KMT - Kraus Messtechnik GmbH

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Home Page http://www.kmt-telemetry.com, Email: info@kmt-telemetry.com

KMT
TELEMETRY

User Manual
CTP4/8/16

4/8/16-channel sensor telemetry system with different sensor inputs. High transmitting rate up to 5Mbit

NEW

INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

- Inputs for STG, TH-K, ICP or VOLT
- Simultaneous sampling
- 16 bit resolution
- Software programmable
- Signal bandwidth up to 24kHz (4-CH)

- Powering 7-30V
- Radio telemetry transmission
- Output analog +/- 10V (Decoder)
- Digital data interface to PC (option)
- Waterproofed ENC housing (IP65)

Picture show a 16 CH telemetry system (CTP16-ENC and CTP-DEC16 with accessories)

The CTP4/8/16 is a multi-channel sensor telemetry system for moving or point to point applications. The 2-channel plug-in acquisition modules from the encoder are easy to change and include signal condition, anti-aliasing-filter, A/D converter. All channels will simultaneous sampling. All acquisition modules are manage at CTP-Controller and encoded PCM output to the radio transmitter. Finally PCM data is transmitted via radio frequencies to the receiver.

Various configurations of different sensor modules are available incl. signal conditioning for strain gages (STG), thermocouples type K (TH-K), ICP sensors, potentiometer sensors (POT) and also voltage inputs. Mixed configuration available (2-CH-steps). All sensor modules are software programmable via LAN-Adapter. The LAN-Adapter has an integrated web interface and enables easy access!

The stationary receiver (Decoder) provides 4, 8 or 16 +/-10V analog outputs via Sub-D male socket (option: digital PC interface). The analog signal bandwidth can reach up to 24kHz with 5Mbit transmitter in 4-channel mode. The measurement accuracy is <±0.2 % (without sensor). The CTP4/8/16 is specified for operational temperatures from -20° C to +70° C. The maximum distance between transmitter and receiving antenna is approx. 150 m – depending on the application and bitrate!

| Cut off frequency from anti-aliasing filter (-3dB) and sampling rate (red)			
Bit rate	**4 Channels**	**8 Channels**	**16 Channels**
5000 kbit/s*	24000 Hz max. (62500 Hz)	12000 Hz (31250 Hz)	6000 Hz (15625 Hz)
2500 kbit/s	12000 Hz (31250 Hz)	6000 Hz (15625 Hz)	3000 Hz (7812.5 Hz)
1250 kbit/s	6000 Hz (15625Hz)	3000 Hz (7812.5 Hz)	1500 Hz (3906.25 Hz)
625 kbit/s	3000 Hz (7812.5 Hz)	1500 Hz (3906.25 Hz)	750 Hz (1953.125 Hz)
312,5 kbit/s	1500 Hz (3906.25 Hz)	750 Hz (1953.125 Hz)	375 Hz (976.56 Hz)

CTP4/8/16 Encoder for 4-8 or 16 channels

Specify CTP-xx modules at order!!

| 4,8 and 16-CH encoder in IP65 Aluminum housing	Encoder inside (e.g. 4-CH)

CTP acquisition modules
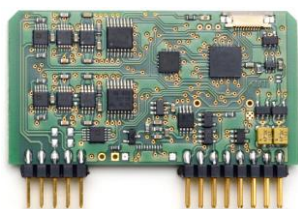
CTP-STG-V3
Acquisition module for 2 strain gages
Full, half and quarter bridge (≥350Ω)
Fixed excitation 4V DC
Offset calibration by auto zero
Manual offset shifting after auto zero
Gain: 125-250-500-1000-2000
Test shunt-cal step
Signal bandwidth 0Hz to 3000Hz*
Resolution 16bit
Accuracy <0.2%
Current consumption with full bridge 350 ohm 75mA
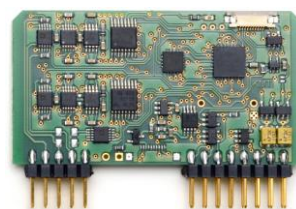
CTP-VOLT-V3
Acquisition module for 2x high level inputs
Range: ±0,625V, ± 1,25V, ±2,5V, ± 5V, ±10V
Signal bandwidth 0Hz to 3000Hz*
(*see table of cut-off-frequency)
Resolution 16bit
Accuracy <0.2%
Current consumption 60mA
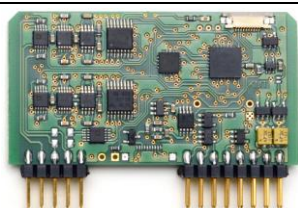
CTP-ICP®-V3
Acquisition module for 2 ICP sensors
Current EXC. 4mA
Gain: 1-2-4-8-16-32
Signal bandwidth 3 Hz to 3000Hz*
(*see table of cut-off-frequency)
Resolution 16bit
Accuracy <0.2%
Current consumption 100mA
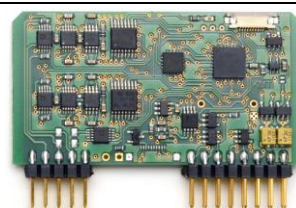
CTP-TH-K-V3
Acquisition module for 2x TH-K
Inputs galvanic isolated
Range -50 to 1000°C, -50 to 500°C
or -50 to 250°C
Cut-off filter 30Hz (more on request)
Resolution 16bit
Accuracy: 0.2% at 1000°C range
Current consumption 110mA
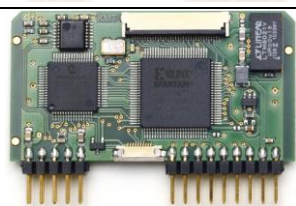
CTP-CONTROL-V3
Controller 1- 32 acquisition modules
Output: PCM
Programmable via LAN adapter
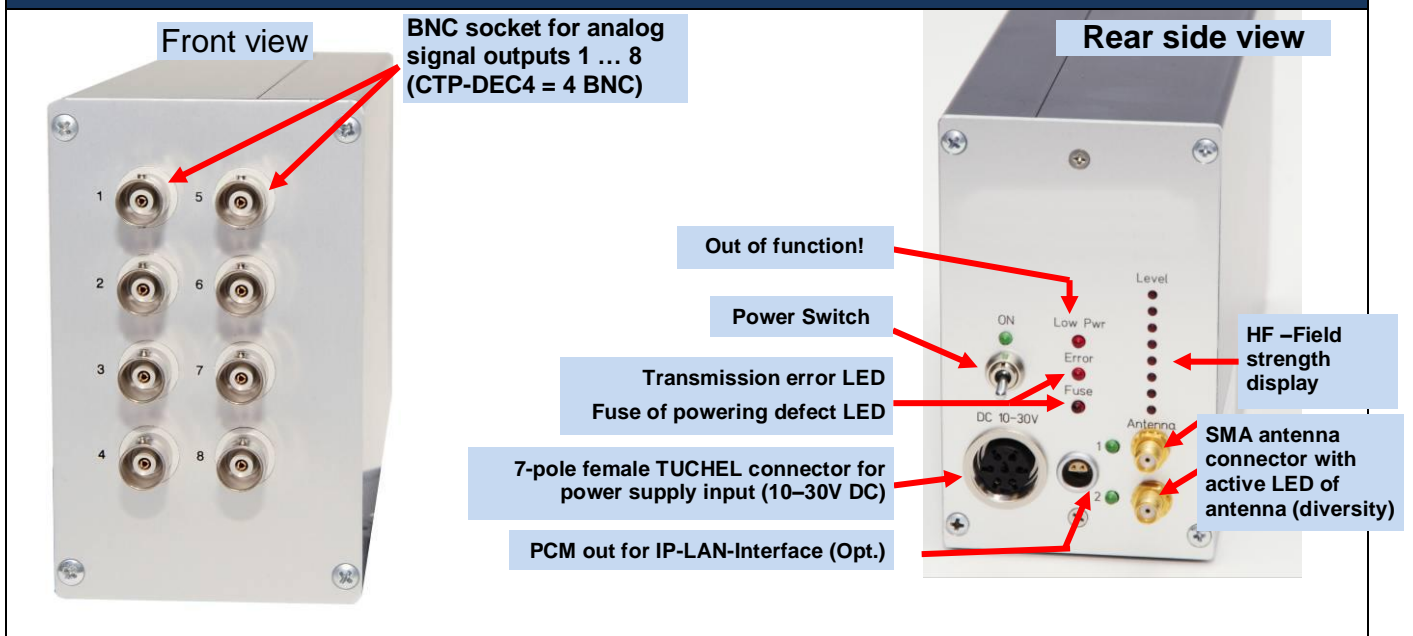Current consumption 40mA, with LAN-adapter 140mA

System Parameters ENCODER:

Channels:	4,8 or 16
Resolution:	16 bit A/D converter with anti-aliasing filter, simultaneous sampling of all channels
Line-of-sight distance:	up to 150m (depends of application and bit rate) More range with special antennas on request!
Powering:	7-30V DC
Analog signal bandwidth:	See table
Transmission:	Digital PCM format
Transmission Power:	10mW!
Dimensions:	CT4= 90x90x52mm, CT8=90x125x52mm, CT16=90x185x52mm (L x W x H)
Weight:	CT4=450g, CT8=580g, CT16=820g
Operating temperature:	- 20 … +80°C
Housing:	Aluminum anodized, waterproofed (IP65)
Humidity:	20 ... 80% no condensing
Vibration:	5g
Static acceleration:	100g in all directions
Shock:	200g in all directions

Technical specifications are subject to change without notice!

CTP-DEC8 (4)   Receiver unit for max 8 (4) Channels output via BNC
(radio transmission version with diversity receiver 312.5 … 1250kbit)

Front view

BNC socket for analog signal outputs 1 … 8 (CTP-DEC4 = 4 BNC)

Rear side view

Out of function!

Power Switch

Transmission error LED

Fuse of powering defect LED

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

PCM out for IP-LAN-Interface (Opt.)

HF –Field strength display

SMA antenna connector with active LED of antenna (diversity)

System Parameters:

Channels:	8 x +/-10V analog outputs via BNC or 4x BNC at CTP-DEC4
Resolution:	16 bit D/A converter, with smoothing filter
Power supply input:	10-30 VDC, power consumption <24 Watt
Analog signal bandwidth:	see frequency table
Transmission:	Digital PCM Format
Dimensions:	205 x 105 x 65mm
Weight:	1.25 kg without cables and antenna

Overall system accuracy between encoder input and decoder output: +/-0.2% without sensor influences

Environmental

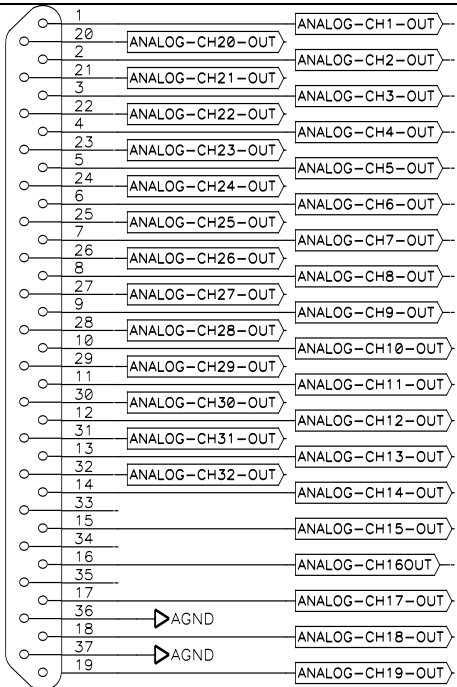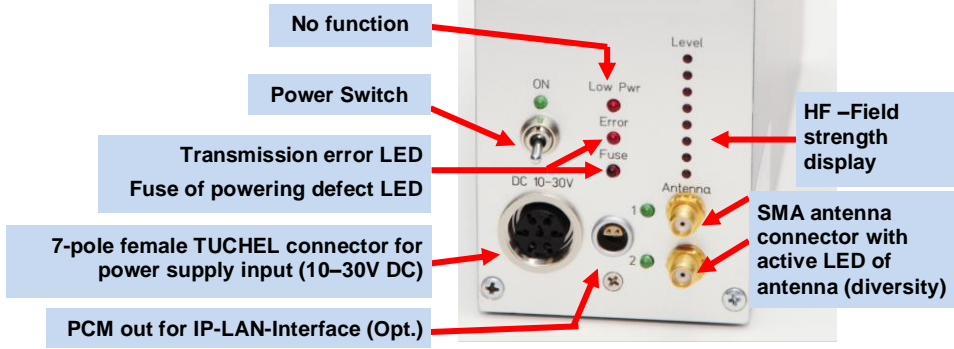|	
Operating:	-20 … +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g
Static acceleration:	10g in all directions
Shock:	100g in all directions

CTP-DEC16   Receiver unit for max 16 Channels output via 37 pol. Sub D
(radio transmission version with diversity receiver 312.5 … 1250kbit)
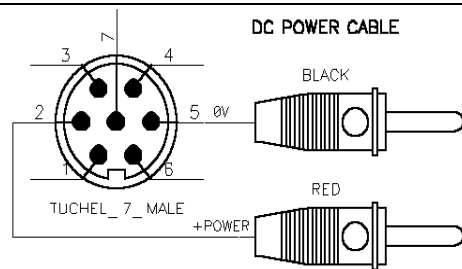
Front side view

Female 37 pole Sub-D for analog signal output, CH 1 to 16

Rear side view

No function

Power Switch

Transmission error LED

Fuse of powering defect LED

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

PCM out for IP-LAN-Interface (Opt.)

HF –Field strength display

SMA antenna connector with active LED of antenna (diversity)

Pin	Signal		Pin	Signal
1				ANALOG–CH1–OUT
20	ANALOG–CH20–OUT		2	ANALOG–CH2–OUT
21	ANALOG–CH21–OUT		3	ANALOG–CH3–OUT
22	ANALOG–CH22–OUT		4	ANALOG–CH4–OUT
23	ANALOG–CH23–OUT		5	ANALOG–CH5–OUT
24	ANALOG–CH24–OUT		6	ANALOG–CH6–OUT
25	ANALOG–CH25–OUT		7	ANALOG–CH7–OUT
26	ANALOG–CH26–OUT		8	ANALOG–CH8–OUT
27	ANALOG–CH27–OUT		9	ANALOG–CH9–OUT
28	ANALOG–CH28–OUT		10	ANALOG–CH10–OUT
29	ANALOG–CH29–OUT		11	ANALOG–CH11–OUT
30	ANALOG–CH30–OUT		12	ANALOG–CH12–OUT
31	ANALOG–CH31–OUT		13	ANALOG–CH13–OUT
32	ANALOG–CH32–OUT		14	ANALOG–CH14–OUT
33			15	ANALOG–CH15–OUT
34			16	ANALOG–CH16OUT
35			17	ANALOG–CH17–OUT
36	AGND		18	ANALOG–CH18–OUT
37	AGND		19	ANALOG–CH19–OUT

Plug-side

DC POWER CABLE

TUCHEL_7_MALE

BLACK — 0V

RED — +POWER

Optional BNC16Box. Connect on 37pol Sub-D

CTP –DEC16 System Parameters:

Channels:	16 x +/-10V analog outputs via Sub-D male socket
Resolution:	16 bit D/A converter, with smoothing filter
Power supply input:	10-30 VDC, power consumption <24 Watt
Analog signal bandwidth:	see frequency table
Transmission:	Digital PCM Format
Dimensions:	205 x 105 x 65mm
Weight:	1.25 kg without cables and antenna
Overall system accuracy between encoder input and decoder output: +/-0.2% without sensor influences	
Environmental	
Operating:	-20 … +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g
Static acceleration:	10g in all directions
Shock:	100g in all directions

CTP-DEC16   Receiver unit for max 16 Channels output via 37 pol. Sub D
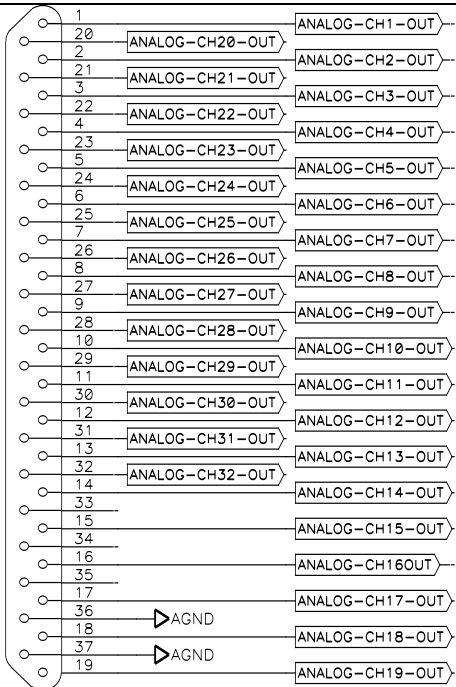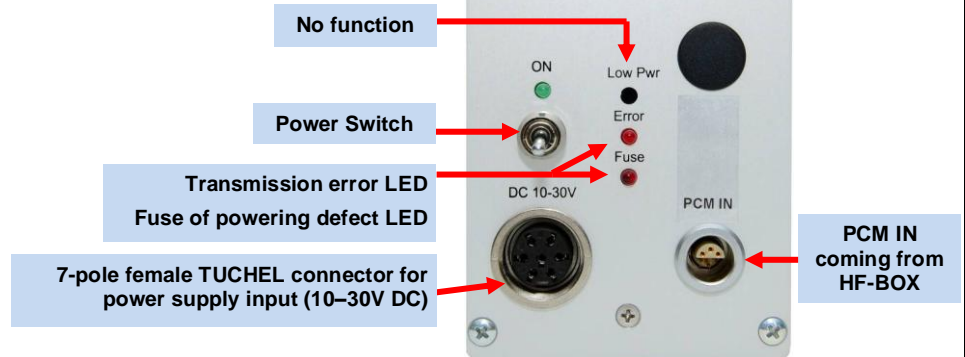### (radio transmission version via quad receiver 1250-5000kbit)

Front side view

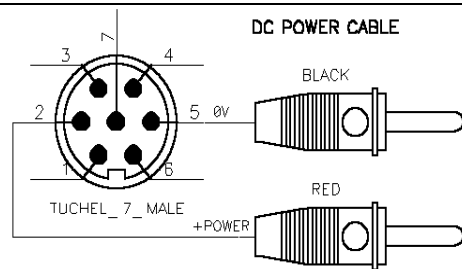**Female 37 pole Sub-D for analog signal output, CH 1 to 16**

Rear side view

CTP - DEC16

No function

ON   Low Pwr

Power Switch

Error

Transmission error LED

Fuse

Fuse of powering defect LED

DC 10-30V   PCM IN

PCM IN coming from HF-BOX

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

Pin	Signal	Pin	Signal
1		1	ANALOG–CH1–OUT
20	ANALOG–CH20–OUT	2	ANALOG–CH2–OUT
21	ANALOG–CH21–OUT	3	ANALOG–CH3–OUT
22	ANALOG–CH22–OUT	4	ANALOG–CH4–OUT
23	ANALOG–CH23–OUT	5	ANALOG–CH5–OUT
24	ANALOG–CH24–OUT	6	ANALOG–CH6–OUT
25	ANALOG–CH25–OUT	7	ANALOG–CH7–OUT
26	ANALOG–CH26–OUT	8	ANALOG–CH8–OUT
27	ANALOG–CH27–OUT	9	ANALOG–CH9–OUT
28	ANALOG–CH28–OUT	10	ANALOG–CH10–OUT
29	ANALOG–CH29–OUT	11	ANALOG–CH11–OUT
30	ANALOG–CH30–OUT	12	ANALOG–CH12–OUT
31	ANALOG–CH31–OUT	13	ANALOG–CH13–OUT
32	ANALOG–CH32–OUT	14	ANALOG–CH14–OUT
33		15	ANALOG–CH15–OUT
34		16	ANALOG–CH16OUT
35		17	ANALOG–CH17–OUT
36	AGND	18	ANALOG–CH18–OUT
37	AGND	19	ANALOG–CH19–OUT

Plug-side

DC POWER CABLE

TUCHEL_7_MALE
BLACK
RED
+POWER
0V

Optional BNC16Box. Connect on 37pol Sub-D

CTP –DEC16 System Parameters:
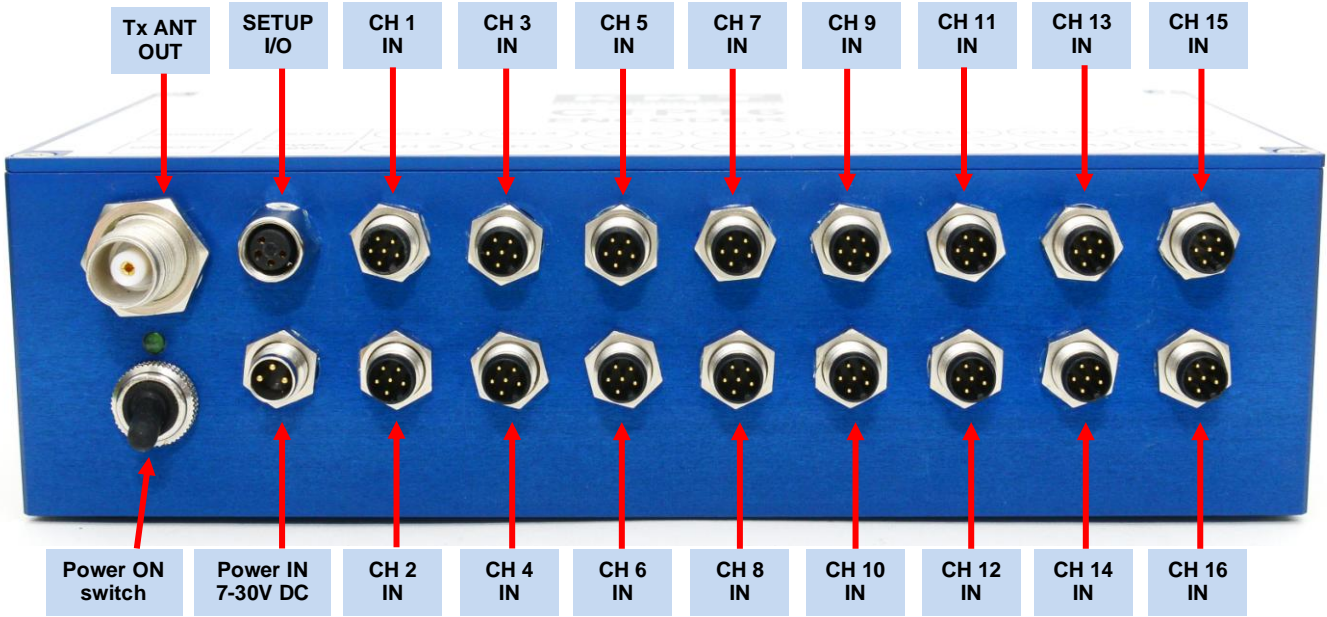
Channels:	16 x +/-10V analog outputs via Sub-D male socket
Resolution:	16 bit D/A converter, with smoothing filter
Power supply input:	10-30 VDC, power consumption <24 Watt
Analog signal bandwidth:	see frequency table
Transmission:	Digital PCM Format
Dimensions:	205 x 105 x 65mm
Weight:	1.00kg without cables and antenna
Overall system accuracy between encoder input and decoder output: +/-0.2% without sensor influences	
Environmental	
Operating:	-20 … +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g
Static acceleration:	10g in all directions
Shock:	100g in all directions

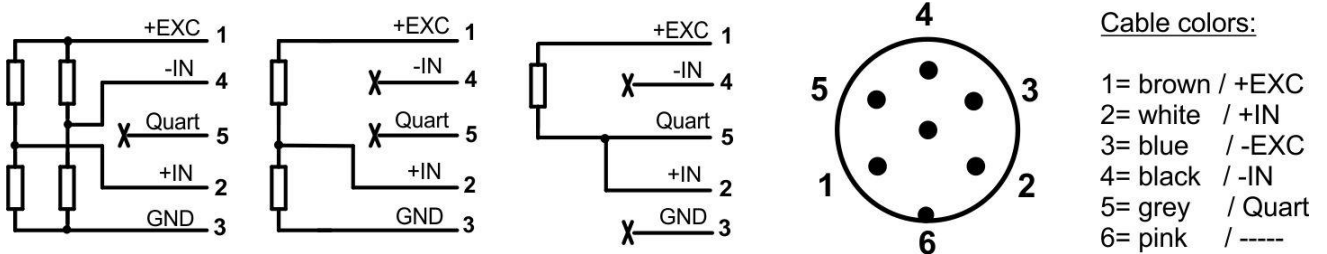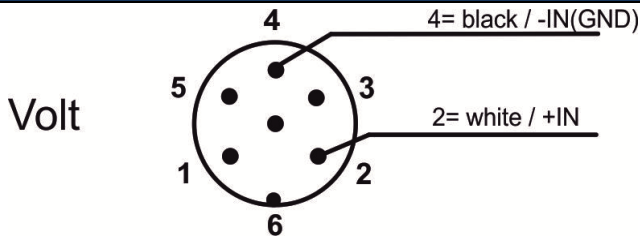## CTP4/8/16 Encoder for 4, 8 or 16 channels – Modules

Radio transmitter

Controller

CTP-Acquisition modules - 2 channels on each
1/2   3/4   5/6   7/8   9/10   11/12   13/14   15/16

If not all 8 CTP modules plugged, a BUS-PLUG must plug on empty slot!

Otherwise the digital bus between is open and system don't work!!
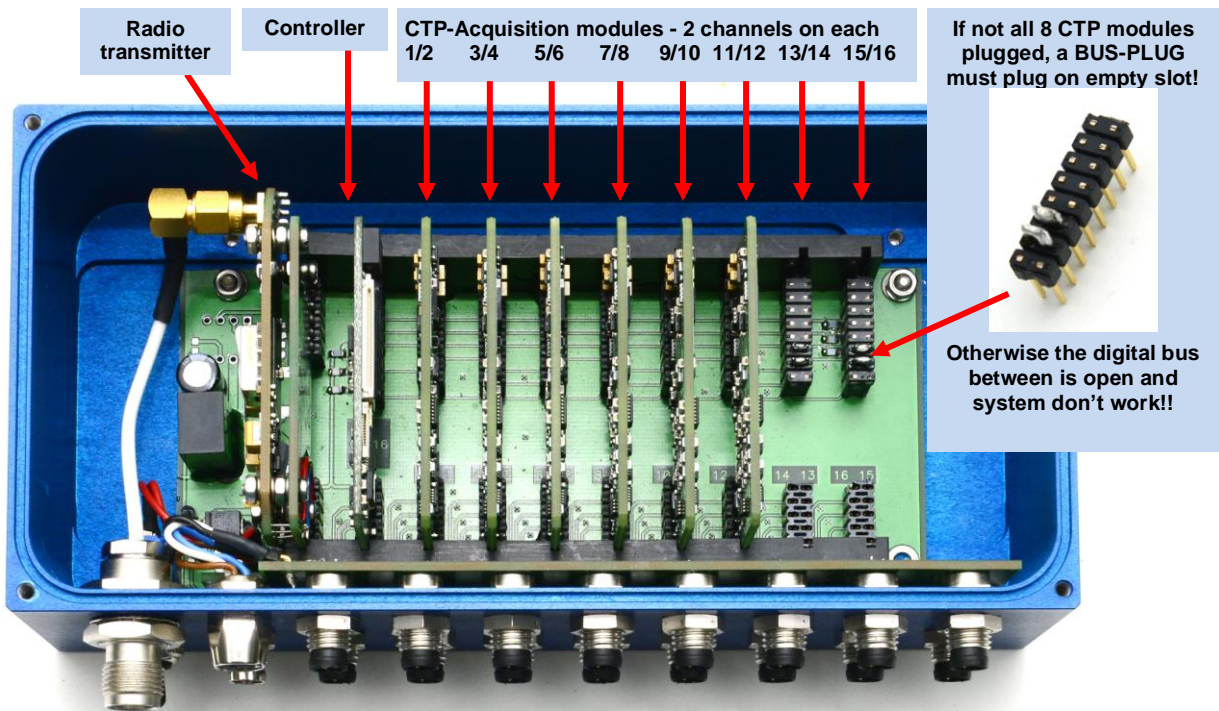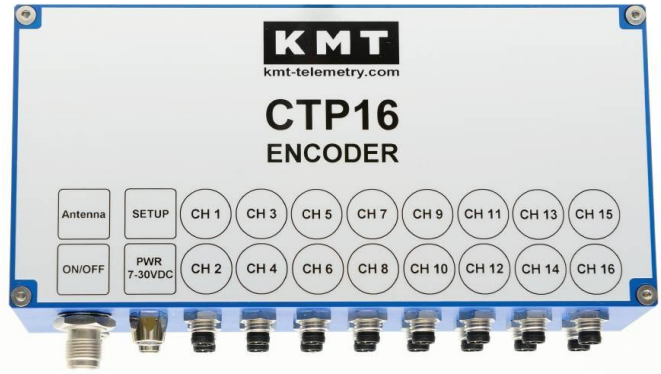
CTP4/8/16 Encoder for 4, 8 or 16 channels – Pin connection

Tx ANT OUT	SETUP I/O	CH 1 IN	CH 3 IN	CH 5 IN	CH 7 IN	CH 9 IN	CH 11 IN	CH 13 IN	CH 15 IN

Power ON switch	Power IN 7-30V DC	CH 2 IN	CH 4 IN	CH 6 IN	CH 8 IN	CH 10 IN	CH 12 IN	CH 14 IN	CH 16 IN

Strain gage connection

+EXC 1
-IN 4
Quart 5
+IN 2
GND 3

Cable colors:

1= brown / +EXC
2= white / +IN
3= blue / -EXC
4= black / -IN
5= grey / Quart
6= pink / -----

VOLT connection

Volt

4= black / -IN(GND)
2= white / +IN

ICP connection

ICP

4= black / -IN(GND)
2= white / +IN
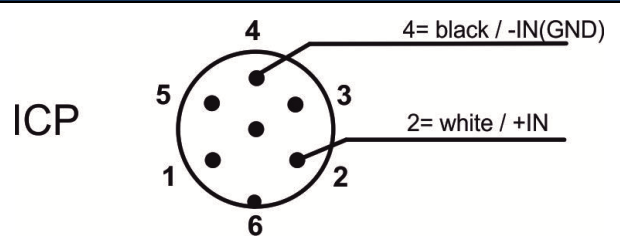
Setup connection
PWR – Powering connection

TH-Adapt

brown	+3V3	1
black	-IN	4
grey	Amp.Temp	5
white	+IN	2
blue	GND	3

Setup connection

Cable colors:

1= brown / +6,5V
2= black / RX
3= white / TX
4= blue / -----

PWR – Powering connection

Cable colors:

1= brown / +Vin
2= black / GND
3= Blu / -----
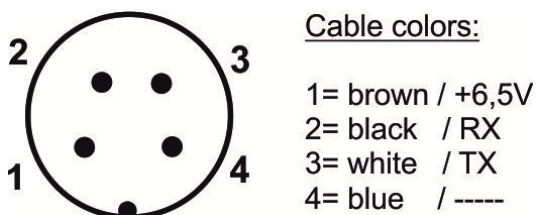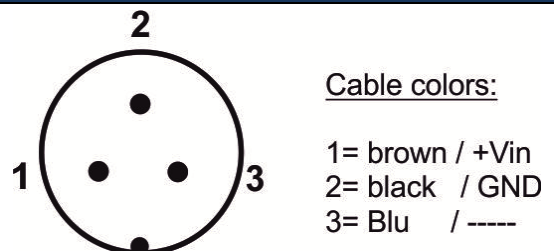
HF BOX Quad (receiver box with 4 receivers receiver 1250-5000kbit)

PCM OUT
Pin 1 -----
Pin 2 = PCM + (pink wire)
Pin 3 = PCM -- (blue wire)
Pin 4/5 = common GND & shield
      (black/green)
Pin 6 -----

4x HF Level display

**Active DATA LED, up to 2 receivers can be active!
If a fault data is identified, it will switch
automatically to a valid data from other receiver**

Transmission error LED

Fuse of powering defect LED

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

DC POWER CABLE

BLACK

TUCHEL_7_MALE

RED
+POWER

4x SMA inputs for Rx antenna

Power Switch

**PCM IN
coming from
HF-BOX**

**PCM/ DATA cable
Length 5m standard
(up to 25m on request)**

HF BOX Quad System Parameters:

HF receivers	4
Antenna connection	SMA
Output	PCM
Power supply input:	10-30 VDC, power consumption <24 Watt
Dimensions:	205 x 105 x 65mm
Weight:	1.050 kg without cables and antenna
Environmental	
Operating:	-20 … +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g
Static acceleration:	10g in all directions
Shock:	100g in all directions

Set of CTP-Decoder with external HF-Box (static part)

4x 0dB magnetic foot antennas with coaxial cable

Quad receiver

CTP DEC16

Option BNC16 BOX

DC power cable for DEC16 & HF BOX

5m PCM DATA cable

OPTION! AC/DC adapter for DEC16 & HF BOX
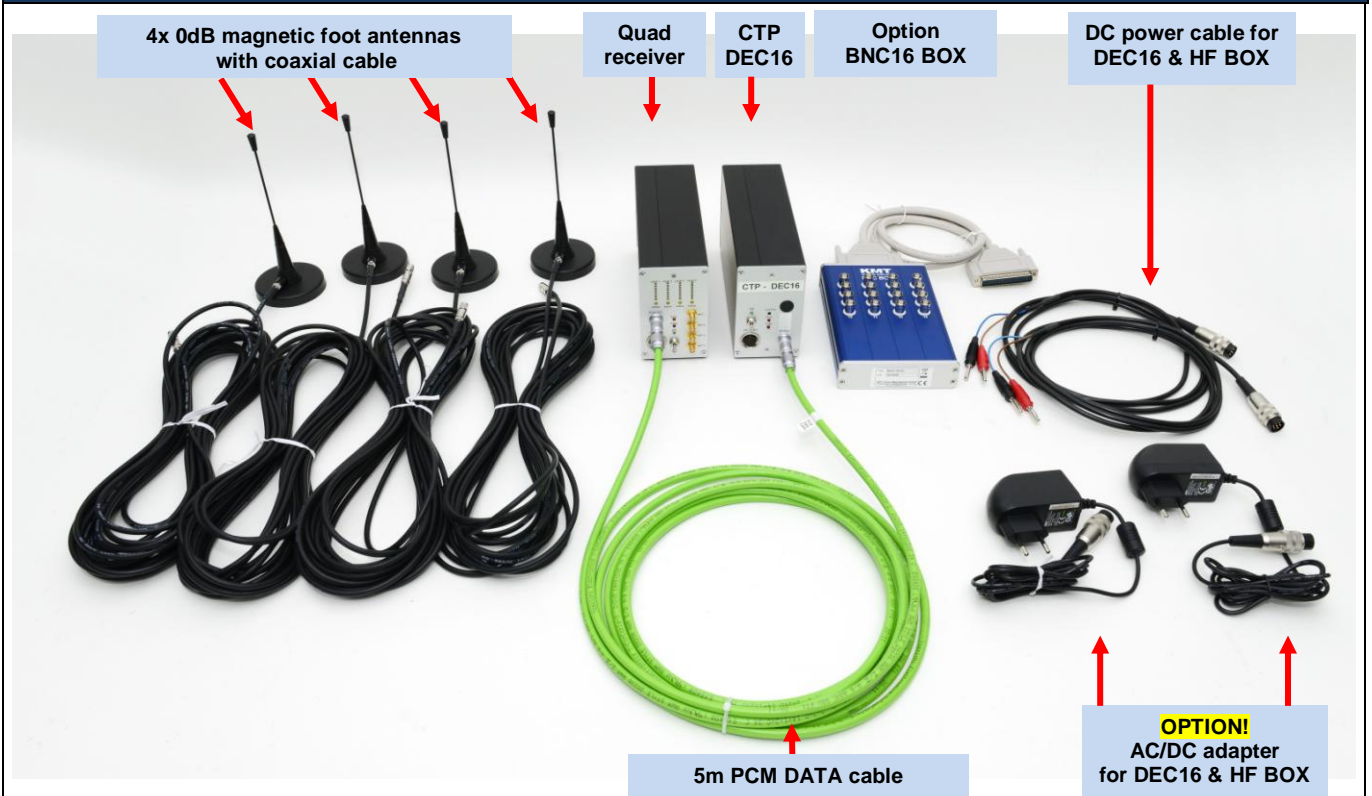
Set of CTP-ENCODER (rotating part)
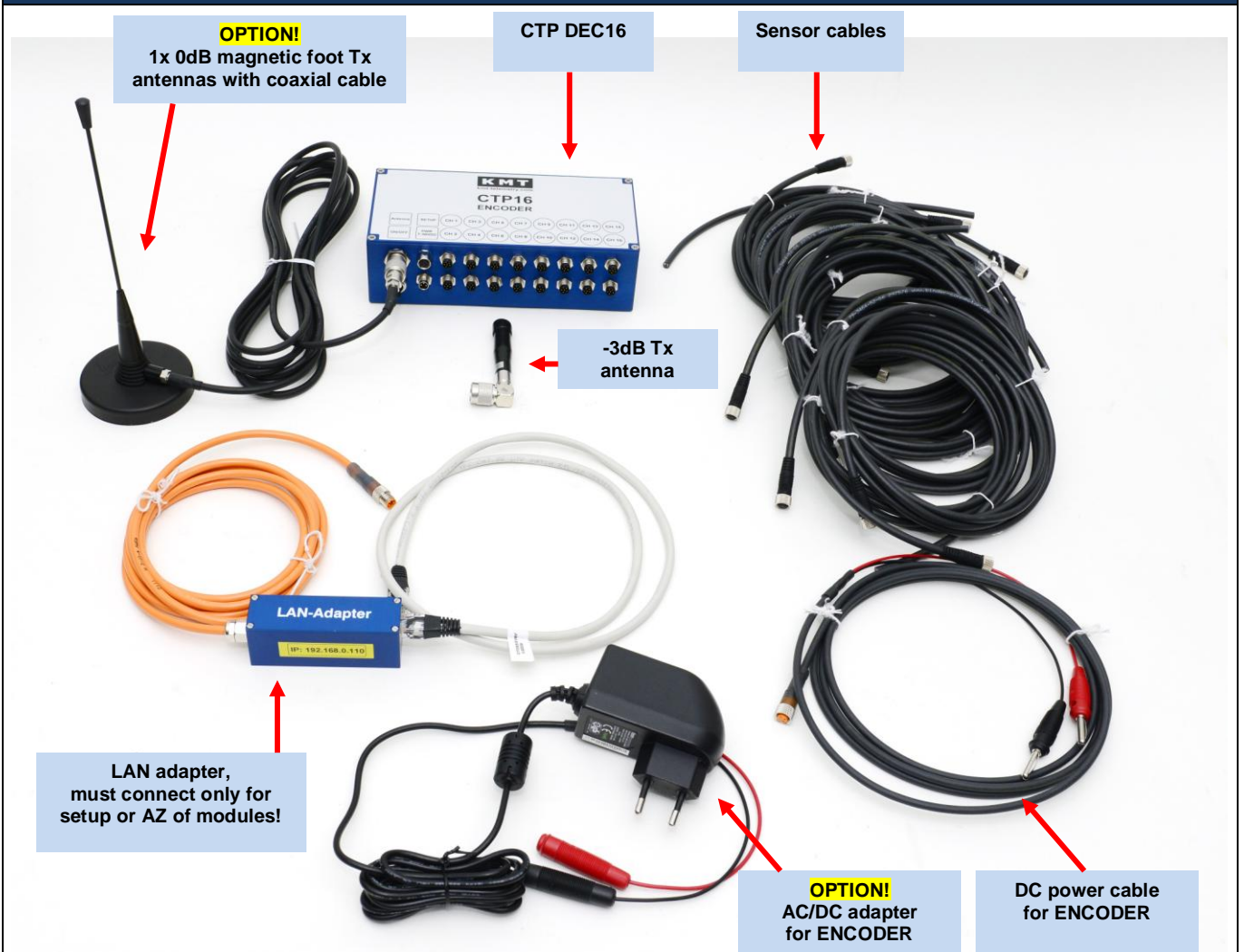
OPTION! 1x 0dB magnetic foot Tx antennas with coaxial cable

CTP DEC16

Sensor cables

-3dB Tx antenna

LAN-Adapter
IP: 192.168.0.110

LAN adapter, must connect only for setup or AZ of modules!

OPTION! AC/DC adapter for ENCODER

DC power cable for ENCODER

RX ANT

We recomment to have at all Rx antennas the same distance to Tx antenna!

1-3m between TX/RX

90° between each antennas

Shaft radial view

RX ANT

TX ANT

RX ANT

RX ANT

Quad radio receiver
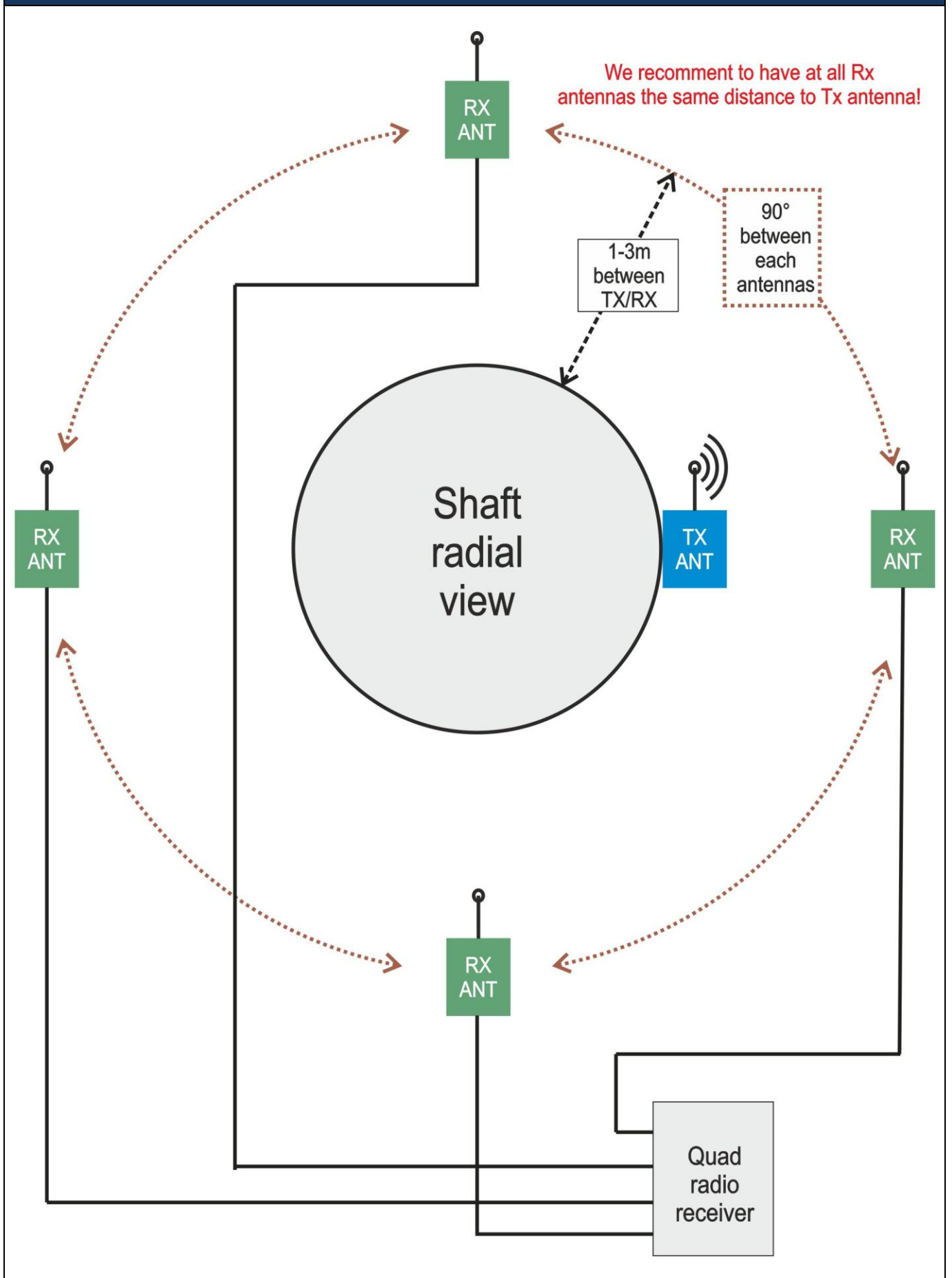
CTP ENCODER
Software setup via LAN-Adapter and notebook

LAN cross-over cable

Power IN 7-30V DC

LAN-Adapter

IP: 192.168.0.110

LAN Adapter only for SETUP
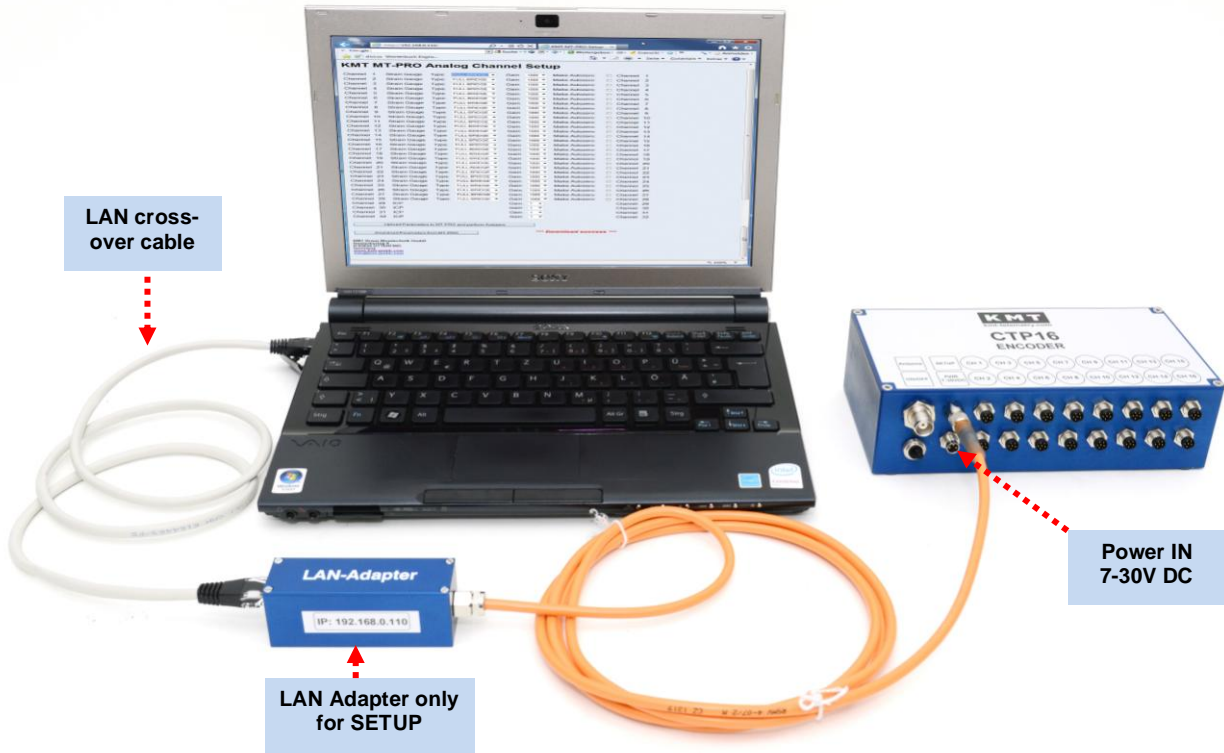
1) Power the CTP ENCODER with power 7-30 VDC

2) Connect the LAN-Adapter on the SETUP connector ov CTP ENCODER

3) Adjust your notebook to manual on e.g. IP 192.168.0.20

4) Connect LAN-Adapter with your notebook via cross-over LAN cable

5) Open e.g. Microsoft Internet Browser and enter IP address **192.168.0.110** of LAN-Adapter

6) Now you get access on the web-interface and can adjust the CTP acquisition module

MTP-CONTROL V3 - Software setup
DOWNLOAD parameters for device

http://192.168.0.110/   KMT MT-PRO Setup

KMT MT-PRO Analog Channel Setup

Channel	1	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	1
Channel	2	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	2
Channel	3	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	3
Channel	4	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	4
Channel	5	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	5
Channel	6	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	6
Channel	7	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	7
Channel	8	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	8
Channel	9	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	9
Channel	10	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	10
Channel	11	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	11
Channel	12	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	12
Channel	13	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	13
Channel	14	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	14
Channel	15	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	15
Channel	16	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	16
Channel	17	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	17
Channel	18	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	18
Channel	19	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	19
Channel	20	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	20
Channel	21	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	21
Channel	22	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	22
Channel	23	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	23
Channel	24	Strain Gauge	Type: FULL-BRIDGE	Gain: 1000	Make Autozero: ☐	Manual Offset: 0	Channel	24

[Upload Parameters to MT-PRO and perform Autozero]

[Download Parameters from MT-PRO]   *** Download success ***

[Switch on Test-Shunt Resistors for 20 sec.]

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Gewerbering 9
D-83624 OTTERFING
Germany
www.kmt-gmbh.com
info@kmt-gmbh.com

**First you can download the stored parameters from the acquisition modules via LAN adapter from the controller module .
All connected acquisition modules will detect!**

Caution:

Never use the refresh button ↻ on your browser; otherwise the parameters of you browser cash will upload to the MTP-STG!°

BRIDGE setting STG

KMT MT-PRO Analog Channel Setup

Channel 1	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 1
Channel 2	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 2
Channel 3	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 3
Channel 4	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 4

FULL-BRIDGE
HALF-BRIDGE
QUARTER-BRIDGE

Channel 5	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 5
Channel 6	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 6
Channel 7	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 7
Channel 8	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 8
Channel 9	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 9
Channel 10	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 10
Channel 11	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 11
Channel 12	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 12
Channel 13	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 13
Channel 14	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 14
Channel 15	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 15
Channel 16	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 16
Channel 17	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 17
Channel 18	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 18
Channel 19	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 19
Channel 20	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 20
Channel 21	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 21
Channel 22	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 22
Channel 23	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 23
Channel 24	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel 24

[Upload Parameters to MT-PRO and perform Autozero]

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[Switch on Test-Shunt Resistors for 20 sec.]

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Select full-, half- or quarter-bridge by popup window

Execute through "Upload Parameters to MT-PRO and perform Autozero" button

If you want test your bridge, you can execute the function Test-Shunt Resistor for 20 sec. button

In this case <u>all</u> STG channels get a shunt-cal step of about 80% of the from measuring range at GAIN 2000
In this case <u>all</u> STG channels get a shunt-cal step of about 40% of the from measuring range at GAIN 1000
In this case <u>all</u> STG channels get a shunt-cal step of about 20% of the from measuring range at GAIN 500
In this case <u>all</u> STG channels get a shunt-cal step of about 10% of the from measuring range at GAIN 250
In this case <u>all</u> STG channels get a shunt-cal step of about 5% of the from measuring range at GAIN 125

KMT MT-PRO Analog Channel Setup

Channel	1	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	1

Gain popup options: 2000 / 1000 / 500 / 250 / 125

Channel	2	Strain Gauge	Type: FULL-BRIDGE ▼	Gain:	Make Autozero: ☐	Manual Offset: 0	Channel	2
Channel	3	Strain Gauge	Type: FULL-BRIDGE ▼	Gain:	Make Autozero: ☐	Manual Offset: 0	Channel	3
Channel	4	Strain Gauge	Type: FULL-BRIDGE ▼	Gain:	Make Autozero: ☐	Manual Offset: 0	Channel	4
Channel	5	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	5
Channel	6	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	6
Channel	7	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	7
Channel	8	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	8
Channel	9	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	9
Channel	10	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	10
Channel	11	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	11
Channel	12	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	12
Channel	13	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	13
Channel	14	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	14
Channel	15	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	15
Channel	16	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	16
Channel	17	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	17
Channel	18	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	18
Channel	19	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	19
Channel	20	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	20
Channel	21	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	21
Channel	22	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	22
Channel	23	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	23
Channel	24	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	24

[Upload Parameters to MT-PRO and perform Autozero]

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[Switch on Test-Shunt Resistors for 20 sec.]

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Select gain of 125-250-500-1000 or 2000 by popup window
After change the gain you must make a new autozero!!

Execute through "Upload Parameters to MT-PRO and perform Autozero" button

KMT MT-PRO Analog Channel Setup

Channel 1	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☑	Manual Offset: 0	Channel 1
Channel 2	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☑	Manual Offset: 0	Channel 2
Channel 3	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 3
Channel 4	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 4
Channel 5	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☑	Manual Offset: 0	Channel 5
Channel 6	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 6
Channel 7	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 7
Channel 8	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 8
Channel 9	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 9
Channel 10	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 10
Channel 11	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 11
Channel 12	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 12
Channel 13	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 13
Channel 14	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 14
Channel 15	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 15
Channel 16	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 16
Channel 17	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 17
Channel 18	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 18
Channel 19	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 19
Channel 20	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 20
Channel 21	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 21
Channel 22	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 22
Channel 23	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 23
Channel 24	Strain Gauge	Type: FULL-BRIDGE ▾	Gain: 1000 ▾	Make Autozero ☐	Manual Offset: 0	Channel 24

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Select Auto-Zero per channel. The Auto-Zero function will be executed only <u>one time</u> per upload the parameters to MTP-STG! It will be stored also after power off in the MTP-STG until you make a <u>new</u> Auto-Zero on this channel!

Execute through "Upload Parameters to MT-PRO and perform Autozero" button

Manual Offset shifting after AutoZero

KMT MT-PRO Analog Channel Setup

Channel	1	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☑	Manual Offset: 1234	Channel	1
Channel	2	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☑	Manual Offset: -359	Channel	2
Channel	3	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	3
Channel	4	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	4
Channel	5	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☑	Manual Offset: 0	Channel	5
Channel	6	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	6
Channel	7	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	7
Channel	8	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	8
Channel	9	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	9
Channel	10	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	10
Channel	11	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	11
Channel	12	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	12
Channel	13	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	13
Channel	14	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	14
Channel	15	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	15
Channel	16	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	16
Channel	17	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	17
Channel	18	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	18
Channel	19	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	19
Channel	20	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	20
Channel	21	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	21
Channel	22	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	22
Channel	23	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	23
Channel	24	Strain Gauge	Type: FULL-BRIDGE ▼	Gain: 1000 ▼	Make Autozero: ☐	Manual Offset: 0	Channel	24

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After AutoZero you can shift (if necessary) the offset in +/-2000 steps

Execute through "Upload Parameters to MT-PRO and perform Autozero" button