DIREKTRONIK
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HW group

Sens-485-UI

Converter 0..15V and 0..25mA into RS-485

Converter for mounting on the DIN rail converts the galvanic isolated analog voltage and current signals from two inputs to the line RS-485. Both inputs can measure the current or voltage. It´s possible switch the measured quantity by the command over the line RS-485.

Converter Sens-485-UI communicates over the line RS-485 by ASCII protocol, compatible with Poseidon products family. Converter uses two addresses determined by two alphabetic signs (e.g. „A"/"a") except the letter „T" (see protocol description).
The first channel represents the address with capital letter (e.g. „A"), the second channel represents the address with small letter (e.g. „a"). Both addresses are assigned simultaneously by the assignment of the capital letter.

Basic features

- **Input:** Two independent channels Ch1 and Ch2

    o Each channel can measure current and voltage

    o Measured variable (current or voltage) can be set over RS-485

    o Current range: 0 up to +25mA

    o Voltage range: 0 up to +15V DC

- **Output**: RS-485 bus

    o ASCII protocol, compatible with Poseidon products family

    o Output resolution for two decimal places

- DIN molding version

- Power supply 8 up to 28V DC, Ch1 and Ch2 isolated by galvanic way
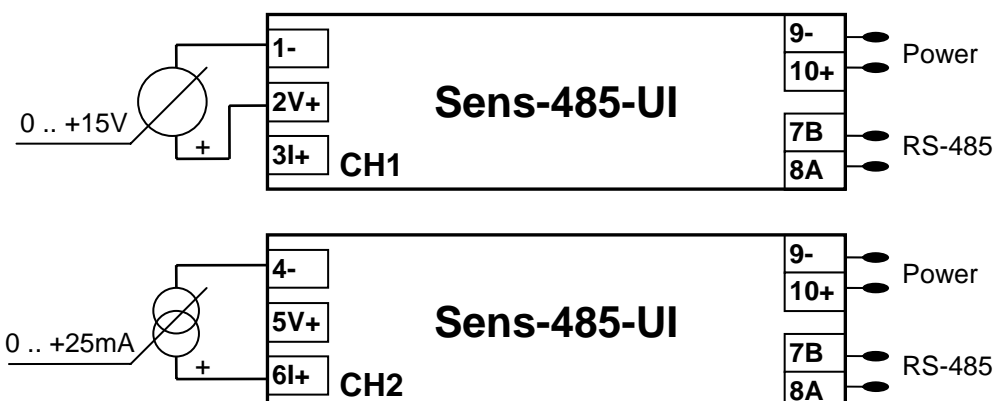
Parameters

- **Inputs Ch1 and Ch2**
  - Current input: 0 up to 25 mA
  - Voltage input: 0 - 15V
  - Exactitude of the conversion: error of measurement < 0,1% from the range
  - Isolation solidity of input Ch1 contra Ch2: 2kV
  - Galvanic isolation – input to the line RS-485 and power supply: 4kV

- **External dimensions:** 22,5 x 85 x 70 mm
  - Mechanical version for mounting on DIN rail 35 mm
  - Protection grade box/terminal block: IP40 / IP10
  - Connection: conductor 0,5 up to 2,5mm^2
  - Range of operative temperatures: -25 up to +70°C

- **Supply voltage**: 8 up to 28V DC (protection contra reversal of polarity)
  - Consumption: <7 mA, during transmission typ. 60 mA

- **Communication**: RS485 / 9600Bd / 8N1
  - Up to 31 converters on the line RS485, up to 1200m distance
  - Doesn´t contain the termination of the line RS-485
  - Address: 25 addresses „A/a" up to „Z/z" except „T/t"
  - Change of the address: over the line RS-485 by special command

- **Type tests**
  - Basic type test according to EN 770
  - EMC evaluated according to EN 61326-1
  - Security evaluated according to EN 61010-1

Connection of the terminals

1(-), 2(U+), 3(I+):   CH1 – channel 1 input
4(-), 5(U+), 6(I+):   CH2 - channel 2 input
7(B), 8(A):   line RS485
9(-), 10(+):   power supply 8…28V DC

Converter mounting

Mechanically, the converters are mounted on the DIN rail 35 mm. When the upper edge is put on, you have to unscrew the pawl of the fastening mechanism by a screwdriver and press the device by his lower part in the direction to the rail. After locking it, the mounting is finished. The demounting is processed by the same way.
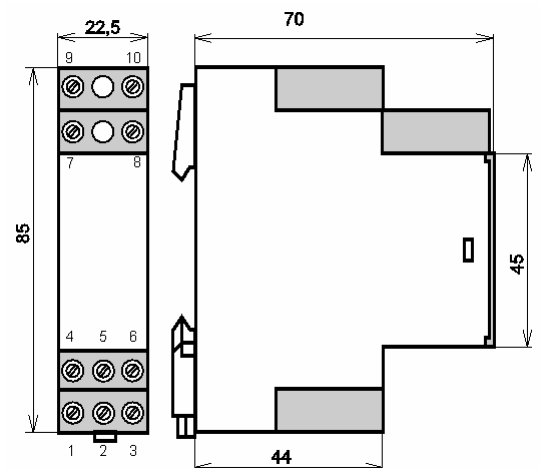
Connecting to Poseidon devices

Sens-485-UI unit can be connected to the Poseidon family devices with RS-485 bus (Industrial Bus). To connect over RJ45 connector and TP cabling, use this scheme.
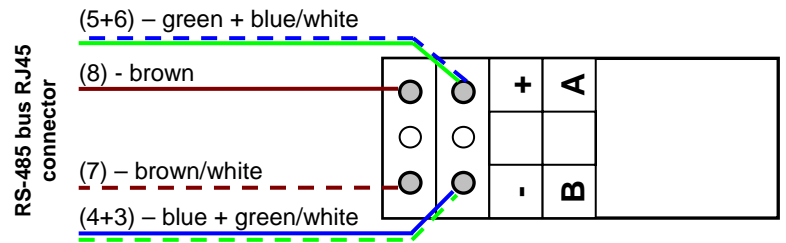
Communication protocol

The sensors work in question – answer mode. Response time on the line is no more than 20ms.

Communication bus ………………   RS-485
Range of addresses ....   "A/a" .. "Z/z" (exception??? „T/t") (25 addresses)

Communication..................................... ASCII, described below
Response time .... max. 20 ms on the command

Velocity ....   9600 baud
Number of data bits   8
Parity ....   none
Number of stop bits   1

Reading of the value

Function	Command format	Example
Question on the values of temperature	T<address>I	TAI
Answer from the sensor (everything OK)	*<address><value><CR>	*A+000.00V
Answer from the sensor (error)	*<address>Err<CR>	*AErr

> **<address>** is a sign of the range „**A**" **..** „**Z**" and „**a**" **..** „**z**" except „**T**",
> **<CR>**   is a sign 0xD or 13 dec - line-break
> **<value>**   is in two decimal places format *A+015.55V or *A+015.55a for current measurement.

Device identification

Function	Command in format	Example
Question on device type	T<address>?	TA?
Answer from the sensor (everything OK)	*<address><Identification><cr>	*ASens-U

> **<Identification>**   **string** „Sens-U" or „Sens-I"

Sensor address settings

If you use this command, **only one sensor** has to be connected on the line RS-485 and switched on. Exactly, you change the address on this sensor. In the case of the detection of other sensor, is impossible set the address. Dispatching time of entire command could not be more than 3 seconds.

Function	Command in format	Example
Change of address	`T#<new address>`	T#A
Answer from the sensor	`*<new address>OK<CR>`	*AOK

`<address>` is sign of the range „A" .. „Z" except **„T"**, address of second channel (small letter) is set automatically according to the first channel.

`<CR>` is a sign 0xD or 13 dec - line - break

Note: *Always set the address only in the form of capital letter, other address (same letter in small form) is set automatically.*

Change of input configuration

Switch-over of the measurement of the channel from the current to voltage is chosen by setting the address 1 up to 4.

- Configuration „1" – Ch1 measures current

- Configuration „2" – Ch1 measures voltage

- Configuration „3" – Ch2 measures current

- Configuration „4" – Ch2 measures voltage

Function	Command in format	Example
Set Ch2 for current measurement	`T#<configuration>`	T#4
Answer from the sensor for acceptation	`*<address>OK<CR>`	*AOK
Answer from the sensor (error)	`*<address>Err<CR>`	*AErr

`<CR>` is sign 0xD or 13 dec – line-break

Change of Sens-485 RS-485 bus address configuration

- Only one sensor can be connected on the RS-485 line

- You define only big letter of the RS-485 address, the small one is assigned automatically

- Use the same procedure as for configuration change (next chapter) just use for the address capital letter from range „A/a up to Z/z". exept "T".

- Don't forget to unplug the power or RJ45 connector with RS-485 for 5 seconds before start Assign new Address to the Sens-UI device by "9 ... `Assign RS-485 sensor address`"

Change of Sens-485 configuration (UI / IU / UU / II)

The Sens-485 is default configured to "UI" configuration (Voltage Ch1, Current Ch2). This chapter show, how you can by yourselves change configuration for every channel.

The default "**UI**" configuration (Channel1 measures current, Channel2 measures voltage) you can modify by the **setting of the special RS-485 address**. The change of address is confirmed in terminal, **Sens-UI keeps previous address** from the range „A/a up to Z/z". You can change only channel configuration by assign address 1,2,3 or 4.

- Configuration „**1**" – Ch1 measures **current**,
- Configuration „**2**" – Ch1 measures **voltage** (default configuration of Ch1),
- Configuration „**3**" – Ch2 measures **current,** (default configuration of Ch2)
- Configuration „**4**" – Ch2 measures **voltage**

Process of the configuration change with Poseidon model 1250

- Connect the Sens-485-UI to over **RJ45 TP cable** with RS-485 bus to Poseidon unit: White/Brown (GND) = **9-**, Brown (+12V) = **10+**, White/Blue (A) = **8A**, Blue (B) = **7B**,

- Connect over program **Telnet** to the port 99 (see TCP Setup in the manual for Poseidon)

- Check that only Sens-485-UI is connected to RS-485 bus

- **Step 1** – Connect Sens-485-UI to Poseidon model 1250 on RS-485 bus

- **Step 2** – Choose autodetection of the sensors (key „3") and confirm automatic search (key „y" a „y"). In dump of sensors is possible see retrieval of Sens-485-UI in the presetting configuration (UI) in the address „A/a".

- **Step 3** – Switch off the Sens-485-UI power (plug the RJ45 connector out)

- **Step 4** – Wait for 5 seconds

- **Step 5** – Switch on the Sens-485-UI power (plug the RJ45 connector back to Poseidon)

- **Step 6** – Press 9 to choose the "9 ... Assign RS-485 sensor address"

- **Step 7** – Press Enter as reply to: "Please check you have only one sensor on the RS-485 bus (Press enter to continue)"

- **Step 8** – Press number from range 1..4, it's configuration number 1 up to 4 from the list for the Sens-485-UI configuration change mentioned above. Setting change is confirmed by message „Address changed".

- **Step 9** – Choose autodetection of the sensors (key „3") and confirm automatic search (key „y" and „y"). In dump of sensors is possible see retrieval of Sens-485-UI in changed configuration (II) on the address „A/a".

Sens-485-UI support in Poseidon

After the connection to the **Poseidon model 1250** unit, data measured by Sens-485-UI unit are available over the local network or Internet in your browser.

The values are available over these protocols too:

- Modbus/TCP

- SNMP

- XML

- Email Alert for the value out of predefined range

- SNMP trap Alert in case any value is out of the predefined range