# Product information

# S7-Panel-PLC

# PC1561T



-image of PC1561T-0-02



(valid from PLC-version PC1011T-0-**02**)

**Rev. 01 → 02:** Pin 33 corrected

## Description

### S7-Panel-PLC with

- 15,6" TFT Display
  (1366x768 Pixel)
- resistive Touch
  front protection class IP65)

### Standard configuration:

**RS232 with**
- free ASCII-Protokoll

**RS485 with**
- free ASCII protocol
- Modbus RTU
- with switchable terminate
  resistors for RS485

**2x Ethernet (as switch
  or separated) with**
- S7-connection (Put/Get)
- Send/ Receive via
  TCP and UDP,
- Modbus TCP

**CAN**
- protocol compatible to
  - CANopen®
  - Layer2 communication
- with switchable terminate
  resistors for RS485

**Micro-SD-card slot**
- for SD-cards up to
  8GByte

**Run/Stop switch**

**State LEDs** for
  Power, Battery, Error, Run

**Onboard-Periphery**
**12 digital I/Os**
 thereof 2 PWM-Outputs
 thereof 2 PushPull-Outputs
**12 digital Inputs´s**
 thereof 2 Counters 1kHz
 thereof 2 Counters 100kHz
**3 analog I/O's**
 ((switchable per channel as
 input/output and for U / I)
**3 analog Inputs**
(customizable as
RTD/ U/ I/ TC/ DMS)

**Inserting stripes**
- for Logo and identification
  (thereby customized
  adaption possible easy)

### Scope of delivery:
- Mounting kit with
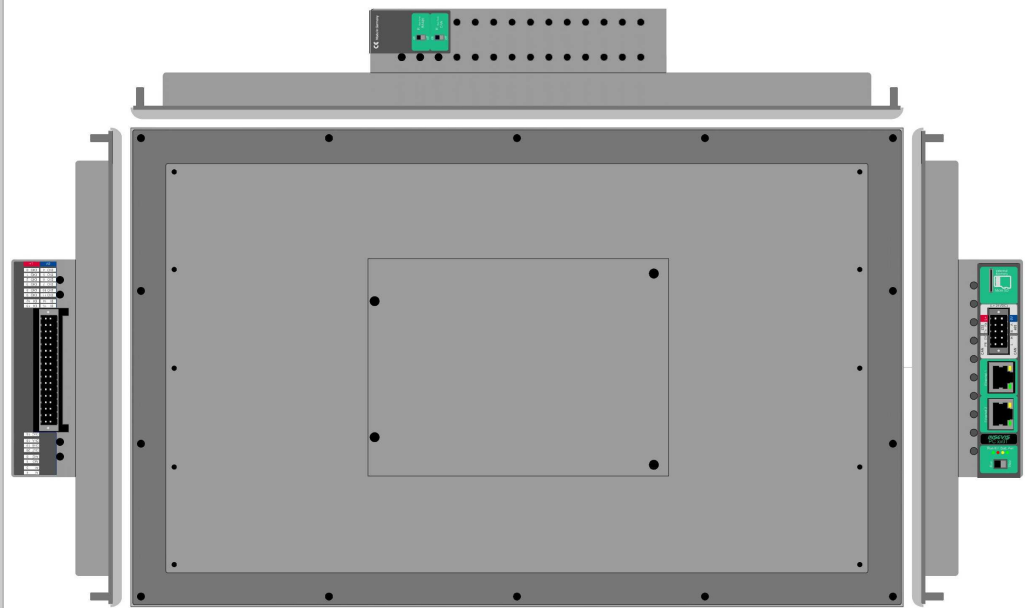  grounding terminal i
- Technical data sheet



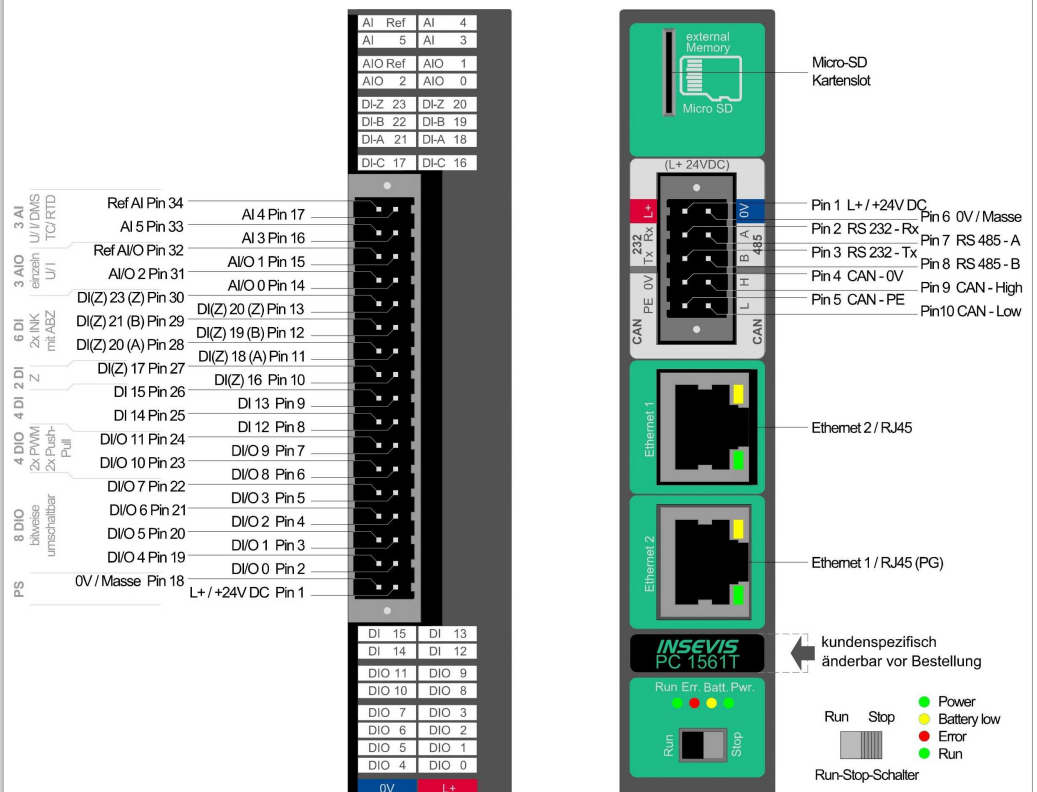*Figure above: View to rear side and connections sides of PC1561T- (horizontal use)*



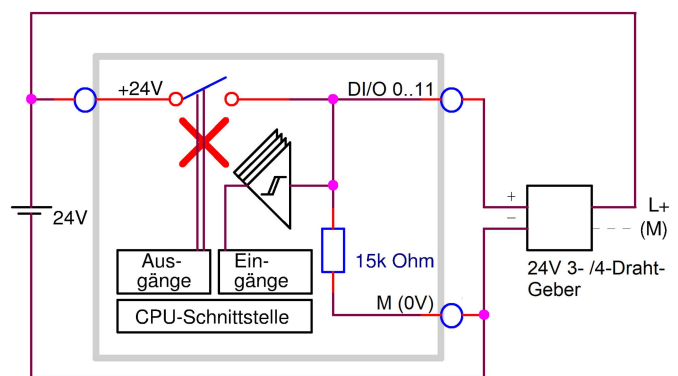*Figure Above: CPU and Periphery connectors of Panel-PLC PC1561T*

## Technical data

| | |
|---|---|
| Dimensions W x H x D (mm)<br><br>Cut out W x H (mm) / Weight | 420 x 260x 59<br>387 x 228<br>ca. 1400 g |
| Operating temperature range<br>Storage temperature range | -20°C ... +60°C (ohne Betauung)<br>-30°C ... +80°C |
| IP-protection class<br>    front panel<br>    rear side | frontseitig IP65<br>rückseitig IP41 |
| Connection technology | lösbare Steckverbinder mit 2 seitlichen Schraubflanschen,<br>Zugfederkontakt für Querschnitte max. 1,5mm², maximale Leitungslänge 30m |
| Load voltage L+ | 24V DC (11 V ... 30V DC) |
| Current consumption<br>Power dissipation | 400mA ??? |
| Start-up current | < 3A |
| Diagonal of display (inch)<br>Display resolution (pixel) | 10,1" (258mm)<br>1024x600 Pixel (16:9) |
| Display unit<br>Operating unit | TFT Display mit 16Bit Farben<br>analog resistive Touchscreen |
| Visualization tool<br>unit to reference there | VisuStage<br>PC156xT |

## Technical data — CPU

| | |
|---|---|
| CPU-Type | **Type T** (PC1561**T**) |
| Working memory = battery<br>backed load memory<br>Diagnostic buffer | 1MB 512 kByte remanent<br>8MB<br>100 entries (all remanent) |
| Flash<br>  internal - for visualization<br>  external memory | 48 MByte<br>Micro SD, up to max. 8 GByte (not necessary for S7-program, only for archiving) |
| OB, FC, FB, DB<br>Lokal data<br>Number of in- and outputs<br>Process image<br>Number of Merkerbytes<br>Number of Taktmerker<br>Number of timer, counter<br>Depth of nesting | each 2.048<br>32kByte (2kByte per block)<br>in each case 4.096 Byte (32.769 Bit) addressable<br>in each case 4.096 Byte (default set is 128 Byte)<br>4.096 (remanence adjustable, default set is 0..15)<br>8 (1 Merkerbyte)<br>in each case 512 (each remanence adjustable, default set is 0)<br>up to 16 code blocks |
| Real-time clock<br>elapsed hour counter | yes (accumulator-backed hardware clock)<br>1 (32Bit, resolution 1h) |
| Program language<br>Program system | STEP 7® - AWL, KOP, FUP, S7-SCL, S7-Graph from Siemens<br>SIMATIC® Manager from Siemens or products compatible to it |
| Operating system<br>Program unit to reference | compatible to S7-300® from Siemens<br>CPU 315-2DP/PN (6ES7 315-2EH14-0AB0 and firmware V3.1 Siemens) |
| Serial interfaces<br>(protocols) | COM1: RS 232 (free ASCII)<br>COM2: RS 485 (free ASCII, Modbus-RTU) |
| Ethernet<br>(protocols) | 2x Ethernet: (switch or separated ports):<br>10/100 MBit with parts of CP343 functionality<br>(RFC1006, TCP, UDP, Modbus-TCP) |
| CAN<br>(protocols) | CAN-telegrams (Layer 2), compatible to CANopen®<br>master 10 kBaud ... 1 MBaud |
| Onboard periphery | 12 dI/O, 12 dI (Z), 3 a/I/O (U/ I), 3 aI (U/ I/ RTD/ TC/ DMS) |
| Decentral periphery | - INSEVIS- periphery (with automatic configuration via „ConfigStage")<br>- diverse external periphery families (Modbus RTU/TCP, CAN)<br>- all CANopen® slaves according to DS401<br>- all Profinet IO devices |

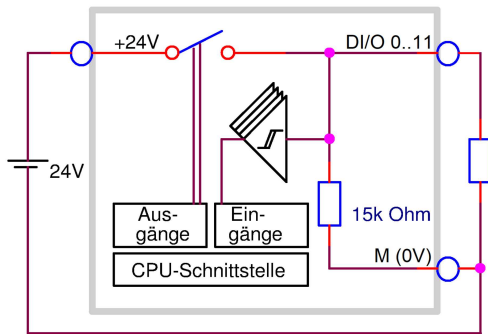| Technical data | digital Inputs/Outputs | | |
|---|---|---|---|
| Load voltage L+<br>Current consumption<br>Power loss | 10 V ... 30 V DC<br>10 mA (without load)<br>internally limited | Cable length<br>   - unshielded (max.)<br><br>   - shielded (max.) | 30 m<br>100 m |
| Digital inputs/outputs<br><br>Diagnostic LEDs | 8 outputs<br>(each with read-back input)<br><br>none | Outputs:<br>Switch-on delay<br>Switch-off delay<br>Inputs:<br>Switch-on delay<br>Switch-off delay | 50 µs (type.)<br>30 µs (typ., without load)<br><br>1,5 ms<br>4,5 ms |
| Digital inputs /<br>Digital push-pull outputs | 2x2 push-pull outputs<br>(can be switched off in pairs)<br>(each with read-back input) | Function of the<br>push-pull outputs | output<br>PWM (0..100%)<br>PWM + direction bit<br>(0 .. +/- 100% |
| Output current<br>   for signal 0<br>   for signal 1<br>Input current<br>   for signal 1 | 0,5 mA (max.)<br>0,5 A (max. up to 60°C)<br><br>1 mA (type) | Max. switching frequency<br>of the outputs | 100 Hz (with resistive load) |
| Signal level of the outputs<br>   for signal 0<br>   for signal 1<br>Input voltage<br>   for signal 0<br>   for signal 1 | 1,0 V at 500 Ω (max.)<br>L+ - 1,0 V at 0,5 A load (min.)<br><br>0V ... +5 V<br>+10,5V ... +30 V | Max. switching frequency<br>of the push/pull PWM outputs | 50 kHz (with resistive load) |
| Function slower counter | 2 up counters<br>16 bit optionally as<br>counter value or frequency [Hz] | Function fast counters | 2 counters<br>16 bit<br>Incremental encoder 4-fold<br>or up-counter<br>Optionally with zero-track reference<br>function |
| max. frequency<br>slow counter | 1 kHz | max. frequency at input pins<br>high-speed counters | 100 kHz |
| Open-circuit monitoring,<br>fault diagnosis<br>Potential isolation to the PLC | no<br>no | Total current | 2 A (max. up to 60°C) |

## Block diagrams digital inputs/outputs
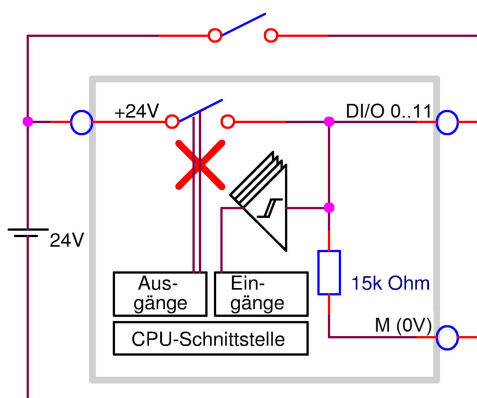


Block diagram of the DIOs only as input for 2-wire encoders

Block diagram of the DIOs for 3-/4-wire encoders

*Block diagram of the DIOs as read-back output*



*Configuration block start/end addresses (in bytes)
and I/O assignment in the ConfigStage*

## Configuration of the PWM outputs

**Push-pull outputs or PWM
(setting via ConfigStage)**
Channel 1.0/1.1 and 1.2/1.3 in pairs

Configuration **"Input"**
→ both outputs deactivated

Configuration "**Input/Output**"
→ 2 read-back outputs
(active high AND low switching !)

Configuration **"PWM uni"**
→ Channel 1.0 or 1.2 deactivated as bit
Set value of the PWM duty cycle
in the specified output word,
Specification of the frequency constant
→ Channel 1.1 or 1.3 as output (can be read back)

Configuration „**PWM bidir**"
→ Channel 1.0 or 1.2 as uni, but setpoint with sign
→ Channel 1.1 or 1.3 as direction bit (= sign)



## Configuration of the counter inputs

**Slow counters
(setting via ConfigStage)**

Configuration **"Input"**
→ Channel 2.0 or 2.1 are normal inputs,
   Counter is switched off
Configuration **"counting up"**
→ On channel 2.0 or 2.1, rising edges are
counted
  Address of the counter word and the reset bit are displayed
  (input bit switched off)

"**Frequency measurement**" configuration
→ The frequency [Hz] is output instead of the counter value

**Fast counters
(setting via ConfigStage)**

Configuration „**Input**"
→ Channel 2.2 - 2.4 resp. 2.5 - 2.7 are
normal Inputs,
Counter is switched off

Configuration **"counting up"**
→ Rising edges are counted on channel 2.2 or 2.5,
→ the other signals (B and Z) are inputs

Configuration **"counting up/down"**
→ rising edges are counted on channel 2.2 buw 2.5 and
→ Channel 2.3 or 2.6 serves as a direction bit (0=backwards, 1=forwards)
→ Z is input

Configuration **"Encoder x4"**
→ Channel 2.2/2.3 or 2.5/2.6 form an encoder input with quadruple evaluation
→ Z is input
Configuration **"counting up/down zero" "Encoder x4 zero"**
→ In addition, the Z input can be activated via the "enable reference" bit:
On a rising edge at the Z bit, the counter is reset to 0 and the enable reference bit is deleted.
Notes on using the counter inputs

**Channel 2: Digital input or Low/High speed counter**

| | Mode | Input address | Counter word input address | Reset bit output address | Enable bit output address |
|---|---|---|---|---|---|
| Channel 2.0 | Counter up ∨ | | 4 | 2.0 | |
| Channel 2.1 | Input | 2.1 | | | |
| | Counter up | | | | |
| Channel 2.2 (A) | Frequency measure | 2.2 | | | |

## Notes on using the counter inputs

- Counters can only be set (and held) to zero by setting the reset bit (static)
- the configuration cannot be changed at runtime under Step7:
- all addresses are specified as an offset in relation to the configured start address

| Technical data | analog Inputs/Outputs U/l | | |
|---|---|---|---|
| Load voltage L+ | -<br>(internal supply) | Cable length<br>   - unshielded (max.)<br>   - shielded (max.) | 30 m<br>100m |
| Analogue inputs<br><br>Input ranges | 3 (alternatively configurable to outputs via software)<br>0...20 mA, 4...20 mA, +/- 20mA<br>0..10 V | Permissible voltage between inputs and A-GND (max.) | -1 V ... + 24 V DC |
| Diagnostic LEDs | none | Error message if range is exceeded | Parameterizable diagnostic and limit value alarms on request |
| Number format | 9400 ... 6C00 (hexadecimal) for measuring range +/- 20mA otherwise 0000 ... 6C00 (hexadecimal) | Wire break monitoring | by exceeding or falling below the measuring range<br>(for 4..20 mA) |
| Overload range | 20 mA ... 22 mA<br>10V … 11,3 V | Signal transmitter connection type | unbalanced to A-GND<br>(single ended) |
| Input resistance | 0Ω (typ.) for measuring range current<br>1MΩ (typ.)<br>for voltage measuring range | Measuring principle/<br>Conversion principle<br><br>Resolution | successive approximation<br><br>12 Bit |
| Abtastzykluszeit<br>= IntegrationszeitSampling cycle time<br>= Integration time | parameterizable 1ms ... 35767 ms<br>default: 100 ms<br>(= mains frequency filter 50Hz and 60Hz) | Accuracy (related to measuring range) | < 1% |
| Analog outputs<br>Output ranges | 3 (alternatively to inputs configurable via software)<br>0(4)...20mA , 0...10V | Number format | 0000 ... 6C00 (hexadecimal) |
| Output resolution | 12 Bit | Short-circuit protection | yes |
| Diagnostic LEDs | none | Overdrive range | 20 ... 23 mA<br>10 ... 11,3 Vsettling timeSettling time: |
| Settling time: | Time constant t (typ) 1,5 ms | Short-circuit current (typ.) | 20 mA (at 10V)<br>32 mA (at mA) |
| Load resistor/ load resistor to A-GND | mA: 500 Ω (max.)<br>V: 1 kΩ (min.) | Accuracy (related to measuring range) | < 1% |

## Block diagrams analog inputs/outputs U/I
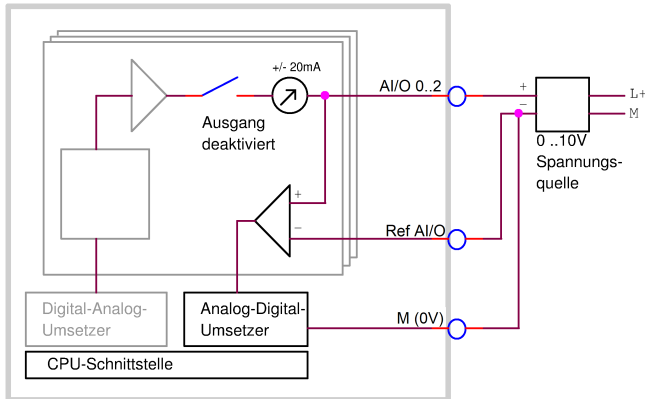


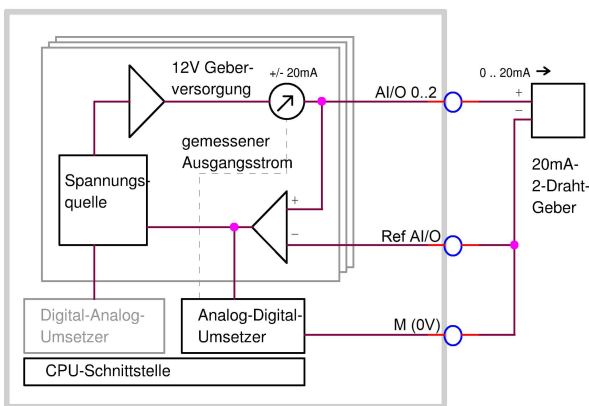Block diagram of the analog inputs for 0 ... 10 V



Configuration block addresses (in bytes)
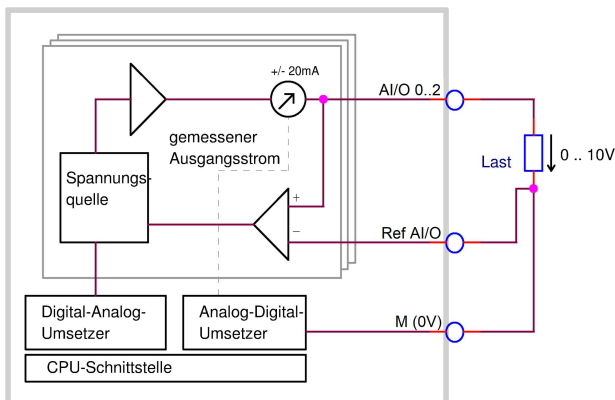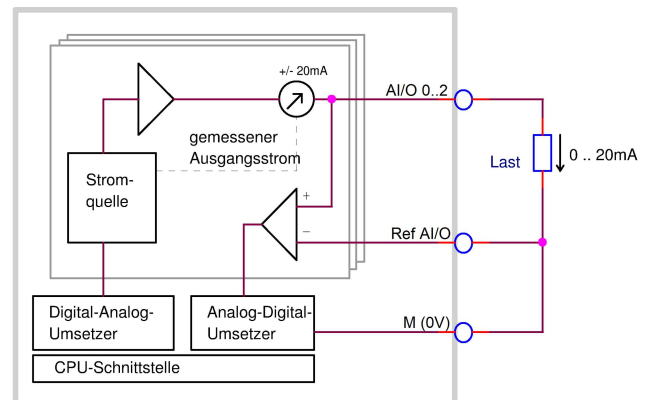and measuring range configuration Analogue I/O in the ConfigStage



Block diagram of the analogue inputs for 20 mA
with 2-wire encoder
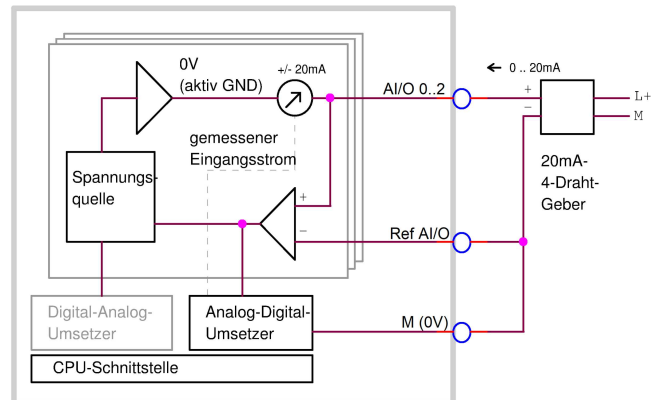


Block diagram of the analogue inputs for 20 mA
with 3/4-wire encoder


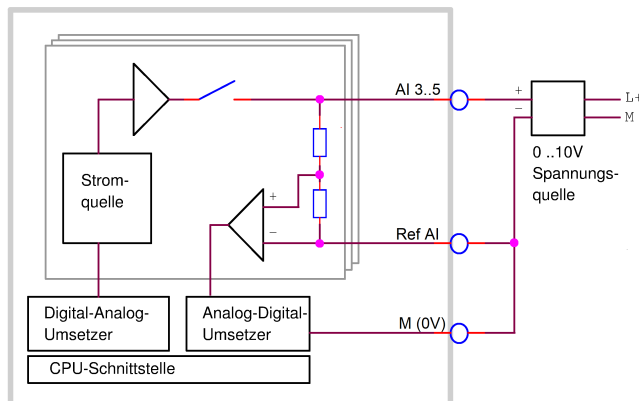
Block diagram of the analogue outputs for 10 V



Block diagram of the analogue outputs for 20 mA

| Technical data | Analog inputs U/I/RTD/TC/SG | | |
|---|---|---|---|
| Load voltage L+ | -<br>(internal supply) | Cable length<br>  - unshielded (max.)<br>  - shielded (max.) | 30 m<br>100m |
| Input ranges | 0...20 mA, 4...20 mA, 0..10 V, DMS, PT100, PT1000, 2 kOhm, TC<br>possible combinations:<br>- 3x 20 mA or 10 V<br>- 1x DMS<br>- 3x PT100/PT1000/R (2 wire)<br>- 1x PT100/PT1000/R (3 wire) +<br>1x PT100/PT1000/R (2 wiret)<br>- 2x ThermoCouples , 1x PT100 | Permissible voltage between inputs and A-GND (max.) | -1 V ... + 24 V DC |
| Diagnostic LEDs | none | Error message if range is exceeded | Parameterizable diagnostic and limit value alarms on request |
| Number formats:<br>Measuring range 20mA /10V:<br>PT100 / TC | 0 ... 6C00 (hexadecimal)<br>1/10 °C, 1/100 °C | Wire break monitoring | due to overrange or underrange |
| Overdrive range | 20 mA ... 22 mA<br>10V … 11,3 V | Connection type of the signal transmitter<br>Measuring ranges mA, V:<br>otherwise: | unbalanced (single ended)<br>against 0V<br>potential-free (floating) |
| Input resistance | 70Ω (typ.) for measuring range mA<br>1MΩ (typ.) otherwise | Measuring principle/<br>Conversion principle<br>Resolution | Sigma Delta<br><br>16 Bit |
| Sampling cycle time<br>= Integration time | parameterizable<br>default: 100 ms<br>depending on the measuring range | Accuracy (related to measuring range) | < 1% Internal |
| Internal resistance<br>strain gauges | 1kOhm | | |

## Blockschaltbilder analoge Eingänge U/I/RTD/TC



*Block diagram of the analog inputs for 0 ... 10 V*
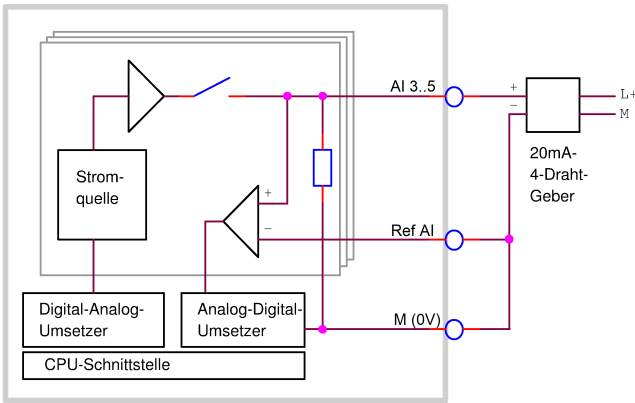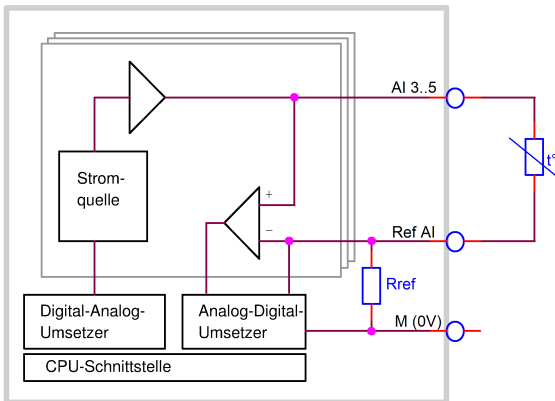


*Configuration block addresses (in bytes) and measuring range configuration in the ConfigStage Voltage/current mode*

*Block diagram of the analog inputs for 20 mA with 3/4 wire encoder*
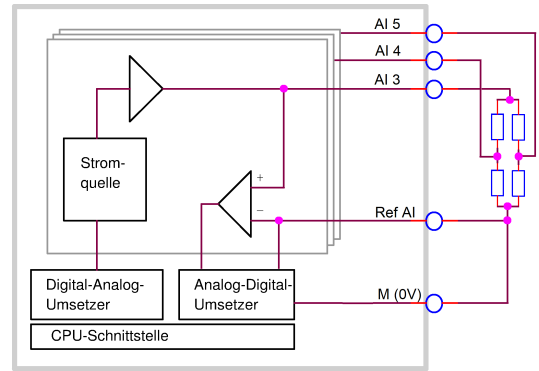


*Block diagram of the analog inputs for strain gages (strain gauge)*



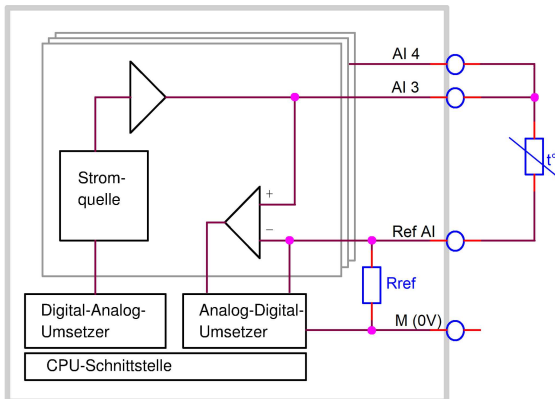*Block diagram of the analog inputs for PT100/PT1000/R 2-wire*



*Configuration block addresses (in bytes) and measuring range configuration Analog Input in the ConfigStage Mode temperature*



*Block diagram of the analog inputs for PT100/PT1000/R 3-Wire*
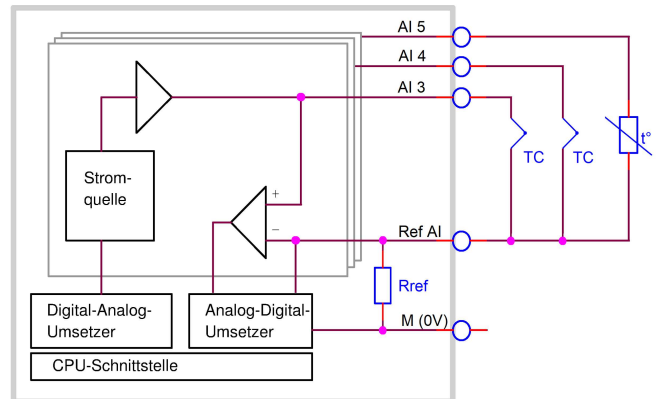


*Block diagram of the analog inputs for thermocouples*

**Assignment of the process image:**

| Offset | I/O | Function | Description |
|---|---|---|---|
| Assignment of the process image: Digital inputs<br>The module occupies 16 bytes in the process image (from the configured start address). | | | |
| 0..2 | I | Input DI0.0..DI2.7 | Input bits (possibly blocked - depending on configuration) |
| 3 | I | reserved | |
| 4,5 | I | Slow counter 0 | Counter word (16-bit high-endian), measuring range depending on configuration |
| 6,7 | I | Slow counter 1 | Counter word (16-bit high-endian), measuring range depending on configuration |
| 8..11 | I | Fast counter 0 | Counter word (32-bit high-endian), measuring range depending on configuration |
| 12..15 | I | Fast counter 1 | Counter word (32-bit high-endian), measuring range depending on configuration |

| Offset | I/O | Function | Description |
|---|---|---|---|
| Assignment of the process image: Digital outputs<br>The module occupies 8 bytes in the process image (from the configured start address). | | | |
| 0 | O | Output DO0..DO7 | Standard-PLC outputs |
| 1 | O | Output DO8..DO11 | 4 push/pull outputs (4 bits unused) |
| 2 | O | Resetbits slow counter | .0 Reset Counter 0, .1 Reset Counter1 |
| 3 | O | Reset-/Controlbits fast counter | .0 Reset Counter 0, .1 Reset Counter1<br>.2 EnableRef Counter 0, .3 EnableRef Counter1 |
| 4,5 | O | PWM 0 target value | (16 Bit high-endian) |
| 6,7 | O | PWM 1 target value | (16 Bit high-endian) |

| Offset | I/O | Function | Description |
|---|---|---|---|
| Assignment of the process image: Analog inputs<br>The module occupies 6 input words in the process image (from the configured start address). | | | |
| 0,2,4 | I | Input AI0..AI2 | Measurement range depending on configuration |
| 6,8,10 | I | Input AI3..AI5 | Measurement range depending on configuration |

| Offset | I/O | Function | Description |
|---|---|---|---|
| Assignment of the process image: Analog outputs<br>The module occupies (from configured start address) 3 output words in the process image. | | | |
| 0,2,4 | O | Output AO0..AO2 | Measurement range depending on configuration |

## Cut out in switching cabinet

**Dimensions / Cut out**

B x H  (mm)  387 x 228
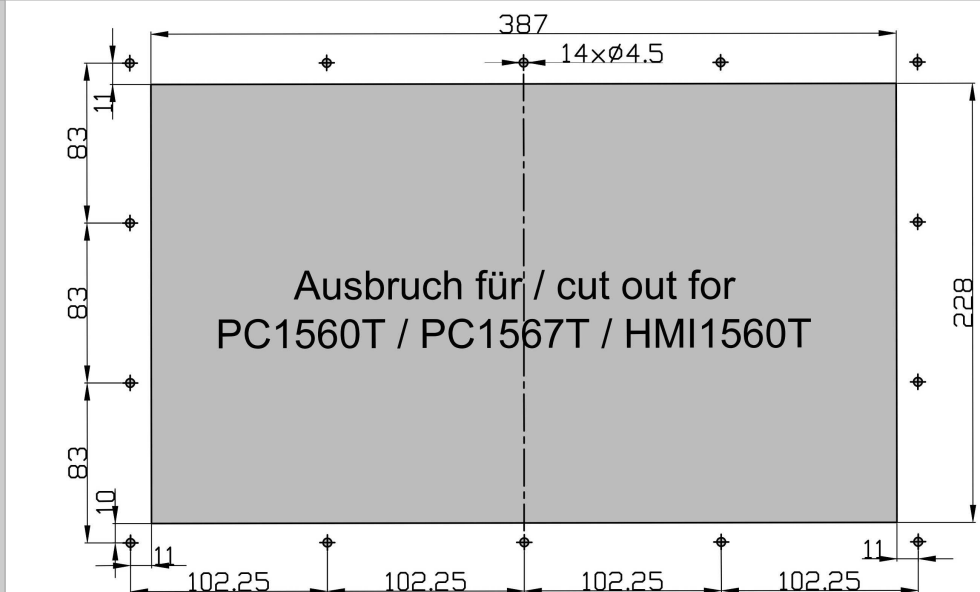14 holes with D 4,5mm

**Mounting depth**

54mm

**Kabelabgänge**

Standard-Schnittstellen
2x RJ45 (Ethernet)
E-CONS10, E-CON(S)34

PC1011T-0-02
→ to the left
PLC-interfaces E-CON(S) 10
→ to the right:*
I/O interfaces E-Con(S) 34

*)  at rear view and
 horizontal mounting

**Drill jig →**

387

14×Ø4.5

228

Ausbruch für / cut out for
PC1560T / PC1567T / HMI1560T

11    102.25    102.25    102.25    102.25    11

83    83    83    11    10

**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 of devices

| Identification | Standard | Identification |
|---|---|---|
| S7-Panel-PLC **PC1011T** | PC1011T-0-02 | S7-Panel-PLC **PC1011T** |

## Ordering data of accessoires

| Identification / Order-No. | Identification / Order-No. |
|---|---|
| Connector 2x5pin (bolt flanges) / E-CONS10-00 | Micro SD-card 2GB (external memory) / E-MSD2-00 |
| Connector 2x17polig (Locking lever) / E-CON34-00 | Micro SD-card 4GB (external memory) / E-MSD4-00 |
| Connector 2x17polig (bolt flanges) / E-CONS34-00 | 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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With publication of this swformation all other versions are no longer valid.