

# CT4/8

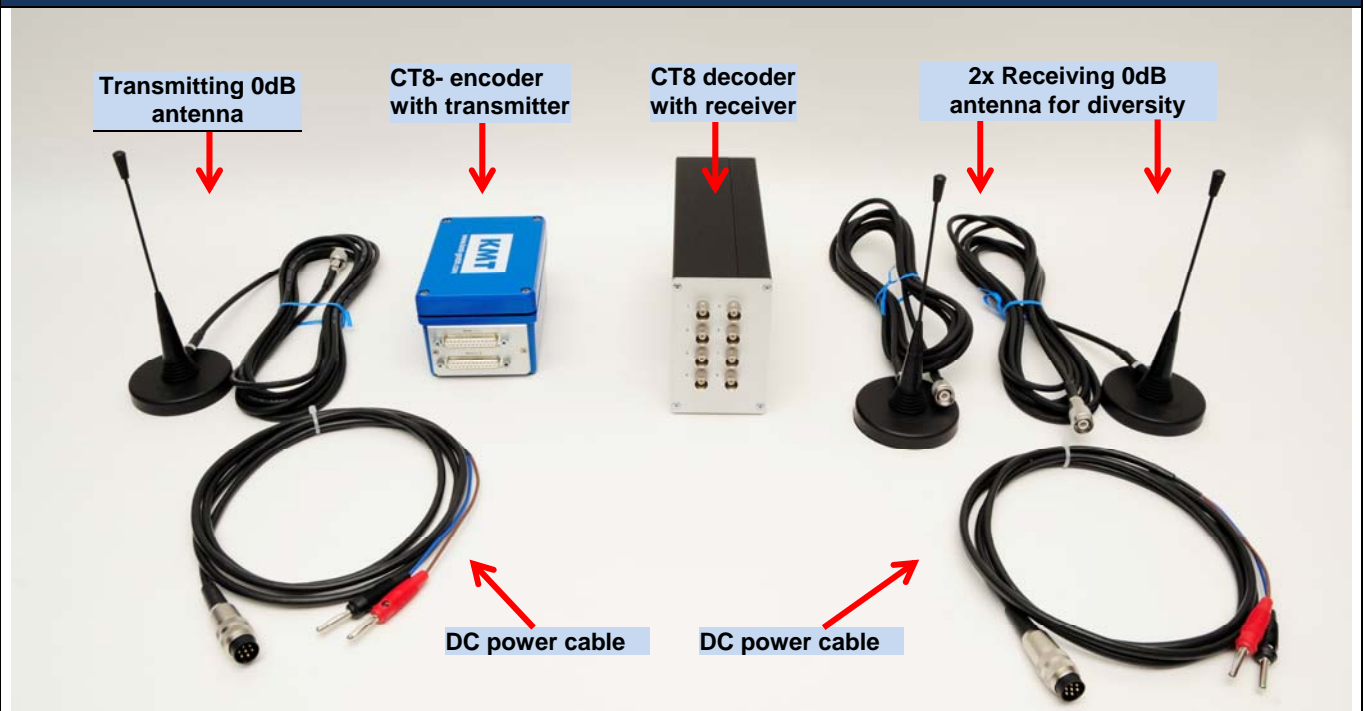
## User manual



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

**INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!**

## General functions:

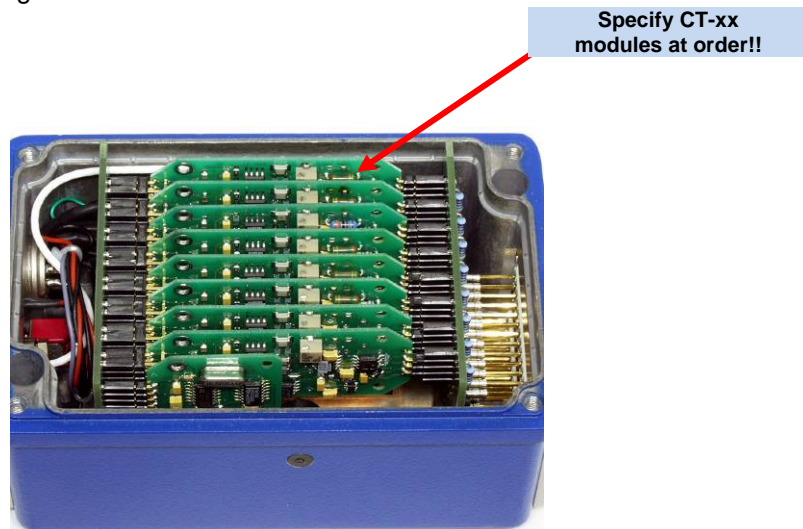


Picture shows a CT8 telemetry system with optional diversity receiver

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.

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.



## 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 TNC 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**



**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°C to +1000°C (other on request) **with galvanic isolation**

**CT-PT100:**

Sensor: resistance temperature detectors (RTDs) with resistance of 100 ohm  
 Temperature measuring range: -100°C to +500°C

**CT-VOLT:**

High-level inputs: +/- 5 Volt or +/- 10 Volt (other ranges on request)

**CT-ICP:**

Sensor: For ICP® sensor inputs, Current exc. 4mA  
 Signal gain x 2, 4, 8, 16, 32 - Signal bandwidth 3 Hz up to 6000Hz (depended of transmitter)

**CT-POT:**

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

**System Parameters:**

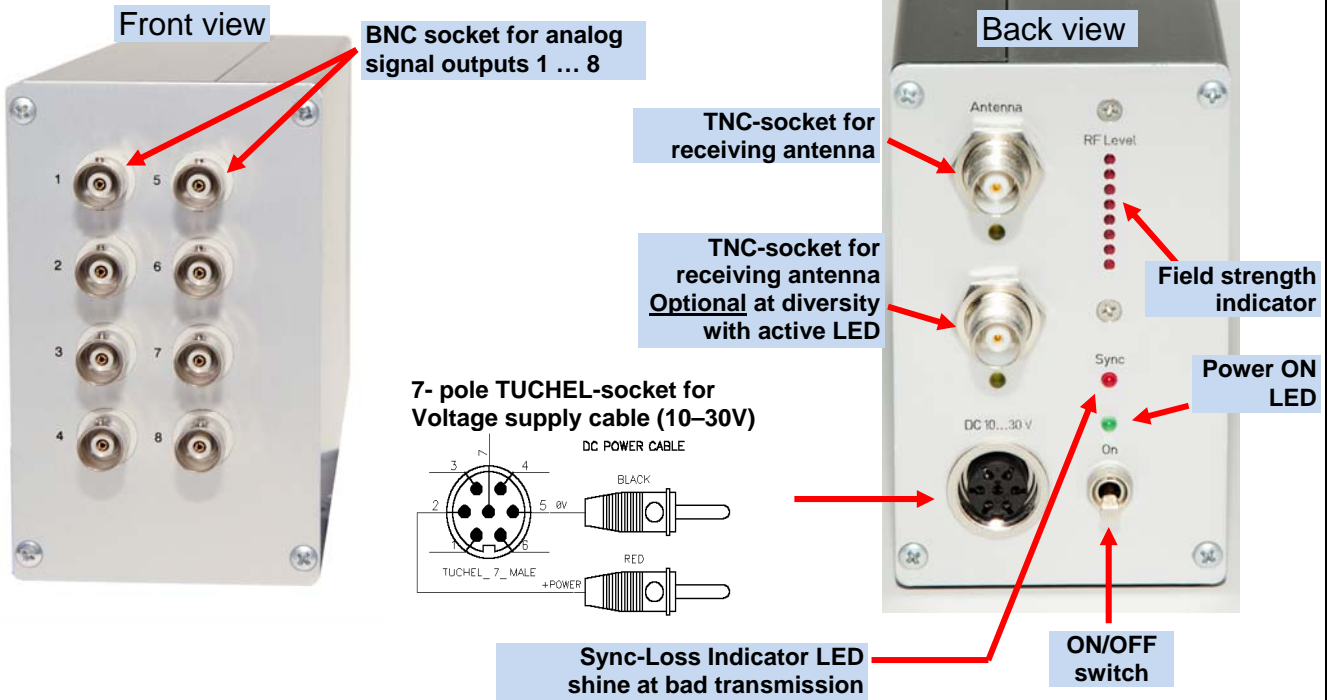
Channels: 4 or 8  
 Resolution: 12 bit A/D converter with anti aliasing filter, simultaneous sampling of all channels  
 Line-of-sight distance with diversity telemetry: 200m with 40kbit, 150m with 320/kbit, 100m with 640kbit, 50m with 1280kbit (free view)  
 Line-of-sight distance with **non-diversity** telemetry: 500m with 40kbit (free view)  
 Powering: 10-30V DC  
 Power consumption: 200 mA (at 12V) using 8 STG sensors at 350 Ohms and 40kbit transmitter

Bit rate	Cut off frequency from anit-aliasing filter (-3dB)	
	Scanning rate (red)	
	4 Channels	8 Channels
1280 kb/s	6000 Hz (24615 Hz)	3000 Hz (12800 Hz)
640 kbit/s	3000 Hz (12308 Hz)	1500 Hz (6400 Hz)
320 kbit/s	1500 Hz (6154 Hz)	750 Hz (3200 Hz)
40 kbit/s	190 Hz (770 Hz)	95 Hz (400 Hz)

depending of transmitter!

Analog signal bandwidth:  
 Dimensions: 132 x 85 x 68mm  
 Weight: 0.8 kg without cables  
 Transmission: Digital PCM Miller format - FSK  
 Transmission Power: 10mW  
 Operating temperature: - 20 ... +70°C  
 Housing: Aluminum  
 Humidity: 20 ... 80% no condensing  
 Static acceleration: 100g in all directions  
 Shock: 200g in all directions

## Technical data: Receiving CT8 DEC (Decoder)



### System Parameters:

Channel: 8 analog outputs via (BNC) +/-5V  
 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

Cut off frequency from anti-aliasing filter (-3dB)		
Scanning rate (red)		
Bit rate	4 Channels	8 Channels
1280 kbit/s	6000 Hz (24615 Hz)	3000 Hz (12800 Hz)
640 kbit/s	3000 Hz (12308 Hz)	1500 Hz (6400 Hz)
320 kbit/s	1500 Hz (6154 Hz)	750 Hz (3200 Hz)
40 kbit/s	190 Hz (770 Hz)	95 Hz (400 Hz)

Analog signal bandwidth:

Dimensions:

Weight:

Overall system accuracy  
between encoder input  
and decoder output:

#### Environmental

Operating:

Humidity:

Vibration:

Static acceleration:

Shock:

205 x 105 x 65mm

1.00 kg without cables and antenna

+/-0.25% without sensor influences, with CT-TH-K-ISO only +/-1%

-20 ... +70°C

20 ... 80% not condensing

5g Mil Standard 810C, Curve C

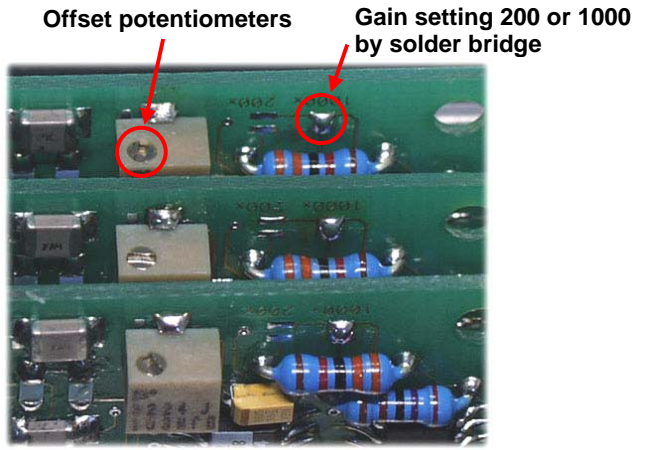
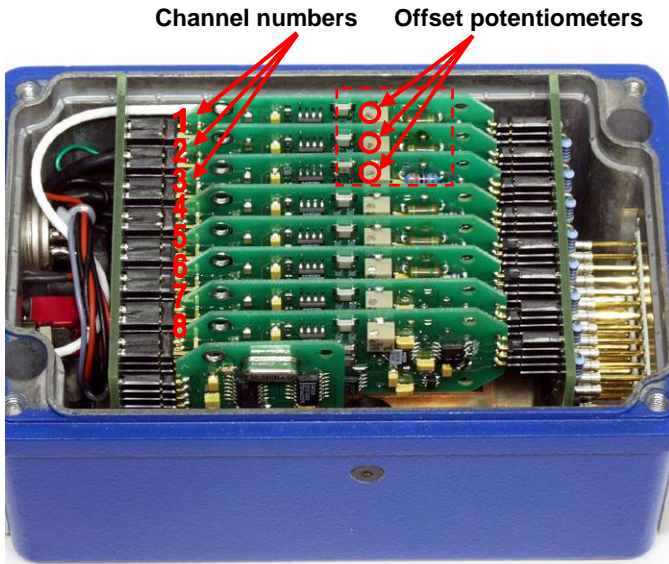
10g in all directions

100g in all directions

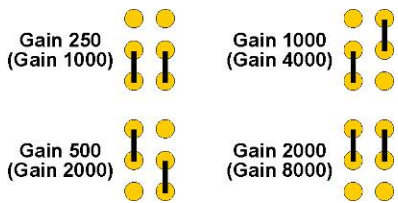
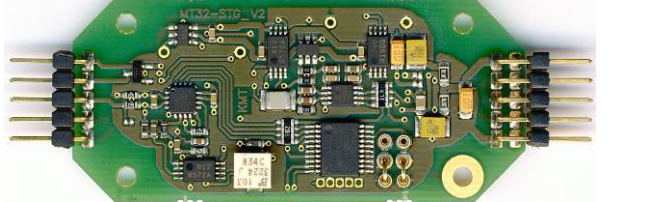
*Technical specifications are subject to change without notice*



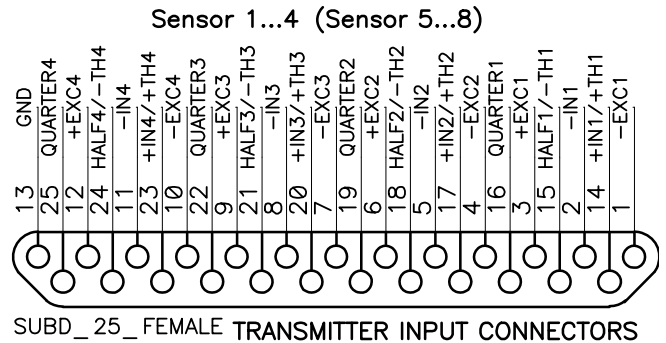
# Connection STG



**CT-STG-V1 module**  
 Type: Strain gage >350 Ohms  
 Excitation: 4 VDC (fixed)  
 Gain: 200 or 1000 by solder bridge  
 Accuracy: +/- 0.25%

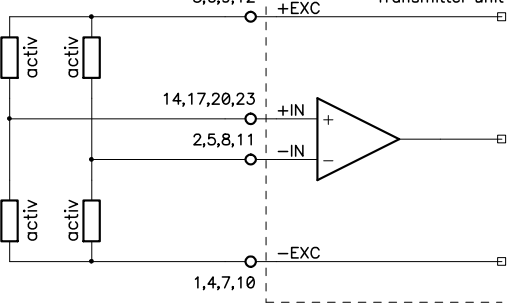


**CT-STG-V2 module**  
 Type: Strain gage >350 Ohms  
 Excitation: 4 VDC (fixed)  
 Gain: 250-500-1000 or 2000 by jumper  
 or on request 1000-2000-4000-8000  
 Accuracy: +/- 0.25%

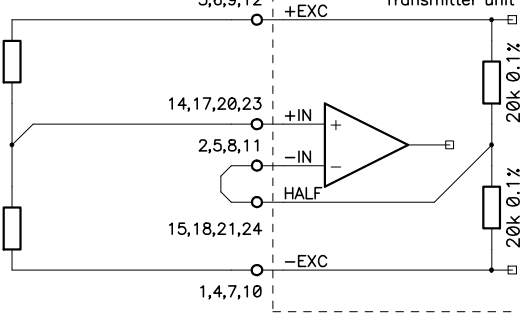


## Connection STG - Bridge

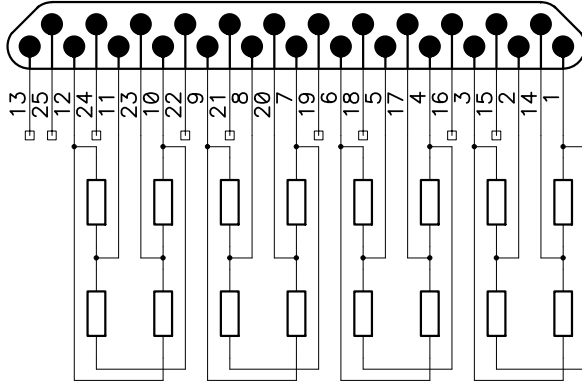
**STG FULL BRIDGE**



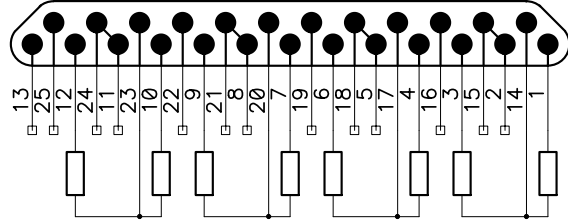
**STG HALF BRIDGE**



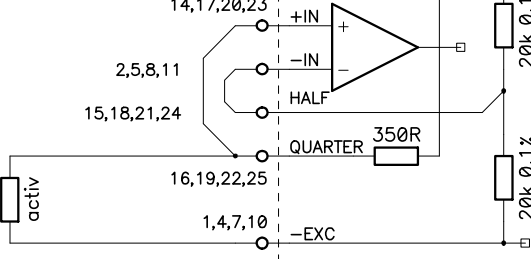
**SUBD\_25\_MALE**



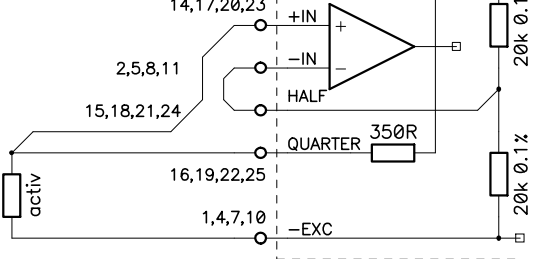
**SUBD\_25\_MALE**



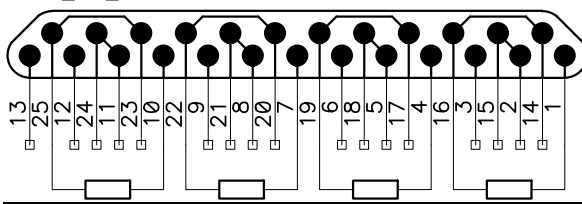
**STG QUARTER BRIDGE (2 - WIRE)**



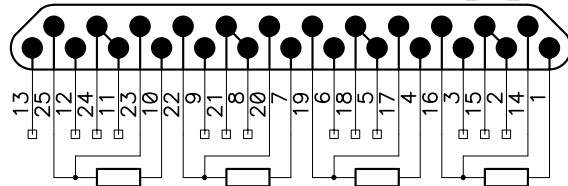
**STG QUARTER BRIDGE (3 - WIRE)**



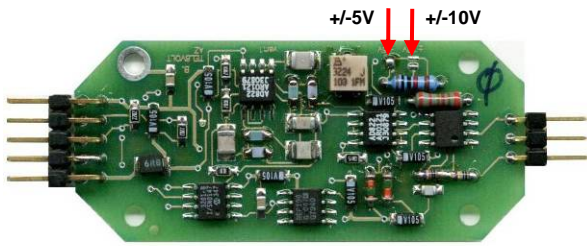
**SUBD\_25\_MALE**



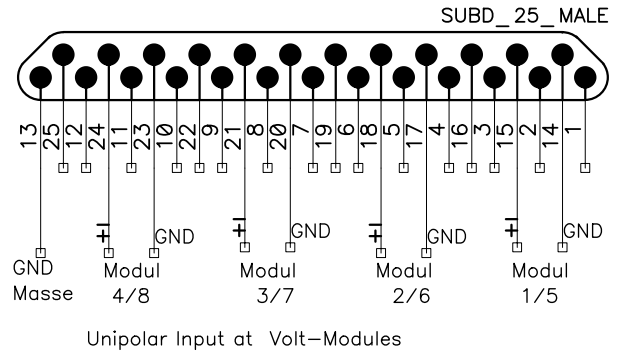
**SUBD\_25\_MALE**



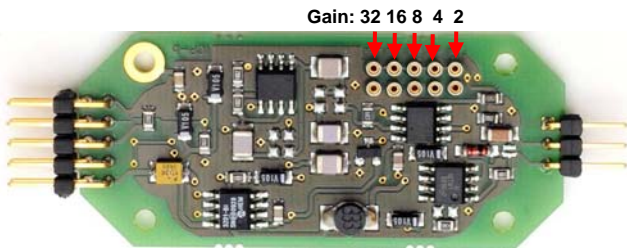
## Connection CT-Volt



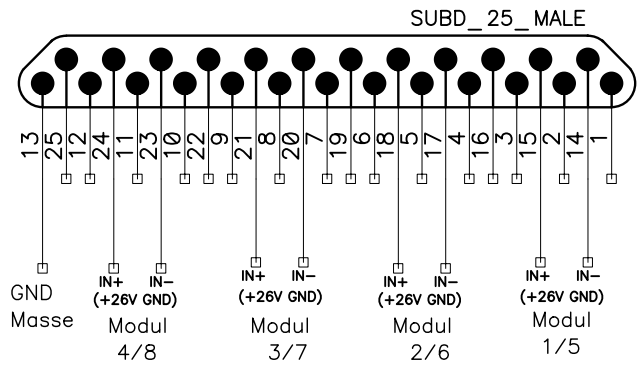
**CT-Volt module**  
 Type: Volt  
 Range: +/-5 or +/-10V  
 Accuracy +/- 0.25%



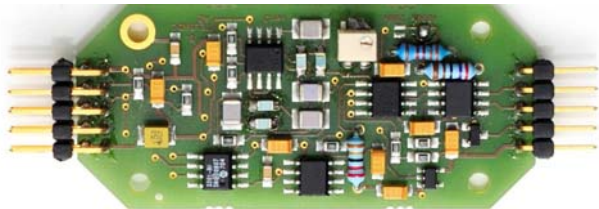
## Connection CT-ICP



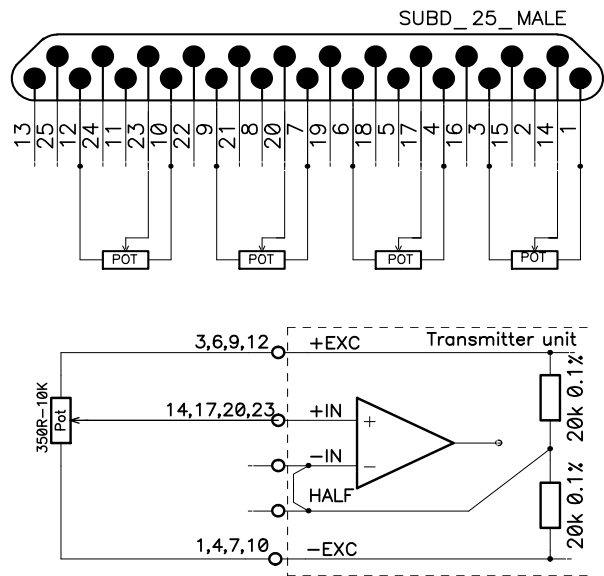
**CT-ICP module**  
 Type: ICP  
 Gain: 2x, 4x, 8x, 16x or 32x  
 Constant current: 4mA  
 Accuracy +/- 0.25%



## Connection CT-POT



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

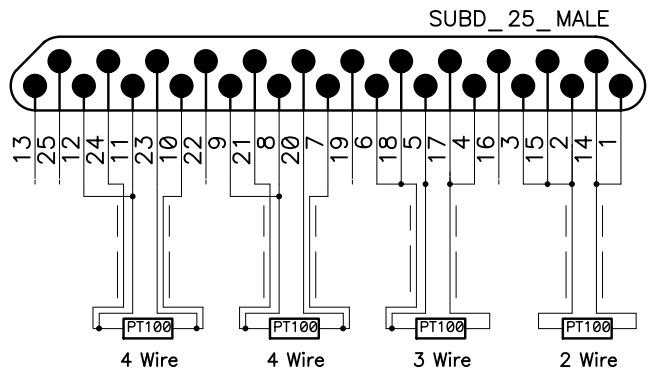


## Connection CT-Pt100



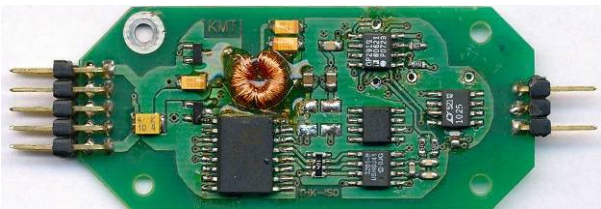
### CT-Pt100

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



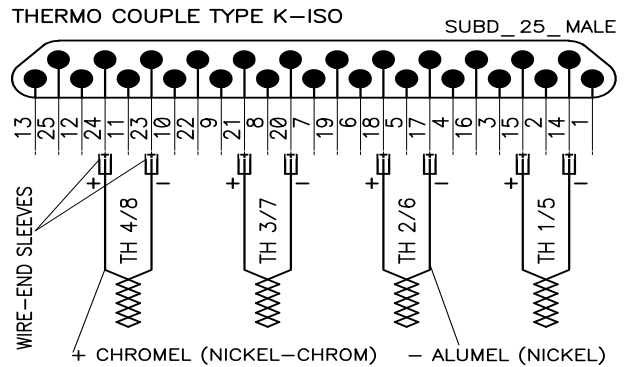
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-100	-0,997	150	1,500	400	4,004
-50	-0,497	200	2,001	450	4,498
0	0,001	250	2,501	500	4,999
50	0,499	300	3,001		
100	1,000	350	3,501		

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



### Thermo couple

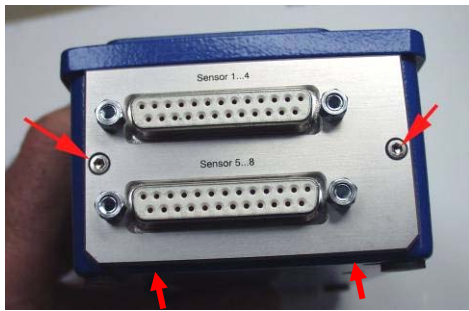
Type: K  
 Range: -50°C – 1000°C  
 Bandwidth: 0-20Hz (more on request)  
 Accuracy +/- 1%



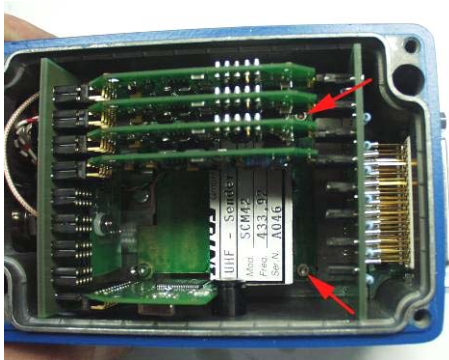
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
-50	-0.220	250	1.236	550	2.754	850	4.262
0	0.013	300	1.482	600	3.010	900	4.506
50	0.254	350	1.734	650	3.266	950	4.746
100	0.504	400	1.990	700	3.519	1000	4.980
150	0.752	450	2.242	750	3.700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



## 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!*