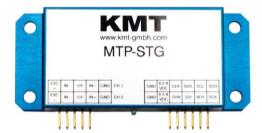
### **KMT - Kraus Messtechnik GmbH**

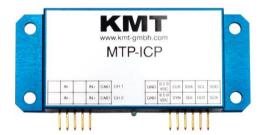
Gewerbering 9, D-83624 Otterfing, Germany, 208024-48737, Fax. 08024-5532 Home Page http://www.kmt-telemetry.com, Email: info@kmt-telemetry.com



# **MTP**

# Multi channel telemetry system for rotating application, full software programmable with 16 bit resolution













- 2 to 64 channel
- Signal bandwidth 0-24000Hz
- Inputs for STG, TH-K, ICP or VOLT
- STG Auto Zero calibration
- 4V bridge Excitation
- Gain 125-250-500-1000-2000

- 16 bit ADC, simultaneous sampling
- Full software programmable
- Inductive or battery power
- Rugged housing, water protected
- Output analog +/- 10V
- Digital data interface to PC

#### **Short description:**

The MTP telemetry is a small and flexible telemetry system for rotating applications. Each sensor module (2-channel) is equipped with signal conditioning, anti-aliasing filters, analog-to-digital converters and a digital output. All these up to 32 modules (=64 channels) will controlled by MTP-Controller 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 25cm module to module. The MTP-Controller output is a PCM bit stream signal which can be modulated for emission by a transmitter module for distances of up to 0.1 with inductive telemetry transmission or up to 10m with radio telemetry transmission. Suitable for wireless data transmission rates of 312.5kbit/s up to 5000kbit/s

#### MTP acquisition modules (rotor side)

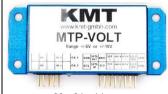


80 x 34 x 14 mm Weight 60 grams

#### MTP-STG-V3

Acquisition module for 2 strain gages Full, half >=350 hme and quarter bridge 350 hme Fixed excitation 4V DC Offset calibration by auto zero Manual offset shifting after auto zero Gain: 125-250-500-1000-2000 Test shunt-cal step Signal bandwidth 0Hz to 24000Hz\* ('see table of cut-off-frequency) Resolution 16bit Accuracy <0.2% Powering: 6.5-9V DC Current consumption with full bridge 350 ohm 75mA

Vibration: 5g Static acceleration: 3000g



80 x 34 x 14 mm Weight 60 grams

#### MTP-VOLT-V3

Acquisition module for 2x high level inputs

Range: ±0,625V, ± 1,25V, ±2,5V, ± 5V, ±10V

Signal bandwidth 0Hz to 24000Hz\* (\*see table of cut-off-frequency) +4V sensor excitation max. 20mA Resolution 16bit Accuracy <0.2% Powering: 6.5-9V DC Current consumption 60mA Vibration: 5g

Static acceleration: 3000g Shock: 10000g



80 x 34 x 14 mm Weight 60 grams

#### MTP-ICP®

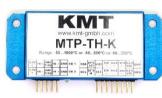
Shock: 10000g

Acquisition module for 2 ICP sensors Current EXC. 4mA Gain: 1-2-4-8-16-32

Signal bandwidth 3 Hz to 24000Hz\* (\*see table of cut-off-frequency)
Resolution 16bit

Accuracy <0.2%
Powering: 6.5-9V DC
Current consumption 100mA
Vibration: 5g

Static acceleration: 3000g Shock: 10000g



80 x 34 x 14 mm Weight 60 grams

#### MTP-TH-K

Acquisition module for 2x TH-K <u>Inputs galvanic isolated</u> Range -50 to 1000°C, -50 to 500°C or -50 to 250°C

Cut-off filter 30Hz (more on request)

Resolution 16bit Accuracy: 0.2% at 1000°C range

Powering: 6.5-9V DC Current consumption 110mA Vibration: 5g

Static acceleration: 3000g Shock: 10000g



#### MTP-Pt100/1000 (RTD)

Acq. module for 2 RTD sensors Range -100 to 600°C, -50 to 300°C or -25 to 150°C

Type Pt100 or Pt1000
Current EXC. 1mA
Connection: 4-, 3- and 2 wire
Sensor break detection
Signal bandwidth 6Hz
Resolution 16bit
Accuracy <0.2%

Current consumption 60mA Vibration: 5g Static acceleration: 3000g

Shock: 10000g

Powering: 6.5-9V DC

80 x 34 x 14 mm Weight 60 grams



#### MTP-CONTROL

Controller 1- 32 acquisition modules

Output: PCM

Programmable via LAN adapter Powering: 6.5-9V DC

Current consumption 40mA, with LANsetup adapter 140mA

Vibration: 5g
Static acceleration: 3000g

Shock: 10000g

#### Additional environmental

Operating Temperature -20 – +80°C Storage Temperature -30 – +90°C Humidity 100%

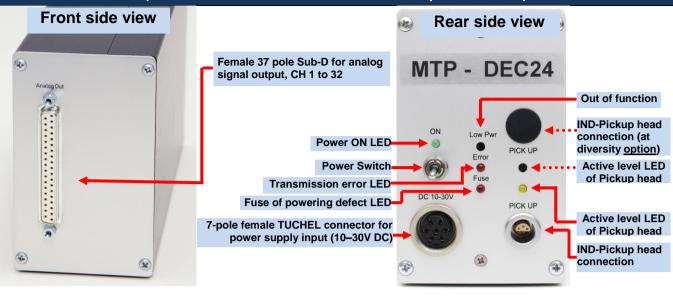
#### Signal bandwidth, sampling rates and delay time:

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

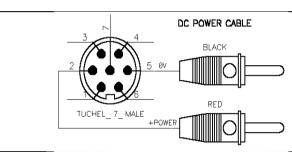
Delay Time from Analog In to Analog Out (theoretical, brown)

Bit rate 2 Channels 4 Channels 8 Channels 16 Channels 32 Channels 64 Channels 24000 Hz max. 12000 Hz 6000 Hz 3000 Hz 1500 Hz 5000 kbit/s (62500 Hz) (7812 5 Hz) 17<u>,</u>9 ms 1,6 ms 4.5 ms 8,9 ms 24000 Hz max. 12000 Hz 6000 Hz 3000 Hz 1500 Hz 750 Hz 2500 kbit/s (7812.5 Hz) (1953.125 Hz) (31250 Hz) (15625 Hz) (3906.25 Hz) 1.6 ms 4.5 ms 8 9 mg 17.9 ms 12000 Hz 6000 Hz 3000 Hz 1500 Hz 750 Hz 375 Hz (3906.25 Hz) 17,9 ms (31250 Hz) 2,3 ms 1250 kbit/s (15625Hz) (7812.5 Hz) (1953.125 Hz) (976.56 Hz) 71,5 ms 4.7 ms 9.1 ms 35,7 ms 6000 Hz 3000 Hz 1500 Hz 750 Hz 375 Hz 190Hz 625 kbit/s (3906.25 Hz) (488.28 Hz) (7812.5 Hz) (1953.125 Hz) (976.56 Hz) (15625Hz) 142,3 ms 4.7 ms 9.4 ms 71.5 ms 18.3 ms 35.7 ms 3000 Hz 1500 Hz 750 Hz 375 Hz 95 Hz 190 Hz 312,5 kbit/s (7812.5 Hz) (3906.25 Hz) (1953.125 Hz) (976.56 Hz) (488.28 Hz) (244.14 Hz) 9,4 ms 71,5 ms 142,5ms 19.1 ms 36.3 ms 285 ms

## MTP-DEC8/16/32 Receiver unit for max 32 Channels output via 37 pol. Sub D (inductive transmission 45MHz version up to 5000Mbit)



	1		ANALOG-CH1-OUT >
(	20	ANALOG-CH20-OUT	
0-	21		ANALOG-CH2-OUT
0-	3	ANALOG-CH21-OUT	ANALOG-CH3-OUT >
	22	ANALOG-CH22-OUT	-ANALUG-CH3-UUT
~ o-	4	711171200 01122 001	ANALOG-CH4-OUT >
0	23 5	ANALOG-CH23-OUT	
_ ~	24	TANKA OO OUGA OUT	-ANALOG-CH5-OUT)
	6	ANALOG-CH24-OUT	ANALOG-CH6-OUT >
0-	25	ANALOG-CH25-OUT	ANALOG ONG GOT
	7 26		ANALOG-CH7-OUT
0-	8	ANALOG-CH26-OUT	ANALOG OUR OUT
	27	ANALOG-CH27-OUT	ANALOG-CH8-OUT
· ~	9	7111 LOG 01127 0017	ANALOG-CH9-OUT >
0	28 10	ANALOG-CH28-OUT	
_ ~	29	ANALOG CUOO CUT	ANALOG-CH10-OUT
0	11	ANALOG-CH29-OUT	ANALOG-CH11-OUT
0-	30 12	ANALOG-CH30-OUT	
0-	31		ANALOG-CH12-OUT
0	13	ANALOG-CH31-OUT	ANALOG-CH13-OUT
-	32	ANALOG-CH32-OUT	ANALOG-CITIS-COT
0-	14 33	[]	ANALOG-CH14-OUT
0	15	<del></del>	
0	34	_	ANALOG-CH15-OUT
Г о <u>—</u>	16		ANALOG-CH16OUT >
0	35 17		
_ 0-	36	NACNID	ANALOG-CH17-OUT
0	18	<b>D</b> AGND	ANALOG-CH18-OUT
0	37		7444200 01110 0017
\ 0 )	19	•	ANALOG-CH19-OUT
		P	lug-side
			lug side





#### MTP -DEC8/16/24/32 System Parameters:

Channel: 8,16 or 32x +/-10V analog outputs via Sub-D male socket

Resolution: 16 bit D/A converter, with smoothing filter

Power supply input: 10-30 VDC, power consumption <24 Watt

Transmission: Digital PCM Bi-Phase Format – FSK, receiver

Dimensions: 205 x 105 x 65mm

Weight: 1.25 kg without cables and antenna Overall system accuracy between encoder input and decoder output: <0.2% without sensor influences

Environmental

Operating: -20 ... +70°C

Humidity: 20 ... 80% not condensing

Vibration: 5

Static acceleration: 10g in all directions
Shock: 100g in all directions

#### MTP-DEC8/16/32 Receiver unit for max 32 Channels output via 37 pol. Sub D (radio transmission version with diversity receiver 320-1280kbit)



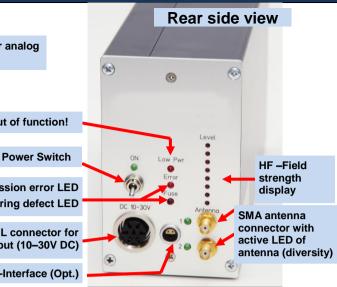
Female 37 pole Sub-D for analog signal output, CH 1 to 32

Out of function!

**Transmission error LED** Fuse of powering defect LED

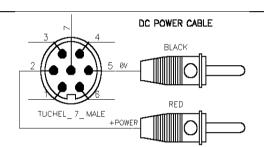
7-pole female TUCHEL connector for power supply input (10-30V DC)

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



1 1		ANALOG-CH1-OUT >
	ANALOG-CH20-OUT	
		ANALOG-CH2-OUT -
	ANALOG-CH21-OUT	
22	ANALOG CUIDO OUT	ANALOG-CH3-OUT)
4	ANALUG-CHZZ-UUT	ANALOG-CH4-OUT >
	ANALOG-CH23-OUT	7.11.12.00 0111 0017
		ANALOG-CH5-OUT >
	ANALOG-CH24-OUT	
25	ANALOG CUOE OUT	ANALOG-CH6-OUT >
7	ANALOG-CH25-001	ANALOG-CH7-OUT >
	ANALOG-CH26-OUT	71101200 0117 0017
		ANALOG-CH8-OUT -
9	ANALOG-CH27-OUT	[1111 00 0110 011 <del>7</del> ]
28	VVIVI OC_CH38_UIT/	ANALOG-CH9-OUT)
10	ANALOG-CH20-001	ANALOG-CH10-OUT
	ANALOG-CH29-OUT	
		ANALOG-CH11-OUT
12	[ANALOG-CH30-OUT]>	ANALOG CUITO OUT
31	- ANALOG-CH31-OLIT	ANALOG-CH12-OUT
	THE COLOR	ANALOG-CH13-OUT
	ANALOG-CH32-OUT	
		ANALOG-CH14-OUT
15	<del></del>	ANALOG-CH15-OUT
34	<del></del>	ANALOG CITIS COT
		ANALOG-CH16OUT >
		[
36	NACNID	ANALOG-CH17-OUT
18	PAGNU	ANALOG-CH18-OUT
<u> 19</u>	•	ANALOG-CH19-OUT
	В	lua-sida
	20 2 2 1 3 22 4 23 5 5 24 6 6 25 7 26 8 8 27 9 28 10 29 11 30 29 11 30 13 33 15 13 33 15 14 14 15 16 16 17 17 18 18 18 18 18 18 18 18 18 18 18 18 18	20 — ANALOG-CH20-OUT > 21

Plug-side





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

#### MTP -DEC8/16/24/32 System Parameters:

Channel: 8,16 or 32x +/-10V analog outputs via Sub-D male socket

Resolution: 16 bit D/A converter, with smoothing filter Power supply input: 10-30 VDC, power consumption <24 Watt Transmission: Digital PCM Bi-Phase Format - FSK,

205 x 105 x 65mm Dimensions:

1.25 kg without cables and antenna Overall system accuracy between encoder input and decoder output: <0.2% without sensor influences

Environmental

-20 ... +70°C Operating:

Humidity: 20 ... 80% not condensing

Vibration:

Static acceleration: 10g in all directions 100g in all directions Shock: