KMT - Kraus Messtechnik GmbH

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User Manual

CTP8-Rotate

8 (4) channel telemetry for rotating applications like wheels or rotors, high signal bandwidth, 16bit, software programmable

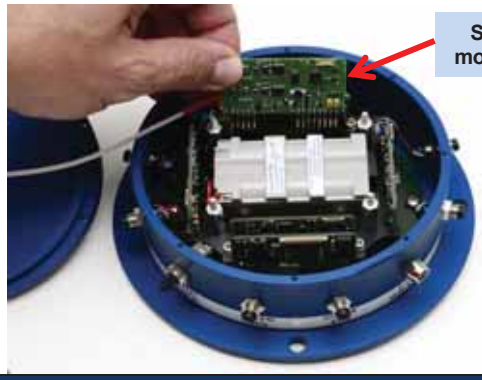
INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

- Inputs for STG, TH-K, ICP or VOLT
- Simultaneous sampling
- 16 bit resolution
- Software programmable
- Signal bandwidth: up to 24kHz (4 CH)
- Battery power up to 10h
- Radio telemetry transmission
- Output analog +/- 10V
- Digital data interface to PC (option)
- Waterproofed ENC housing (IP65)

General functions:

The CTP8-Rotate is a 8-channel telemetry system for rotating applications with integrated signal conditioning for sensor signals, wireless digital transmission and analog reproduction.
In the encoder/transmitter unit the sensor signals are conditioned, filtered (anti-aliasing) and digitized (16-bit). Simultaneous sampling is provided for all channels. Finally the PCM encoded 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 provides 8x +/-10V analog outputs via BNC socket (option: digital PC interface).
The analog signal bandwidth is 0-750 Hz (320kbit) and up to 0-12000Hz (5000kbit) for 8 channels.
On request is a 4 CH version with 0-24000Hz (5000kbit) also available
The measurement accuracy is <±0.2 % (without sensor). The CTP8-Rotate is specified for operational temperatures from -20° C to +70° C.
The maximum distance between transmitter and receiving antenna is approx. 10-20 m (30-60 feet) – depending on the application! Mixed configuration available (2-CH-steps).



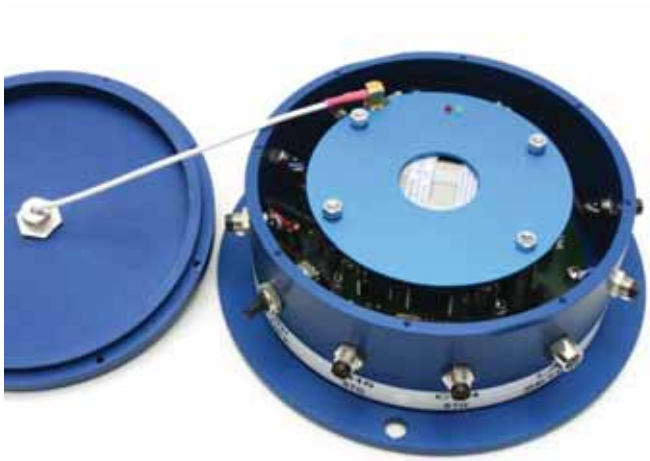
Frequency table	Cut off frequency from anti-aliasing filter (-3dB) and sampling rate (see red)	
Bit rate	**4 CH (Option)**	**8 CH.**
5000kbit	24000 Hz (62500 Hz)	12000 Hz (31250 Hz)
2500kbit	12000 Hz (31250 Hz)	6000 Hz (15625 Hz)
1250kbit	6000 Hz (15625Hz)	3000 Hz (7812.5 Hz)
625kibt	3000 Hz (7812.5 Hz)	1500 Hz (3906.25 Hz)
312.5kbit	1500 Hz (3906.25 Hz)	750 Hz (1953.125 Hz)

Different applications:

CAR wheel	Truck wheel	Helicopter rotor
		

CTP8-Rotate Transmitting Unit Technical Data (Encoder)

Encoder in IP65 Aluminum housing



Encoder inside

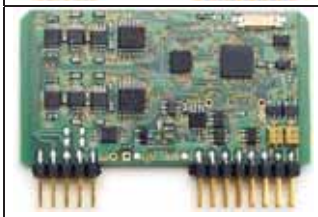
CTP acquisition modules (rotor side)

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 24000Hz*
Resolution 16bit
Accuracy <0.2%
Current consumption with full bridge 350 ohm 75mA

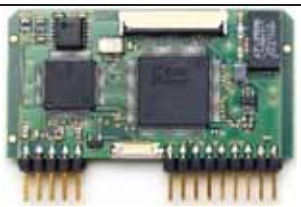
CTP-VOLT-V3
Acquisition module for 2x high level inputs
Range: ±0,625V, ± 1,25V, ±2,5V, ± 5V, ±10V
Signal bandwidth 0Hz to 24000Hz*
(*see table of cut-off-frequency)
Resolution 16bit
Accuracy <0.2%
Current consumption 60mA

CTP-ICP®-V3
Acquisition module for 2 ICP sensors
Current EXC. 4mA
Gain: 1-2-4-8-16-32
Signal bandwidth 3 Hz to 24000Hz*
(*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-Pt100/1000 (RTD) V3
Acq. module for 2 RTD sensors
Range -100 to 600°C, -50 to 300°C
or -25 to 150°C
Type Pt100 or Pt1000
Current EXC. 1mA
Connection: 4-, 3- and 2 wire
Sensor break detection
Signal bandwidth 6Hz
Resolution 16bit
Accuracy <0.2%
Current consumption 60mA



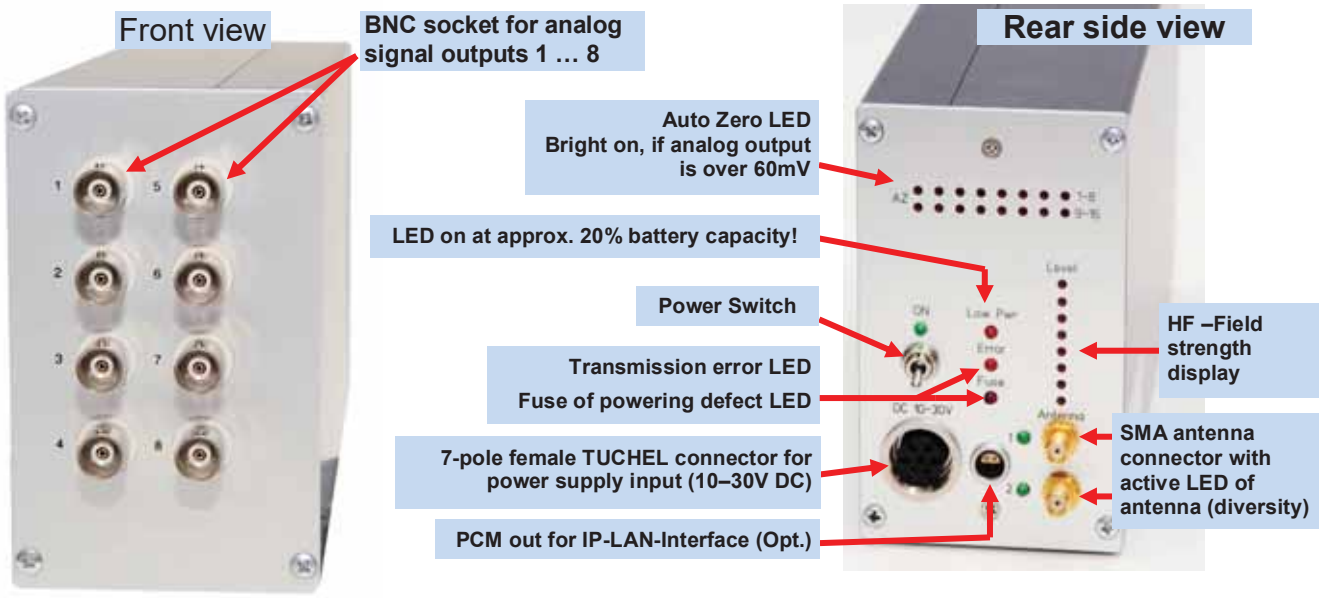
CTP-CONTROL-V3
Controller 1- 32 acquisition modules
Output: PCM
Programmable via LAN adapter
Current consumption 40mA, with LAN-adapter 140mA

System Parameters ENCODER:

Channels:	8 (optional 4 on request)
Resolution:	16 bit A/D converter with anti-aliasing filter, simultaneous sampling of all channels
Line-of-sight distance:	up to 20m (depends of application and bit rate)
Powering:	Li Ion Accumulator 7.2V 4600mAh, capacity up to 10 hours
Power consumption:	400 mA using 8x STG full bridge sensors 350 Ohms
Analog signal bandwidth:	See table
Transmission:	Digital PCM Miller format - FSK
Transmission Power:	10mW!
Dimensions:	Diameter 145mm, bottom plate diameter 175mm, height 62mm (without antenna)
Weight:	1.3 kg without sensor cables
Operating temperature:	- 20 … +70°C
Housing:	Aluminum anodized, waterproofed (IP65)
Humidity:	20 ... 80% no condensing
Vibration:	5g Mil Standard 810C, Curve C
Static acceleration:	100g in all directions, 3000 RPM
Shock:	200g in all directions

Technical specifications are subject to change without notice!

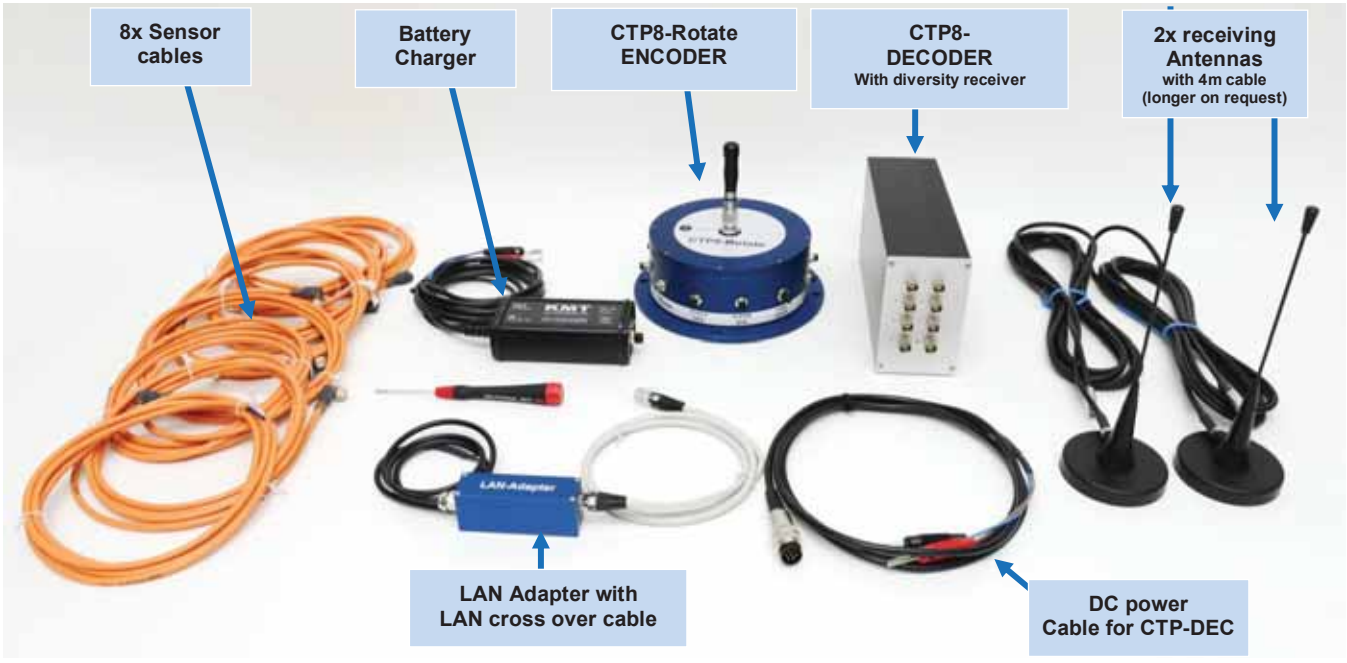
CTP-DEC8 Receiver unit for max 8 Channels output BNC (radio transmission version with diversity receiver 312.5 … 1250kbit)



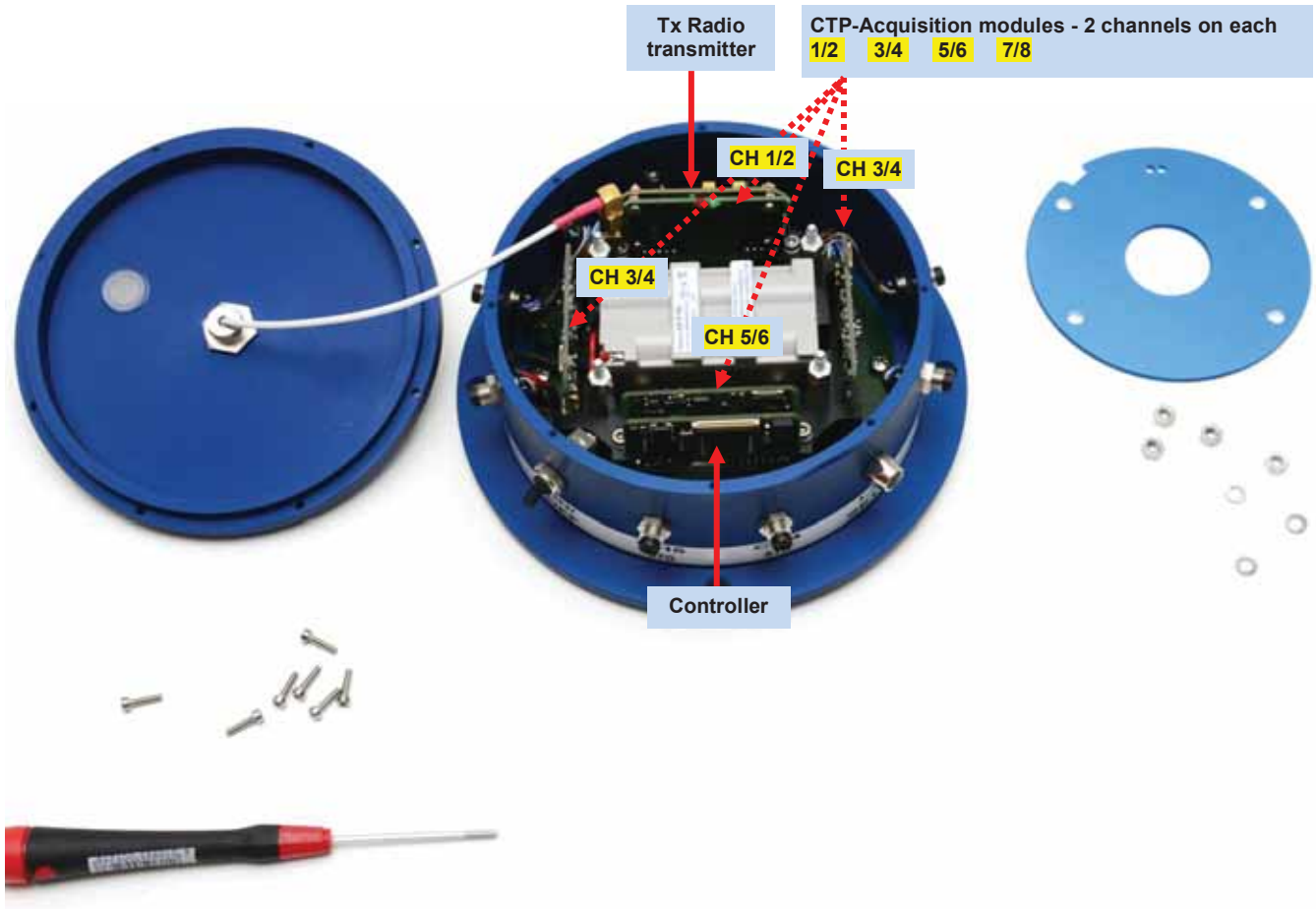
CTP –DEC8 System Parameters:

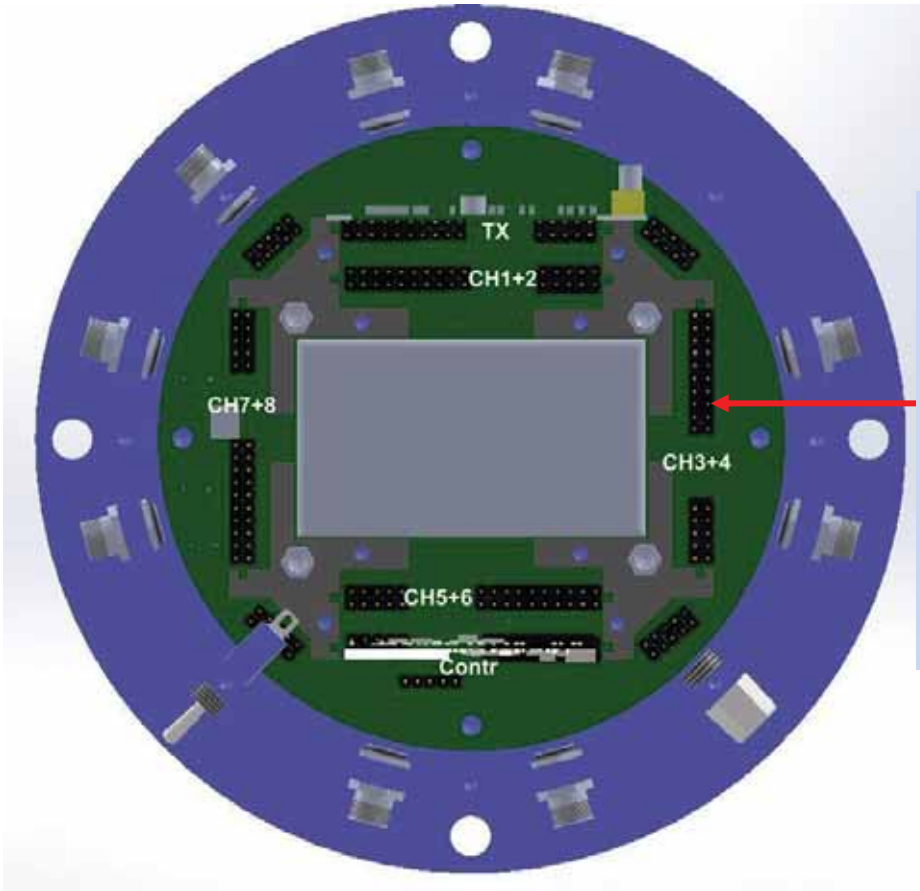
Channel:	8 x +/-10V analog outputs BNC socket
Resolution:	16 bit D/A converter, with smoothing filter
Power supply input:	10-30 VDC, power consumption <24 Watt
Transmission:	Digital PCM Format – FSK,
Dimensions:	205 x 105 x 65mm
Weight:	1.25 kg without cables and antenna
Overall system accuracy between encoder input and decoder output:	+/-0.25% 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

SET of CTP8-Rotate 315.5k…1250kibt telemetry



CTP8-Rotate Encoder for 8 channels – Modules place



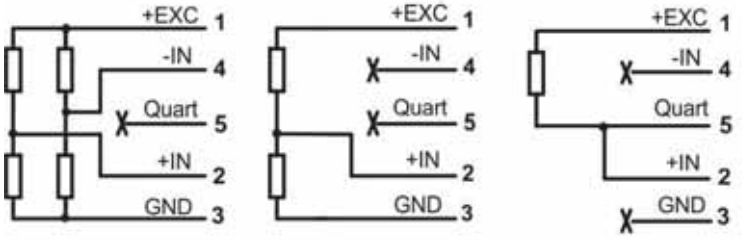


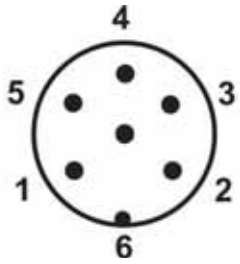
If not all 4 CTP modules plugged, a BUS-PLUG must plug on empty slot!

Otherwise the digital bus between is open and system don't work!!

CTP8-Rotate Encoder – Pin connection

Strain gage connection

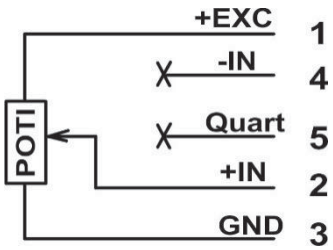


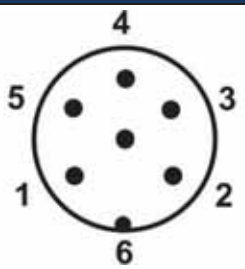


Cable colors:

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

Potentiometer

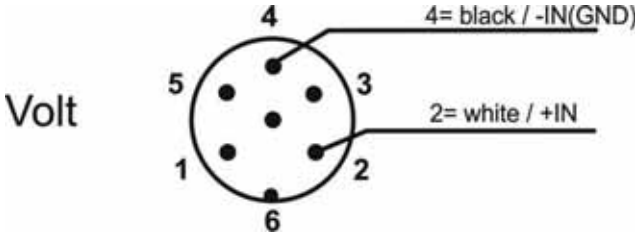




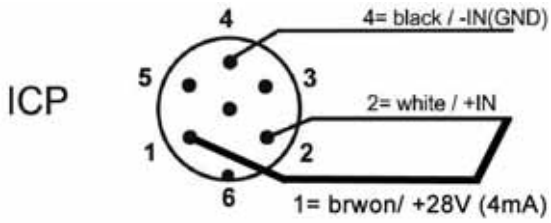
Cable colors:

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

VOLT connection

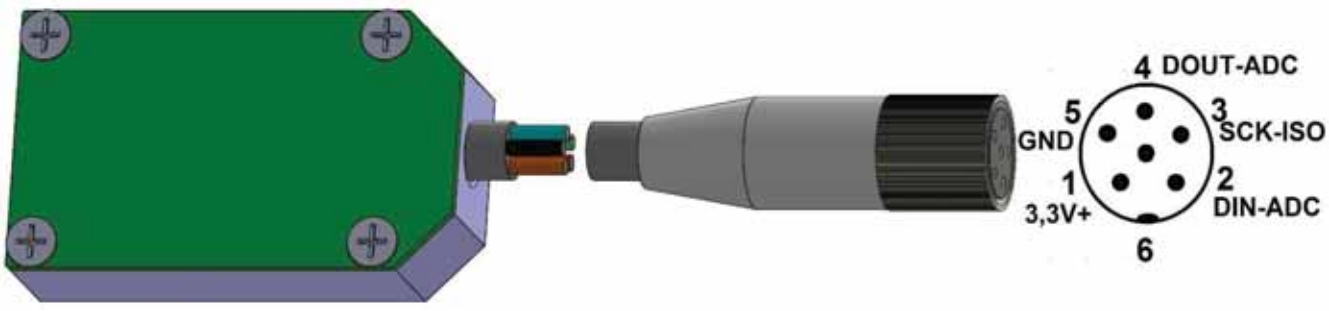


ICP connection



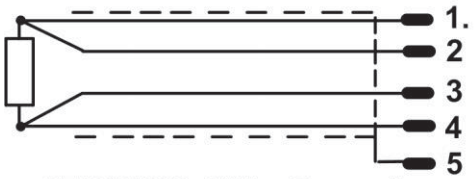
Pin 1+2 must connect together for ICP powering!

Th-K connection

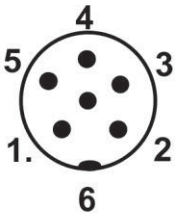


CTP16-Rotate Encoder – Pin connection

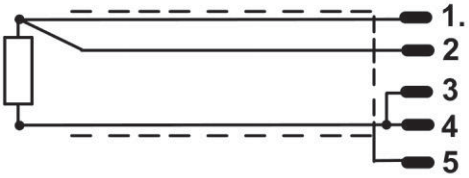
Pt100/1000



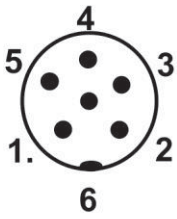
PT100/1000 4-Wire Connection



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

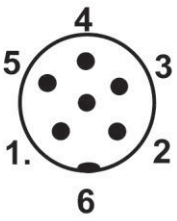


PT100/1000 3-Wire Connection



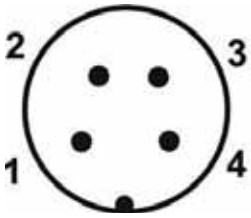
1= brown / +EXC
2= white / +IN
3= blue / -EXC
4= black / -IN
5= grey / Shield
6= pink / NU

PT100/1000 2-Wire Connection



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

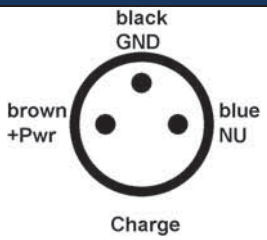
Setup LAN connection



Cable colors:

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

Li Ion re-chargeable battery with charger unit for CTP16-Rotate



Charge plug at CTP16-Rotate ENC

Attention:
Li Ion Accumulator 7.2V 7600mAh has a capacity for about 8-10h.
If the green LED indicator is ON, system is power ON
If the red LED indicator is ON, battery is about 90% discharged and the device will switch off after 20-30 minutes!

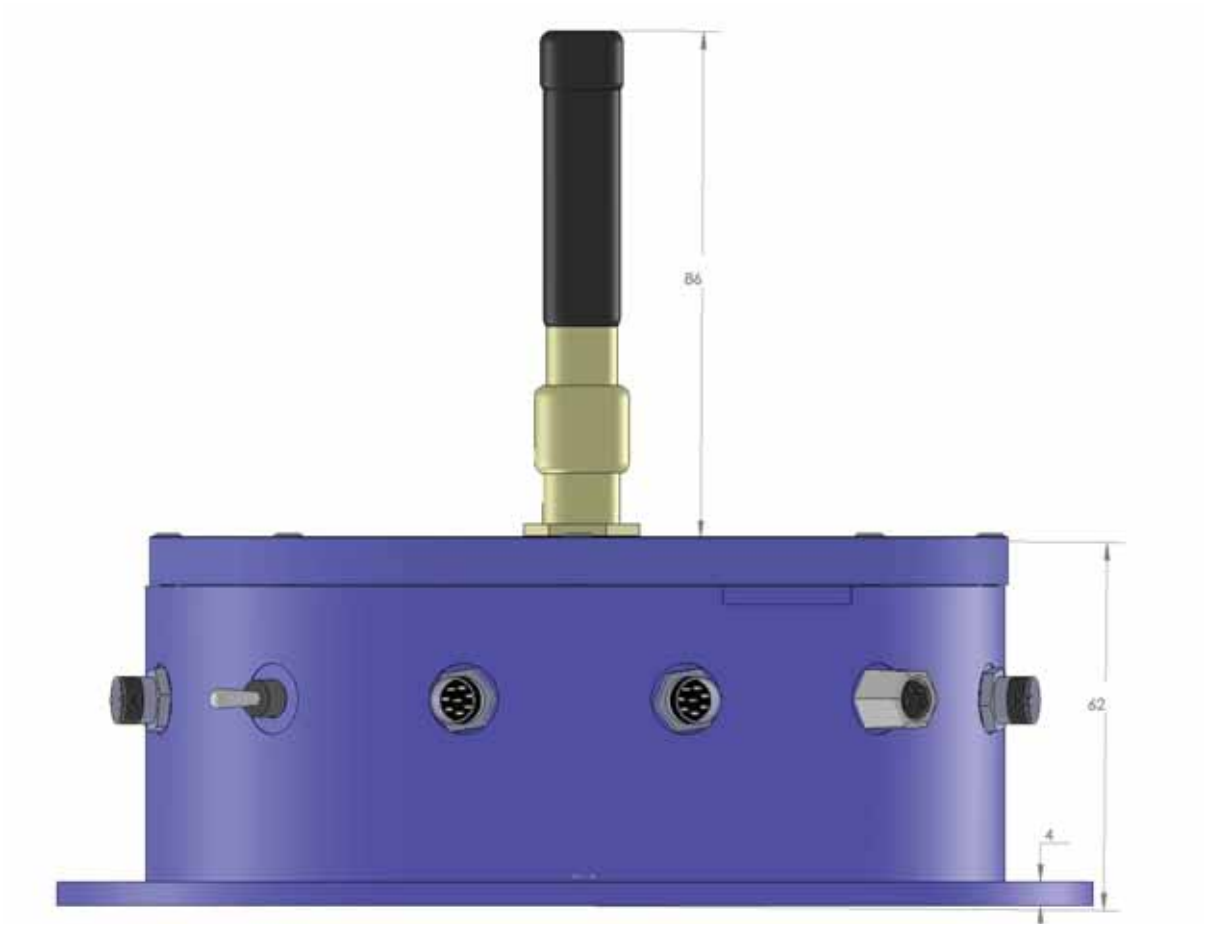
CT-CHARGER XL for CTP-Rotate

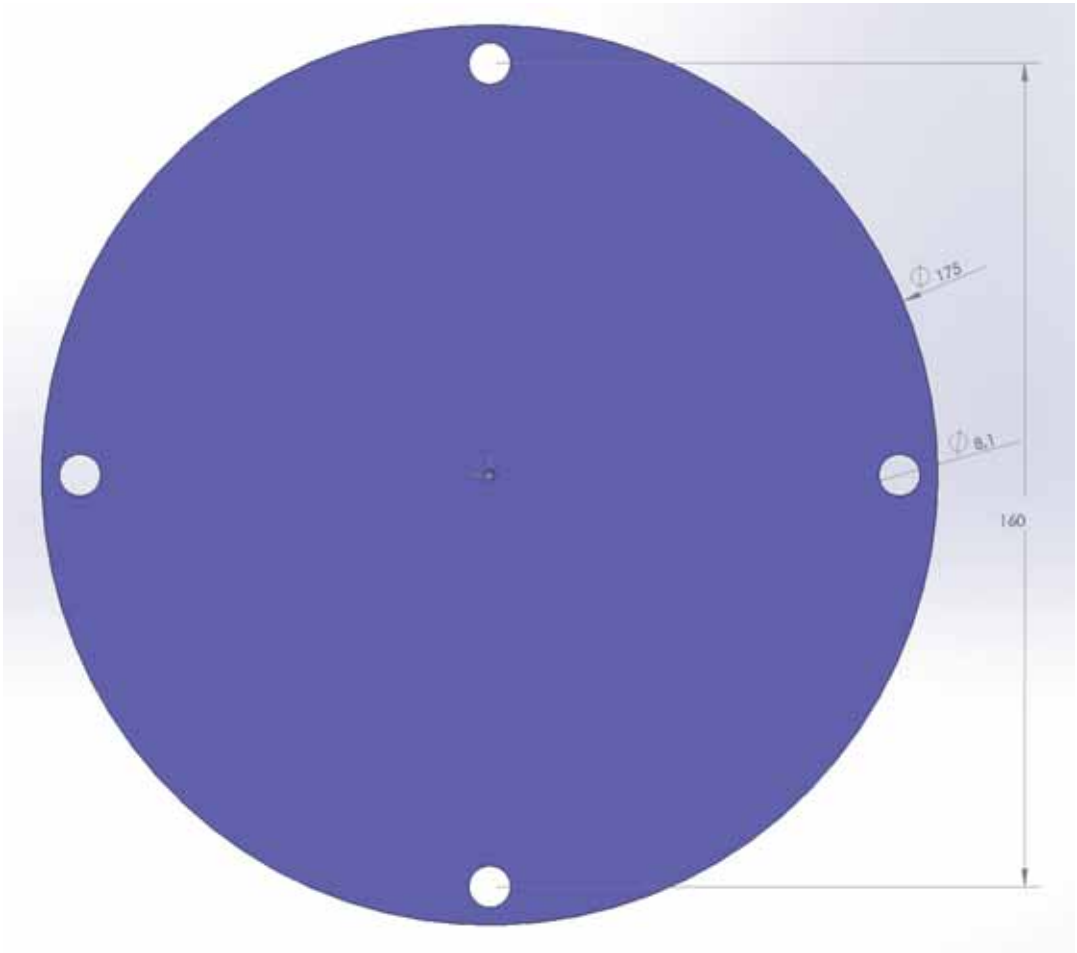
1. Plug the 3-pole socket (charger) in to the CTP-Rotate encoder.
2. Plug banana plugs on to a battery or AC/DC power supply with a voltage range of 10-30V, 30 WATT
3. Press and hold the switch for 1 second to begin charging. The battery will now charge. Charge time 8 hours!

Setup connection

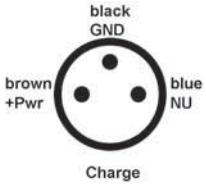
Charger

CTP8-Rotate Encoder – Dimensions





Li Ion re-chargeable battery with charger unit for CTP8-Rotate



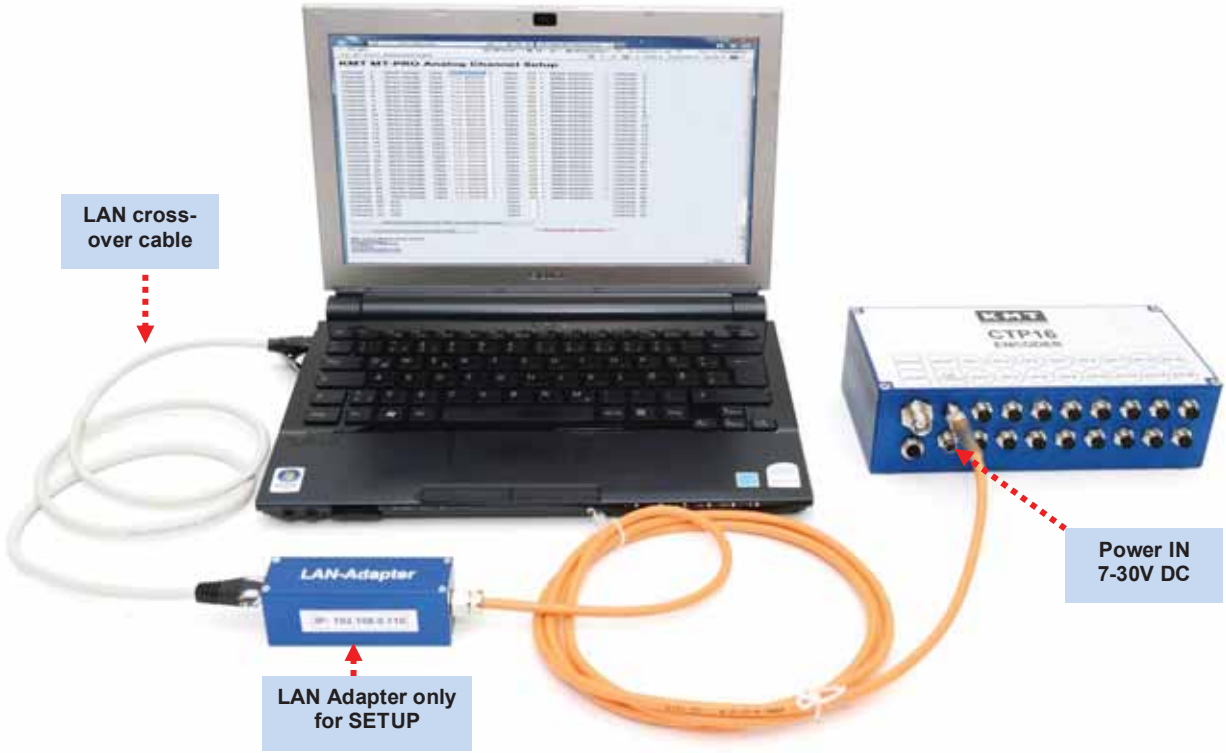
Charge plug at CTP8-Rotate ENC

Attention:
Li Ion Accumulator 7.2V 4600mAh has a capacity for about 10h hours.
If the green LED indicator is ON, system is power ON
If the red LED indicator is ON, battery is about 80% discharged and the device will switch off after 30-60 minutes!

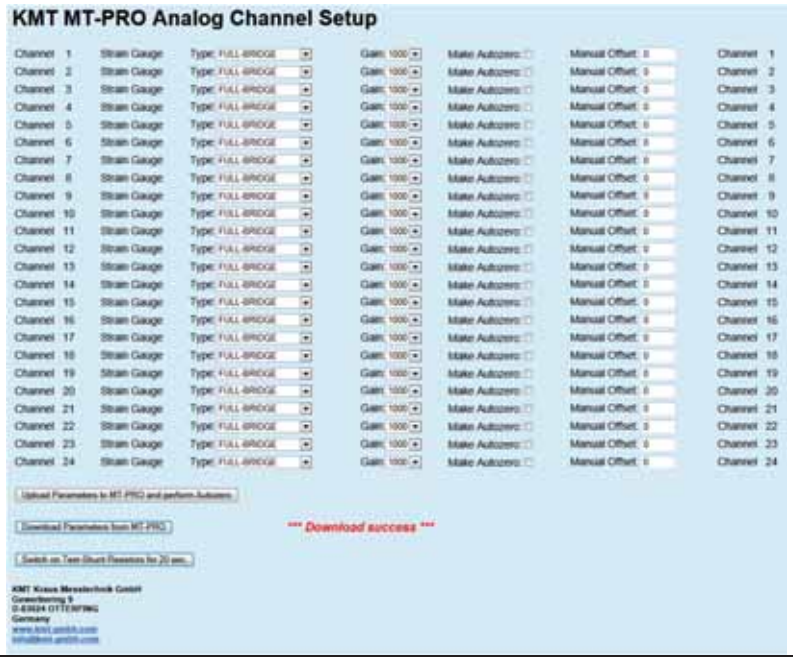
CT-CHARGER for CTP8-Rotate with 500mA charge current

1. Plug the 3-pole socket (charger) in to the CTP8-Rotate encoder.
2. Plug banana plugs on to a battery or AC/DC power supply with a voltage range of 10-30V,
3. Press and hold the switch for 1 second to begin charging. The battery will now charge. Charge time 9-10 hours!

CTP ENCODER (example with CTP16-ENC)
Software setup via LAN-Adapter and notebook

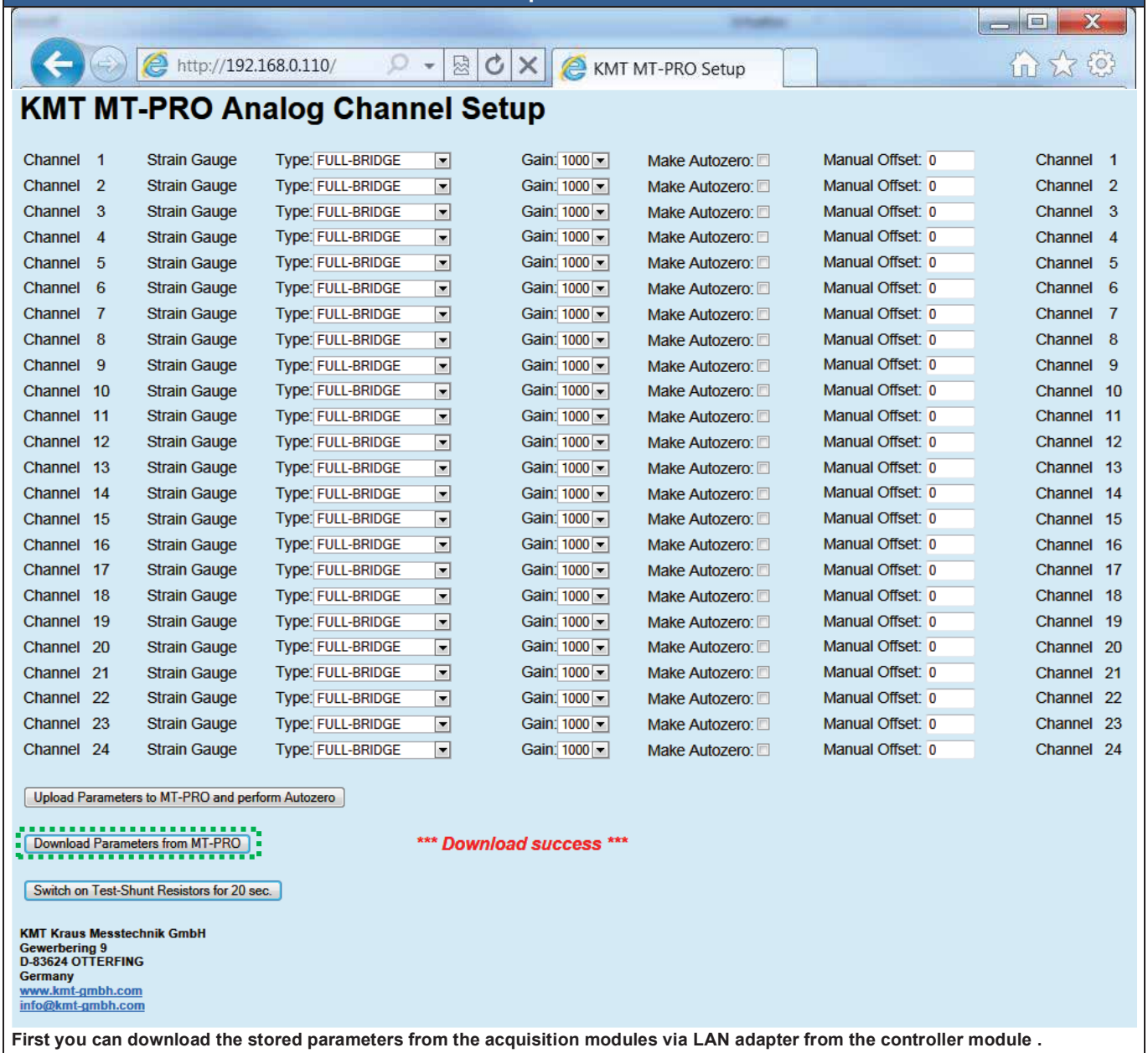


1) Power the CTP ENCODER with power 7-30 VDC
2) Connect the LAN-Adapter on the SETUP connector ov CTP ENCODER
3) Adjust your notebook to manual on e.g. IP 192.168.0.20
4) Connect LAN-Adapter with your notebook via cross-over LAN cable
5) Open e.g. Microsoft Internet Browser and enter IP address **192.168.0.110** 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



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
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

FULL-BRIDGE
HALF-BRIDGE
QUARTER-BRIDGE

Upload Parameters to MT-PRO and perform Autozero

Download Parameters from MT-PRO

*** Download success ***

Switch on Test-Shunt Resistors for 20 sec.

KMT Kraus Messtechnik GmbH
Gewerbering 9
D-83624 OTTERFING
Germany
www.kmt-gmbh.com
info@kmt-gmbh.com

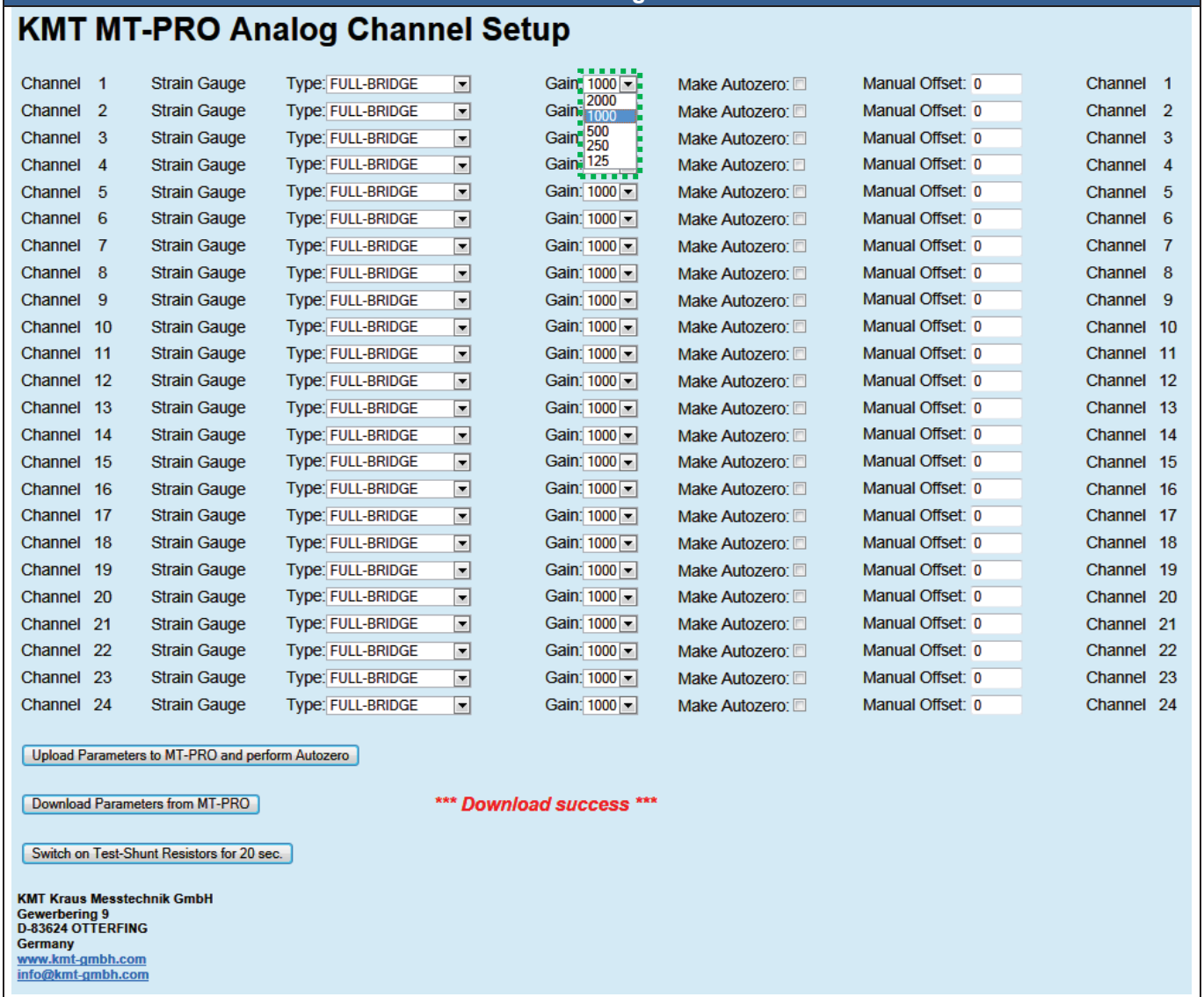
Select full-, half- or quarter-bridge by popup window

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

GAIN setting STG



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

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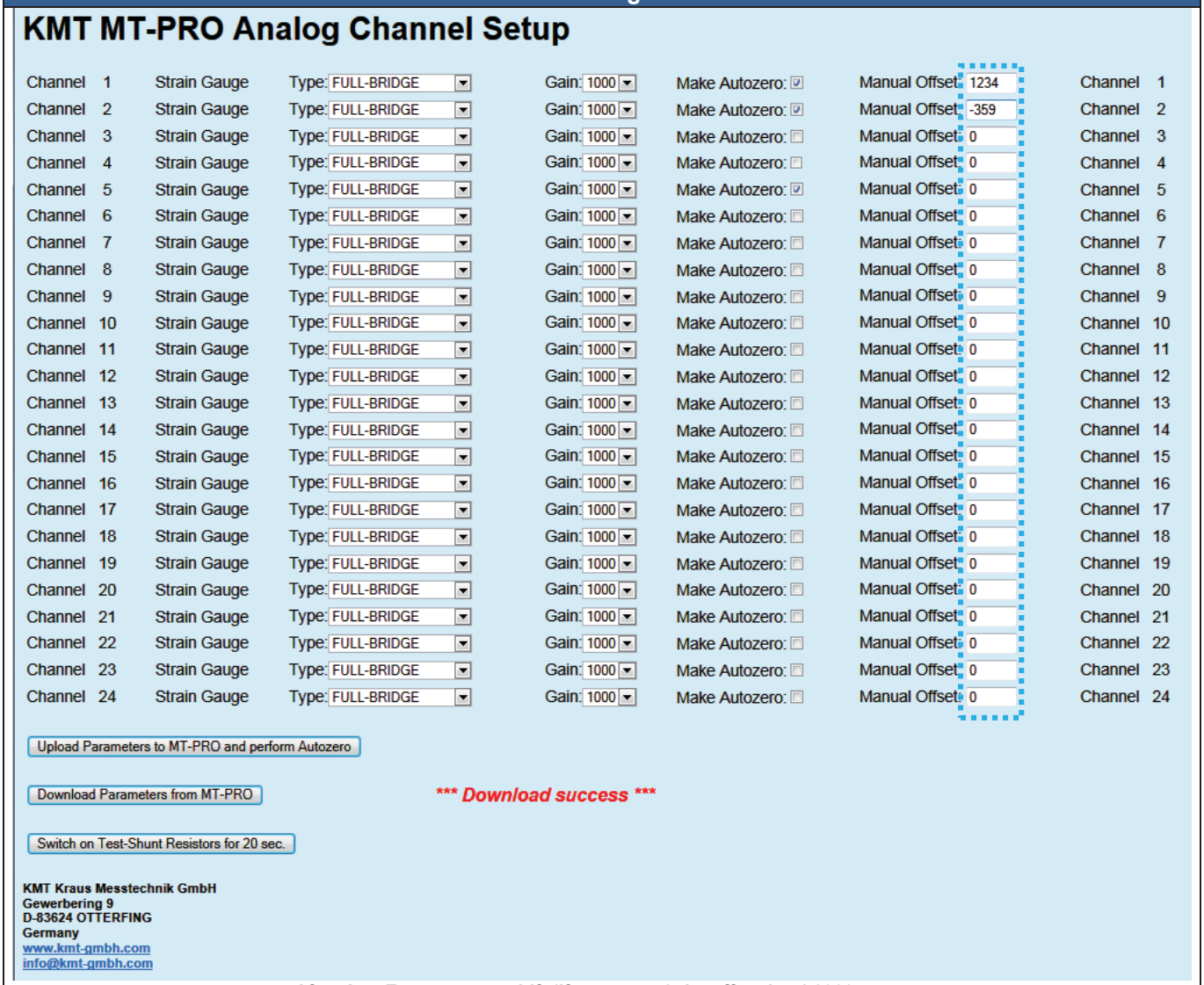
Select Auto-Zero per channel. The Auto-Zero function will be executed only one time per upload the parameters to MTP-STG! It will be stored also after power off in the MTP-STG until you make a new Auto-Zero on this channel!

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

Manual Offset shifting after AutoZero



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

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

Installation example

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