

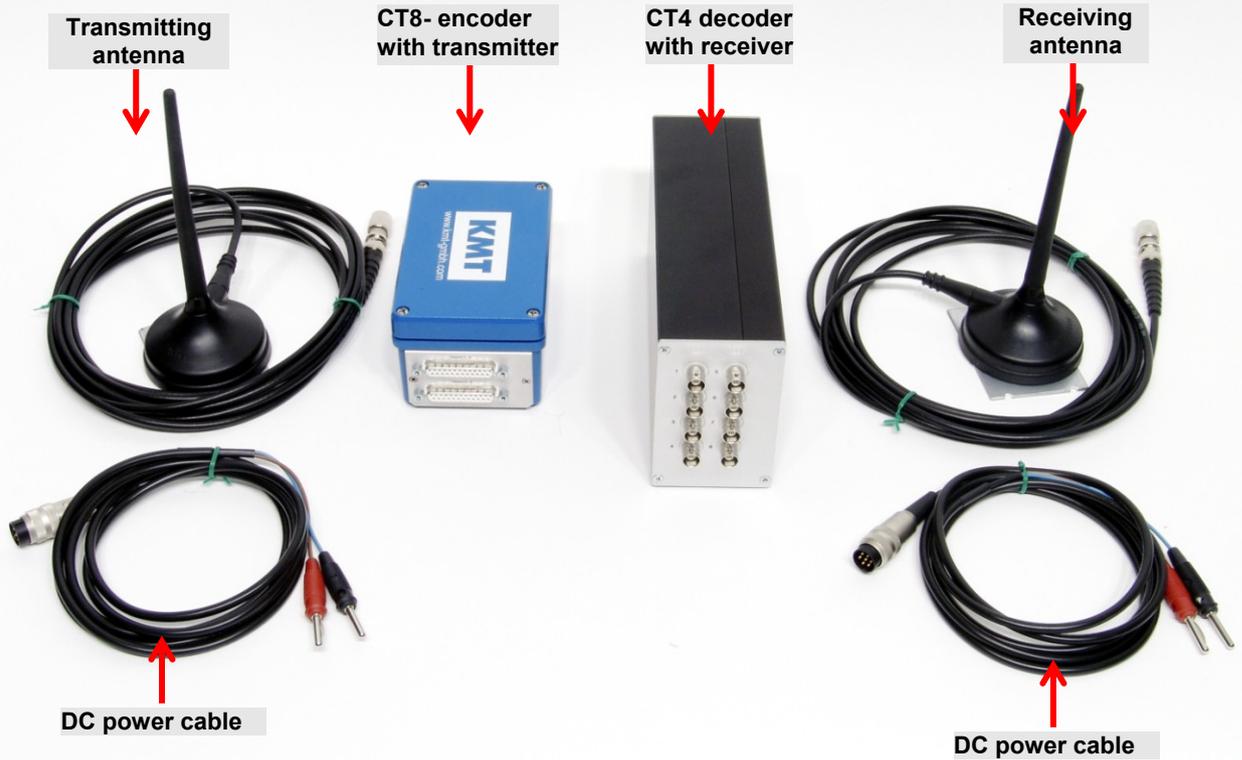
## CT4/8

### User manual



**8-channel telemetry system including  
signal conditioning for strain gage, thermo  
couples, Pt100, ICP, POT and high-level inputs**

**General functions:**

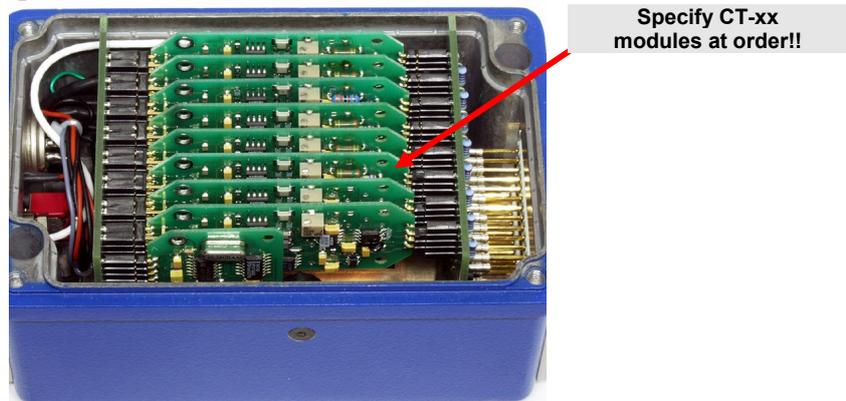


**Picture shows a CT8 telemetry system with standard accessories**

The CT8 Compact is a 8-channel telemetry system with integrated signal conditioning for sensors, wireless digital transmission and analog reproduction.

The conditioned measured values are routed via anti-aliasing filter to a 12-bit A/D converter, simulate sampling of all channels, encoded in PCM format and transferred to the HF transmitter as modulation variables. Dynamic range is 72dB with a signal-to-noise ratio of approximately 70dB. Four different carrier frequencies available with the 40kbit transmitter ( 433.3 to 434.5 MHz range) and enable a signal bandwidth of 8 x 0-95 Hz. With the 320kbit/s transmitter only one carrier frequency available in the 433,9 MHz band and enable a signal bandwidth of 8 x 0-750 Hz.

Various configurations of different sensor modules are possible like signal conditioning for strain gages (STG), thermocouples type K (Th-K), thermo sensors Pt100, ICP sensors, potentiometer sensors (POT) and also Voltage inputs (+/-5 or +/-10V), mixed configuration available.



<b>Frequency table</b>	Cut off frequency from anit-aliasing filter (-3dB) and scanning rate (see red)	
<b>Bit rate</b>	<b>4 CH.</b>	<b>8 CH.</b>
320 kbit/s	1500 Hz (6154 Hz)	750 Hz (3200 Hz)
40 kbit/s	190 Hz (770 Hz)	95 Hz (400 Hz)

### Transmitter Device (Encoder)



**Front side view**

**25-pole female SubD input connector for sensors 1 to 4**

**25-pole female SubD input connector for sensors 5 to 8**

**Female BNC connector for transmitter antenna**

**Power ON LED**

**7-pole female TUCHEL connector for power supply input (10–30V DC)**

**Auto Zero Switch (option)**

**Power Switch**

**2-pole female LEMOSA connector (for test purposes only)**



**Rear side view**

### CT-4/8-ENC

**CT-STG V1:**

Sensor: strain gage,  $\geq 350$  Ohms  
 Bridge completion: full, half and quarter-bridge (optional)  
 Excitation: 4 VDC (fixed), short-circuit protection up to 20mA  
 Gain: 200 or 1000 - selectable by solder jumpers  
**Optional Gain: 250-500-1000-2000 with new CT-STG V2 module**  
 Offset: Zero adjustment by potentiometer or optional Auto-zero function (which is not lost by power-off), offset range up to 80% of full scale.

**CT-TH-K-ISO:**

Sensor: thermo-couple, type K ( with cold junction compensation)  
 Temperature measuring range:  $-50^{\circ}\text{C}$  to  $+1000^{\circ}\text{C}$  (other on request) **with galvanic isolation**

**CT-PT100:**

Sensor: resistance temperature detectors (RTDs) with resistance of 100 ohm  
 Temperature measuring range:  $-100^{\circ}\text{C}$  to  $+500^{\circ}\text{C}$

**CT-VOLT:**

High-level inputs:  $\pm 5$  Volt or  $\pm 10$  Volt (other ranges on request)

**CT-ICP:**

Sensor: For ICP® sensor inputs, Current exc. 1, 4, and 10mA  
 Signal gain x 2, 4, 8, 16, 32 - Signal bandwidth 3 Hz up to 3000Hz (depended of transmitter)

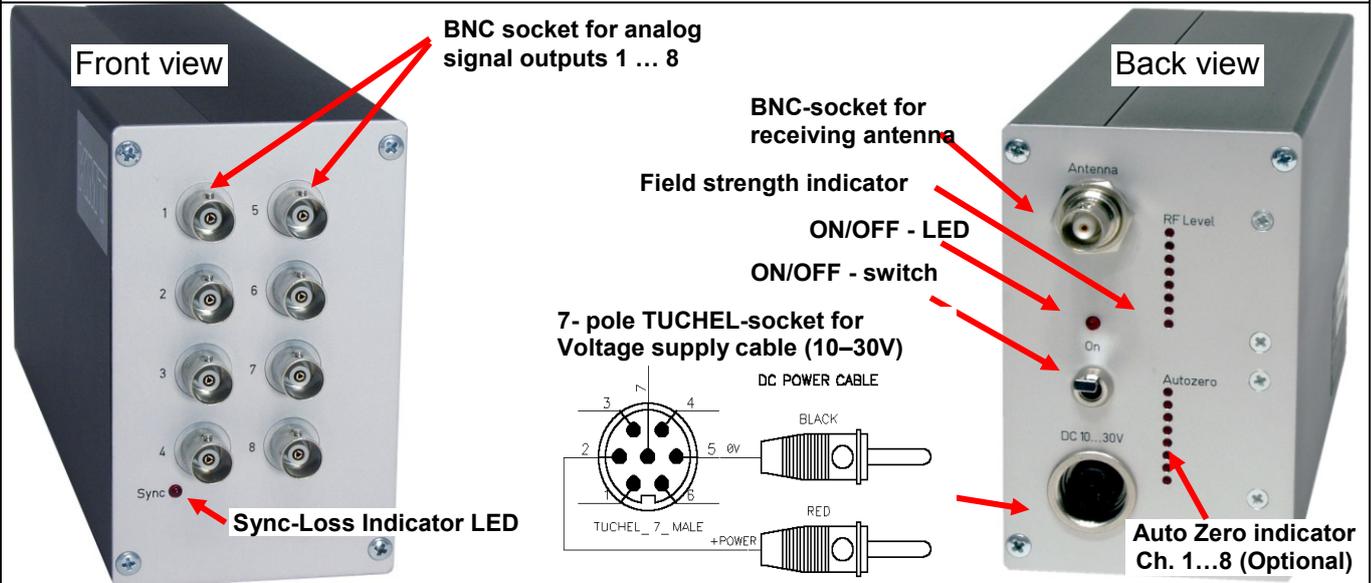
**CT-POT:**

Sensor: Potentiometer Sensor  $>350$  Ohms to 10kOhm  
 Excitation: 4 VDC (fixed)

**System Parameters:**

Channels: 4 or 8  
 Resolution: 12 bit A/D converter with anti aliasing filter, simultaneous sampling of all channels  
 Line-of-sight distance: 500 m with 10mW transmitting power (433MHz Band, FSK modulation)  
 Powering: 10-30V DC  
 Power consumption: 200 mA (at 12V) using 8 STG sensors at 350 Ohms and 40kbit transmitter  
 Analog signal bandwidth: (-3dB cut-off frequency)  
   4-channel version 4 x 0 ... 190Hz with 40 kbit/s transmitter (433,3, 433.7, 434.1 and 434,5 MHz)  
   8-channel version 8 x 0 ... 95Hz with 40 kbit/s transmitter (433,3, 433.7, 434.1 and 434,5 MHz)  
   4-channel version 4 x 0 ... 1500Hz with 320 kbit/s transmitter (1x 433,9 MHz)  
   8-channel version 8 x 0 ... 750Hz with 320 kbit/s transmitter (1x 433,9 MHz)  
 Dimensions: 132 x 85 x 68mm  
 Weight: 0.8 kg without cables  
 Transmission: Digital PCM Miller format - FSK  
 Transmission Power: 10mW  
 Operating temperature:  $-20 \dots +70^{\circ}\text{C}$   
 Housing: Aluminum  
 Humidity: 20 ... 80% no condensing  
 Static acceleration: 100g in all directions  
 Shock: 200g in all directions

**Technical data:**  
Receiving Unit CT4/8 DEC (Decoder)

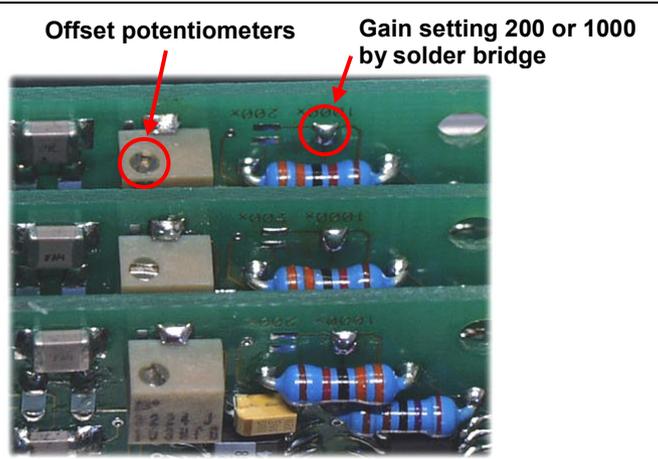
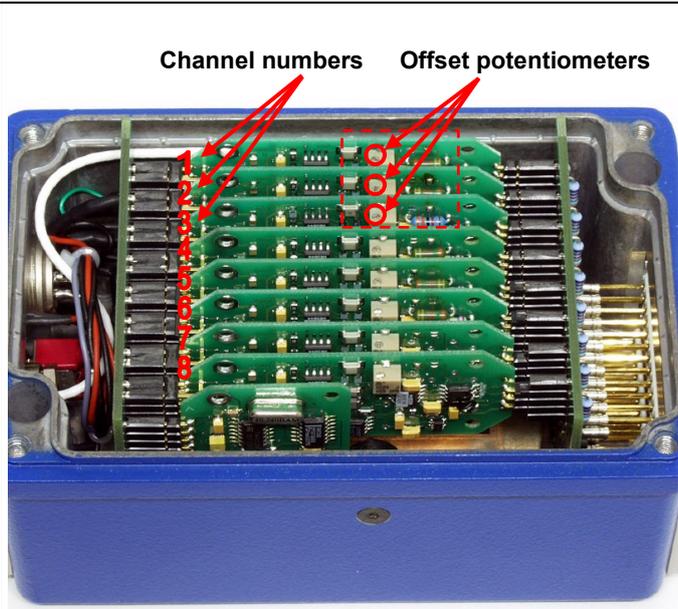


**System Parameters:**

Channel:	8 analog outputs via (BNC) +/-5V (optional +/-10V)
Resolution:	12 bit D/A converter, with smoothing filter
Dynamic:	72dB
Power supply input:	10-30 VDC
Current consumption:	300mA at 10V, 100mA at 30V
Analog signal bandwidth:	(-3dB cut-off frequency)
4-channel version	4 x 0 ... 190Hz with <u>40 kbit/s transmitter</u> (433,3, 433.7, 434.1 and 434,5 MHz)
8-channel version	8 x 0 ... 95Hz with <u>40 kbit/s transmitter</u> (433,3, 433.7, 434.1 and 434,5 MHz)
4-channel version	4 x 0 ... 1500Hz with <u>320 kbit/s transmitter</u> (1x 433,9 MHz)
8-channel version	8 x 0 ... 750Hz with <u>320 kbit/s transmitter</u> (1x 433,9 MHz)
Dimensions:	205 x 105 x 65mm
Weight:	1.00 kg without cables and antenna
Overall system accuracy between encoder input and decoder output:	+/-0.25% without sensor influences
<u>Environmental</u>	
Operating:	-20 ... +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g Mil Standard 810C, Curve C
Static acceleration:	10g in all directions
Shock:	100g in all directions

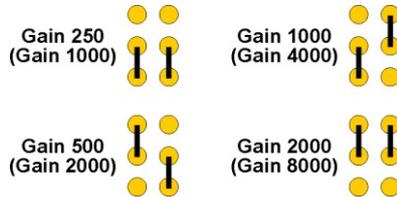
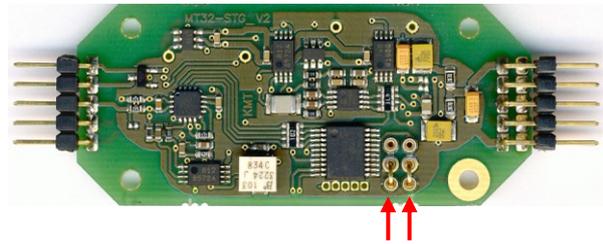
*Technical specifications are subject to change without notice!*

## Connection STG



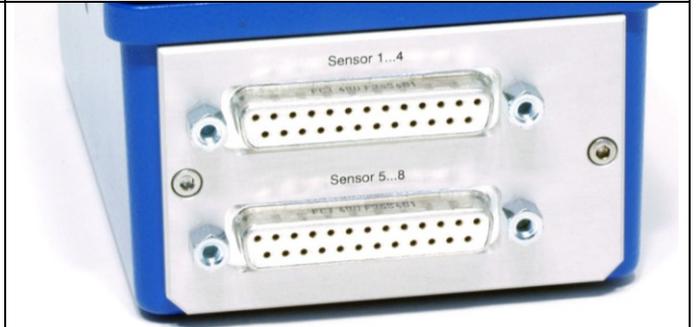
### CT-STG-V1 module

Type: Strain gage >350 Ohms  
 Excitation: 4 VDC (fixed)  
 Gain: 200 or 1000 by solder bridge  
**Accuracy +/- 0.25%**

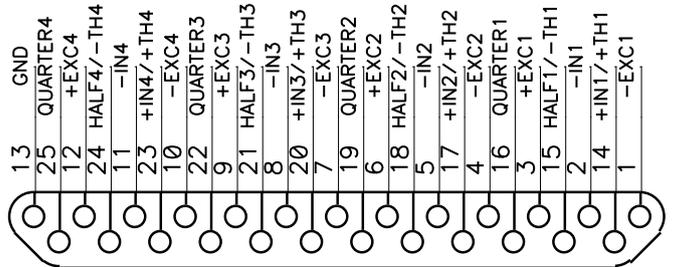


### CT-STG-V2 module

Type: Strain gage >350 Ohms  
 Excitation: 4 VDC (fixed)  
 Gain: 250-500-1000 or 2000 by jumper  
 or on request 1000-2000-4000-8000  
**Accuracy +/- 0.25%**

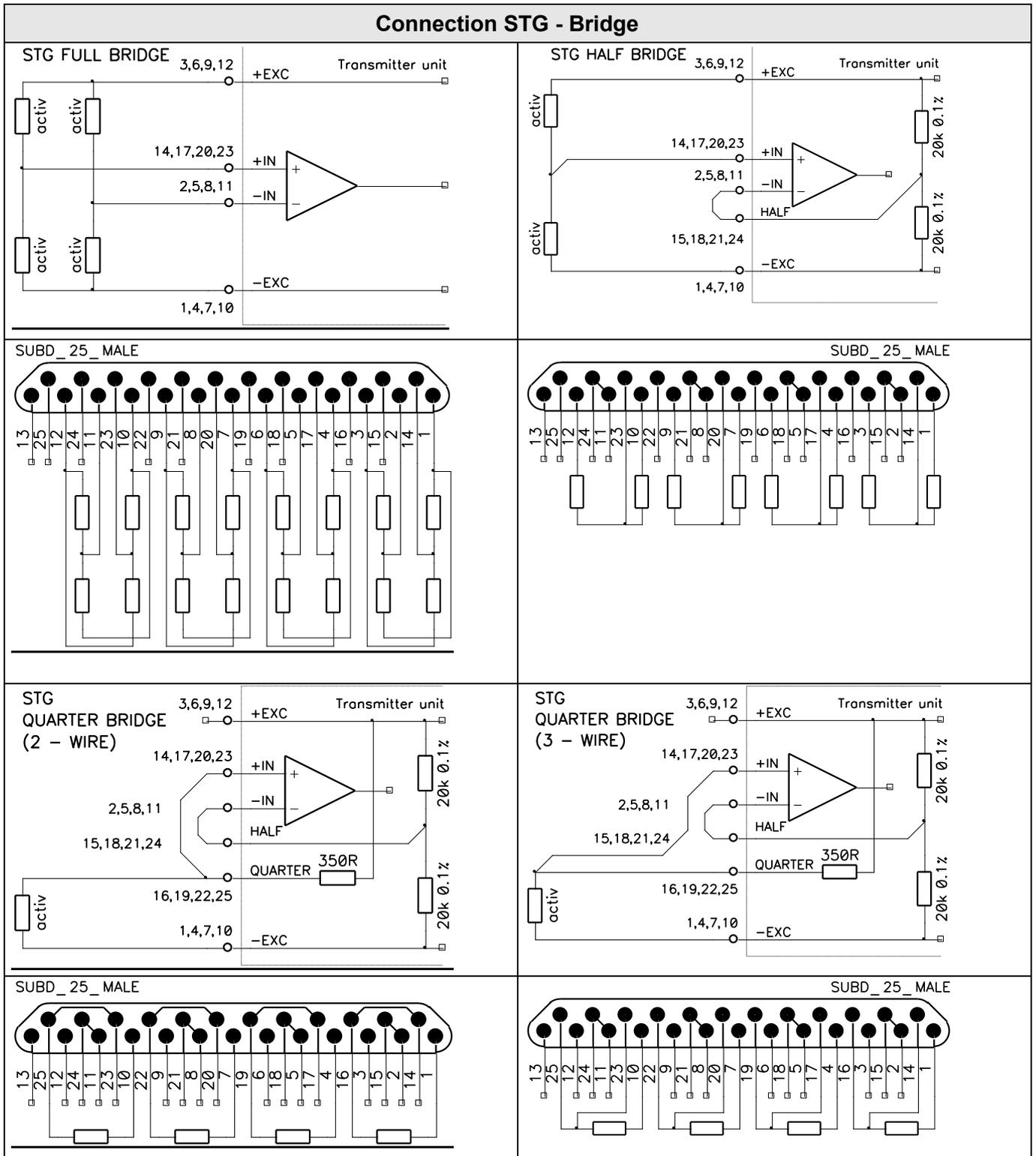


### Sensor 1...4 (Sensor 5...8)

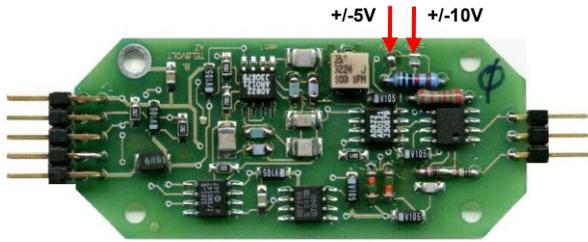


SUBD\_25\_FEMALE TRANSMITTER INPUT CONNECTORS

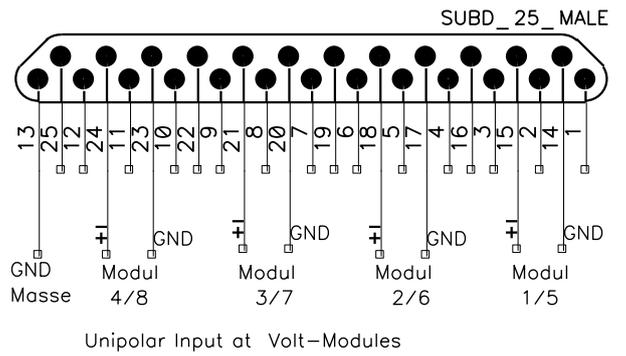
## Connection STG - Bridge



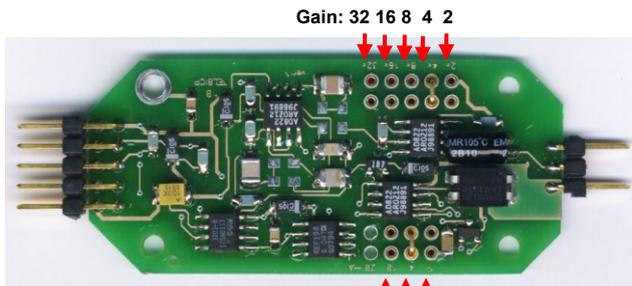
### Connection CT-Volt



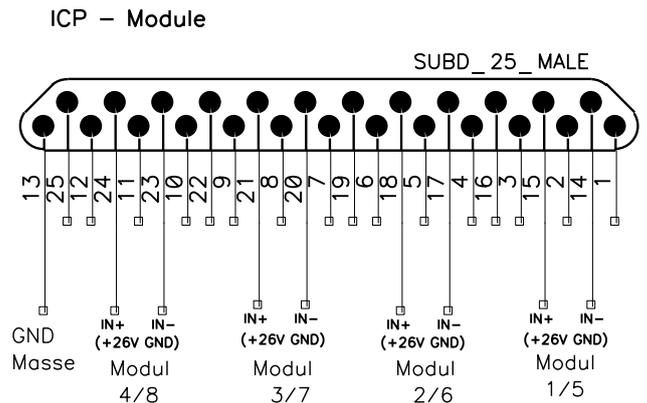
**CT-Volt module**  
 Type: Volt  
 Range: +/-5 or +/-10V  
 Accuracy +/- 0.25%



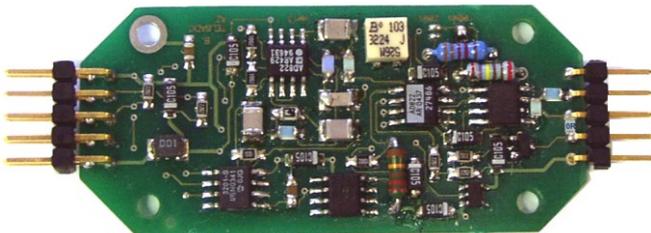
### Connection CT-ICP



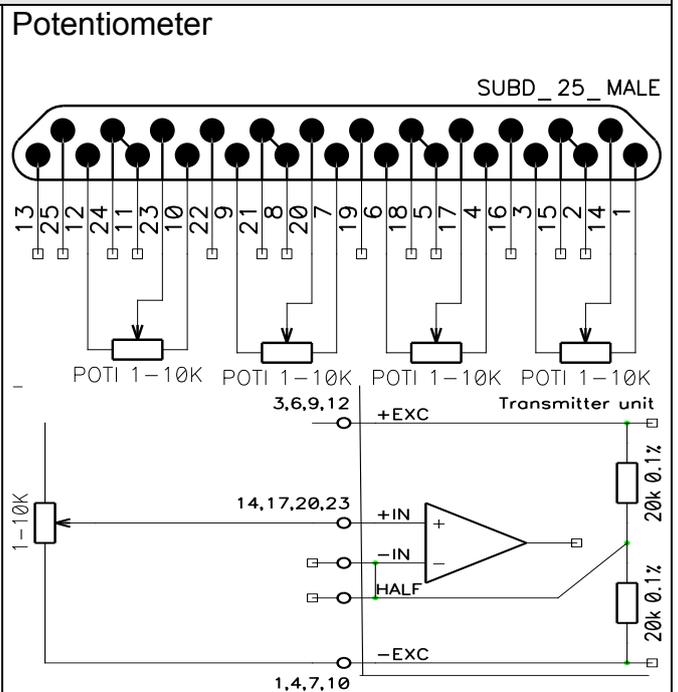
**CT-ICP module**  
 Type: ICP  
 Gain: 2x, 4x, 8x, 16x or 32x  
 Constant current: 1, 4 or 10mA  
 Accuracy +/- 0.25%



### Connection CT-POT



**CT-POT module:**  
 Sensor: Potentiometer Sensor >350 Ohms to 10kOhm  
 Excitation: 4 VDC (fixed)  
 Accuracy +/- 0.25%

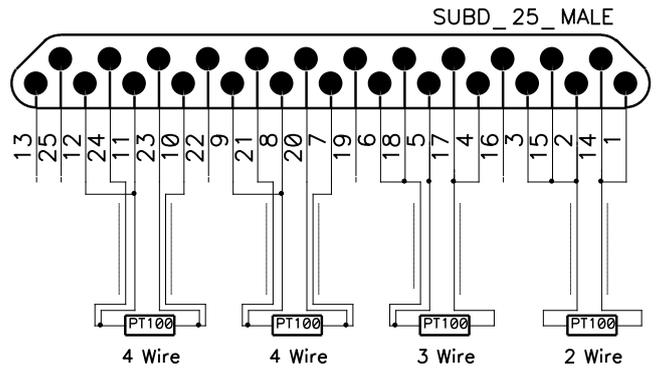


### Connection CT-Pt100



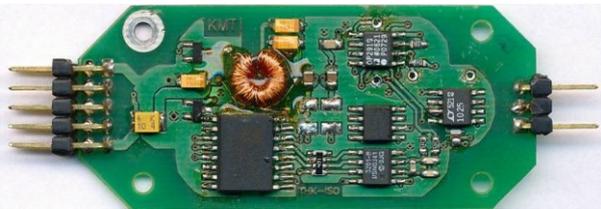
#### CT-Pt100

Type: RTD 100 ohm  
 Range: -100 to 500°C  
 Accuracy +/- 0.25%



Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-100	-0,997	150	1,500	400	4,004
-50	-0,497	200	2,001	450	4,498
0	0,001	250	2,501	500	4,999
50	0,499	300	3,001		
100	1,000	350	3,501		

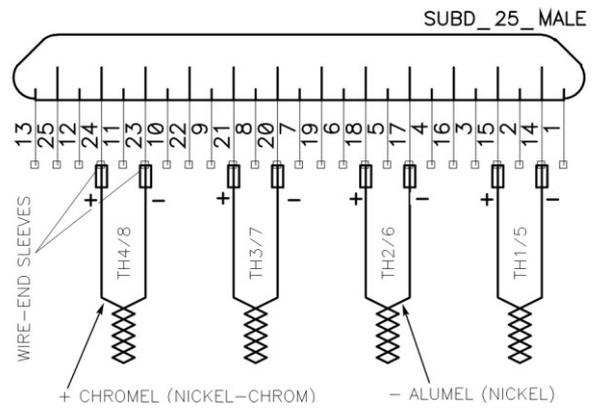
### Connection CT-TH-K-ISO (with galvanic isolation!)



#### Thermo couple

Type: K  
 Range: -50°C – 1000°C  
 Bandwidth: 0-20Hz (more on request)  
 Accuracy +/- 1%

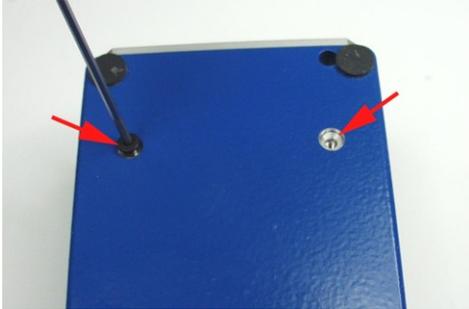
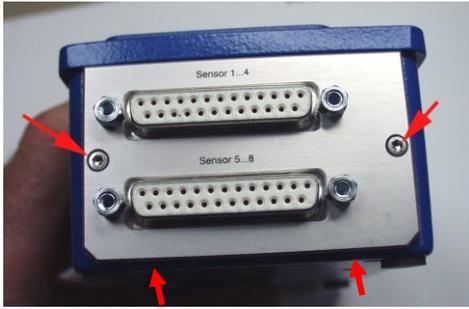
#### THERMO COUPLE TYPE K- ISO



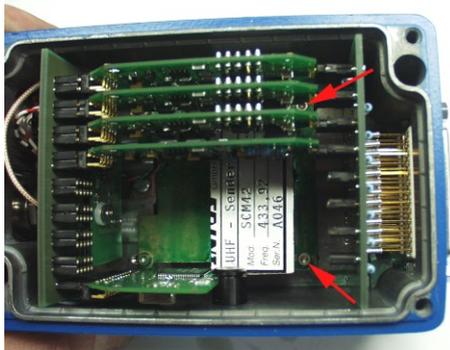
Temperature [°C]	Output [V]						
-50	-0.220	250	1.236	550	2.754	850	4.262
0	0.013	300	1.482	600	3.010	900	4.506
50	0.254	350	1.734	650	3.266	950	4.746
100	0.504	400	1.990	700	3.519	1000	4.980
150	0.752	450	2.242	750	3.700		
200	0.992	500	2.498	800	4.015		

With option +/-10V output you must multiply the table value with \*2

## How to change CT Modules at the CT4/8-ENC



1. Open this 4 screws



2. Open this 2 screws



3. Move the right part to right



4. Than you can take out the modules and change to other.

5. Assembly in reverse order!

**Work with care!**