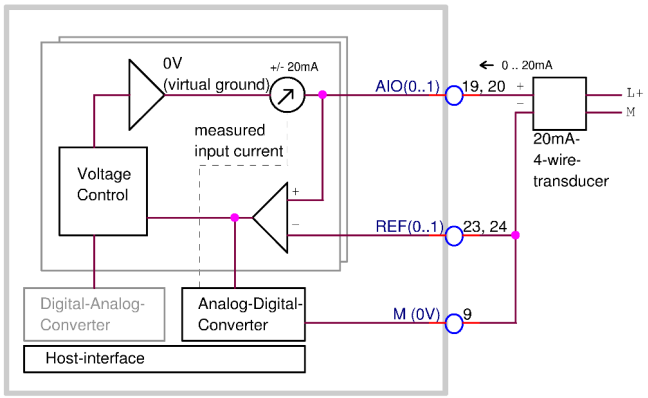
Block diagram for analog inputs for 0 .. 10 V



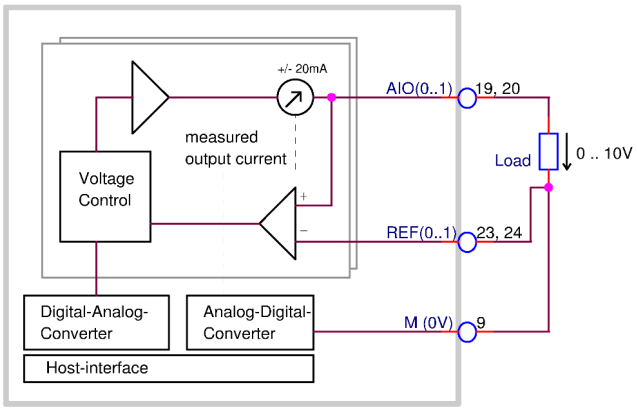
Configuration block of I/O-parameterizing in the ConfigStage



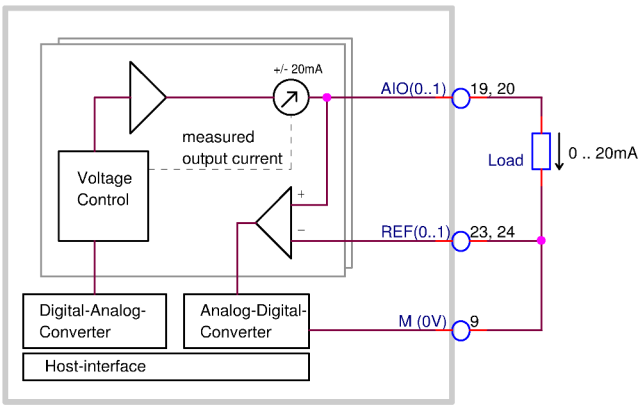
Block diagram for analog inputs for 20 mA with 2-wire-encoder



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

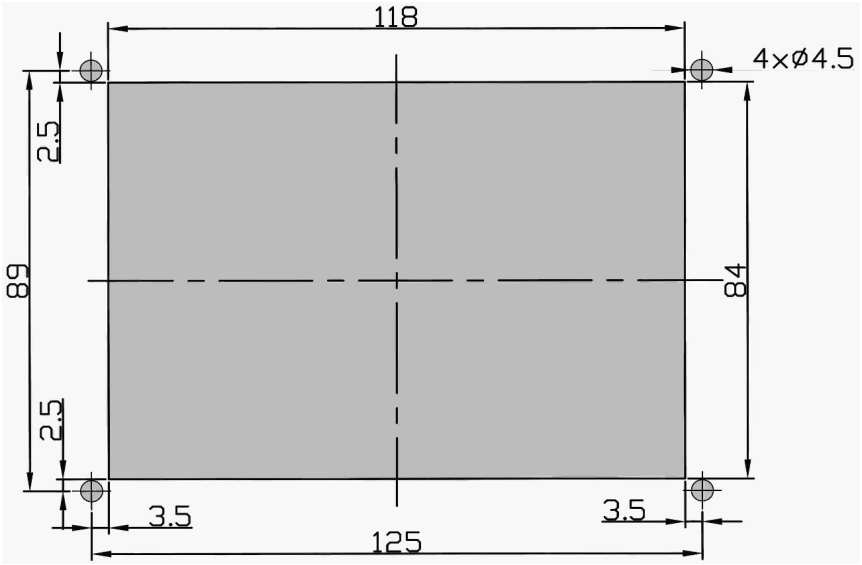
Control panel cut out

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 buttom (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
Additional documentation by manuals is available as well sample applications at the download area of www.insevis.com in English language for free download.

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Disposal
Do not throw old appliances in the household waste! In the interest of environmental protection, old appliances must be collected separately from unsorted municipal waste. You can find out more about the proper disposal / return of your old appliance at www.insevis.com/disposal.
Attention: The deletion of personal data on the old devices to be disposed of is the responsibility of the end user.

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