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MTP-NT

User Manual

Sophisticated multi-channel telemetry system for rotating application, fully software programmable with 16 bit resolution

INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

- 2 to 256 channels
- Signal bandwidth up to 24000 Hz
- Inputs: STG, IEPE, VOLT, THERMO
- Auto offset compensation (STG/VOLT)
- 4V Bridge excitation
- STG Input ranges ±40 to ±0.3 mV/V
- 16 bit ADC (internal 18 bit)
- Fully software programmable
- Inductive or battery powered
- Rugged housing, water protected
- Analog output +/- 10V
- Digital Ethernet output for PC

Safety notes

- The device should only 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 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 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.

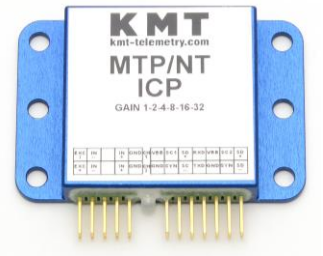
Short description:

The MTP-NT telemetry is a miniaturized measurement system suitable for sophisticated industrial measurement tasks and rotating applications. Each 2-channel sensor module is equipped with signal conditioning, anti-aliasing filters, analog-to-digital converters (16 bit) and a digital communication bus connection. All these up to 128 modules (=256 channels) will be controlled by the MTP-NT-Controller module via a daisy-chain system bus (extendable to several meters). 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 undesired interferences in noisy environments. The MTP-NT Controller outputs a PCM bit stream signal in NRZ format with data rates up to 5000 kbit/s. The inductive transmitter module transfers the signal over distances of up to 50 mm and the radio transmitter is able to cover ranges of 10m, depends of application.

MTP-NT acquisition modules (rotor side)

60 x 40 x 10 mm
Weight 40 grams

MTP-NT-STG2
Acquisition module for 2 strain gauges
Full, half and quarter bridge (≥ 350 Ω)
Full, half and quarter bridge (120 Ω)
Fixed excitation 4 Vdc
Offset compensation by auto zero
Manual offset shifting after auto zero
Input ranges ±40 to ±0.3 mV/V
Shunt-calibration 100 kΩ 0.1%
Signal bandwidth 0 Hz to 24000 Hz*
(*see table of cut-off-frequencies)
ADC Resolution 16 Bit
Measurement uncertainty < 0.1%
Power supply: 6 to 9 Vdc
Current consumption (with two full bridges 350 Ohm) 100 mA



60 x 40 x 10 mm
Weight 40 grams

MTP-NT-IEPE2
Acquisition module for 2 IEPE/ICP® sensors
Current EXC. 4mA
Input ranges 20 to ±0.3 Vpp
Signal bandwidth 3 Hz to 24000Hz*
(*see table of cut-off-frequency)
ADC Resolution 16 Bit
Measurement uncertainty < 0.1%
Power supply: 6 to 9 Vdc
Current consumption 140 mA

60 x 40 x 10 mm
Weight 40 grams

MTP-NT-VOLT2
Acquisition module for 2x high level inputs
Input ranges ±10 to ±0.08 V
Signal bandwidth 0 Hz to 24000 Hz*
(*see table of cut-off-frequencies)
+4 V sensor excitation max. 20 mA
ADC Resolution 16 Bit
Measurement uncertainty < 0.1%
Power supply: 6 to 9 Vdc
Current consumption 60 mA

60 x 40 x 10 mm
Weight 40 grams

MTP-NT-THERMO 2
Acquisition module for 2x Temperature Sensor
Inputs galvanically isolated (max. potential difference 32 Vdc)
Lowpass filter 1 Hz to 32 Hz (programmable)
Sensor types
RTD, Thermocouple, NTC, (& customer-specific types)
Measuring range -273.15 °C to +1635°C
Power supply: 6 to 9 Vdc
Current consumption 90 mA

60 x 40 x 10 mm
Weight 40 grams

MTP-NT-CON-IND-Tx
Controller 1- 128 acquisition modules
Output: PCM
built-in inductive transmitter
Programmable via RS232/USB adapter and remote software
Power supply: 6 to 9 Vdc
Current consumption 150 mA

Common characteristics / Environment

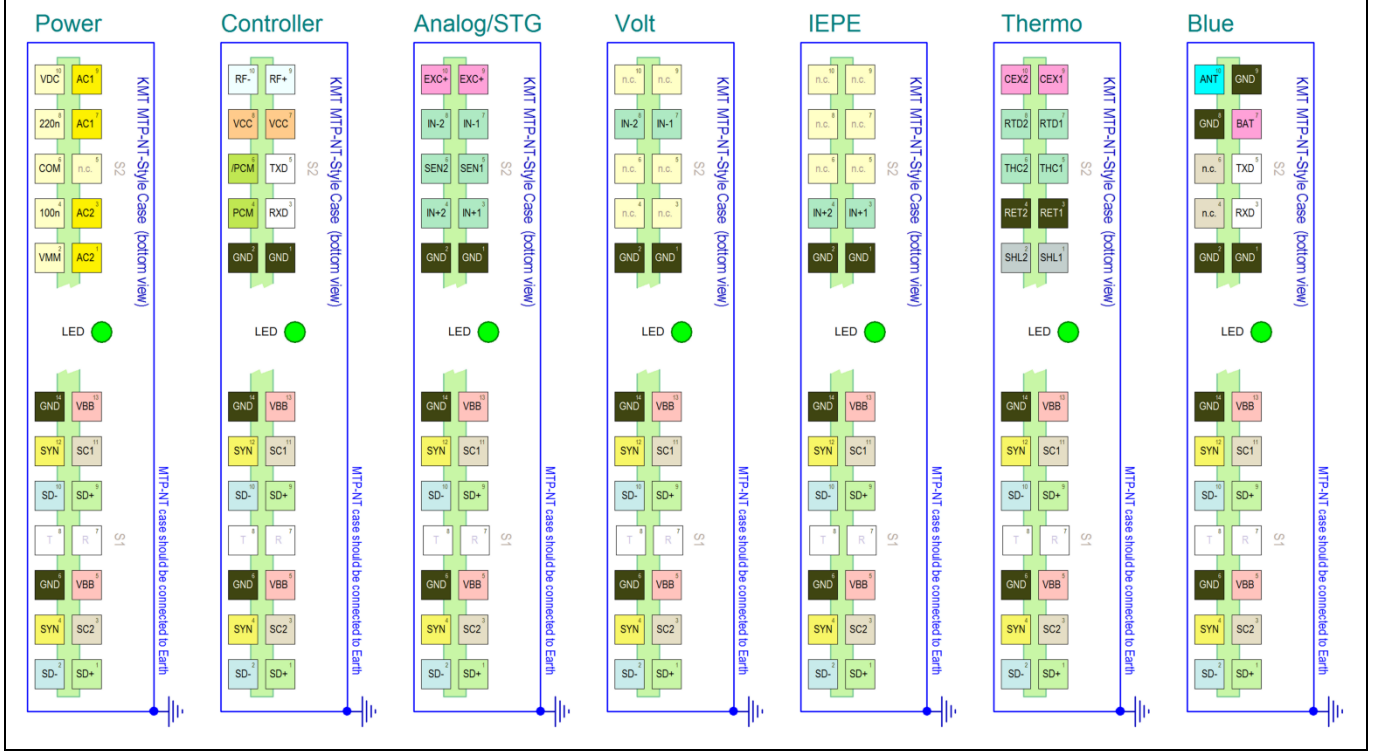
Vibration (random)	0.1 g²/Hz (20 Hz to 2 kHz)	Operating temperature	-40 to +85°C
Vibration (sine)	20 g (20 Hz to 2 kHz)	**optional**	**-40 to +125°C**
Shock (½ sine)	10000 g peak (11 ms)	Storage temperature	-40 to +125°C
Static Acceleration	3000 g (depends of mounting!)	Humidity	100 %

Signal bandwidth and sampling rates MTP-NT

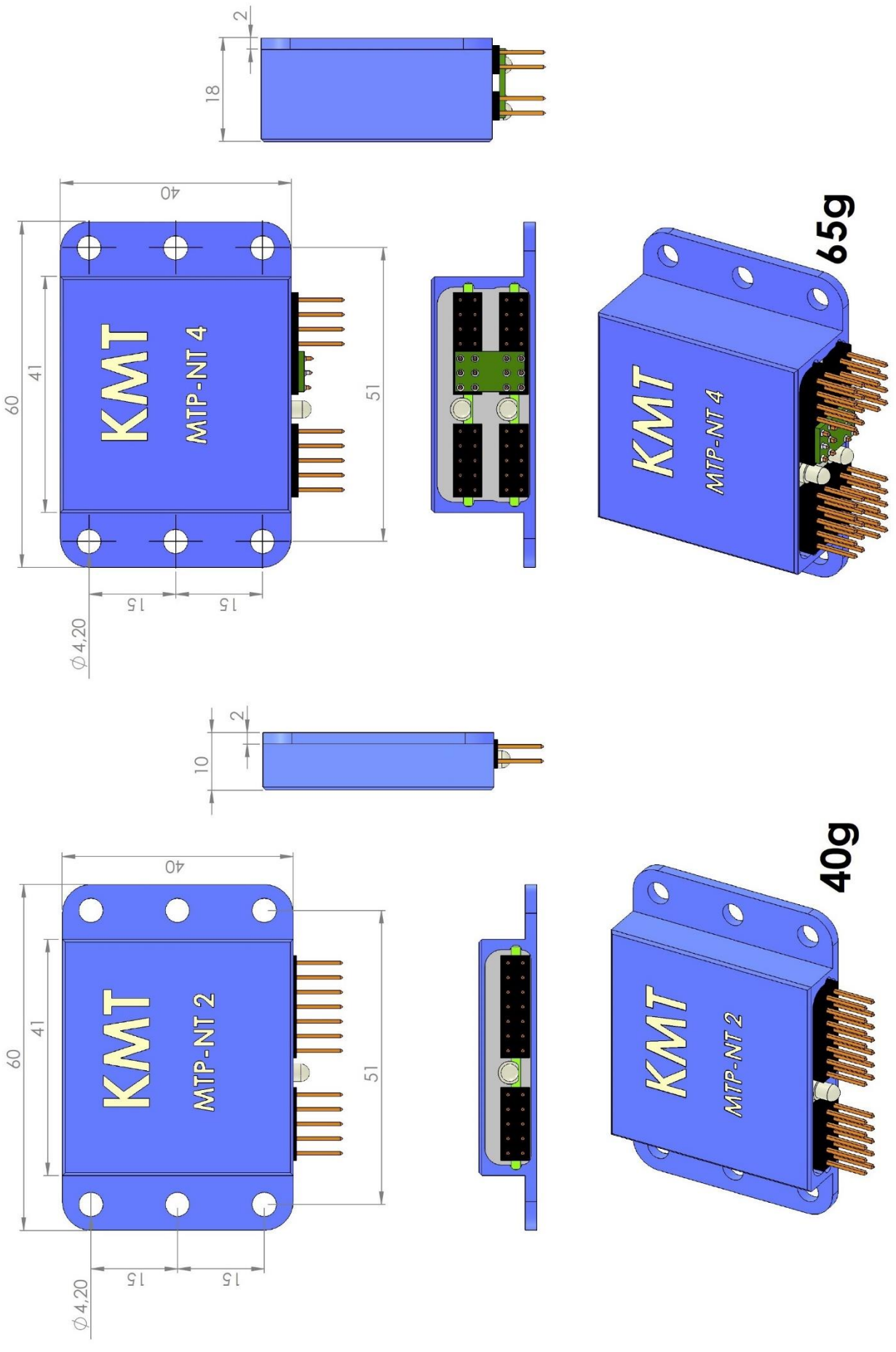
Cut off frequency from anti-aliasing filter (-3dB) and sampling rate (red)

Bit rate	2 CH	4 CH	8 CH	16 CH	32 CH	64 CH	128 CH	256 CH
10000 kbit/s	------	------	24000 Hz max. (62500 Hz)	12000 Hz (31250 Hz)	6000 Hz (15625 Hz)	3000 Hz (7812.5 Hz)	1500 Hz (3906.25 Hz)	750 Hz (1953.125 Hz)
5000 kbit/s	------	24000 Hz max. (62500 Hz)	12000 Hz (31250 Hz)	6000 Hz (15625 Hz)	3000 Hz (7812.5 Hz)	1500 Hz (3906.25 Hz)	750 Hz (1953.125 Hz)	375 Hz (976.56 Hz)
2500 kbit/s	24000 Hz max. (62500 Hz)	12000 Hz (31250 Hz)	6000 Hz (15625 Hz)	3000 Hz (7812.5 Hz)	1500 Hz (3906.25 Hz)	750 Hz (1953.125 Hz)	375 Hz (976.56 Hz)	190Hz (488.28 Hz)
1250 kbit/s	12000 Hz (31250 Hz)	6000 Hz (15625Hz)	3000 Hz (7812.5 Hz)	1500 Hz (3906.25 Hz)	750 Hz (1953.125 Hz)	375 Hz (976.56 Hz)	190Hz (488.28 Hz)	95 Hz (244.14 Hz)
625 kbit/s	6000 Hz (15625Hz)	3000 Hz (7812.5 Hz)	1500 Hz (3906.25 Hz)	750 Hz (1953.125 Hz)	375 Hz (976.56 Hz)	190Hz (488.28 Hz)	95 Hz (244.14 Hz)	------
312,5 kbit/s	3000 Hz (7812.5 Hz)	1500 Hz (3906.25 Hz)	750 Hz (1953.125 Hz)	375 Hz (976.56 Hz)	190 Hz (488.28 Hz)	95 Hz (244.14 Hz)	------	------

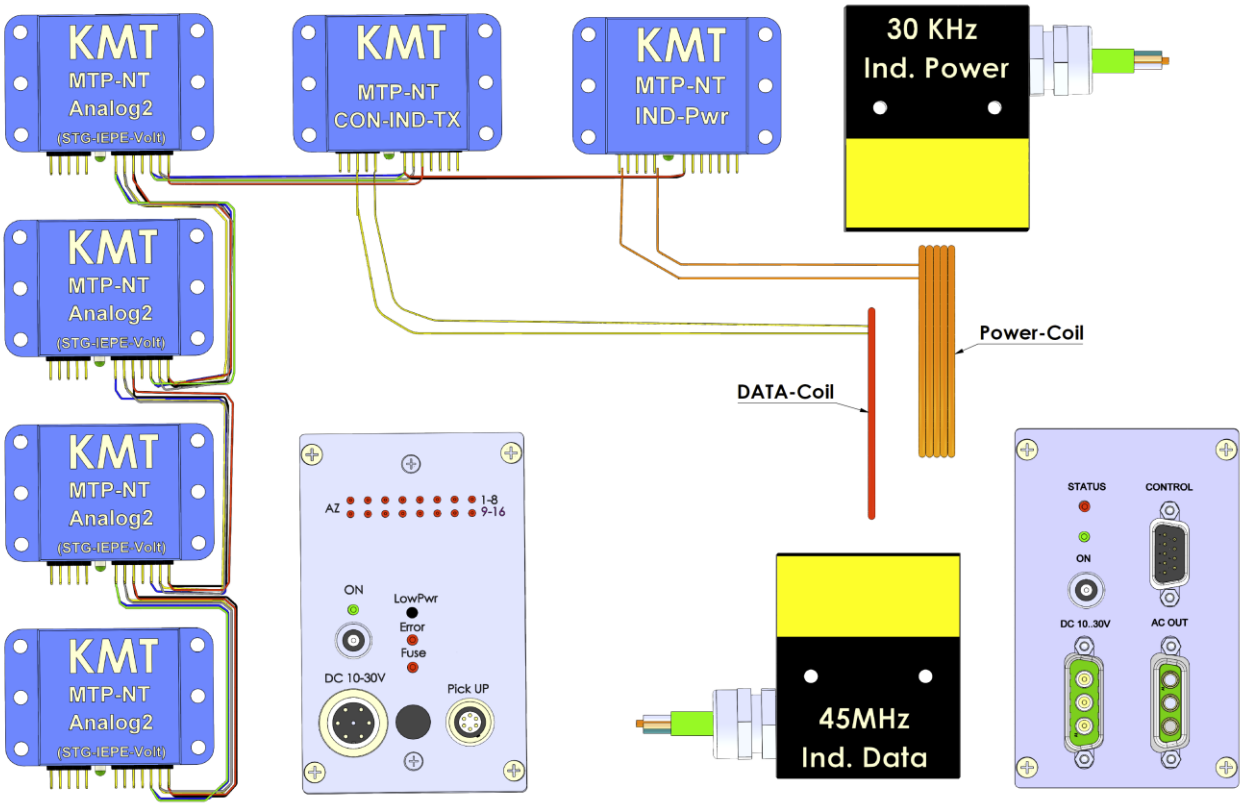
MTP-NT connection overview

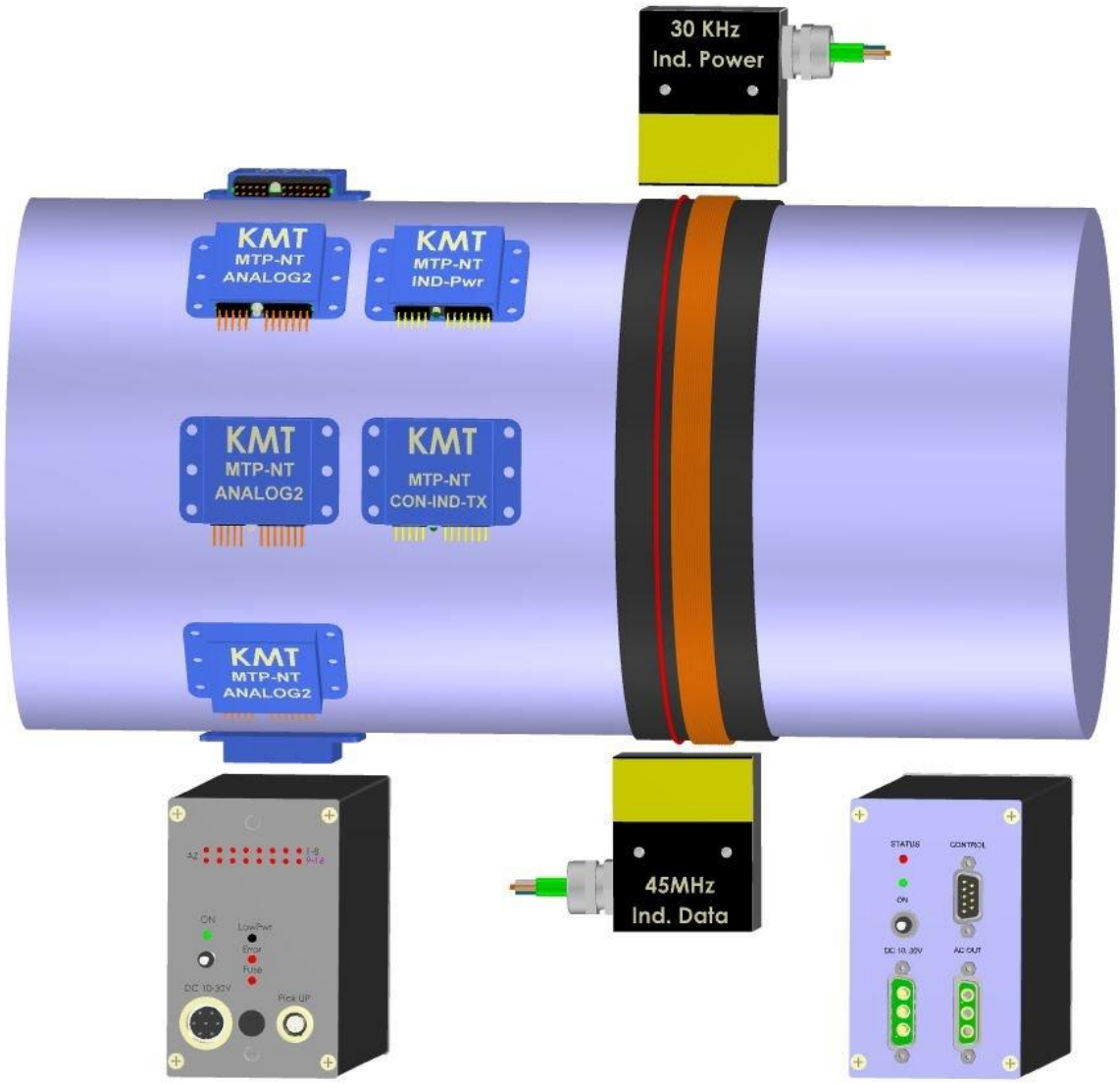


MTP-NT housing dimensions for 2- and 4-channels

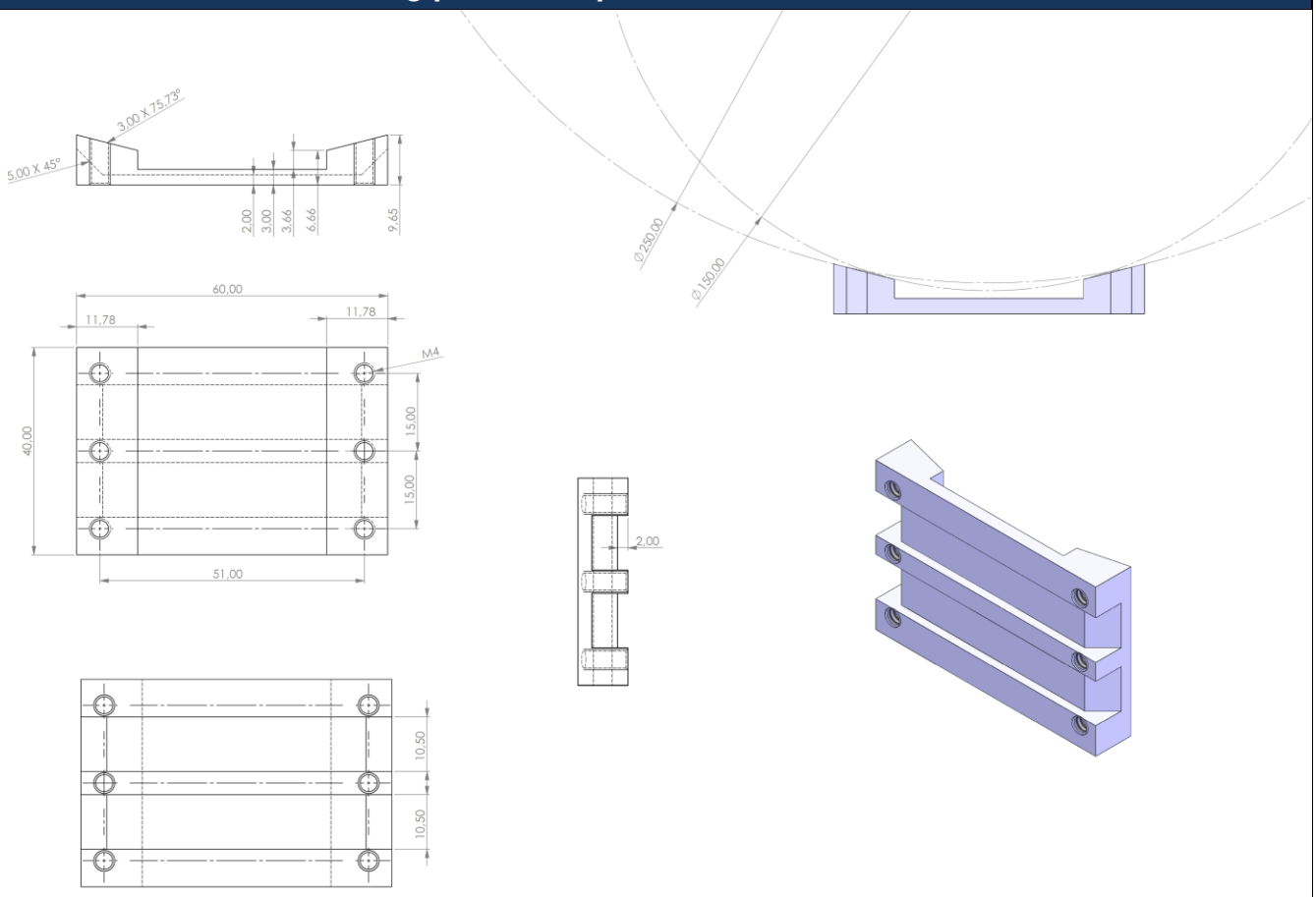


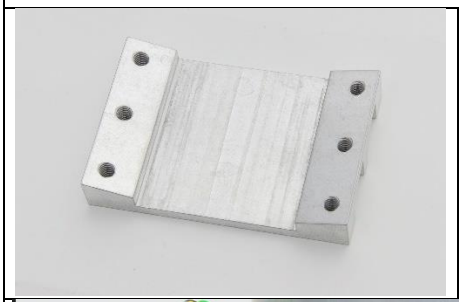
MTP-NT Bock diagram

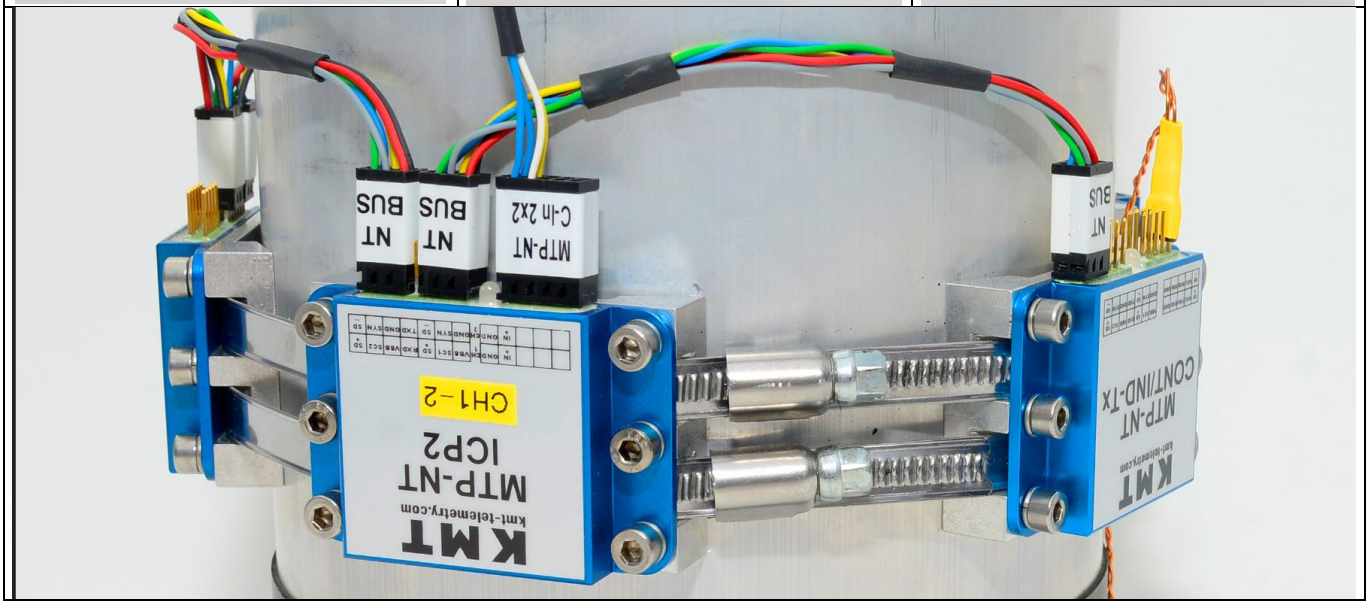




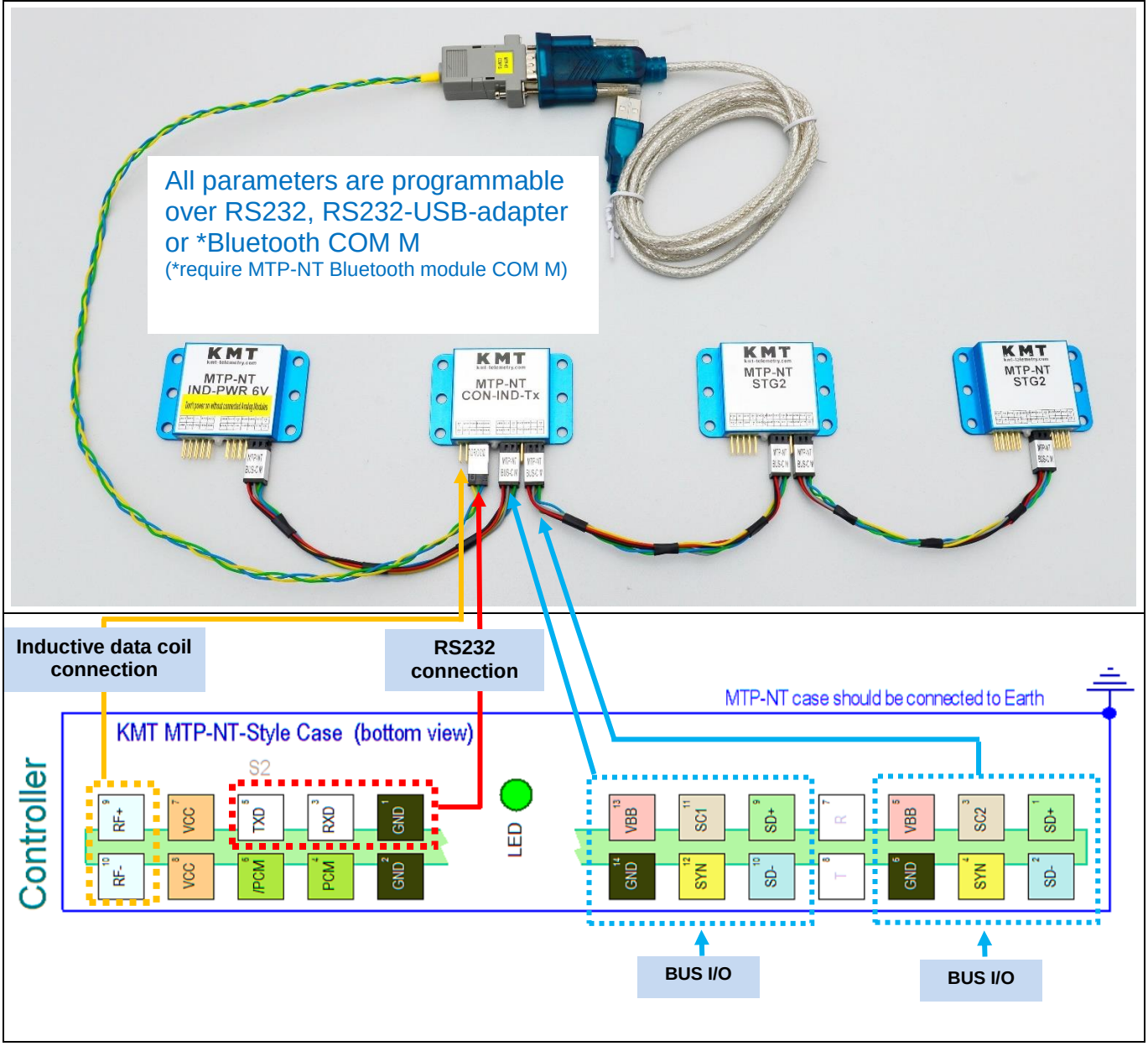
MTP-NT Modules mounting plate example for shaft diameters 100-200 or 150-250mm





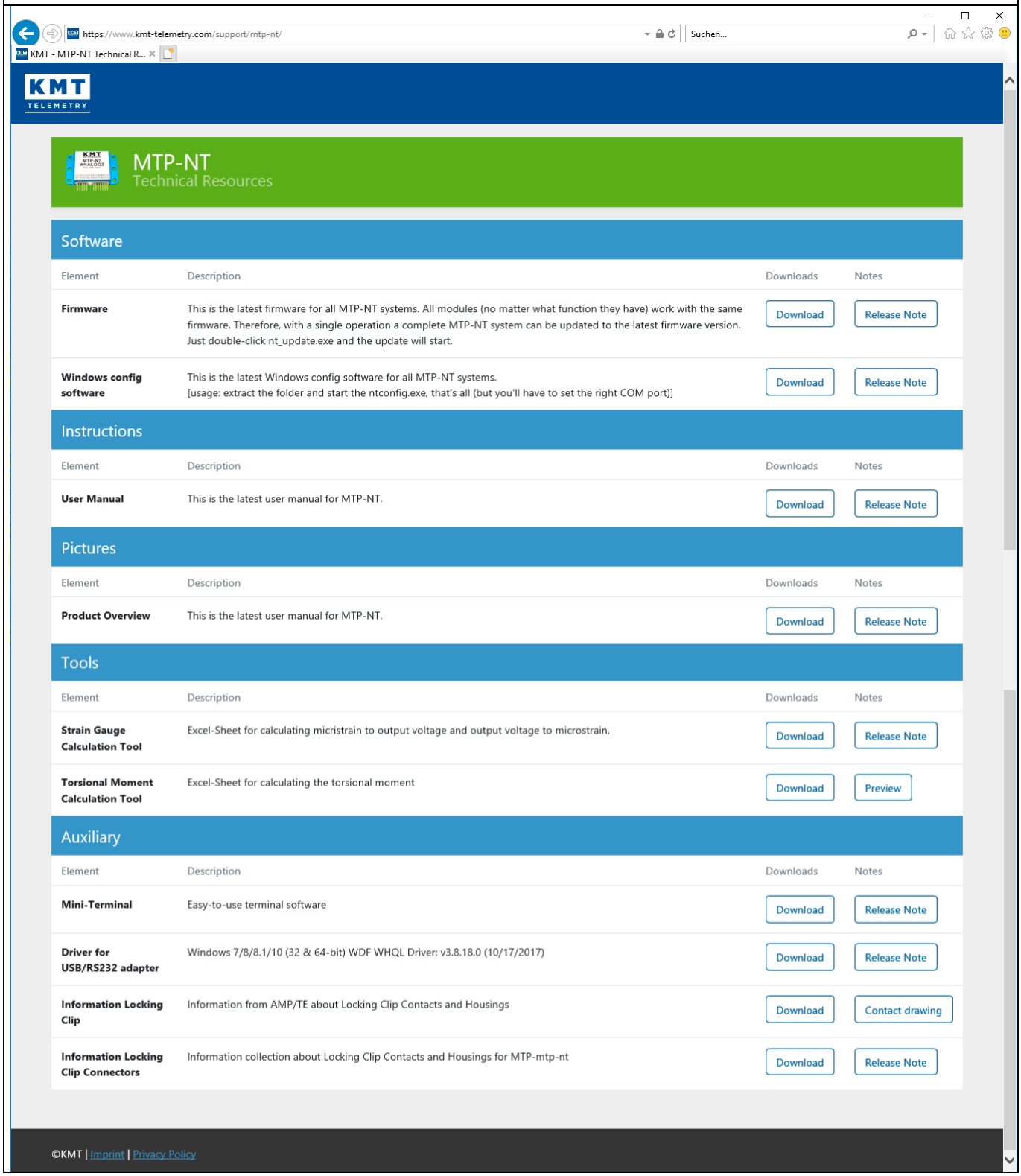


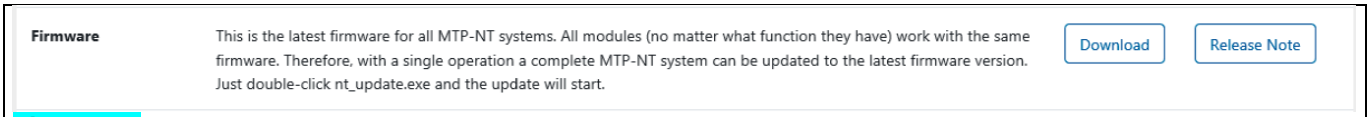
MTP-NT – Setting of parameters or firmware update of all modules via RS232



Download latest firmware, windows config software, user manual and other tools under:

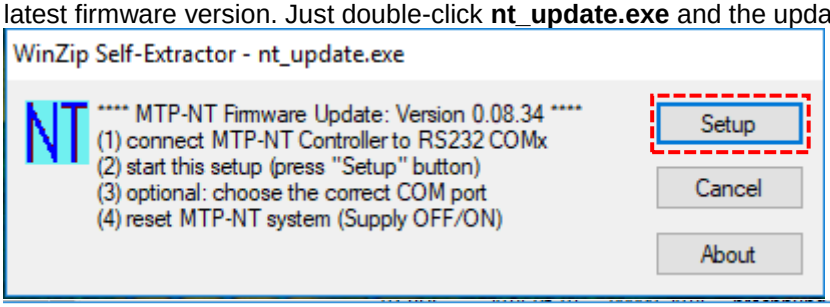
https://www.kmt-telemetry.com/support/mtp-nt/

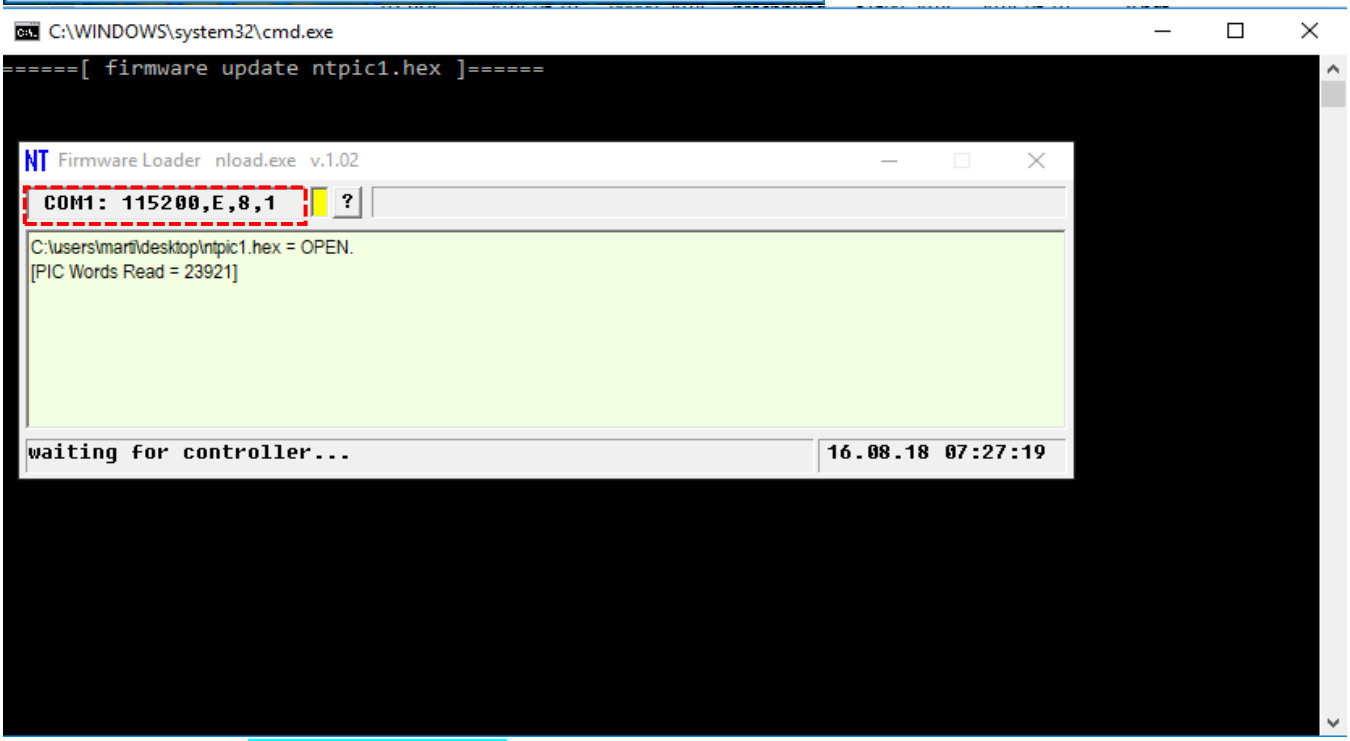




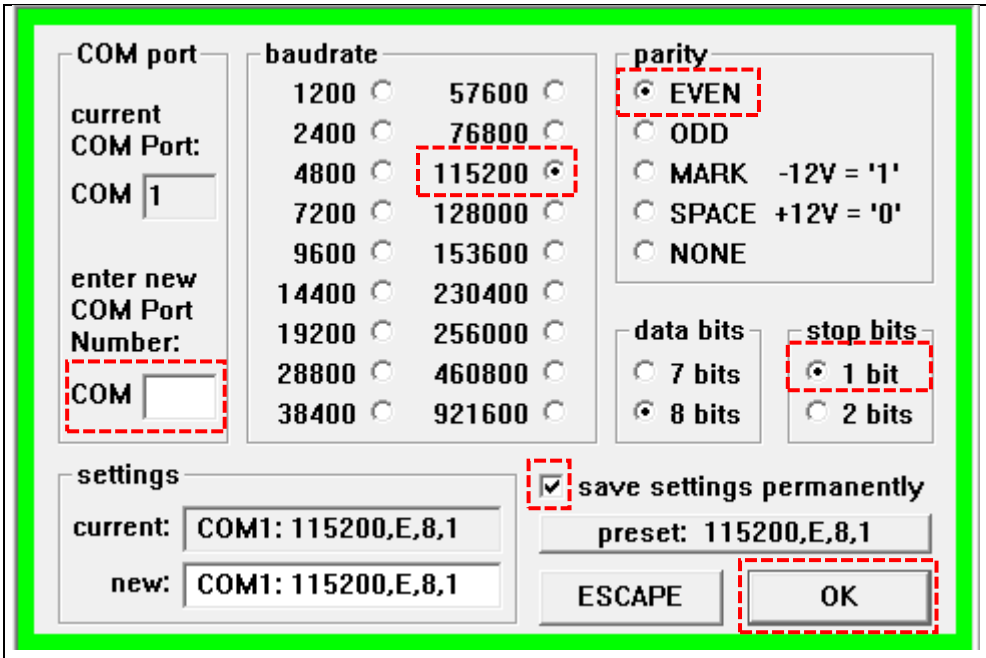
Firmware:

This is the latest firmware for all MTP-NT systems. All MTP-NT modules (no matter what function they have) work with the same firmware. Therefore, with a single operation a complete MTP-NT system can be updated to the latest firmware version. Just double-click **nt_update.exe** and the update will start.





Click with mouse on COM1: 115200, E,8,1 and you can select:



- COM port you must select the COM port of your USB/COM adapter, e.g. COM3
- baudrate must select 115200
- parity must select EVEN
- data bits must select 8 bits
- stop bits must select 1 bits
- save settings permanently (yes)
- OK

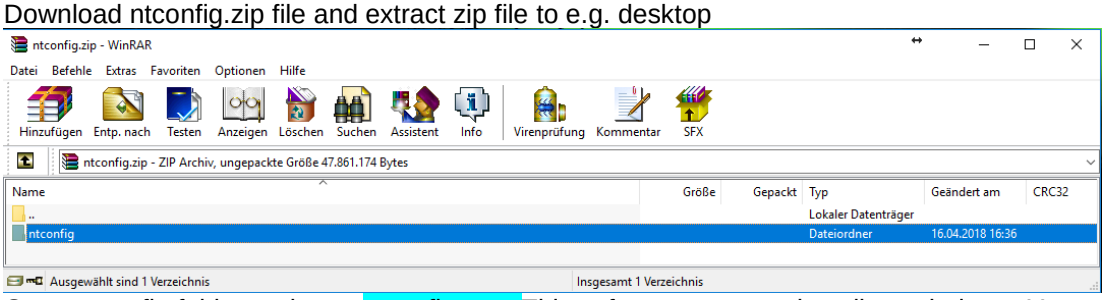
After your settings, reset MTP-NT system with power OFF/ON and the setup will start automatically …….

Download latest firmware, windows config software, user manual and other tools under:
https://www.kmt-telemetry.com/support/mtp-nt/

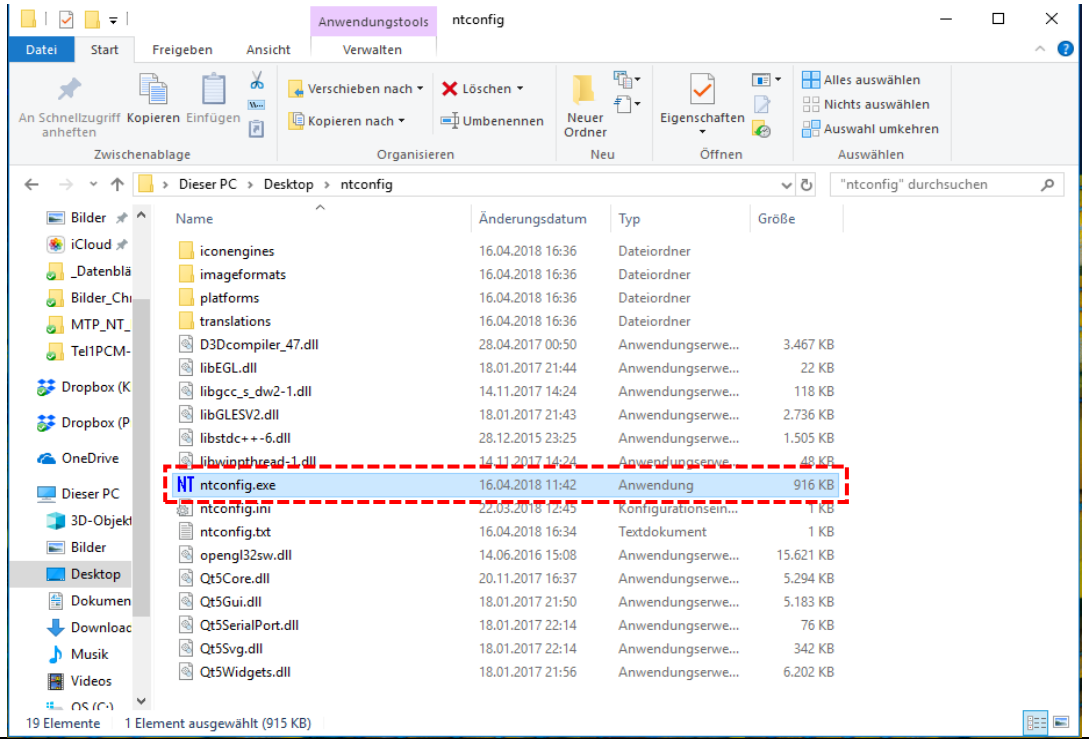
Windows config software	This is the latest Windows config software for all MTP-NT systems. [usage: extract the folder and start the ntconfig.exe, that's all (but you'll have to set the right COM port)]	Download	Release Note

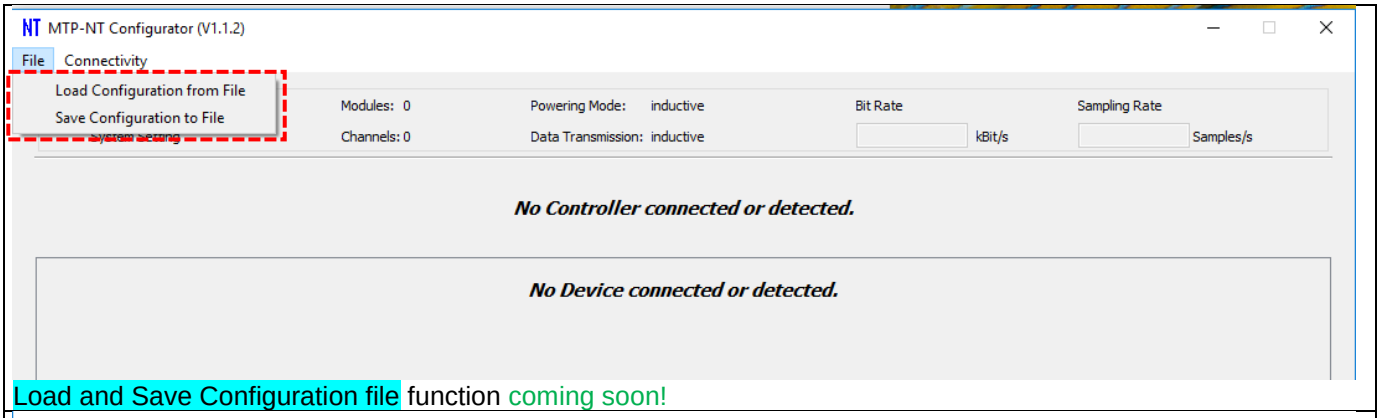
ntconfig.zip

Download ntconfig.zip file and extract zip file to e.g. desktop

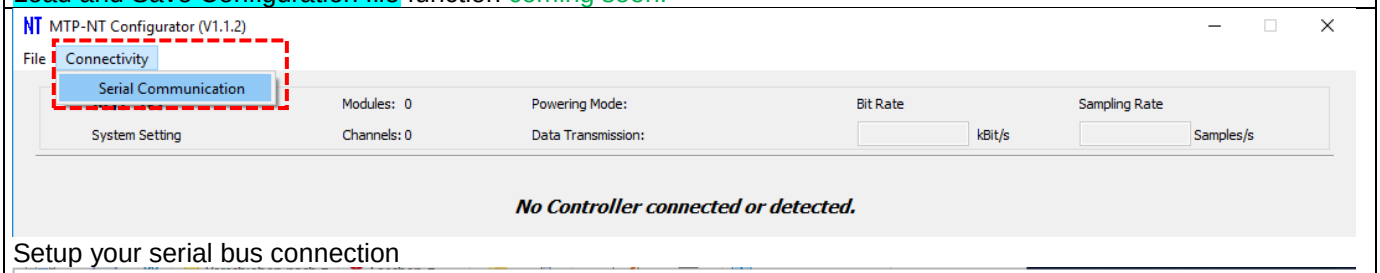


Open ntconfig folder and start ntconfig.exe. This software must not install on windows. You can start direct from this ntconfig folder!

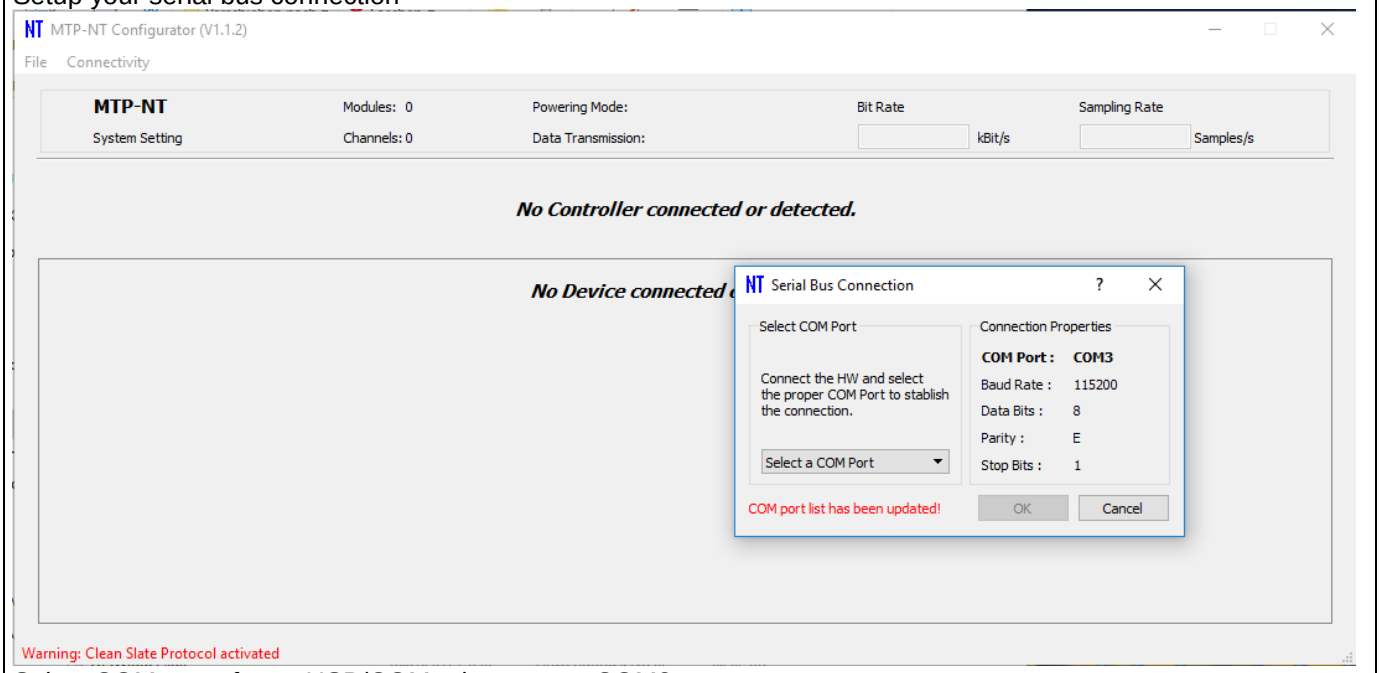




Load and Save Configuration file function coming soon!

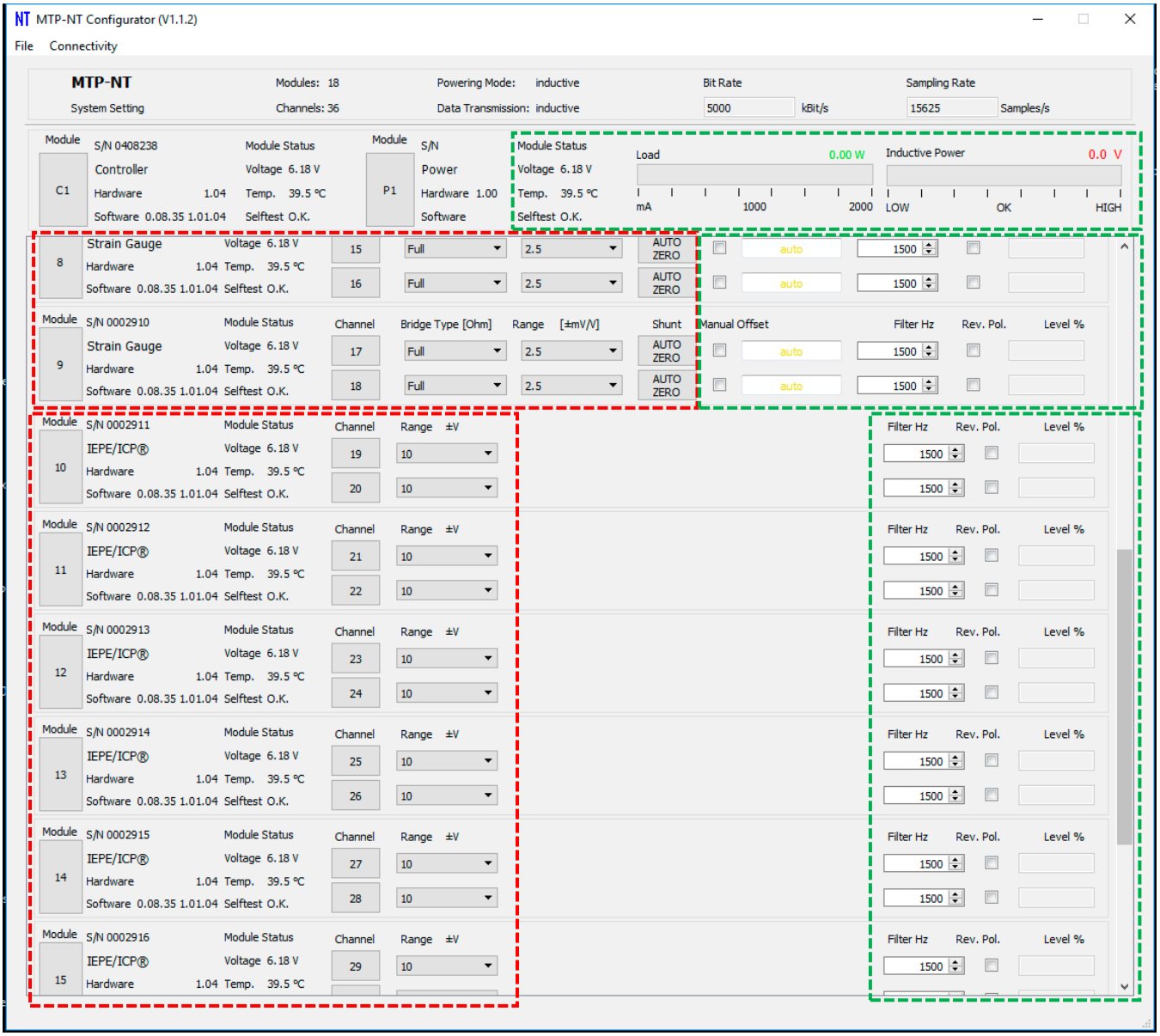


Setup your serial bus connection



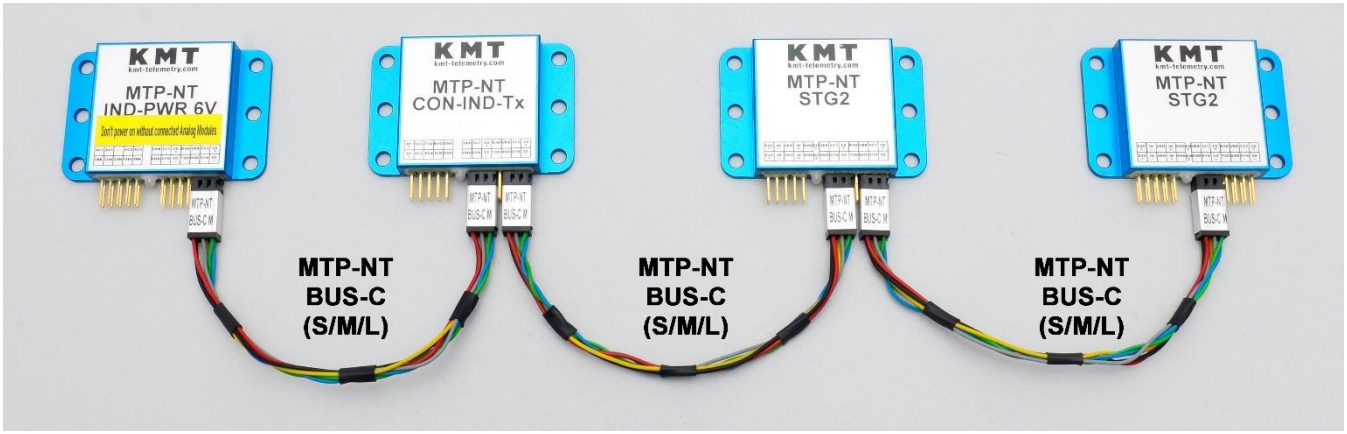
Select COM port of your USB/COM adapter, e.g. COM3

Now the setup will download from the MTP-NT-CONTOLER in real time:



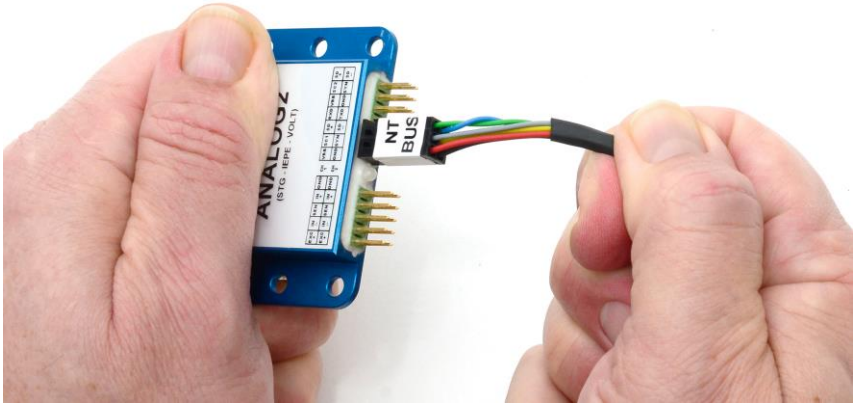
Green frame = This function coming soon!
Red frame is full in function!

MTP-NT – Easy to connect with daisy-chain connection with the same MTP-NT-BUS-C cable



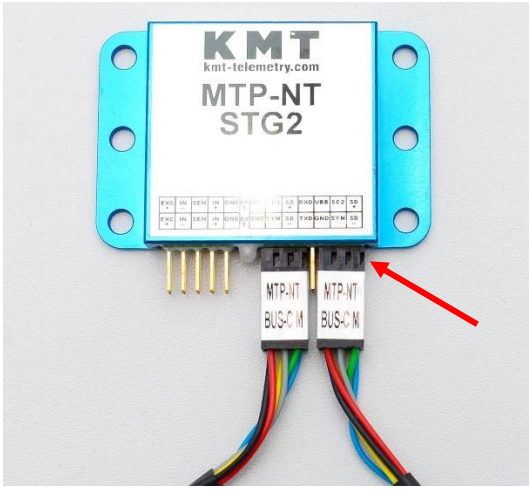
The bus is extendable to several meters!

AMP "Locking-Clip" crimp connectors withstand ultra-harsh vibration and shock environment

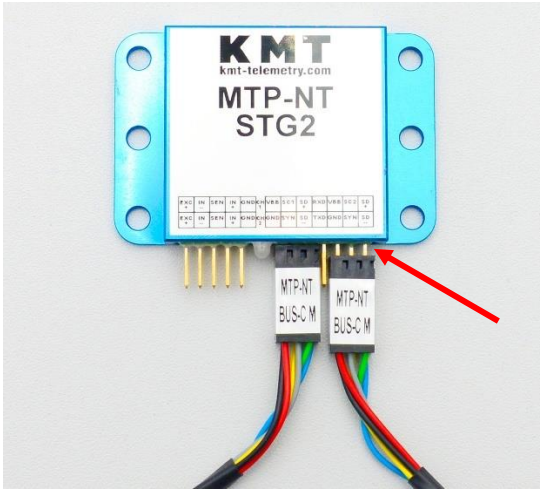


Caution: Locking-Clip must be complete connected!

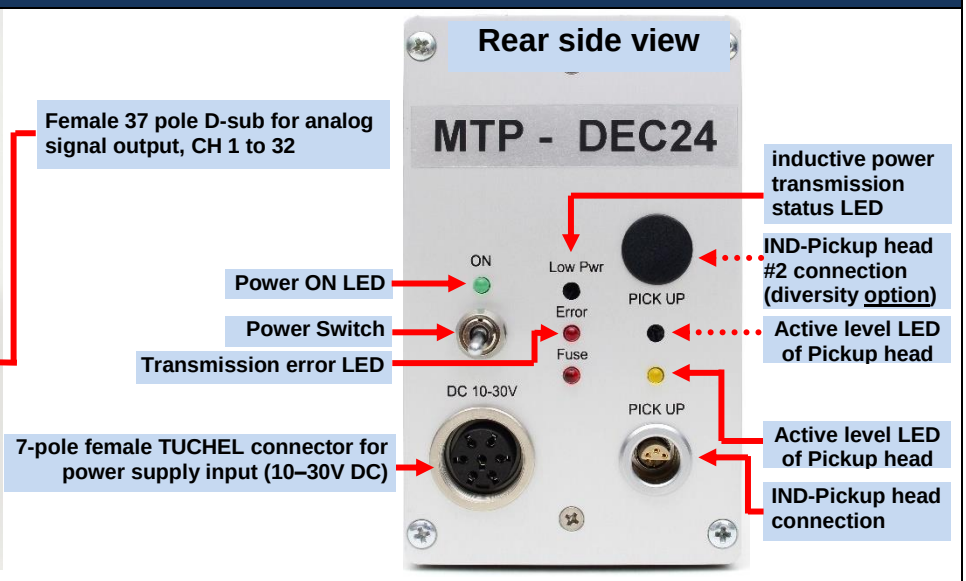
GOOD ☺

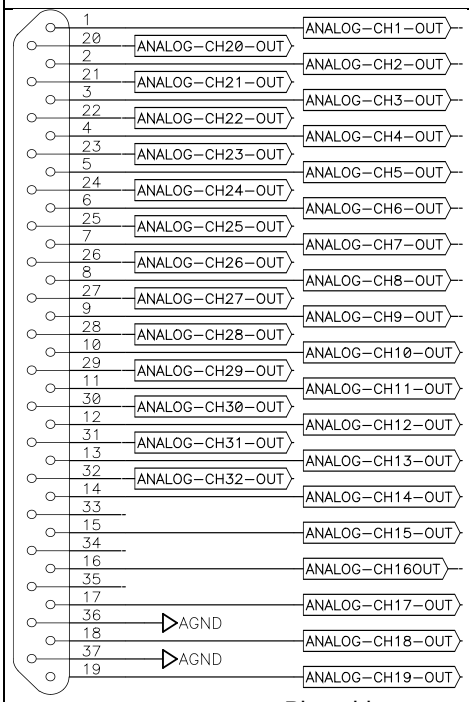


BAD ☹

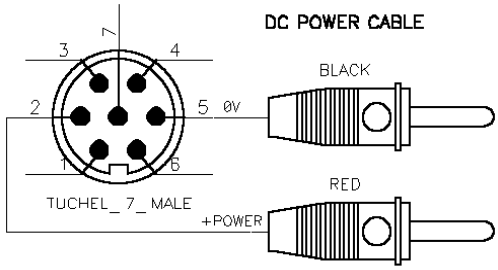


MTP-NT-DEC8/16/24/32 Receiver unit for max 32 Channels output via 37 pol. D-sub Inductive transmission 45 MHz version up to 5000 Mbit (10000Mbit on special request!)





Plug-side

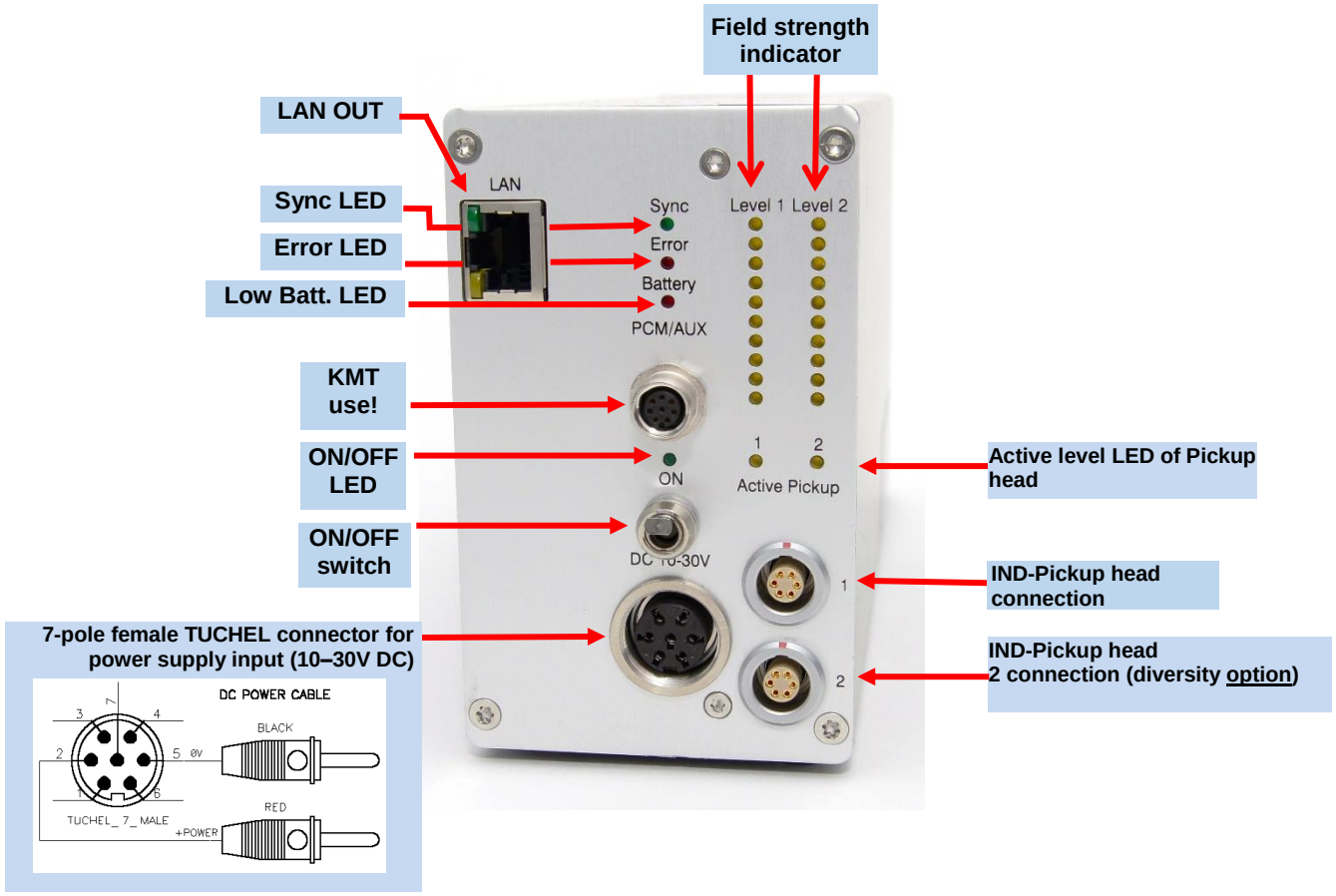


Optional BNC16/32 Box. Connect on 37pol D-Sub

MTP-NT –DEC8/16/24/32 System Parameters:

Channels:	8,16,24 or 32x +/-10 V analog outputs via D-sub female socket
Resolution:	16 bit D/A converter, with smoothing filter
Power supply input:	10-30 Vdc, power consumption < 24 Watt
Dimensions:	205 x 105 x 65mm
Weight:	1.25 kg without cables and data pickup head
Overall measurement uncertainty (sensor input → decoder output):	< 0.1% without sensor influences
Environmental	
Operating:	-20°C to +70°C
Humidity:	+80% not condensing (@ +20°C)
Vibration:	5g
Static acceleration:	10g in all directions
Shock:	100g in all directions

MTP-NT-DIG-DEC-V2 Receiver unit with ethernet (LAN) output
Inductive transmission 45 MHz version up to 5000 Mbit (10000Mbit on special request!)



MTP-NT-DIG-DEC-V2 System Parameters:

Channels:	2-256 CH ethernet outputs via LAN
Power supply input:	10-30 Vdc, power consumption < 24 Watt
Dimensions:	205 x 105 x 65mm
Weight:	0.990 kg without cables and data pickup head
Overall measurement uncertainty (sensor input → decoder output):	< 0.1% without sensor influences
Environmental	
Operating:	-20°C to +70°C
Humidity:	+80% not condensing (@ +20°C)
Vibration:	5g
Static acceleration:	10g in all directions
Shock:	100g in all directions

05.06.16 Version 002

KMT IP LAN Interface TCP Settings

1. TCP Block Format

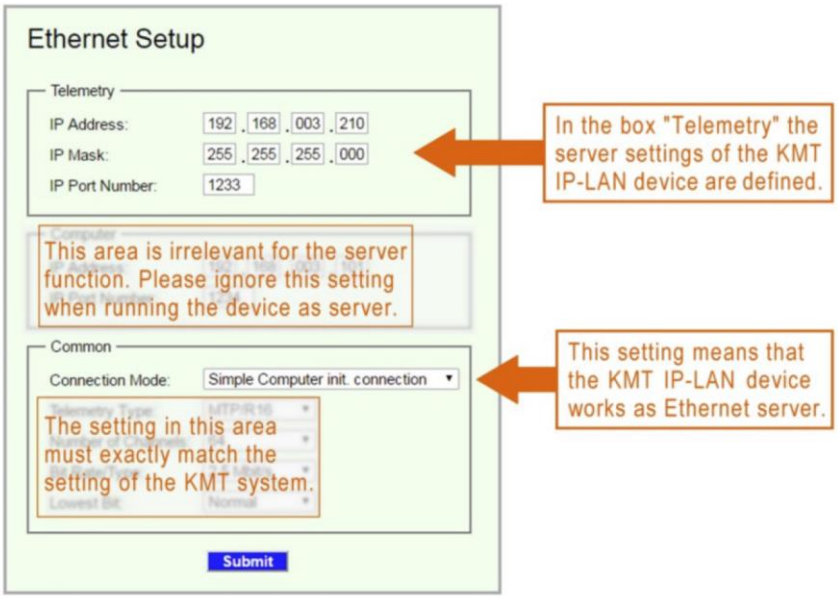
Index	Name	Size / Format	Example	Comment
0	frame_size	2 Byte unsigned int	00000000 00001000 Frame Size = 8 Bytes	Frame Size in Bytes
2	number_of_frames	2 Byte unsigned int	00000000 00001010 10 Frames	Number of Frames
4		frame_size (Bytes)		first Frame
...	...	...	...	...
n		frame_size (Bytes)		last Frame

blue = Data Section

n = ((4 + (frame_size * number_of_frames)) - frame_size)

- The data sample format is 16 Bit unsigned integer, as it comes from the A/D converter.
- The frame size is the data sample size (2 bytes) times number of channels.
- The order of bytes is Little-Endian (Intel).

2. IP-LAN Device Setting (**server mode** for PC client software)



3. Method for transmitting data via TCP

(a) Ensure that a valid PCM data stream is present at the PCM input. Otherwise the device will send nothing over TCP.
(b) Open the socket defined in the box "Telemetry" with your own client software (see paragraph 2).
(c) The IP-LAN device will immediately start to transmit the data stream (see paragraph 1).
(d) Note that your software must be fast enough to prevent an overflow of the TCP buffer. Otherwise you could receive garbage. The only way to check data integrity is to check the plausibility of the header. In particular, the frame size must never change within a session, and the number of frames must not contain idiotic values.

Data frame:

For 4 Channels: 32 bit Barker Synch Code + 4x16 bit Data + 4x16 bit Data + 4x16 bit Data + 4x16 bit Data + 32 bit reserved

For 8 Channels: 32 bit Barker Synch Code + 8x16 bit Data + 8x16 bit Data + 32 bit reserved

For 16 Channels: 32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved

For 32 Channels: 32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.1 = CH1..Ch16) **+**

32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.2 = CH17..Ch32)

For 64 Channels: 32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.1 = CH1..Ch16) **+**

32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.2 = CH17..Ch32) **+**

32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.3 = CH33..Ch48) **+**

32 bit Barker Synch Code + 16x16 bit Data + 32 bit reserved (Frame Nr.4 = CH49..Ch64)

MTP-NT DEC4/8/16/24/32 with analog output via BNC (4/8) or Sub-D 16/24/32

4 CH

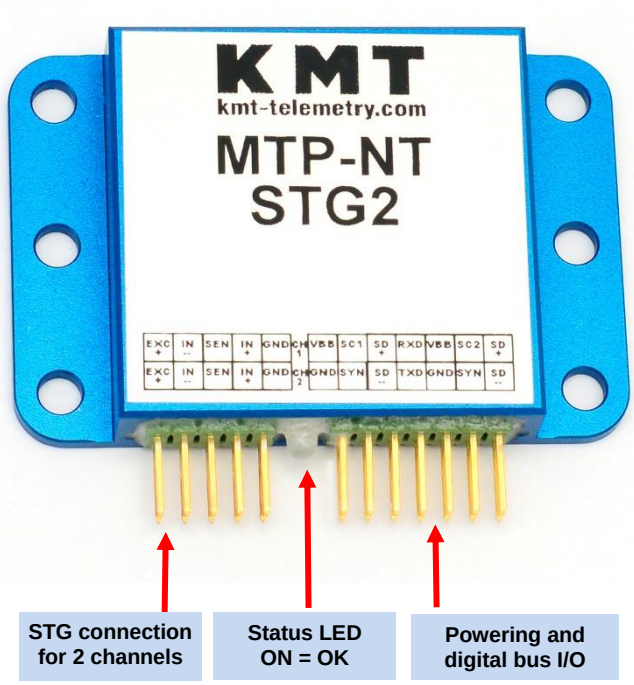
8 CH

16/24/32 CH

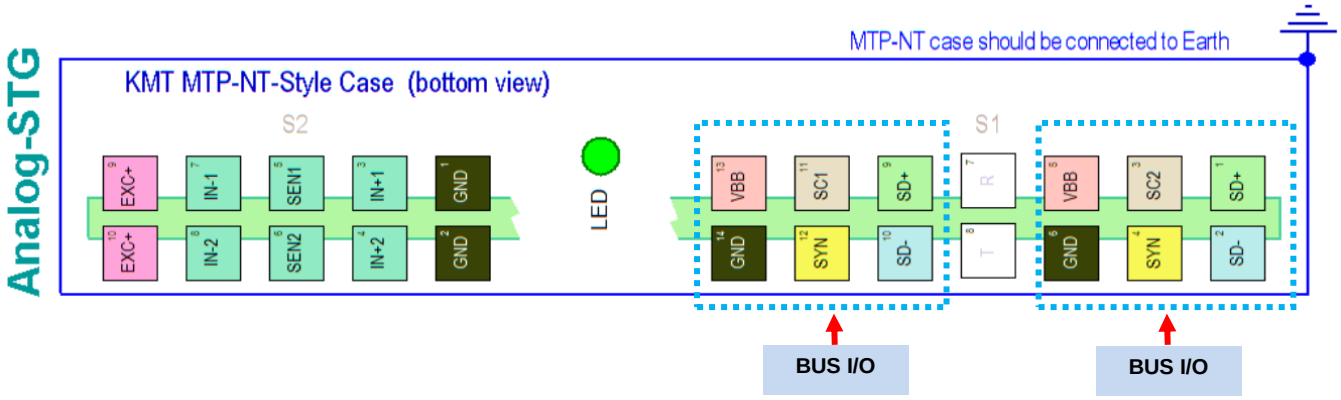
MTP-NT-DIG-DEC-V2 with ethernet output via LAN

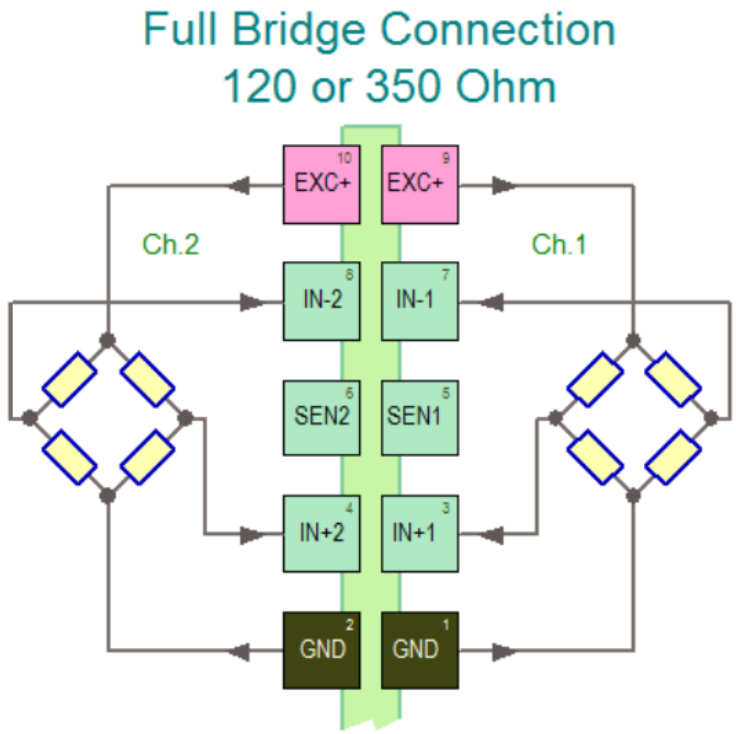
2-256 CH

MTP-NT STG - Acquisition module for 2 channels strain gages (STG)

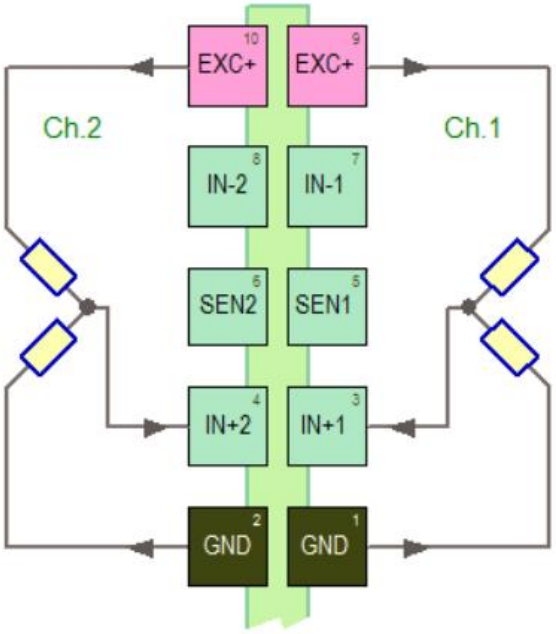


MTP-NT-STG2
Acquisition module for 2 strain gauges
Full, half and quarter bridge (≥ 350 Ω)
Full, half and quarter bridge (120 Ω)
Fixed excitation 4 Vdc
Offset compensation by auto zero
Manual offset shifting after auto zero
Gain 62.5-8000 (40 to 0.3 mV/V)
Shunt-calibration 100 kΩ 0.1%
Signal bandwidth 0 Hz to 24000 Hz*
(*see table of cut-off-frequencies)
ADC Resolution 16 Bit
Gain uncertainty < 0.1%
Power supply: VBB = 6 to 9 Vdc
Current consumption (with full bridge 350 Ohm) 90 mA

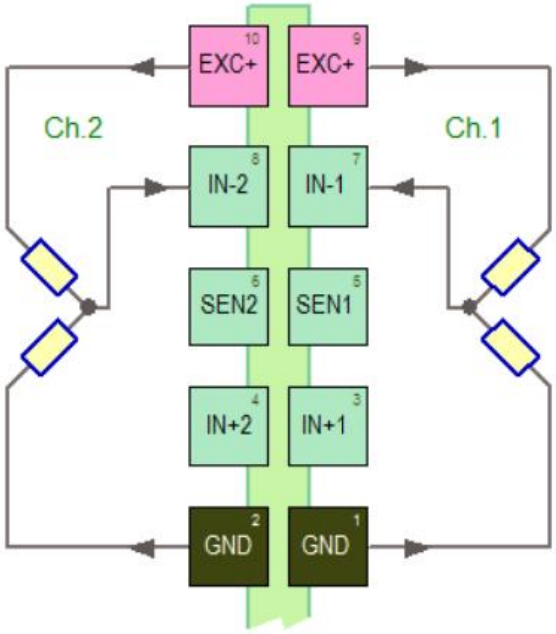




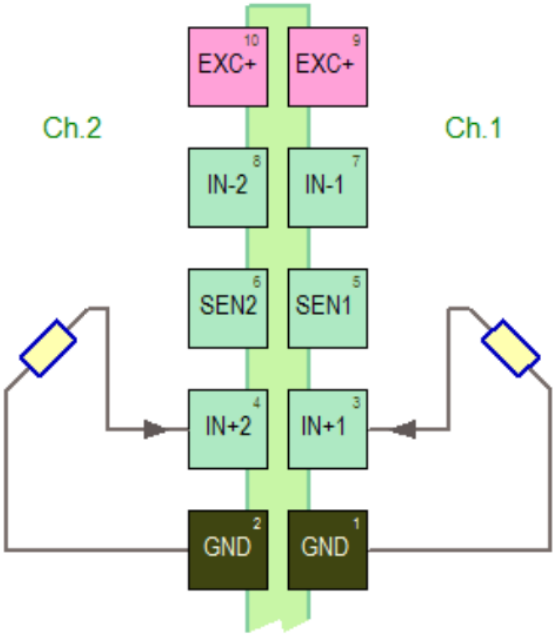
Half Bridge Connection 350 Ohm



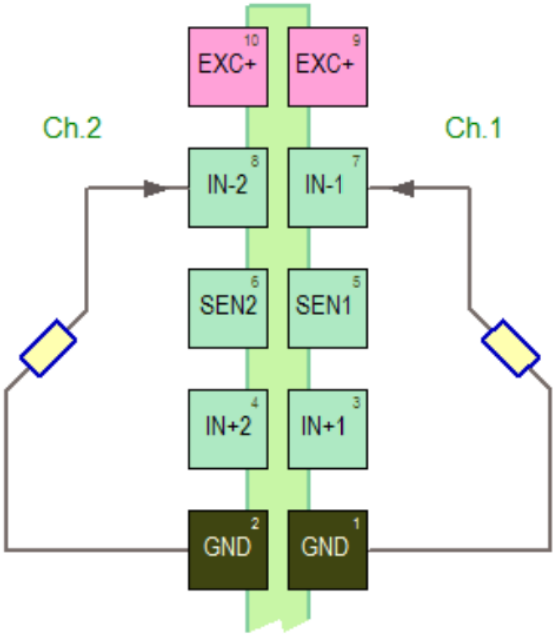
Half Bridge Connection 120 Ohm



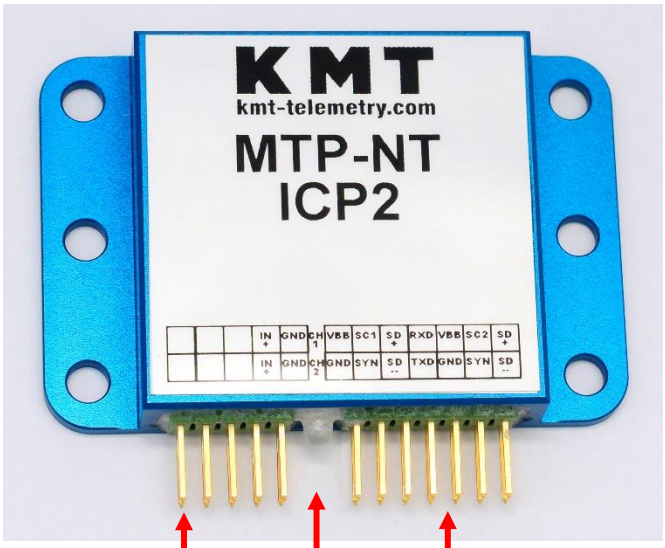
Quarter Bridge Connection 350 Ohm



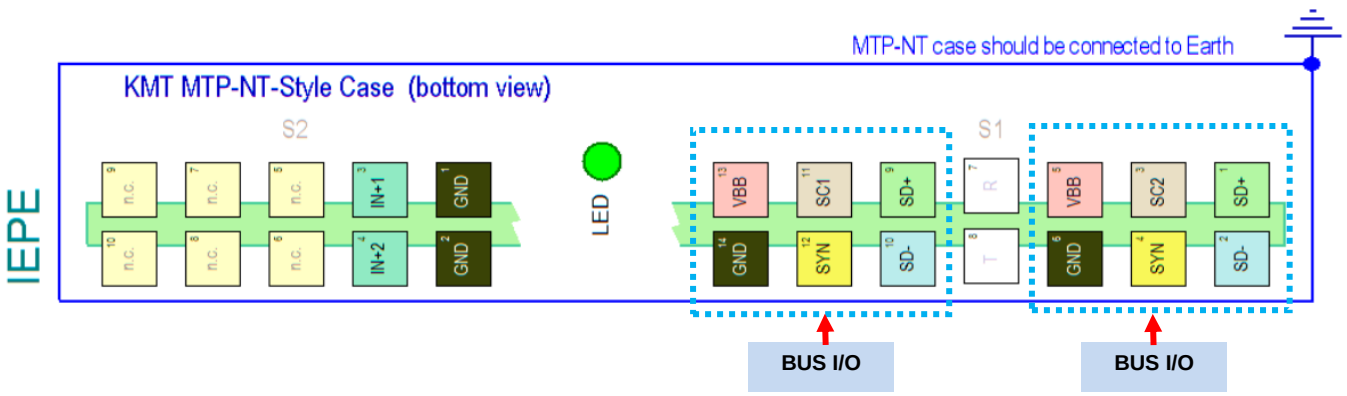
Quarter Bridge Connection 120 Ohm

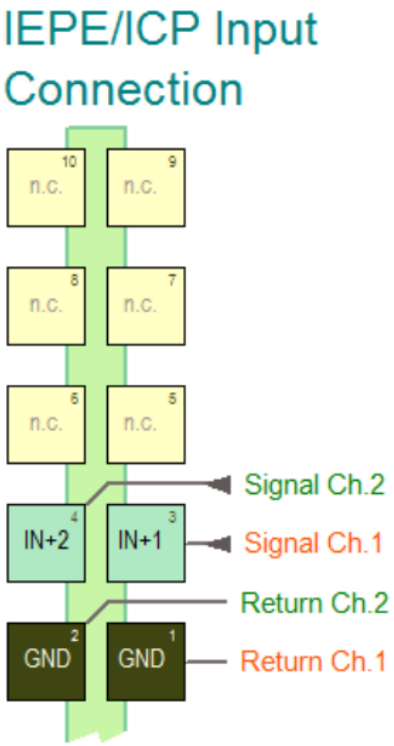


MTP-NT ICP - Acquisition module for 2 channels IEPE sensor

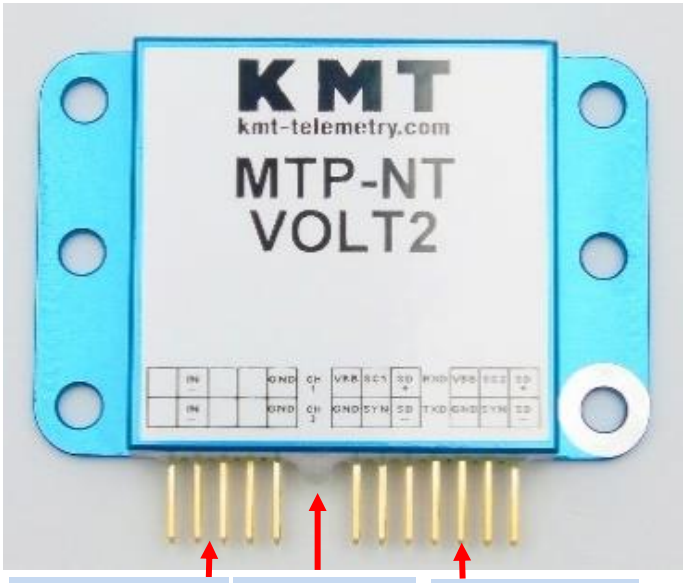


MTP-NT-IEPE2/ICP
Acquisition module for 2 IEPE/ICP® sensors
Current EXC. 4mA
Gain: 1-2-4-8-16-32
Signal bandwidth 3 Hz to 24000Hz*
(*see table of cut-off-frequency)
ADC Resolution 16 Bit
Gain uncertainty < 0.1%
Power supply: 6 to 9 Vdc
Current consumption 120 mA

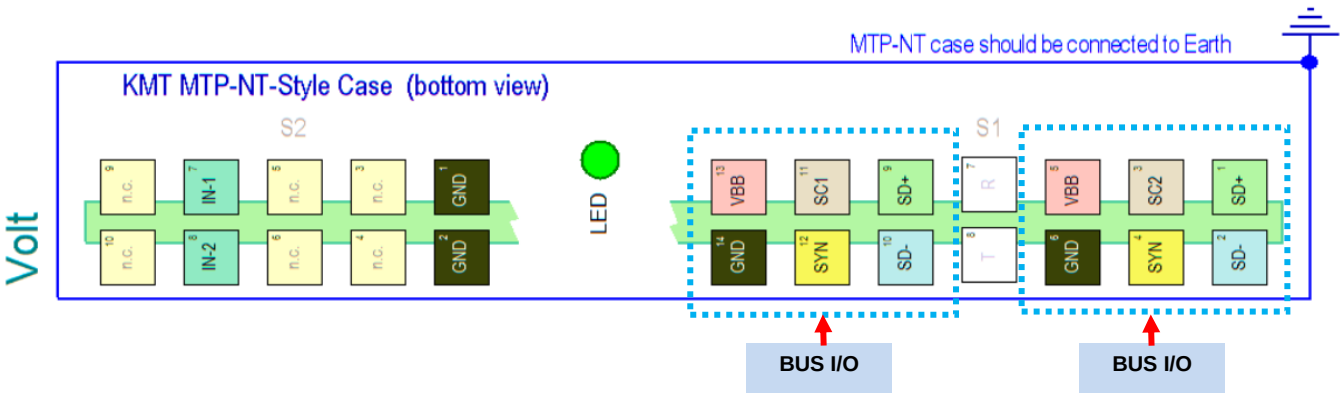


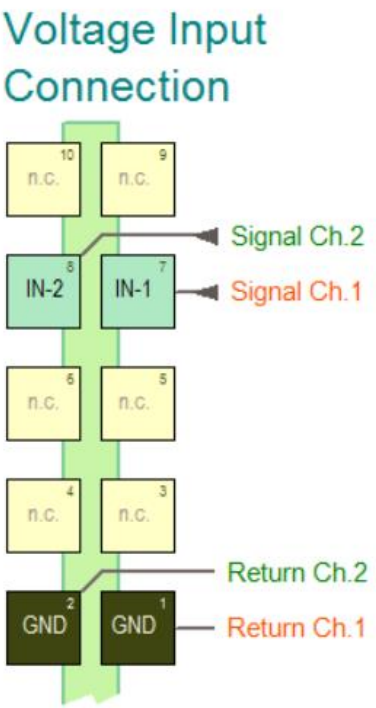


MTP-NT VOLT - Acquisition module for 2 channels VOLT inputs



MTP-NT-VOLT
Acquisition module for 2x high level inputs
Input ranges ±10 to ±0.08 V
Signal bandwidth 0 Hz to 24000 Hz*
(*see table of cut-off-frequencies)
+4 V sensor excitation max. 20 mA
ADC Resolution 16 Bit
Measurement uncertainty < 0.1%
Power supply: 6 to 9 Vdc
Current consumption 60 mA





MTP-NT THERMO - Acquisition module for 2 channels THERMO inputs

VOLT connection for 2 channels | **Status LED ON = OK** | **Powering and digital bus I/O**

MTP-NT-THERMO 2

Acquisition module for 2x Temperature Sensor
Inputs galvanically isolated (max. potential difference 32 Vdc)
Lowpass filter 1 Hz to 32 Hz (programmable)

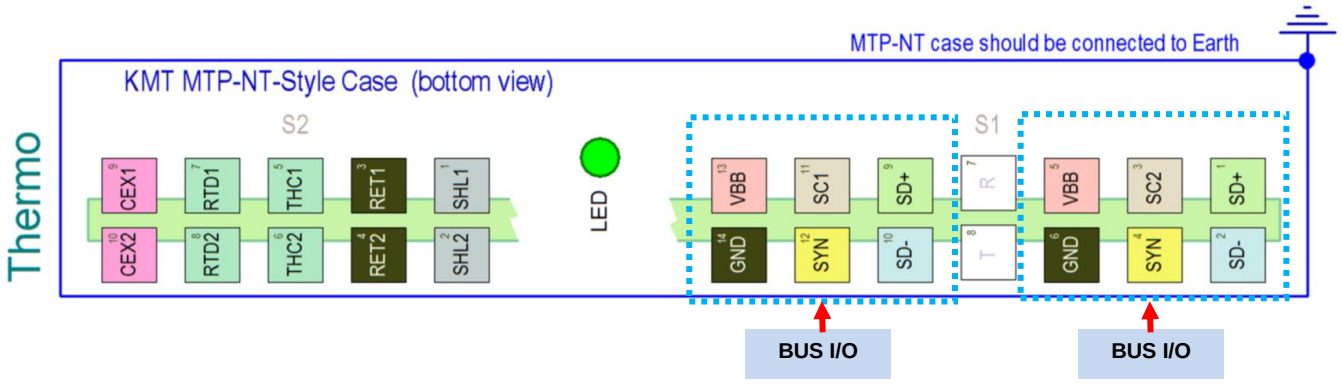
RTD Sensor types: PT100, PT500, PT1000
Connection: 2-Wire and 3-Wire
Excitation current 1 mA

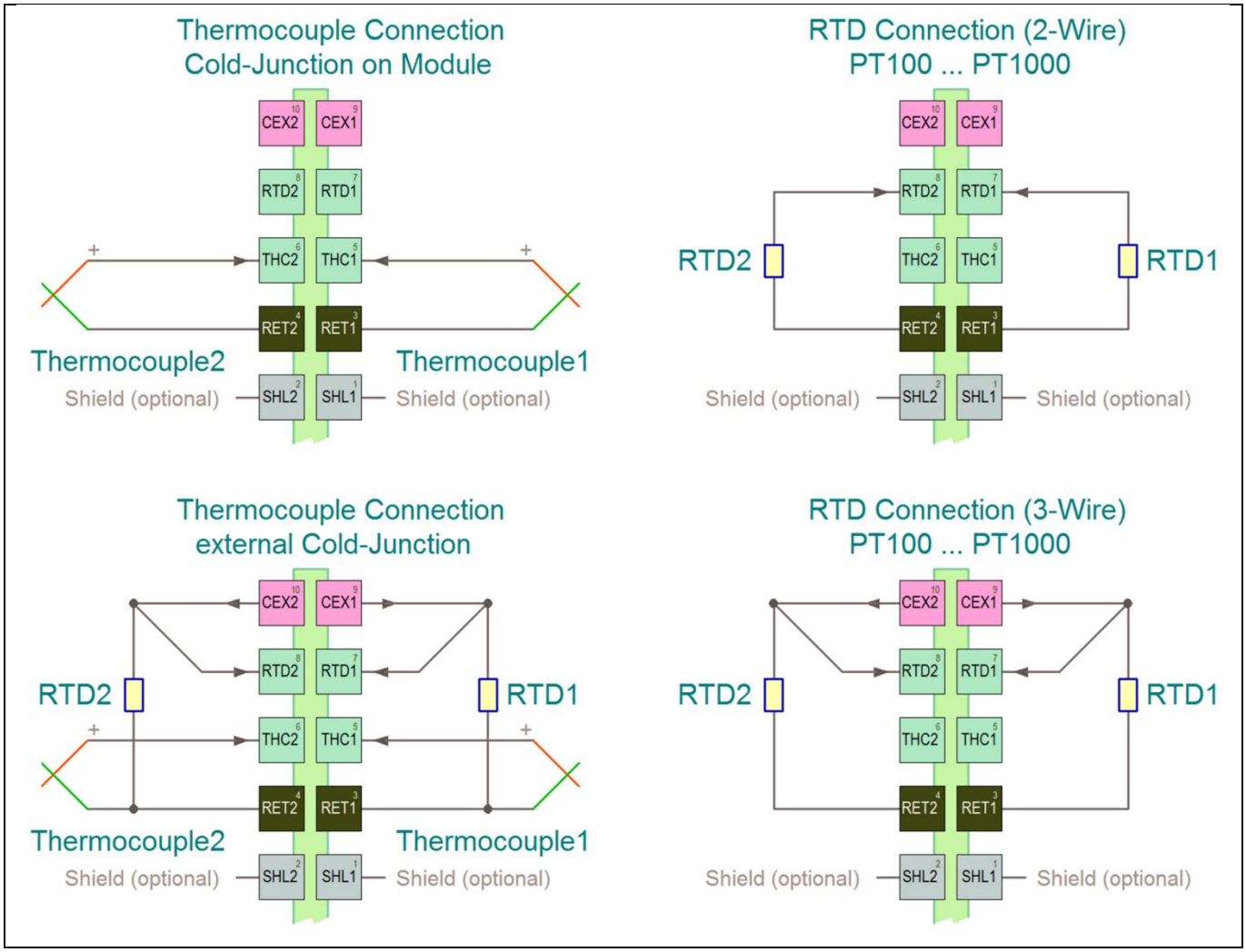
Thermocouple Sensor types: K(NiCr-Ni)
J(Fe-CuNi)*, N(NiCrSi-NiSi)*, E(NiCr-CuNi)*, T(Cu-CuNi)*, R(Pt13Rh-Pt)*, S(Pt10Rh-Pt)*, B(Pt30Rh-Pt6Rh)*
Reference junction compensation internal & external (RTD sensor)

Other Sensor types: NTC(Thermistor)*, customer-specific*

Measuring range -273.15 °C to +1635.2 (programmable +817.6, +408.8)
Output resolution 20 Bit/K (10 Bit/K or 5 Bit/K programmable)
Measurement uncertainty 1 K
Sensor break detection
Power supply: 6 to 9 Vdc
Current consumption 90 mA

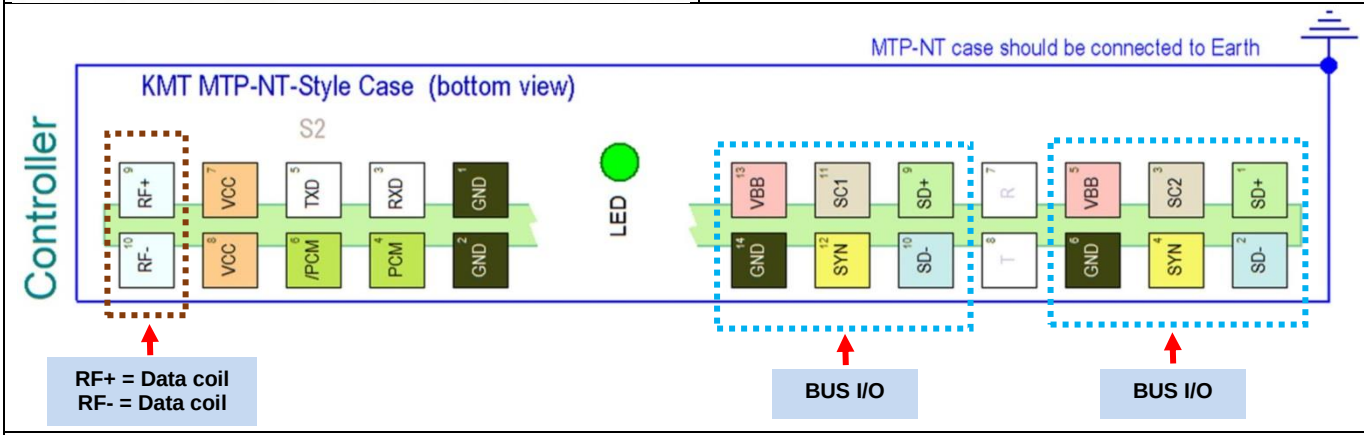
* per Software update

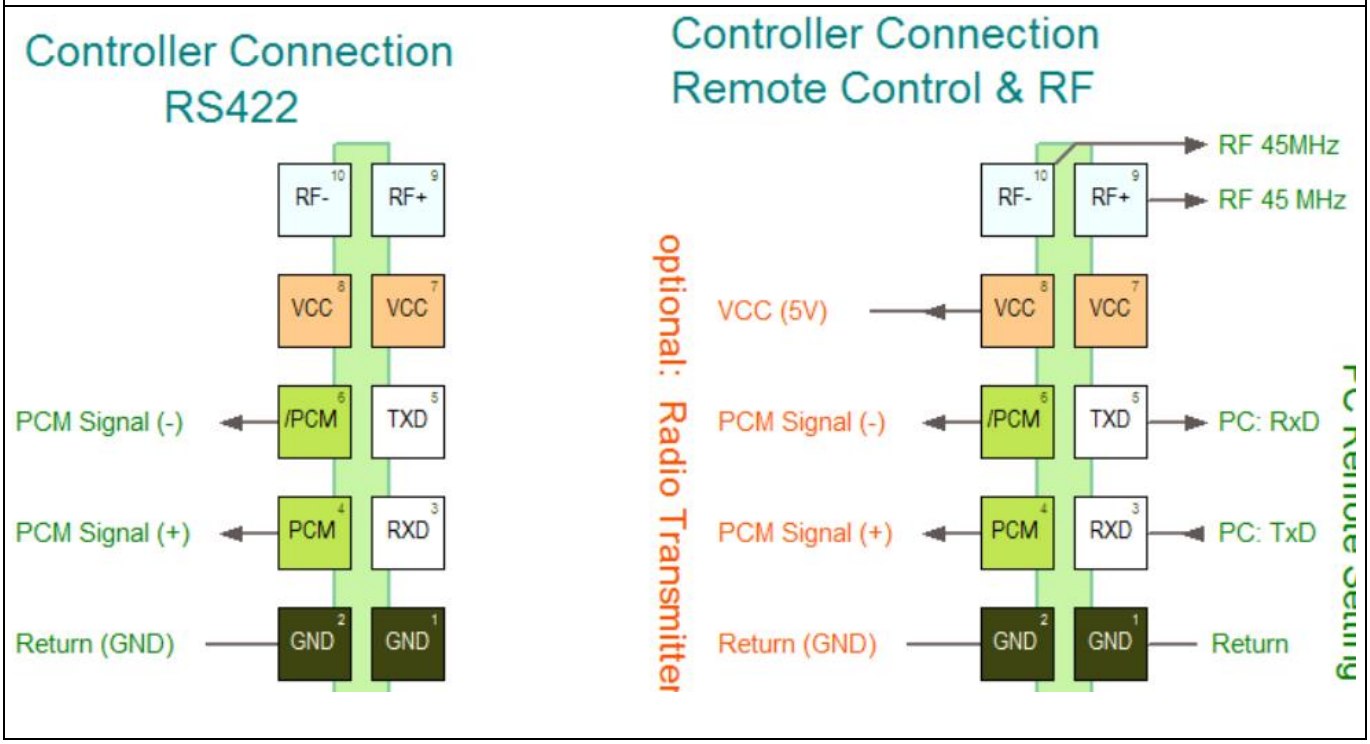



Thermocouple Connection
Cold-Junction on Module
CEX2
CEX1
RTD2
RTD1
THC2
THC1
RET2
RET1
SHL2
SHL1
Thermocouple2
Thermocouple1
Shield (optional)
Shield (optional)
RTD Connection (2-Wire)
PT100 ... PT1000
RTD2
RTD1
Shield (optional)
Shield (optional)
Thermocouple Connection
external Cold-Junction
RTD Connection (3-Wire)
PT100 ... PT1000

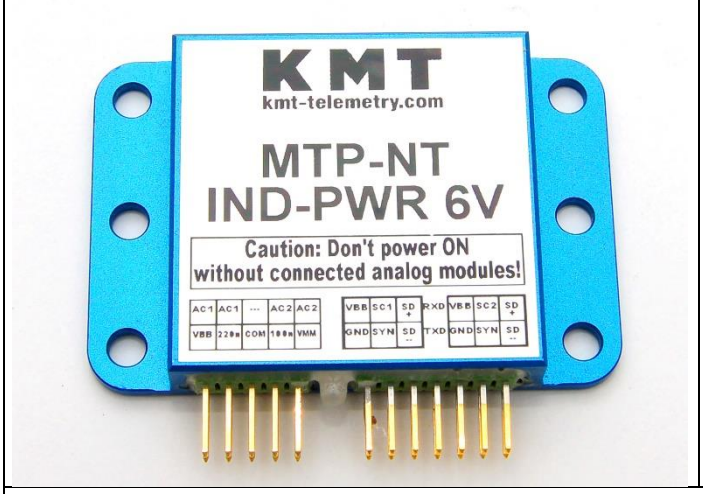
MTP-NT CON-IND-Tx - Controller for 256 channels with integrated IND-Tx

MTP-NT-CON-IND-Tx
Controller 1- 128 acquisition modules = 256 channels
Output: PCM
IND-Transmitter included
Programmable via RS232/USB adapter and remote software
Power supply: VBB= 6 to 9 Vdc
Current consumption 150 mA





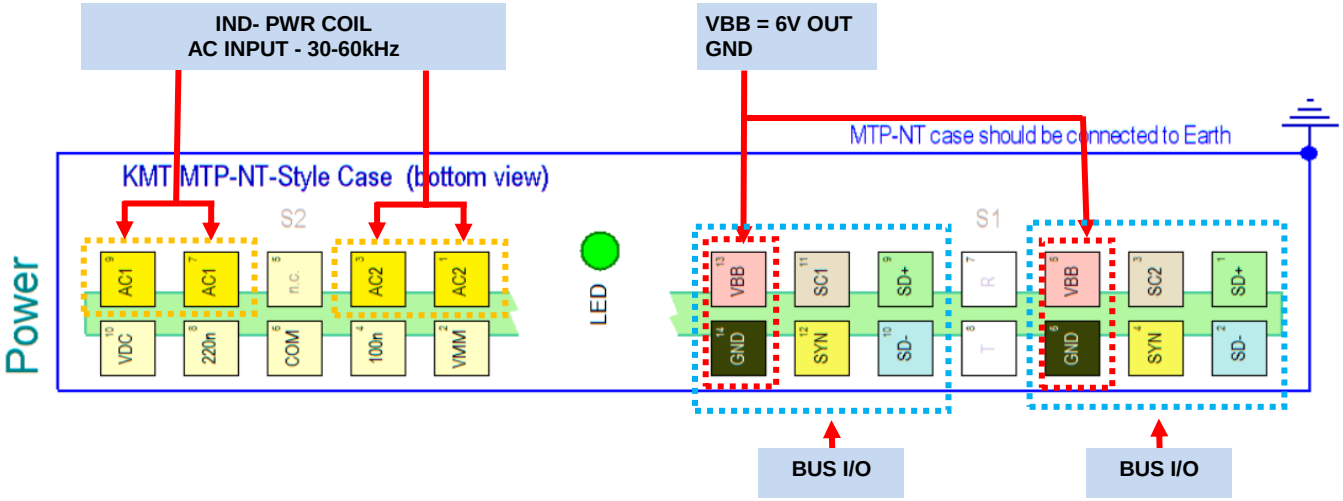
MTP-NT IND-PWR - AC/DC Module for inductive power transmission



MTP-NT IND-PWR 6V
AC/DC Module for inductive power
Input: 30-60 kHz 10-40V AC
Output: 6.1 Vdc
Current: up to 2400 mA (more on request)
Weight: 40 grams
Vibration: 5 g
Shock: 3000 g

Don't power ON without connected Analog modules like MTP-NT-STG, ICP ..... Otherwise you can damage it!!

MTP-NT IND-PWR: Pin assignment

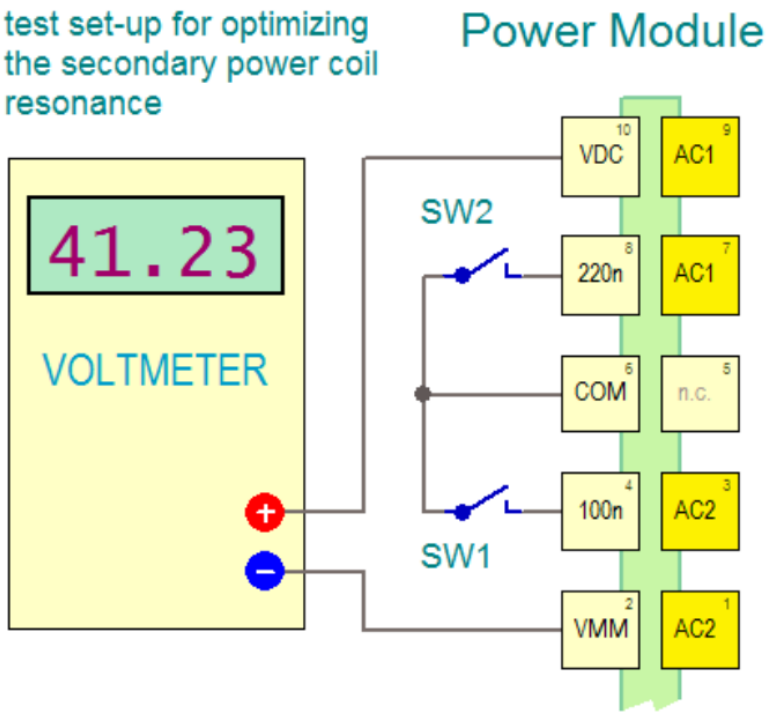


Instructions for adjusting the resonance

The secondary coil for power transmission creates a parallel resonant circuit with a capacitor, which must be tuned to the frequency of the power generator, so that the best possible efficiency is achieved. This (switchable) capacitor is installed in the power module; the capacity is variable between 150 nF and 470 nF.
With the "test set-up" (see wiring diagram on the right) you can optimize the resonance.

If the lowest capacitance (both switches open) is still insufficient to provide a good coil-to-powerhead distance, the coil should be experimentally decreased by one turn.

If the largest capacity (both switches closed) is insufficient, the coil should be increased by one turn.



Allowed voltage range between VMM and VBB

This voltage is the (rectified) internal operating voltage of the power module.

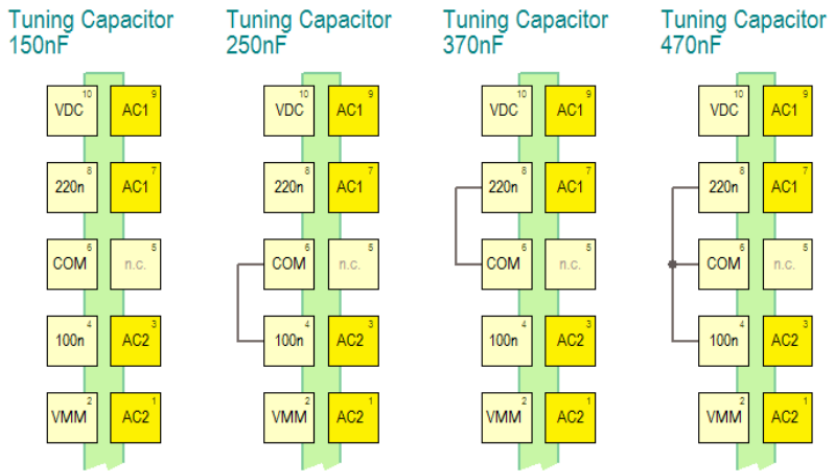
The absolute maximum value of this voltage is 60 volts DC, and under no circumstances should it be exceeded. Therefore, during initial start-up, the power head should not be brought too close to the secondary coil, and then slowly approached to the coil while observing the voltmeter.

The minimum value is 18 volts DC [TBD]. Below this value, a function of the power module is no longer guaranteed.

The ideal voltage should be in the range of about 25 volts to 40 volts DC.

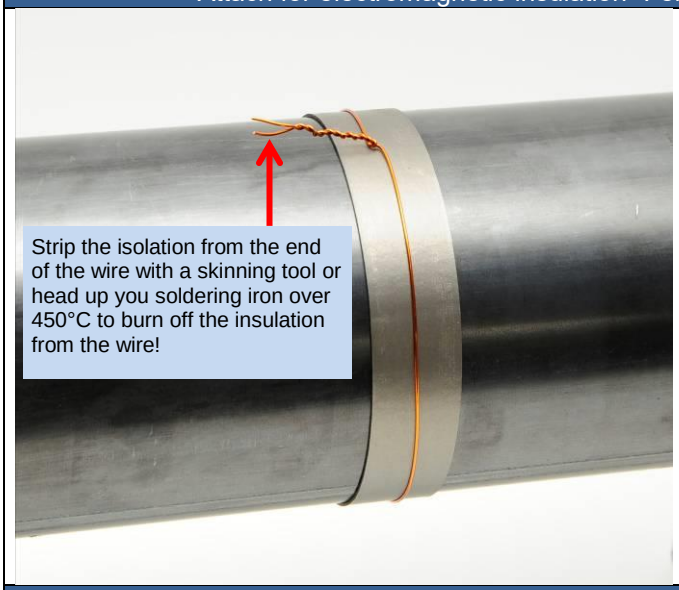
Relationship between switch setting and capacity

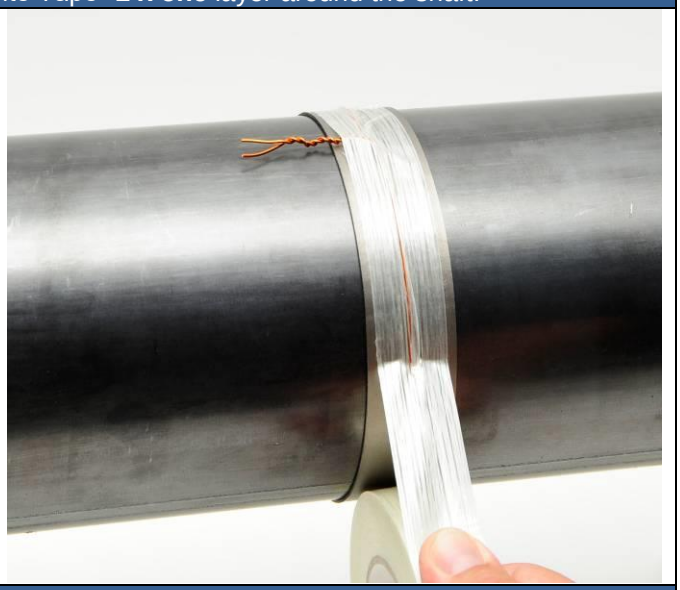
Once the optimal capacity has been found, the required connections can be fixed with a three-pin female connector. This socket connector must have solder bridges as shown in the wiring diagram on the right, and must be plugged on the middle three post pins (on the bottom row of posts). A socket connector with high insertion force must be used, so that it can't get lose in operation.



Inductive transmission (2500kbit) with MTP-NT-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 0.63-1.00mm wire
(CUL = Enameled 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!,
at 0.63 not necessary)

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

MTP-NT CON-IND-TX with 45MHz carrier!
Pickup head (2500kbit)

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!!

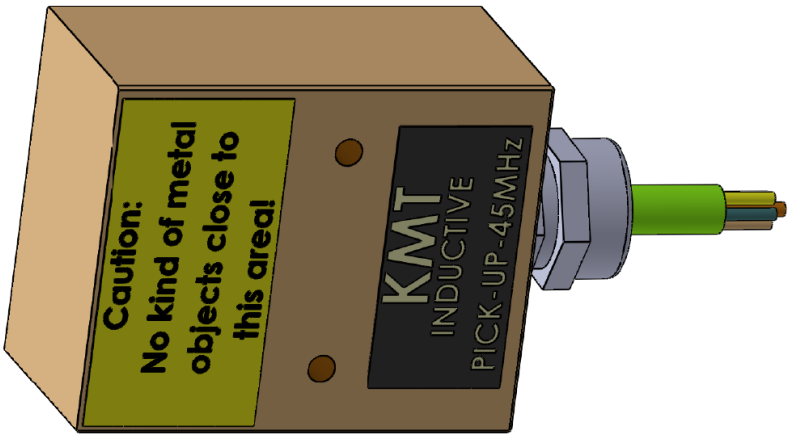
CAUTION:
If you want to install also an inductive power coil close to the data coil, the minimal distance must be <5mm!
(distance between IND-PWR coil to IND-DATA coil)

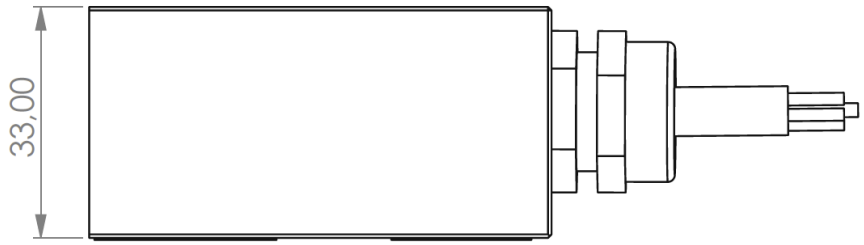
Picture of IND-PICKUP-HEAD 45MHz

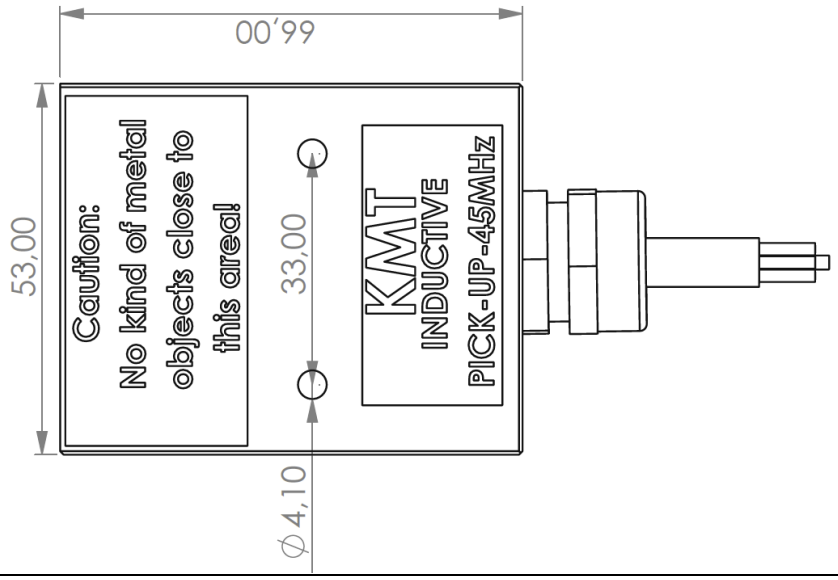
IND-PICKUP-HEAD 45MHz - cable rear side (radial to shaft)

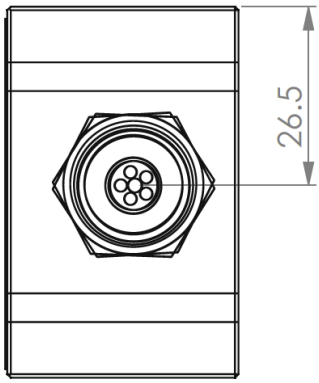
IND-PICKUP-HEAD 45MHz – cable right side (axial to shaft)

Dimensions of IND-PICKUP-HEAD 45MHz - cable rear side (radial to shaft)









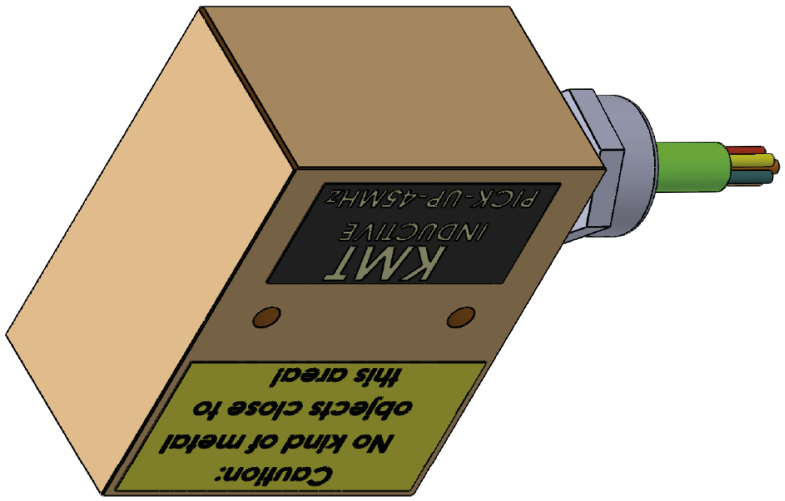
Date	Version	Mat:			
09.07.2018	rev1	Remarks:			
		Bl: A4	Weight-gr: 152.34	Scale 1:1	Part: PU-45MHz-rad-bg

KMT TELEMETRY

hu

www.kmt-telemetry.com
E-mail: info@kmt-telemetry.com
Tel:+49 8024-48737,Fax:+49 8024-5532

Dimensions of IND-PICKUP-HEAD 45MHz – cable right side (axial to shaft)



Date	Version	Mat:
09.07.2018	rev1	

Remarks:

Bl : A4 Weight-gr: 151.37

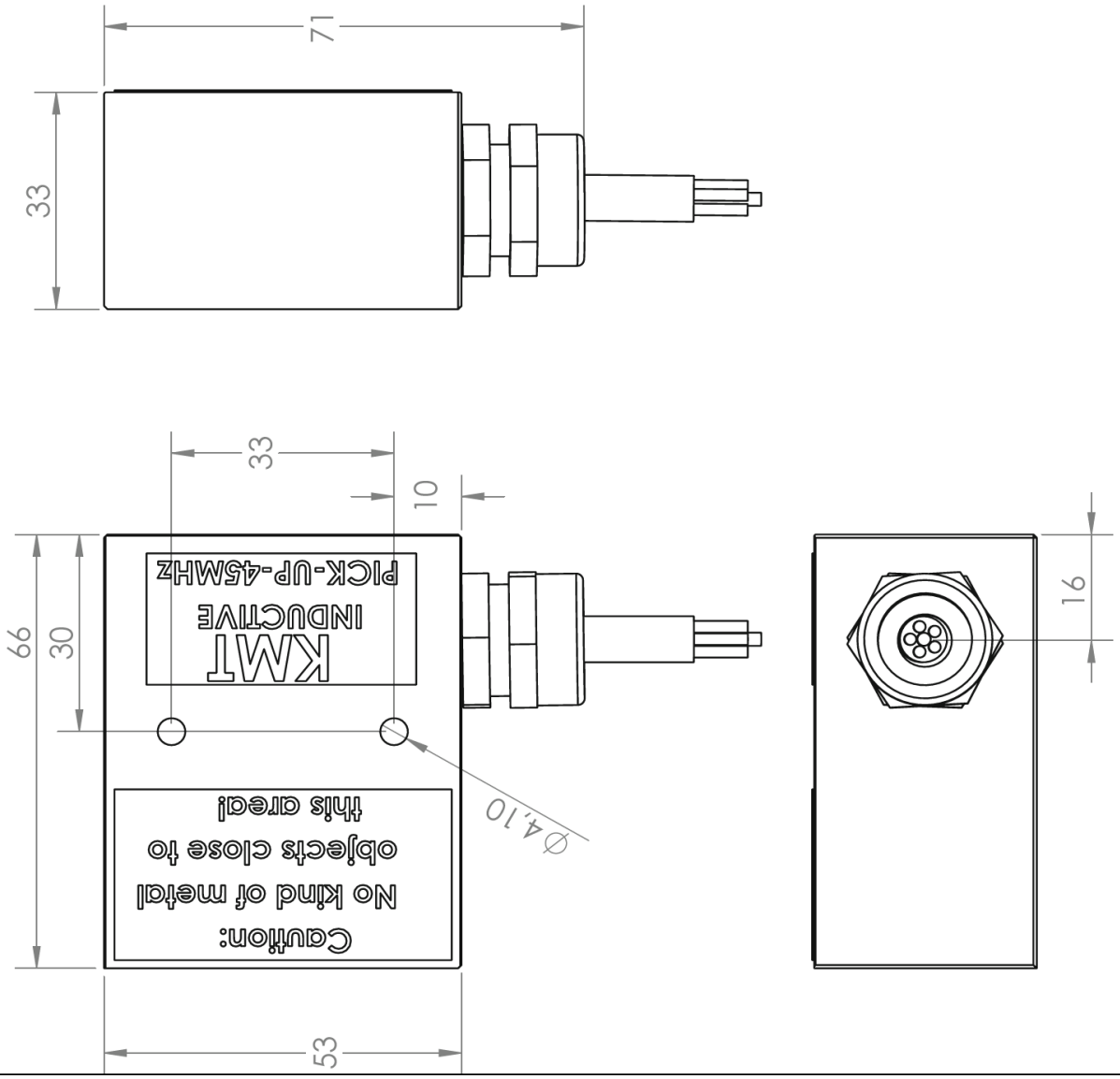
Scale 1:1

Part: PU-45MHz-ax-bg

hu

KMT TELEMETRY

E-mail: info@kmt-gmbh.com
Tel: 08024-48737, Fax. 08024-5532

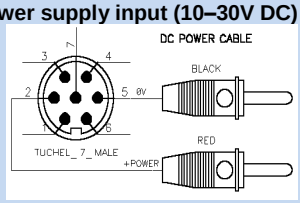


MTP-NT-DEC 8/16/32 Receiver unit for max 32 Channels output via 37 pol. Sub D (radio transmission version with HF BOX Quad with 4 receiver 1250 … 5000kbit)

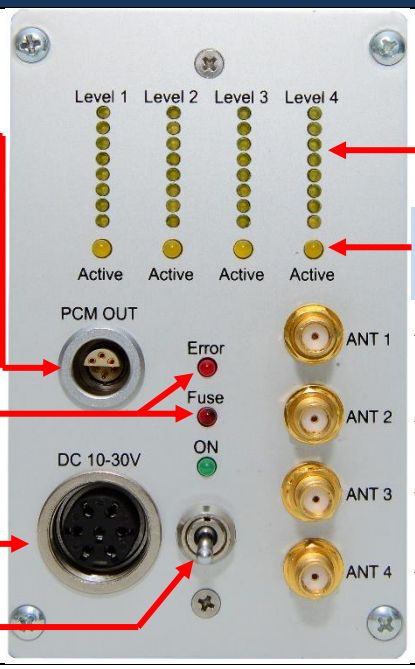
PCM OUT
Pin 1 -----
Pin 2 = PCM + (pink wire)
Pin 3 = PCM -- (blue wire)
Pin 4/5 = common GND & shield (black/green)
Pin 6 -----

Transmission error LED
Fuse of powering defect LED

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



Power Switch

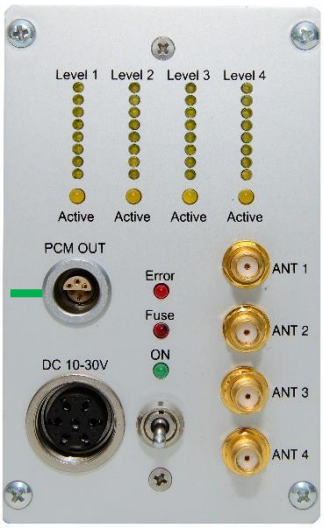


4x HF Level display

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

4x SMA inputs for RX antenna

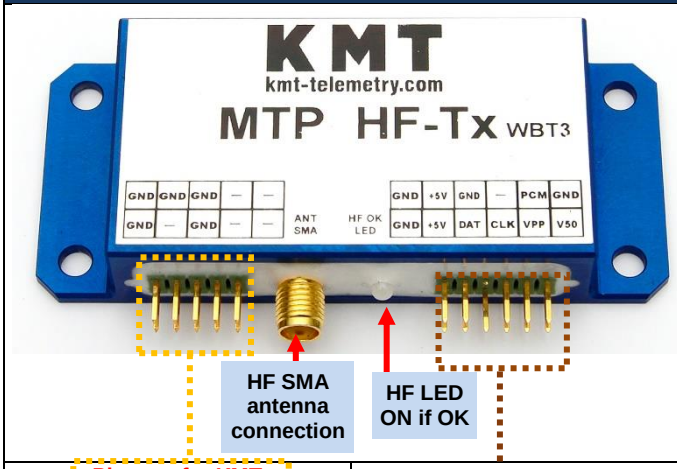
PCM/ DATA cable
Length 5m standard
(up to 25m on request)

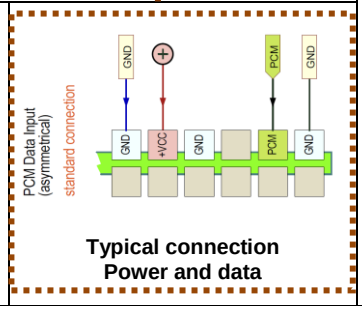


HF BOX Quad System Parameters:

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

HF-TX - Radio transmitter

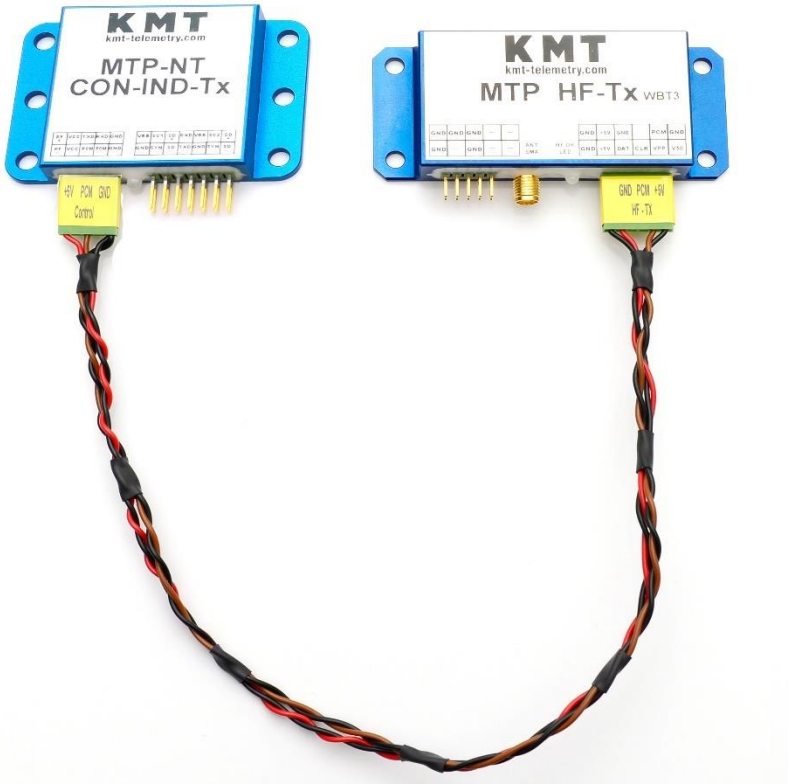




MTP-HF-TX (New version 2016) for MTP and MTP-NT

Radio data transmission transmitter
Transmission rate 312.5, 625, 1250, 2500 and 5000kbit/s,
Distance up to 1m (between wire antenna and receiving antenna)
Consumption of current: 100mA
Powering: 5V DC (powering comes via MTP-Controller)
Vibration: 5g
Static acceleration: 3000g
Shock: 10000g
Water protected, but not connectors!

Wire antenna for shaft application with SMA connector



MTP-NT-Control with MTP HF-Tx

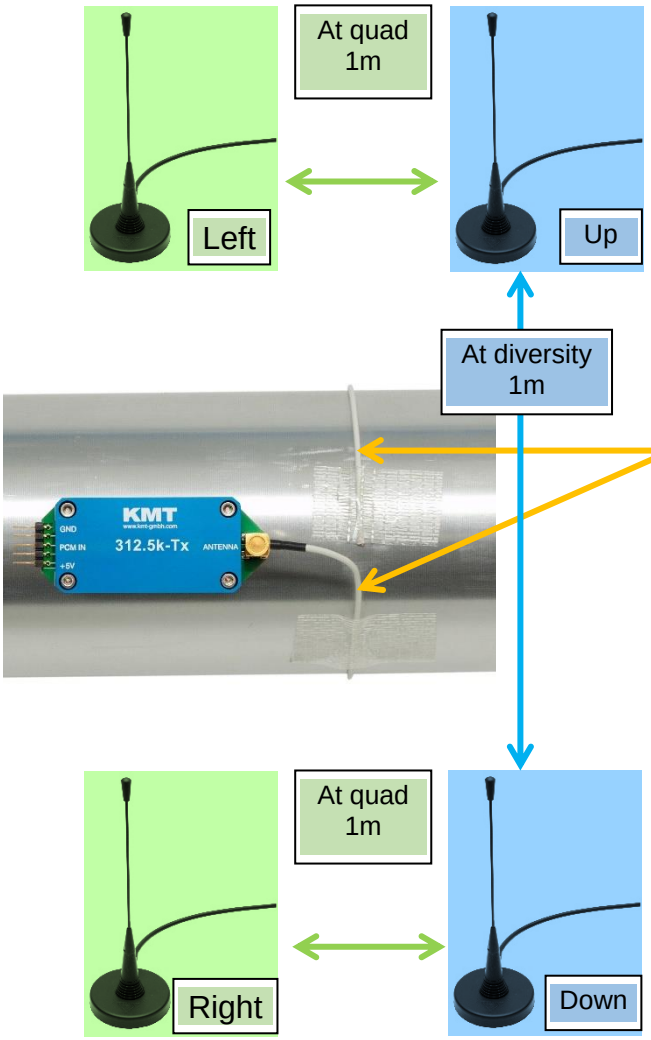
MT32-IND-TX (Version until 2015) for MTP
Inductive data transmission transmitter with 45MHz carrier
Transmission rate 2500kbit/s
Distance up to 100mm, typical 50mm (between coil and pickup)
Consumption of current: 70mA
Powering: 5V DC (powering comes via MTP-Controller)
Vibration: 5g
Static acceleration: 3000g
Shock: 10000g
Water non-protected

MTP 312.5 - 5000k Installation of the radio transmitter on a shaft

For rotating application we normal recommend an inductive transmission instead of radio transmission!

Cable Red = +5V
Cable Black = GND (Ground)
Cable Brown = PCM In
Cable White = Wire antenna

All cable connections should be soldered.

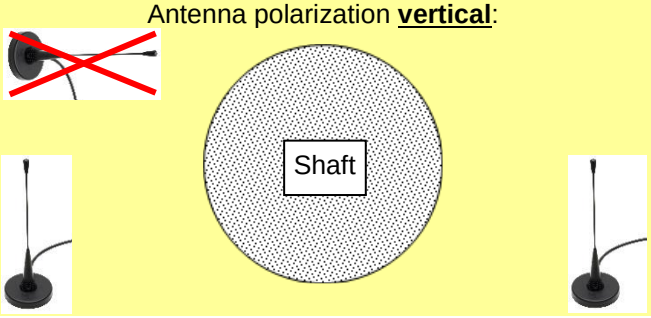


Installation of diversity antennas (2x):
Install about 1m far from shaft,
1x up and 1x down side

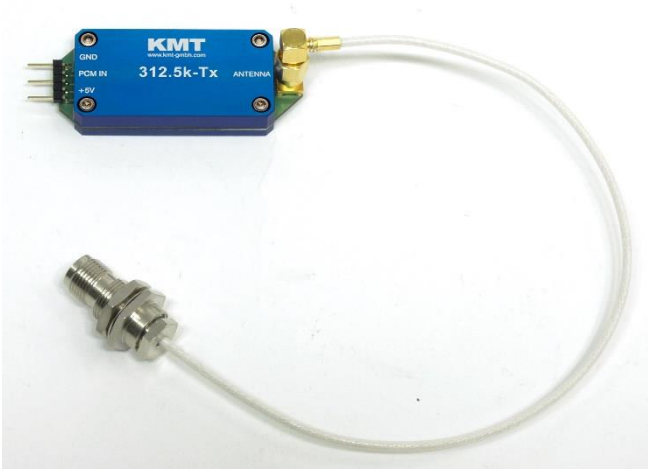
Mount the cable antenna exactly one winding around the shaft and fix all with 3 windings mounting tape – finish!

The cable antenna can extend or shorten depending upon requires! (Isolate the solder connection, if you extend the wire antenna cable!)

Antenna polarization **vertical**:



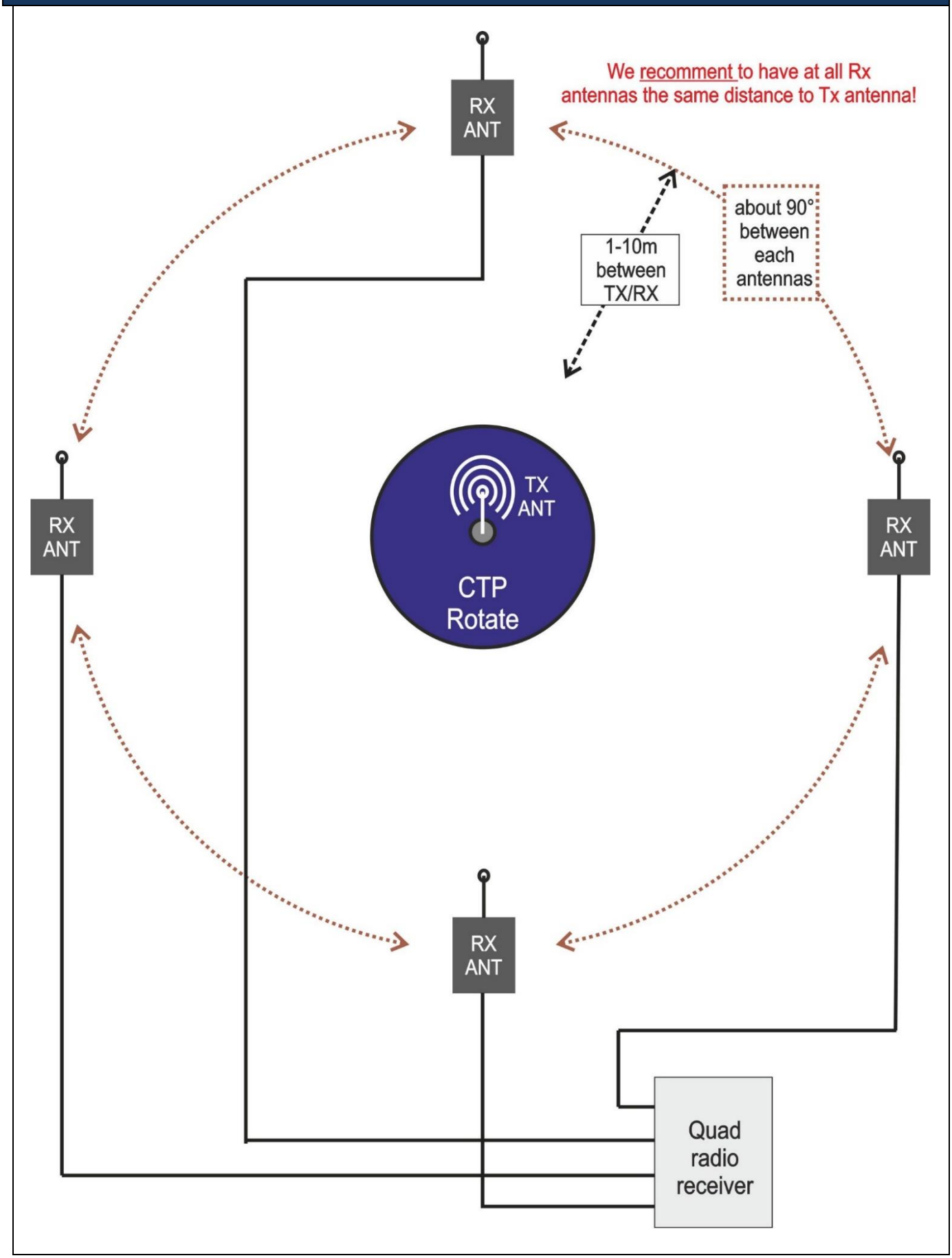
Installation of quad antennas (4x):
Install about 1m far from shaft,
1x up and 1x down side and
1x left and 1x right side
About 1m distance to each other antenna



This coaxial adapter (**Tx-TNC-adapter**) makes it possible to connect an antenna with TNC connector for point to point applications. (option)

Transmitting antenna 0dB with magnetic foot (option)

Recommend position of receiving standard magnetic foot antennas if the radio transmitter antenna is mount on top of end of shaft

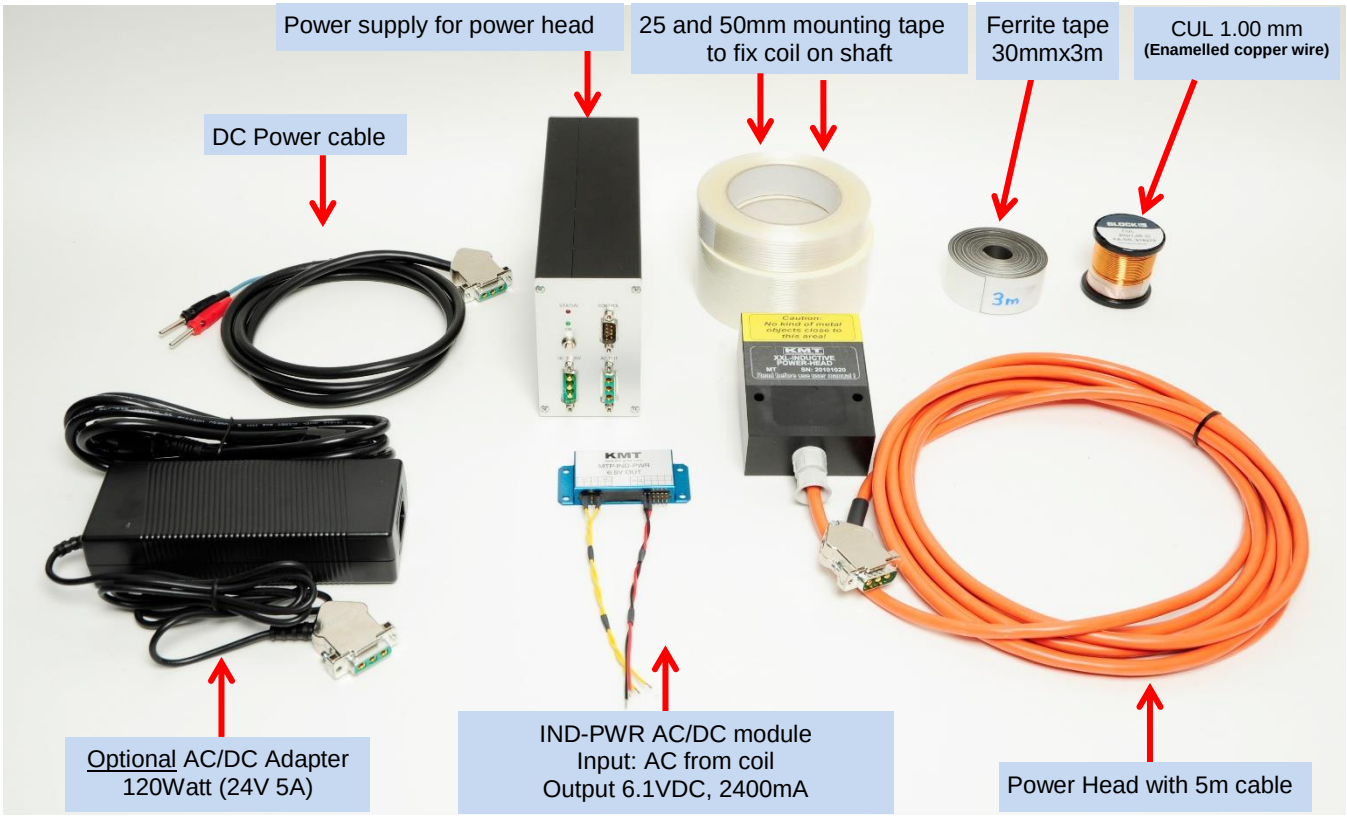


KMT - Kraus Messtechnik GmbH

Gewerbering 9, D-83624 Otterfing, Germany, ☎ 08024-48737, Fax. 08024-5532
Home Page: http://www.kmt-telemetry.com, Email: info@kmt-telemetry.com

MTP-NT
INDUCTIVE POWER XL, XXL and XXXL
with flat COIL
User Manual

Inductive power supply set



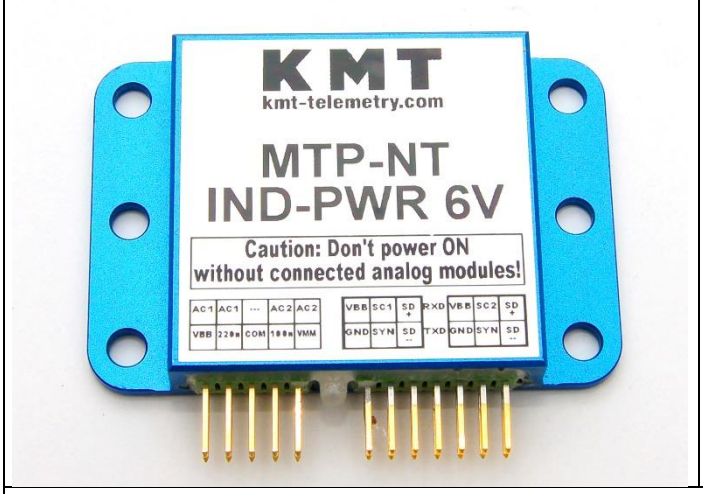
Picture shows standard Inductive Power Supply for diameter up to 300mm

INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

Safety notes for inductive powering

- The device should only 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 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 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.

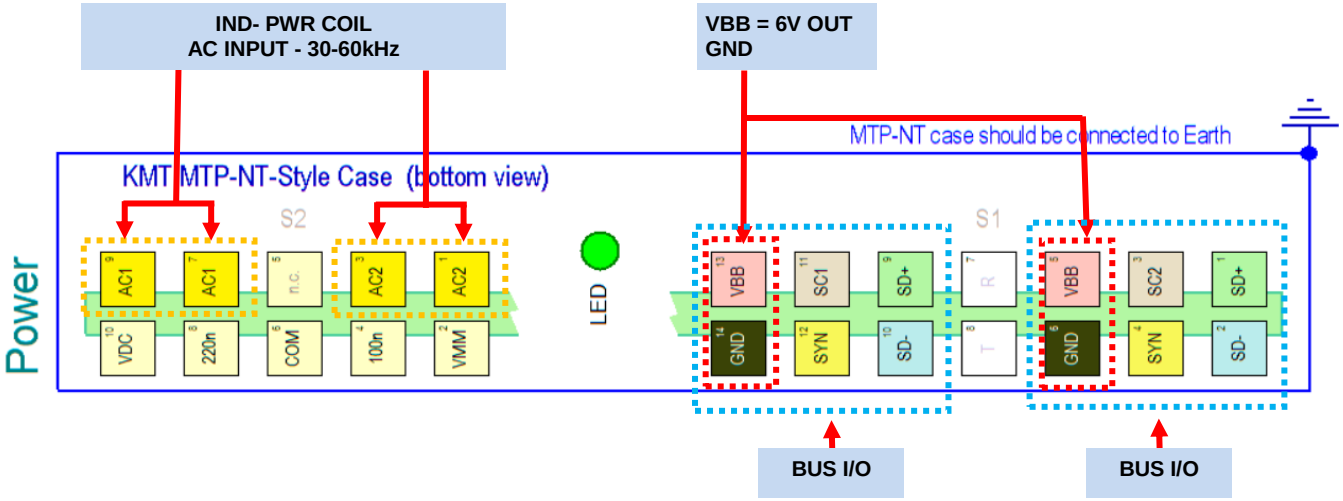
MTP-NT IND-PWR - AC/DC Module for inductive power transmission



MTP-NT IND-PWR 6V
AC/DC Module for inductive power
Input: 30-60 kHz 10-40V AC
Output: 6.1 Vdc
Current: up to 2400 mA (more on request)
Weight: 40 grams
Vibration: 5 g
Shock: 3000 g

**Don't power ON without connected Analog modules like MTP-NT-STG, ICP ……
Otherwise you can damage it!!**

MTP-NT IND-PWR: Pin assignment

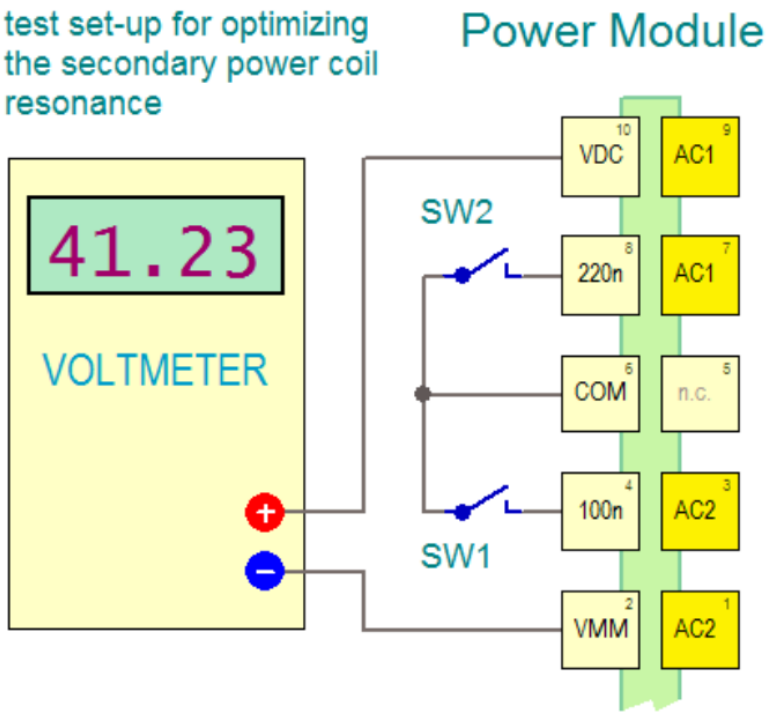


Instructions for adjusting the resonance

The secondary coil for power transmission creates a parallel resonant circuit with a capacitor, which must be tuned to the frequency of the power generator, so that the best possible efficiency is achieved. This (switchable) capacitor is installed in the power module; the capacity is variable between 150 nF and 470 nF.
With the "test set-up" (see wiring diagram on the right) you can optimize the resonance.

If the lowest capacitance (both switches open) is still insufficient to provide a good coil-to-powerhead distance, the coil should be experimentally decreased by one turn.

If the largest capacity (both switches closed) is insufficient, the coil should be increased by one turn.



Allowed voltage range between VMM and VBB

This voltage is the (rectified) internal operating voltage of the power module.

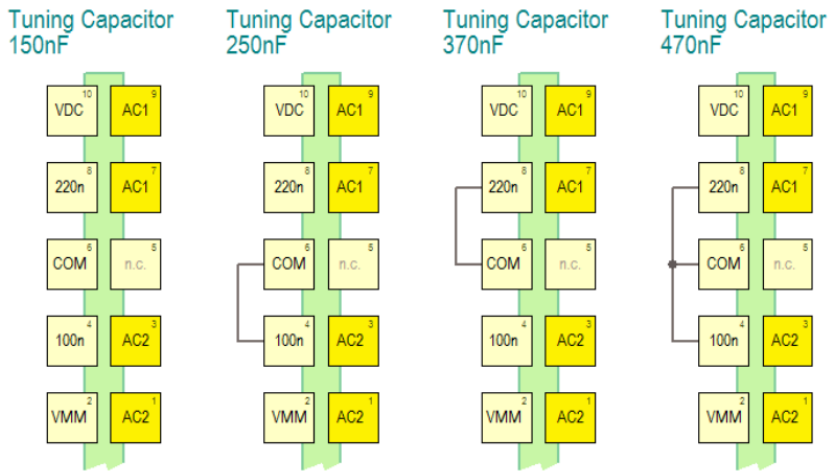
The absolute maximum value of this voltage is 60 volts DC, and under no circumstances should it be exceeded. Therefore, during initial start-up, the power head should not be brought too close to the secondary coil, and then slowly approached to the coil while observing the voltmeter.

The minimum value is 18 volts DC [TBD]. Below this value, a function of the power module is no longer guaranteed.

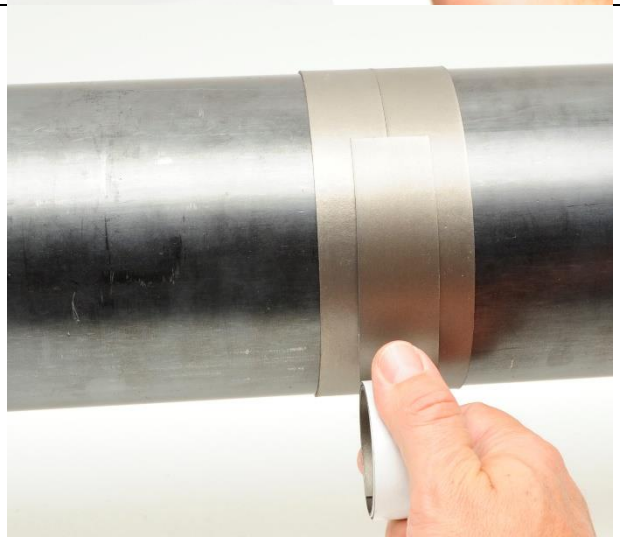
The ideal voltage should be in the range of about 25 volts to 40 volts DC.

Relationship between switch setting and capacity

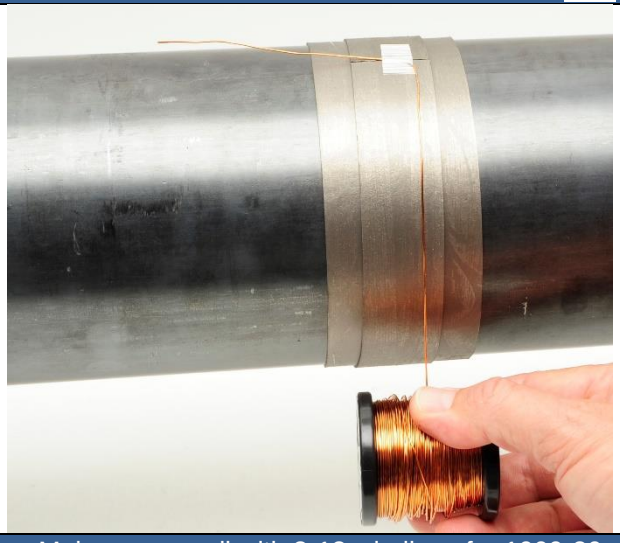
Once the optimal capacity has been found, the required connections can be fixed with a three-pin female connector. This socket connector must have solder bridges as shown in the wiring diagram on the right, and must be plugged on the middle three post pins (on the bottom row of posts). A socket connector with high insertion force must be used, so that it can't get lose in operation.

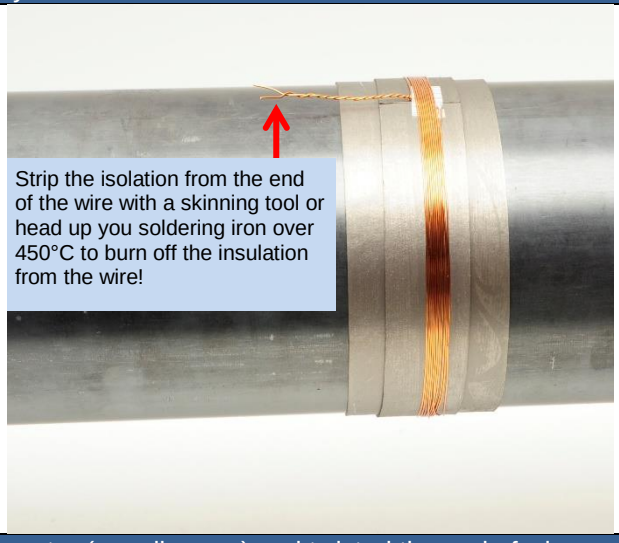


MTP-NT inductive power supply
Installation of coil for inductive powering on shaft

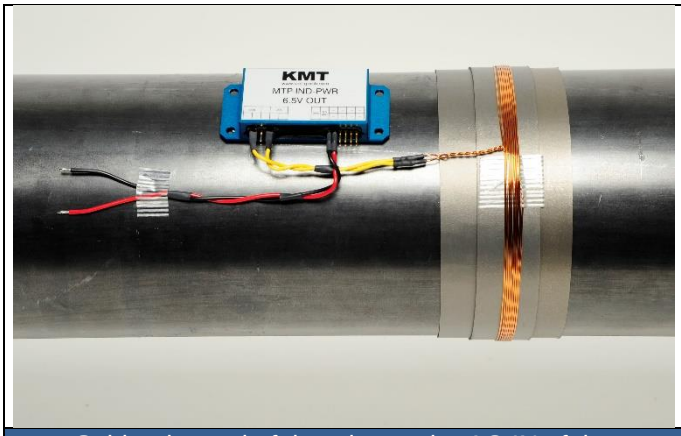


Attach for electromagnetic isolation “Ferrite Tape” 2x parallel and
1x in the middle over two layer around the shaft

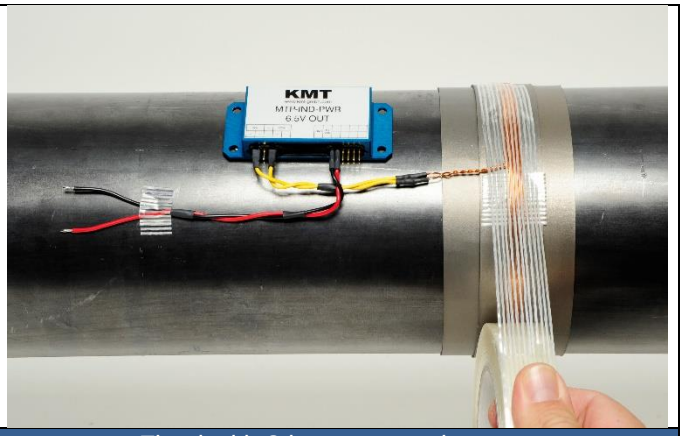




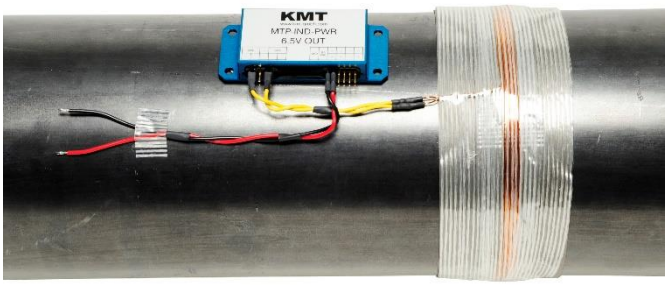
Make power coil with 3-18 windings for 1000-20mm diameter (see diagram) and twisted the end of wire.
Use 0.63…1.00 mm (1.00mm for diameter of 100-1000mm) CUL wire (Enameled copper wire)



Solder the end of the wire on the AC IN of the IND-PWR module and isolate all solder points with shrink tubing.

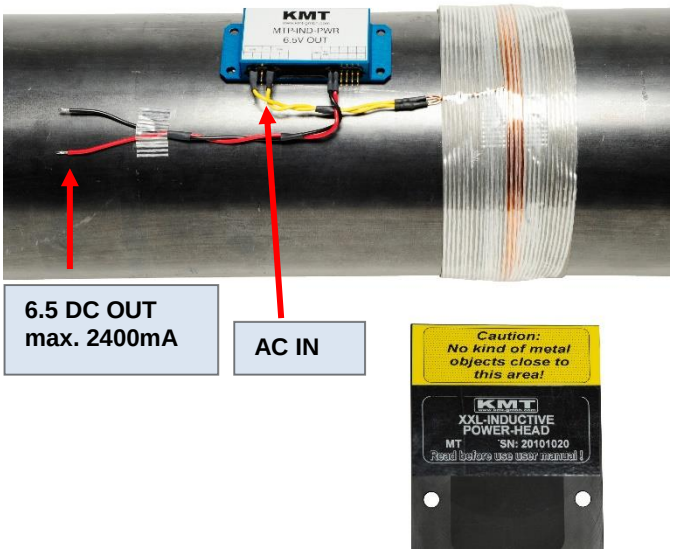


Fixed with 3 layers mounting tape



Note: “The inductive load of the MTP-NT 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 6.5 V!

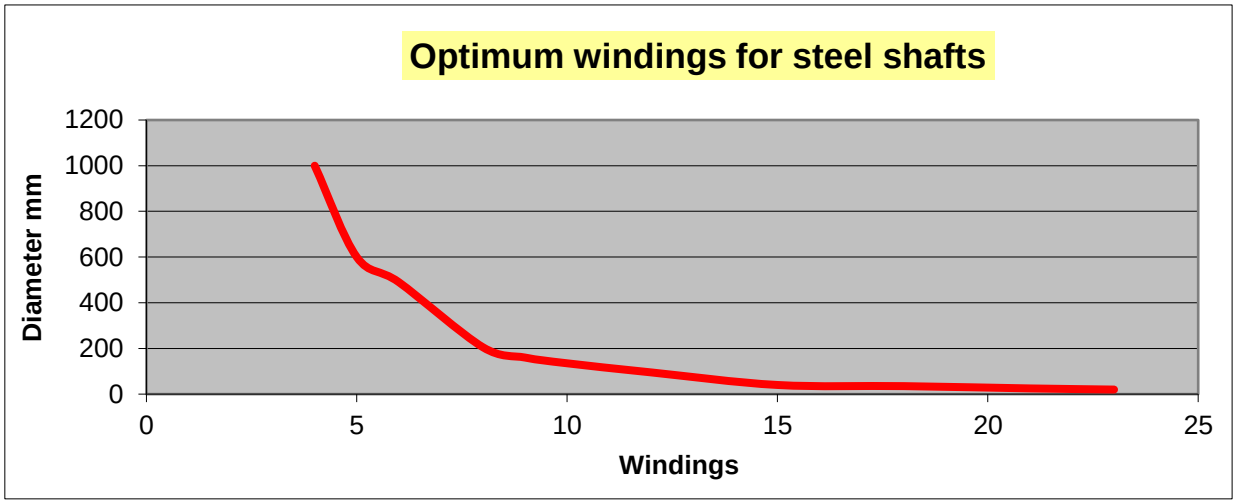


The pins “Coil” are the AC power input from the coil. On the pins “+6.5” and “GND“ you get a stabilized output voltage of 6.5V DC.
The max. load current on the DC output is 2400mA.
The IND-PWR converter will use instead battery pack!
Never use any battery together with the MTP-NT IndPwr!

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

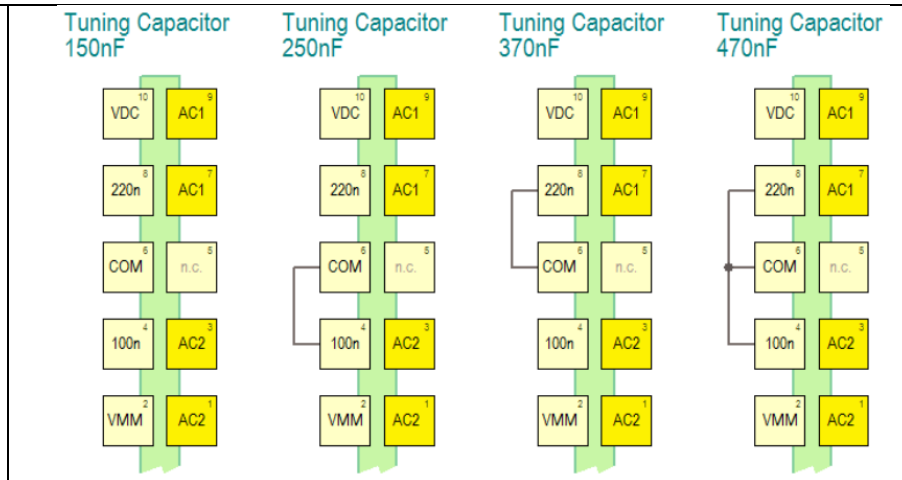
The center of the coil should be in the same horizontal position as the center of the power head. The distance is optimal in the range between 5 and 10mm. (depends of shaft and current consumption)

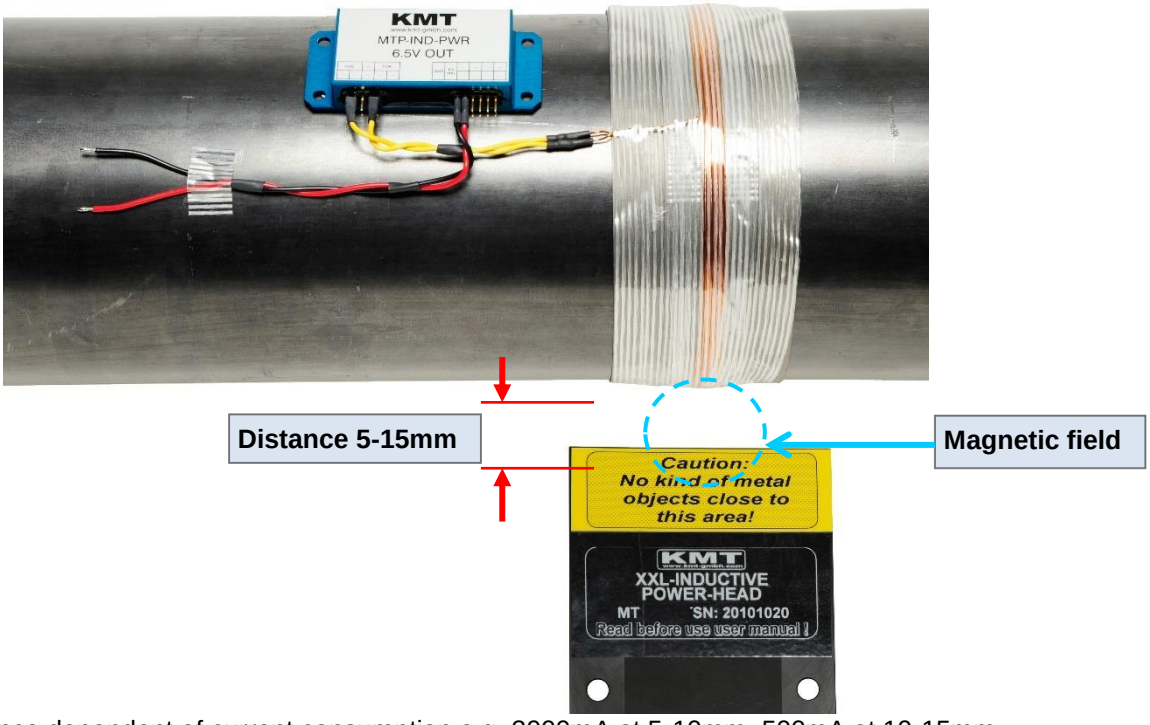
Find the correct amount of windings of inductive power coil



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

Windings (+/-1)	nF	Diameter (mm)
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





Distance dependent of current consumption e.g. 2000mA at 5-10mm, 500mA at 10-15mm

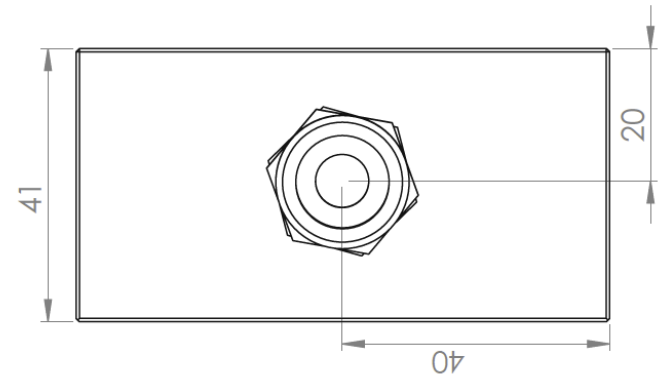
Recommend power heads:				
Diameter:	150mm	300mm	500mm	1000mm
4 - Channel	XL	XL	XL	2XL
8 - Channel	XL	XL	2XL	3XL
16 - Channel	XL	2XL	3XL	3XL
32 - Channel	2XL	3XL	3XL	4XL

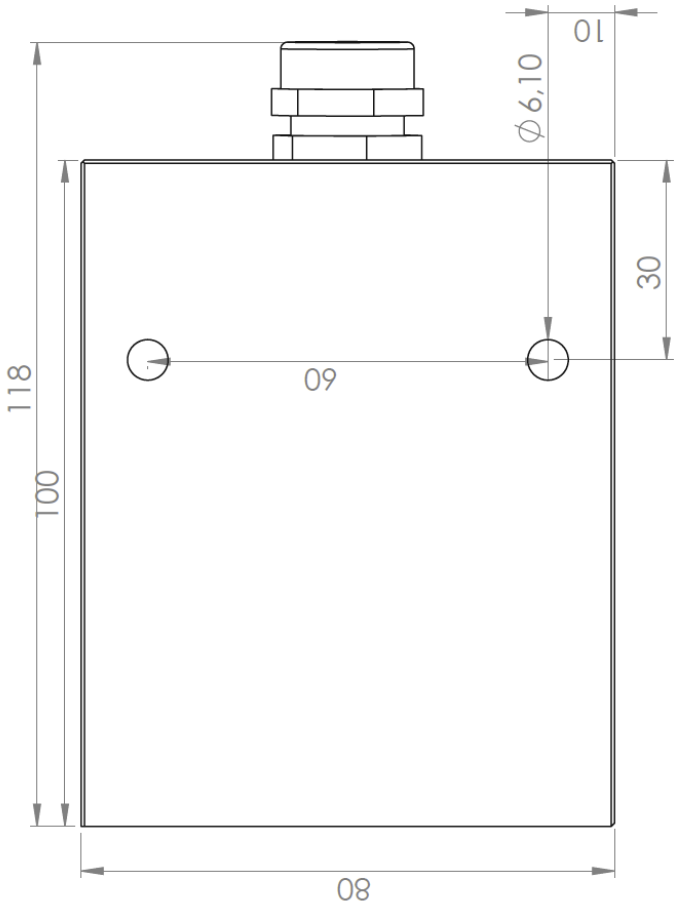
IND-PWR-HEAD-XL and XXL

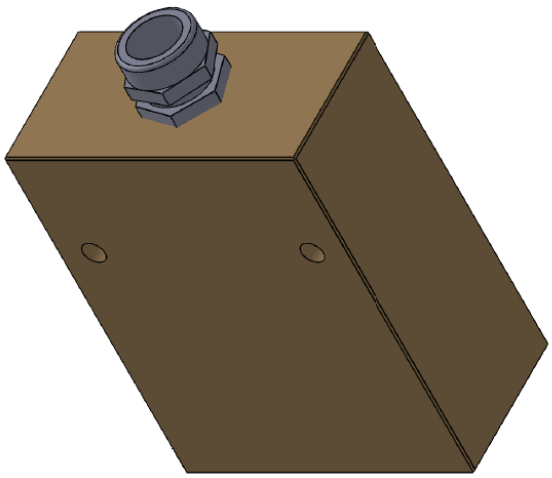
IND-PWR-HEAD-XXXL (old version)

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

Dimensions of IND-PWR-HEAD- XL and XXL

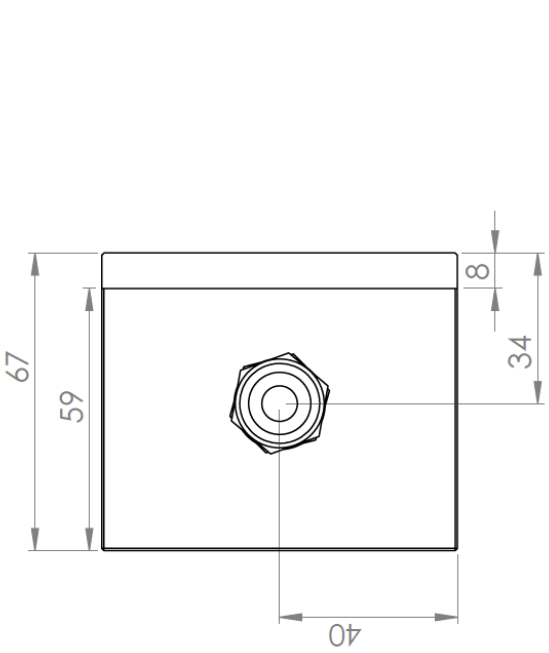


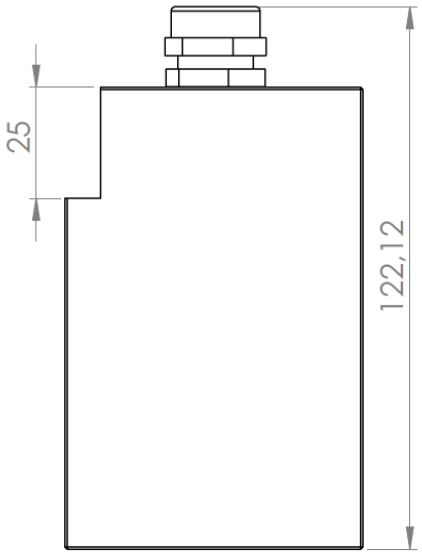


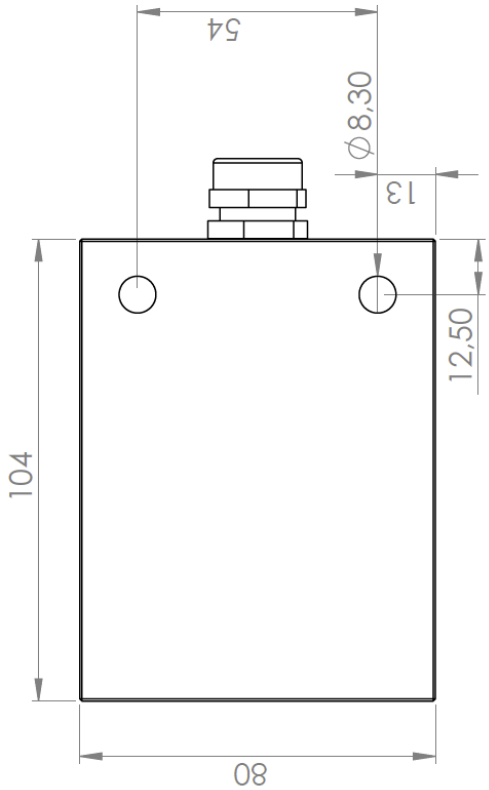


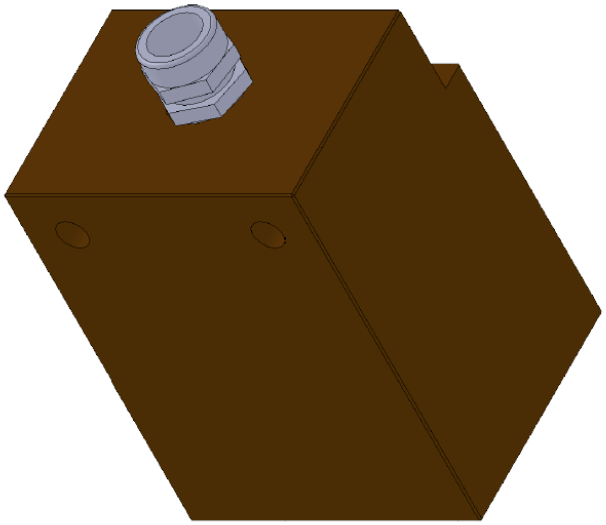
Mat:					
Remarks:					
Bl : A4	Weight-gr: 424.73				
Scale 1:1	Part: PH-2XL-bg				
hu	E-mail: info@kmt-gmbh.com Tel: 08024-48737, Fax. 08024-5532				
Version					
Date 29.06.2018	KMT TELEMETRY				

Dimensions of IND-PWR-HEAD-XXXL (old Version)









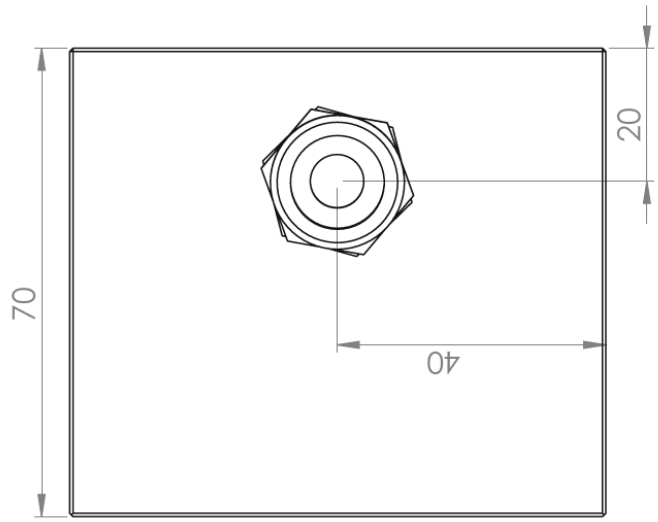
Mat:			
Remarks:			
Bl : A4	Weight-gr:		
Scale	Part:		
1:1.5	PU-Pwr-XXXL-bg		

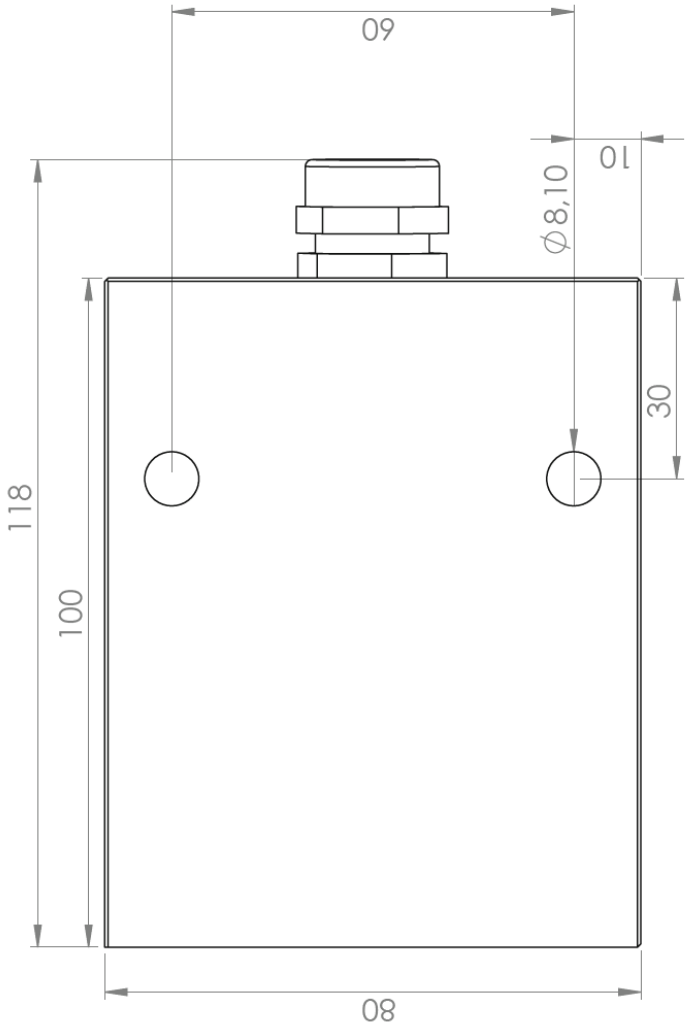
Version: Date 10.10.2016

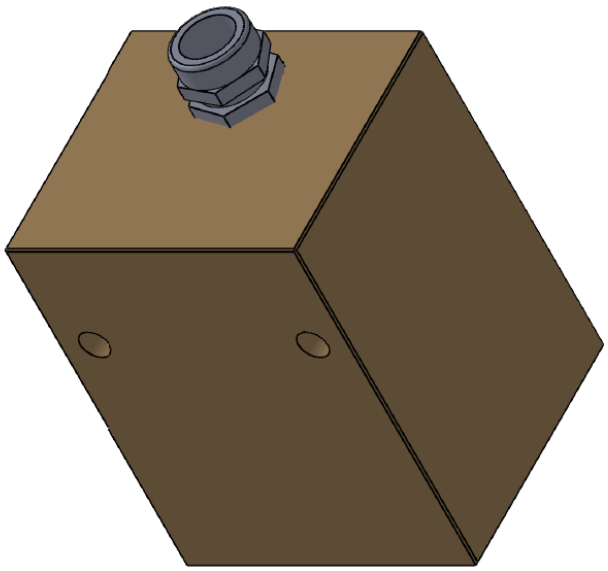
KMT TELEMETRY

E-mail: info@kmt-gmbh.com
Tel: 08024-48737, Fax. 08024-5532

Dimensions of IND-PWR-HEAD-3XL (New Version)



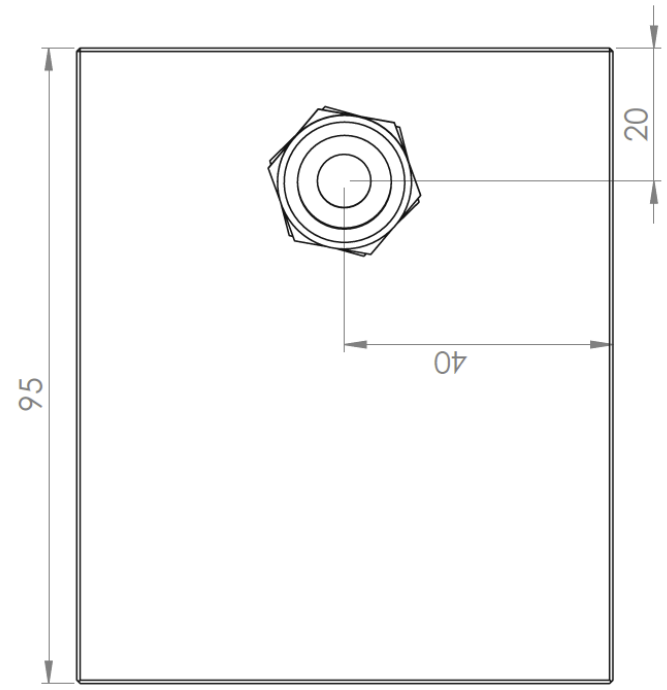


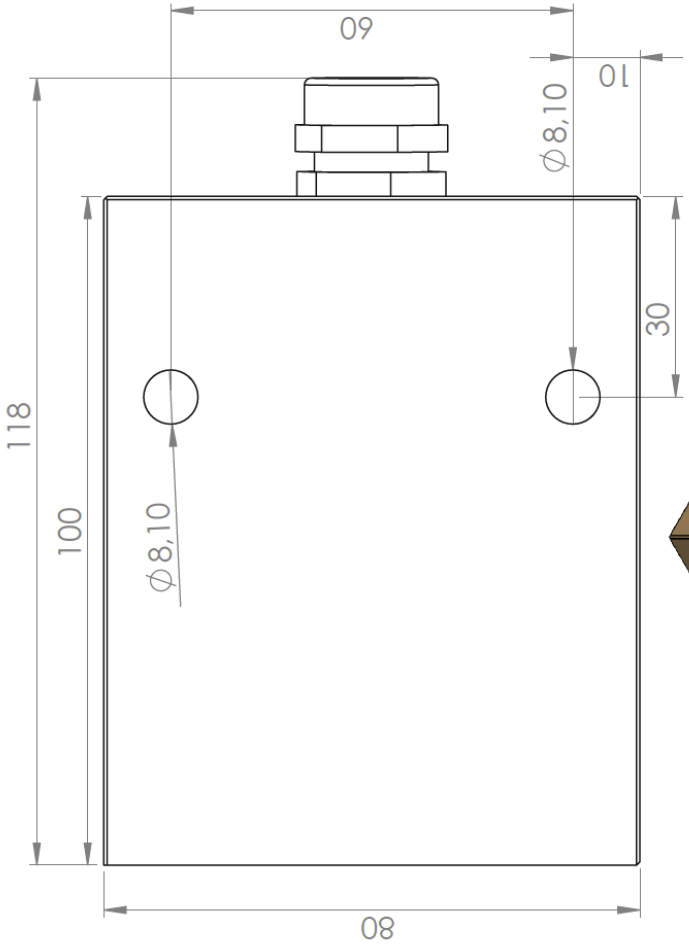


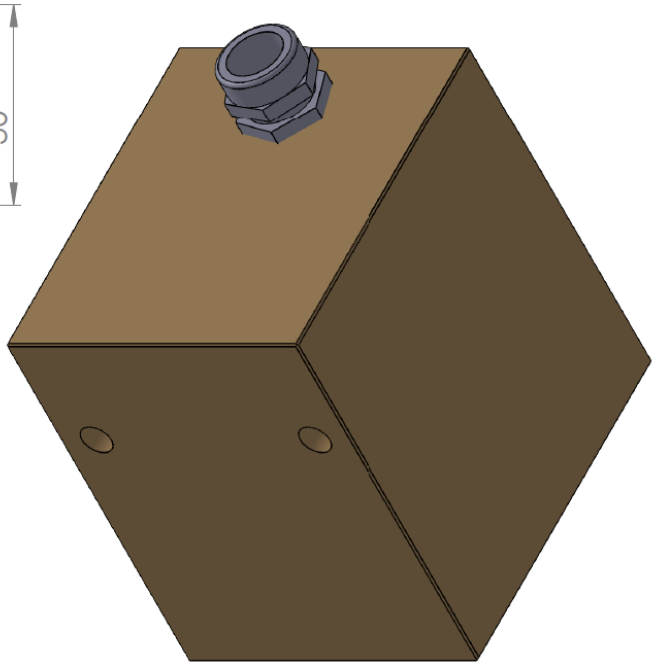
Date	Version	Mat:			
29.06.2018		Remarks:			
			Bl : A4	Weight-gr:	720.06
			Scale	Part:	PH-3XL-bg
			1:1		
			hu	E-mail: info@kmt-gmbh.com Tel: 08024-48737, Fax. 08024-5532	

KMT TELEMETRY

Dimensions of IND-PWR-HEAD-4XL (New Version)

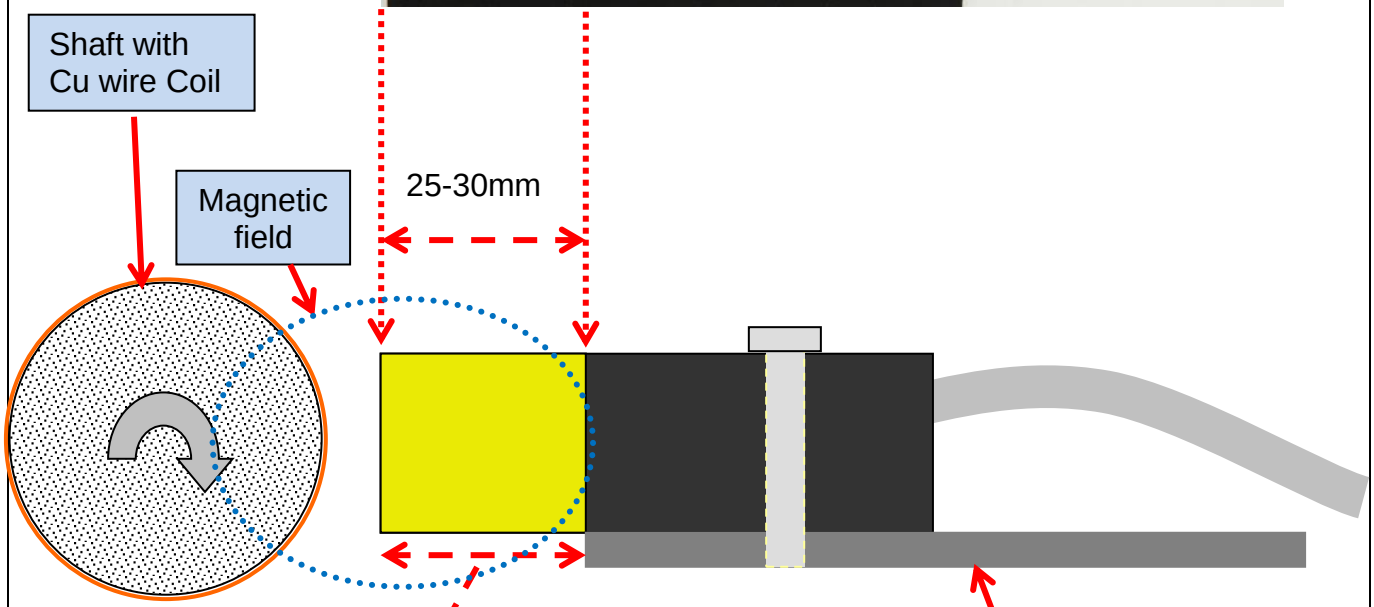






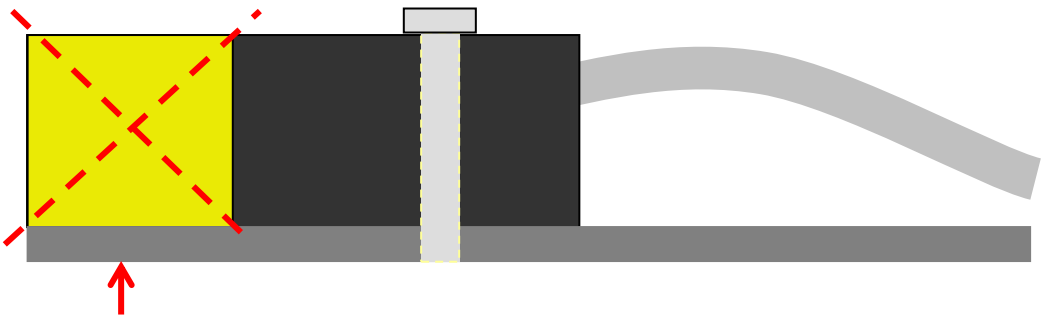
Mat:					
Remarks:			Bl : A4	Weight-gr: 976.70	
			Scale 1:1	Part: PH-4XL-bg	
Version		KMT TELEMETRY	hu	E-mail: info@kmt-gmbh.com Tel: 08024-48737, Fax: 08024-5532	
Date 29.06.2018					

MTP-NT IND-PWR
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, 2XL, 3XL and 4XL Powerhead

Technical data

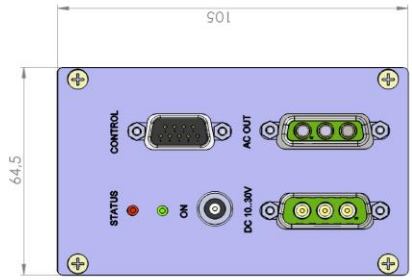
IND-Power generator for L, XL, 2XL
without cooling rip

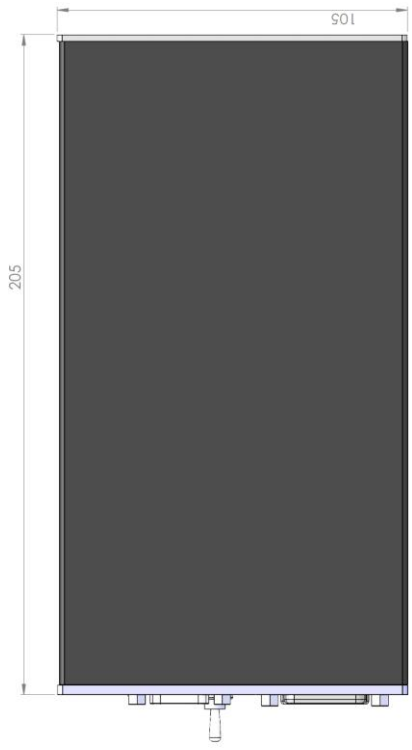
IND-Power generator for 3XL and 4XL
with cooling rip

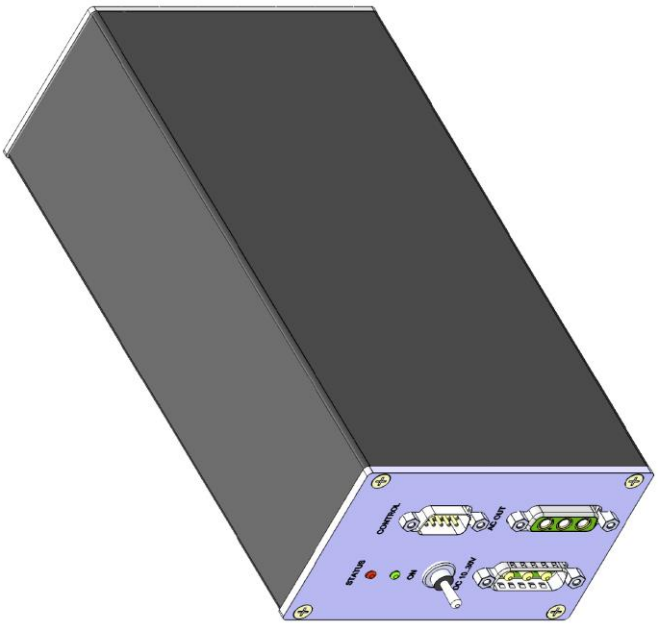
Power output:	AC 25-35kHz for power head L, XL, XXL, 3XL and 4XL
Power input:	10-30 V DC, typical 24V
Power consumption	<100 Watt, deepens of power head
Dimensions:	205 x 105 x 65mm
Weight:	1.275 kg (2XL), 3.350 kg (4XL)
Environmental	
Operating:	-20 … +70°C
Humidity:	20 ... 80% not condensing
Vibration:	5g Mil Standard
Static acceleration:	10g in all directions
Shock:	50g in all directions

IND-Power generator for L, XL and 2XL Powerhead

Dimensions:

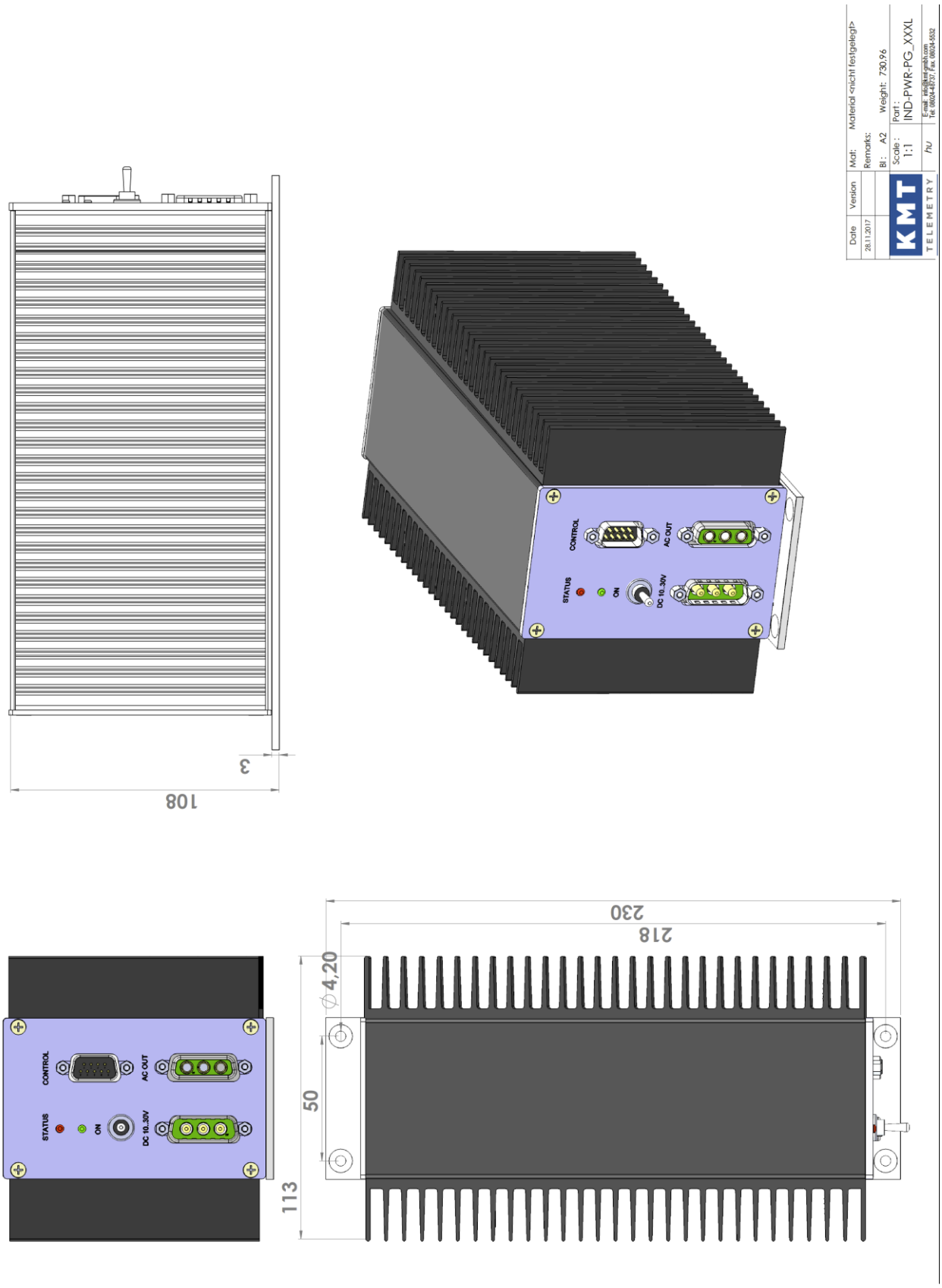






IND-Power generator for 3XL and 4XL Powerhead

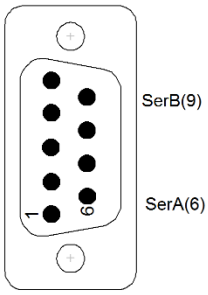
Dimensions:



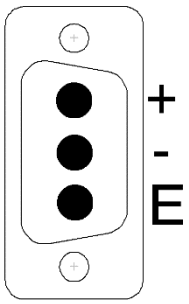
Mounting plate is an option!

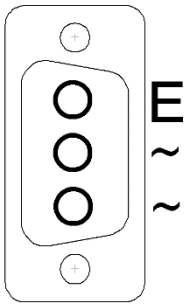
MTP-NT IND-PWR-XXL
Pin connection

RS 485



CONTROL - Not used!



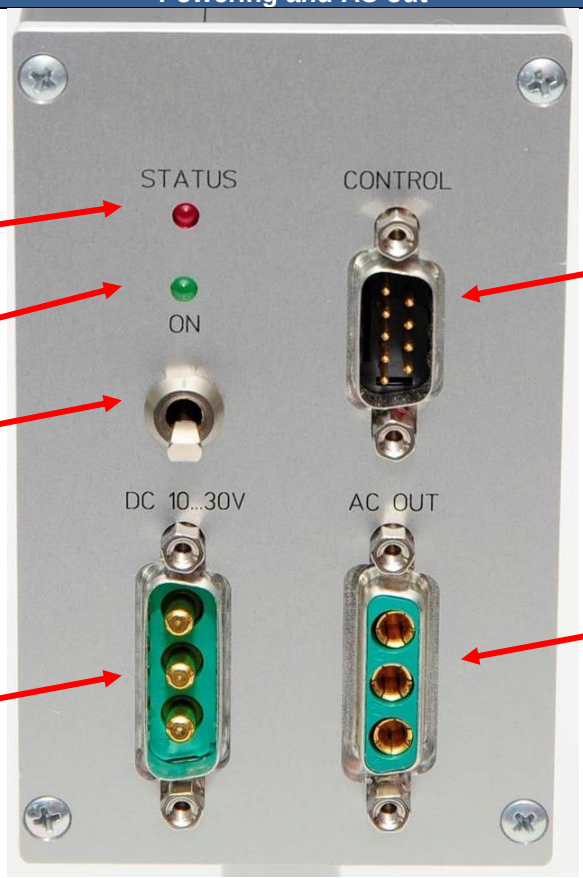


DC 10-30V
typical 24V, 5A
(up to 100 WATT*

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 out of function

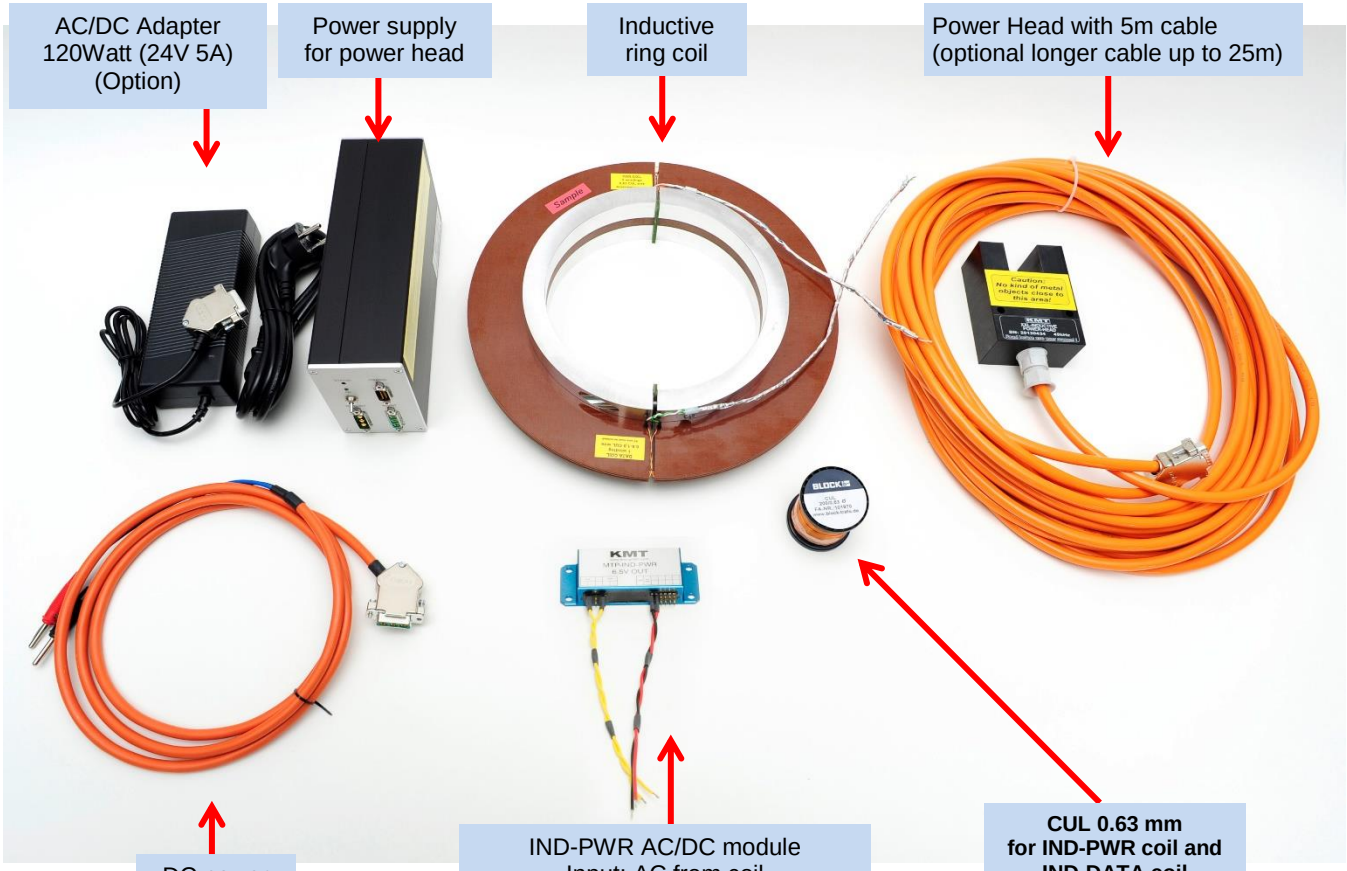
AC 25-35kHz output for power head

KMT - Kraus Messtechnik GmbH

Gewerbering 9, D-83624 Otterfing, Germany, ☎ 08024-48737, Fax. 08024-5532
Home Page http://www.kmt-telemetry.com, Email: info@kmt-telemetry.com

MTP
INDUCTIVE POWER
with RING COIL
User Manual

Inductive power supply set



INSTRUCTIONS FOR QUALIFIED PERSONNEL ONLY!

Safety notes for inductive powering

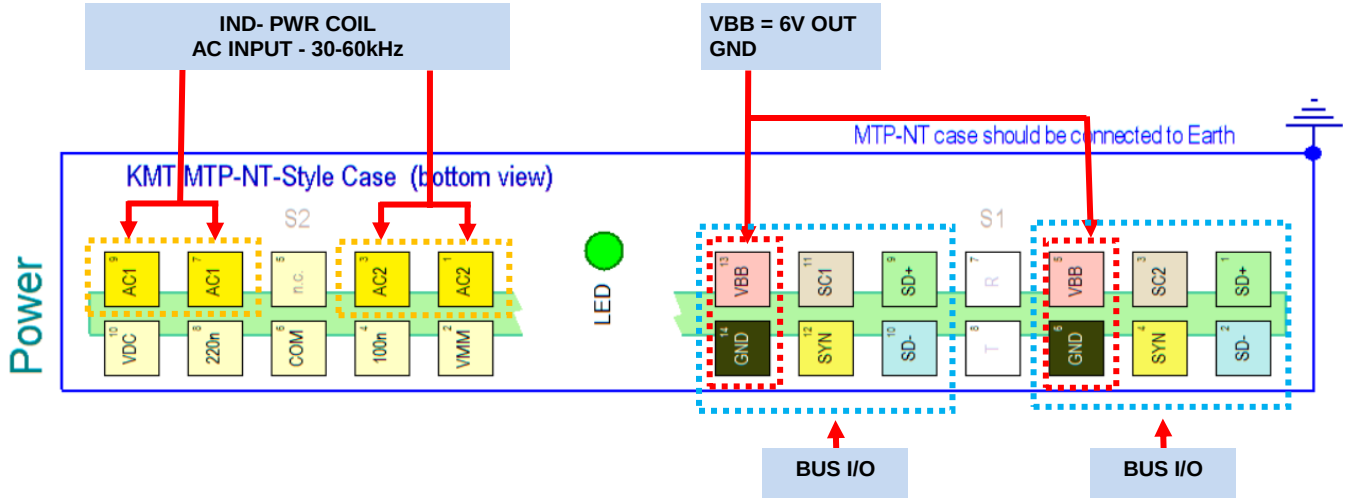
- The device should only applied by instructed personnel.
- The power head emits strong magnetic radiation at 30-60 kHz to a distance of 300 mm. Therefore persons with cardiac pacemakers should not work with this device!
- Magnetic data storage media should be kept in a distance of at least 3m from the 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 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 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.

MTP-NT IND-PWR - AC/DC Module for inductive power transmission

MTP-NT IND-PWR 6V
AC/DC Module for inductive power
Input: 30-60 kHz 10-40V AC
Output: 6.1 Vdc
Current: up to 2400 mA (more on request)
Weight: 40 grams
Vibration: 5 g
Shock: 3000 g

**Don't power ON without connected Analog modules like MTP-NT-STG, ICP ……
Otherwise you can damage it!!**

MTP-NT IND-PWR: Pin assignment



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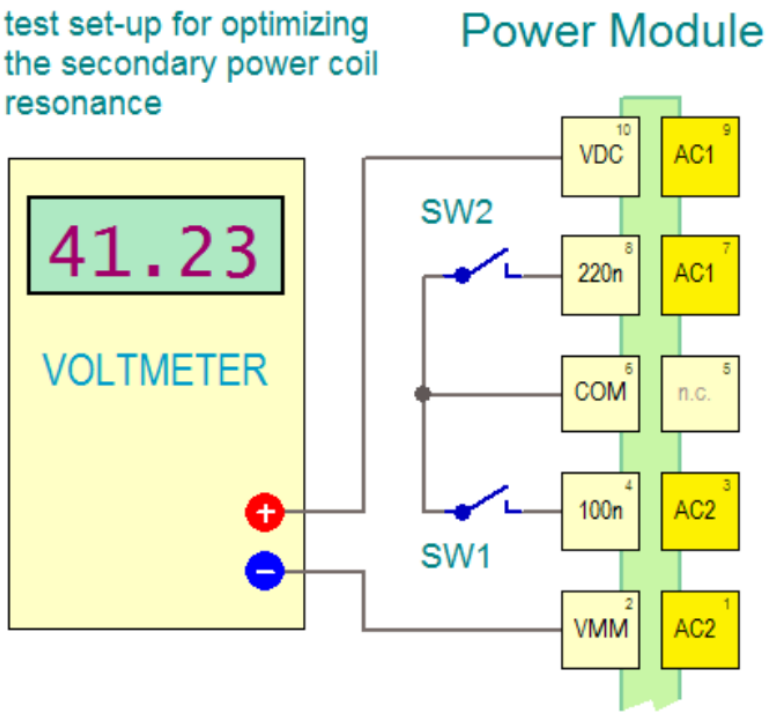

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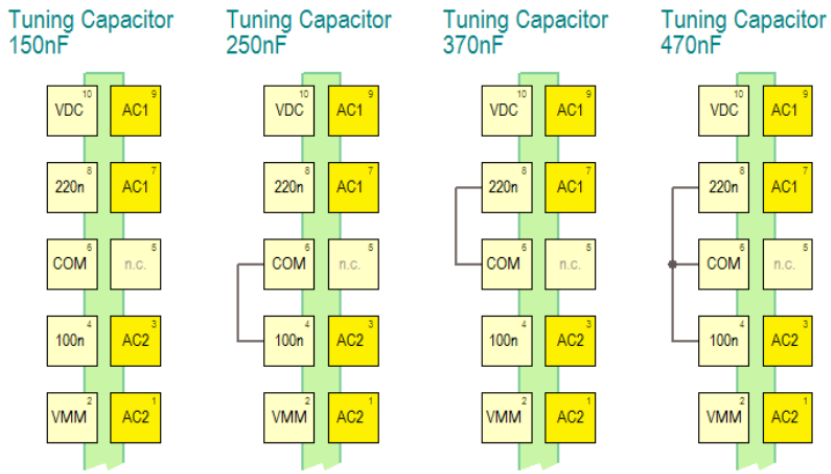
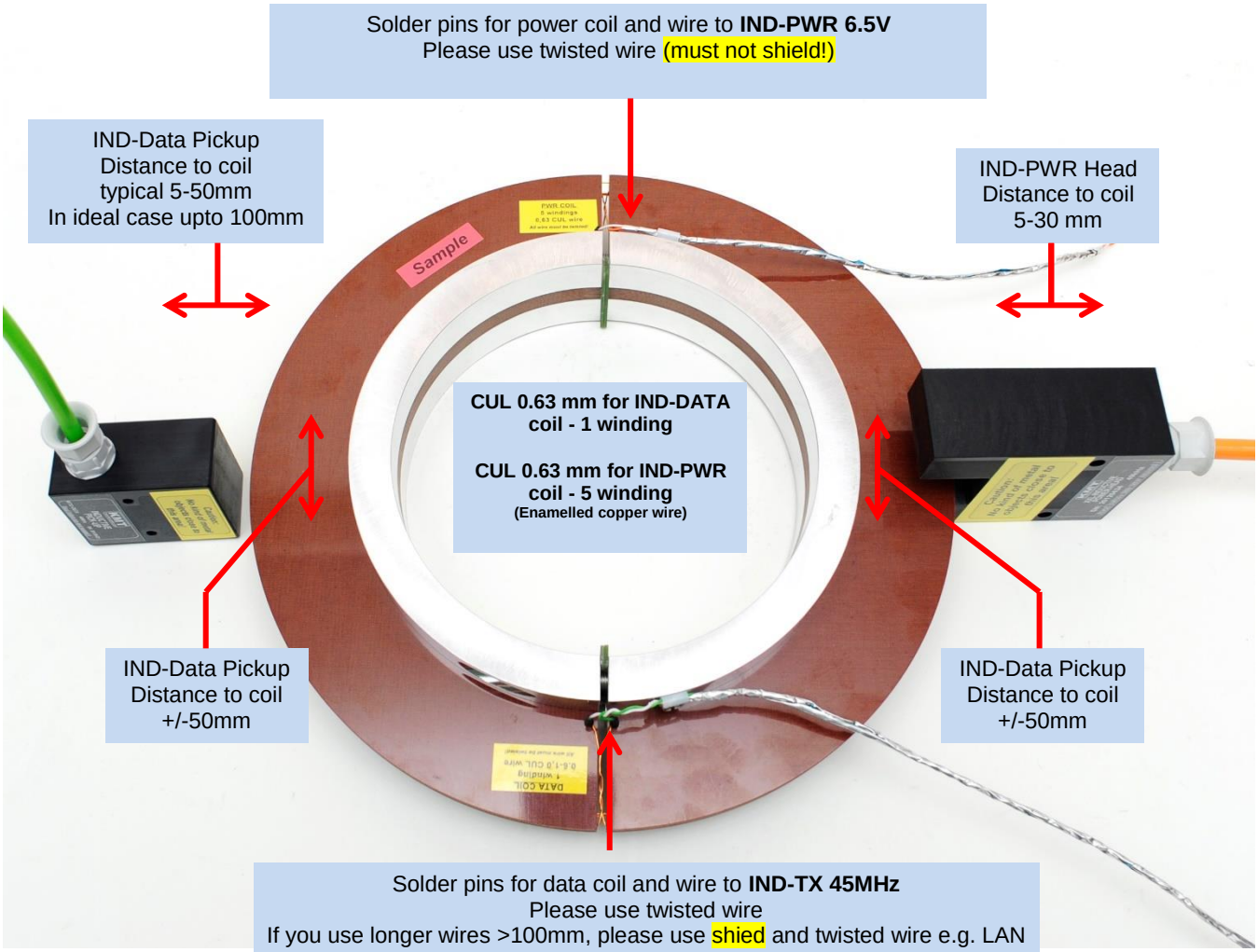
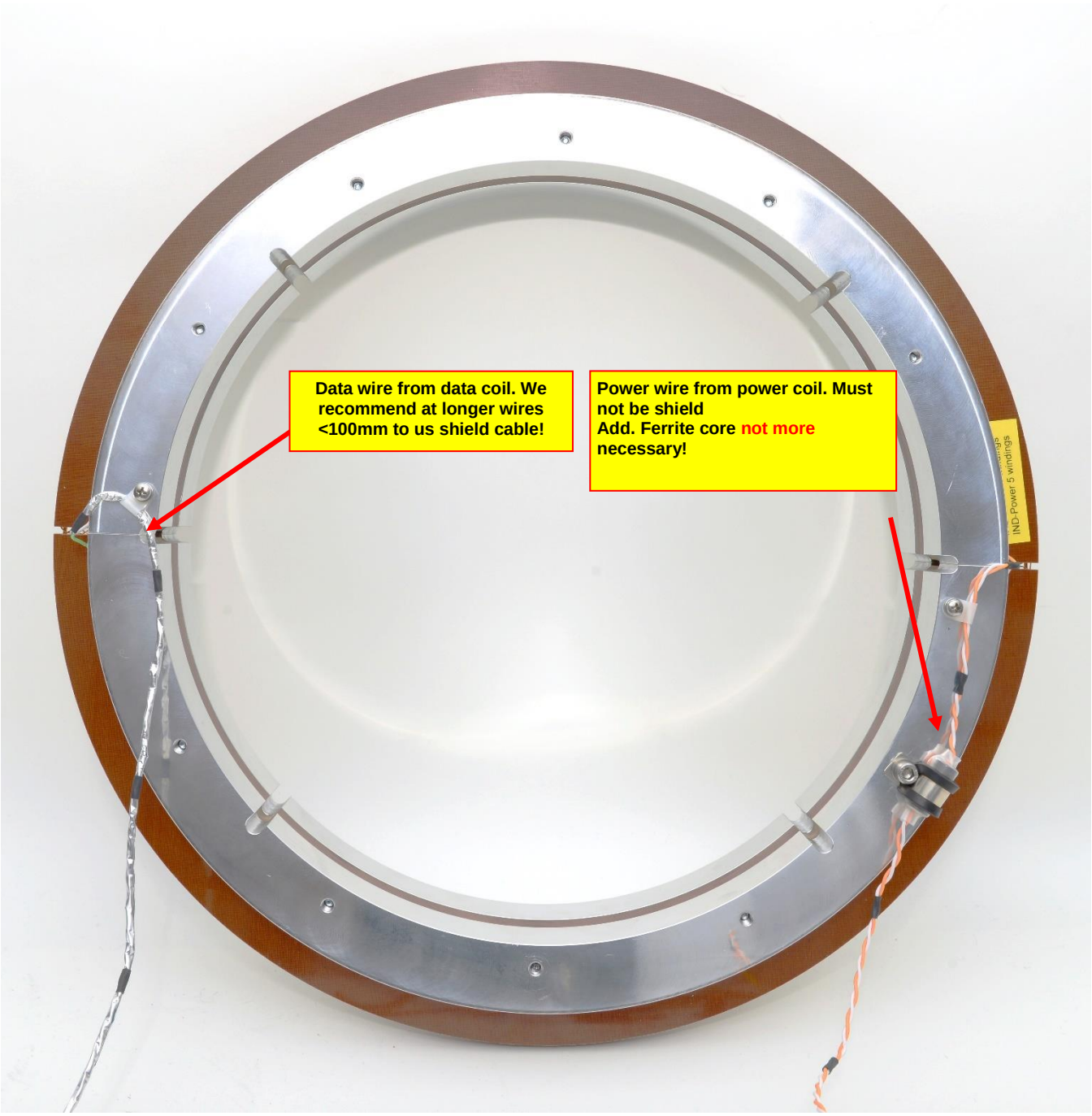


Inductive power supply
RING COIL - Distance power head and pickup head

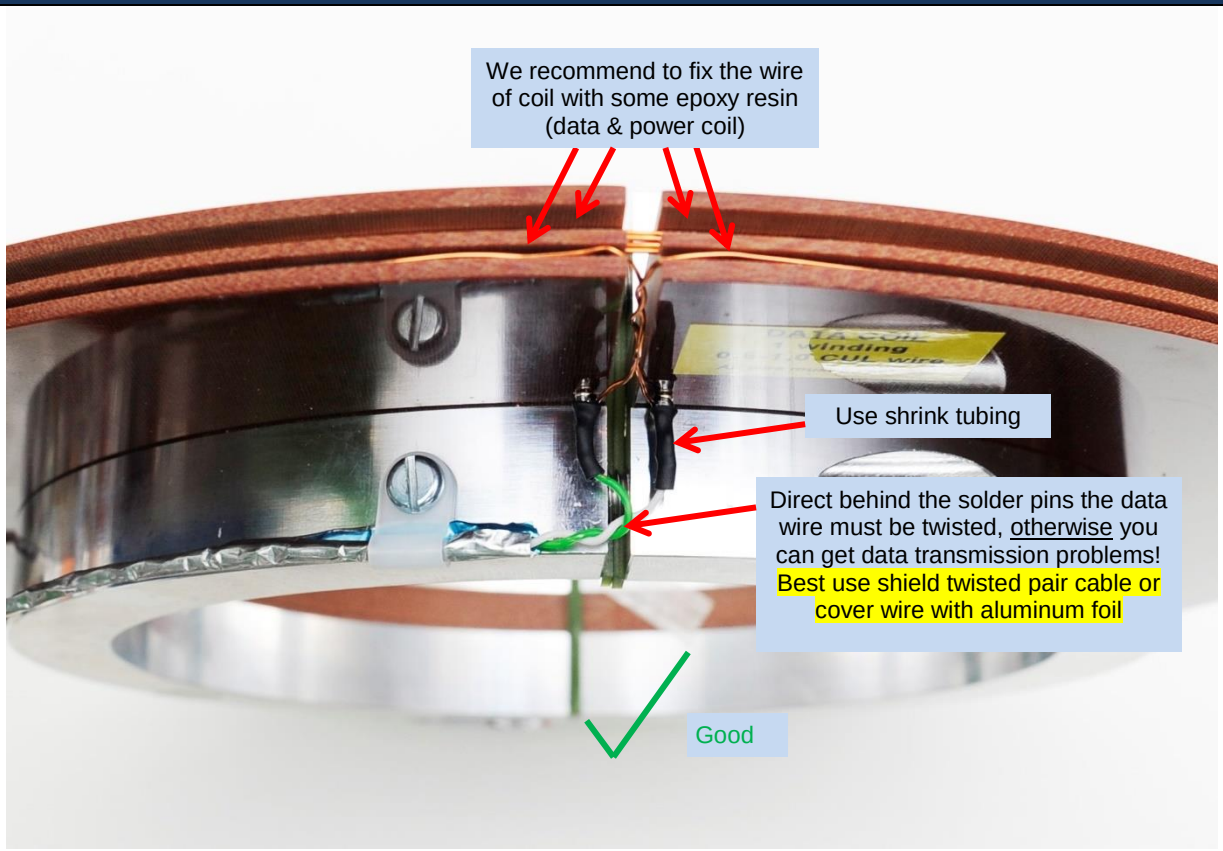


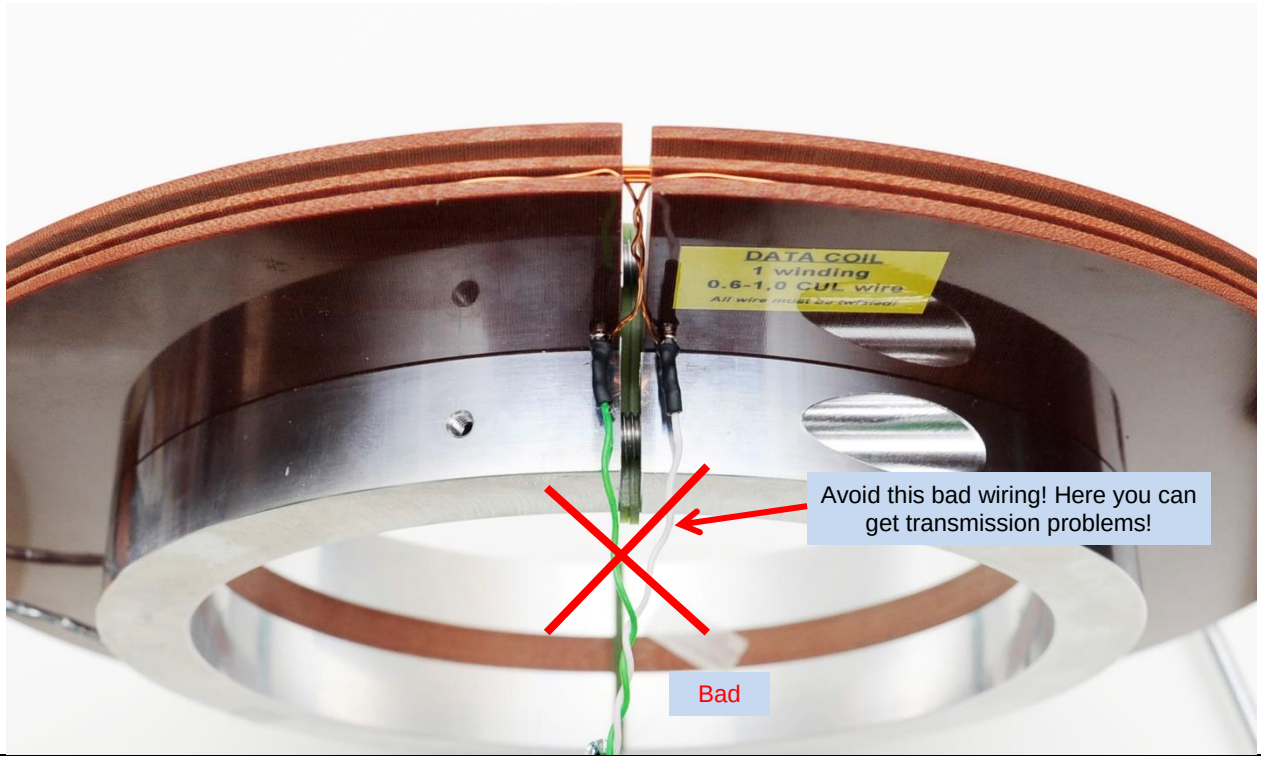
Data cable CAT. 7A S/FTP 4P AWG22 (= solid bare copper wire 0.64mm-diameter) recommend
or
Data cable CAT. 7 S/FTP 4P AWG23 (= solid bare copper wire 0.55mm-diameter)

RING COIL – uncouple the 45MHz frequency from inductive data coil with ferrite core filter to reach better transmitting range!



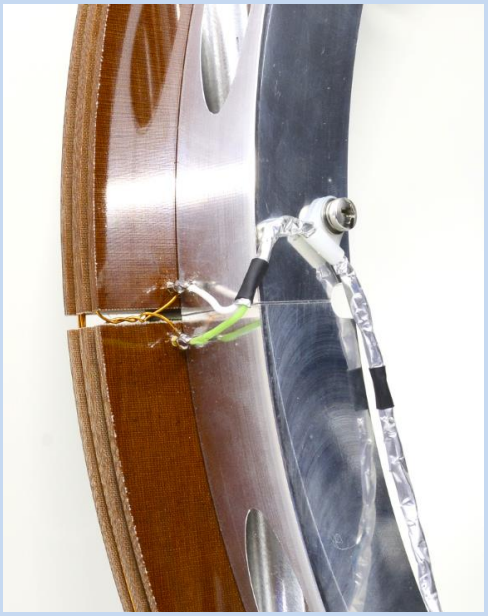
Inductive power supply
RING COIL – wire connection





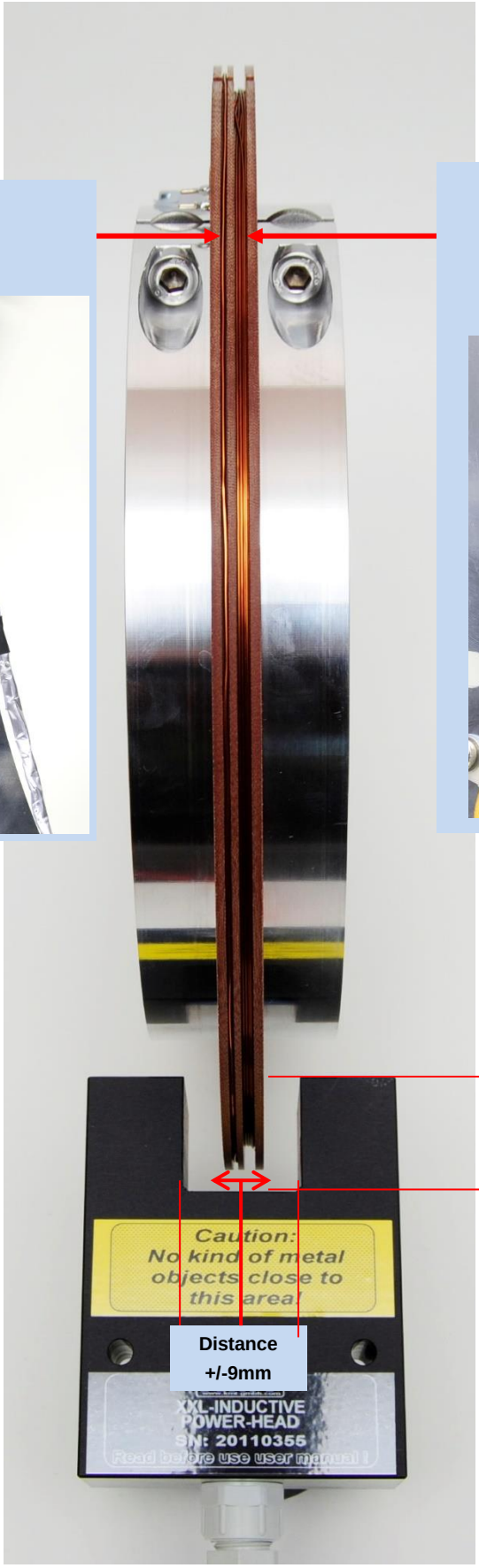
Inductive power supply
RING COIL – Distance power head

DATA-COIL
1 winding with
CUL wire 0.63mm
(Enamelled copper wire)



PWR-COIL
5 winding with
CUL wire 0.63mm
(Enamelled copper wire)

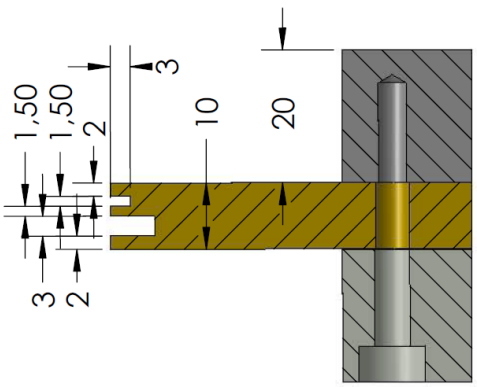
Windings depends of diameter!!
See label on RING Coil



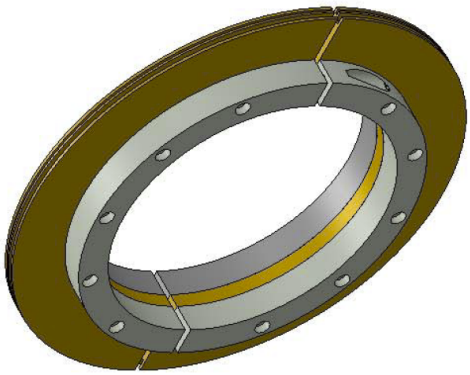
Distance 5-30mm

Distance
+/-9mm

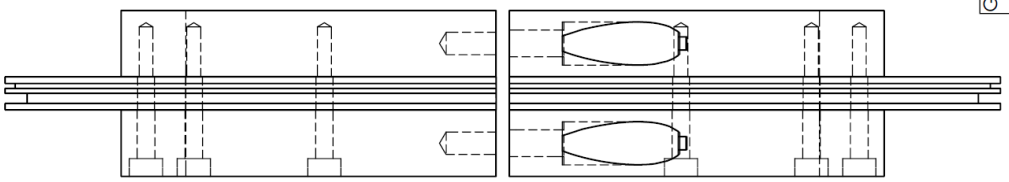
Inductive power supply
Example of a RING COIL with inner diameter 191mm

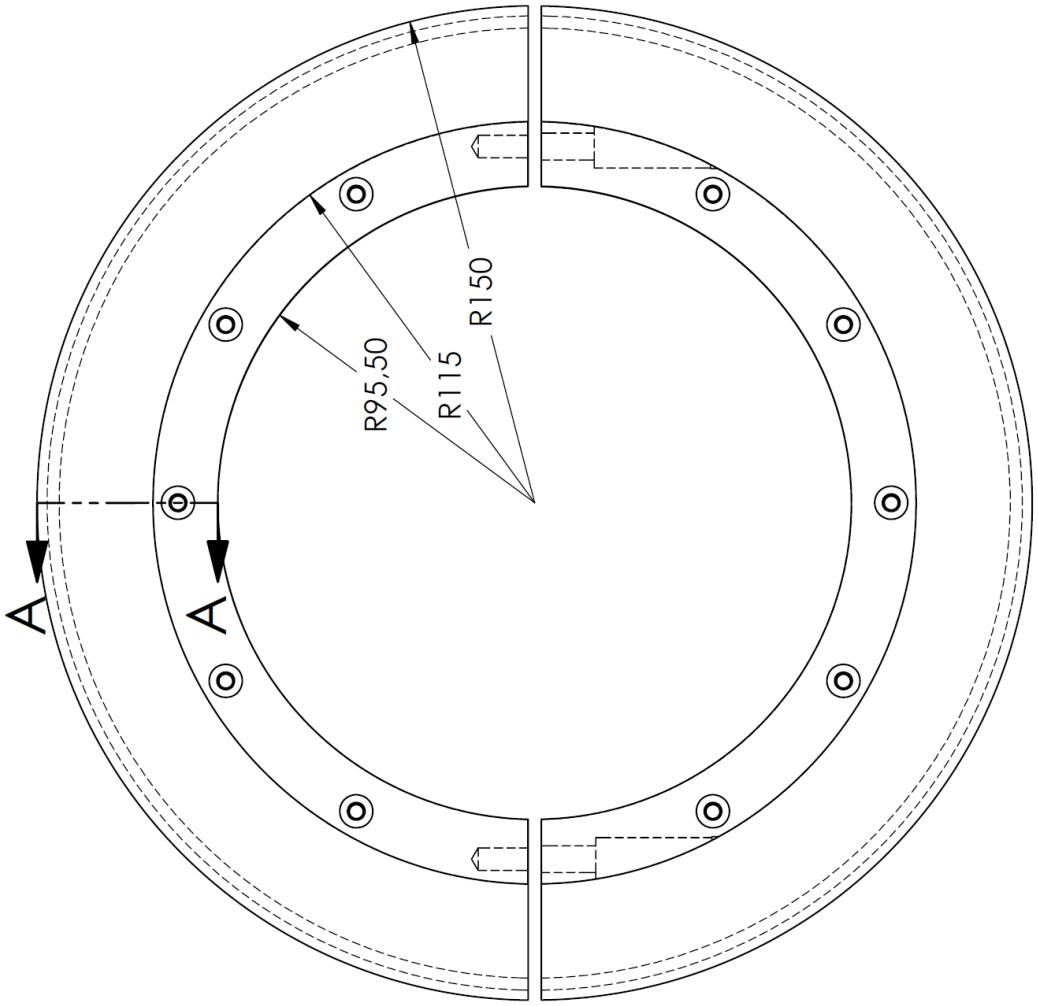


SCHNITT A-A
MAßSTAB 1 : 1

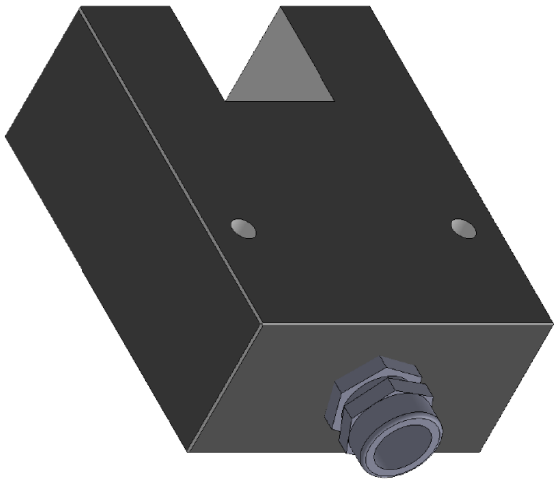


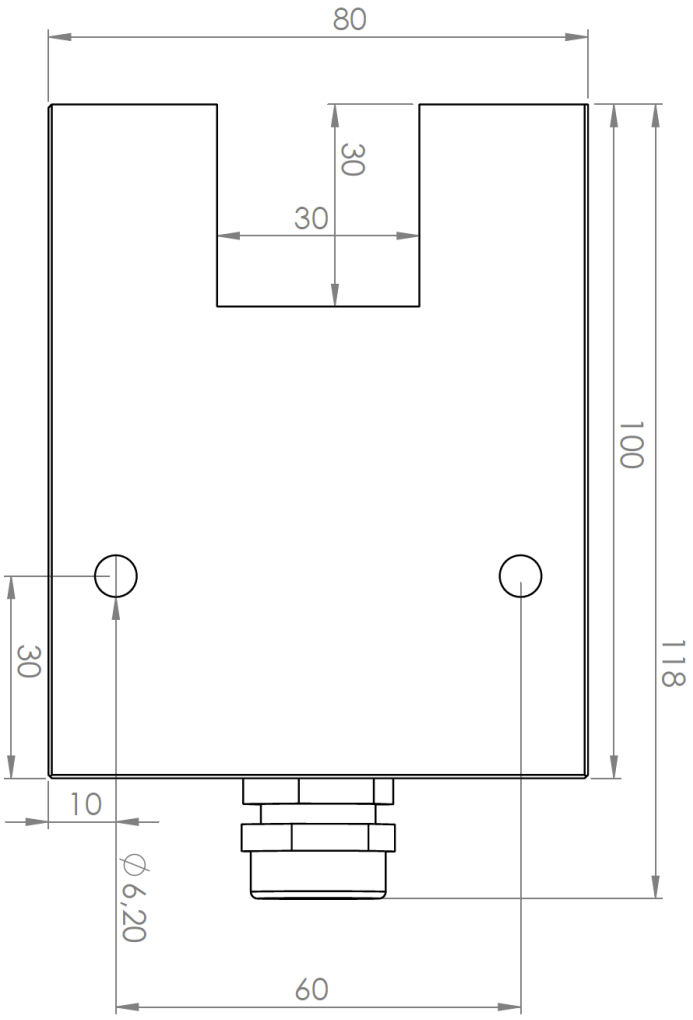
ÄND.
BLATT 1 VON 1
GRÖSSE A
ZEICHNUNGSNR. Ring191B
MASSSTAB: 1:5

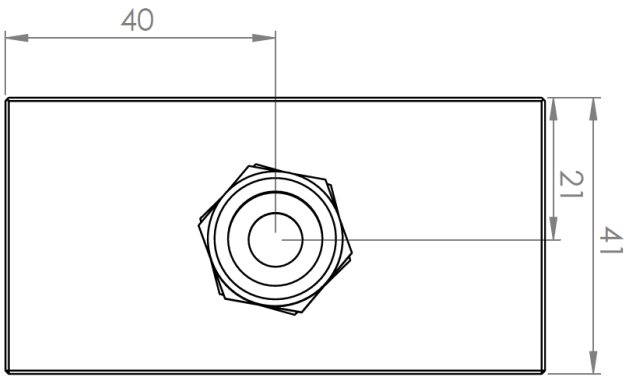




Dimensions of IND-PWR-HEAD-XXL



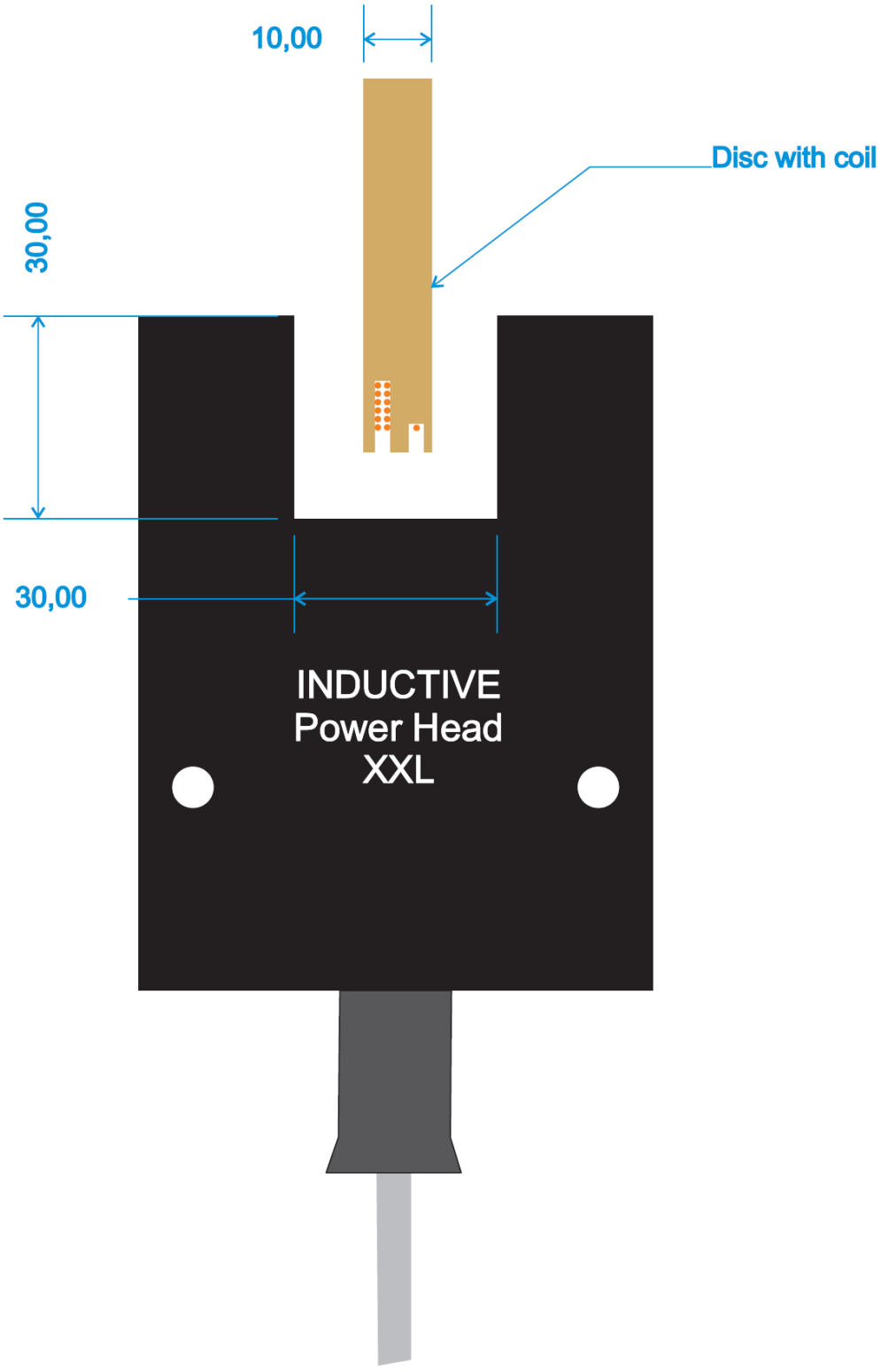




KMT TELEMETRY		Date	10.10.2016
		Version	
		Remarks:	
		Mat:	
hU	Scale 1:1	Bl.: A4	Weight-gr: 376.66
	Part: PH-XXL-Schlitz-bg		
E-mail: info@kmt-gmbh.com Tel: 08024-48737, Fax. 08024-5532			

Dimensions of IND-PWR-HEAD-XXL

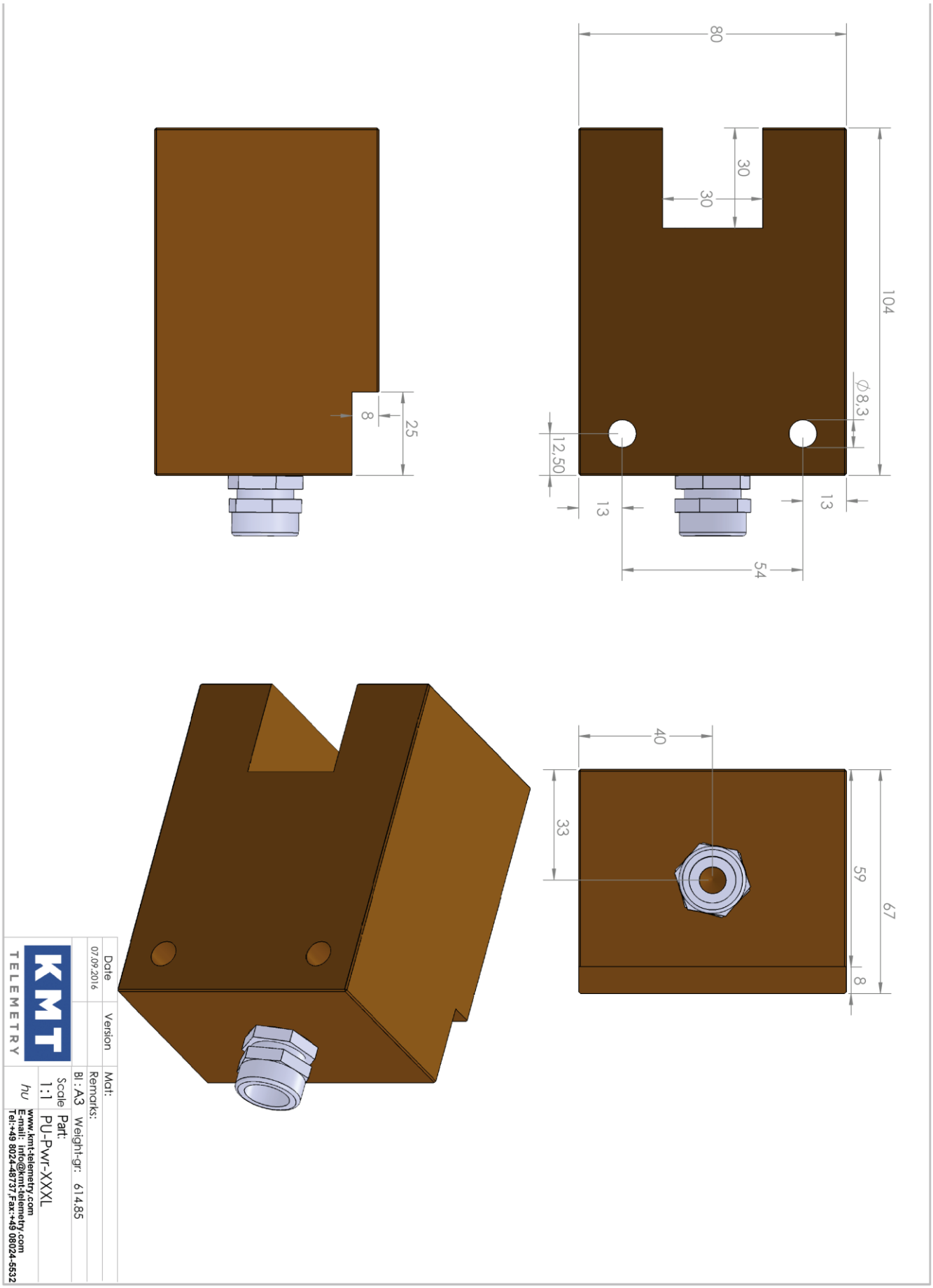
INDUCTIVE POWER HEAD XXL
Coil distances



IND-PWR-HEAD-XXL

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

Dimensions of IND-PWR-HEAD-XXXL (Old version)



IND-PWR-HEAD-XXXL (Old version)

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