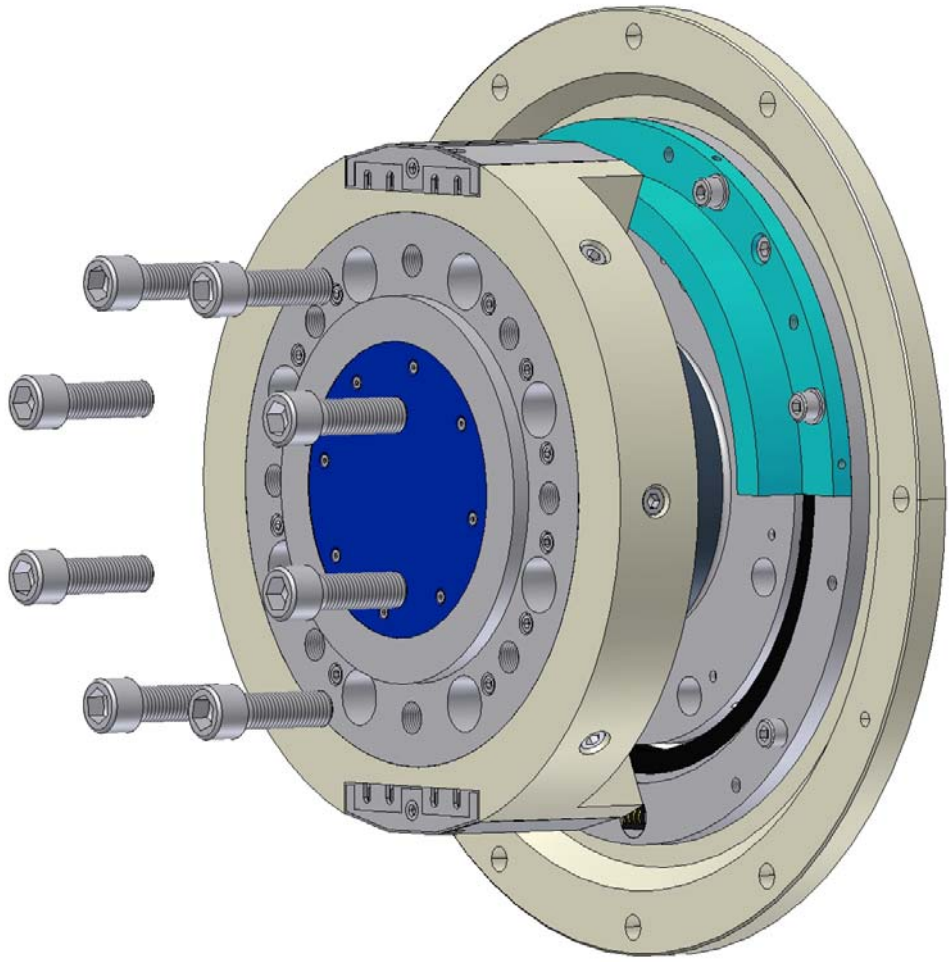
Manual TC308

TCU19 / TC308 / 309

Software version 1.82



1 Description TC308 / 309

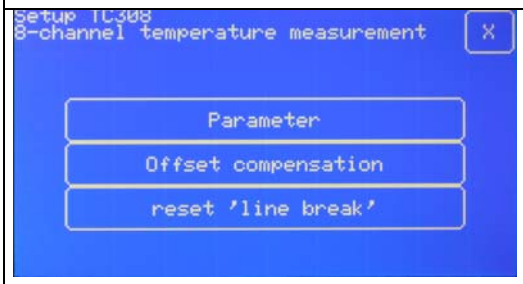
The card TC308 / 309 receives the serial data from a 8 channel temperature measuring system from -25°C to 1000°C. The serial data can be input directly via the 10 pol. MIL-Connector or via the signal Mdf2 from the card TC104b. The card TC308/TC309 includes 8 D/A Converter for an analogue Output +/-10V.

Prozessor	Fujitsu 90F594 256k Flash 16Bit 16MHz
Incoming signal	10400 Baud seriell (8 x Temperature + internal signals)
Channel select	Intern TTL – Logik
Sample rate	6 Measuring values/ second / channel
Effective range	-25°C bis 1000°C Typ J / Typ K
Accuracy	± 1 °C
Analogue Output signal	16 Bit for +10V / -10V
Analogue Output impedance	50 Ohm

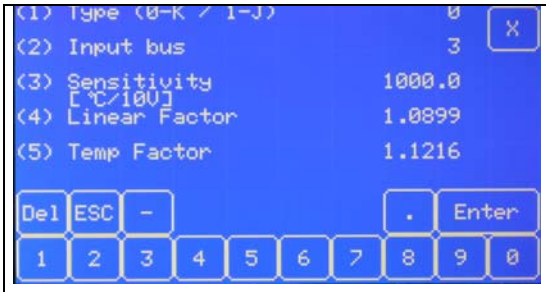
TC309
Plug in card with 10 pole central plug

TC 308
Plug in card without 10 pole central plug
(Temperature signal via X730 TC104)

2 Setup TC308/309

	Press ‘Setup’
	Select the installed card TC308
	Select ‘Parameter’

2.1 Parameter



(1) Thermocouple **Type**

-0- Type K

-1- Type J

Thermocouple linearization Type K or Type J.

(2) Input Bus

-1- RS422/intern

Connect the temperature measuring system to X731 -10 pol. central plug

-2- Bus A

TC308 is placed in slot 2-4 and the temperature signal is input at TC104 in slot 1.

-3- Bus B

TC308 is placed in slot 5-6 and the temperature signal is input at TC104 in slot 4.

(3) Sensitivity [°C/10V]

Scaling of the analogue output.

E.g. 1000 -> 0°C = 0 Volt ; 1000°C = 10 Volt

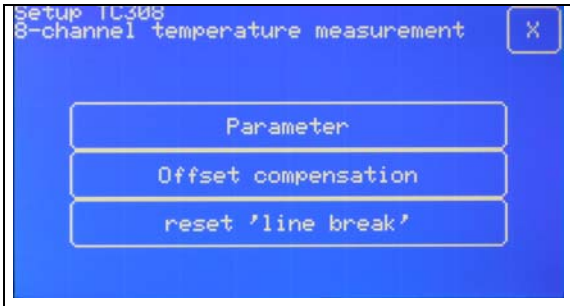
(4) Linear Factor

(5) Temp Factor

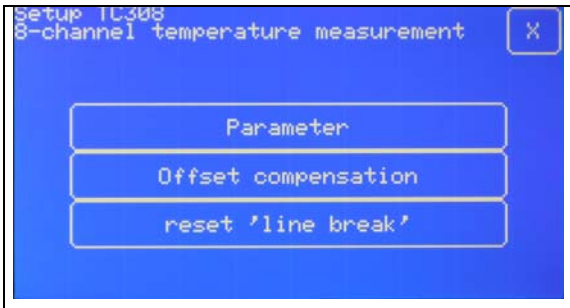
Calibration factors determined during calibration procedure of the measuring system. Factory set factors are documented on the torque transeducer test report.

To leave the menu press ‘X’.

2.2 Offset correction

	For each thermocouple it is possible to set a separate offset. This is only a zero point correction. A recalibration is not necessary. Select 'Offset compensation'
	For example: Connect thermocouple to channel 1. Press change.
	Enter the present temperature and press ENTER. The new internal offset value is stored.

2.3 Reset line break recognition

	To reset the defect thermocouple detection select 'reset line break'.
	The TC104 is induced to switch off the power supply to the flange for approximately 3 seconds.

TEMPERATURE TRANSDUCER TEST REPORT

Model NO.: QKS4/8 SERIAL NO.: QKS4/8-1790

Production NO.: 104930

SPECIFICATION:

Linearfactor (x)	1,0526
Tempfactor (y)	1,0833
Temp1 Offset	41
Temp2 Offset	40
Temp3 Offset	38
Temp4 Offset	42
Temp5 Offset	41
Temp6 Offset	41
Temp7 Offset	36
Temp8 Offset	35

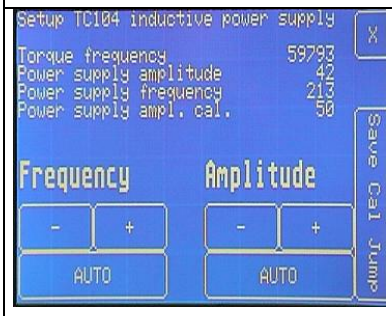
REMARKS:

Warming Up Time: 30 minutes

The values in brackets mark the input parameters when using terminal input.

Date: 19.01.2007 Tested By: U. Hecht

2.4 Inductive Power Supply (TC309)

	Press ‘Auto Search Power Supply’ During the automatic setup the display shows ‚wait. At the end of the automatically trimming the display shows ‚ready’. If all is o.k. press X to leave the menu.
	For Service and special application use the menu SERVICE. Here you can manually setup the inductive power supply.

Having input ‚Auto Search Power Supply’, the evaluation unit searches for the right resonance frequency and for the right amplitude of the connected torquemeter. After that, the torque frequency of the unloaded torquemeter must be about 60 kHz. The whole procedure takes a few seconds.
The values ‚Power supply amplitude’, ‚Power supply frequency’, ‚Zero Torque’ and the ‚calibration jump’ are stored in the internal EEPROM, automatically.

2.5 Defective Thermocouple

If a thermocouple is not connected or defective (line break), the temperature rises to value greater than 1000°C. For a value greater than 1024°C the corresponding channel is shut off at the rotatory site and the display of the TCU19 indicates an adjustable value (Analog output corresponds to the indicated value). The temperature at which the TCU19 displays the line break value can also be altered.

The value for the defect thermocouple detection can be setup in the terminal menu “-K- Temp. Calibration“ -> “a“ .

If a new thermocouple is connected to the transmitter electronic it the must be reset to switch on the channel. To reset the thermocouple channel do the following:
Switch Off- / On the TCU19 or
Disconnect and re-connect the central cable or
Press line break reset in Setup / TC308

2.6 DIP Switch settings TC308/TC309

This PCB has a µController on board with a flash memory. So it is possible to change the software of the TC104 via a flash update. For that, you can use the serial interface in connection with a special software.
Flash update:
Switch off the unit.
Set the Dip-Switches to the following position:
1 on
2 off
3 on/off (120 Ohm CAN)
4 off
Power on the unit.
Start the Flash Software on your PC.
Press OPEN and search for the newest software version on your PC.
After this is done, press FULL OPERATION to start the transfer of the file.
If all is correct, the program shows ‘ALL OK’.
Switch off the unit.
Set the Dip-Switches to the following position:
1 off
2 on
3 on/off (120 Ohm CAN)
4 off
Power on the unit.

Note
It is important, that your COMMAND.COM in the directory c:\
has the property ‘Automatisch schließen beim beenden’

2.7 CAN Identifier

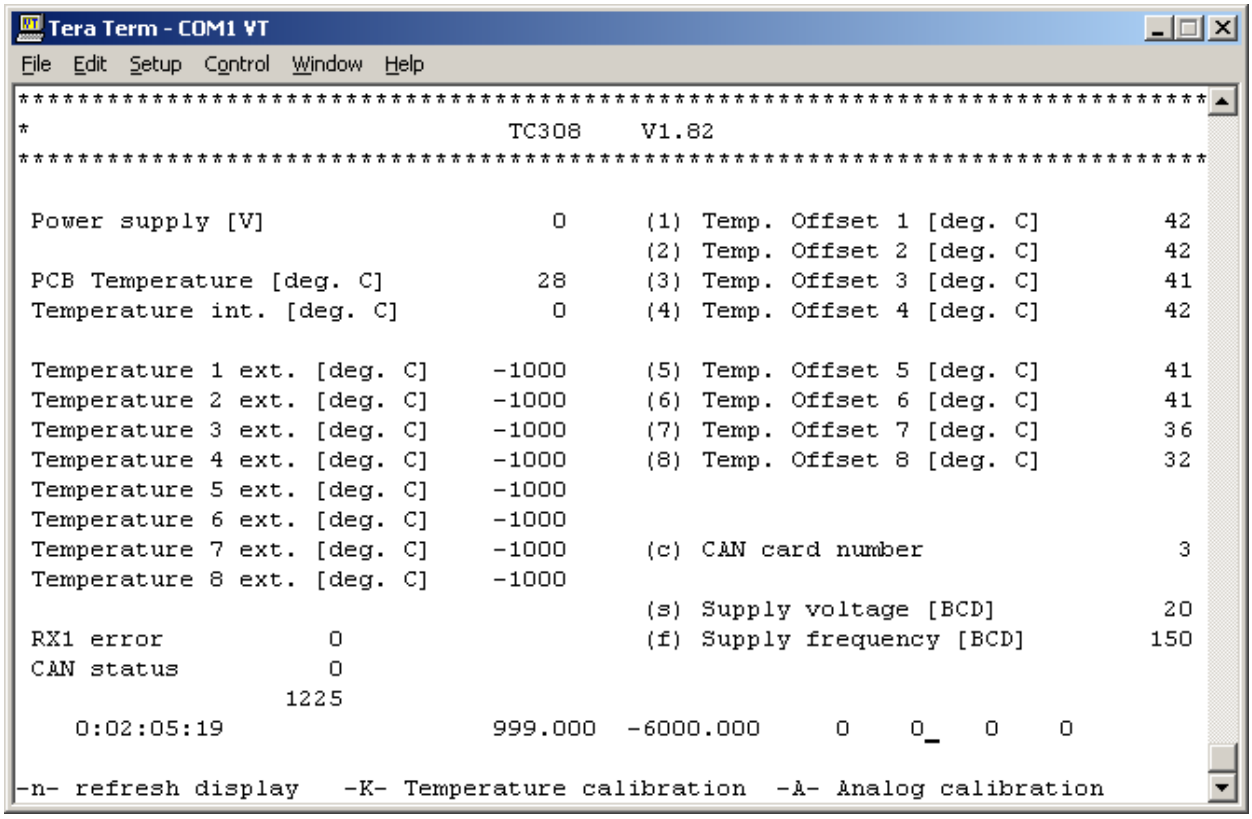
All Values decimal:

CAN Identifier	Measured quantity	Unit
1	Temperature1	°C
2	Temperature2	°C
3	Temperature3	°C
4	Temperature4	°C
5	Temperature5	°C
6	Temperature6	°C
7	Temperature7	°C
8	Temperature8	°C

2.8 Terminal settings

With a terminal program it is possible to setup the card and to calibrate the thermocouple.

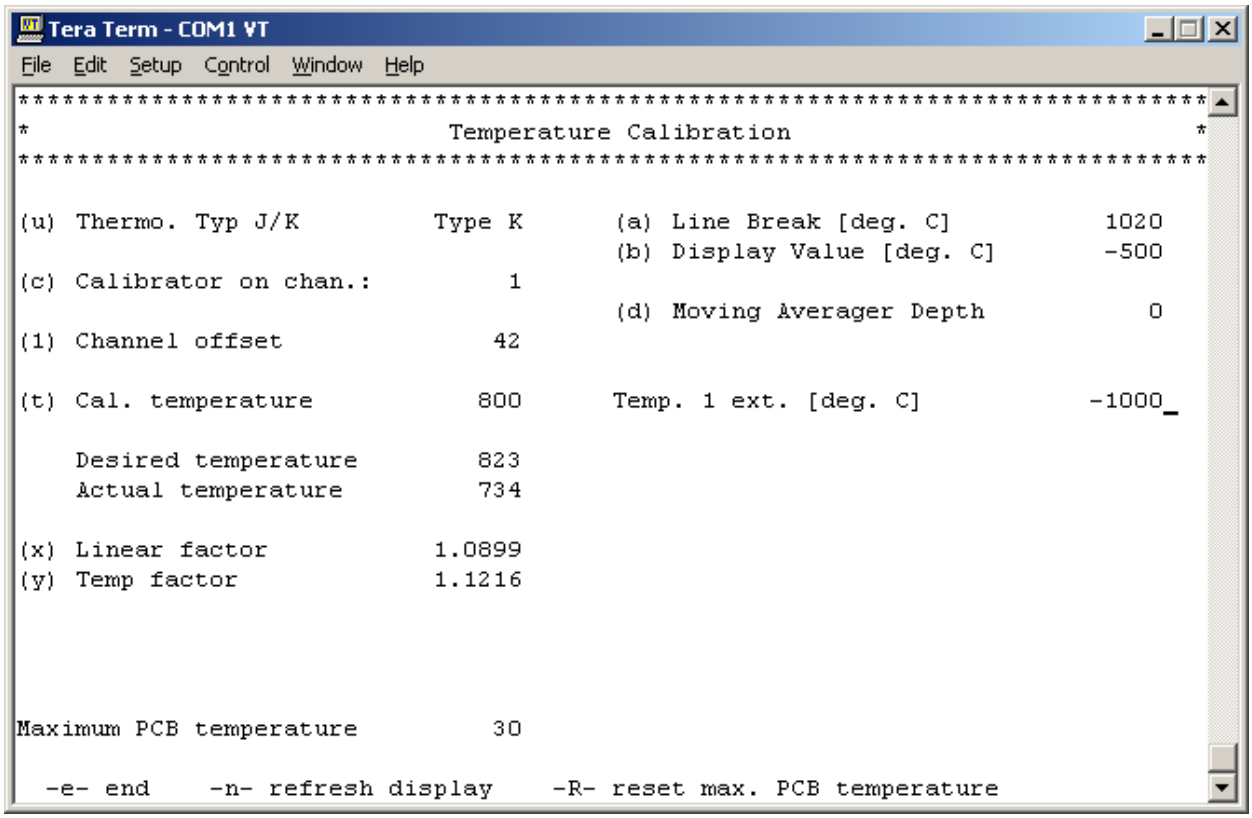
Settings 9600 Baud, 8 Data bits, 1 Stop bit, no Parity, no Protocol. (cable 1:1)



Input	Description
1-8	Offset values for temperature channel 1-8 (see calibration protocol and hints.
c	**CAN IDENTIFIER INTERN** (If CAN Identifier is set to '0', the card will automatically setup the CAN Identifier).
s	Inductive power supply amplitude
f	Inductive power supply frequency 556 = automatic search power supply frequency and amplitude 555 = automatic search power supply frequency
n	Refresh display.
K	Calibration of the thermocouple
A	Calibration of the analogue outputs

Display	Description
Power supply	Voltage (rotating part). The value must be >13,5 V and < 17 V
PCB temperature	Temperature PCB TC308 / 309
Temperature Int.	Temperature rotating part.
RX1 error	0 , Transmission o.k. >0 Transmission error between transmitter and receiver.
CAN status	Internal CAN Bus Status. 0 – o.k.

2.8.1 Calibration Thermocouple



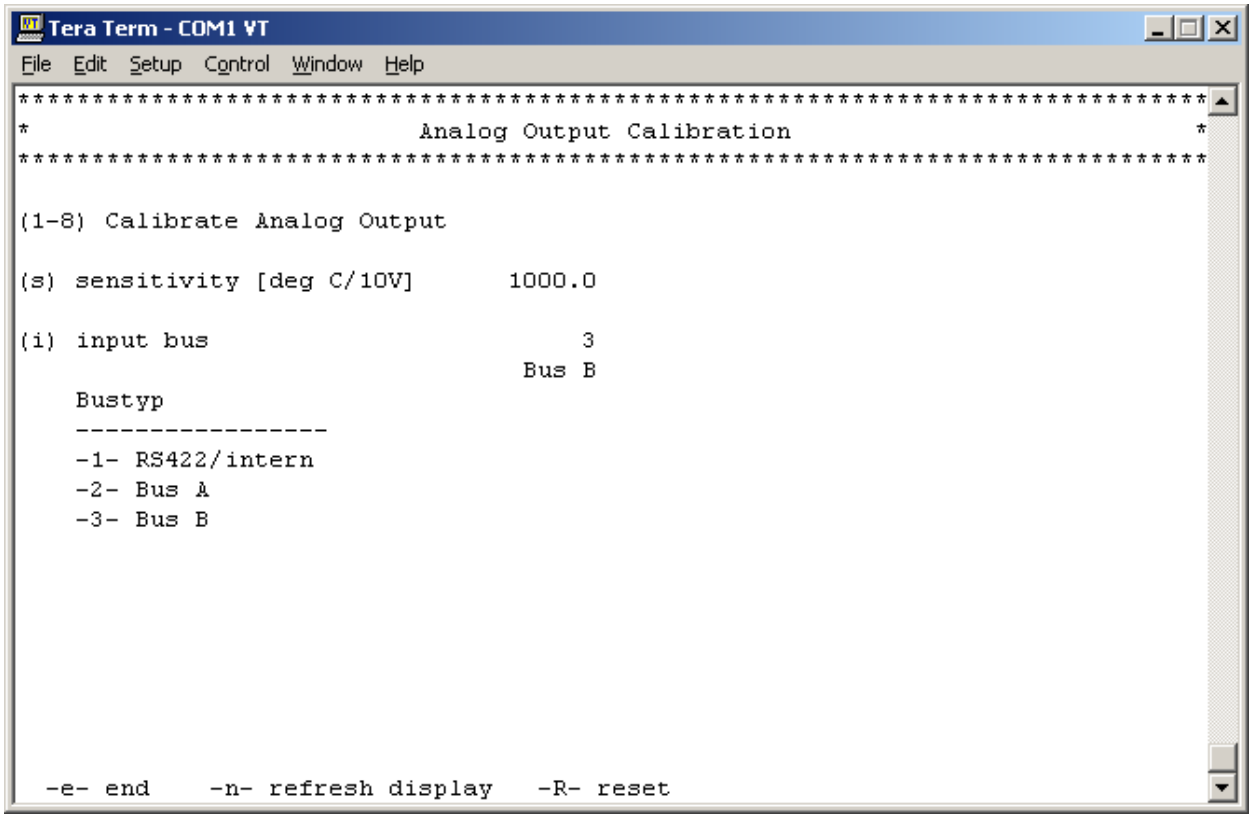
Input	Description
u	Select thermocouple type Change between type K and type J
c	Select channel the temperature calibrator is connected with
1	Offset of input channel
t	Calibration value
x	Calibration value from torque transducer test report
y	Calibration value from torque transducer test report
a	Temperature at which the TCU19 displays the line break value
b	Linebreak value which is displayed when transmitted value from the flange is above the line break temperature
d	A moving average filter is implemented to reduce noise of the temperature channels. 0 disables the averager
R	RESET all adjustments Press R and switch OFF/ON the unit

Calibration:

1. Connect Thermocouple calibrator with selected channel (Transmitter).
2. Simulate 0°C.
3. Set offset with (1), so that the display shows Temp. X ext. 0°C.
4. Simulate a value between 500°C and 1000°C. For example 800°C.
5. Enter the simulated value with (t). After pressing ENTER the new parameter curve will be calculated.
6. With x and y it is possible to calibrate the transmitter with the help of the torque transducer test report. In this case the values are determined by GIF.
7. If you change the card TC308 it not necessary to recalibrate the transmitter. In this case put in the values x and y from the old card.

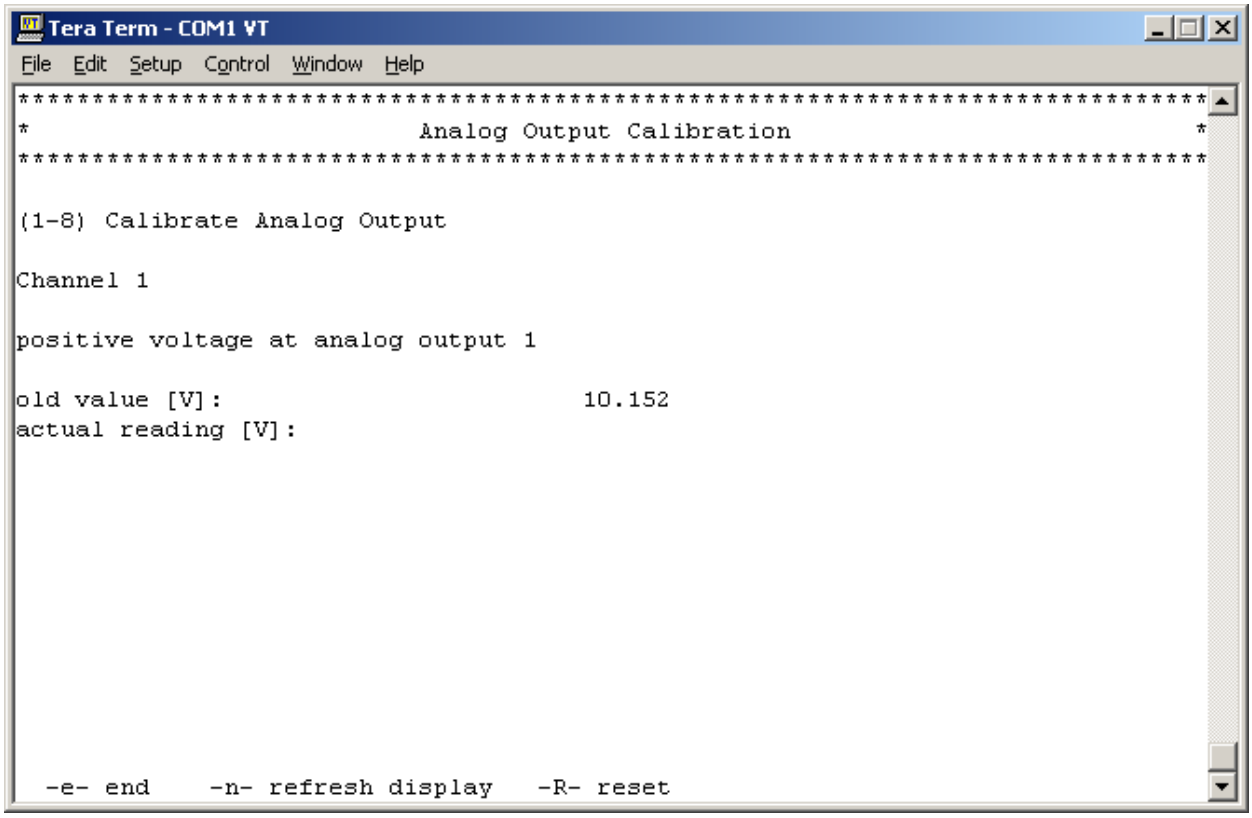
After this calibration remove the calibrator and connect the real thermocouples with the transmitter.
After that enter in the offset values for channel 1-8, so that the temperatures 1-8 are displayed correctly.

2.8.2 Settings analogue Outputs



Input	Description
1-8	Calibration analogue output 1-8
s	Scaling analogue Output for ±10V. i.e. Input 1000 ±1000° -> ±10V
i	Input Bus 1: Temperature signal connect to X731 (10 pol. connector) 2: BUS A -> Temperature signal connect to TC104 (TC308 with address 1-4) 3: BUS B -> Temperature signal connect to TC104 (TC308 with address 5-8)

2.8.3 Calibration menu analogue output

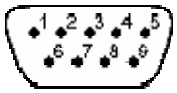
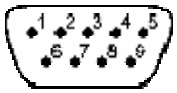


E.g. channel 1:

1. Connect a voltmeter to X790 (Pin 2 -1) and press 1.
2. Now the voltage at pin 2 is about 10V. Read the exact value from the voltmeter and enter this value. After that a negative voltage will be present at pin2 (ca -10V). Read the exact value from the voltmeter and enter this value.
3. The TC308 calculates the internal parameters from these values and stores the parameters in the internal EEPROM.

Do the same procedure for channels 2-8.
All channels are calibrated by GIF and with this method it is possible to check the analogue outputs.
For that proceed exactly as described above, however do not enter new values. Press ESC, if you are asked to enter the new values. In this case the old values are kept.

3 Plug connection

X790 9-pole Sub-D male  TC308 Temperaturmessung analoger Ausgang ± 10V	1 SIGNAL MASSE 2 Temp1 3 Temp2 4 Temp3 5 Temp4 6 Temp5 7 Temp6 8 Temp7 9 Temp8	X790 9-pole Sub-D male  TC308 Temperature Measuring analoger Ausgang ± 10V	1 SIGNAL Ground 2 Temp1 3 Temp2 4 Temp3 5 Temp4 6 Temp5 7 Temp6 8 Temp7 9 Temp8
X792 9 polig Sub-D female  RS232 Serielle Schnittstelle TC308 Temperaturmessung	1 N.C. 2 TxD 3 RxD 4 N.C. 5 SIGNAL MASSE 6 N.C. 7 N.C. 8 N.C. 9 N.C.	X792 9 pole Sub-D female  RS232 Serial Com. Port TC308 Temperature Measuring	1 N.C. 2 TxD 3 RxD 4 N.C. 5 SIGNAL GROUND 6 N.C. 7 N.C. 8 N.C. 9 N.C.
X 731 10-pole Mil Temperatursignale (Zentralkabel)	A Ground B VCC 15V C NC D Signal PS GND E Signal Temperatur - F Signal Temperatur + G NC H Signal PS I NC K NC	X 731 10-pole Mil Temperature signals (Central cable)	A Ground B VCC 15V C NC D Signal PS GND E Signal Temperature - F Signal Temperature + G NC H Signal PS I NC K NC

4 Imprint

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