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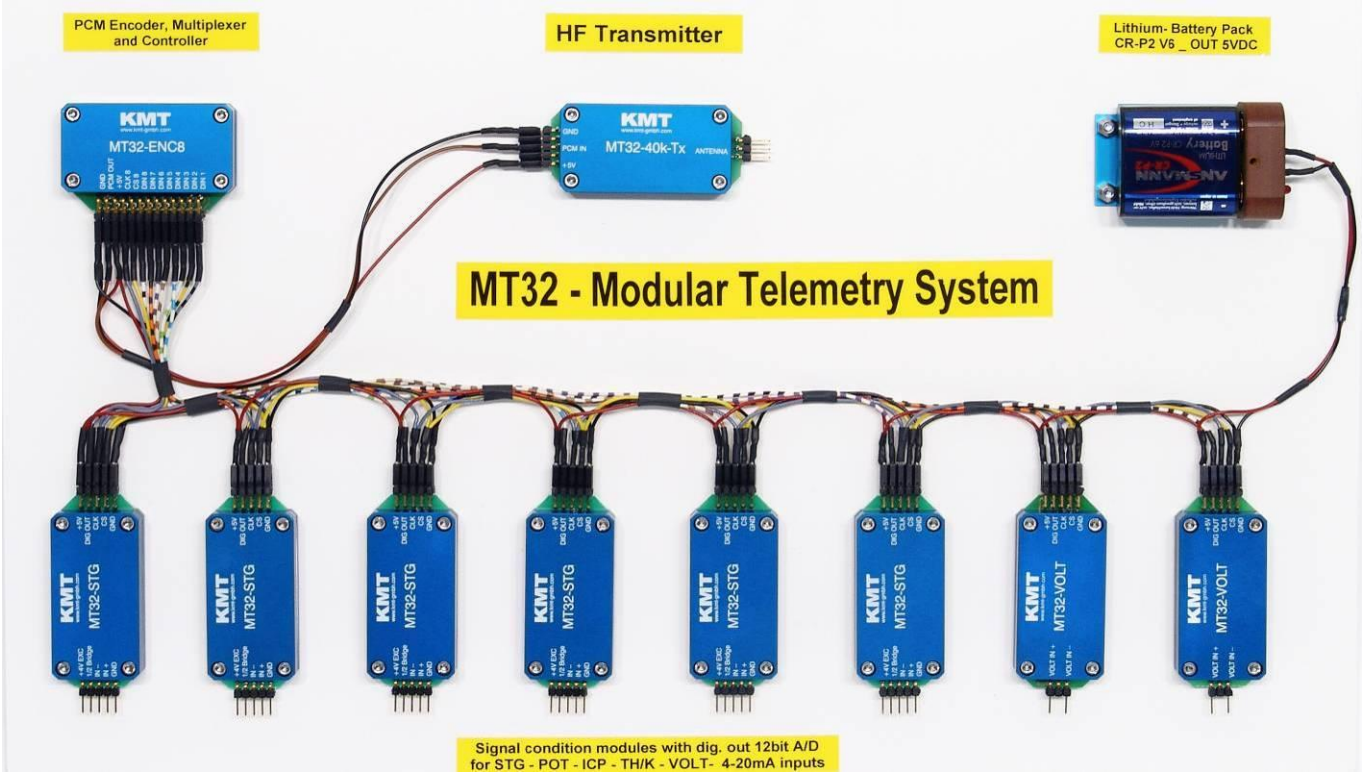
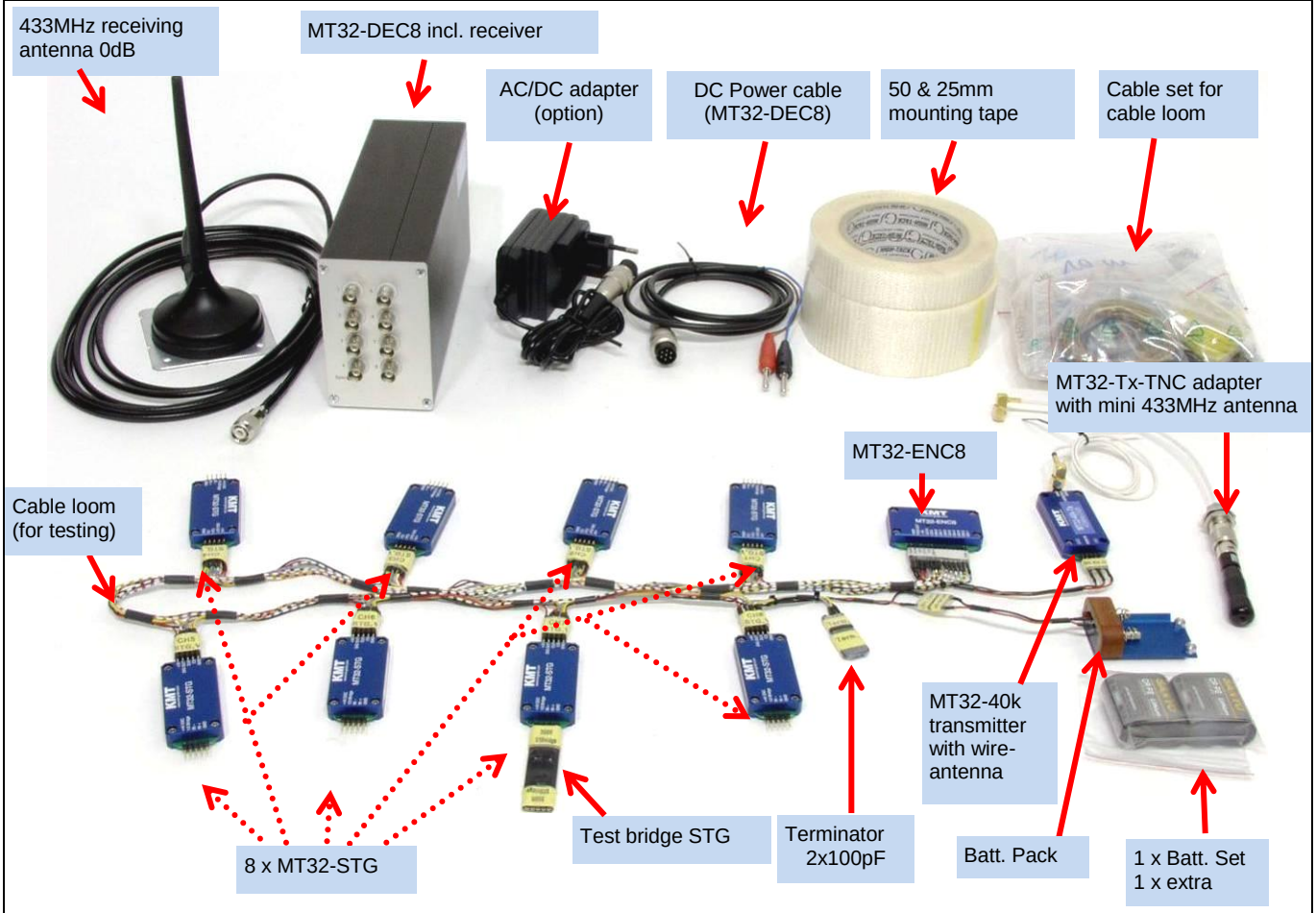
MT32 Telemetry
User Manual

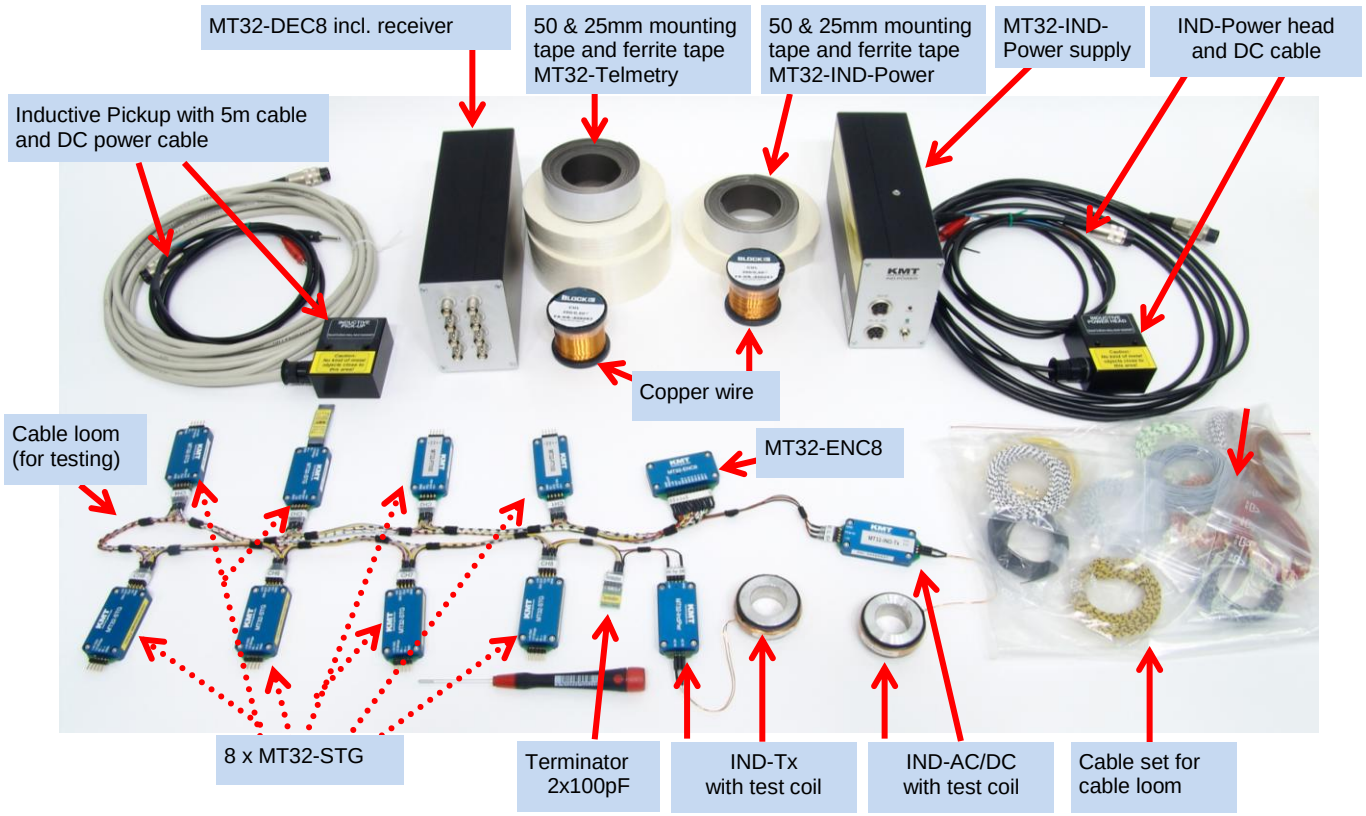


MT32 - 8 channel set with battery power and 40kbit radio transmitter



Order example: MT32-8CH-40k, 8xSTG, BATT, BW 8x0-95Hz		
8	**MT32-STG**	**Signal conditioning module for strain gages with digital data acquisition**
1	**MT32-ENC8**	**Encoder for up to 8 acquisition module**
1	**MT32-40k-10**	**ISM-Band telemetry transmitter and receiver (distance up to 0.5 to 10m)**
1	**BATT-PACK**	**Battery pack**
1	**BATT-SET**	**Battery set**
1	**MT32-DEC8**	**Decoder for 8 channels, Output 8 x BNC**
1	**AC/DC**	**AC/DC power supply for DEC8 (Optional)**
8	**MT32-STG**	**Signal conditioning module for strain gages with digital data acquisition**
		Cable loom, cable set for loom, DC power cable, terminator, mounting tape and test bridge STG are include in delivery!

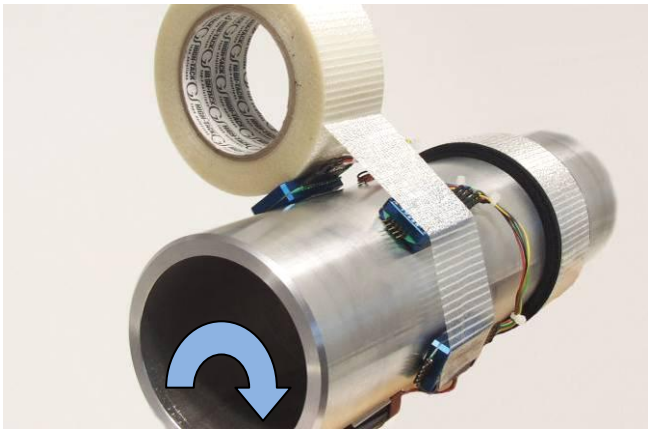
MT32 - 8 channel set with inductive power and 2560kbit inductive transmitter



Order example: MT32-8CH-IND-TX-RX, 8xSTG, IND-PWR, BW 8x0-6000Hz		
8	**MT32-STG**	**Signal conditioning module for strain gages with digital data acquisition**
1	**MT32-ENC8**	**Encoder for up to 8 acquisition module**
1	**MT32-IND-RX-TX**	**Inductive telemetry 2560kbit transmitter and receiver (distance 0.1m)**
1	**IND-PWR-L**	**Inductive power supply**
1	**MT32-DEC8**	**Decoder for 8 channels, Output 8 x BNC**
2	**AC/DC**	**AC/DC power supply (1x for DEC8, 1x for IND-PWR)**
		Cable loom, cable set for loom, DC power cable, terminator, mounting tape and test bridge STG are include in delivery!

Installation of the MT32 Modules

Attach all the MT32 modules on the final position on the shaft using the “tesa® Power-Strips® Mini”.

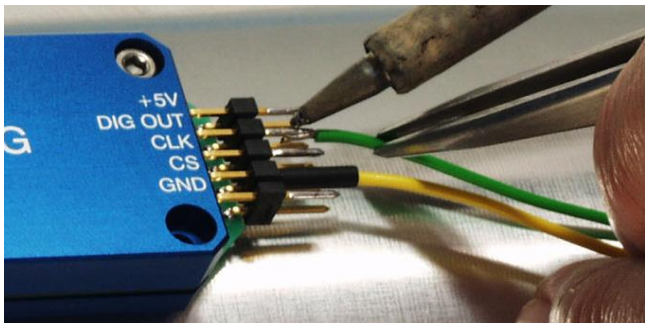


Fix all MT32 modules with at least 10 layers of the special mounting tape around the shaft. According to the shafts RPM and diameter it’s particularly paid attention to safe mounting of the components. The manufacturer doesn’t accept liability for damages, which results from not sufficiently attachment of the individual components. The provided cable harness and the tape are only for test purposes, in order to test the electrical function of the units in the idle state of the shaft.

During the rotation test appropriate safety tools are to be attached.
The entire installation may be used only by authorized persons. By using tape for the attachment, it has to be used in the direction of rotation of the shaft and the end has to be secured against removing. Only non-elastic tapes with high tensile strength have to be used for pre-fixing. **Add. use horse clamps for final fixing!!**

The individual components are to be distributed in such a way on the shaft that imbalances will avoid.

hose clamps



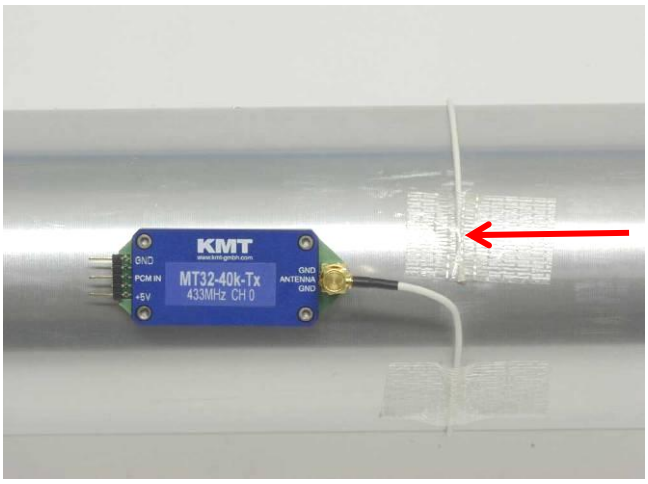
All cable connections soldered!

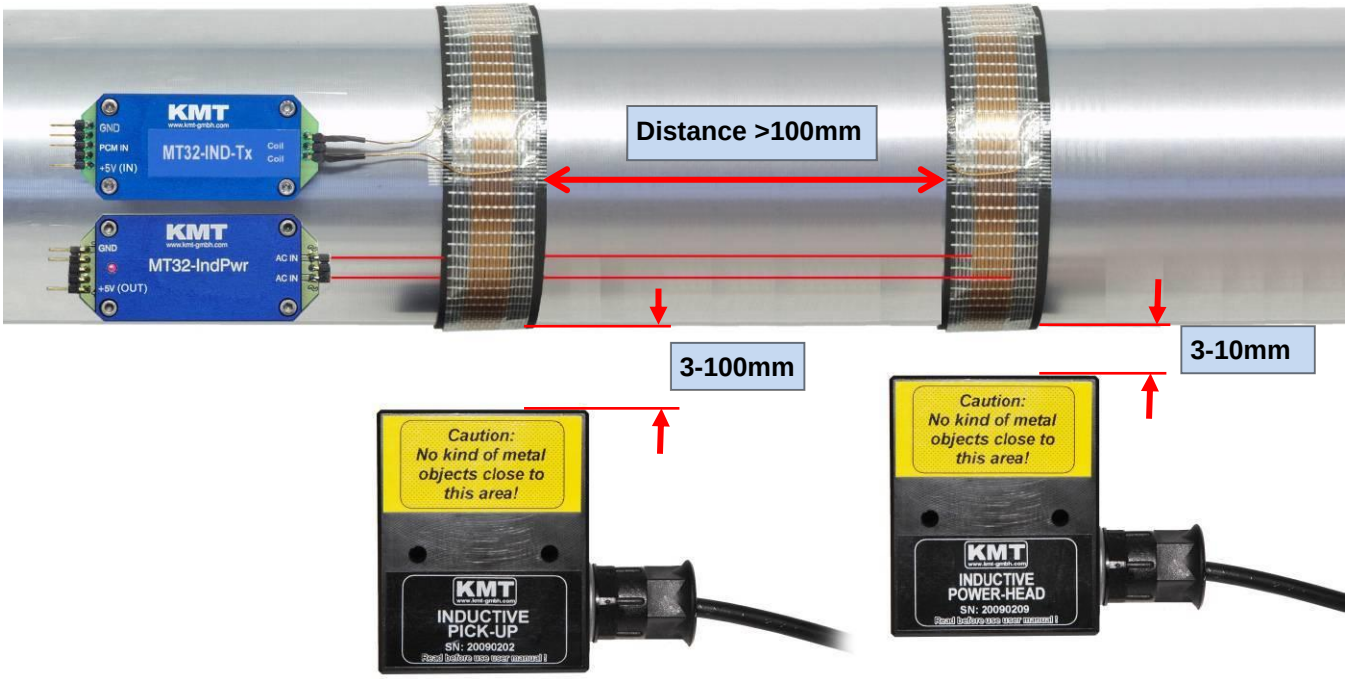
The user has to pay attention to connect the wires to the correct pins - the units have no reverse-connect protection!

MT32 to consider at assembling

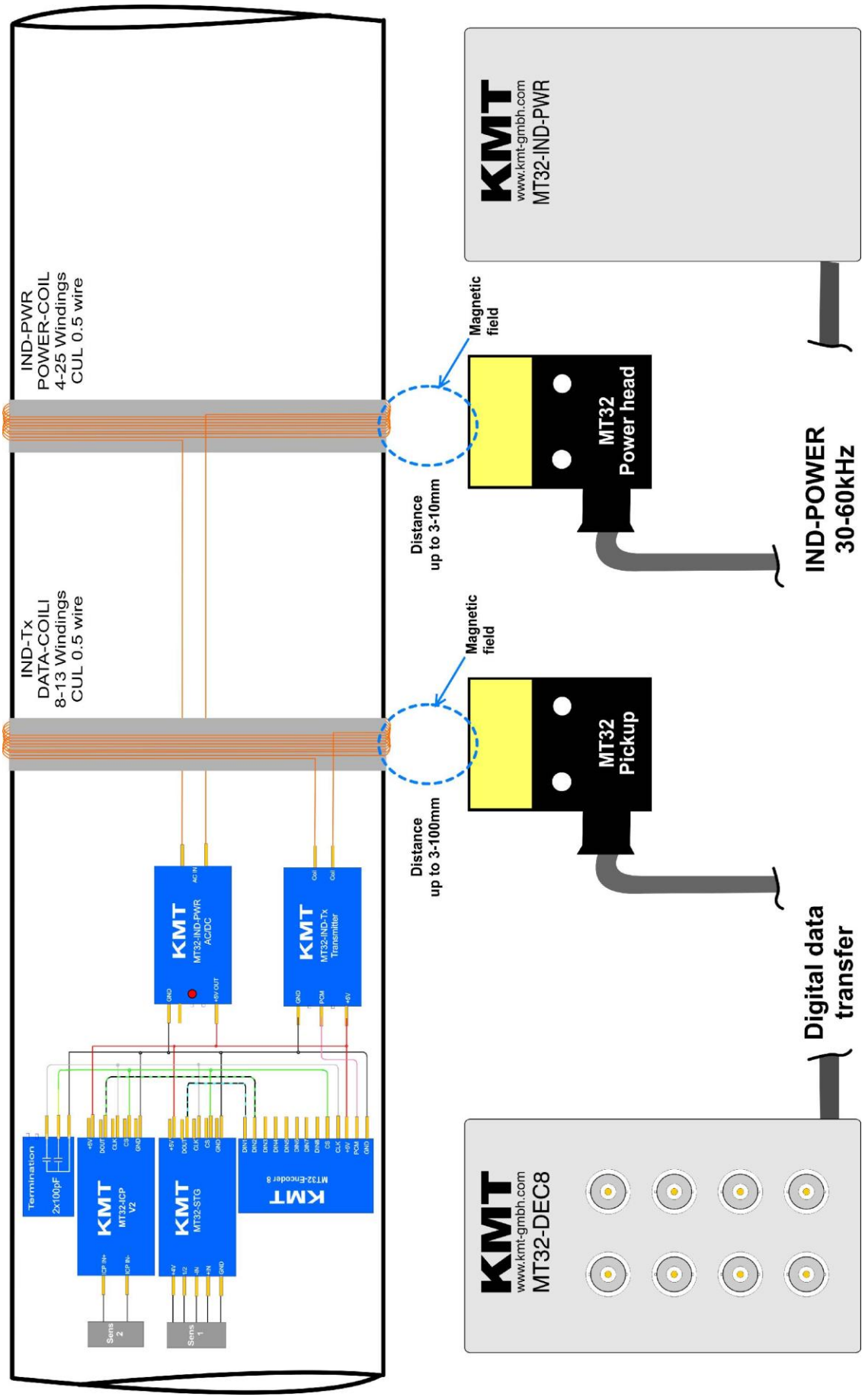
According to the shafts RPM and diameter is particularly paid attention to safe mounting of the components. The manufacturer doesn't accept liability for damages, which results from not sufficiently attachment of the individual components. The provided cable harness and the tape are only for test purposes, in order to test the electrical function of the units in the idle state of the shaft.
During the rotation test appropriate safety tools are to be attached. The entire installation may be used only by authorized persons. By using tape for the attachment, it has to be used in the direction of rotation of the shaft and the end has to be secured against removing. Only non-elastic tapes with high tensile strength have to be used.
The individual components are to be distributed in such a way on the shaft that imbalances will avoid. All wire connections should be soldered. The user has to pay attention to the correct polarity of the cables – the units have no reverse-connect protection!
Transmitting antennas and sensors should not be installed next to each other. To ensure a reliable function, the receiving antenna should be positioned in such a way that all LEDs lights up at the field level display on the receiver. The minimum level for transmission are 4 LEDs. The Sync LED at the receiver lights up in case of transmission errors, caused by to less field strength or disturbances in the digital transmission path.

Don't plug any modules if Power is ON!!! First power OFF!!

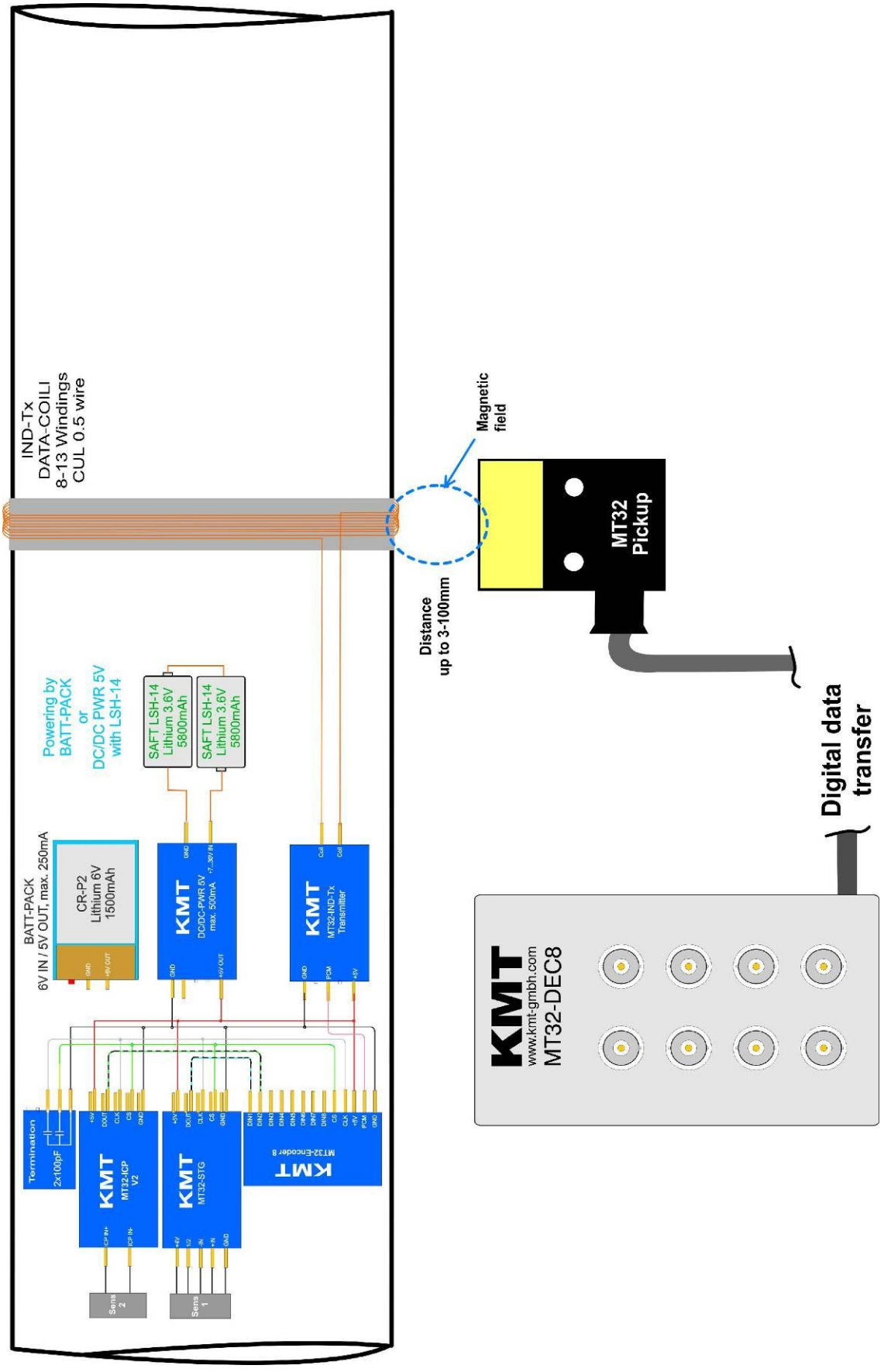
MT32-40k	Installation of the radio transmitter on a shaft
	Cable Red = +5V Cable Black = GND (Ground) Cable Brown = PCM In Cable White = Wire antenna All cable connections should be soldered.
	Mount the cable antenna exactly one winding around the shaft and fix all with 3 windings mounting tape – finish! The cable antenna can extend or shorten depending upon requires!
 	This coaxial adapter (**MT32-40k-Tx-TNC-adapter**) makes it possible to connect a 433 MHz antenna with TNC connector for point to point applications. (option) 433 MHz transmitting antenna 0dB with magnetic foot (option)

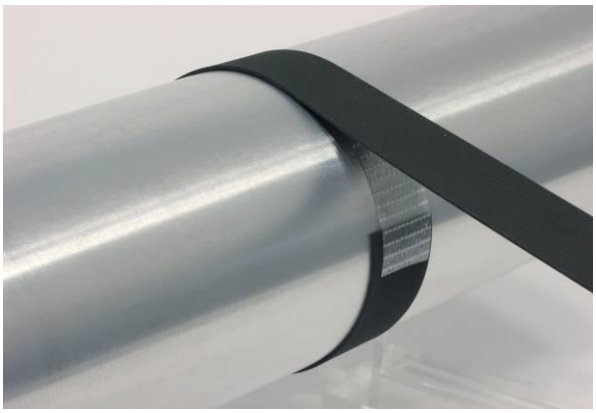
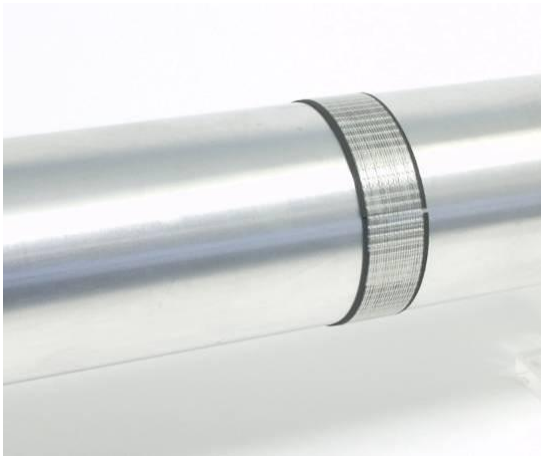
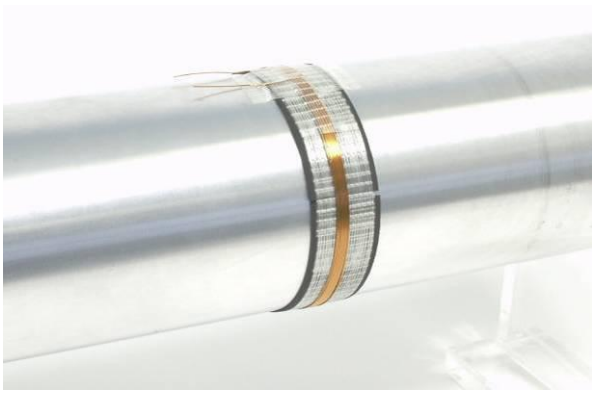
MT32-IND-TX-RX Inductive data transfer 1280kbit (2560kbit)	
	Cable Red = +5V IN Cable Black = GND (Ground) Cable Brown = PCM In Copper wire = Coil All cable connections should be soldered.
	Inductive pickup with 5m cable (optional 25m)
 **Sync loss LED LED on = error in the transmission! LED off = good transmission!**	Receiver unit (rear view) with pick up input
	
To avoid transmitting error, the mounting distance between Inductive Power Head and Inductive Pickup Head must be at least 100mm. **Note: Less distance between the two <--> coils, you get also less distance for the inductive pick up to the coil!**	

Block diagram
MT32 Telemetry with inductive data transmission and inductive power supply



Block diagram
MT32 Telemetry with inductive data transmission and battery power supply

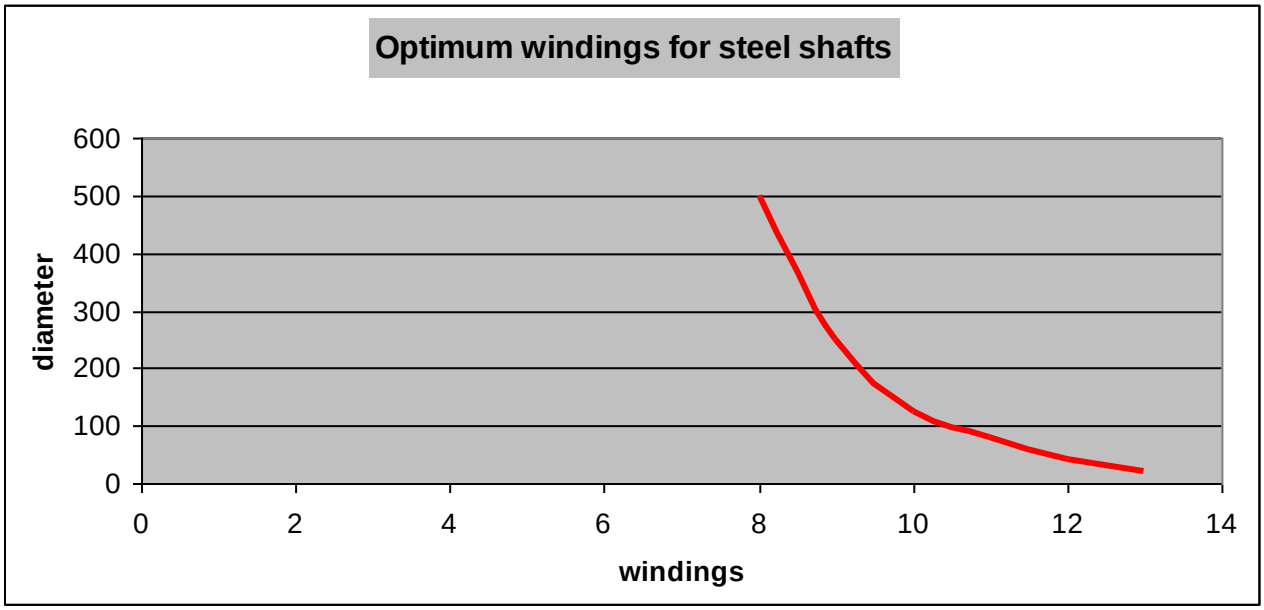


MT32-IND-TX-RX	Installation of coil for inductive data transmission on shaft
 	Attach for electromagnetic insulation “Ferrite Tape” **1x one** layer around the shaft. Fixed with 2 layers mounting tape 
 	Wind the 0.5 mm enameled copper wire around the shaft: 8-13 windings for 1000-20mm diameter Fix all with 2-3 layers around the coil with mounting tape.

MT32-IND-TX-RX Find the correct amount of windings of inductive data coil

The number of windings depends on several factors. The most important influential factors are the diameter, the materiel of the shaft and the environment around the shaft. The table standing below will help you to find the right number windings for steel shafts. The table below is a help to estimate the number of windings fast. To optimize your results you can try one winding more or less.

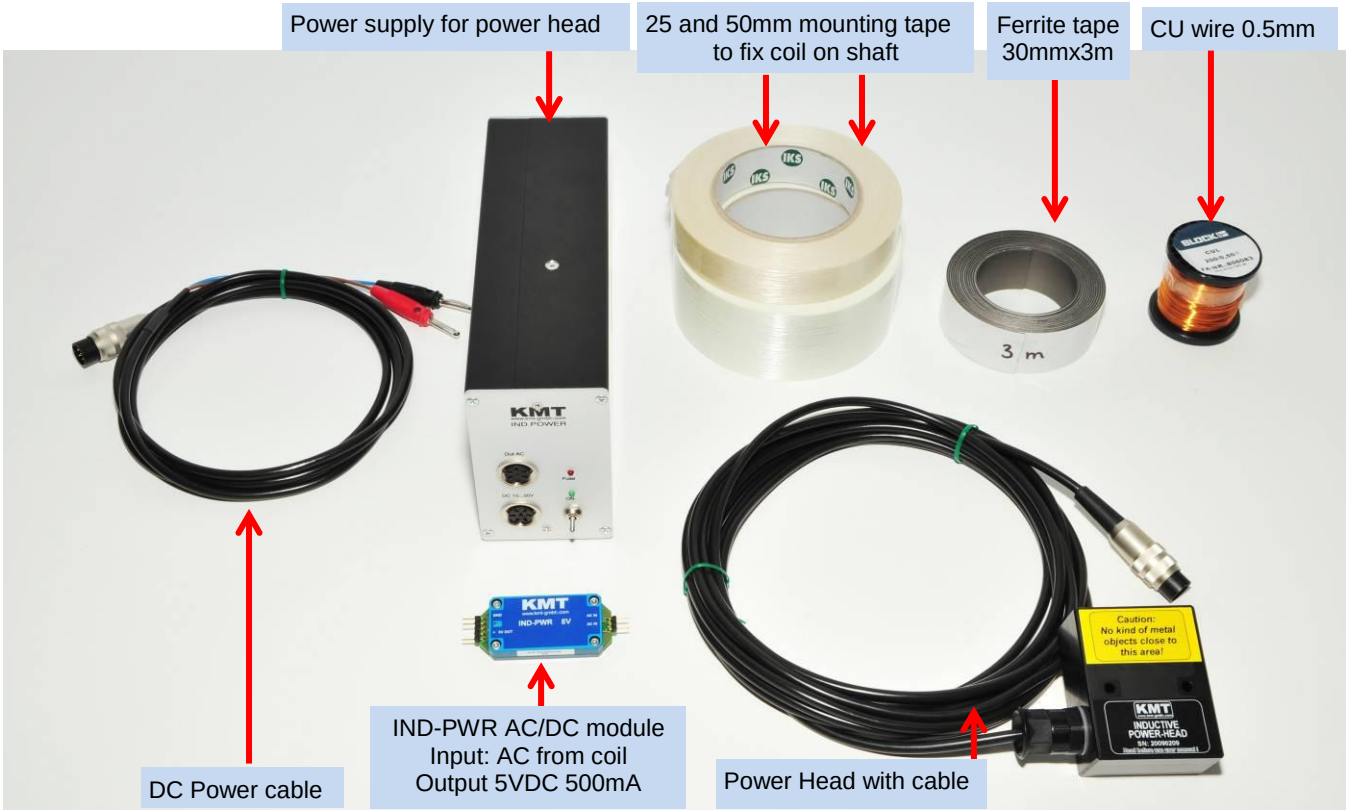
Coil, depends of shaft diameter 8-13 parallel windings of 0.5 CUL wire



Windings	Diameter (mm)
8	600
8	500
9	250
10	125
11	80
12	40
13	20

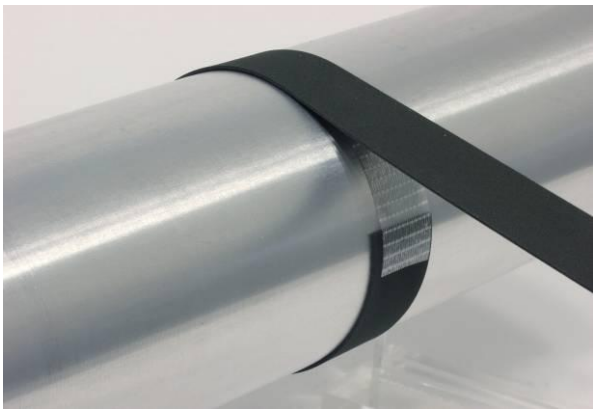
MT32-IND-PWR Inductive power supply set

Picture shows standard Inductive Power Supply for diameter up to 300mm

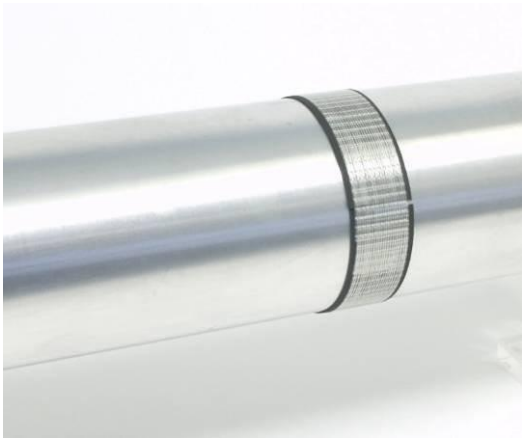


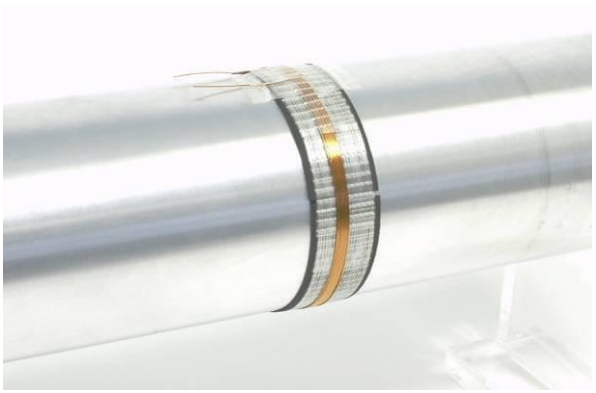
Mounted on shaft

MT32-IND-PWR Installation of coil for inductive powering on shaft



Attach for electromagnetic insulation “Ferrite Tape” **2 x one** layer around the shaft.
Fixed with 2 layers mounting tape





Wind the 0.5 mm enameled copper wire around the shaft:

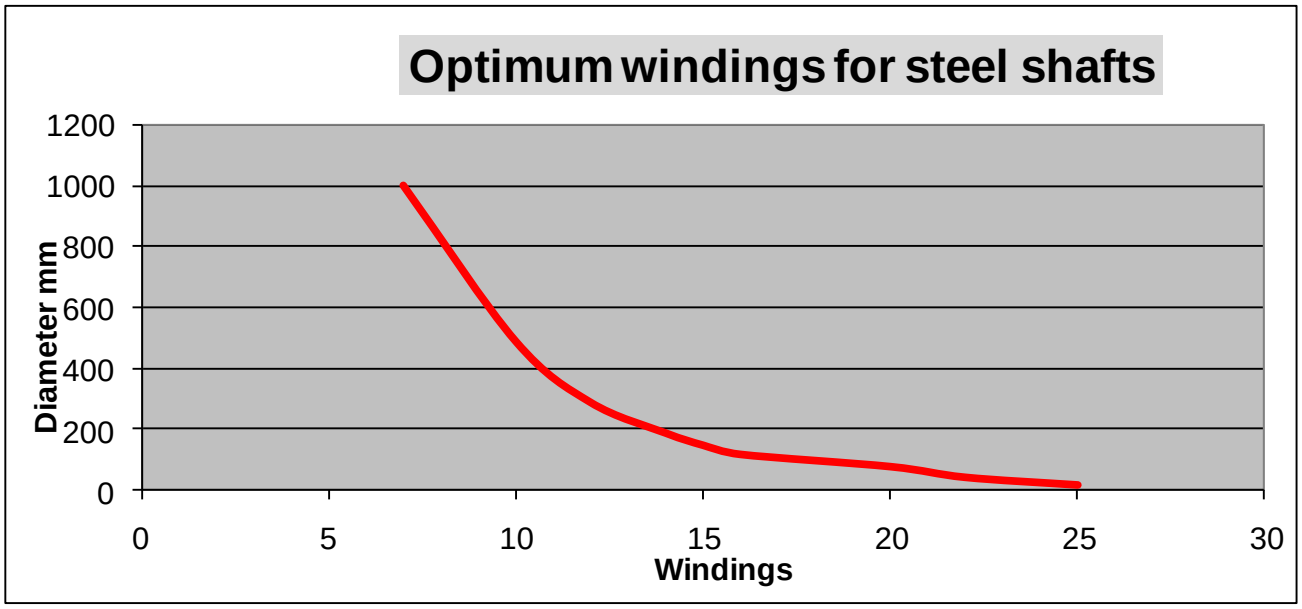
7-25 windings for 1000-20mm diameter
Other diameter on request!

Note: “The inductive load of the MT32- IND-PWR and the capacitor in the Power Head must be in resonance to get the optimal transmission. The inductive load of the shaft depends of diameters, material and number of windings. ”

To find the optimal transmission try one winding more or less. The LED on the Inductive Power module will help to find the best configuration. The distance between power head and the coil is 3-10mm.

Control the output voltage and move the power head in the max distance to the coil. The minimum Output voltage must be >4,8 V!

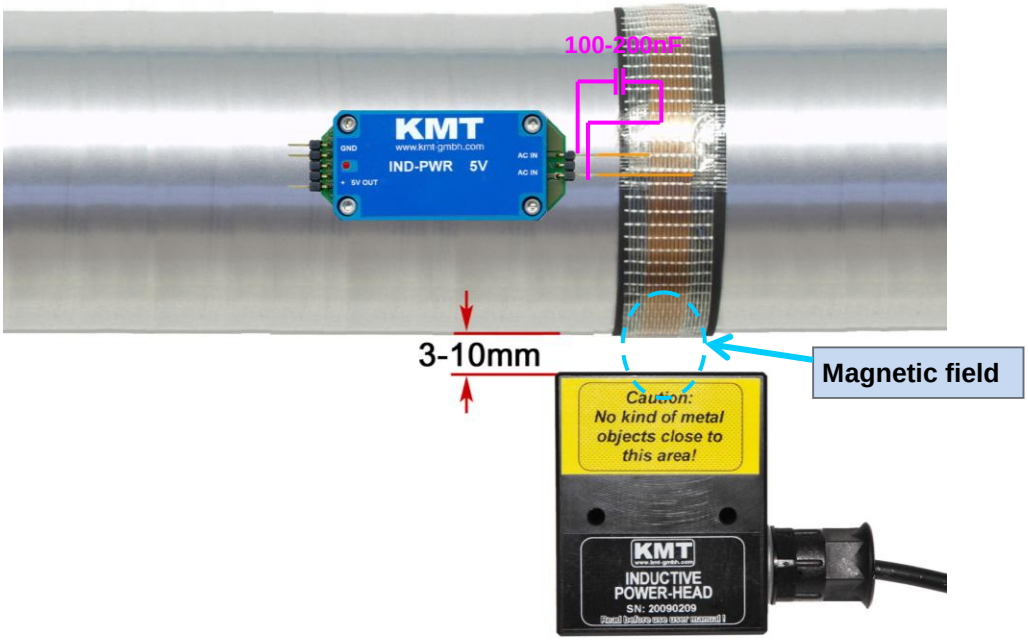
Fix all with 2-3 layers around the coil with mounting tape.



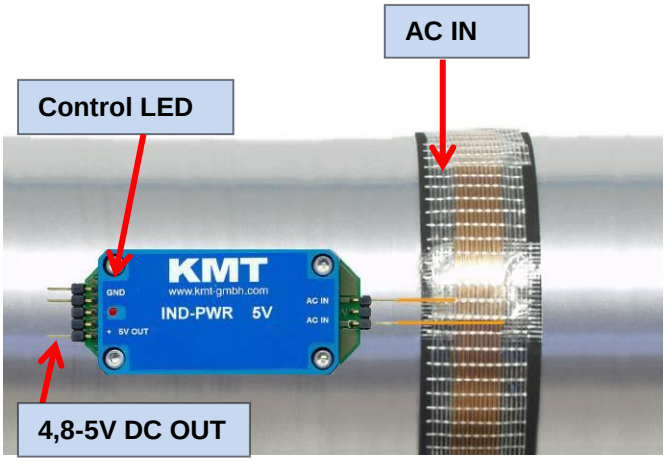
Diameter (mm)	Windings	Fine adjustment capacitor parallel to coil
1000	4-5	100-200nF (Type MKT or MKS 250V)
490	4-5	100-200nF (Type MKT or MKS 250V)
290	5	100-200nF (Type MKT or MKS 250V)
190	7	---
150	9	---
120	10	---
80	12	---
45	16	---
20	25	---

We recommend a capacitor decade e.g

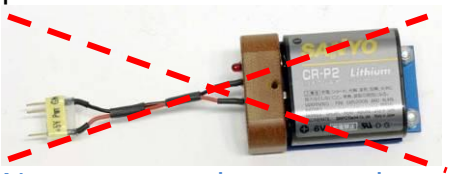
100pF .... 11,111 µF



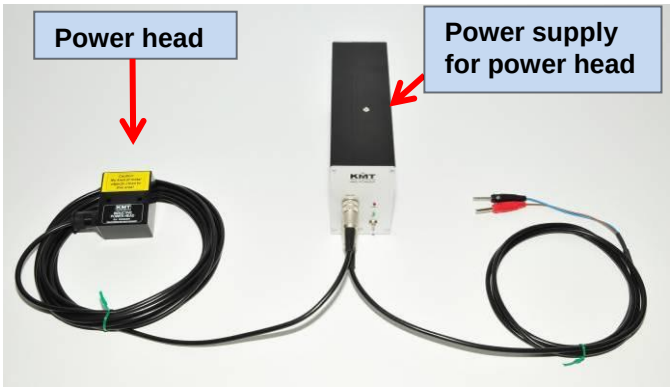
MT32-IND-PWR Installation of the power head for inductive powering



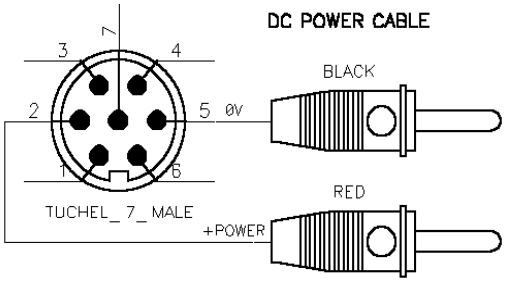
The pins “AC IN” are the AC power input from the coil. On the pins “+5” and “GND“ you get a stabilized output voltage of 5V DC. The control LED will lights up, as soon as the power head is switched on and at the right position - close enough to the coil on the shaft.
The max. load current on the DC output is 500mA. (depends of diameter and distance)
The AC/DC converter will use instead battery pack!

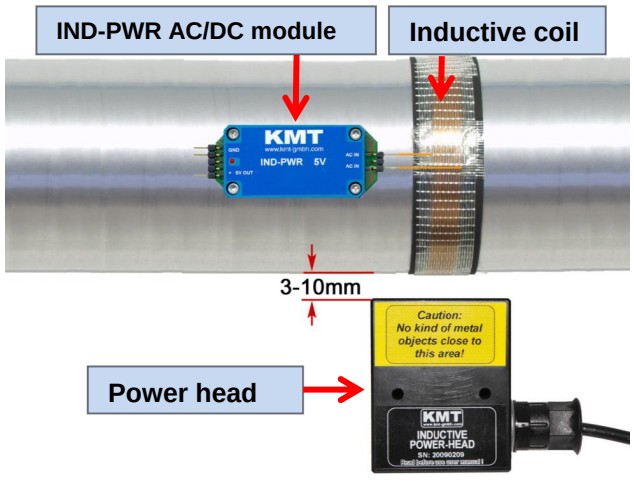


Never use any battery pack together with the MT32-IndPwr!



Connect the power head on the “AC Out” socket of the power box and then the DC power cable on the “DC In 10-30V” socket. The two banana plugs have to be connected to a DC power source with red on +10-30V DC and **black** on **0V**.



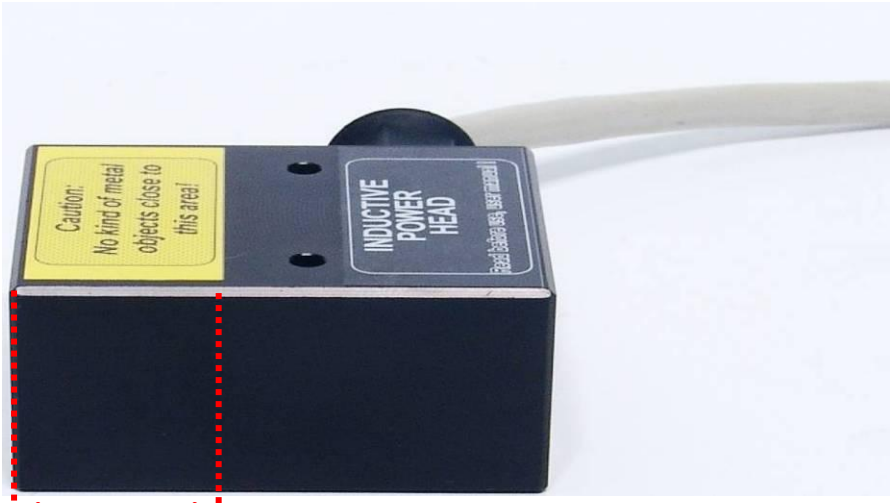


You should mount the power head at a fixed location that it’s as free as possible from vibration influences.

The center of the coil should be in the same horizontal position as the center of the power head. The distance is optimal in the range between 3 and 10mm. (depends of shaft and current consumption)

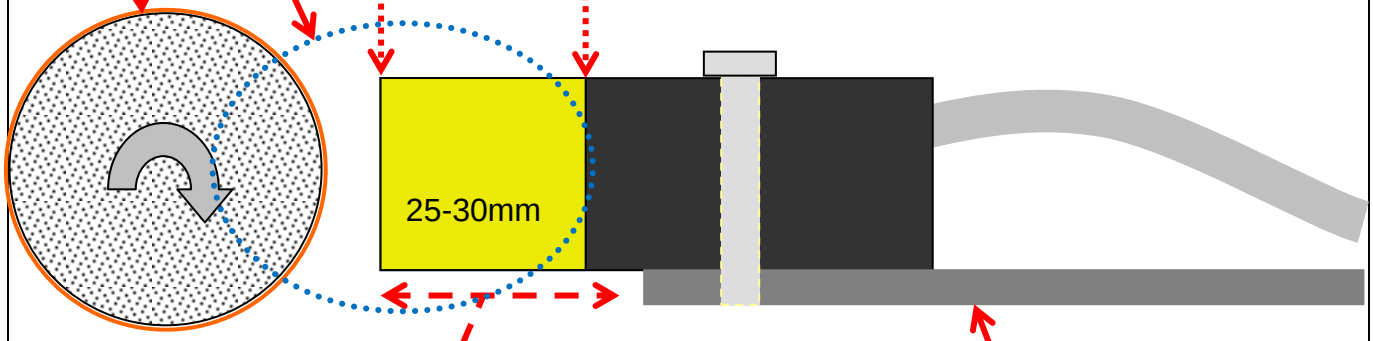
If the red LED of the AC/DC converter lights up, the position of the power head is OK.

MT32-IND-PWR
Following must be considered at the mounting of the inductive power head



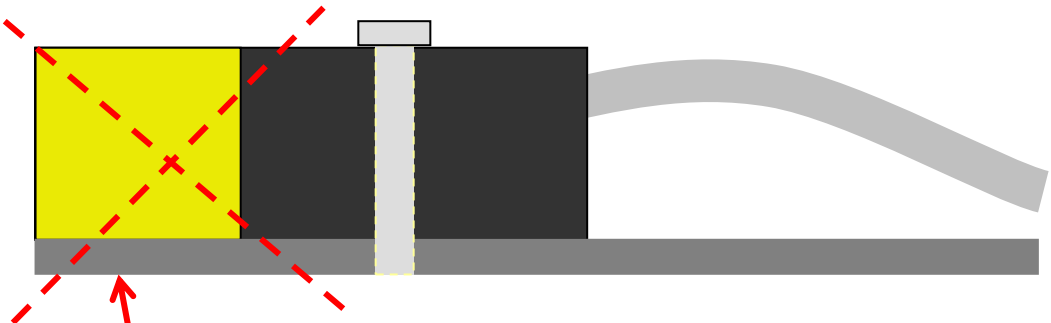
Shaft with Cu wire Coil

Magnetic field



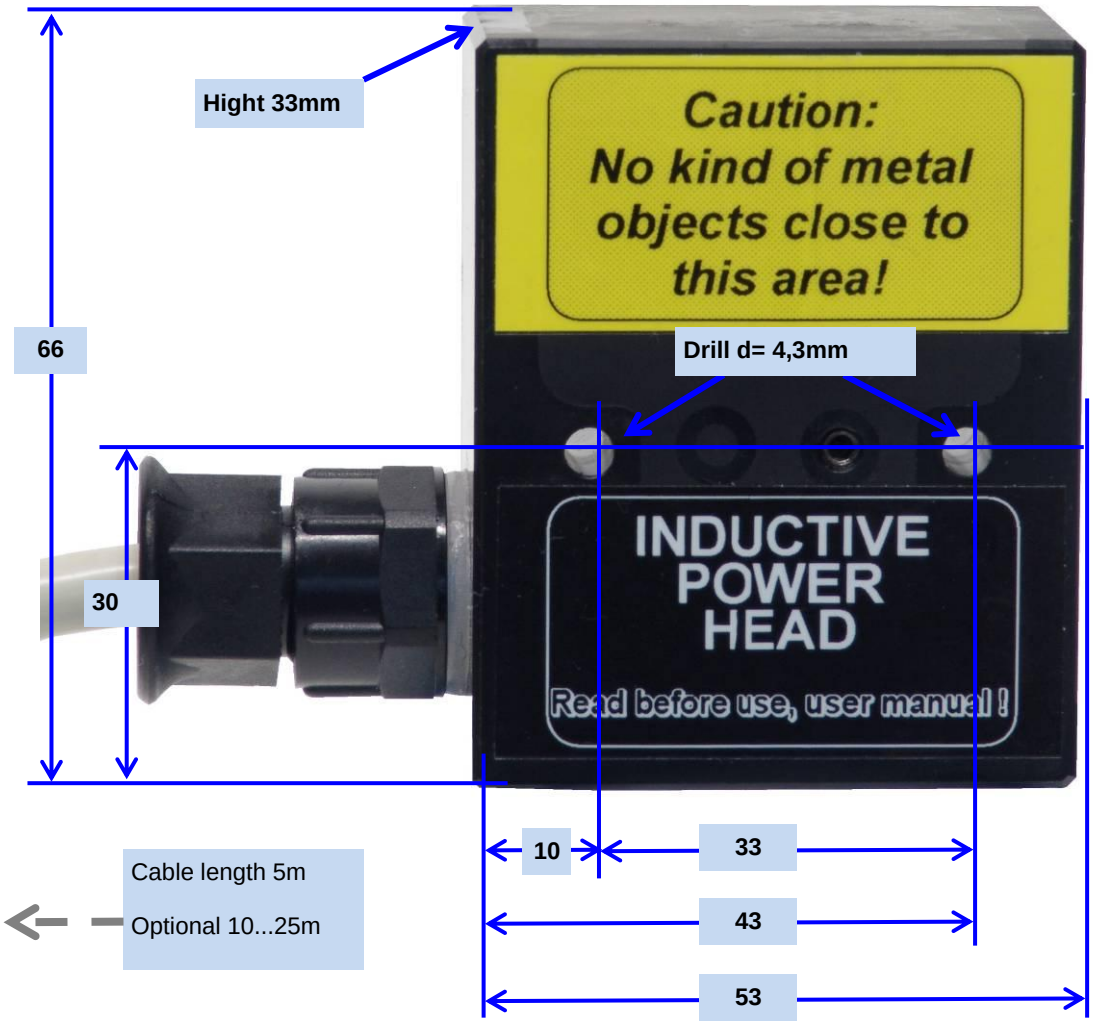
Don't use for mounting any kind metal in this area (25-30mm)! Otherwise flow magnetic energy in the metal also and degrease the distance between power head and coil (on shaft)!

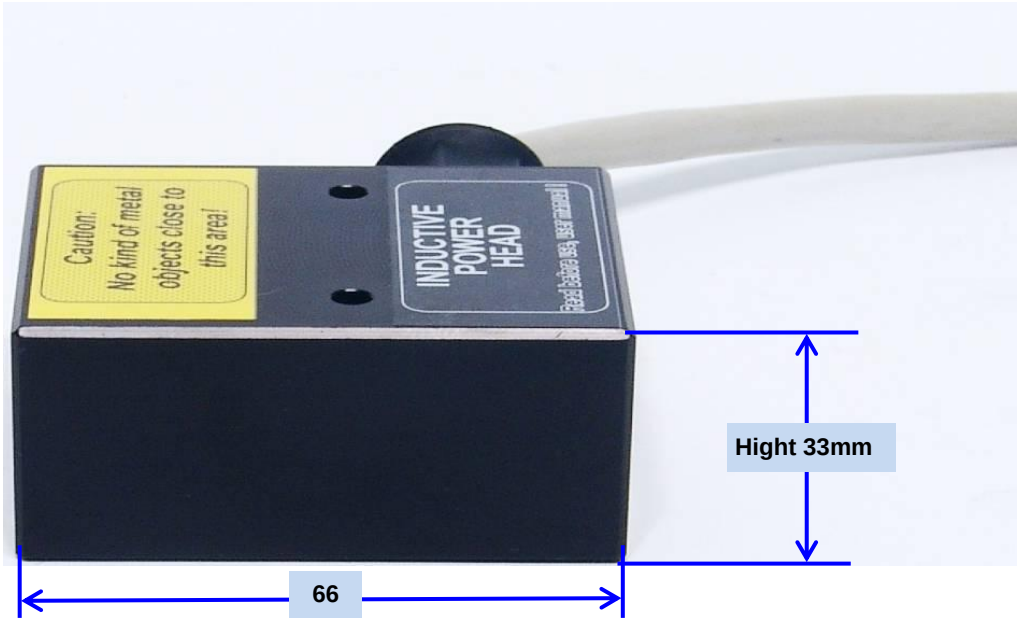
Example of mounting



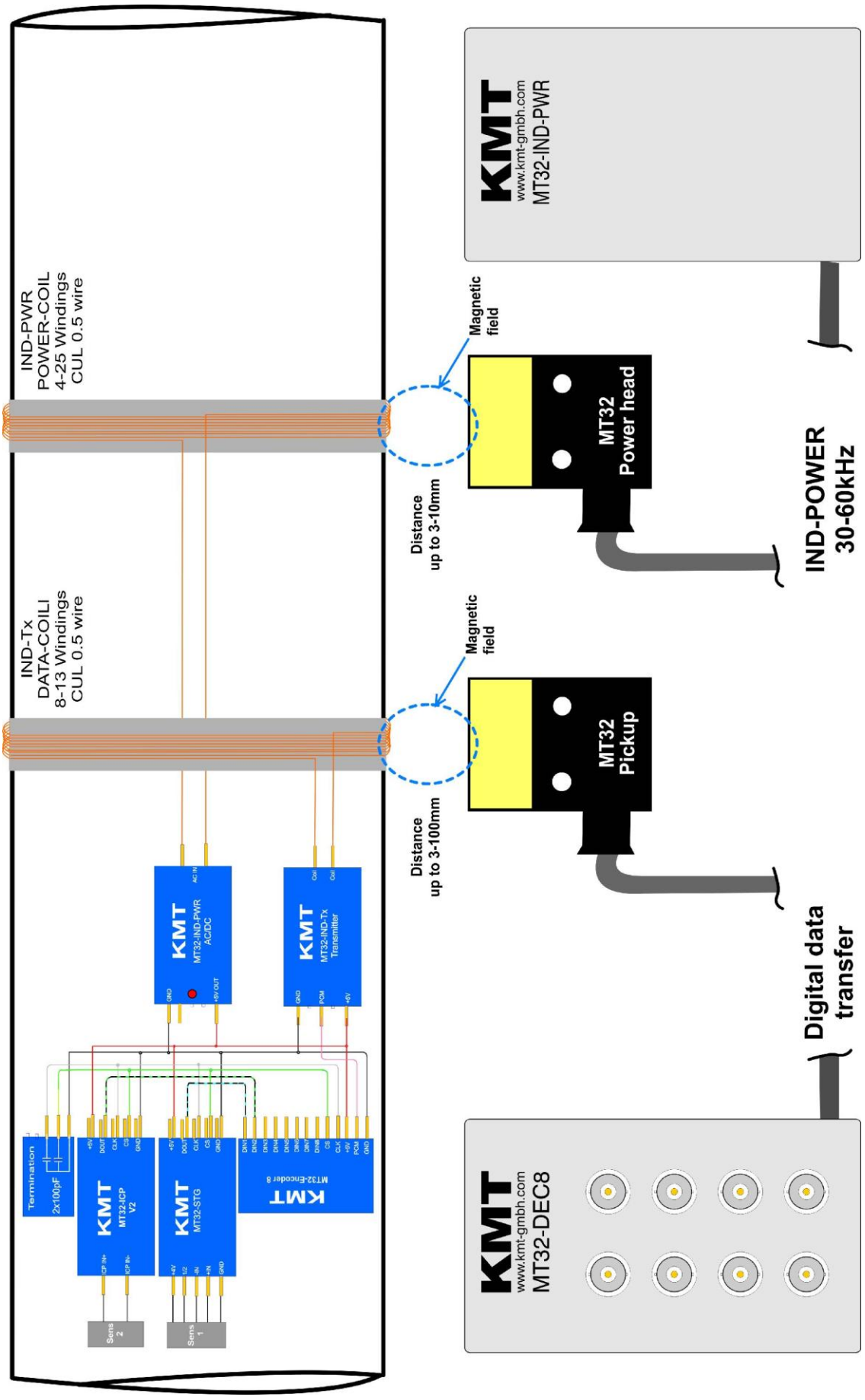
Wrong!!! Mounting plate cover the active area of inductive head

Dimensions of pickup and power head





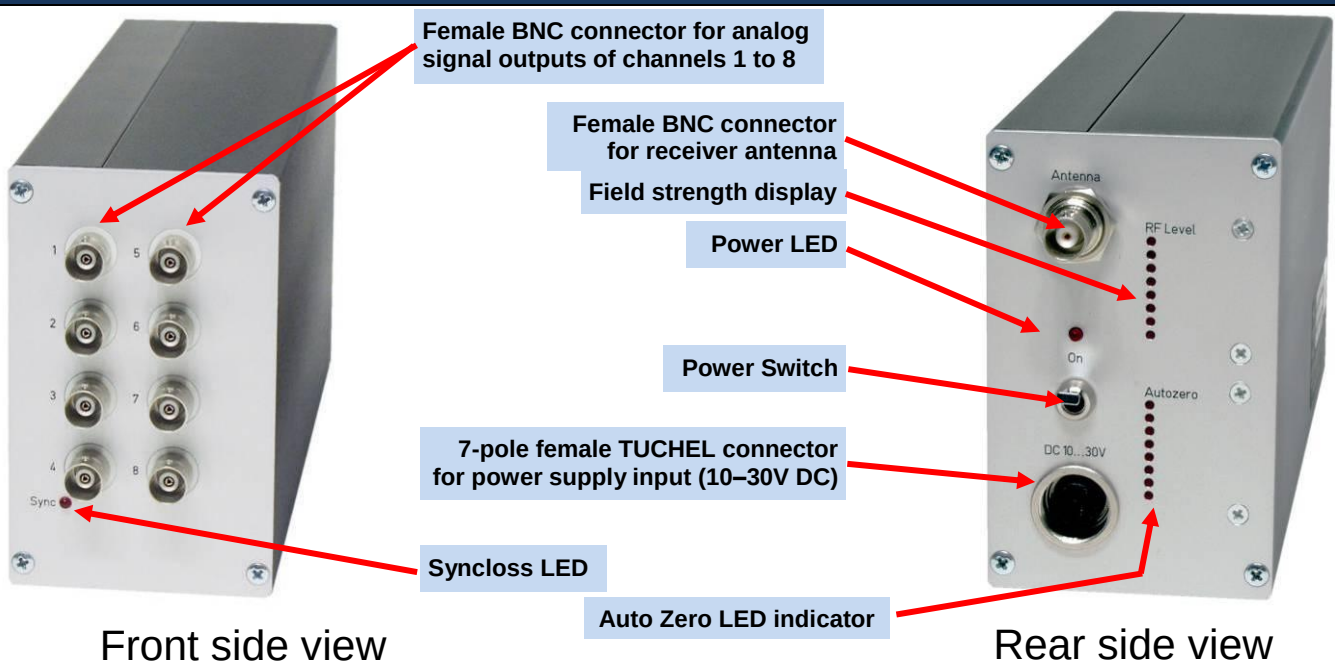
Block diagram
MT32 Telemetry with inductive data transmission and inductive power supply

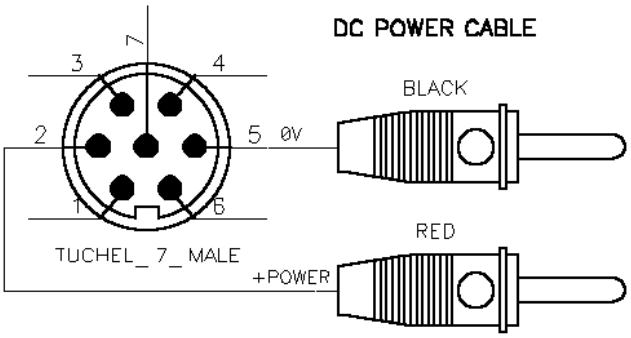


Safety notes for inductive powering

- The device should only applied by instructed personnel.
- The power head emits strong magnetic radiation at 60 kHz to a distance of 20 cm. Therefore persons with cardiac pacemakers should not work with this device!
- Magnetic data storage media should be kept in a distance of at least 3m from the power head to avoid data loss. The same is valid for electromagnetic sensitive parts, devices and systems.
- Do not place the power head in the switched-on state on metallic objects, because this results in eddy currents which could overload the device and strong heat up small objects. Also the probe could be destroyed!
- No metallic objects, other than the disc-type coil, should be located in the air gap of the power head. The same applies to metallic parts within a radius of up to 15–20 mm in all directions.
- Do not use damaged or faulty cables!
- Never touch in the area between shaft and inductive head, the rotating shaft itself or rotor electronic contacts during operation!
- This is a “Class A” system suitable for operation in a laboratory or industrial environment. The system can cause electromagnetic interferences when used in residential areas or environments. In this case the operator is responsible for establishing protective procedures.

MT32-DEC8 Receiver unit for max 8 Channels output via BNC





Receiver unit

Power supply voltage:	10-30V DC
Power consumption:	3W
Output signal voltage:	±5V
Output connector type:	BNC (2, 4 or 8 channels)
Weight:	1250g
Dimensions:	205 x 105 x 65 (without connectors)
Operating temperature:	-20°C … +70°C

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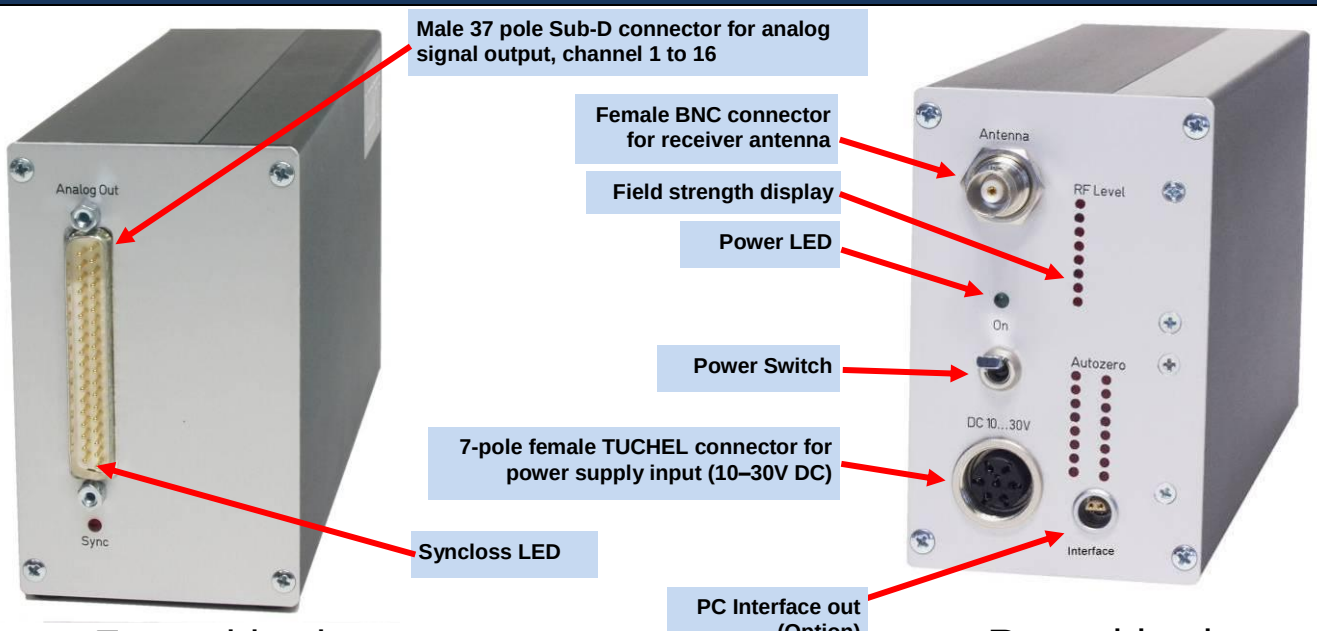
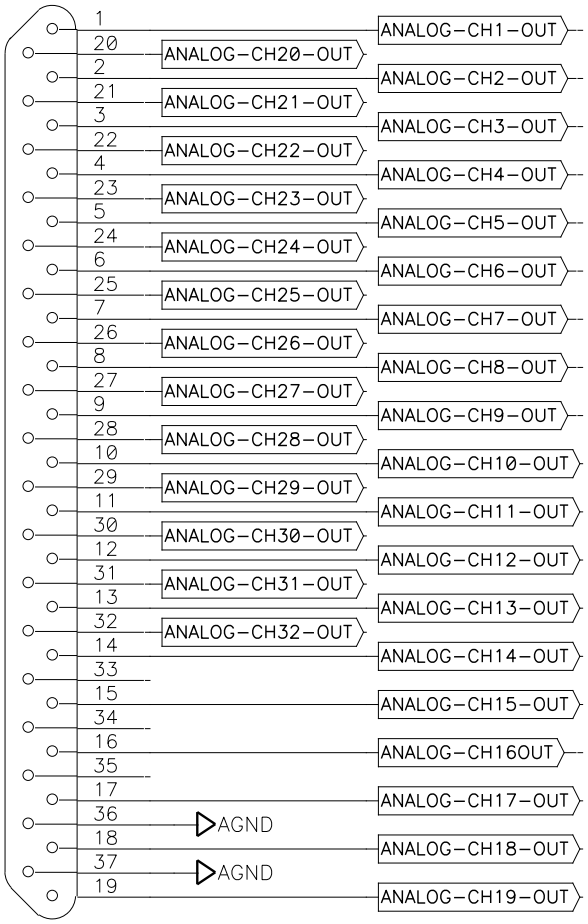
MT32-DEC16 Receiver unit for max 16 Channels output via 37 pol. Sub D



Front side view

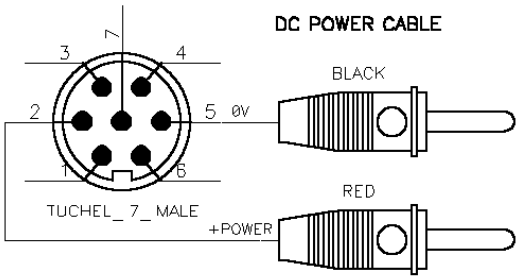
Rear side view

Pin connection 37pol Sub-D

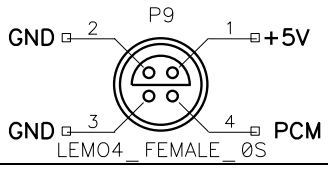


Pin 1 to 32 = CH 1… 32 analog out

Pin 36-37 = Common analog ground (AGND)



PC Interface out



Technical data:

Power supply voltage:	10-30V DC
Power consumption:	3W
Output signal voltage:	±5V
Output connector type:	BNC (2, 4 or 8 channels)
Weight:	1250g
Dimensions:	205 x 105 x 65 (without connectors)
Operating temperature:	-10°C … +70°C

Optional BNC16 Box. Connect on 37pol Sub-D -->

MT32-STG-V1 Acquisition module for strain gages (STG)

MT32-STG-V1

Bridge types: Full and half
(quarter bridge only with external completions resistor!)

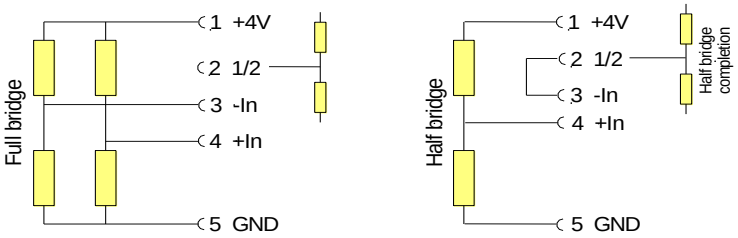
Bridge resistance: ≥ 350Ω for full and half
Excitation voltage: 4V fixed, 20mA max.

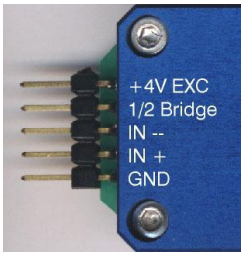
Gain: 200 or **1000** (factory setting)

Gain and STG-Sensitivity (output +/-5V at decoder)	
Gain 200 = +/-6.25mV/V	Gain 1000 = +/-1.25mV/V

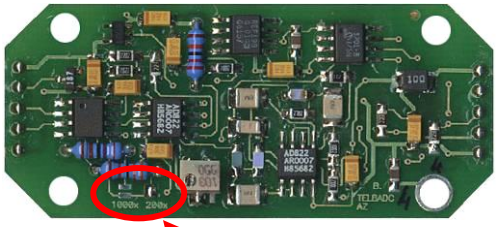
Offset compensation: By potentiometer or Auto Zero **(80% of full range)**

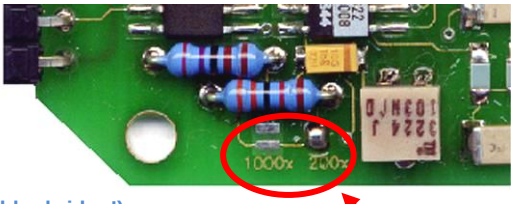
STG pin assignment





Gain setting





(Selectable by solder bridge!)

The closed solder bride determines the enabled gain of 200 or 1000.

For changing the gain in this example from 1000 to 200 - open the “1000x” and close the “200x” solder bridge.

Offset adjustment via Poti

STG - Sensor →

→ **MT32-ENC8**

The offset adjustment takes place via this screw using a suitable screw driver

Offset adjustment via Auto Zero at the ENC8

Auto Zero Switch

Auto Zero display

LED Off = AZ successful
LED On = AZ not successful

MT32-STG-V2 Acquisition module for strain gages (STG)

MT32-STG-V2

Bridge types: Full and half
(quarter bridge only with external completions resistor!)

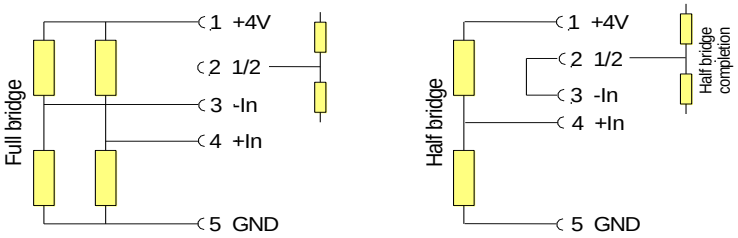
Bridge resistance: ≥ 350Ω for full and half
Excitation voltage: 4V fixed, 20mA max.

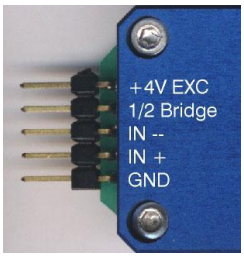
Gain: (factory setting) 250-500-**1000**-2000 or
(specify at order) 1000-2000-4000-8000

Gain and STG-Sensitivity (output +/-5V at decoder)	
Gain 250 = +/-5mV/V	Gain 2000 = +/-0.650mV/V
Gain 500 = +/-2.5mV/V	Gain 4000 = +/-0.3125mV/V
Gain 1000 = +/-1.250mV/V	Gain 8000 = +/-0.15625 mV/V

Offset compensation: By potentiometer or
Auto Zero **(80% of full scale)**

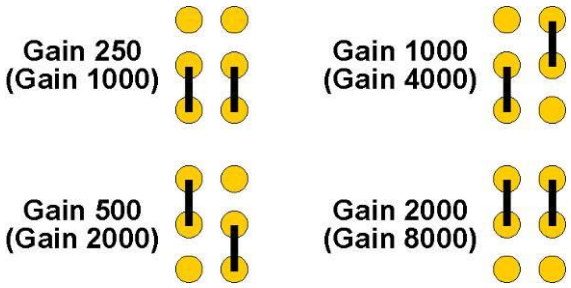
STG pin assignment





Gain setting

The jumper determines the enabled gain between 250-500-**1000**- and 2000 (standard) or 1000-2000-4000-8000 (on request)



Gain 1000-2000-4000-8000 on request!

Offset adjustment via Poti

STG - Sensor →  → **MT32-ENC8**

The offset adjustment takes place via this screw using a suitable screw driver

Offset adjustment via Auto Zero at the ENC8

Auto Zero Switch

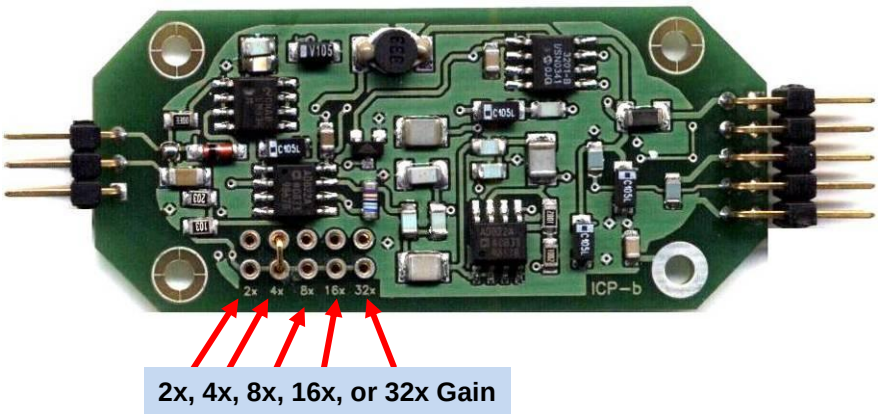
Auto Zero display

LED Off = AZ successful
LED On = AZ not successful

MT32-ICP Acquisition module for ICP

MT32-ICP
For ICP® sensor inputs
Current exc. 4mA fixed
(Optional 1mA)
Signal gain x 2, 4, 8, 16 and 32
(Optional x 1, 2, 4, 8 and 16)
Signal bandwidth 3 Hz up to 24000Hz*
(*deepens of the max. cut of frequency)
Resolution 12bit = 72dB dynamic range

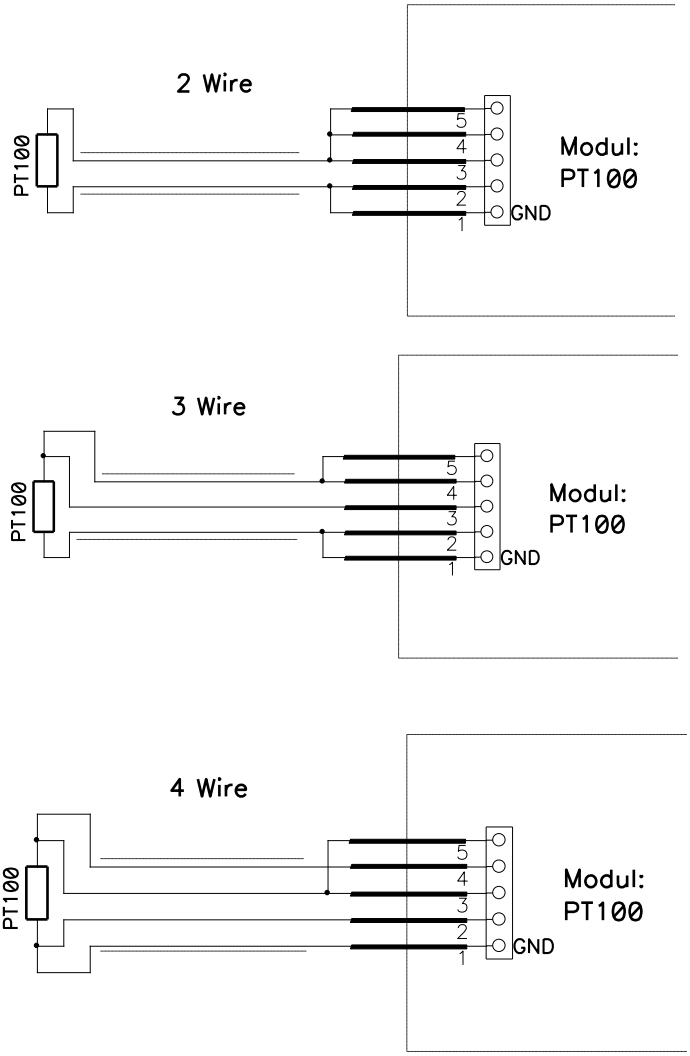
Gain setting



2x, 4x, 8x, 16x, or 32x Gain

MT32-PT100 Acquisition module for PT100

MT32-PT100
For thermo resistors
Range -100 …+500 °C
Resolution 12bit = 72dB dynamic range
Accuracy <0.25%



Temperature/Voltage table (+/-0.25% accuracy)

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		

MT32-THK-ISO Acquisition module for TH K-ISO with galvanic isolation!)

MT32-TH K-ISO
For thermo couples type K (***with*** galvanic isolation!)
Range -50 to 1000 °C (other range on request)
Resolution 12bit = 72dB dynamic range
Accuracy <1%

Temperature/Voltage table

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	3.766		
200	0.992	500	2.498	800	4.015		

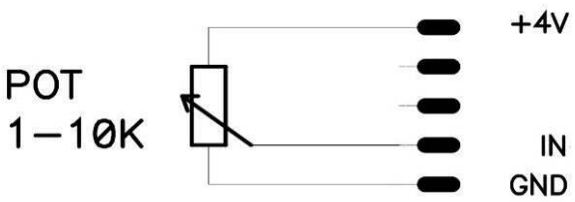
MT32-THK Acquisition module for TH K

MT32-TH (***without*** galvanic isolation!)
For thermo couples type K
Range 0 to 1000 °C (other range on request)
Resolution 12bit = 72dB dynamic range
Accuracy <1%

Temperature/Voltage table

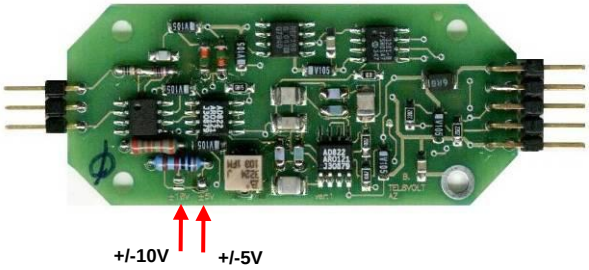
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
0	-5,003	250	-2,546	500	0,002	750	2,558
50	-4,515	300	-2,044	550	0,515	800	3,061
100	-4,009	350	-1,538	600	1,031	850	3,550
150	-3,516	400	-1,029	650	1,542	900	4,035
200	-3,031	450	-0,515	700	2,052	1000	5,000

MT32-POT Acquisition module for POT



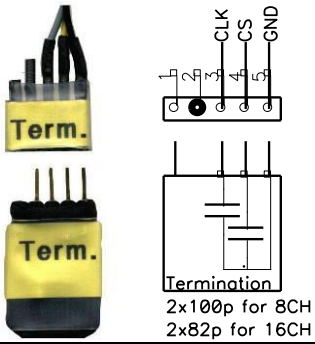
MT-POT
For all potentiometer values 350Ohm to 10kOhm
Excitation: 4 VDC (fixed)
Resolution 12bit = 72dB dynamic range

MT32-VOLT Acquisition module for Volt



MT32-VOLT
For high level inputs ±5V or ±10V
Resolution 12bit = 72dB dynamic range

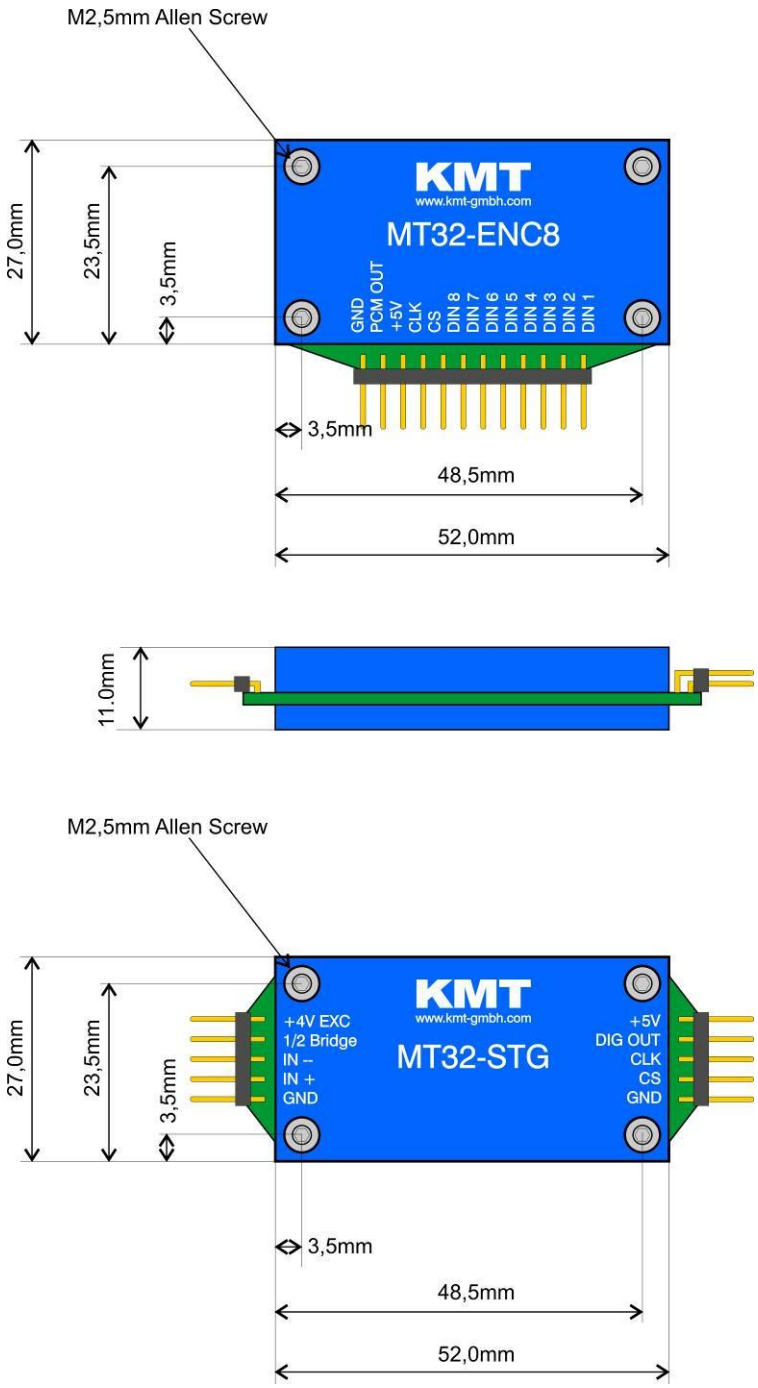
MT32 Termination of CLK and CS signal

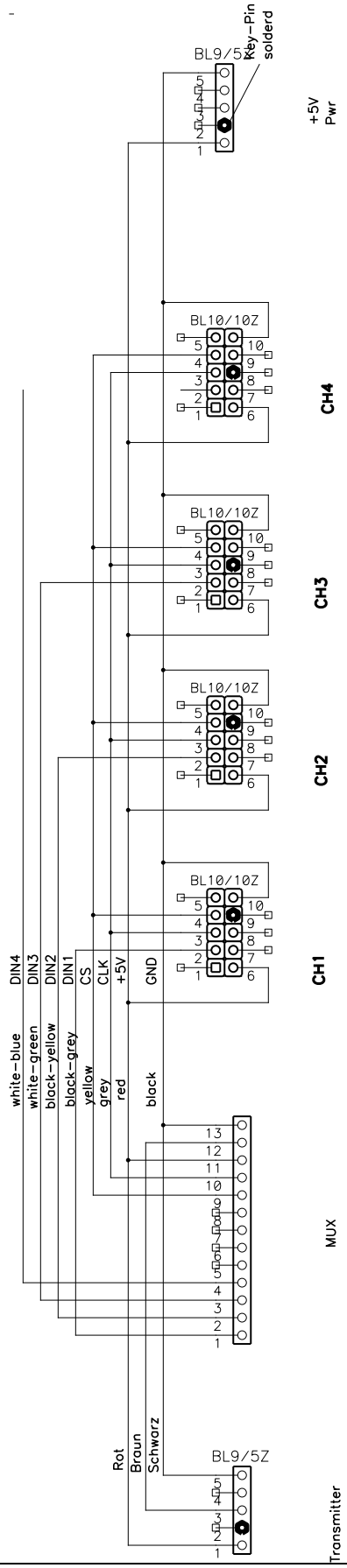
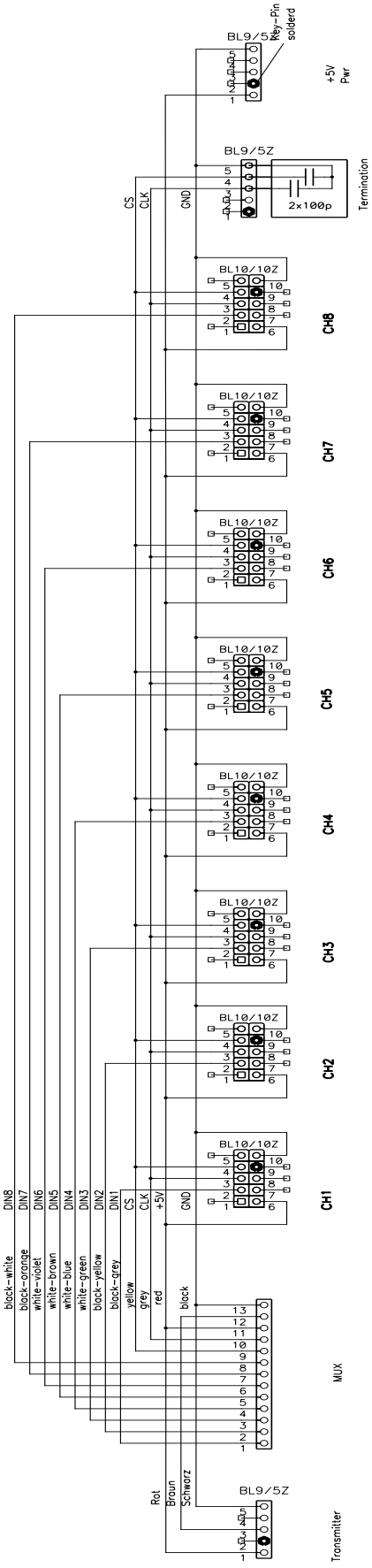


Important:
MT32-Termination-Plug
The CLK and CS signal must be terminated to GND with a 100pF (82pF at 16CH) capacitor!
(from 8-32 channels necessary!)

See pin connection diagram:

MT32 acquisition modules - dimensions

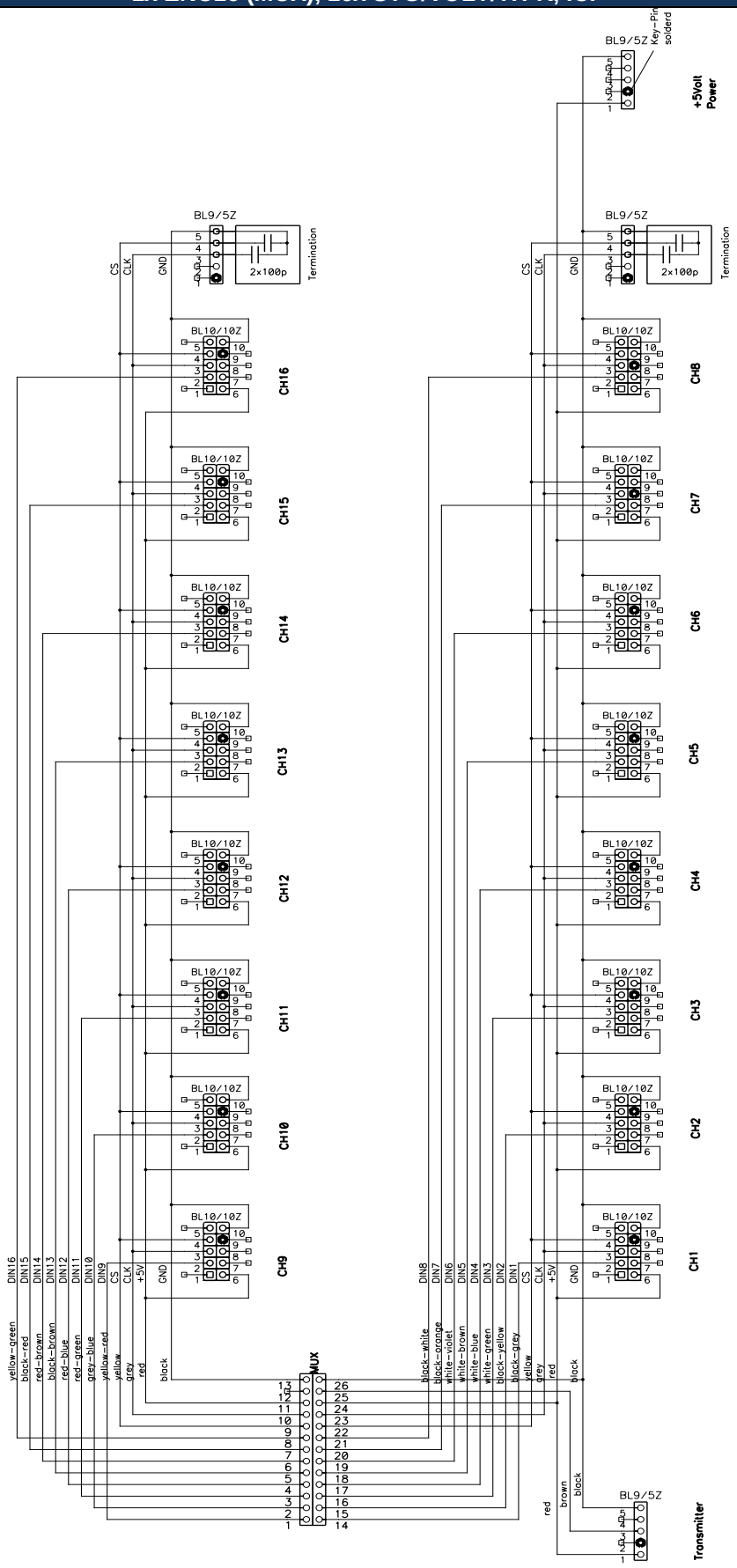


Pin connection e.g.: 1x ENC8 (MUX), 2x STG/VOLT/TH-K, ICP,	Pin connection e.g.: 1x ENC8 (MUX), 8x STG/VOLT/TH-K, ICP
	

Take care with your pin connection, if you solder the cable!

Don't plug any modules if Power is ON!!! First power OFF!!

Pin connection e.g.:
1x ENC16 (MUX), 16x STG/VOLT/TH-K, ICP

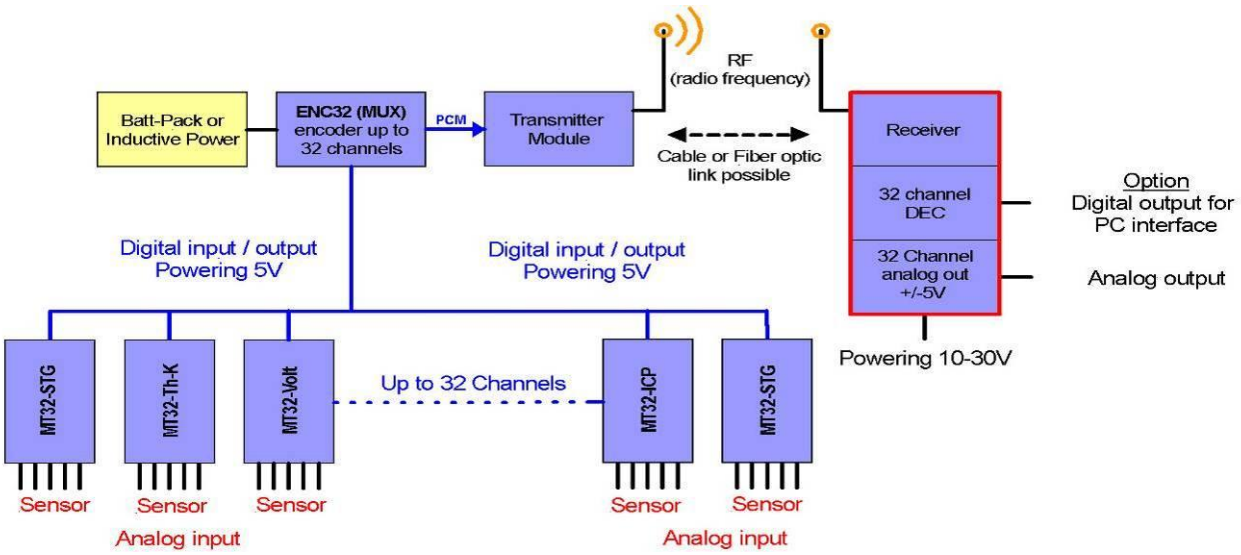


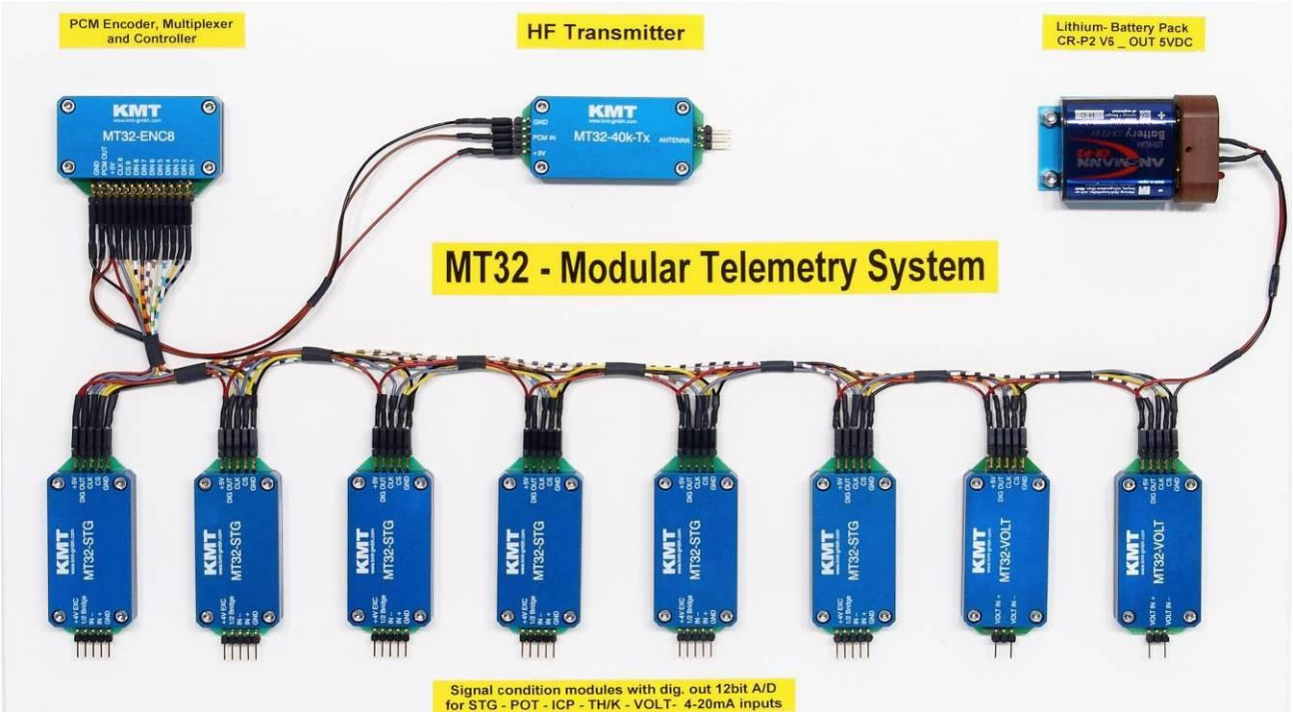
Take care with your pin connection, if you solder the cable!

Don't plug any modules if Power is ON!!! First power OFF!!

Short description:

The MT32 Mini-Telemetry is a very small and flexible telemetry system for rotating, mobile and stationary applications. Each sensor module is equipped with signal conditioning, anti-aliasing filters, analog-to-digital converters and a digital output. All these up to 32 modules will controlled by an encoder (multiplexer with PCM output) module. By this concept it's possible to install the acquisition modules close to the sensor to have short connections for the analog sensor lines. This avoids an undesired coupling of disturbances resulting in noisy signals. The interference insensitive digital outputs then can lead over wider distances of up to 5m to the encoder module. The encoder output is a PCM bit stream signal which can be modulated for emission by a transmitter module.
To support a wide range of applications there are different HF- transmitter types available. This includes different distances (short and long), transmission rates (40, 320, 640, 1280 or 2560kbit/s). Please send us an exactly description of your application with a simple block diagram. This ensures to provide you a proposal for an optimal solution.
The supply voltage for the transmitting part is 5V DC. It can be generated by batteries, inductive or mains power supplies (depends on application). Optional it's also possible to combine all signal acquisition modules, encoder, transmitter and batteries in a small housing as a compact ready-to-use telemetry system (CT8-16). For strain gage applications the offset can compensated by potentiometer on the acquisition module or optional by auto-zeroing via a micro switch on the encoder simultaneously for all modules. The calibration settings are not affected during power off. The receiver station output the signals in a ± 5V full scale range via BNC connectors. It will powered with 10-30V DC or optional by an external mains power supply with 110-230V AC.





MT32 acquisition modules

52 x 27 x 11 mm
Weight 20 grams

MT32-STG V1
For strain gages
Full and half (≥350Ω)
(quarter bridge only with external completions resistor!)
Fixed excitation 4V DC
Offset calibration via potentiometer or optional auto-zeroing
Gain 200 or 1000
Anti aliasing filter
Resolution 12bit = 72dB dynamic range
Accuracy <0.25%
Consumption of current: 20mA

52 x 27 x 11 mm
Weight 20 grams

MT32-POT
For all potentiometer values 350Ohm to 10kOhm
Excitation:4 VDC (fixed)
Resolution 12bit = 72dB dynamic range Anti aliasing filter
Accuracy <0.25%
Consumption of current:20mA

52 x 27 x 11 mm
Weight 20 grams

MT32-STG V2
For strain gages
Full and half (≥350Ω)
(quarter bridge only with external completions resistor!)
Fixed excitation 4V DC
Offset calibration via potentiometer or optional auto-zeroing
Gain: **250-500-1000-2000** or
1000-2000-4000-8000
Specify at order
Anti aliasing filter
Resolution 12bit = 72dB dynamic range
Accuracy <0.25%
Consumption of current: 28mA

52 x 27 x 11 mm
Weight 20 grams

MT32-PT100
For thermo resistors
Range -100 …+500 °C
Resolution 12bit = 72dB dynamic range
Accuracy <0.5%
Consumption of current:5mA

52 x 27 x 11 mm
Weight 20 grams

MT32-ICP
For ICP® sensor inputs
Current ECX. **4mA**
(optional 1mA)
Signal gain x 2, 4, 8, 16 and 32
(optional x 1, 2, 4, 8 and 16)
Signal bandwidth 3 Hz up to 12000Hz*
(*deepens of the max. cut of frequency)
Resolution 12bit = 72dB dynamic range
Accuracy <0.25%
Consumption of current:
40mA with 4mA sensor EXC (Standard)
20mA with 1mA sensor EXC (Option)

52 x 27 x 11 mm
Weight 20 grams

MT32-VOLT
For high level inputs ±5V or ±10V
Resolution 12bit = 72dB dynamic range Accuracy <0.25%
Consumption of current: 10mA

52 x 27 x 11 mm
Weight 20 grams

MT32-TH K-ISO
For thermo couples type K
(with galvanic isolation!)
Range -50 to 1000 °C
(other range on request)
Resolution 12bit = 72dB dynamic range
Bandwidth 0-20Hz
Accuracy <1%
Consumption of current:12mA

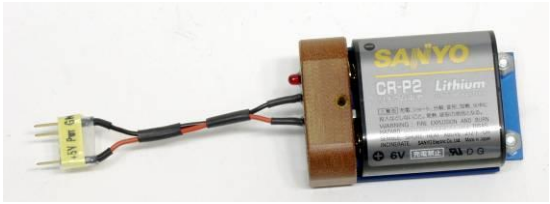
MT32 power supply rotating part

52 x 27 x 11 mm
Weight 20 grams

DC/DC PWR-5V-500
Input **7…30V DC**
Output 5V DC
Max. current 500mA
or
DC/DC PWR-5V-1000
Input **7…30V DC**
Output 5V DC
Max. current 1000mA

Lithium battery from SAFT:
2xLHS14, 3.6V each, 5800mAh
2x 3.6V = 7.2V with 5800mAh
or
2x LHS20, 3.6V each, 13000mAh
2x 3.6V = 7.2V with 13000mAh

This is only a recommendation!
The use of lithium batteries follow at one's own risk!!



58 x 35 x 21 mm
Weight about 60gram

MT32-BATT-PACK
Input 6V via Lithium battery
CR-P2 6V 1500mA/h
Output 5V DC
Low BATT LED display
Max. current 300mA

This is only a recommendation!
The use of lithium batteries follow at one's own risk!!

IND-Pwr-AC/DC module

52 x 27 x 11 mm
Weight 20 grams

MT32- inductive AC/DC PWR 5V
Input AC 30kHz
Output 5V DC
Max. current 500mA

For inductive IND-PWR AC/DC module is an additional power supply necessary!

MT32 encoder and decoder

52 x 27 x 11 mm
Weight 20 grams

MT32-ENC8
PCM encoder module for linking the data of up to 8 SC modules to one PCM bit stream for transmission
Consumption of current: 20mA

65 x 105 x 230 mm - Weight 1000 grams

MT32-DEC8
Receiver for up to 2, 4 or 8 channels
±5V output range on female BNC
Total system accuracy ±0,25%
without sensors
Powering 10–30V DC or
optional 110-230V AC (50Hz-60Hz)
with AC/DC adaptor

52 x 27 x 11 mm
Weight 20 grams

MT32-ENC16
PCM encoder module for linking the data of up to 16 SC modules to one PCM bit stream for transmission.
Consumption of current: 20mA

MT32-DEC16
65 x 105 x 230 mm
Weight 1000 grams

Option :BNC16

MT32-DEC16
Receiver for 16 channels
±5V output range
Output 37pol. Sub D
Total system accuracy ±0,25%
without sensors
Powering 10–30V DC or
optional 110-230V AC
with AC/DC adaptor

Option: BNC16, adaptor Box
37 Sub-D to 16 x BNC Outputs

MT32 transmitter module

52 x 27 x 11 mm
Weight 20 grams

MT32-IND-Tx-1280k
Inductive data transmission transmitter only for rotating applications
Total sampling rate 80 kS/s
Transmission rate 1280kbit/s
Distance up to 0.1m (>100mm)
Optional with 2560kibt/s
Consumption of current: 15mA

52 x 27 x 11 mm
Weight 23 grams

MT32-40k
High power (10mW) module transmitter for long distances up to 250m point to point or
10m on rotating applications.
Total scanning rate 2,5 kS/s
Transmission rate 40kbit/s
Transmission power 10mW
Consumption of current: 40mA

Cut off frequency from anit-aliasing filter (-3dB) and scanning rate (red)

Bit rate	2 Channels	4 Channels	8 Channels	16 Channels	32 Channels
2560 kbit/s	24000Hz (91428 Hz)	12000 Hz (49231 Hz)	6000 Hz (25600 Hz)	3000 Hz (13061Hz)	1500 Hz (6598Hz)
1280 kbit/s	12000 Hz (45714 Hz)	6000 Hz (24615 Hz)	3000 Hz (12800 Hz)	1500 Hz (6530 Hz)	750 Hz (3298 Hz)
640 kbit/s	6000 Hz (22857Hz)	3000 Hz (12308 Hz)	1500 Hz (6400 Hz)	750 Hz (3265 Hz)	375 Hz (1649 Hz)
320 kbit/s	3000 Hz (11428 Hz)	1500 Hz (6154 Hz)	750 Hz (3200 Hz)	375 Hz (1632 Hz)	190 Hz (824 Hz)
40 kbit/s	375 Hz (1428 Hz)	190 Hz (770 Hz)	95 Hz (400 Hz)	47 Hz (204 Hz)	23 Hz (103 Hz)

Scanning rate, signal bandwidth and frame length depending on bit rate and number of channels

Frame example with 8 channels as following: 8Ch x12 bit = 96 bit + 4 bit sync. = 100 bit

1x data frame

1 Ch.	2 Ch.	3 Ch.	4 Ch.	5 Ch.	6 Ch.	7 Ch.	8 Ch.	Sync. bit	
12 bit	12 bit	12 bit	12 bit	12 bit	12 bit	12 bit	12 bit	4 bit	= bit rate100 bit

32 Ch. x 12 bit = 384 bit + 4 bit sync. = 388 bit
16 Ch. x 12 bit = 192 bit + 4 bit sync. = 196 bit
8 Ch. x 12 bit = 96 bit + 4 bit sync. = 100 bit
4 Ch. x 12 bit = 48 bit + 4 bit sync. = 52 bit
2 Ch. x 12 bit = 24 bit + 4 bit sync. = 28 bit

Scanning you can calculate e.g.: 40kbit transfer rate, 8 Ch. = 40000 : 100bit = 400Hz per Ch.

Environmental:

Rotating Part (blue modules):

- Operating Temperature ..... -20 – +80°C
- Storage Temperature..... -30 – +90°C
- Humidity (non-condensing).....20 – 80%
- Vibration.....5g Mil standard 810C, curve C
- Shock & static acceleration (in any direction) 3000g

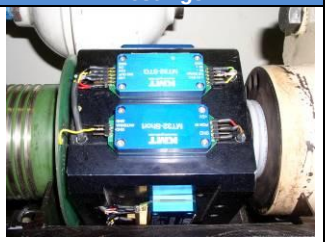
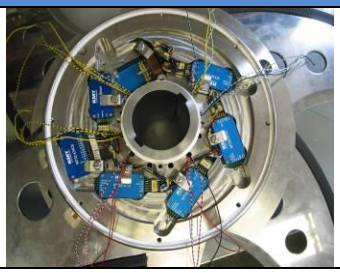
Down load formula (Excel format) to calculate the static acceleration (RPM/diameter):
http://www.kmt-gmbh.com/en/telemetrie/Calculation of radial acceleration of shaft.xls

Receiving Part:



- Operating Temperature ..... -10 – +70°C
- Storage Temperature..... -20 – +80°C
- Humidity (non-condensing).....20 – 80%
- Vibration.....5g Mil standard 810C, curve C
- Shock (in any direction) 100g

Application

Streetcar wheel	Railway wheel	Railway wheel	Railway wheel
			
Belt disk of car	**Drive shaft of ship engines**	**Shaft of wind power plant**	**Test rigs**
			
Drive shaft of wheel loader	**Force measurements**	**24kHz data transmission TTL**	**Special solution for force test at milling machine**
			

Item	Qty.	Type	Description
8a			Order Samples
			MT32-2CH-40k, 2xSTG, BATT, BW 2x0-375Hz
	2	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC8	Encoder for up to 8 acquisition module
	1	MT32-40k-10	ISM-Band telemetry transmitter and receiver (distance up to 0.5 to 10m)
	1	BATT-PACK	Battery pack
	1	BATT-SET	Battery set
	1	MT32-DEC2	Decoder for 2 channels, Output 2 x BNC
	1	AC/DC	AC/DC power supply for DEC2 (Optional)
			MT32-2CH-IND-TX-RX, 2xSTG, BATT, BW 2x0-24000Hz
	2	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC8	Encoder for up to 8 acquisition module
	1	MT32-IND-RX-TX	Inductive telemetry 2560kbit transmitter and receiver (distance 0.1m)
	1	BATT-PACK	Battery pack
	1	BATT-SET	Battery set
	1	MT32-DEC2	Decoder for 2 channels, Output 2 x BNC
	1	AC/DC	AC/DC power supply for DEC2 (Optional)
			MT32-4CH-40k, 4xSTG, BATT, BW 4x0-190Hz
	4	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC8	Encoder for up to 8 acquisition module
	1	MT32-40k-10	ISM-Band telemetry transmitter and receiver (distance up to 0.5 to 10m)
	1	BATT-PACK	Battery pack
	1	BATT-SET	Battery set
	1	MT32-DEC4	Decoder for 4 channels, Output 4 x BNC
	1	AC/DC	AC/DC power supply for DEC4 (Optional)
			MT32-4CH-IND-TX-RX, 4xSTG, BATT, BW 4x0-12000Hz
	4	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC8	Encoder for up to 8 acquisition module
	1	MT32-IND-RX-TX	Inductive telemetry 2560kbit transmitter and receiver (distance 0.1m)
	1	BATT-PACK	Battery pack
	1	BATT-SET	Battery set
	1	MT32-DEC4	Decoder for 4 channels, Output 4 x BNC
	1	AC/DC	AC/DC power supply for DEC4 (Optional)
			MT32-8CH-40k, 8xSTG, BATT, BW 8x0-95Hz
	8	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC8	Encoder for up to 8 acquisition module
	1	MT32-40k-10	ISM-Band telemetry transmitter and receiver (distance up to 0.5 to 10m)
	1	BATT-PACK	Battery pack
	1	BATT-SET	Battery set
	1	MT32-DEC8	Decoder for 8 channels, Output 8 x BNC
	1	AC/DC	AC/DC power supply for DEC8 (Optional)

Item	Qty.	Type	Description
8b			Order Samples
			MT32-8CH-IND-TX-RX, 8xSTG, BATT, BW 8x0-6000Hz
	8	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC8	Encoder for up to 8 acquisition module
	1	MT32-IND-RX-TX	Inductive telemetry 2560kbit transmitter and receiver (distance 0.1m)
	1	BATT-PACK	Battery pack
	1	BATT-SET	Battery set
	1	MT32-DEC8	Decoder for 8 channels, Output 8 x BNC
	1	AC/DC	AC/DC power supply for DEC8 (Optional)
			MT32-8CH-IND-TX-RX, 8xSTG, BATT, BW 8x0-6000Hz, DIG-OUT
			only Digital OUT, with interface and software
	8	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC8	Encoder for up to 8 acquisition module
	1	MT32-IND-RX-TX	Inductive telemetry 2560kbit transmitter and receiver (distance 0.1m)
	1	BATT-PACK	Battery pack
	1	BATT-SET	Battery set
	1	MT32-DEC-DIG	Decoder with only digital output for IF16 or ECIA100
	1	ECIA100	Digital interface for notebook (IF16-PCMCIA)
	1	MLab	32bit data acquisition and on-line processing software for WinXP/2000
	1	MGraph	32bit data analysis software for WinXP/2000 (option)
	1	AC/DC	AC/DC power supply for DEC-DIG (Optional)
			MT32-8CH-IND-TX-RX, 8xSTG, IND-PWR, BW 8x0-6000Hz
	8	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC8	Encoder for up to 8 acquisition module
	1	MT32-IND-RX-TX	Inductive telemetry 2560kbit transmitter and receiver (distance 0.1m)
	1	IND-PWR-L	Inductive power supply
	1	MT32-DEC8	Decoder for 8 channels, Output 8 x BNC
	2	AC/DC	AC/DC power supply (1x for DEC8, 1x for IND-PWR)
			MT32-8CH-IND-TX-RX 6xSTG, 2 x ICP, BATT, BW 8x0-6000Hz
	6	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	2	MT32-ICP	Signal conditioning module for ICP sensors with digital data acquisition
	1	MT32-ENC8	Encoder for up to 8 acquisition module
	1	MT32-IND-RX-TX	Inductive telemetry 2560kbit transmitter and receiver (distance 0.1m)
	1	BATT-PACK	Battery pack
	1	BATT-SET	Battery set
	1	MT32-DEC8	Decoder for 8 channels, Output 8 x BNC
	1	AC/DC	AC/DC power supply
			MT32-16CH-IND-TX-RX 16xSTG, BATT, BW 16x0-3000Hz
	16	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC16	Encoder for up to 16 acquisition module
	1	MT32-IND-RX-TX	Inductive telemetry 2560kbit transmitter and receiver (distance 0.1m)
	1	DC/DC PWR-5V-500	Power modul for blue modules, IN 7-30V OUT 500mA 5VDC
	1	MT32-DEC16	Decoder for 16 channels, Output via 37pol. Sub-D Connector
	1	BNC16 BOX	Adapter BOX for DEC16 multiple 37pole Sub-D to 16 single BNC connectors
	1	AC/DC	AC/DC power supply

Item	Qty.	Type	Description
8c			Order Samples
			MT32-16CH-IND-TX-RX 16xSTG, BATT, BW 16x0-3000Hz
			only Digital OUT, with interface and software
	16	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC16	Encoder for up to 16 acquisition module
	1	MT32-IND-RX-TX	Inductive telemetry 2560kbit transmitter and receiver (distance 0.1m)
	1	DC/DC PWR-5V-500	Power modul for blue modules, IN 7-30V OUT 500mA 5VDC
	1	MT32-DEC-DIG	Decoder with only digital output for IF16 or ECIA100
	1	ECIA100	Digital interface for notebook (IF16-PCMCIA)
	1	MLab	32bit data acquisition and on-line processing software for WinXP/2000
	1	MGraph	32bit data analysis software for WinXP/2000 (option)
	1	AC/DC	AC/DC power supply
			MT32-16CH-IND-TX-RX, 16xSTG, IND-PWR, BW 16x0-3000Hz
	16	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC16	Encoder for up to 16 acquisition module
	1	MT32-IND-RX-TX	Inductive telemetry 2560kbit transmitter and receiver (distance 0.1m)
	1	IND-PWR-XL	Inductive power supply
	1	MT32-DEC16	Decoder for 16 channels, Output via 37pol. Sub-D Connector
	1	BNC16 BOX	Adapter BOX for DEC16 multiple 37pole Sub-D to 16 single BNC connectors
	2	AC/DC	AC/DC power supply (1x for DEC16, 1x for IND-PWR)
			MT32-16CH-40k, 16xSTG, BATT, BW 16x0-47Hz
	16	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC16	Encoder for up to 16 acquisition module
	1	MT32-40k-10	ISM-Band telemetry transmitter and receiver (distance up to 0.5 to 10m)
	1	DC/DC PWR-5V-500	Power modul for blue modules, IN 7-30V OUT 500mA 5VDC
	1	MT32-DEC16	Decoder for 16 channels, Output via 37pol. Sub-D Connector
	1	BNC16 BOX	Adapter BOX for DEC16 multiple 37pole Sub-D to 16 single BNC connectors
	1	AC/DC	AC/DC power supply for DEC16 (Optional)
			MT32-32CH-IND-TX-RX, 32xSTG, BATT, BW 32x0-1500Hz
	32	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC32	Encoder for up to 32 acquisition module
	1	MT32-40k-10	ISM-Band telemetry transmitter and receiver (distance up to 0.5 to 10m)
	1	DC/DC PWR-5V-1000	Power modul for blue modules, IN 7-30V OUT 1000mA 5VDC
	1	MT32-DEC32	Decoder for 32 channels, Output via 37pol. Sub-D Connector
	1	BNC32 BOX	Adapter BOX for DEC32 multiple 37pole SubD to 32 single BNC connectors
	1	AC/DC	AC/DC power supply for DEC32 (Optional)
			MT32-32CH-IND-TX-RX, 32xSTG, IND-PWR, BW 32x0-1500Hz
	32	MT32-STG	Signal conditioning module for strain gages with digital data acquisition
	1	MT32-ENC32	Encoder for up to 32 acquisition module
	1	MT32-IND-RX-TX	Inductive telemetry 2560kbit transmitter and receiver (distance 0.1m)
	1	IND-PWR-XXL	Inductive power supply
	1	MT32-DEC32	Decoder for 32 channels, Output via 37pol. Sub-D Connector
	1	BNC32 BOX	Adapter BOX for DEC32 multiple 37pole SubD to 32 single BNC connectors
	1	AC/DC	AC/DC power supply for DEC32 (Optional)

KMT - Kraus Messtechnik GmbH

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Konformitätserklärung

Declaration of Conformity
Declaration de Conformité

Wir We Nous	**KMT - Kraus Messtechnik GmbH**
Anschrift Address Adress	**Gewerbering 9, D-83624 Otterfing, Germany**

erklären in alleiniger Verantwortung, daß das Produkt
declare under our sole responsibility, that the product
declarons sous notre seule responsibilité, que le produit

Bezeichnung Name Nom	**Messdatenübertragungssystem**
Typ,Modell,Artikel-Nr., Größe Type,Model, Article No.,Taille Type, Modèle, Mo.d'Article,Taille	**MT32 System**

mit den Anforderungen der Normen und Richtlinien
fulfills the requirements of the standard and regulations of the Directive
satisfait aux exigences des normes et directives

108/2004/EG	**Elektromagnetische Verträglichkeit EMV / EMC** DIN EN 61000-6-3 Ausgabe 2002-8 Elektromagnetische Verträglichkeit EMV Teil 6-3 Fachgrundnorm Störaussendung DIN EN 61000-6-1 Ausgabe 2002-8 Elektromagnetische Verträglichkeit EMV Teil 6-1 Fachgrundnorm Störfestigkeit

und den angezogenen Prüfberichten übereinstimmt und damit den Bestimmungen entspricht.
and the taken test reports und therefore corresponds to the regulations of the Directive
et les rapports d'essais notifiés et, ainsi, correspond aux règlement de la Directive.

Otterfing, 30.05.2006	**Martin Kraus**
Ort und Datum der Ausstellung Place and Date of Issua Lieu et date d'établissement	Name und Unterschrift des Befugten Name and Signature of authorized person Nom et signature de la personne autorisée

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