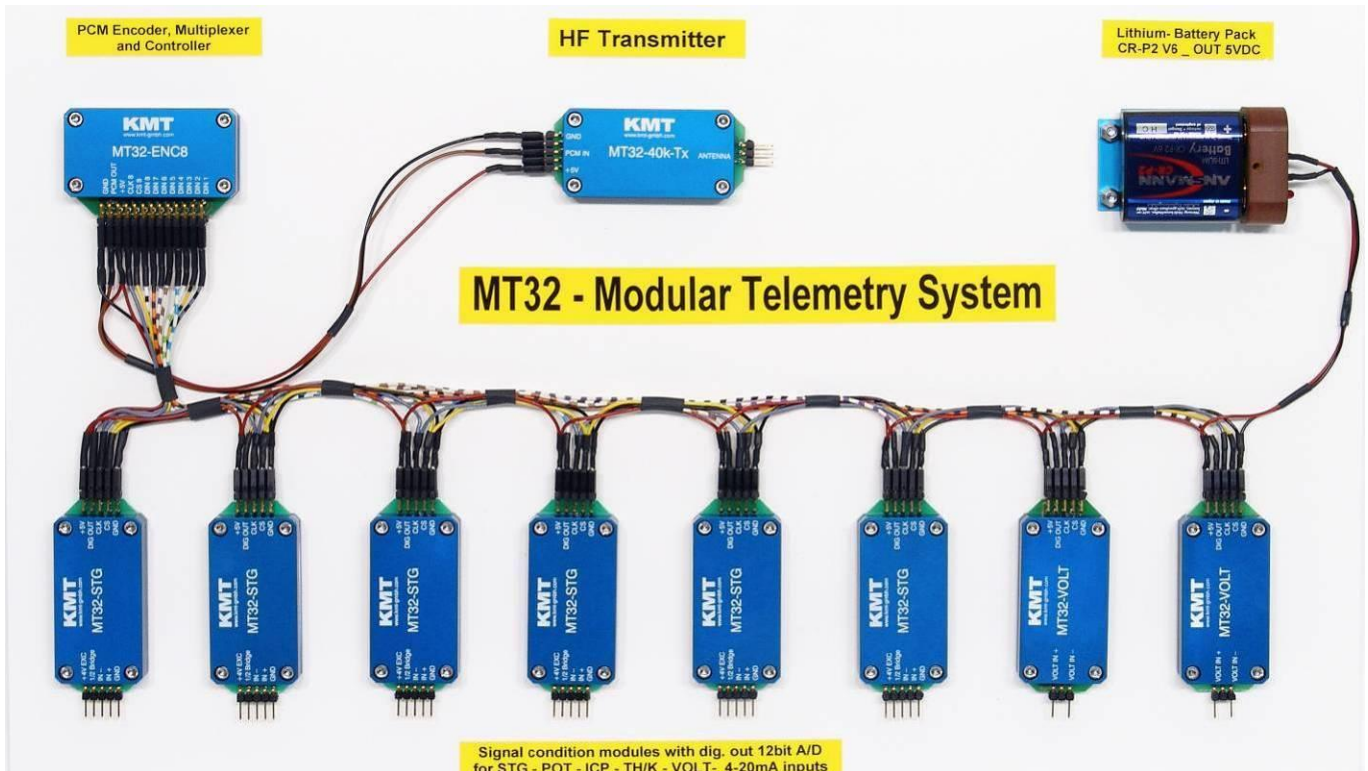


MT32 Telemetry

User Manual



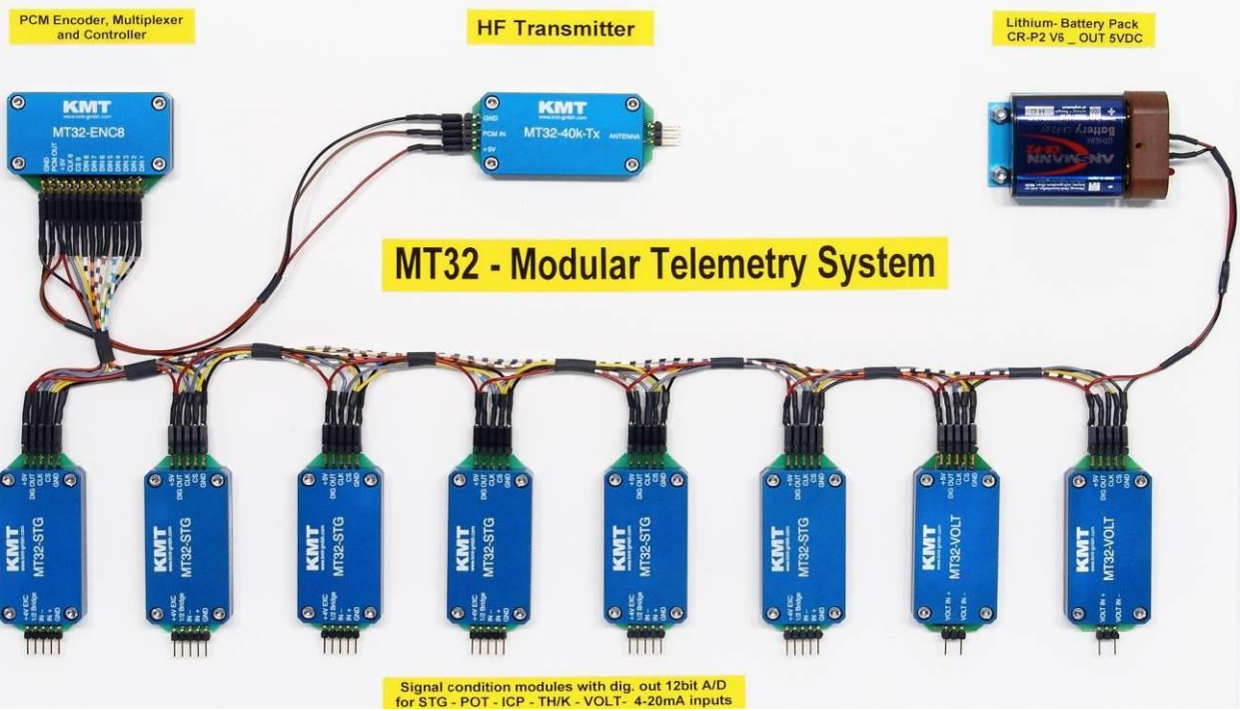
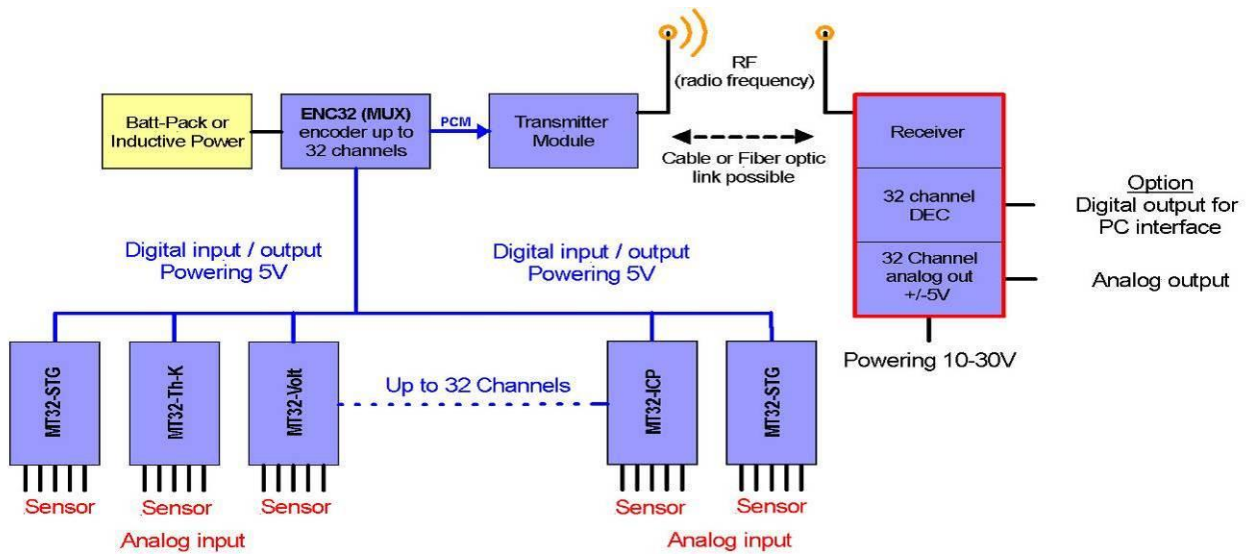
INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

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 be 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 be 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 outputs the signals in a $\pm 5V$ full-scale range via BNC connectors. It will be 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 ($\geq 350\Omega$)
(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 ($\geq 350\Omega$)
(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: 26mA



52 x 27 x 11 mm
Weight 20 grams

MT32-PT100

For thermo resistors
Range -100 ... +500 °C
Resolution 12bit = 72dB dynamic range
Accuracy <0.25%
Consumption of current: 5mA



52 x 27 x 11 mm
Weight 20 grams

MT32-ICP

For ICP® sensor inputs
(Max. input range at gain $2x = \pm 2.5V$)
Current exc. **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* (*dependent of the max. cut of frequency)
Resolution 12bit = 72dB dynamic range
Accuracy <0.25%
Consumption of current: 50mA



52 x 27 x 11 mm
Weight 20 grams

MT32-VOLT

For high level inputs $\pm 5V$ or $\pm 10V$
Resolution 12bit = 72dB dynamic range
Accuracy <0.25%
Consumption of current: 10mA

Optional Volt ISO available with galvanic isolated inputs



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 0-10Hz
Accuracy <1%
Consumption of current: 12mA

MT32 power supply rotating part



52 x 27 x 11 mm
Weight 20 grams

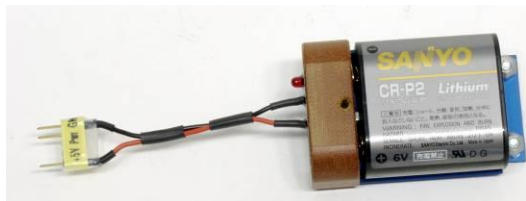
DC/DC PWR 5V-1000

Input 7...30V DC
Output 5V DC
Max. current 1000mA



Lithium battery from SAFT:
2x LSH14, 3.6V each, 5800mAh
2x 3.6V = 7.2V with 5800mAh
or
2x LSH20, 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
for CR-P2 6V 1500mAh/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!!
Batteries must be purchased in your own country!



IND-Pwr-AC/DC module

52 x 27 x 11 mm
Weight 20 grams

MT32- inductive AC/DC PWR 5V

Input: 30-60kHz, 10-50V AC or 24 DC
Output 5V DC
Max. current 1000mA

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-2560k
Inductive data transmission transmitter
Total sampling rate 160 kS/s
Transmission rate 2560kbit/s
Distance up to 0.1m (>100mm)
Consumption of current: 15mA



52 x 27 x 11 mm
Weight 25 grams

MT32-IND-Tx-45MHz-2560k
Inductive data transmission transmitter with **45MHz carrier** (for noise environmental areas!)
Total sampling rate 160 kS/s
Transmission rate 2560kbit/s
Distance up to 0.1m (>100mm)
Consumption of current: 70mA



52 x 27 x 11 mm
Weight 23 grams

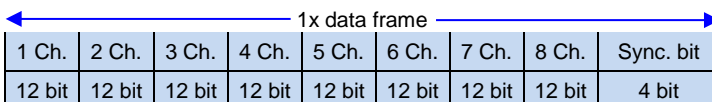
MT32-40k (320-640-1280k available)
Range 10m on rotating applications.
Total scanning rate 2,5 kS/s
Transmission rate 40kbit/s
Transmission power 10mW
Consumption of current: 40mA

Cut off frequency from anti-aliasing filter (-3dB), scanning rate (red), latency time (brown) analog IN/OUT

Bit rate	2 Channels	4 Channels	8 Channels	16 Channels	32 Channels
2560 kbit/s	24000Hz (91428 Hz) 0.079ms	12000 Hz (49231 Hz) 0.149ms	6000 Hz (25600 Hz) 0.29ms	3000 Hz (13061Hz) 0.56ms	1500 Hz (6598Hz) 1.108ms
1280 kbit/s	12000 Hz (45714 Hz) 0.154ms	6000 Hz (24615 Hz) 0.295ms	3000 Hz (12800 Hz) 0.57ms	1500 Hz (6530 Hz) 1.11ms	750 Hz (3298 Hz) 2.23ms
640 kbit/s	6000 Hz (22857Hz) 0.305ms	3000 Hz (12308 Hz) 0.578ms	1500 Hz (6400 Hz) 1.12ms	750 Hz (3265 Hz) 2.24ms	375 Hz (1649 Hz) 4.6ms
320 kbit/s	3000 Hz (11428 Hz) 0.597ms	1500 Hz (6154 Hz) 1.14ms	750 Hz (3200 Hz) 2.26 ms	375 Hz (1632 Hz) 4.64ms	190 Hz (824 Hz) 9.1ms
40 kbit/s	375 Hz (1428 Hz) 4.9ms	190 Hz (770 Hz) 9.4ms	95 Hz (400 Hz) 17.8ms	47 Hz (204 Hz) 35,0ms	23 Hz (103 Hz) 69.3ms

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



= bit rate 100 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

Receiving Part:



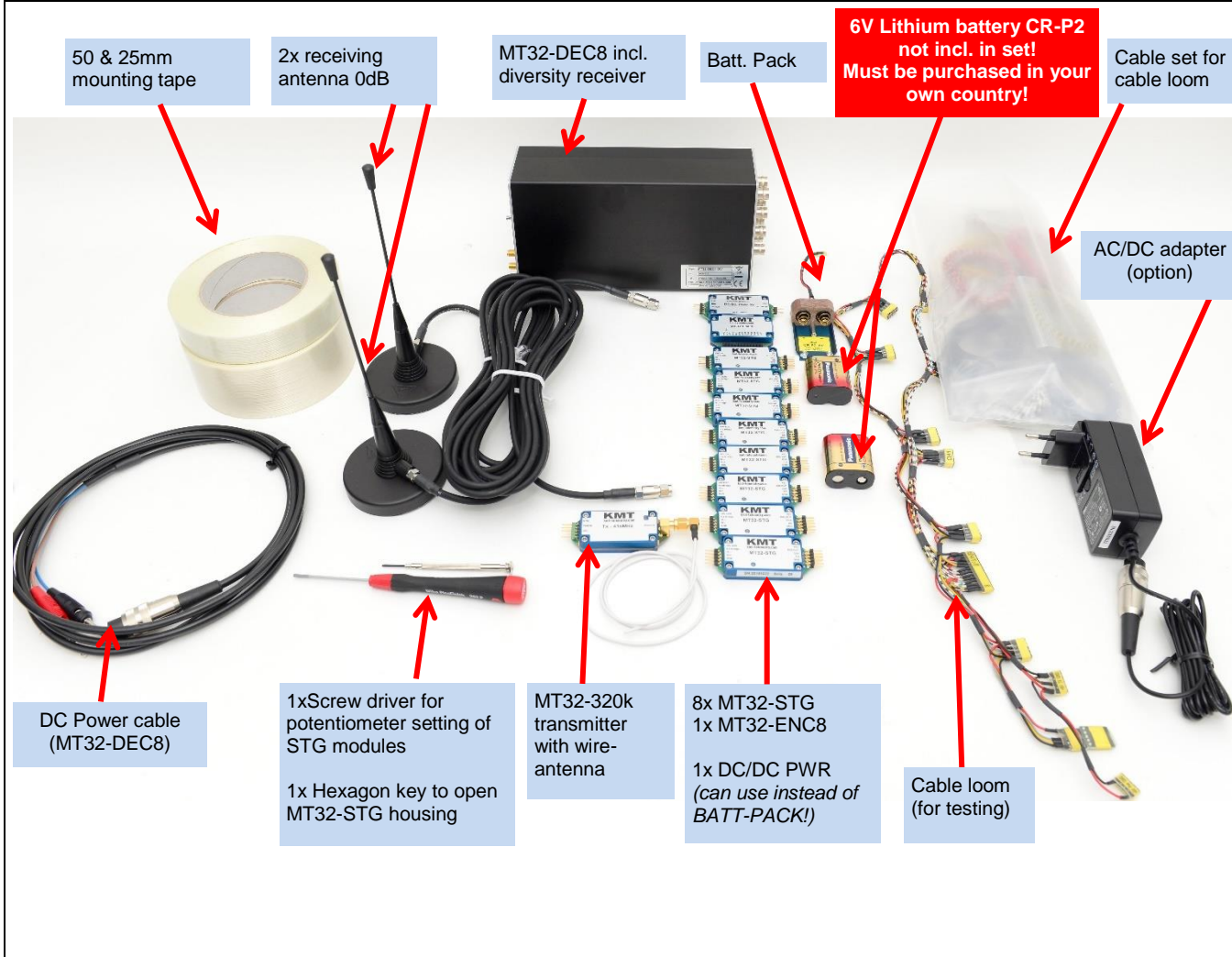
- Operating Temperature -10 – +70°C
- Storage Temperature..... -20 – +80°C
- Humidity (non-condensing).....20 – 80%
- Vibration.....5g Mil standard 810C, curve C
- Shock (in any direction) 100g

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

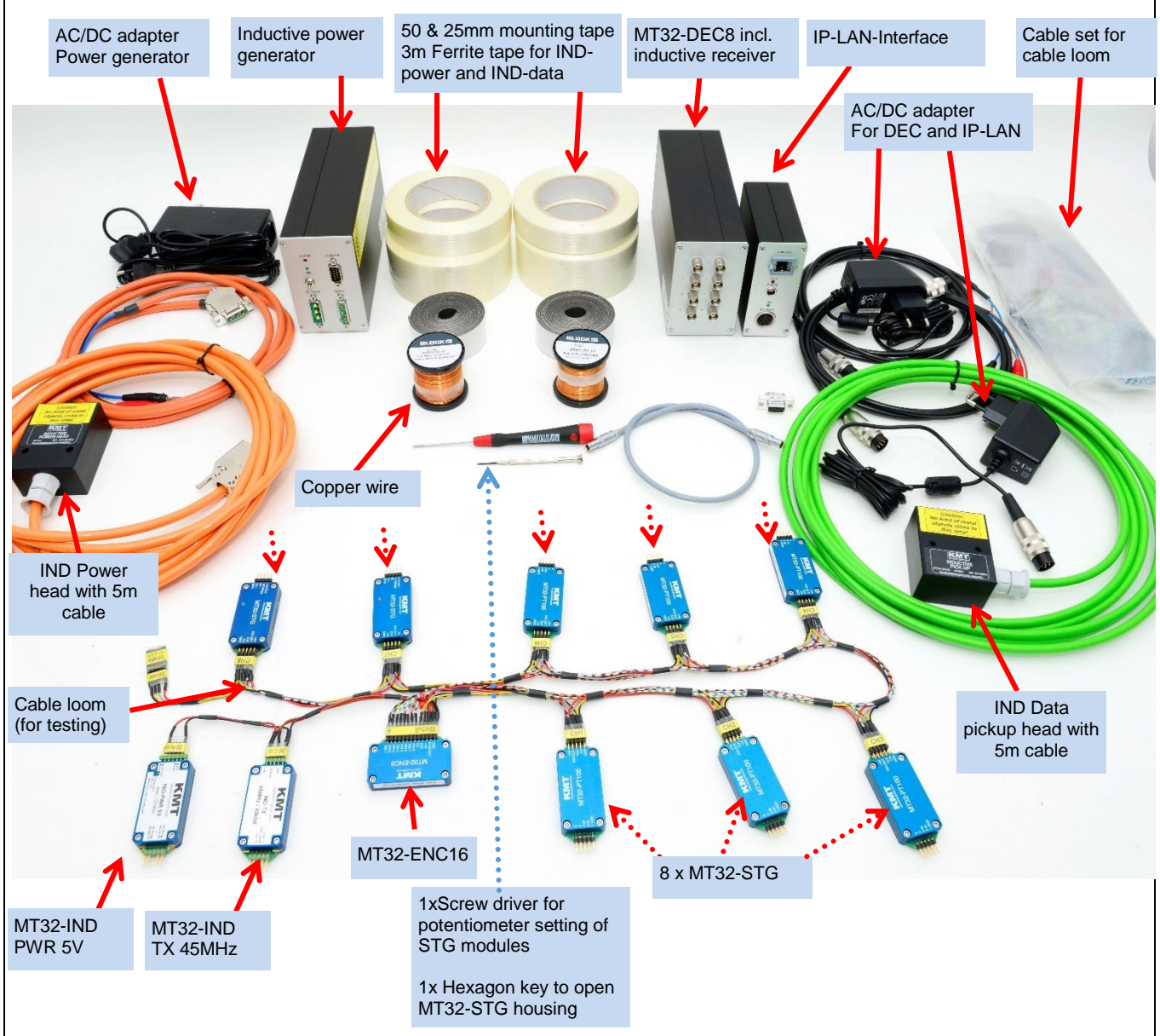
MT32 - 8 channel set with battery power and 320kbit diversity radio telemetry

(picture show only an order example)



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

(picture show only an order example)



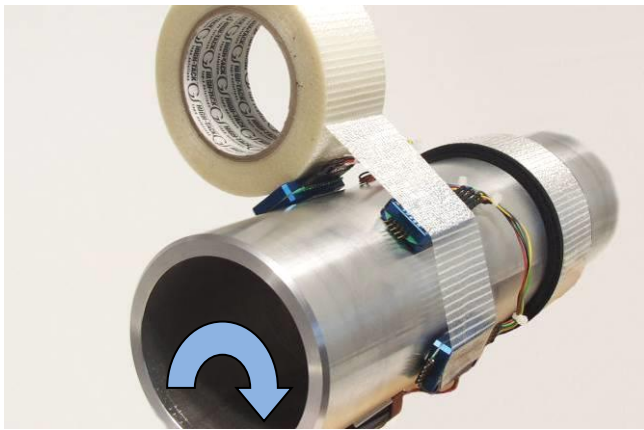
Order example: MT32-8CH-IND-TX-RX 45MHz, 8xSTG, IND-PWR, BW 8x0-6000Hz

8	MT32-STG-V2 NEW	Signal conditioning module for strain gages - gain 250-500-1000-2000
1	MT32-ENC8	Encoder for up to 8 acquisition module
1	MT32-CABLE-LOOM8	Cable loom for 8 channels
1	MT32-CABLE-SET 8	Wire (10m each) in different colors for self-made cable loom for 8 channels
1	MT32-IND-TX-RX-45MHz	Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit
1	IND-PWR-XL	Inductive power supply
1	MT32-DEC8	Decoder for 8 channels, Output 8 x BNC
1	MT32-DEC-DIG-IP-LAN	Digital decoder with PCM-LAN-IP interface
1	RLAB-VL-Win	RemusLAB Full-License data acquisition software
2	AC/DC	AC/DC power supply for DEC8 and IP LAN Interface
1	AC/DC-24V-2.5A	AC/DC power supply 65 WATT for IND-Power Supply L/XL

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.

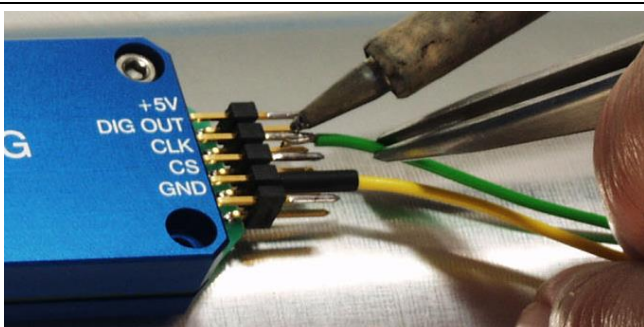


During the rotation test appropriate safety tools are to be attached.

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!

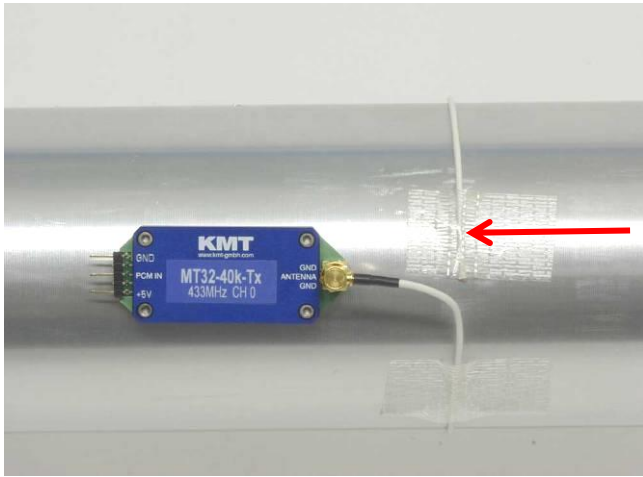
Transmitting antennas and sensors should not be installed next to each other. To ensure a reliable function, the receiving antenna should be positioned in such a way that all LEDs lights up at the field level display on the receiver.

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



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! (isolate the solder connection, if you extend the wire antenna cable!)



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)

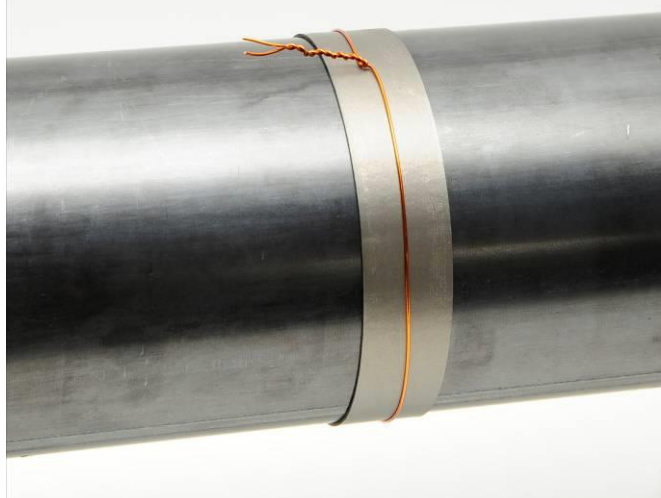


433 MHz transmitting antenna 0dB with magnetic foot (option)

MT32-IND-TX-RX with 45MHz carrier!
With 45MHz carrier is only 1x winding necessary!



Attach for electromagnetic insulation "Ferrite Tape" **2 x one** layer around the shaft.



Make transmitting coil with 1x winding and twisted the end of wire. Use CUL 1mm wire (CUL = Enamelled copper wire)

Fixed it with 3 layers mounting tape

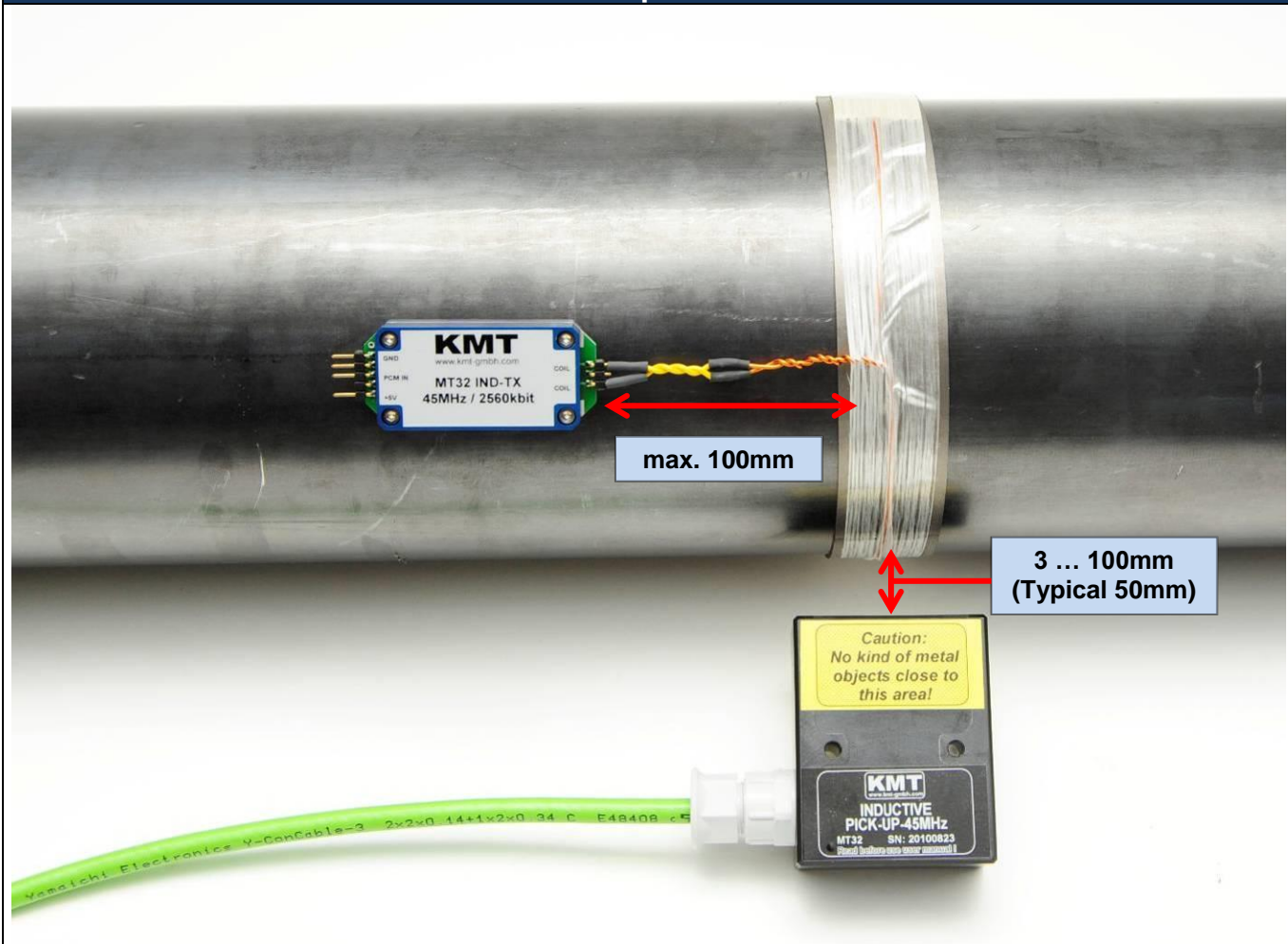


Extend the CUL wire flexible 0.14-0.25mm wire (to decouple the inflexible 1mm wire!)

Twisted also the flexible wire and solder it on the MT32-IND-Tx (isolate all solder points with shrink tubing)

MT32-IND-TX-RX with 45MHz carrier!

Pickup head



Inductive Pick-Up head mount in this position! Distance between head and Tx coil can be up to 100mm
Typical 50mm, distance deepens of application!!

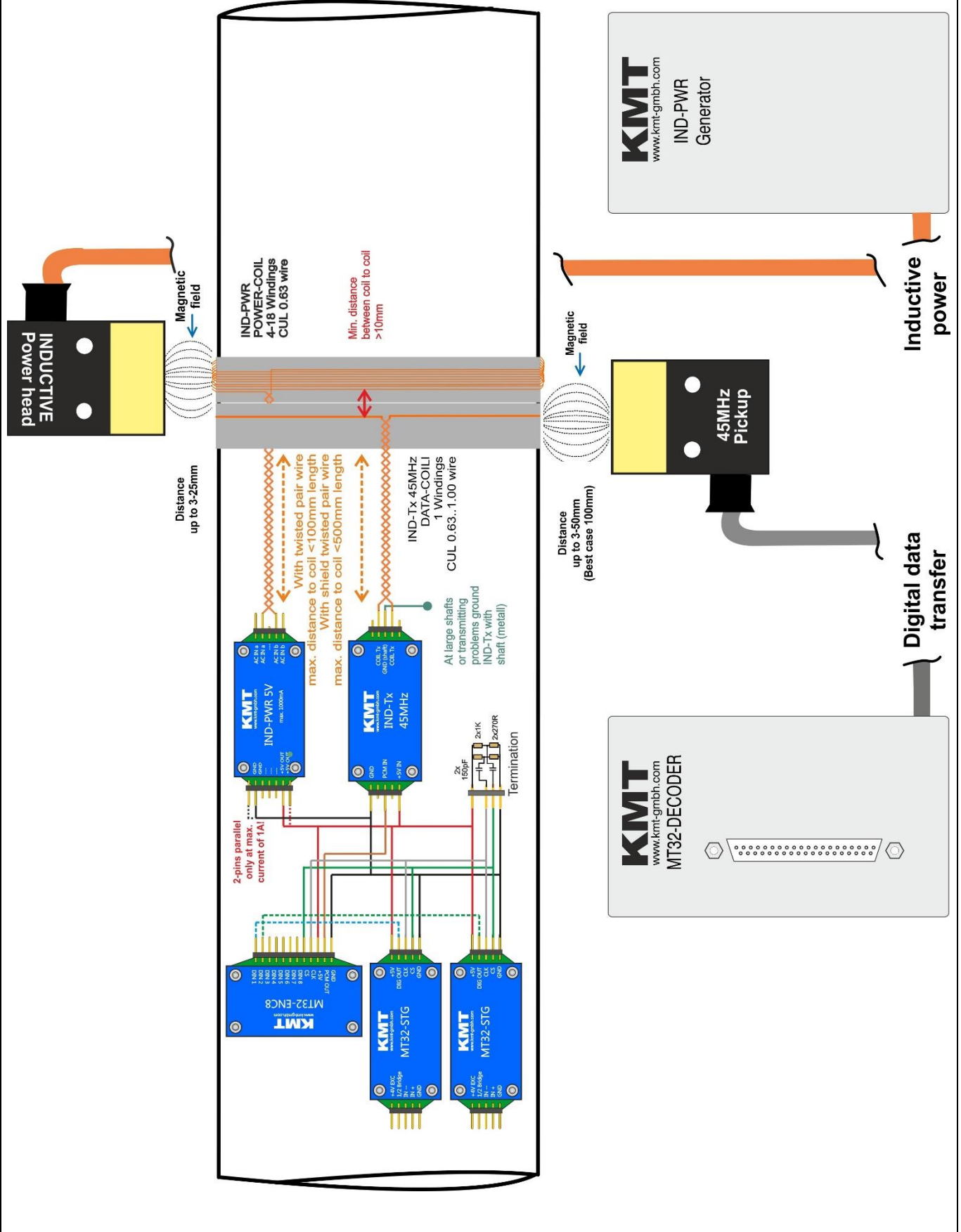
To avoid transmitting problems, the transmitter module must be close the transmitting antenna!
The cables (PCM/GND/+5V) between MT32-IND-TX 45MHz and ENC8/16 can be 1000mm long!

CAUTION:

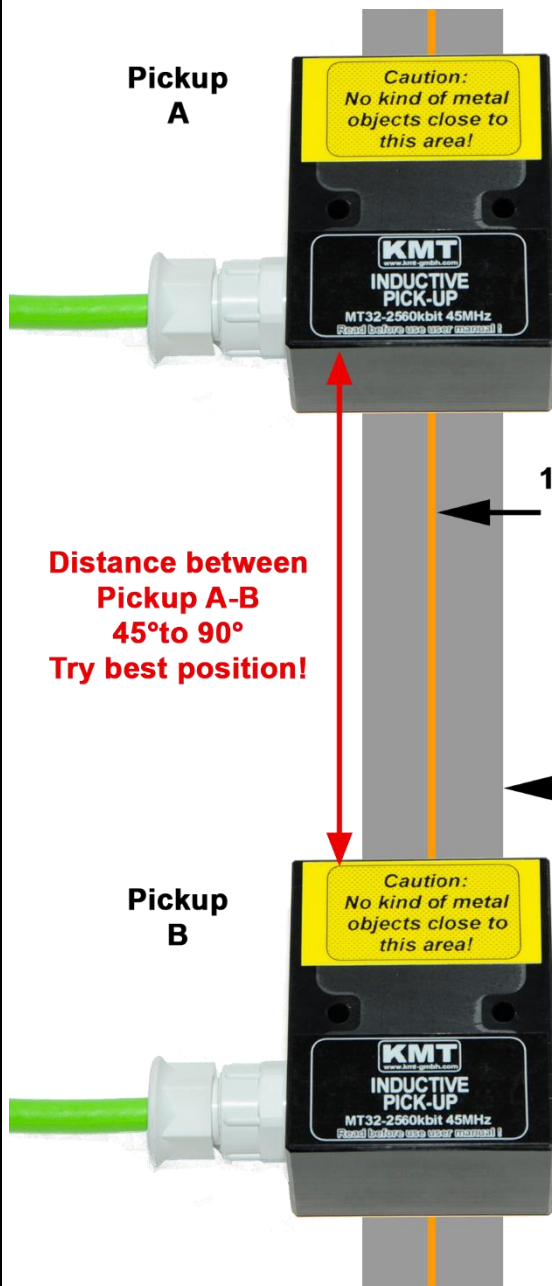
If you want to install also an inductive power coil close to the data coil, the minimal distance must be <math><10\text{mm}</math>! (distance between IND-PWR coil to IND-DATA coil)

MT32 Block diagram

IND-TX-RX with 45MHz carrier and inductive power

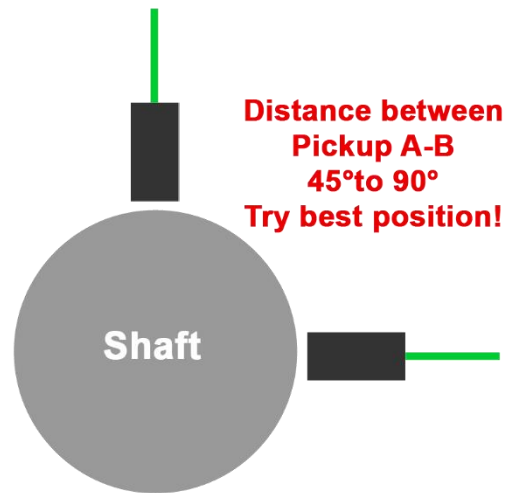


**MT32 Block diagram IND-TX-RX with 45MHz diversity
with two 45MHz carrier pickup heads at large shafts (>500mm)**



At shaft diameter larger than >500mm diameter, you can get zero points in the 45MHz antenna. To avoid transmitting loss, we recommend using a second pickup head! The distance between two pickup heads must be 45° to 90°.

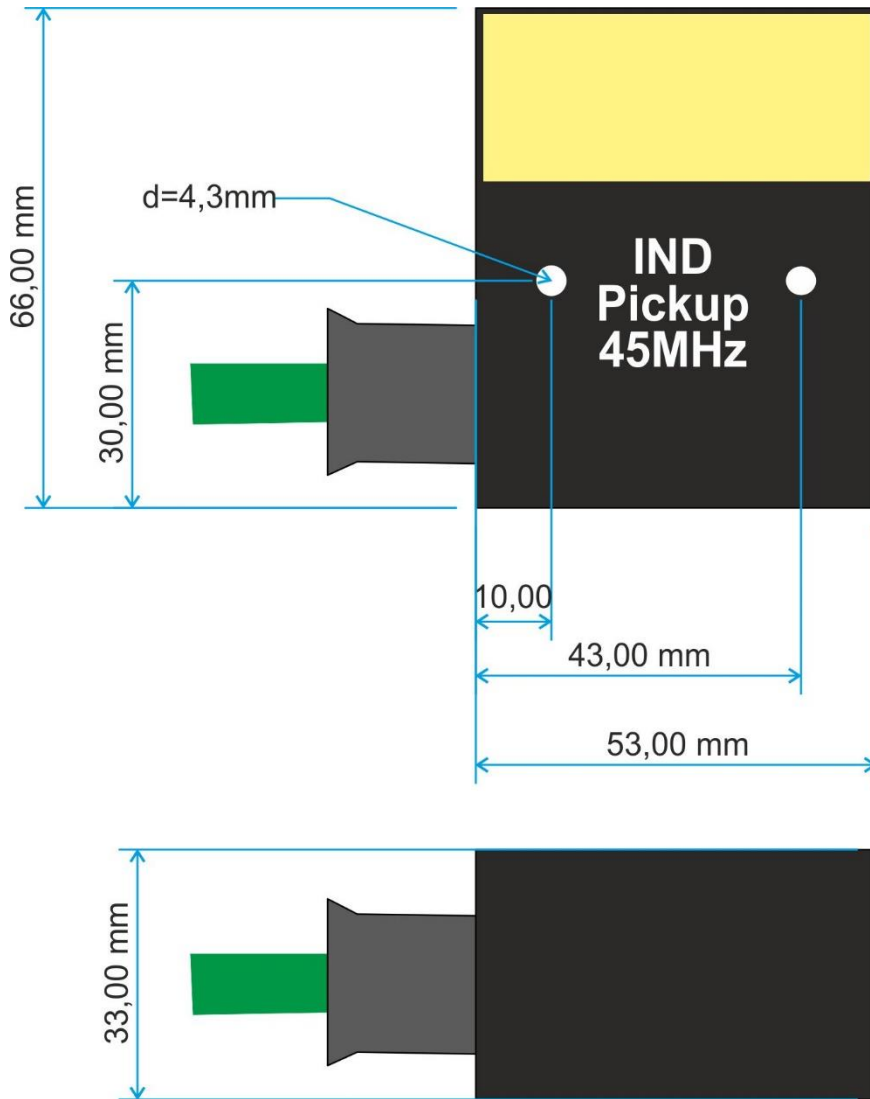
On the MT-DECODER (receiver) you can see the yellow status LED of Pickup. At good magnetic level, the LED is bright and Pickup is active.



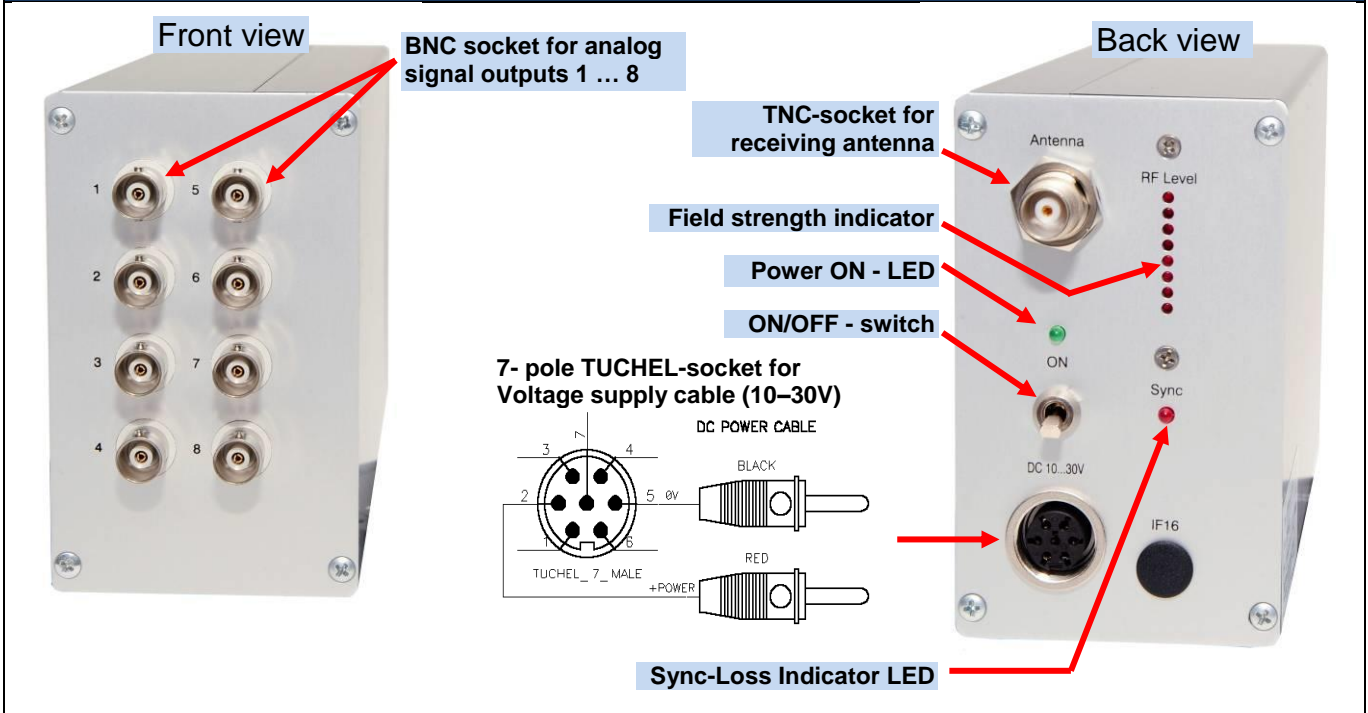
Picture of IND-PICKUP-HEAD 45MHz



Dimensions of IND-PICKUP-HEAD 45MHz



MT32-DEC8 Receiver unit for 8 Channels output via BNC (radio telemetry version)



System Parameters:

Channel: 8 analog outputs via (BNC) +/-5V
 Resolution: 12 bit D/A converter, with smoothing filter
 Dynamic: 72dB
 Power supply input: 10-30 VDC
 Current consumption: 300mA at 10V, 100mA at 30V

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

Analog signal bandwidth:

Dimensions:

Weight:

Overall system accuracy between encoder input and decoder output:

Environmental

Operating:

Humidity:

Vibration:

Static acceleration:

Shock:

205 x 105 x 65mm

1.00 kg without cables and antenna

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

-20 ... +70°C

20 ... 80% not condensing

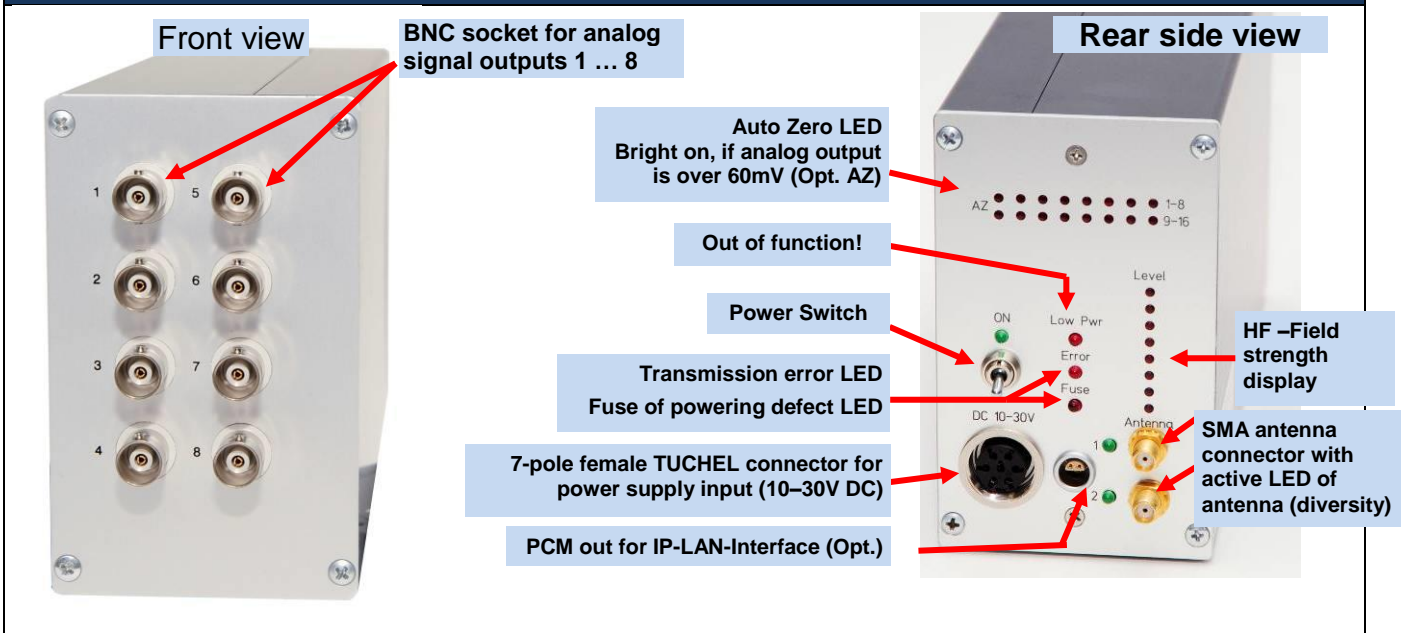
5g Mil Standard 810C, Curve C

10g in all directions

100g in all directions

Technical specifications are subject to change without notice

MT32-DEC8 Receiver unit for 8 Channels output via BNC (radio telemetry version with diversity option)



System Parameters:

Channel: 8 analog outputs via (BNC) +/-5V, Optional +/-10V
 Resolution: 12 bit D/A converter, with smoothing filter
 Dynamic: 72dB
 Power supply input: 10-30 VDC
 Current consumption: 300mA at 10V, 100mA at 30V

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

Analog signal bandwidth:

Dimensions:

Weight:

Overall system accuracy between encoder input and decoder output:

205 x 105 x 65mm

1.00 kg without cables and antenna

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

Environmental

Operating:

Humidity:

Vibration:

Static acceleration:

Shock:

-20 ... +70°C

20 ... 80% not condensing

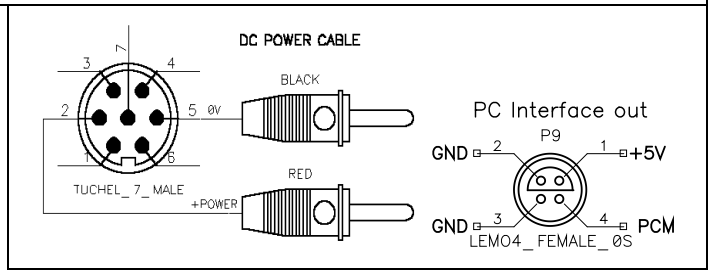
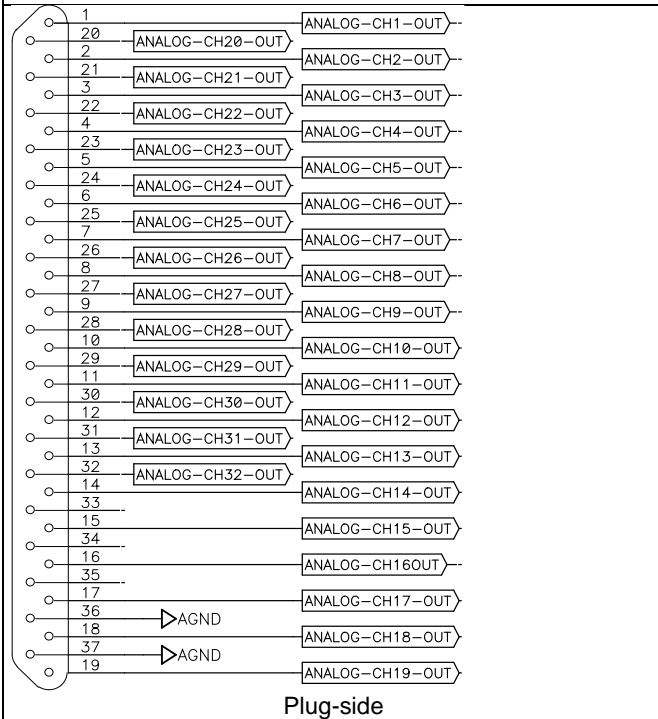
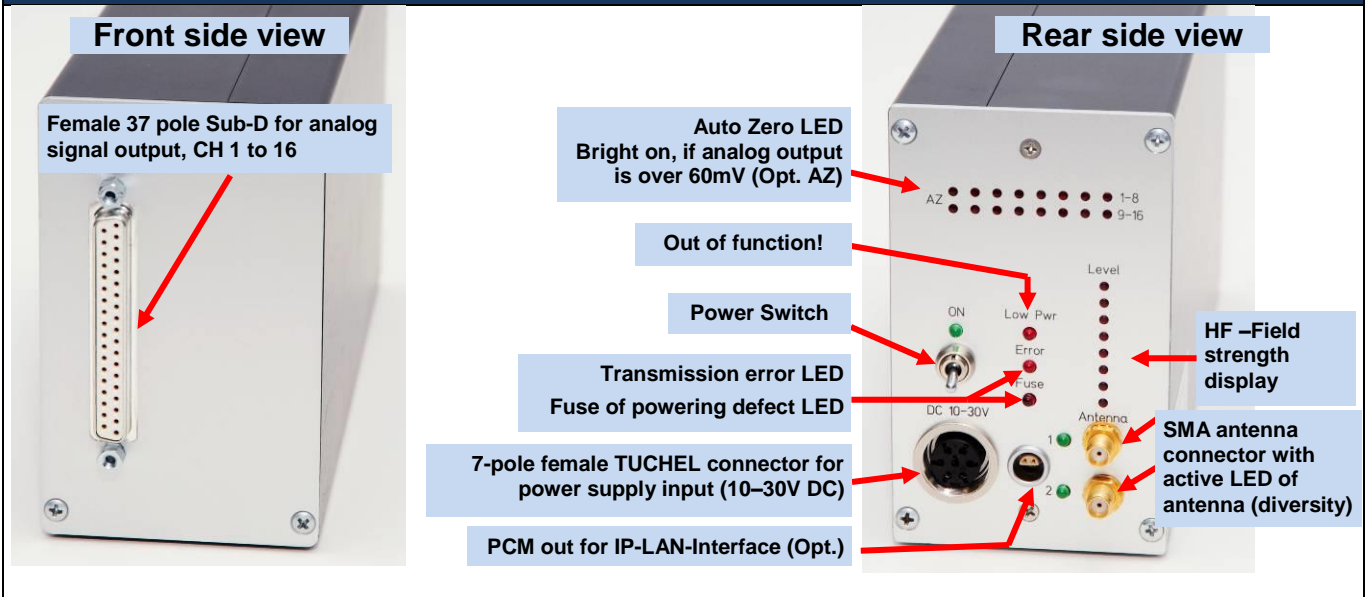
5g Mil Standard 810C, Curve C

10g in all directions

100g in all directions

Technical specifications are subject to change without notice

MT32-DEC16/32 Receiver unit for max 16/32 Channels output via 37 pol. Sub D (radio telemetry version with diversity option)



MT32-DEC16 System Parameters:

Channel:	16x +/-5V (+/-10V Option) analog outputs via Sub-D male socket
Resolution:	12 bit D/A converter, with smoothing filter
Dynamic:	72dB
Power supply input:	10-30 VDC, power consumption 10 Watt
Current consumption:	300mA at 10V, 100mA at 30V
Transmission:	Digital PCM Miller Format – FSK, diversity receiver
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 Mil Standard 810C, Curve C
Static acceleration:	10g in all directions
Shock:	100g in all directions

MT32-DEC16/32 Receiver unit for max 16/32 Channels output via 37 pol. Sub D (inductive pickup head with diversity option)

Front side view

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



Rear side view

MT32-DEC32

Out of function!

Power Switch

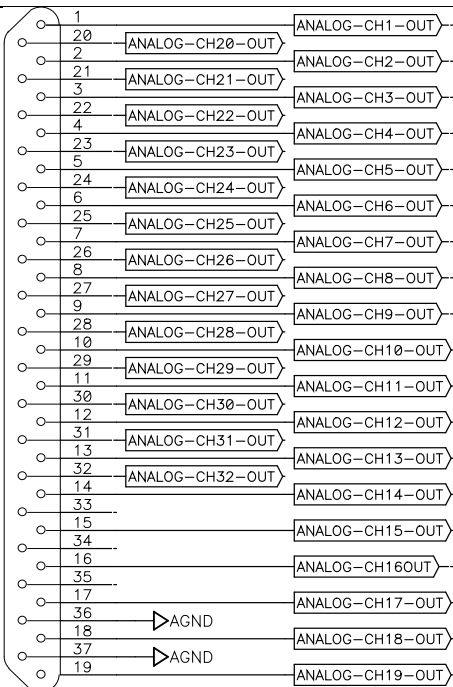
Transmission error LED
Fuse of powering defect LED

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

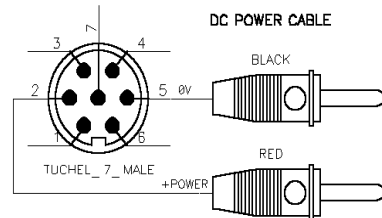
Input for IND-Pickup A

Yellow LED show active pickup head

Input for IND-Pickup B



Plug-side



Optional BNC16 Box. Connect on 37pol Sub-D

MT16- -DEC16 System Parameters:

Channel:	16x +/-5V (+/-10V Option) analog outputs via Sub-D male socket
Resolution:	12 bit D/A converter, with smoothing filter
Dynamic:	72dB
Power supply input:	10-30 VDC, power consumption 10 Watt
Current consumption:	300mA at 10V, 100mA at 30V
Transmission:	Digital PCM Miller Format – FSK, diversity receiver
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 Mil Standard 810C, Curve C
Static acceleration:	10g in all directions
Shock:	100g in all directions

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: $\geq 350\Omega$ for full and half

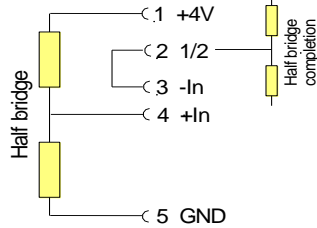
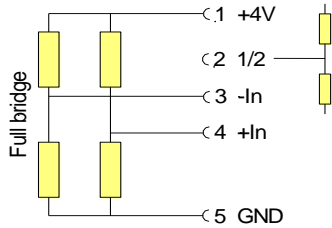
Excitation voltage: 4V fixed, 20mA max.

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

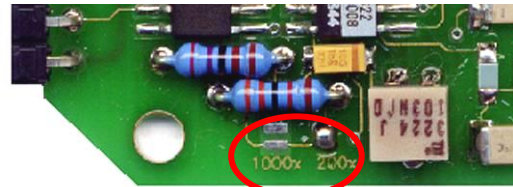
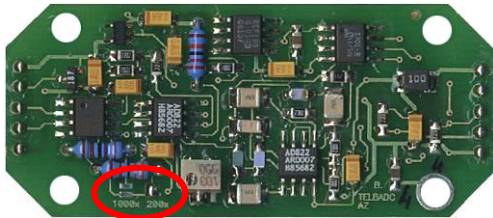
Gain and STG-ensitivity (output +/-5V at decoder)	
Gain 200 = +/- 6.25mV/V	Gain 1000 = +/-1.25mV/V

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

STG pin assignment



Gain setting



(Selectable by solder bridge!)

The closed solder bridge 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



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

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

Bridge resistance: $\geq 350\Omega$ for full and half

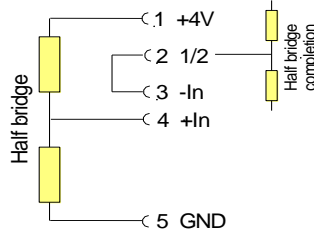
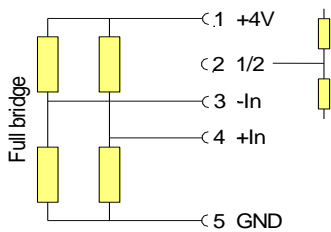
Excitation voltage: 4V fixed, 20mA max.

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

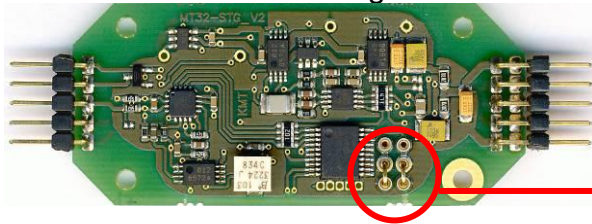
Gain and STG-Sensitivity (output +/-5V at decoder)	
Gain 250 = +/-5mV/V	Gain 2000 = +/-0.625mV/V
Gain 500 = +/-2.5mV/V	Gain 4000 = +/-0.3125mV/V
Gain 1000 = +/-1.250mV/V	Gain 8000 = +/-0.15625 mV/V

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

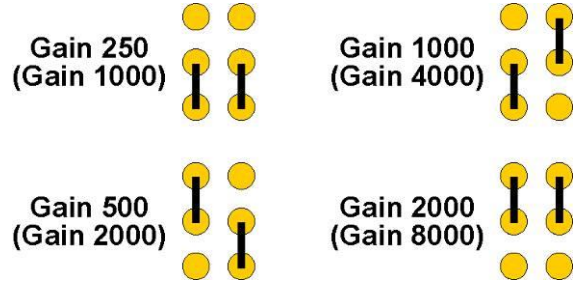
STG pin assignment



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



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

Offset adjustment via Auto Zero at the ENC8



MT32-ICP Acquisition module for ICP



MT32-ICP
For ICP® sensor inputs
(Max. input range at gain 2x = $\pm 2.5V$)
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

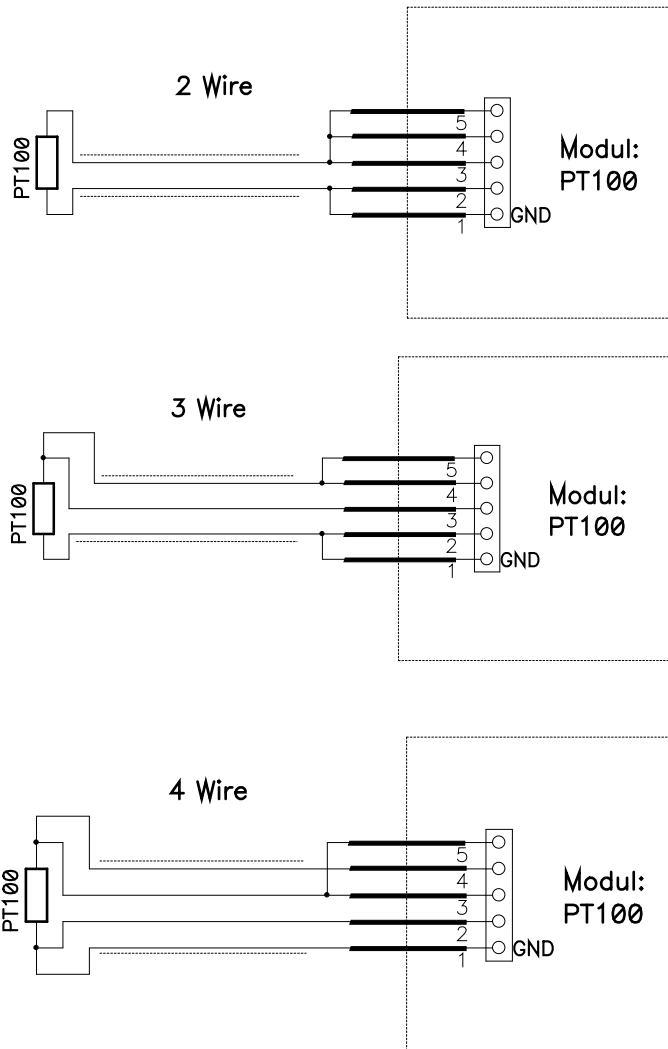


2x, 4x, 8x, 16x, or 32x Gain

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)
 Bandwidth 0-10Hz
 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)
 Bandwidth 0-10Hz
 Resolution 12bit = 72dB dynamic range
 Accuracy <1%

Temperature/Voltage table

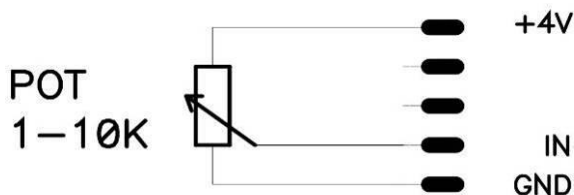
Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]	Temperature [°C]	Output [V]
0	-5,003	250	-2,546	500	0,002	750	2,558
50	-4,515	300	-2,044	550	0,515	800	3,061
100	-4,009	350	-1,538	600	1,031	850	3,550
150	-3,516	400	-1,029	650	1,542	900	4,035
200	-3,031	450	-0,515	700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

MT32-POT Acquisition module for POT

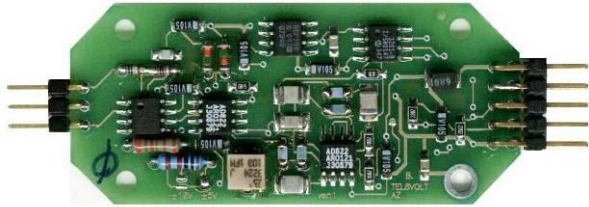


MT-POT

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



MT32-VOLT Acquisition module for Volt



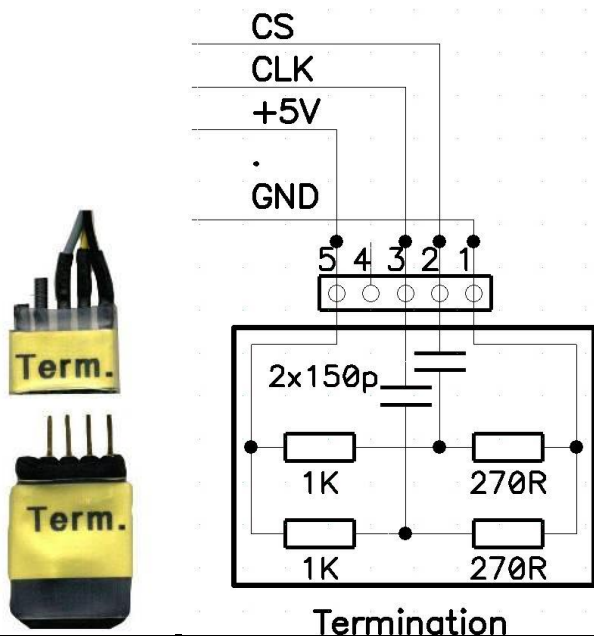
+/-10V ↑↑ +/-5V

MT32-VOLT

For high level inputs $\pm 5V$ or $\pm 10V$
Resolution 12bit = 72dB dynamic range

Optional Volt ISO available with galvanic isolated inputs. Connection same!

MT32 Termination of CLK and CS signal



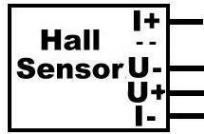
Important:

MT32-Termination-Plug

The CLK and CS signal must be terminated
(from 8-32 channels necessary!)

See pin connection diagram:

FH-301-040



Hall pin assignment

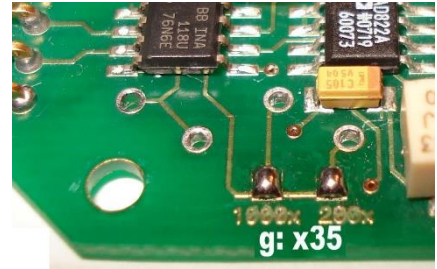
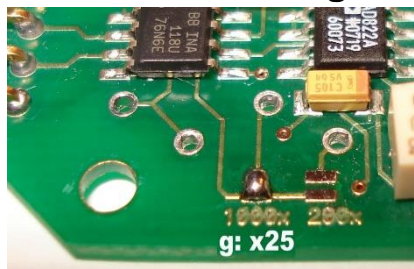
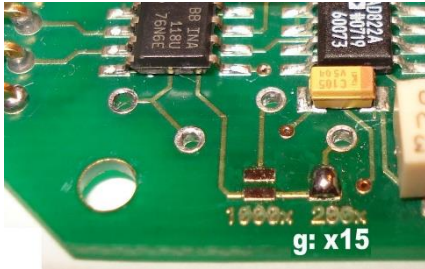
Offset compensation:



By potentiometer (80% of full range)

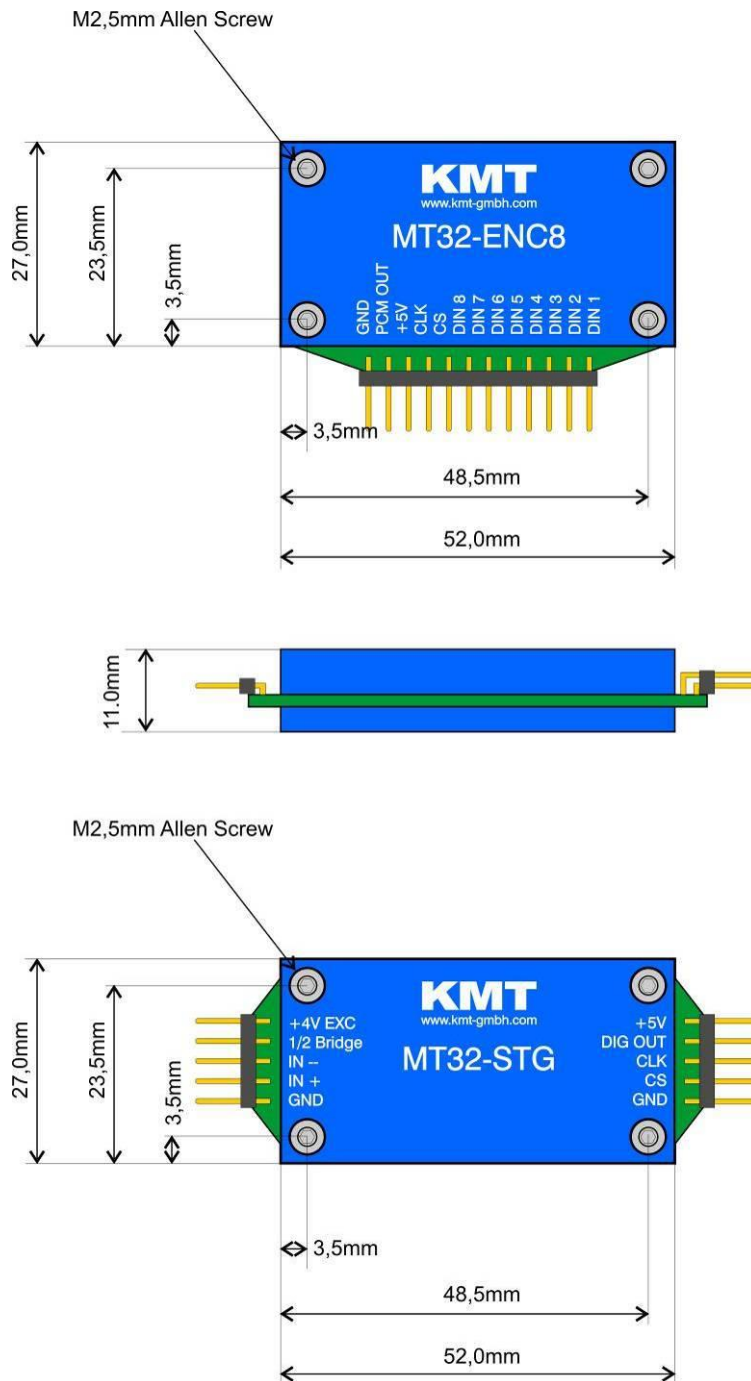
Resolution 12bit = 72dB dynamic range

Gain setting



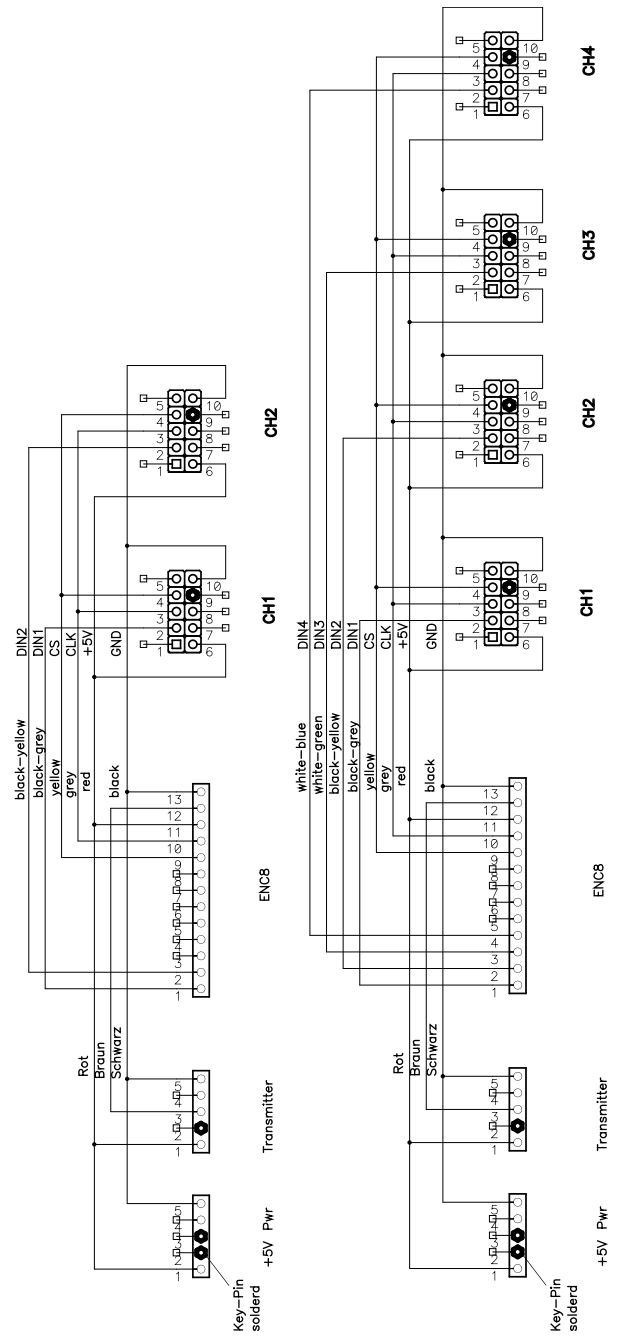
The closed solder bride determines the enabled gain of 15 or 25 or 35

MT32 acquisition modules - dimensions

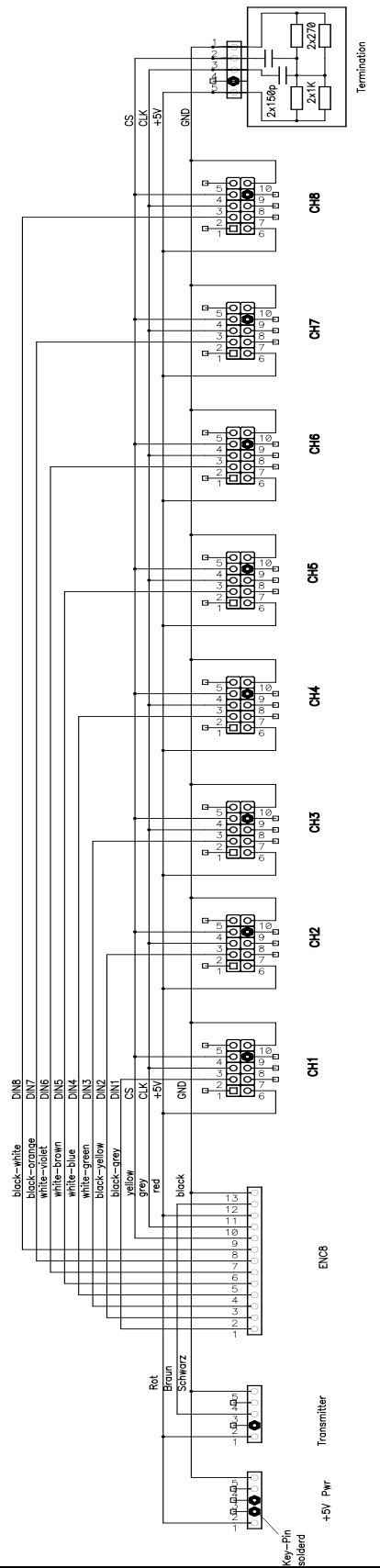


Pin connection e:
1x ENC8, 2x STG/VOLT
1x ENC8, 4x STG/VOLT/TH-K/ ICP-v2

Pin connection e.g.:
1x ENC8, 8x STG/VOLT/TH-K/ ICP-v2

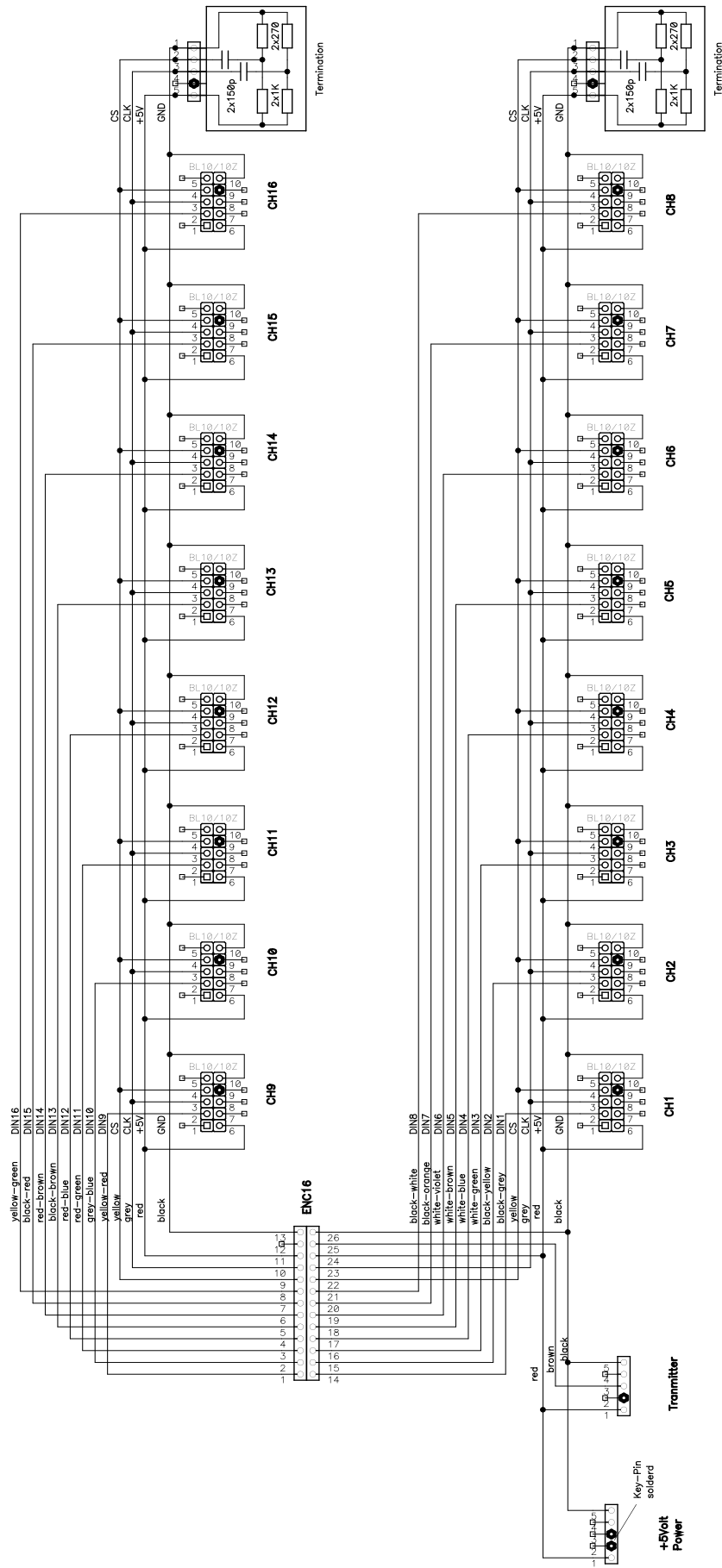


Termination not necessary at 2-CH and 4-CH loom!



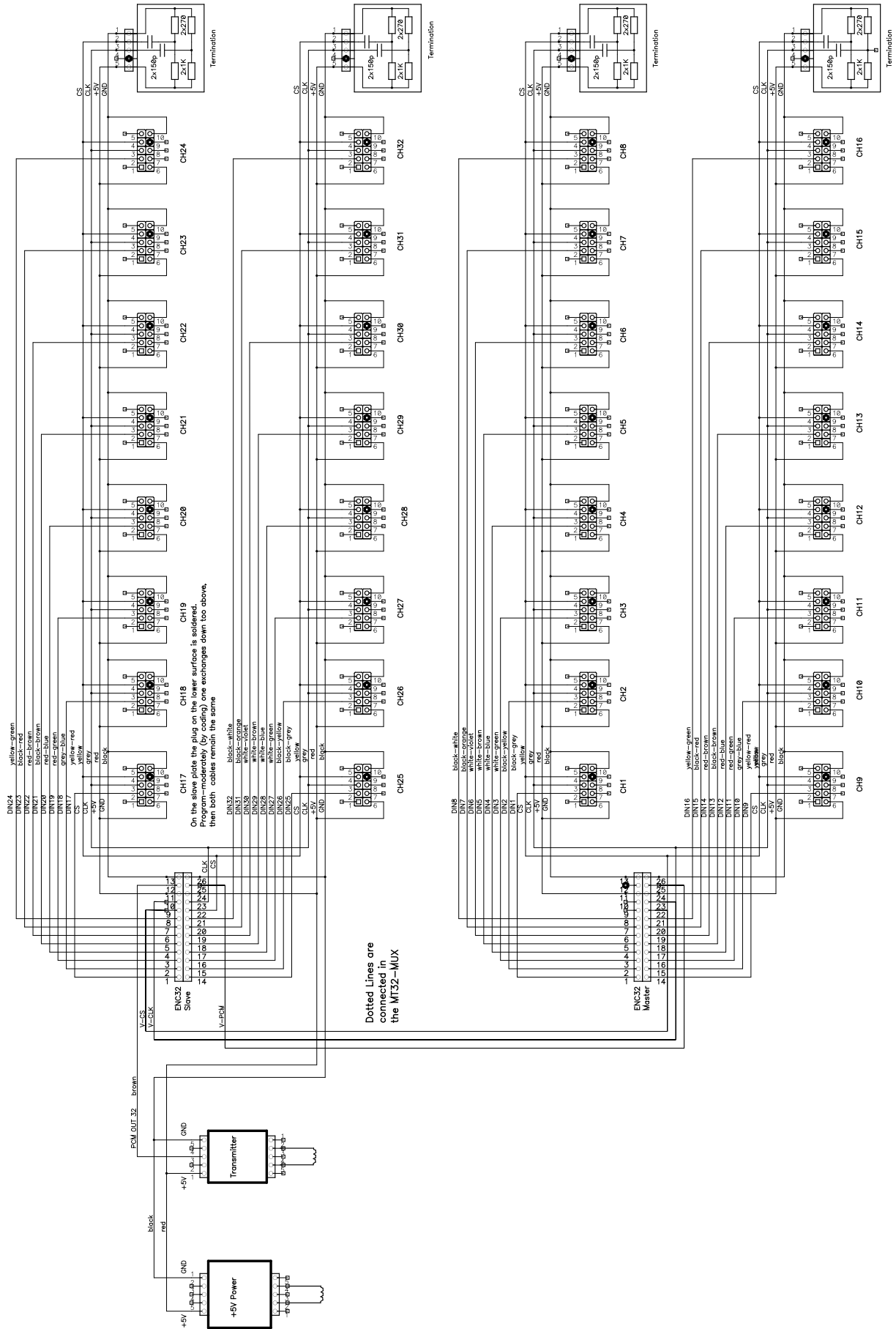
Take care with your pin connection, if you solder the cable!
Don't plug any modules if Power is ON!!! First power OFF!!!

**Pin connection:
1x ENC16, 16x STG/VOLT/TH-K/ ICP-v2**



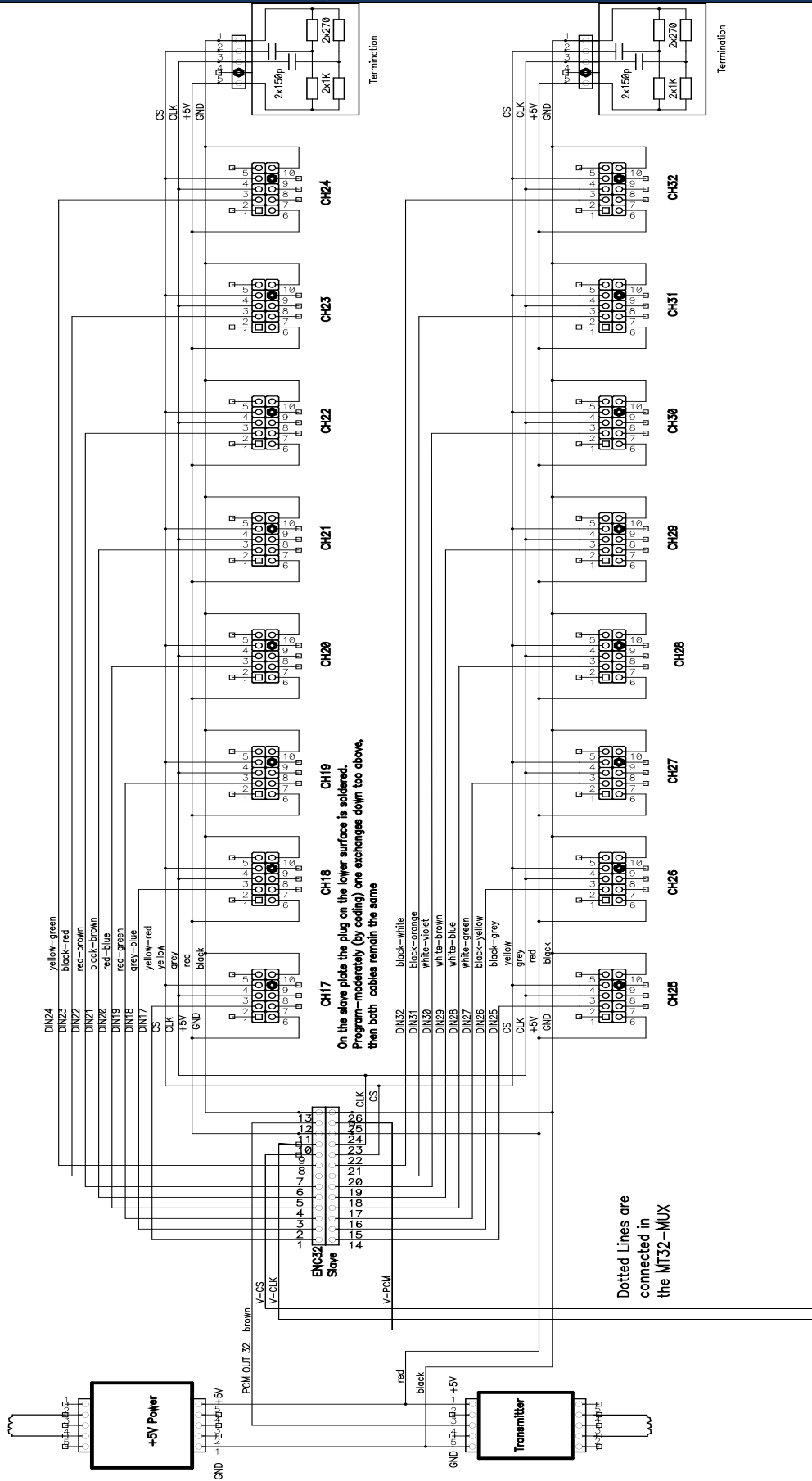
**Take care with your pin connection, if you solder the cable!
Don't plug any modules if Power is ON!!! First power OFF!!!**

Pin connection CH 1-32 (not split): 1x ENC32 MASTER and 1x ENC32 SLAVE



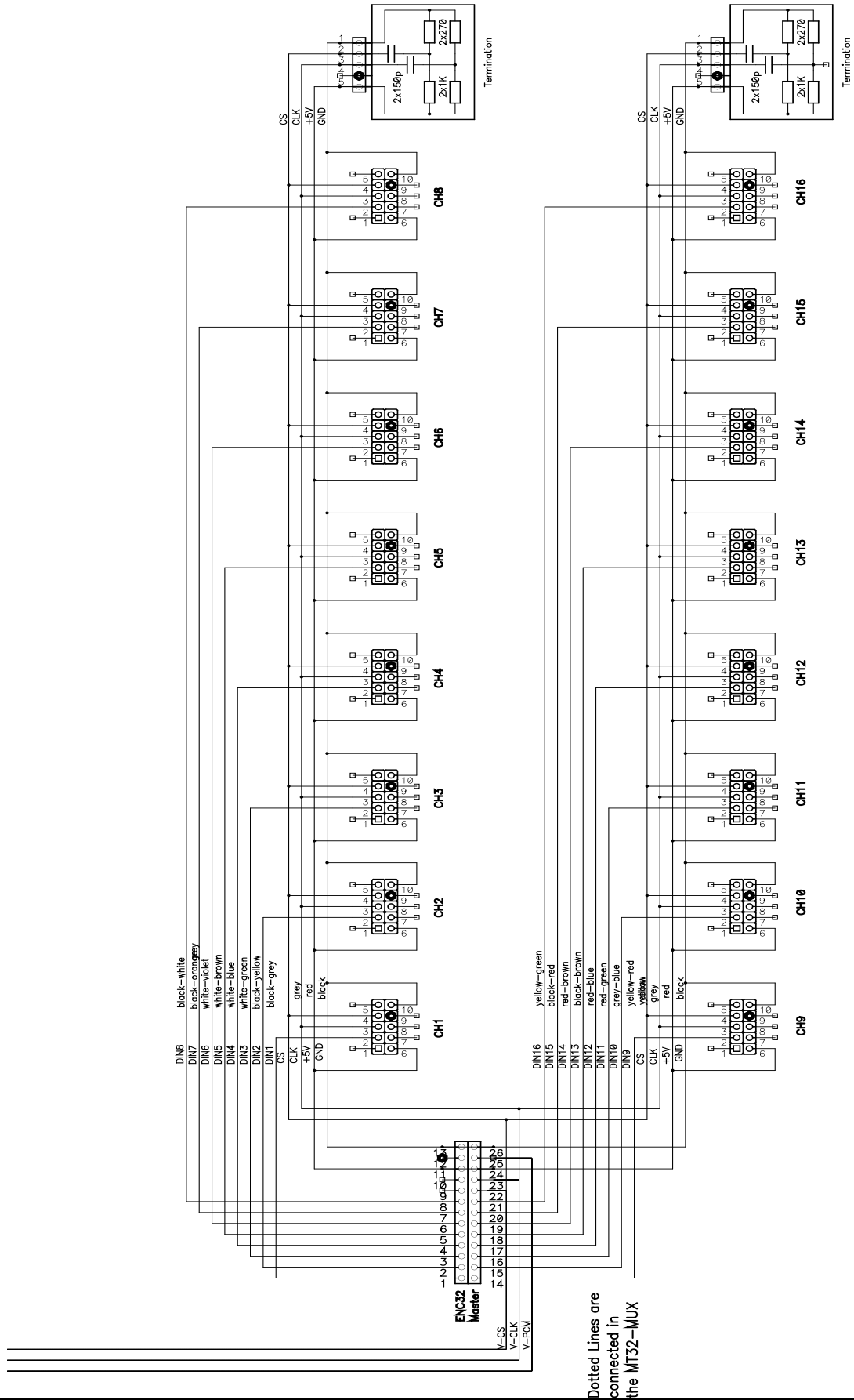
Dotted Lines are connected in the MT32-MUX

Pin connection split into CH 17-32:
1x ENC32 MASTER, 1..16 CH STG/VOLT/TH-K/ ICP-v2



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 split into CH 1-16:
1x ENC32 SLAVE, 17...32 CH STG/VOLT/TH-K/ ICP-v2**



**Take care with your pin connection, if you solder the cable!
Don't plug any modules if Power is ON!!! First power OFF!!**

Item	Qty.	Type	Description
Order Samples			
			MT32-2CH-40k-DIV, 2xSTG, BATT, BW 2x0-375Hz
2		MT32-STG-V2 NEW	Signal conditioning module for strain gages - gain 250-500-1000-2000
1		MT32-ENC8	Encoder for up to 8 acquisition module
1		MT32-CABLE-LOOM2	Cable loom for 2 channels
1		MT32-40k-10-DIV	RF telemetry transmitter and diversity receiver with 40kbit (2,5kS/s)
1		BATT-PACK	Battery pack
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-V2 NEW	Signal conditioning module for strain gages - gain 250-500-1000-2000
1		MT32-ENC8	Encoder for up to 8 acquisition module
1		MT32-CABLE-LOOM2	Cable loom for 2 channels
1		MT32-IND-TX-RX-45MHz	Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit
1		BATT-PACK	Battery pack
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, IND-PWR, BW 2x0-24000Hz
2		MT32-STG-V2 NEW	Signal conditioning module for strain gages - gain 250-500-1000-2000
1		MT32-ENC8	Encoder for up to 8 acquisition module
1		MT32-CABLE-LOOM2	Cable loom for 2 channels
1		MT32-IND-TX-RX-45MHz	Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit
1		IND-PWR-L	Inductive power supply
1		MT32-DEC2	Decoder for 2 channels, Output 2 x BNC
1		AC/DC	AC/DC power supply for DEC2 (Optional)
1		AC/DC-24V-2.5A	AC/DC power supply 65 WATT for IND-Power Supply L/XL
			MT32-4CH-40k-DIV, 4xSTG, BATT, BW 4x0-190Hz
4		MT32-STG-V2 NEW	Signal conditioning module for strain gages - gain 250-500-1000-2000
1		MT32-ENC8	Encoder for up to 8 acquisition module
1		MT32-CABLE-LOOM4	Cable loom for 4 channels
1		MT32-40k-10-DIV	RF telemetry transmitter and diversity receiver with 40kbit (2,5kS/s)
1		BATT-PACK	Battery pack
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-V2 NEW	Signal conditioning module for strain gages - gain 250-500-1000-2000
1		MT32-ENC8	Encoder for up to 8 acquisition module
1		MT32-CABLE-LOOM4	Cable loom for 4 channels
1		MT32-IND-TX-RX-45MHz	Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit
1		BATT-PACK	Battery pack
1		MT32-DEC4	Decoder for 4 channels, Output 4 x BNC
1		AC/DC	AC/DC power supply for DEC4 (Optional)
			MT32-8CH-320k-DIV, 8xSTG, BATT, BW 8x0-750Hz
8		MT32-STG-V2 NEW	Signal conditioning module for strain gages - gain 250-500-1000-2000
1		MT32-ENC8	Encoder for up to 8 acquisition module
1		MT32-CABLE-LOOM8	Cable loom for 8 channels
1		MT32-320k-10-DIV	RF telemetry transmitter and diversity receiver with 320kbit (20kS/s)
1		BATT-PACK	Battery pack
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				
Order Samples							
8	1	1	1	1	1	1	MT32-8CH-IND-TX-RX-45MHz, 8xSTG, BATT, BW 8x0-6000Hz Signal conditioning module for strain gages - gain 250-500-1000-2000 Encoder for up to 8 acquisition module Cable loom for 8 channels Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit Battery pack Decoder for 8 channels, Output 8 x BNC AC/DC power supply for DEC8 (Optional)
8	1	1	1	1	1	1	MT32-8CH-IND-TX-RX, 8xSTG, BATT, BW 8x0-6000Hz, DIG-OUT only Digital OUT, with LAN IP interface and MLAB software Signal conditioning module for strain gages - gain 250-500-1000-2000 Encoder for up to 8 acquisition module Cable loom for 8 channels Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit Battery pack Digital decoder with PCM-LAN-IP interface RemusLAB Full-License data acquisition software AC/DC power supply for DEC-DIG (Optional)
8	1	1	1	1	1	1	MT32-8CH-IND-TX-RX 45MHz, 8xSTG, IND-PWR, BW 8x0-6000Hz Signal conditioning module for strain gages - gain 250-500-1000-2000 Encoder for up to 8 acquisition module Cable loom for 8 channels Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit Inductive power supply Decoder for 8 channels, Output 8 x BNC AC/DC power supply for DEC8 AC/DC power supply 65 WATT for IND-Power Supply L/XL
6	2	1	1	1	1	1	MT32-8CH-IND-TX-RX 6xSTG, 2 x ICP, BATT, BW 8x0-6000Hz Signal conditioning module for strain gages - gain 250-500-1000-2000 Signal conditioning module for ICP sensors with digital data acquisition Cable loom for 8 channels Encoder for up to 8 acquisition module Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit Battery pack Battery set Decoder for 8 channels, Output 8 x BNC AC/DC power supply
16	1	1	1	1	1	1	MT32-16CH-IND-TX-RX 45MHz, 16xSTG, BATT, BW 16x0-3000Hz Signal conditioning module for strain gages - gain 250-500-1000-2000 Encoder for up to 16 acquisition module Cable loom for 16 hannels Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit Power modul for blue modules, IN 7-30V OUT 1000mA 5VDC Decoder for 16 channels, Output via 37pol. Sub-D Connector Adapter BOX for DEC16 multiple 37pole Sub-D to 16 single BNC connectors AC/DC power supply

Item	Qty.	Type	Description
			Order Samples
9c			Order Samples
16	1	MT32-STG-V2 NEW	MT32-16CH-IND-TX-RX 16xSTG, BATT, BW 16x0-3000Hz only Digital OUT, with LAN IP interface and MLAB software Signal conditioning module for strain gages - gain 250-500-1000-2000
1	1	MT32-ENC16	Encoder for up to 16 acquisition module
1	1	MT32-CABLE-LOOM16	Cable loom for 16 hannels
1	1	MT32-IND-TX-RX-45MHz	Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit
1	1	DC/DC PWR-5V-1000	Power modul for blue modules, IN 7-30V OUT 1000mA 5VDC
1	1	MT32-DEC-DIG-IP-LAN	Digital decoder with PCM-LAN-IP interface
1	1	RLAB-VL-Win	RemusLAB Full-License data acquisition software
1	1	AC/DC	AC/DC power supply
16	1	MT32-STG-V2 NEW	MT32-16CH-IND-TX-RX-45MHz, 16xSTG, IND-PWR, BW 16x0-3000Hz Signal conditioning module for strain gages - gain 250-500-1000-2000
1	1	MT32-ENC16	Encoder for up to 16 acquisition module
1	1	MT32-CABLE-LOOM16	Cable loom for 16 hannels
1	1	MT32-IND-TX-RX-45MHz	Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit
1	1	IND-PWR-XL	Inductive power supply
1	1	MT32-DEC16	Decoder for 16 channels, Output via 37pol. Sub-D Connector
1	1	BNC16 BOX	Adapter BOX for DEC16 multiple 37pole Sub-D to 16 single BNC connectors
1	1	AC/DC	AC/DC power supply for DEC16 (Optional)
1	1	AC/DC-24V-2.5A	AC/DC power supply 65 WATT for IND-Power Supply L/XL
16	1	MT32-STG-V2 NEW	MT32-16CH-1280k-DIV, 16xSTG, BATT, BW 16x0-1500Hz Signal conditioning module for strain gages - gain 250-500-1000-2000
1	1	MT32-ENC16	Encoder for up to 16 acquisition module
1	1	MT32-CABLE-LOOM16	Cable loom for 16 hannels
1	1	MT32-1280k-10-DIV	RF telemetry transmitter and diversity receiver with 1280kbit (80kS/s)
1	1	DC/DC PWR-5V-1000	Power modul for blue modules, IN 7-30V OUT 1000mA 5VDC
1	1	MT32-DEC16	Decoder for 16 channels, Output via 37pol. Sub-D Connector
1	1	BNC16 BOX	Adapter BOX for DEC16 multiple 37pole Sub-D to 16 single BNC connectors
1	1	AC/DC	AC/DC power supply for DEC16 (Optional)
32	1	MT32-STG-V2 NEW	MT32-32CH-1280k-DIV, 32xSTG, BATT, BW 32x0-750Hz Signal conditioning module for strain gages - gain 250-500-1000-2000
1	1	MT32-ENC32	Encoder for up to 32 acquisition module
1	1	MT32-CABLE-LOOM32	Cable loom for 32 channels
1	1	MT32-1280k-10-DIV	RF telemetry transmitter and diversity receiver with 1280kbit (80kS/s)
1	1	DC/DC PWR-5V-1000	Power modul for blue modules, IN 7-30V OUT 1000mA 5VDC
1	1	MT32-DEC32	Decoder for 32 channels, Output via 37pol. Sub-D Connector
1	1	BNC32 BOX	Adapter BOX for DEC32 multiple 37pole SubD to 32 single BNC connectors
1	1	AC/DC	AC/DC power supply for DEC32 (Optional)
32	1	MT32-STG-V2 NEW	MT32-32CH-IND-TX-RX 45MHz, 32xSTG, IND-PWR, BW 32x0-1500Hz Signal conditioning module for strain gages - gain 250-500-1000-2000
1	1	MT32-ENC32	Encoder for up to 32 acquisition module
1	1	MT32-CABLE-LOOM32	Cable loom for 32 channels
1	1	MT32-IND-TX-RX-45MHz	Inductive telemetry transmitter and receiver, 45MHz carrier, 2560kbit
1	1	IND-PWR-XXL	Inductive power supply
1	1	MT32-DEC32	Decoder for 32 channels, Output via 37pol. Sub-D Connector
1	1	BNC32 BOX	Adapter BOX for DEC32 multiple 37pole SubD to 32 single BNC connectors
1	1	AC/DC	AC/DC power supply for DEC32 (Optional)
1	1	AC/DC-24V-5A	AC/DC power supply 120 WATT for IND-Power Supply XXL

Konformitätserklärung

Declaration of Conformity
Déclaration 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
déclarons sous notre seule responsabilité, 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

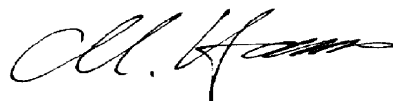
DIN EN 61000-6-3 Ausgabe 2002-8 Elektromagnetische
Verträglichkeit EMV Teil 6-3 Fachgrundnorm Störaussendung

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



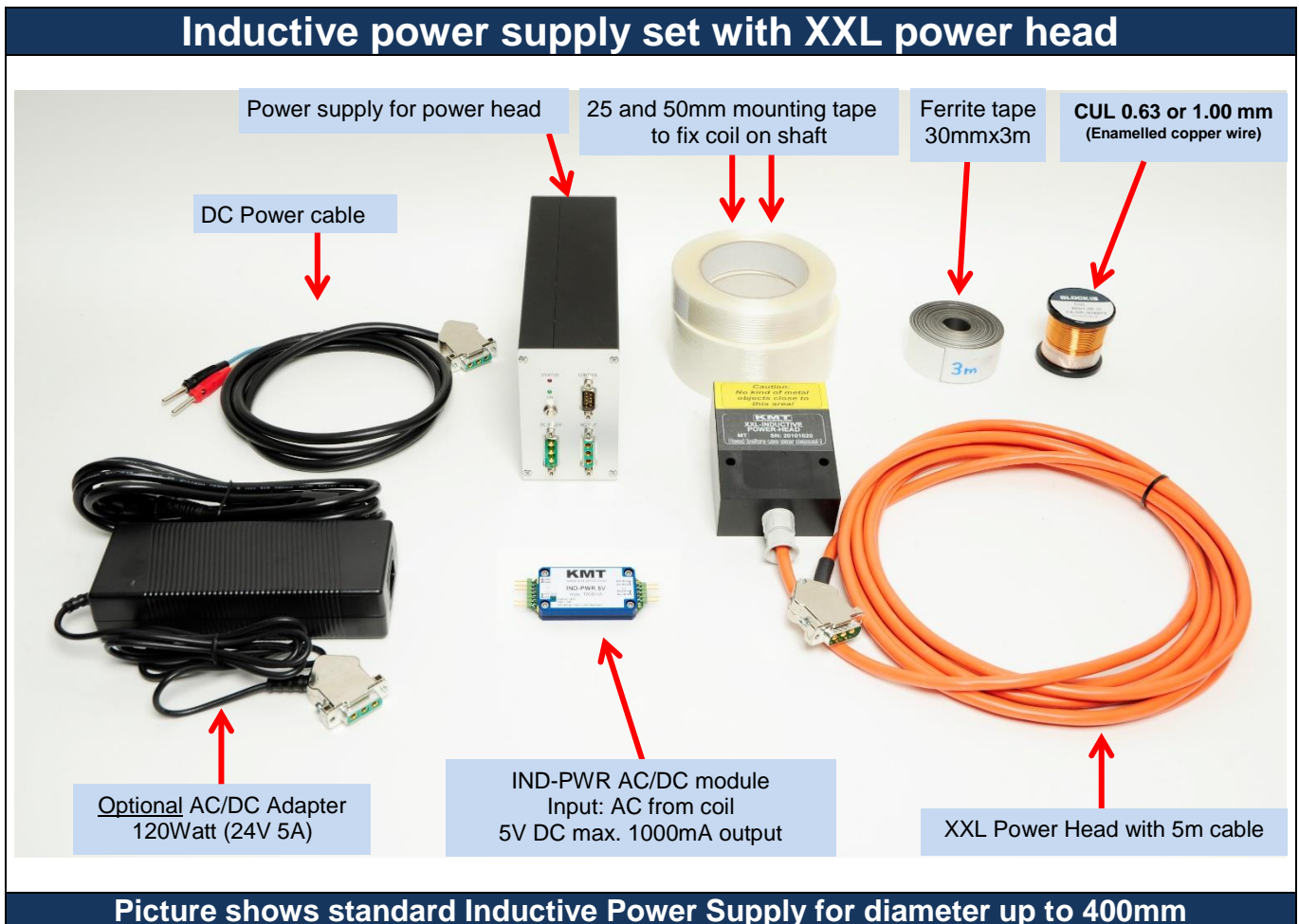
Kraus Messtechnik GmbH
Gewerbering 9
D-83624 Otterfing - Germany
Tel. 08024-48737 - Fax 08024-5532
www.kmt-gmbh.com

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

MT32 IND-PWR L/XL/XXL

NEW User Manual



INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

Safety notes for inductive powering

- The device should only be applied by instructed personnel.
- The power head emits strong magnetic radiation at 30-60 kHz to a distance of 300 mm. 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 strongly 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 50 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.

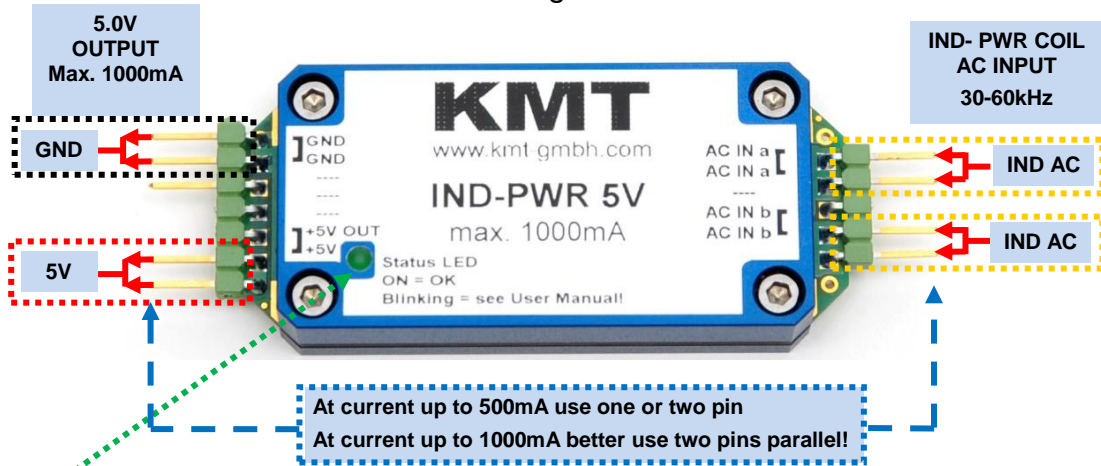
MT32-IND-PWR 5V - AC/DC Module for inductive power

OLD PWR2_3 version until 06/2015



MT32-IND-PWR 5V
 AC/DC Module for inductive power
 Input: 30-60kHz, 10-50V AC
Can also be power with DC 24V (Input via AC IN a and AC IN b)
 Output: 5 VDC
 Current: up to 1000mA
 Weight: 35 gram
 Vibration: 5g
 Shock: 3000g

Pin assignment

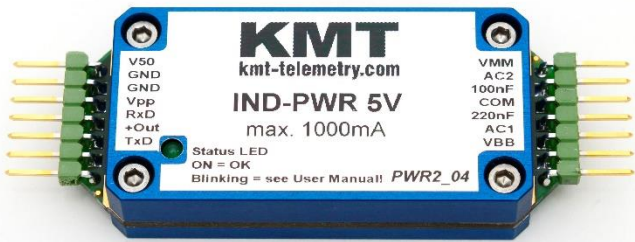


Status LED

- LED ON = right windings and good distance between head and coil
- LED very low blinking = too less windings of IND-Coil or too large distance between head and coil!
- LED fast blinking = too much windings (OVER POWER at IND-Coil) reduce windings or module go hot and switch OFF

MT32-IND-PWR 5V - AC/DC Module for inductive power

NEW PWR2_4 versions from 07/2015



MT32-IND-PWR 5V

AC/DC Module for inductive power

Input: 30-60kHz, 10-50V AC

Can also be power with DC 24V (Input via AC2 and AC1)

Output: 5 VDC

Current: up to 1000mA

Weight: 35 gram

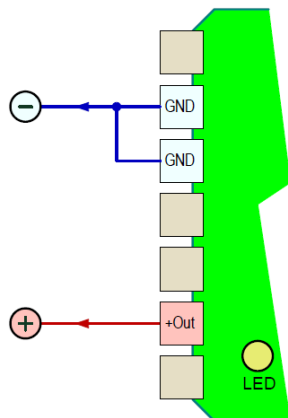
Vibration: 5g

Shock: 3000g

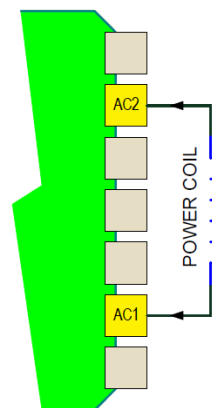
Pin assignment, more info see connection diagram!



DC Output



Power Coil Connection



Standard connection

For cooling of the module, we recommend to mount it on a metal surface, special over a load of >500mA!

Status LED

LED ON = optimal IND-Coil windings and good head/coil distance.

LED slow blinking = IND-Coil resonance not optimal* or too large head/coil distance.

LED fast blinking = OVER POWER MESSAGE: reduce number of turns, or increase head distance.

At excessive thermal overload the module will switch off (internal thermo switch)!

LED ultra-fast blinking & no system function = IND-Coil resonance not optimal* or way too large head/coil distance.

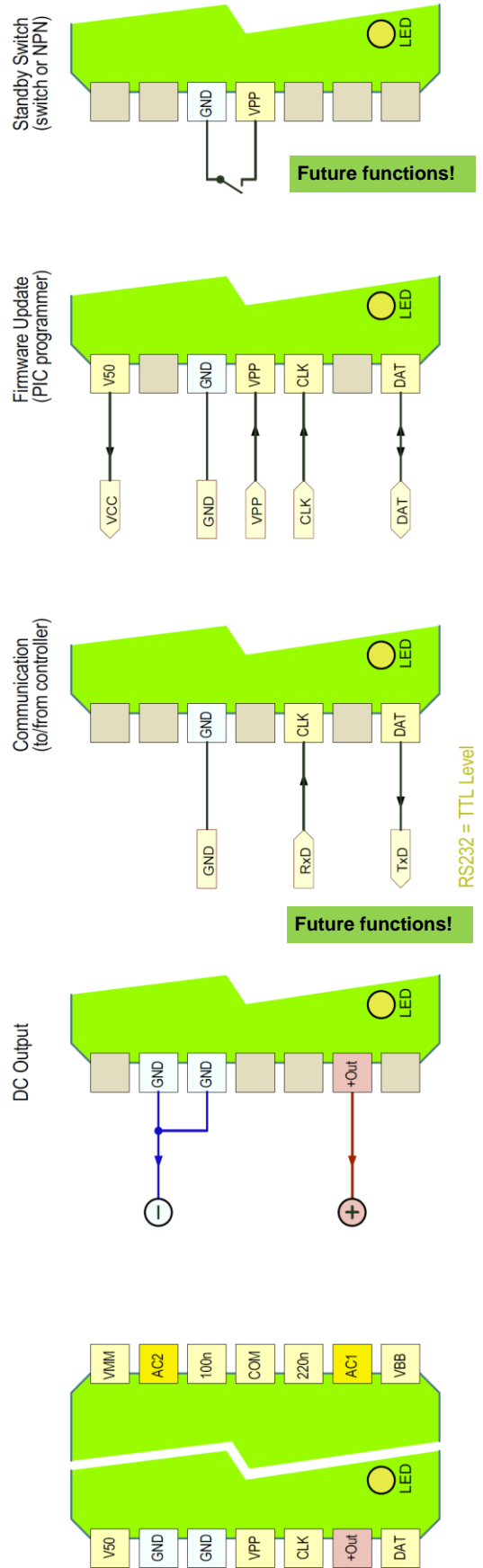
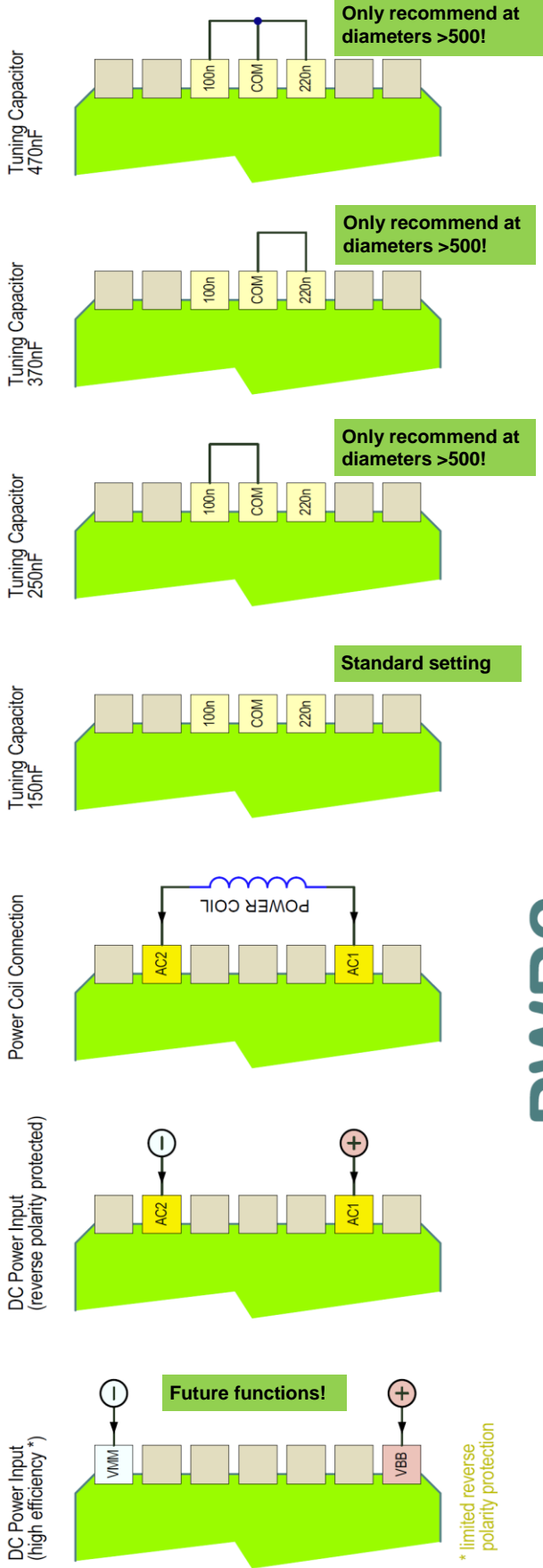
* resonance not optimal means: usually too less number of turns, but also too much turns decrease the energy conversion efficiency.

Missing turns occasionally can be compensated by increasing the tuning capacity up to 470nF (see connection diagram)

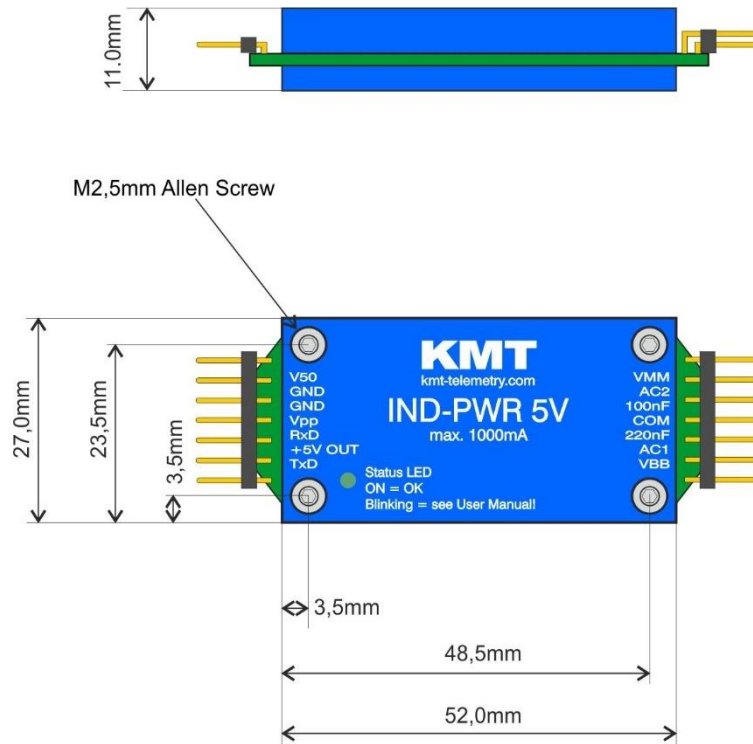
A internal thermos switch avoid overheating of the PWR 2 module!

MT32-IND-PWR 5V - AC/DC Module for inductive power
NEW PWR2_4 version from 07/2015 - connection diagram

PWR2 Connection Overview

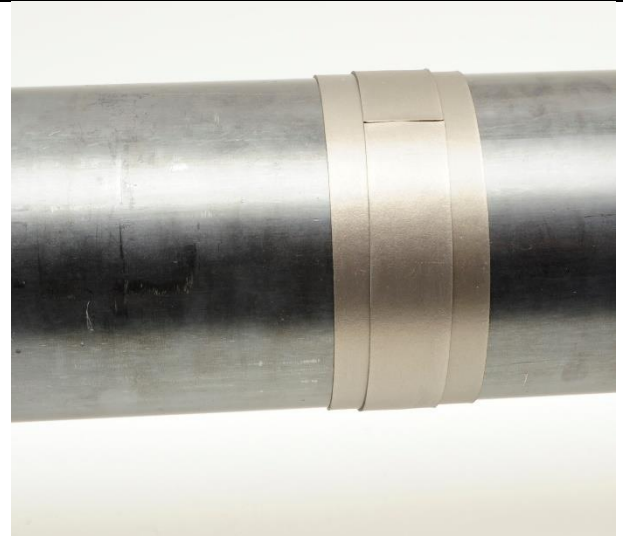
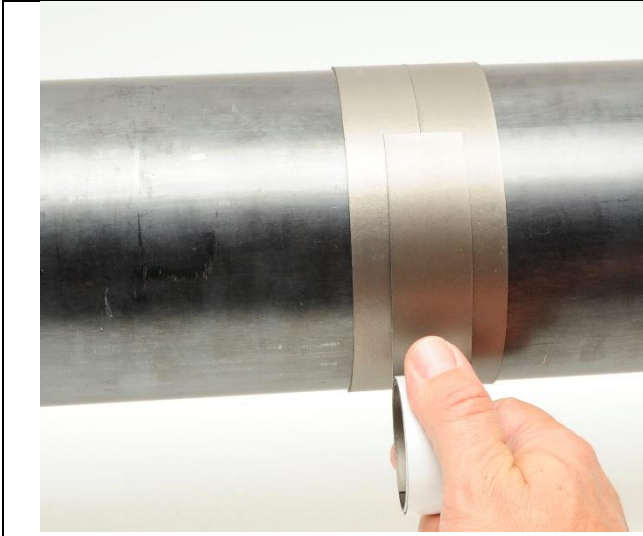
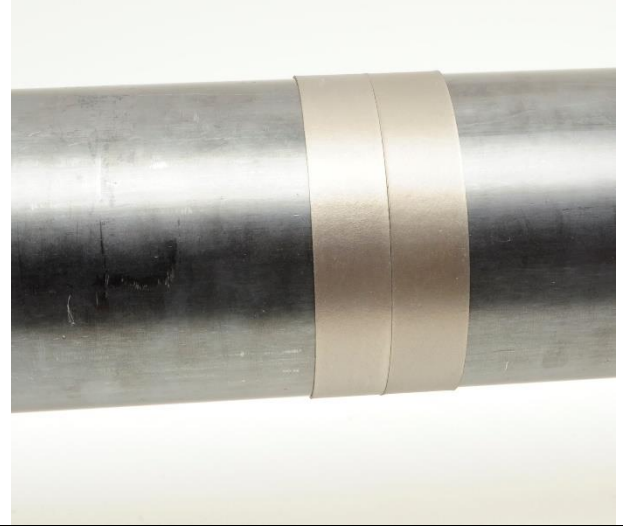


MT32-IND-PWR housing - dimensions

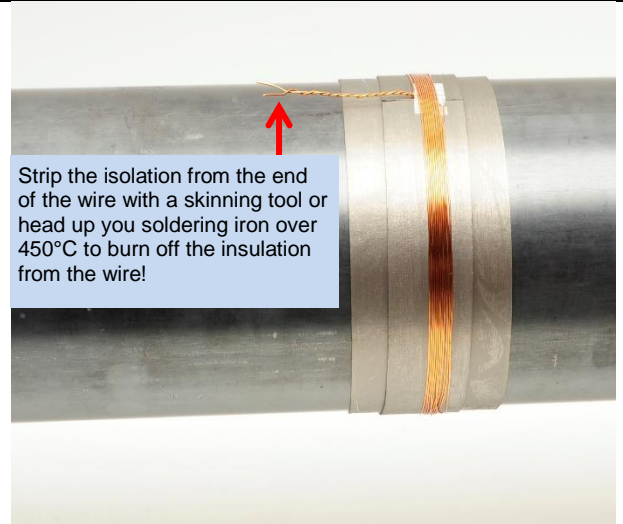
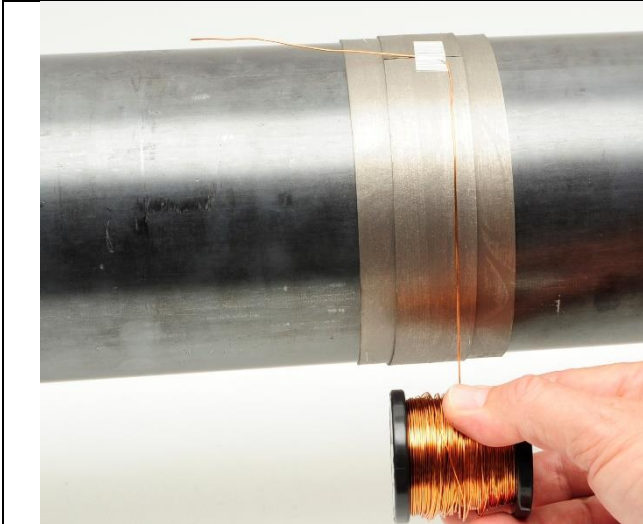


Weight about 35 grams

Inductive power supply Installation of coil for inductive powering on shaft



Attach for electromagnetic isolation "Ferrite Tape" 2x parallel and 1x in the middle over two layer around the shaft



Strip the isolation from the end of the wire with a skinning tool or head up you soldering iron over 450°C to burn off the insulation from the wire!

Make power coil with 3-18 windings for 1000-20mm diameter (see diagram) and twisted the end of wire.
Use 0.63...1.00 mm (1.00mm for diameter of 200-1000mm) CUL wire (Enamelled copper wire)

**Solder the end of the pins on the AC IN of the
IND-PWR module and isolate all solder points with shrink tubing
Fix all with 5 layers mounting tape!**



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!

Control the output voltage and move the power-head in the max distance to the coil.
The output voltage must be 5V

See also status LED

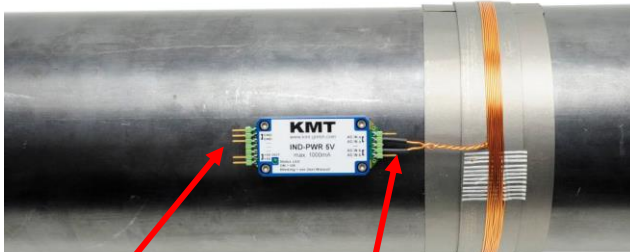
LED ON = optimal IND-Coil windings and good head/coil distance.

LED slow blinking = IND-Coil resonance not optimal* or too large head/coil distance.

LED fast blinking = OVER POWER MESSAGE: reduce number of turns, or increase head distance.
At excessive thermal overload the module will switch off (internal thermo switch)!

LED ultra-fast blinking & no system function = IND-Coil resonance not optimal* or way too large head/coil distance.

* Resonance not optimal means: usually too less number of turns, but also too much turns decrease the energy conversion efficiency.



**5V DC OUT
max. 1000mA**

AC IN



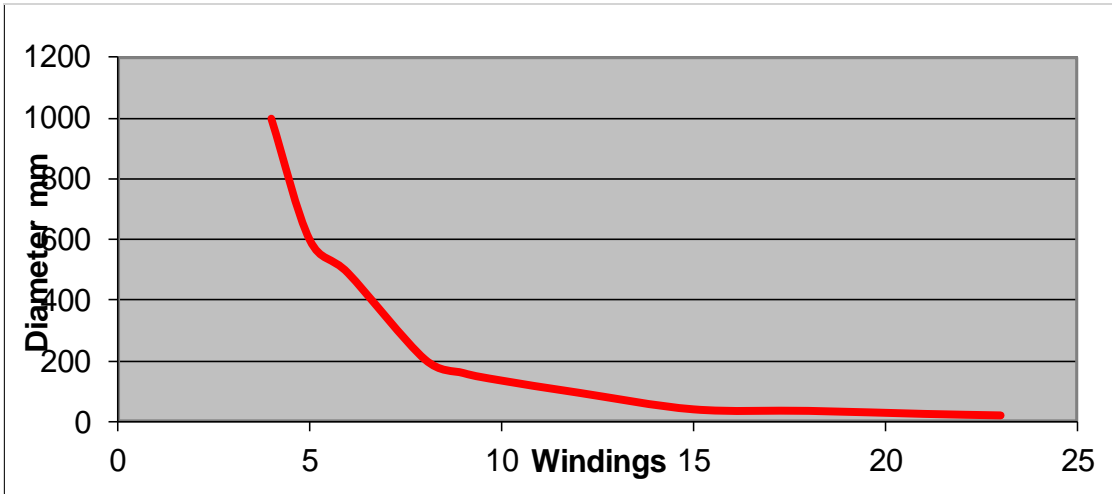
The pins "Coil" are the AC power input from the coil. On the pins "+OUT 5V and "GND" you get a stabilized output voltage of 5V DC.
The max. load current on the DC output is max. 1000mA.

The IND-PWR converter will use instead battery pack!
Never use any battery together with the IndPwr!

You should mount the power head at a fixed location that it's as free as possible from strong 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 5 and 10mm. (depends of shaft and current consumption)

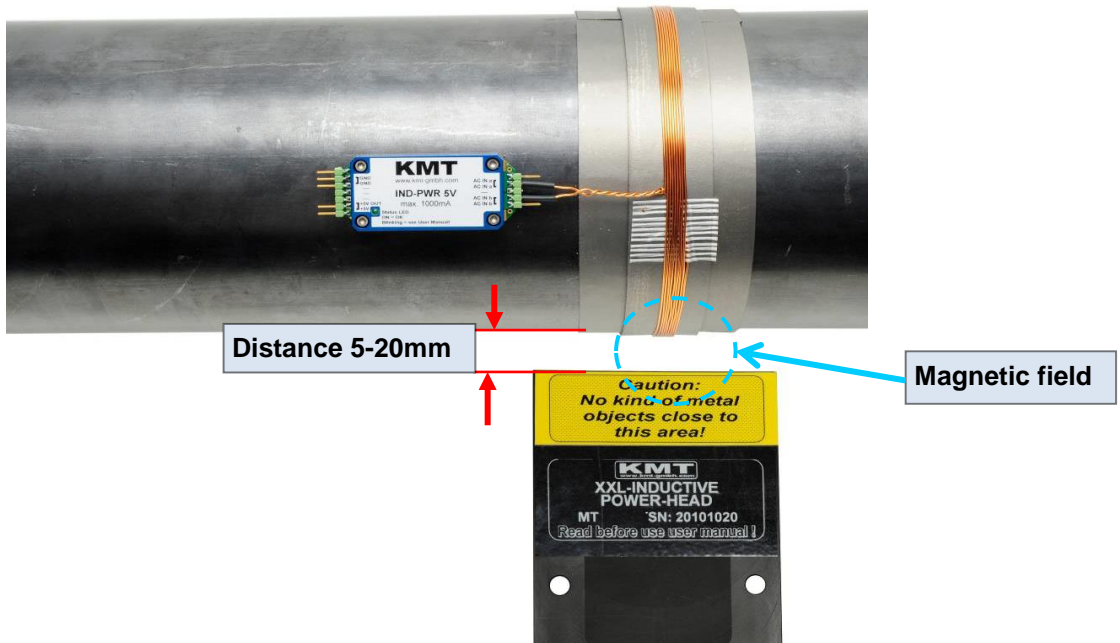
Find the correct amount of windings of inductive power coil



Missing turns occasionally can be compensated by increasing the tuning capacity from 150nF up to 470nF

Windings (+/-1)	nF	Diameter (mm)
3	470nF	1000
4	250nF	1000
5	150nF	600
6	150nF	490
8	150nF	205
9	150nF	160
10	150nF	135
12	150nF	95
15	150nF	40
18	150nF	35
21	150nF	25
23	150nF	20

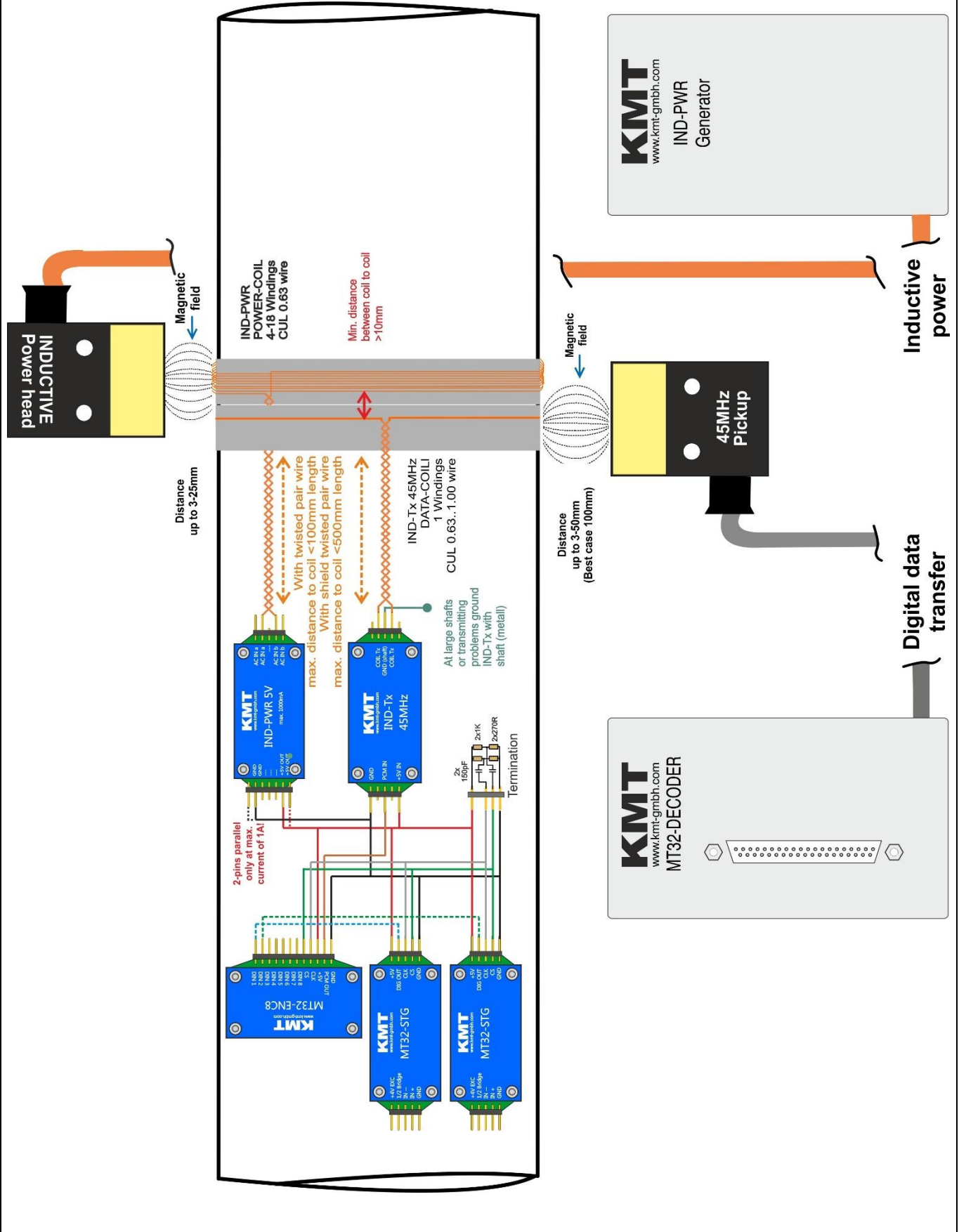
Tuning Capacitor 150nF	Tuning Capacitor 250nF	Tuning Capacitor 370nF	Tuning Capacitor 470nF



Distance dependent of current consumption e.g.:
1000mA at 5-10mm, 500mA at 10-15mm and 250mA at 15-20mm

MT32 Block diagram

IND-TX-RX with 45MHz carrier and inductive power



Recommend power heads:

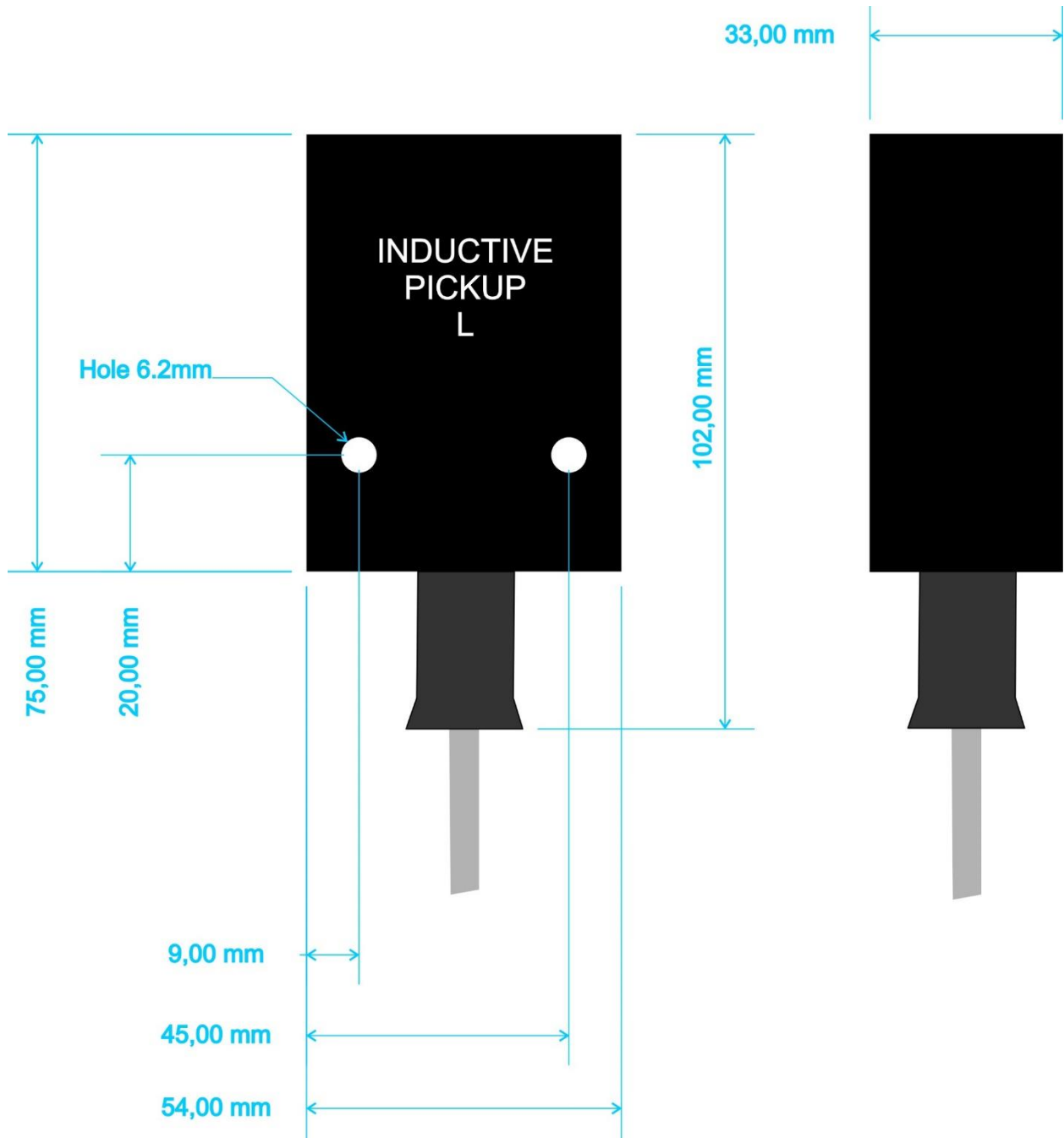
Diameter:	150mm	300mm	500mm	1000mm
2 -Channel	L	XL	XL	XL
4 - Channel	L	XL	XL	XXL
8 - Channel	L	XL	XXL	XXXL
16 - Channel	XL	XXL	XXL	XXXL
32 - Channel	XXL	XXL	XXL	On request

IND-PWR-HEAD-L for diameters up to 150-200mm



Caution
Cable must unrolled for use, otherwise it will warm up!

Dimensions of IND-PWR-HEAD L

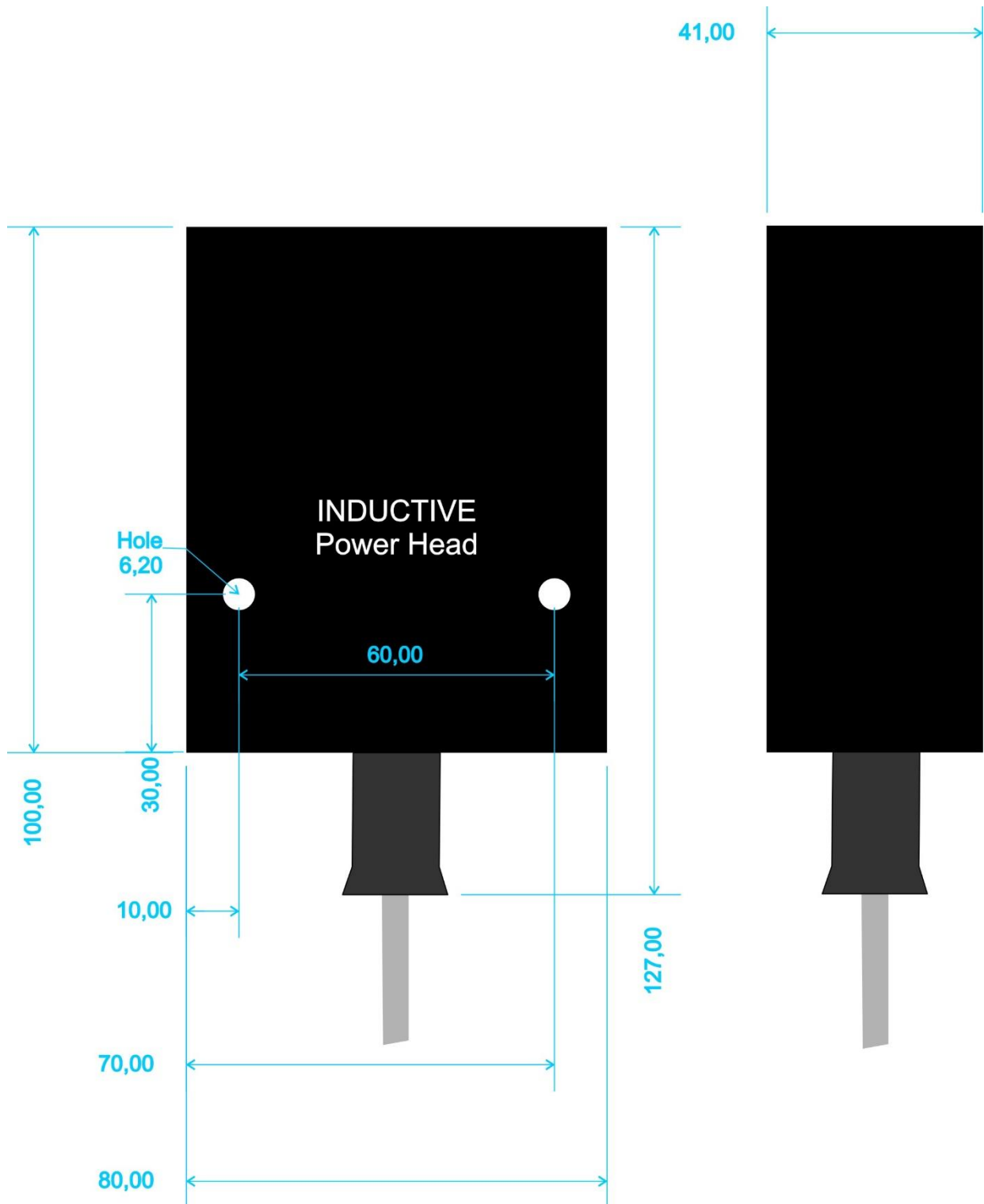


IND-PWR-HEAD XL and XXL
for diameters up to 300mm with XL and 500mm with XXL
(XL and XXL have the same housing and size but inside is a larger coil at XXL version)



Caution
Cable must unrolled for use, otherwise it will warm up!

Dimensions of IND-PWR-HEAD XL and XXL

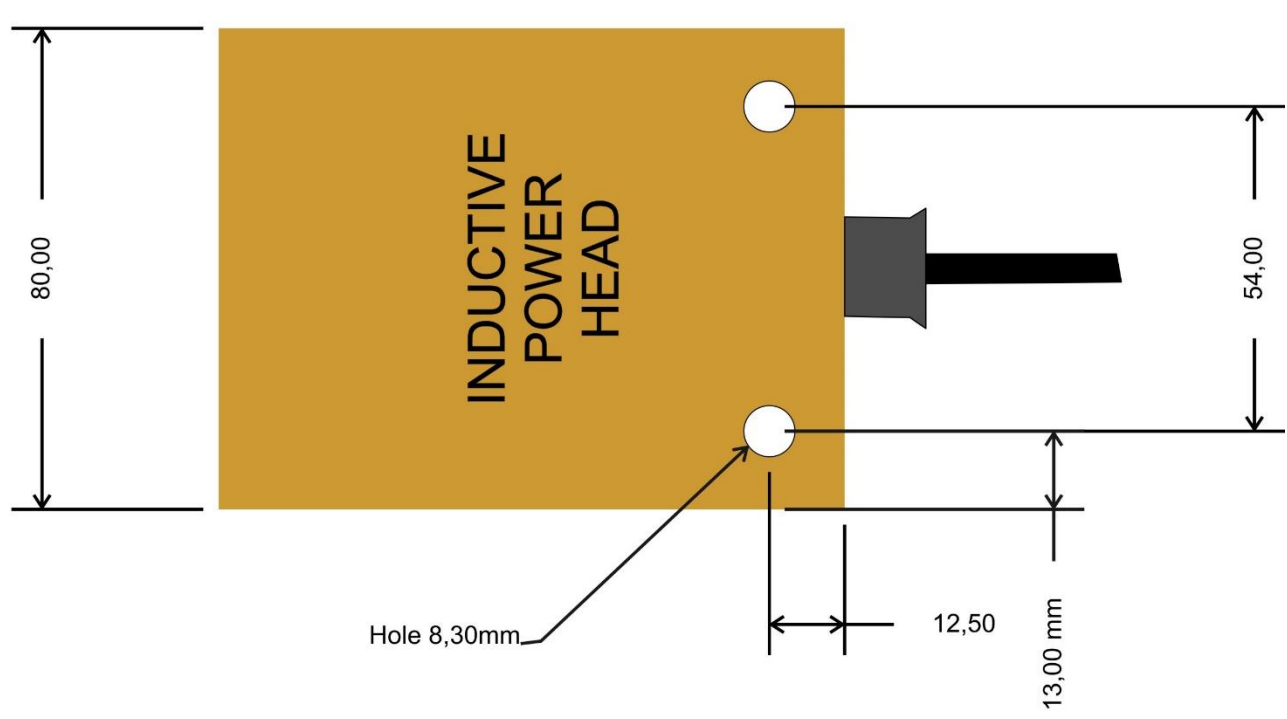
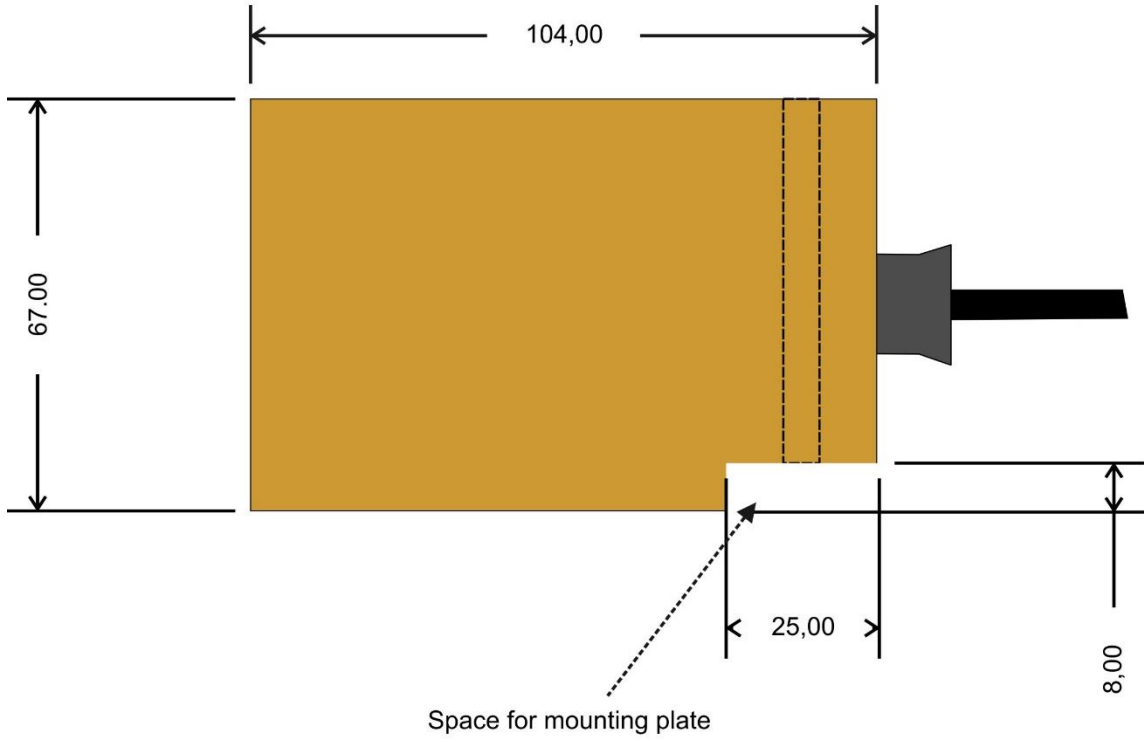


IND-PWR-HEAD XXXL
for diameters up to 1000mm

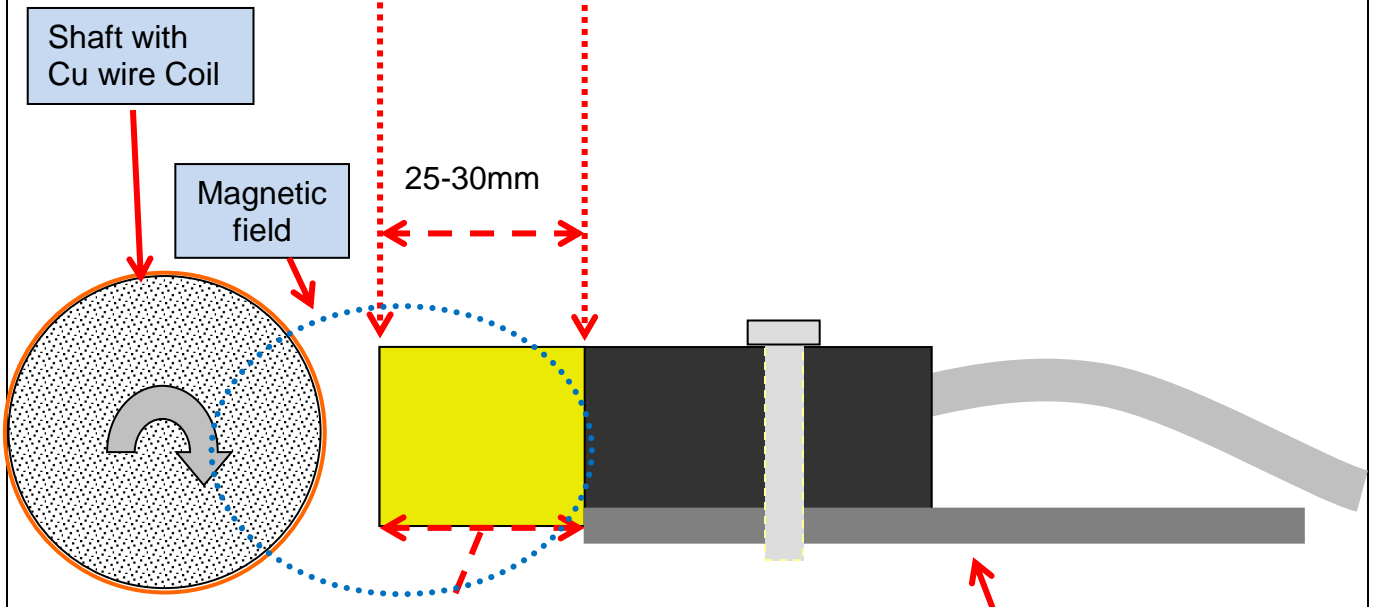


Caution
Cable must unrolled for use, otherwise it will warm up!

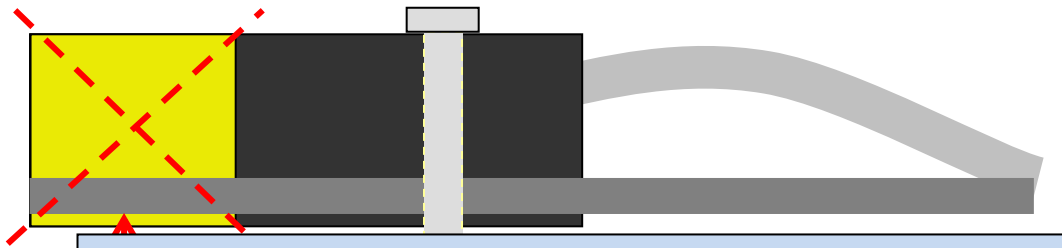
Dimensions of IND-PWR-HEAD XXL



Following must be considered at the mounting of the inductive power head



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



IND-Power generator for L, XL, XXL and XXXL Powerhead

Technical data



L, XL, XXL



XXXL with add. cooling fins

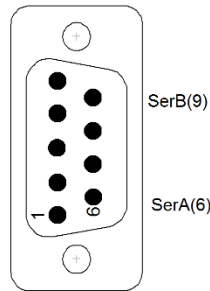
Power output:	AC 25-35kHz for power head L, XL, XXL and XXXL
Power input:	10-30 V DC, typical 24V
Power consumption	up to 100 Watt, deepens of power head
Dimensions:	205 x 105 x 65mm (205 x 105 x 115mm with cooling fins)
Weight:	1.275 kg
Environmental	
Operating:	-20 ... +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g Mil Standard
Static acceleration:	10g in all directions
Shock:	50g in all directions

IND-PWR for L, XL, XXL and XXXL Powerhead

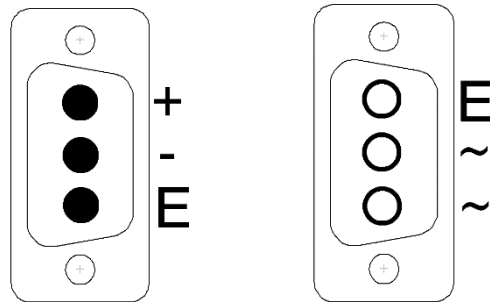
Pin connection



RS 485



CONTROL - Not used!



DC 10-30V
typical 24V

(up to 100 WATT*)

AC 25-35kHz output
power head

*** deepens of power head)**

E= have no function

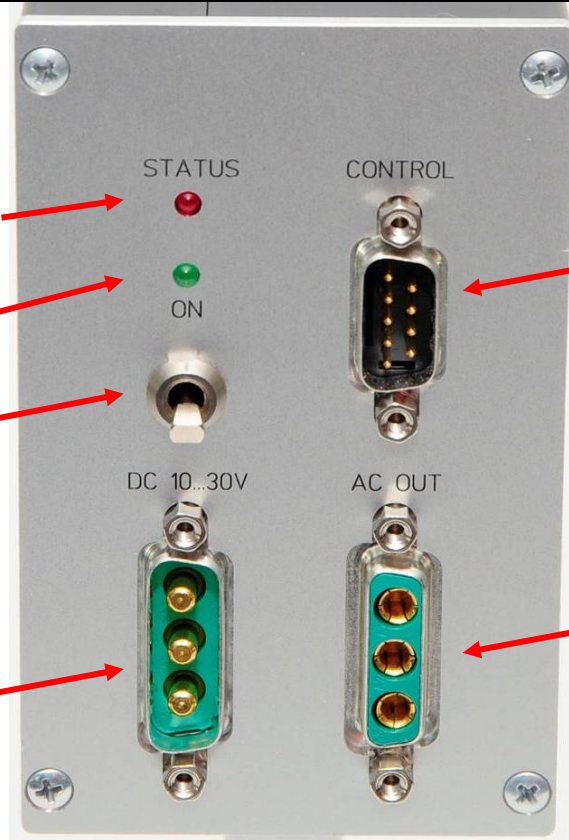
Powering and AC out

LED flashing = auto adjustment
LED ON = finish
ON= Inductive resonance freq.
of power head reached!
Can take up to 20sec.!

Power control LED

Power Switch

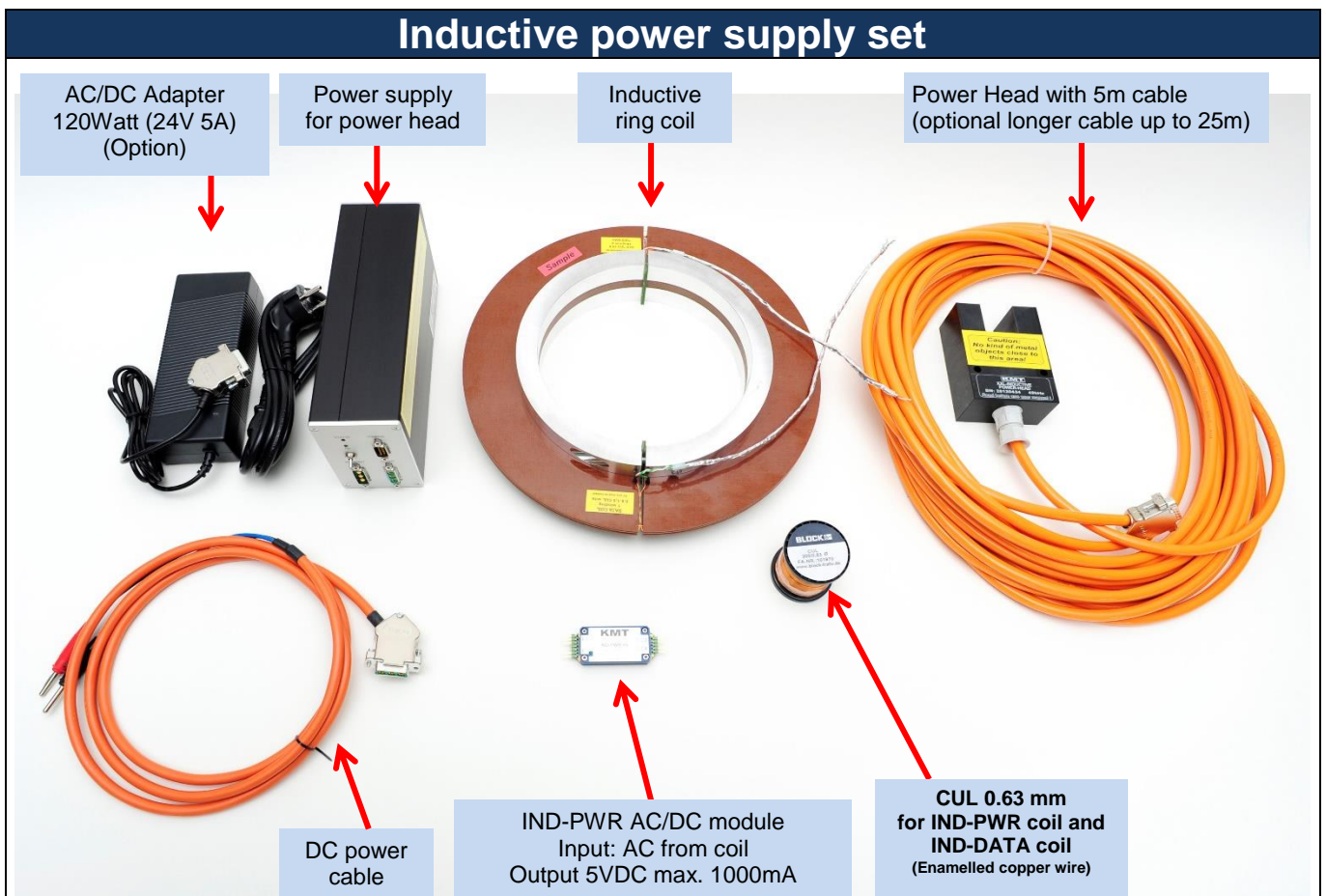
Power INPUT
DC 10-30V
typical 24V
(up to 100WATT*)



Control:
only for KMT use

AC 25-35kHz output
for power head

IND-PWR XXL with RING COIL User Manual



INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

Safety notes for inductive powering

- The device should only be applied by instructed personnel.
- The power head emits strong magnetic radiation at 30-60 kHz to a distance of 300 mm. 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 strongly 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 50 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.

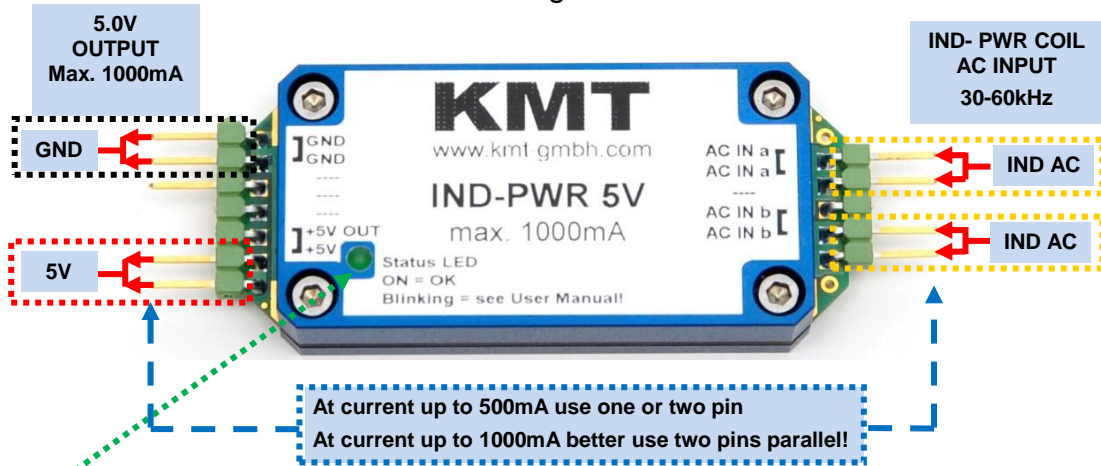
MT32-IND-PWR 5V - AC/DC Module for inductive power

OLD PWR2_3 version until 06/2015



MT32-IND-PWR 5V
 AC/DC Module for inductive power
 Input: 30-60kHz, 10-50V AC
Can also be power with DC 24V (Input via AC IN a and AC IN b)
 Output: 5 VDC
 Current: up to 1000mA
 Weight: 35 gram
 Vibration: 5g
 Shock: 3000g

Pin assignment

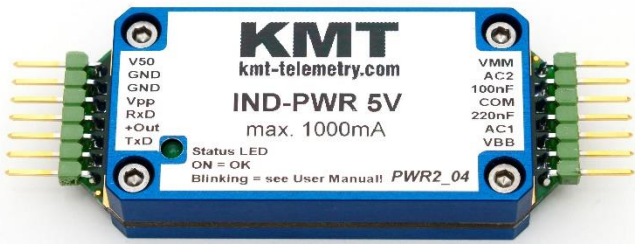


Status LED

- LED ON = right windings and good distance between head and coil
- LED very low blinking = too less windings of IND-Coil or too large distance between head and coil!
- LED fast blinking = too much windings (OVER POWER at IND-Coil) reduce windings or module go hot and switch OFF

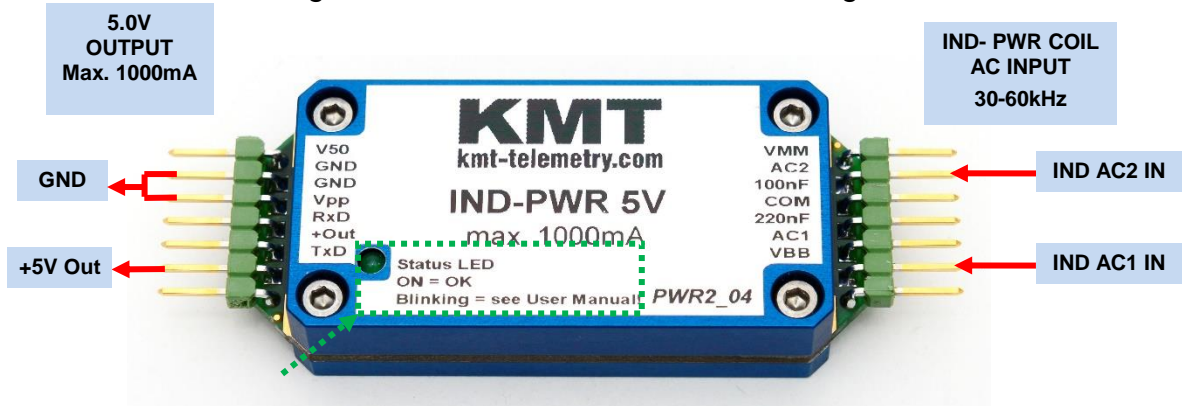
MT32-IND-PWR 5V - AC/DC Module for inductive power

NEW PWR2_4 versions from 07/2015

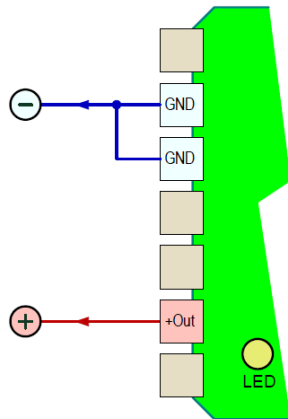


MT32-IND-PWR 5V
 AC/DC Module for inductive power
 Input: 30-60kHz, 10-50V AC
 Can also be power with DC 24V (Input via AC2 and AC1)
 Output: 5 VDC
 Current: up to 1000mA
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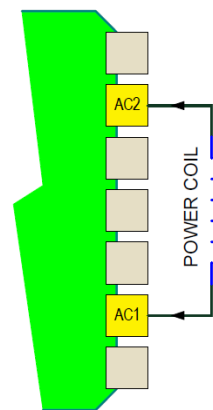
Pin assignment, more info see connection diagram!



DC Output



Power Coil Connection



Standard connection

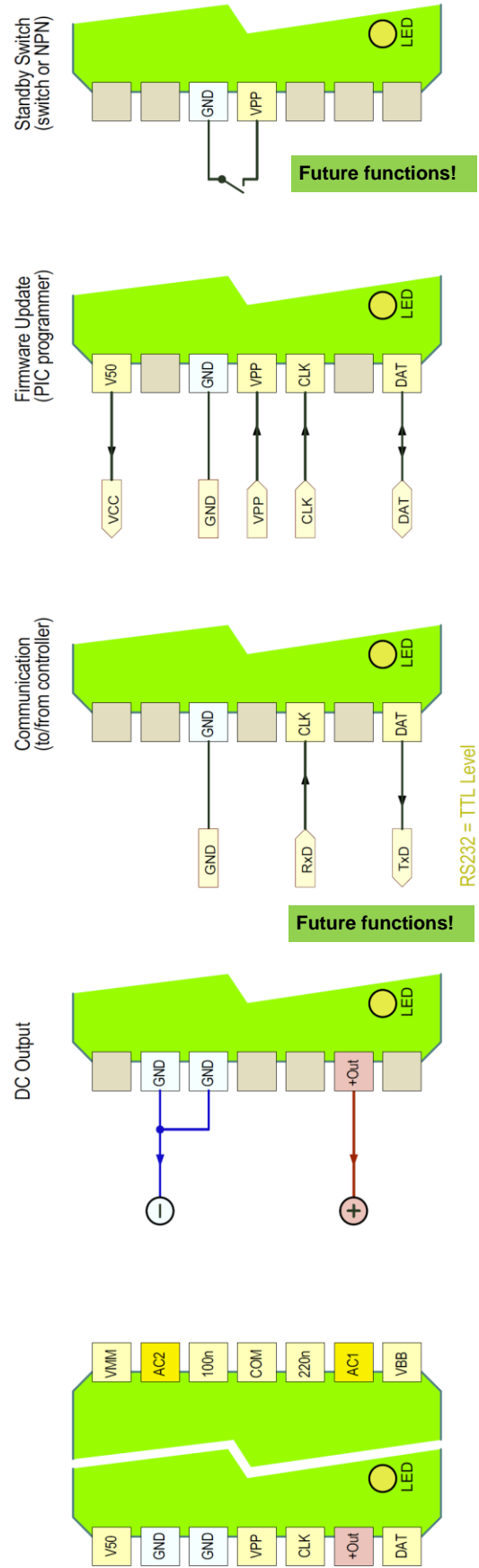
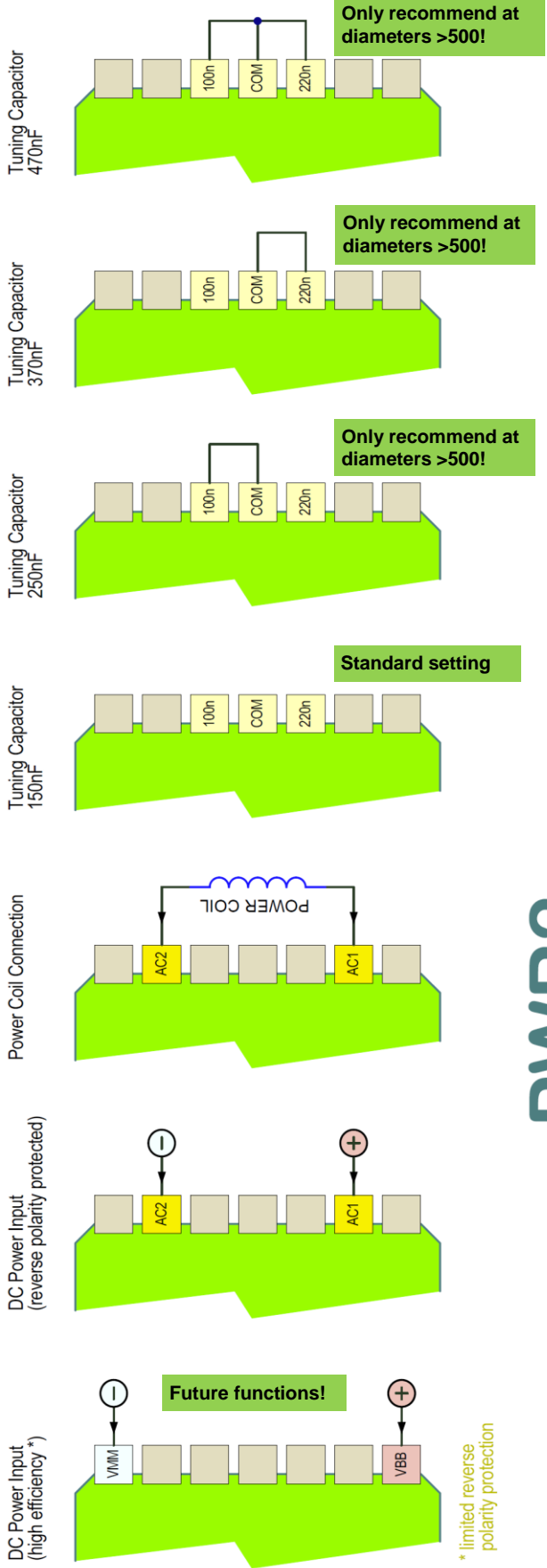
For cooling of the module, we recommend to mount it on a metal surface, special over a load of >500mA!

Status LED

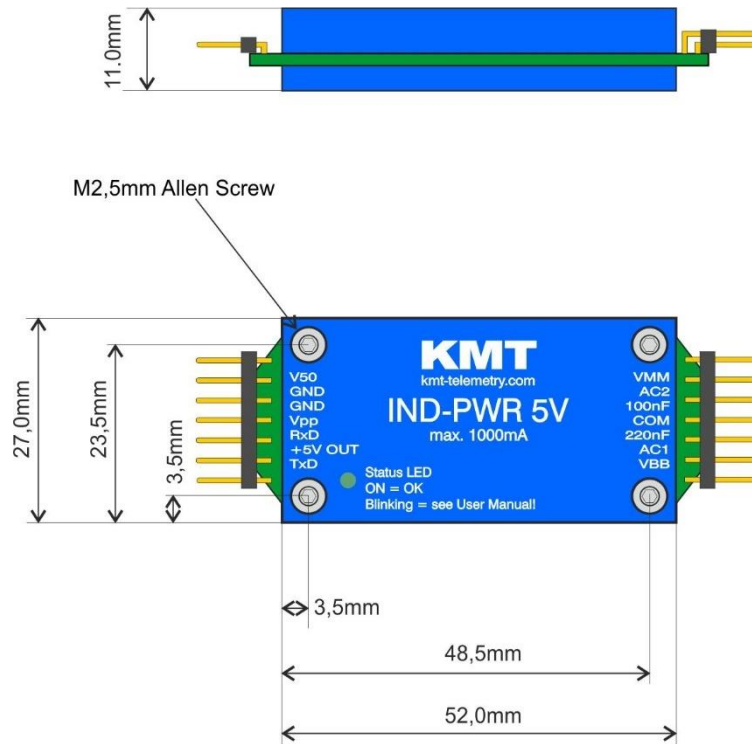
- LED ON = optimal IND-Coil windings and good head/coil distance.
- LED slow blinking = IND-Coil resonance not optimal* or too large head/coil distance.
- LED fast blinking = OVER POWER MESSAGE: reduce number of turns, or increase head distance.
- At excessive thermal overload the module will switch off (internal thermo switch)!
- LED ultra-fast blinking & no system function = IND-Coil resonance not optimal* or way too large head/coil distance.
- * resonance not optimal means: usually too less number of turns, but also too much turns decrease the energy conversion efficiency.
- Missing turns occasionally can be compensated by increasing the tuning capacity up to 470nF (see connection diagram)
- A internal thermos switch avoid overheating of the PWR 2 module!

MT32-IND-PWR 5V - AC/DC Module for inductive power
NEW PWR2_4 version from 07/2015 - connection diagram

PWR2 Connection Overview

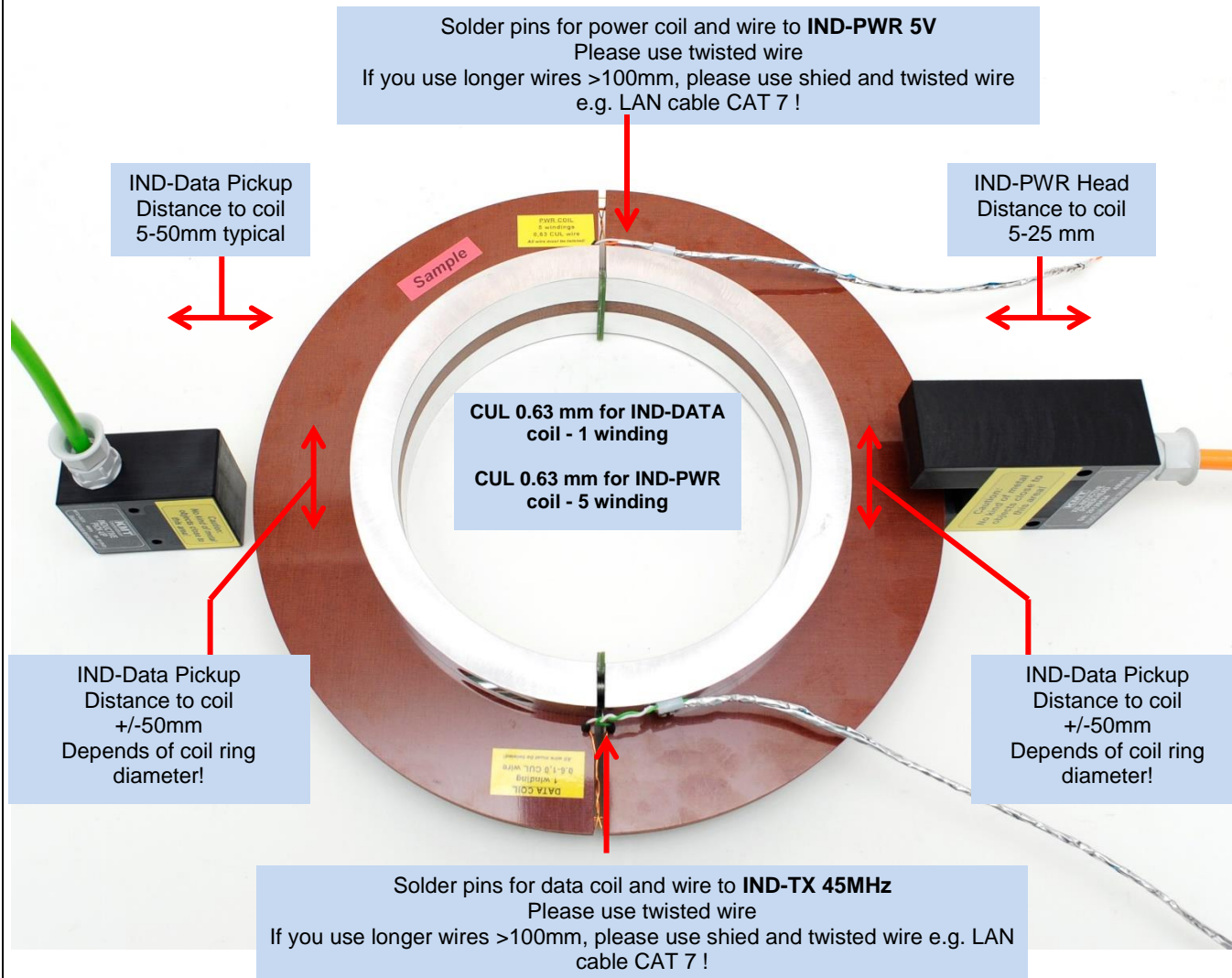


MT32-IND-PWR housing - dimensions



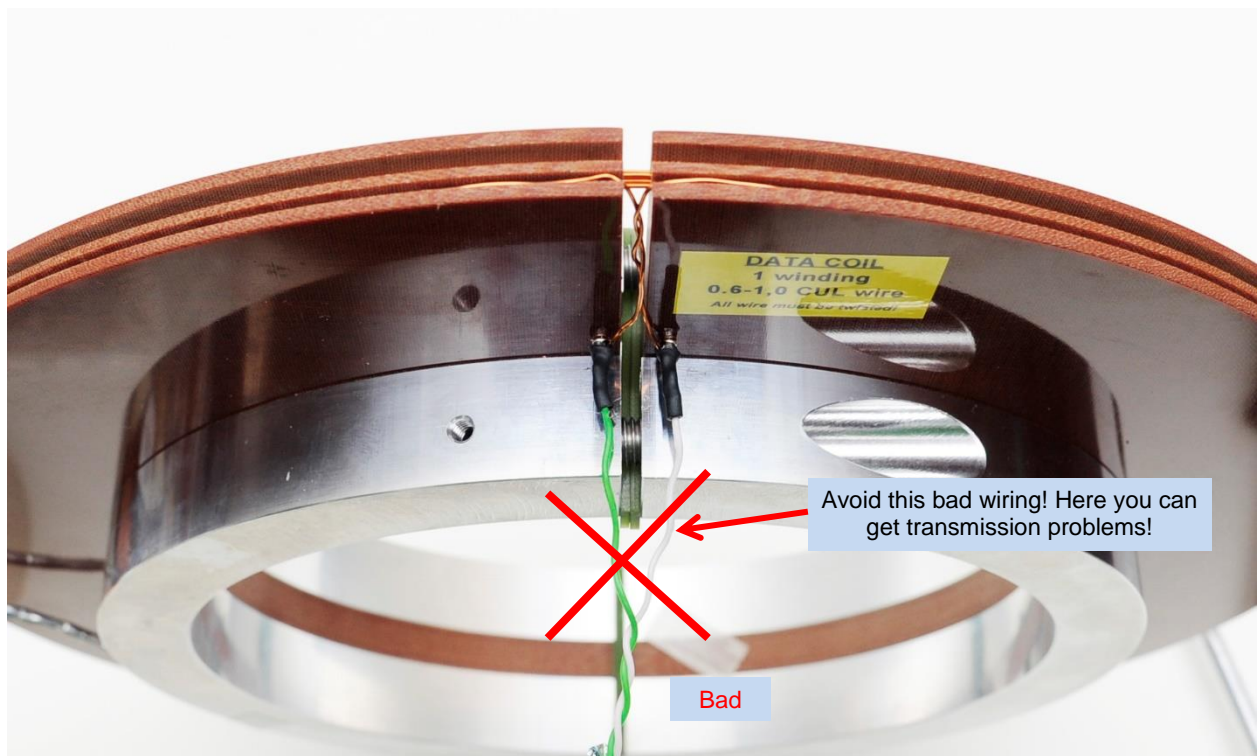
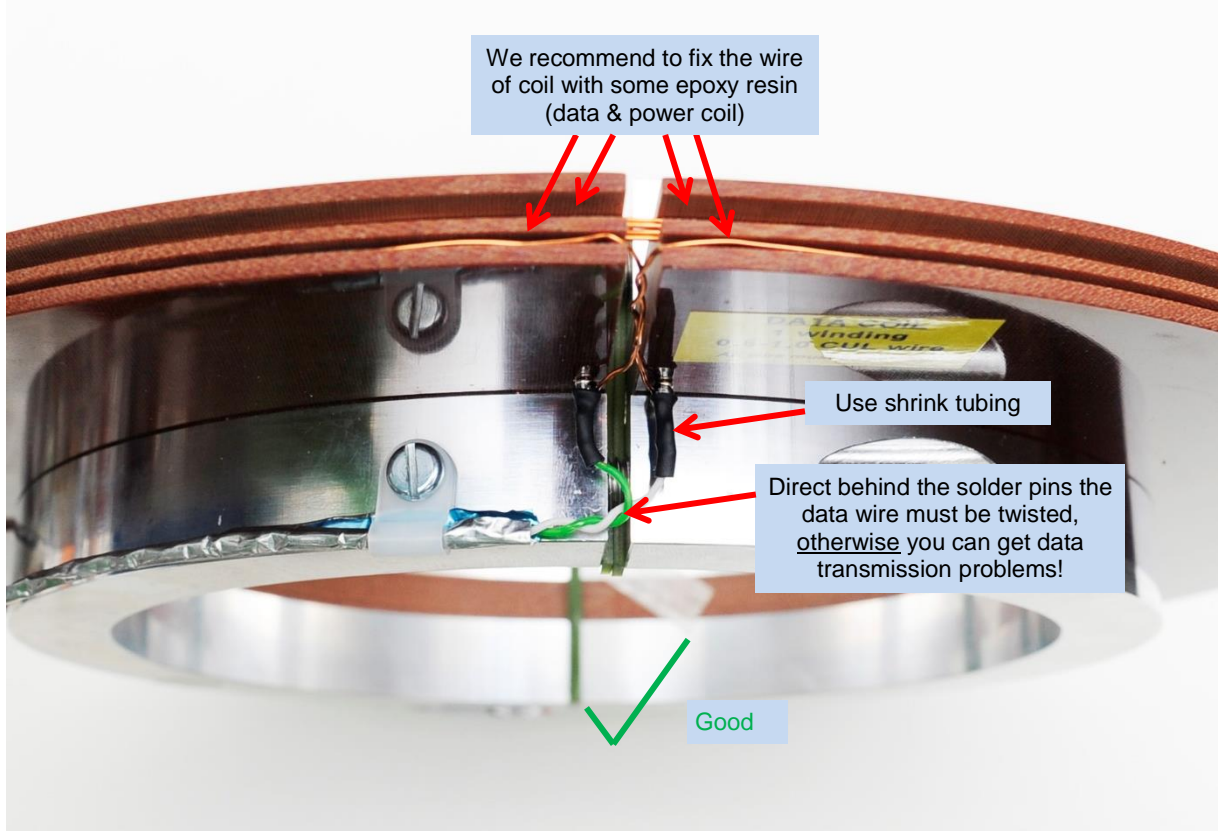
Weight about 35 grams

Inductive power supply RING COIL - Distance power head and pickup head

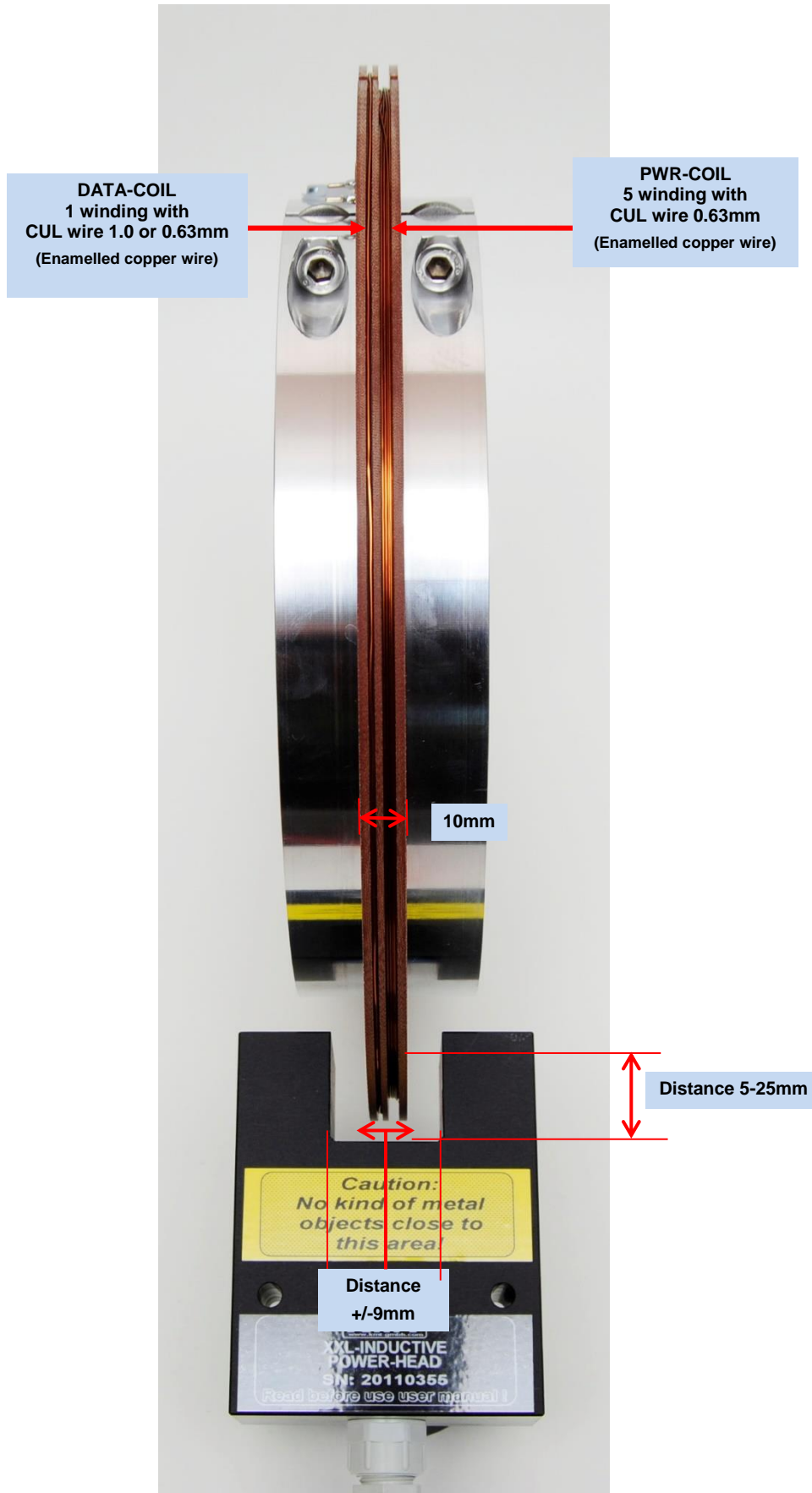


Data cable CAT. 7A S/FTP 4P AWG22 (= solid bare copper wire **0.64mm**-diameter) recommend
or
Data cable CAT. 7 S/FTP 4P AWG23 (= solid bare copper wire 0.55mm-diameter)

Inductive power supply RING COIL – wire connection

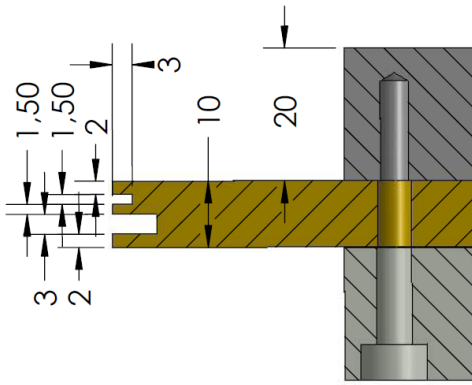


Inductive power supply RING COIL – Distance power head

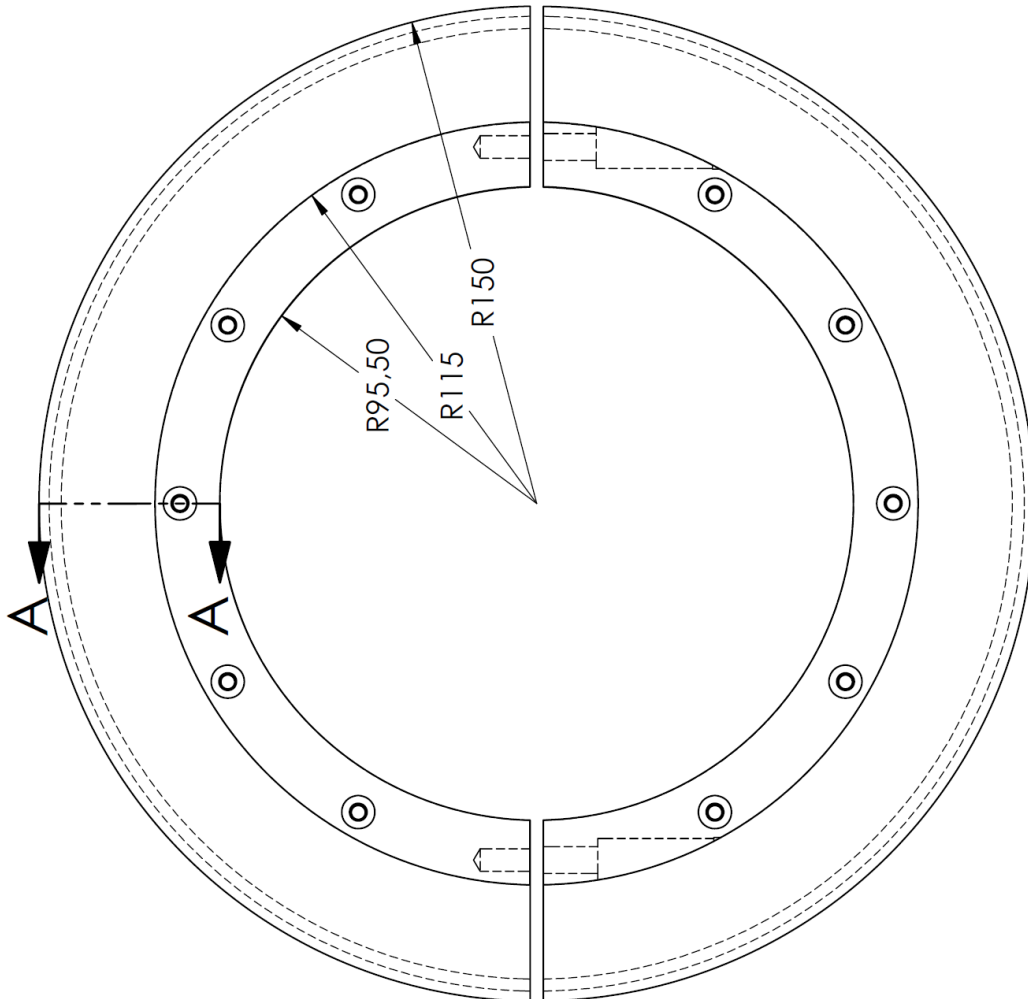
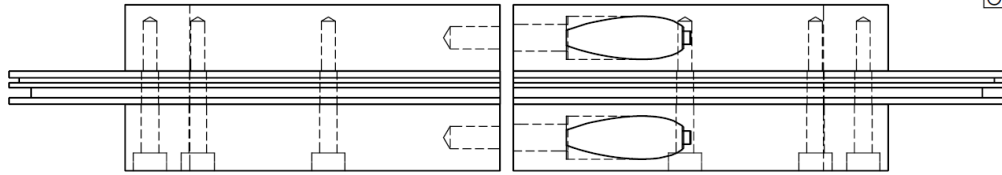
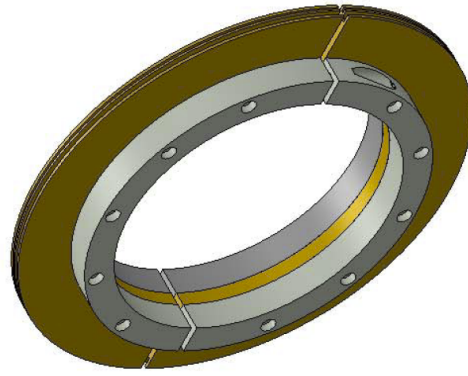


Inductive power supply

Example of a RING COIL with inner diameter 191mm



SCHNITT A-A
MAßSTAB 1 : 1

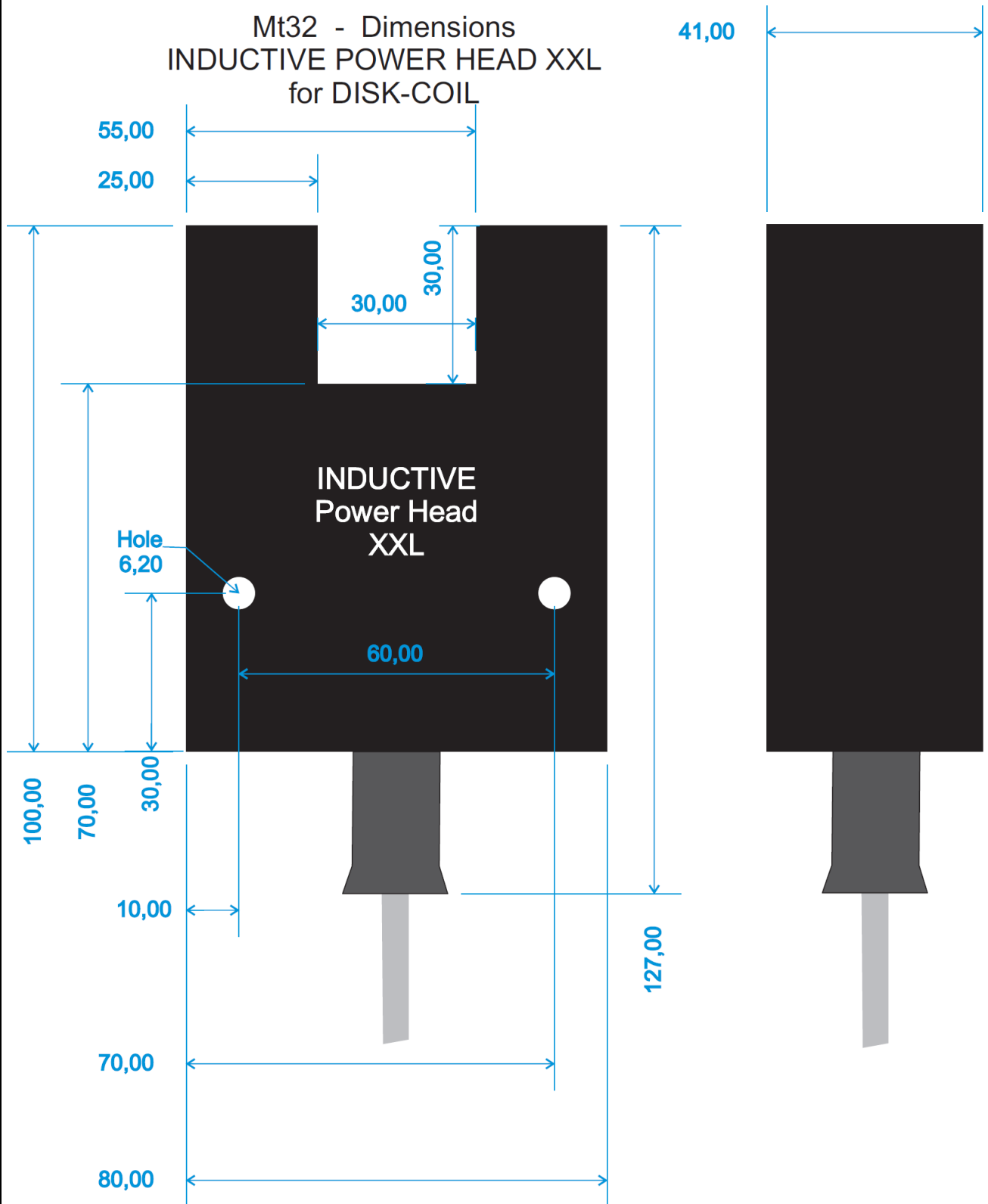


GRÖSSE ZEICHNUNGSNR. **A** RING191B

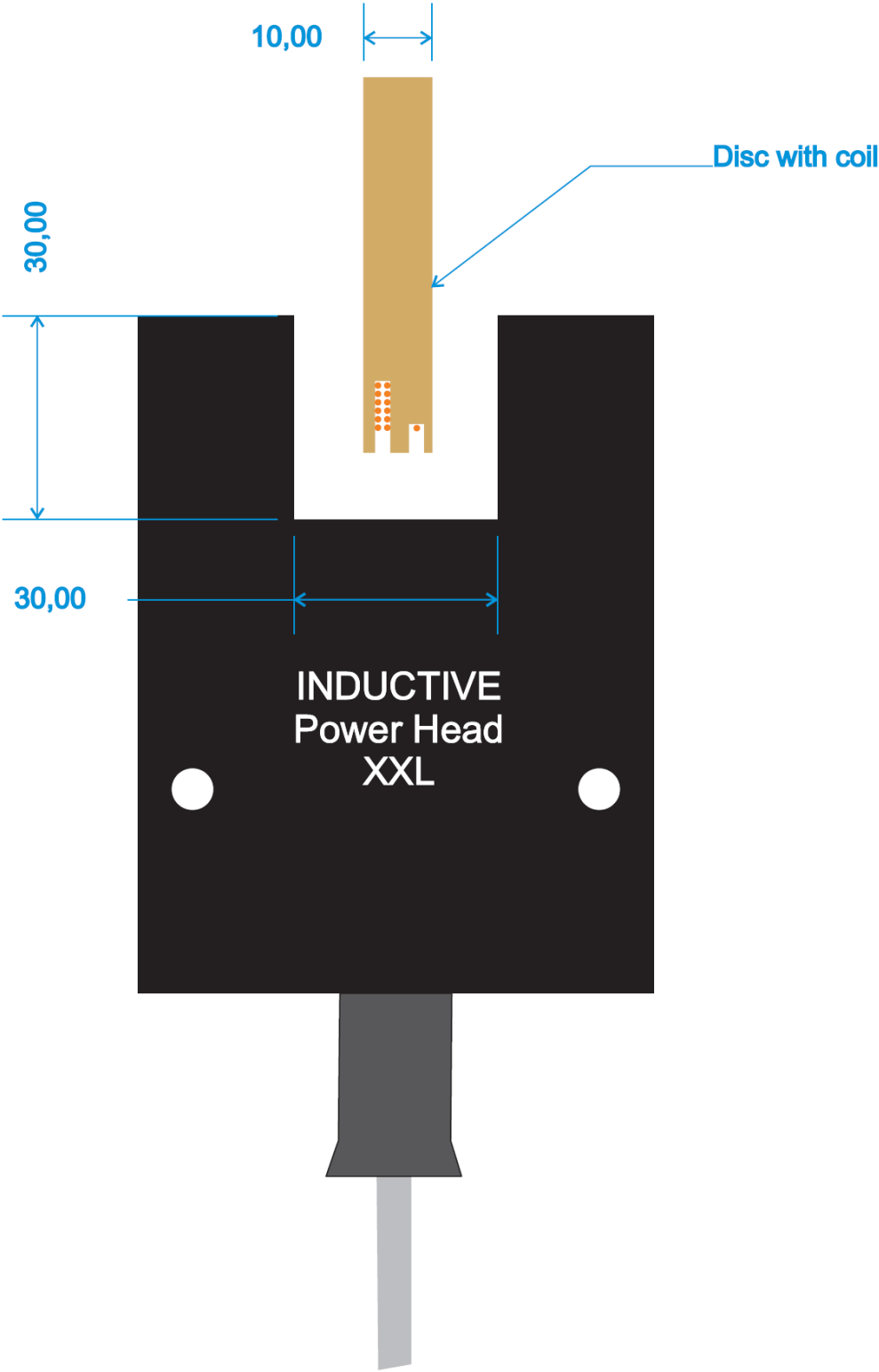
ÄND.
MAßSTAB: 1:5
BLATT 1 VON 1

Dimensions of IND-PWR-HEAD-XXL

Mt32 - Dimensions
INDUCTIVE POWER HEAD XXL
for DISK-COIL



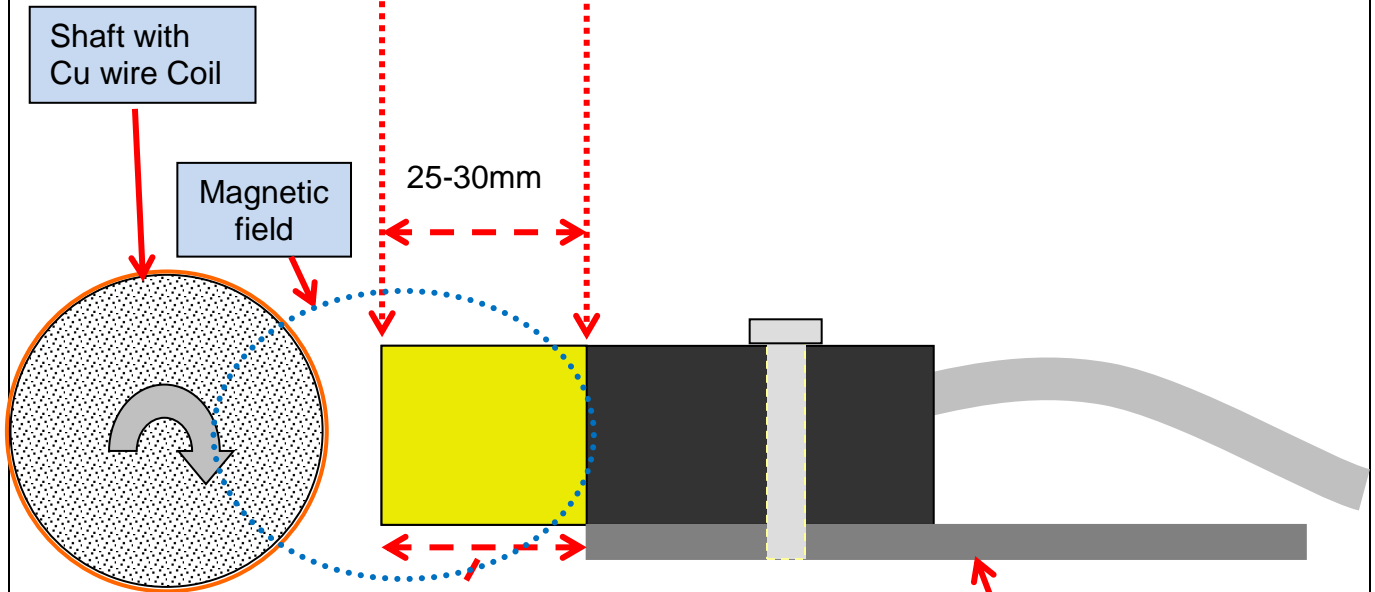
MT32 - Dimensions
INDUCTIVE POWER HEAD XXL
Coil distances





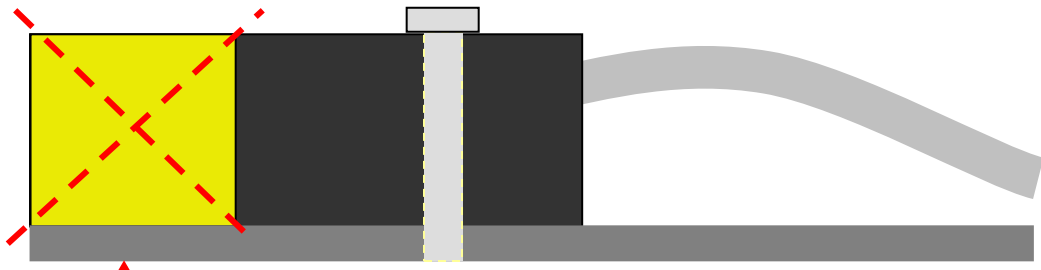
**Caution for use of power heads!
Cable must unrolled for use, otherwise it will warm up!**

Following must be considered at the mounting of the inductive power head



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

Example of mounting



Wrong!!! Mounting (only if metal) plate cover the active area of

IND-Power generator for L, XL, XXL and XXXL Powerhead

Technical data



L, XL, XXL



XXXL with add. cooling fins

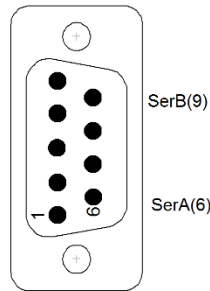
Power output:	AC 25-35kHz for power head L, XL, XXL and XXXL
Power input:	10-30 V DC, typical 24V
Power consumption	up to 100 Watt, depends of power head
Dimensions:	205 x 105 x 65mm (205 x 105 x 115mm with cooling fins)
Weight:	1.275 kg
Environmental	
Operating:	-20 ... +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g Mil Standard
Static acceleration:	10g in all directions
Shock:	50g in all directions

IND-PWR for L, XL, XXL and XXXL Powerhead

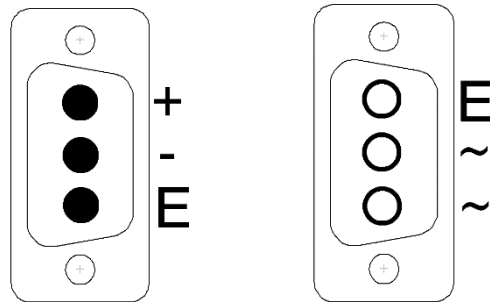
Pin connection



RS 485



CONTROL - Not used!



DC 10-30V
typical 24V

AC 25-35kHz output
power head

(up to 100 WATT* * deepens of power head)

E= have no function

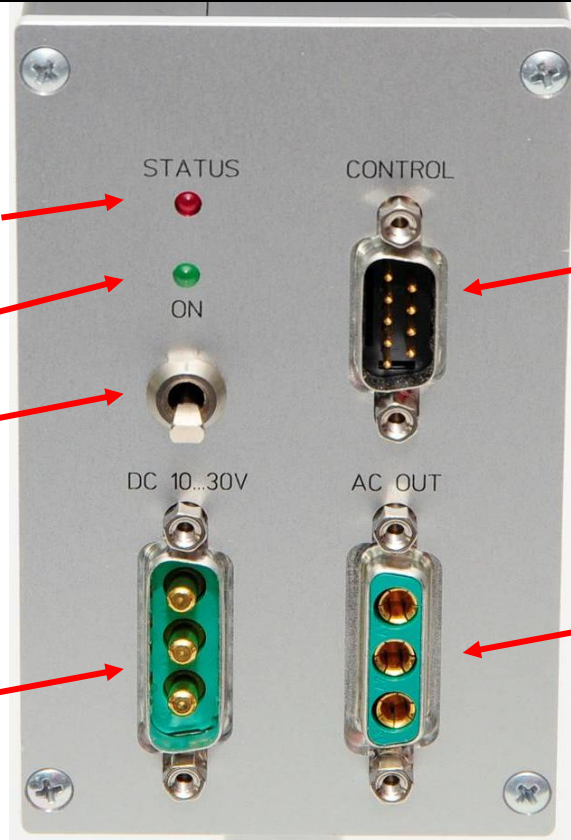
Powering and AC out

LED flashing = auto adjustment
LED ON = finish
ON= Inductive resonance freq.
of power head reached!
Can take up to 20sec.!

Power control LED

Power Switch

Power INPUT
DC 10-30V
typical 24V
(up to 100WATT*)



Control:
only for KMT use

AC 25-35kHz output
for power head