

MCTS II

Multi Channel Current Transducer System

Installation Manual



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1. Introduction

The MCTS is a multichannel high precision current transducer system, mainly used for the range extension of power meters. The rack can be equipped with up to six internal power supplies. All internal power supplies are galvanic isolated from each other and from earth potential. The current output terminals deliver the transducer output current on the back panel. Passive plug-on burden resistors and active plug-on voltage amplifiers are available as an option. The status-readout-interface delivers the transducer status (ok or overload/error) by means of internal galvanic isolated relay contacts.

Warning

Please be aware that an unpowered transducer or a transducer used with open output can be destroyed. The same can happen if a transducer is heavily overloaded. Power and transducer status are visible on the front panel. The information of the status-readout-interface on the back panel can be used to switch off the primary current via a relay or a PLC in case the transducer is overloaded, the MCTS is switched off or the output loop is interrupted. All these events will change the transducer status to error on the front panel led and the status-readout-interface. There is more information about the status-readout-interface available in chapter 6.

2. Receiving of goods

The MCTS system can be equipped with up to six internal power supplies. There are various transducer types available from 60 A up to 2000 A. Connection cables are available in different lengths. Passive plug-on shunts and active plug-on voltage modules are available as an option. A status-readout cable and different current and voltage output cables are available as options either.

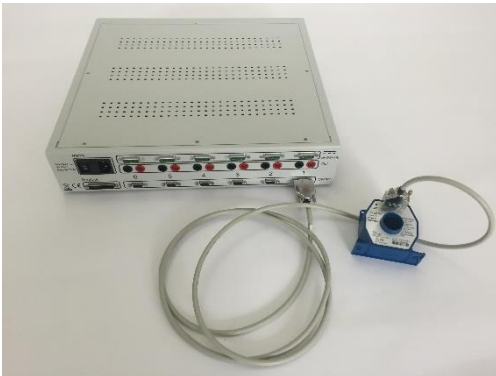
Please compare your order papers with our packing list and the received goods.

3. Hardware Installation

The MCTS is delivered with rack mounting brackets for the easy installation into a 19" cabinet. The mounting brackets can be installed easily with four screws on the left and right side panel. The 19" rack mounting brackets and the screws are delivered with the system.



3.1. Connection of the current sensor to the MCTS rack



The current transducer will be connected to the MCTS rack with the delivered D-SUB current transducer connection cable.

3.2. Connection of the current output to an instrument current input terminal



The transducer output current can be directly connected to the current input terminals of a current or a power meter.

3.3. Connection of the optional voltage output to an instrument voltage input terminal



Before you connect the current output to the voltage input terminal of a voltage meter or the sensor input terminal of a power meter you have to transfer the output current into a voltage signal. For this purpose, passive plug-on burden resistors and active plug-on output voltage amplifiers are available.

4. Operating instructions

Before you switch on the primary current through the current transducer, be sure that the transducer is powered by the MCTS rack and that the output current loop is closed. An unsupplied transducer can be damaged as well as a sensor with open current output loop. The power and transducer states (ok or error/overload) are visible on the front panel and available on the status-readout interface (see chapter 6).

Power-LED off:	System not powered or channel not installed
Power-LED green :	Channel powered
Status-LED off:	System not powered or channel not installed
Status-LED green :	Transducer connected, normal operation
Status-LED red :	Transducer overloaded or interruption in output circuit, switch primary current off!

Example: Four channel MCTS system



Channel 1, 2, 3:	Transducer powered, transducer status ok
Channel 4:	Transducer powered, transducer overloaded, output loop open or transducer defective
Channel 5, 6:	No power supply installed

5. Scaling

Various transducer types are available for the MCTS system. The older types of transducers (IT x0-S) are specified for a maximum DC- or peak-range. To calculate the AC rms-range of the sensor you have to divide the DC- or peak range by the square root of 2. The newer transducer types (IT x5-S and IN) are specified for a maximum rms- and DC-Range. You can find the detailed transducer specification in chapter 7.2.

5.1. Current output ratio

Transducer	DC-Range	rms-range	Ratio	Scaling Factor
IT 65-S	60 A	60 A	60A/100mA	600 : 1
IT 205-S	200 A	200 A	200A/200mA	1000 : 1
IT 405-S	400 A	400 A	400A/266.67mA	1500 : 1
IT 605-S	600 A	600 A	600A/400mA	1500 : 1
IN 1000-S	1000 A	1000 A	1000A/666.67mA	1500 : 1
IN 2000-S	2000 A	2000 A	2000A/1000mA	2000 : 1
IT 60-S	60 A	42 A	60A/100mA	600 : 1
IT 200-S	200 A	141 A	200A/200mA	1000 : 1
IT 400-S	400 A	282 A	400mA/200mA	2000 : 1
IT 700-S	700 A	495 A	700A/400mA	1750 : 1
IT 1000-S/SP1	1000 A	707 A	1000A/1000mA	1000 : 1

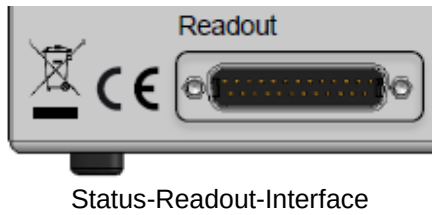
5.2. Sensor output ratio when using the passive plug-on resistors

Transducer	DC-Range	rms-range	Plug-on Burden Resistor	Ratio	Scaling Factor
IT 65-S	60 A	60 A	MCTS/BR25/0.01	60A/2.5V	41.667 mV/A
IT 205-S	200 A	200 A	MCTS/BR10/0.01	200A/2V	10.000 mV/A
IT 405-S	400 A	400 A	MCTS/BR10/0.01	400A/2.667V	6.667 mV/A
IT 605-S	600 A	600 A	MCTS/BR2.5/0.02	600A/1V	1.667 mV/A
IN 1000-S	1000 A	1000 A	MCTS/BR1.5/0.02	1000A/1V	1.000 mV/A
IN 2000-S	2000 A	2000 A	MCTS/BR1/0.02	2000A/1V	0.500 mV/A
IT 60-S	60 A	42 A	MCTS/BR50/0.01	60A/5V	83.333 mV/A
IT 200-S	200 A	141 A	MCTS/BR25/0.01	200A/5V	25.000 mV/A
IT 400-S	400 A	282 A	MCTS/BR1/0.02	400A/0.2V	0.500 mV/A
IT 700-S	700 A	495 A	MCTS/BR1/0.02	700A/0.4V	0.571 mV/A
IT 1000-S/SP1	1000 A	707 A	MCTS/BR1/0.02	1000A/1V	1.000 mV/A

5.3. Sensor output ratio when using the active plug-on voltage amplifiers

Transducer	DC-Range	rms-range	Plug-on Burden Resistor	Ratio	Scaling Factor
IT 65-S	60 A	60 A	MCTS/VM0.1/0.02	60A/7V	116.667 mV/A
IT 205-S	200 A	200 A	MCTS/VM0.2/0.02	200A/7V	35.000 mV/A
IT 405-S	400 A	400 A	MCTS/VM0.26/0.02	400A/7V	17.500 mV/A
IT 605-S	600 A	600 A	MCTS/VM0.4/0.02	600A/7V	11.667 mV/A
IN 1000-S	1000 A	1000 A	MCTS/VM0.66/0.02	1000A/7V	7.000 mV/A
IN 2000-S	2000 A	2000 A	MCTS/VM1/0.02	2000A/7V	3.500 mV/A
IT 60-S	60 A	42 A	MCTS/VM0.1/0.02	60A/7V	116.667 mV/A
IT 200-S	200 A	141 A	MCTS/VM0.2/0.02	200A/7V	35.000 mV/A
IT 400-S	400 A	282 A	MCTS/VM1/0.02	400A/1.4V	3.500 mV/A
IT 700-S	700 A	495 A	MCTS/VM1/0.02	700A/2.8V	4.000 mV/A
IT 1000-S/SP1	1000 A	707 A	MCTS/VM1/0.02	1000A/7V	7.000 mV/A

6. Status readout interface



The channel and transducer states are visible on the MCTS front panel and can be read out via the Status-Readout Interface.

The interface gives out the transducer status by means of potential free relay contacts.

Switching voltage: 200 V
Switching current: 2 A

A status readout cable is available as an option.

Transducer status ok: MCTS on and transducer in normal range
Transducer status error: MCTS off, transducer in over range or current output loop open

6.1. Pin-out of the 25-pole D-SUB

Channel Number	Status	Pin-Connection	Wire Color*
1	ok	14 - 2	green - brown
	power off, error, overload	14 - 1	green - white
2	ok	16 - 4	pink - grey
	power off, error, overload	16 - 3	pink - yellow
3	ok	18 - 6	black - red
	power off, error, overload	18 - 5	black - blue
4	ok	20 - 8	red/blue - grey/pink
	power off, error, overload	20 - 7	red/blue - violet
5	ok	22 - 10	white/yellow - brown/green
	power off, error, overload	22 - 9	white/yellow - white/green
6	ok	24 - 12	grey/brown - white/grey
	power off, error, overload	24 - 11	grey/brown - yellow/brown

* Status-Readout-Interface cable MCTS/ROC is available as an option

7. Specifications

7.1. Rack specifications



Front

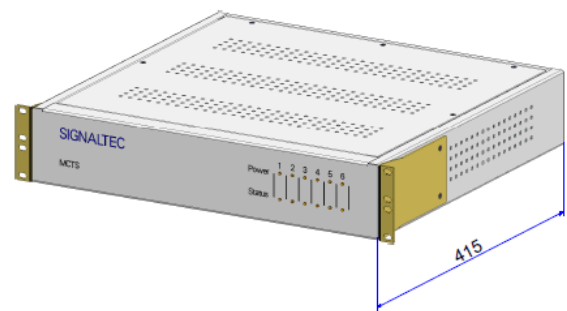
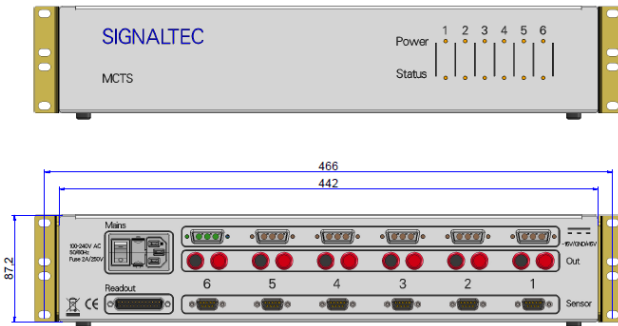


Rear

Dimensions

Cabinet Width: 442 mm (19" rack type)
Cabinet Height: 87,2 mm (2 HU)
Cabinet Depth: 415 mm

Mass Basic Unit: 6.8 kg
Mass Internal power supply: 0.5 kg
Mass 19" mounting brackets: 0.5 kg



General Data

Operation Temperature: -10 ... 60 °C
Operation Humidity: 20 ... 90 % RH, noncondensing
Warranty period: 36 Months

To ensure mechanical stability please use 19" rack rails.

Electrical Data

Supply voltage: 100-240 VAC, 50/60 Hz, fused with 6 A slow blow
Output voltages: + 15 V_{DC}, 3.4 A_{max} / -15 V_{DC}, 2.0 A_{max}
Max. Power Consumption: The maximum power consumption depends on the number of channels installed, the number of transducers connected and the current consumption of each transducer. The maximum power consumption of a six channel MCTS with transducers IN 2000-S at 2000 A_{rms} primary current is around 175 W.

7.2. Transducer specifications

7.2.1. Transducers with rms-range

Newer LEM transducer types of the IT xx5-S series and the IN series are specified for a maximum rms-range.

Type	IT 65-S	IT 205-S	IT 405-S	IT 605-S	IN 1000-S	IN 2000-S
						
Current Range						
DC	60 A	200 A	400 A	600 A	1000 A	2000 A
AC Sinus	60 A	200 A	400 A	600 A	1000 A	2000 A
Peak	85 A	283 A	566 A	845 A	1414 A	2828 A
100 ms Overload	300 A _{pk}	1000 A _{pk}	2000 A _{pk}	3000 A _{pk}	5000 A _{pk}	10000 A _{pk}
Ratio	600 : 1	1000 : 1	1500 : 1	1500 : 1	1500 : 1	2000 : 1
Output Range	0 ... 100 mA _{rms}	0 ... 200 mA _{rms}	0 ... 266.67 mA _{rms}	0 ... 400 mA _{rms}	0 ... 666.67	0 ... 1 A _{rms}
Max. Measuring Resistance (Full Range)	50 Ω	20 Ω	15 Ω	5 Ω	4 Ω	3.5 Ω
Bandwidth (-3 dB, Small Signal 0,5 %)	DC ... 800 kHz	DC ... 1 MHz	DC ... 300 kHz	DC ... 300 kHz	DC ... 440 kHz	DC ... 140 kHz
Step Response (0 ... 90 %)	1 μs	1 μs	1 μs	1 μs	1 μs	1 μs
Error (of Full Scale)	< 0.033 %	< 0.0103 %	< 0.0059 %	< 0.0039 %	< 0.0012 %	< 0.0012 %
Temp.-Coefficient (of Full Scale)	< 2.5 ppm/K	< 1 ppm/K	< 1 ppm/K	< 1 ppm/K	< 0.3 ppm/K	< 0.1 ppm/K
Frequency Influence* (of Measured Value)	< 0.025 %/kHz	< 0.1 %/kHz	< 0.175 %/kHz	< 0.3 %/kHz	< 0.1 %/kHz	< 0.1 %/kHz
Angular Accuracy*	< 0.01 ° + 0.02 °/kHz	< 0.01 ° + 0.075 °/kHz	< 0.01 ° + 0.08 °/kHz	< 0.01 ° + 0.175 °/kHz	< 0.01 ° + 0.05 °/kHz	< 0.01 ° + 0.075 °/kHz
Temperature Range	-40 ... 85 °C	-40 ... 85 °C	-40 ... 85 °C	-40 ... 85 °C	-40 ... 85 °C	-40 ... 85 °C
Test Voltage 50 Hz	5.4 kV	5.4 kV	4.6 kV	4.6 kV	4.2 kV	6 kV
Inner Diameter	26 mm	26 mm	30 mm	30 mm	38 mm	70 mm
Mass	0.33 kg	0.35 kg	1.08 kg	1.08 kg	1.3 kg	4.2 kg
Link to LEM Data Sheet for detailed Specifications	IT 65-S	IT 205-S	IT 405-S	IT 605-S	IN 1000-S	IN 2000-S

* Verified with 50 Arms, DC ... 10 kHz

7.2.2. Transducers with peak-range

Older LEM transducer types of the IT xx0-S series are specified for a maximum DC-range. They can be used up to the equal AC-rms-range by using a limited burden resistor.

Type	IT 60-S	IT 200-S	IT 400-S	IT 700-S	IT 1000-S/SP1
					
Current Range					
DC	60 A	200 A	400 A	700 A	1000 A
AC Sinus	42 A	141 A	282 A	495 A	707 A
Peak	60 A	200 A	400 A	700 A	1000 A
100 ms Overload	300 A _{pk}	1000 A _{pk}	2000 A _{pk}	3500 A _{pk}	4000 A _{pk}
Ratio	600 : 1	1000 : 1	2000 : 1	1750 : 1	1000 : 1
Output Range	0 ... 100 mA _{pk}	0 ... 200 mA _{pk}	0 ... 200 mA _{pk}	0 ... 400 mA _{pk}	0 ... 1000 mA _{pk}
Max. Measuring Resistance (Full Range)	60 Ω	30 Ω	2.5 Ω	2.5 Ω	3 Ω
Bandwidth (-3 dB, Small Signal 0,5 %)	DC ... 800 kHz	DC ... 500 kHz	DC ... 500 kHz	DC ... 100 kHz	DC ... 500 kHz
Step Response (0 ... 90 %)	1 μs	1 μs	1 μs	1 μs	1 μs
Error (of Full Scale)	< 0.027 %	< 0.0083 %	< 0.0043 %	< 0.0053 %	< 0.0053 %
Temp.-Coefficient (of Full Scale)	< 2.5 ppm/K	< 2 ppm/K	< 1 ppm/K	< 0.5 ppm/K	< 0.5 ppm/K
Frequency Influence* (of Measured Value)	< 0.025 %/kHz	< 0.075 %/kHz	< 0.05 %/kHz	< 0.1 %/kHz	< 0.3 %/kHz
Angular Accuracy (DC ... 10 kHz)	< 0.01 ° + 0.05 °/kHz	< 0.01 ° + 0.075 °/kHz	< 0.01 ° + 0.075 °/kHz	< 0.01 ° + 0.12 °/kHz	< 0.015 ° + 0.15 °/kHz
Temperature Range	10 ... 50 °C	10 ... 50 °C	10 ... 50 °C	10 ... 50 °C	10 ... 50 °C
Test Voltage 50 Hz	5.4 kV	5.4 kV	5.4 kV	4.6 kV	3.1 kV
Inner Diameter	26 mm	26 mm	26 mm	30 mm	30 mm
Mass	0.3 kg	0.3 kg	0.3 kg	0.8 kg	1 kg
Link to LEM Data Sheet for detailed Specifications	IT 60-S	IT 200-S	IT 400-S	IT 700-S	IT 1000-S/SP1

* Verified with 50 Arms, DC ... 10 kHz

7.3. Connection cable specifications



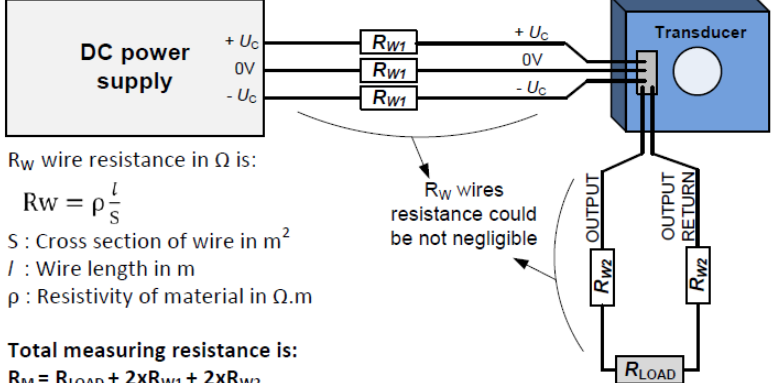
Connection cables from the MCTS rack to the transducers are available in various cable lengths. Special cable lengths can be manufactured according demand. Be aware that the cable resistance is part of the maximum measuring resistance mentioned in the transducer data sheets. The cables are available with two different wire cross sections, 0.34 mm² and 0.75 mm².

Power supply and load

In order to reach the measuring range according to the maximum measuring resistor, be careful with the setup measurement when wires length are high. It means that:

- the wires resistance could be not negligible
- the voltage at the output of the DC power supply and the voltage at the transducer could be significantly different.

Minimum $\pm U_C - 5\%$ must be seen by the transducer



R_W wire resistance in Ω is:

$$R_W = \rho \frac{l}{S}$$

S : Cross section of wire in m²
 l : Wire length in m
 ρ : Resistivity of material in $\Omega \cdot m$

Total measuring resistance is:
 $R_M = R_{LOAD} + 2xR_{W1} + 2xR_{W2}$

If $R_{W1} = R_{W2} = R_{WIRE}$ then $R_M = R_{LOAD} + 4xR_{WIRE}$

7.3.1 Standard Connection Cables

Order Number	Cable Length	Wire Cross Section	Single Wire Resistance	Loop Resistance (4 x R_{WIRE})	Mass
MCTS/TPS/1.5	1.5 m	0.34 mm ²	0.08 Ω	0.31 Ω	0.21 kg
MCTS/TPS/2.5	2.5 m	0.34 mm ²	0.13 Ω	0.52 Ω	0.28 kg
MCTS/TPS/3	3 m	0.34 mm ²	0.16 Ω	0.63 Ω	0.32 kg
MCTS/TPS/5	5 m	0.34 mm ²	0.26 Ω	1.05 Ω	0.47 kg
MCTS/TPS/10	10 m	0.34 mm ²	0.52 Ω	2.09 Ω	0.84 kg
MCTS/TPS/15	15 m	0.34 mm ²	0.79 Ω	3.14 Ω	1.21 kg
MCTS/TPS/20	20 m	0.34 mm ²	1.05 Ω	4.19 Ω	1.58 kg
MCTS/TPS/25	25 m	0.34 mm ²	1.31 Ω	5.24 Ω	1.95 kg
MCTS/TPS/30	30 m	0.34 mm ²	1.57 Ω	6.28 Ω	2.32 kg
MCTS/TPS/5/0.75	5 m	0.75 mm ²	0.12 Ω	0.47 Ω	0.65 kg
MCTS/TPS/10/0.75	10 m	0.75 mm ²	0.24 Ω	0.95 Ω	1.15 kg
MCTS/TPS/15/0.75	15 m	0.75 mm ²	0.36 Ω	1.42 Ω	1.70 kg
MCTS/TPS/20/0.75	20 m	0.75 mm ²	0.47 Ω	1.90 Ω	2.30 kg
MCTS/TPS/30/0.75	30 m	0.75 mm ²	0.71 Ω	2.85 Ω	3.30 kg

7.3.2 Total Measuring Resistance at Full Scale

Transducer	Measuring Resistance
IT 60-S	60 Ω
IT 200-S	30 Ω
IT 400-S	2.5 Ω
IT 700-S	2.5 Ω
IT 1000-S/SP1	3 Ω
IT 65-S	50 Ω
IT 205-S	20 Ω
IT 405-S	15 Ω
IT 605-S	5 Ω
IN 1000-S	4 Ω
IN 2000-S	3.5 Ω

7.3.3. Maximum Burden Resistor depending on Transducer and Connection Cable

The remaining burden resistance can be calculated by subtraction of the connection cable loop resistance from the transducer total measuring resistance.

Example IN 1000-S with 15 meters cable 0.34 mm² and 0.75 mm²:

IN 1000-S total measuring resistance: 4 Ω at 1000 A_{rms}

MCTS/TPS/15 loop resistance: 3.14 Ω → Maximum burden resistor = 4 Ω - 3.14 Ω = 0.86 Ω

MCTS/TPS/15/0.75 loop resistance: 1.42 Ω → Maximum burden resistor = 4 Ω - 1.42 Ω = 2.58 Ω

7.4. Burden module specifications



The transducer system delivers the transducer output current at the 4 mm output terminals on the back panel of the rack. For those instruments which don't have current input terminals, optional high precision passive and active plug-on burden modules with very low phase angle error are available. The active voltage output modules are supplied by the MCTS rack with a 3-pole D-SUB connector.

7.4.1. Passive plug-on burden resistor specifications



Passive plug-on burden resistors are available from 1 Ω to 50 Ω . The burden resistor is limited by the transducer and the length of the connection cable. For higher output voltages active plug-on burden amplifiers are available.

Order Number	Resistance Value	Accuracy	Max. Output Voltage	Bandwidth	Phase Error	Load Influence
MCTS/BR1/0.02	1 Ω	0.02 % of MV	1.00 V _{rms} @ 1000 mA _{rms}	> 1 MHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/BR1.5/0.02	1.5 Ω	0.02 % of MV	1.00 V _{rms} @ 667 mA _{rms}	> 1 MHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/BR2.5/0.02	2.5 Ω	0.02 % of MV	1.58 V _{rms} @ 632 mA _{rms}	> 1 MHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/BR3.75/0.02	3.75 Ω	0.02 % of MV	1.94 V _{rms} @ 516 mA _{rms}	> 1 MHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/BR5/0.02	5 Ω	0.02 % of MV	2.24 V _{rms} @ 447 mA _{rms}	> 1 MHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/BR10/0.01	10 Ω	0.01 % of MV	3.16 V _{rms} @ 316 mA _{rms}	> 1 MHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/BR25/0.01	25 Ω	0.01 % of MV	5.00 V _{rms} @ 200 mA _{rms}	> 1 MHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/BR50/0.01	50 Ω	0.01 % of MV	7.07 V _{rms} @ 141 mA _{rms}	> 1 MHz	< 1° @ 100 kHz	< 0.1 ppm/mW

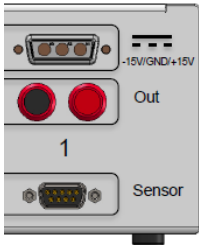
Mechanical Data

Width:	51 mm
Height:	51 mm
Depth:	62 mm (Connectors included)
Mass:	85 g

7.4.2. Active plug-on voltage amplifier specifications



The output voltage level the transducer can drive is limited. The active plug-on burden modules combine a very precise burden resistor with a highly accurate voltage amplifier. The plug-on burden voltage modules deliver 7 V_{rms} (9.9 V_{pk}) at transducer nominal value.



The active plug-on voltage output modules are powered by the 3-pole D-SUB on the back panel of the system.

Order Number	Input Resistance	Accuracy [% of V + % of R]	Max. Output Voltage	Bandwidth	Phase Error	Load Influence
MCTS/VM1/0.02	1 Ω	0.01 % + 0.01 %	7 V _{rms} @ 1000 mA _{rms}	> 300 kHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/VM0.66/0.02	1.5 Ω	0.01 % + 0.01 %	7 V _{rms} @ 667 mA _{rms}	> 300 kHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/VM0.4/0.02	2.5 Ω	0.01 % + 0.01 %	7 V _{rms} @ 400 mA _{rms}	> 300 kHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/VM0.26/0.02	3.75 Ω	0.01 % + 0.01 %	7 V _{rms} @ 267 mA _{rms}	> 300 kHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/VM0.2/0.02	5 Ω	0.01 % + 0.01 %	7 V _{rms} @ 200 mA _{rms}	> 300 kHz	< 1° @ 100 kHz	< 0.1 ppm/mW
MCTS/VM0.1/0.02	10 Ω	0.01 % + 0.01 %	7 V _{rms} @ 100 mA _{rms}	> 300 kHz	< 1° @ 100 kHz	< 0.1 ppm/mW

Mechanical Data

Width: 51 mm
 Height: 51 mm
 Depth: 62 mm (Connectors included)
 Mass: 105 g

8. Switching off and deinstallation

Before you switch off the MCTS rack, open the output current loop or remove any cable between rack and sensor, make sure that the primary current is switched off. An unpowered transducer can be damaged.

9. Installation of additional internal power supplies (channel extension)

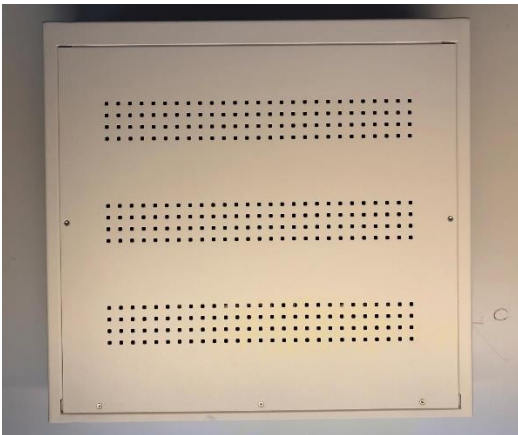
The MCTS system can be ordered with one to six internal power supplies (MCTS2/1CH to MCTS/6CH). The system can be extended with addition power supplies (MCTS/PS) easily.



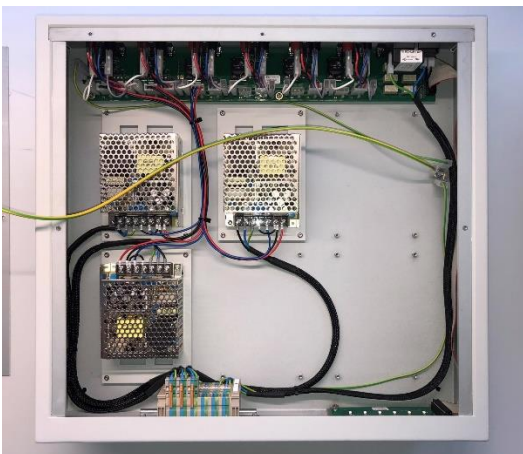
For the modification you need one power supply kit MCTS/PS. It consists of the following components:

- 1 pcs. power supply 50 W
- 1 pcs. primary connection cable
- 1 pcs. secondary connection cable
- 1 pcs. baseplate
- 4 pcs. TORX screw T10
- 4 pcs. toothed washers

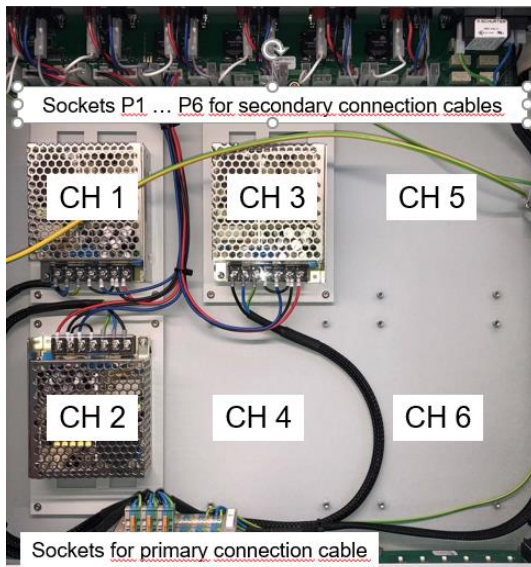
Example for systems modification from three to four channels:



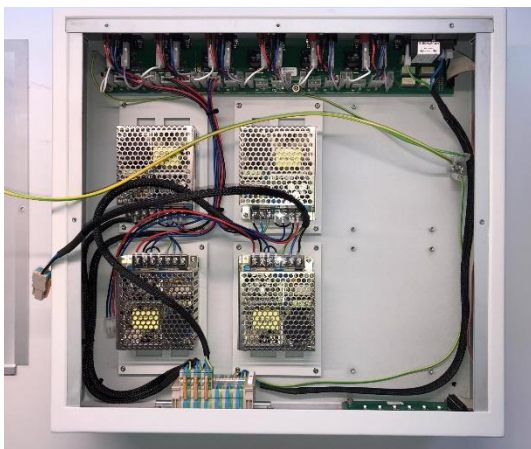
Remove the five TORX screws from the top panel and open the system. Be absolutely sure that the power cord has been unplugged before you open the rack.



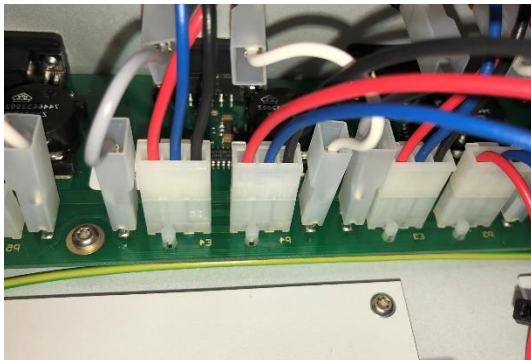
Remove the top panel.



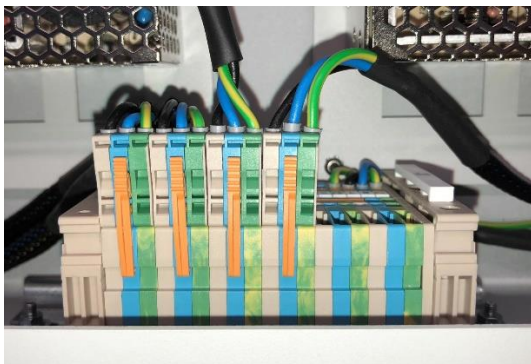
You find the sockets for the connection of the secondary on the electronics board in the back of the system. The sockets for the primary AC power connection cables are in the front of the rack.



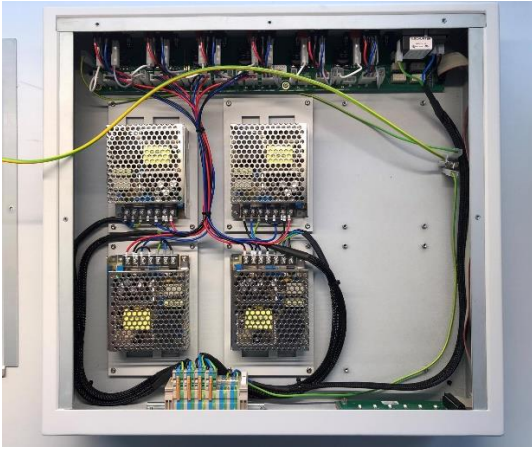
Mount the MCTS/PS with the four TORX screws and the four toothed washers. Primary or secondary connection cables from adjacent power supplies might be in the way and need to be removed from the cable harness.



Plug the +/- 15 V secondary connection cable into the socket P4 of the electronics board.



Plug the primary connection cable into the connection block.



Fix the primary and secondary connection cable with some cable ties at the cable harness and close rack.



Connect to power plug, switch the system on and check the channel power.



Perform a safety test according VDE 0701 / 0702 (EN 62638).

10. Accessories

	MCTS/CB Carrying bag for rack, transducers, cables and burden modules		BPL0.5 4 mm banana-plug test lead set, length 0.5 m
	TSC Transducer soft case for use with carrying bag TSC1 for IT 60-S, 65-S, 200-S, 205-S, 400-S TSC2 for IT 405-S, 605-S, 700-S, IN 1000-S TSC3 for IT 1000-S/SP1 TSC4 for IN 2000-S		BPL01 4 mm banana-plug test lead set, length 1 m
	MCTS/ROC 18-pole D-SUB-cable for status-readout-interface, length 3 m		BNCL1 BNC to BNC test lead, length 1 m
	BNC4A BNC to 4 mm banana-plug adapter		BNC4L1 BNC to 4 mm banana-plug test lead, length 1 m