



OVERVIEW

- Voltage and current auto range measurements up to 600VLN, 5A
- Universal wide auxiliary power supply range 24 – 300 Vdc, 40 – 276 Vac
- Power accuracy class 0.5 (EN 60 688)
- Up to four I/O modules (analogue output)
- Programmable bipolar analogue output; multiple breakpoints, nonlinear characteristics.
- Simple USB setting without auxiliary power supply

PROPERTIES

- Measurements of instantaneous values of more than 50 quantities (V, A, kW, kVA, kvar, kWh, kvarh, PF, Hz, THD, etc.)
- Power accuracy class 0.5
- Input frequency: 50/60 Hz, 400 Hz
- Serial communication (RS232 or RS485 up to 115,200 bit/s) and USB 2.0
- MODBUS RTU communication protocol
- Up to 4 I/O (analogue outputs)
- Single wide auxiliary power supply range 24 – 300 Vdc, 40 – 276 Vac or fixed AC: 110V, 230V, 400V
- Automatic range of current and voltage (max. 5 A and 600 VL-N)
- Housing for DIN rail mounting
- User-friendly setting software

DESCRIPTION

MNC-MFTD is intended for measuring and monitoring single-phase or three-phase electrical power network. It measures RMS value by means of fast sampling of voltage and current signals, which makes instruments suitable for acquisition of transient events. A built-in microcontroller calculates measurands (voltage, current, frequency, power, power factor, THD phase angles, etc.) from the measured signals.

APPLICATION

The MNC-MFTD multifunction transducer is used for measuring and monitoring of all single-phase or three-phase values. Wide range of various I/O modules makes MNC-MFTD a perfect choice for numerous applications. Analogue outputs with fast response. MNC-MFTD is delivered un-configured for customer configuration with user friendly setting software. MNC-MFTD supports standard serial communication RS485 with speed up to 115200 baud, which is perfect for simple applications and serial bus interfacing. Additional USB 2.0 interface can only be used for a fast setup without need for auxiliary power supply. This interface is provided with only BASIC insulation and can be used ONLY unconnected to power inputs.

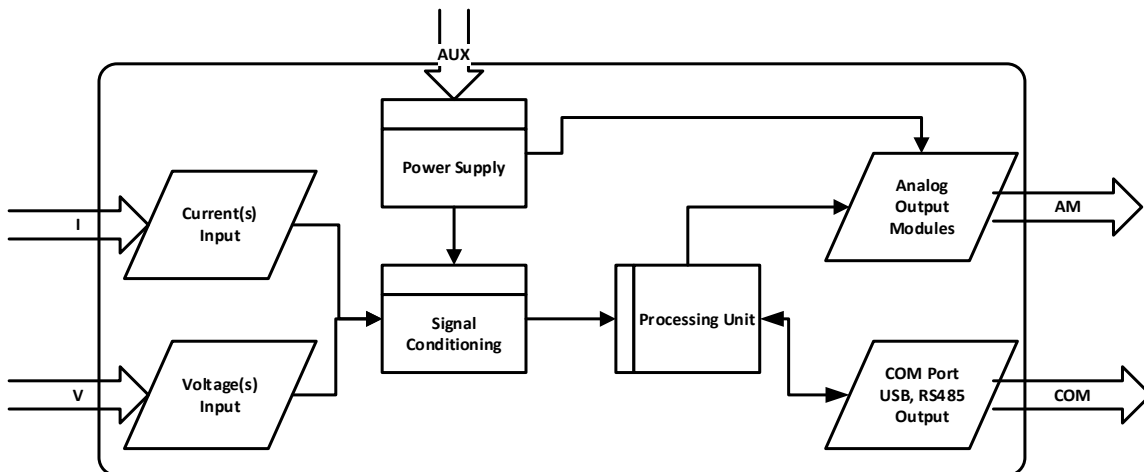


Figure 1 Block Diagram of MNC-MFTD



PROGRAMMING

MNC-MFTD multifunction transducer is completely programmable. It can be programmed using standard RS485 communication or USB communication .For more information about connection and programming see MNC-MFTD User’s manual. Primary-secondary ratio (U, I), input and output values are all programmed by setting software via RS485 communication. It is possible to choose between several standard output value ranges (-100% ... 0% ... 100%):

- 0-20mA
- 0-10mA
- 0-5mA
- 0-1mA

Within these four ranges it is possible to set any linear or bent (with maximum 5 break points) output characteristic.

COMPLIANCE WITH STANDARDS:

<i>Standard EN</i>	<i>Description</i>
61010	Safety requirements for electrical equipment for measurement ,control and laboratory use
60688	Electrical measuring transducers for converting AC electrical variables into analogue and digital signals
61326-1	EMC requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements
60529	Degrees of protection provided by enclosures (IP code)
60 068-2-1/ - 2/ -6/ -27/-30	Environmental testing (-1 Cold, -2 Dry heat, -30 Damp heat, -6 Vibration, -27 Shock)
UL94	Tests for flammability of plastic materials for parts in devices and appliances

TECHNICAL DATA

MEASUREMENT INPUT

Nominal frequency (f_N) 50/60 Hz

CURRENT MEASUREMENTS:

Nominal values 1, 5 A

Nominal current (I_N) 5 A

Max. measured value 5 A sinusoidal

Max. allowed value (thermal) 15 A cont. (acc. to EN 60 688) 20 × I_N; 5 × I_s

Consumption < I² × 0.01Ω per phase

VOLTAGE MEASUREMENTS:

Nominal values 62.5, 125, 250, 500 V_{L-N}

Nominal voltage (U_N) 500 V_{L-N}

Max. measured value (cont.) 600 V_{L-N}; 1000V_{L-L}

Max. allowed value 2 × U_N; 10 s (acc. to EN 60 688)

Consumption < U²/ 3.3 MΩ per phase

Input impedance 3.3 MΩ per phase

FREQUENCY MEASUREMENT:

Frequency measuring range 16 ... 400 Hz.

SYSTEM:

Voltage inputs can be connected either directly to low voltage network or via a high-voltage transformer to high voltage network. Current inputs can be connected either directly to low voltage network or shall be connected to network via a corresponding current transformer (with standard 1 A or 5 A outputs). For more information about different system connections see ELECTRICAL CONNECTIONS guide on software.



COMMUNICATION

Type	RS232	RS485	USB
Connection type	Direct	Network	Direct
Max. connection length	3 m	1000 m	-
Number of bus stations	-	≤ 32	-
Connection terminals	Screw terminals	USB mini	
Insulation	Protection class II, 3.3 kVACRMS 1 min	Basic isolation only	
Transfer mode	Asynchronous		
Protocol	MODBUS RTU		
Transfer rate	2.4 kBaud to 115.2 kBaud	USB 2.0	

SAFETY FEATURES

Protection Pollution	Protection class II degree 2
Installation category	CAT III; 600 V meas. Inputs Acc. to EN 61010-1 CAT III; 300 V aux. supply Acc. to EN 61010-1
Test voltages According to EN 61010-1	UAUX↔I/O, COM: 3320 VACrms UAUX↔U, I inputs: 3320 VACrms U, I in↔I/O, COM: 3320 VACrms U in↔I in: 3320 VACrms
EMC	Directive on electromagnetic compatibility 2014/30/EU According to EN 61326-1
Enclosure material	PC/ABS
Flammability	According to UL 94 V-0

MNC-MFTD has a USB communication port, located on the bottom under small circular plastic cover. It is intended for settings ONLY and requires NO auxiliary power supply. When connected to this communication port MNC-MFTD is powered by USB.

MECHANICAL

Dimensions	W100 × H75 × D105 mm
Max. conductor cross section for terminals	2.5 mm ² with pin terminal 4 mm ²
vibration withstand	7 g, 3 ... 100 Hz, 1 oct/min 10 cycles in each of three axes
Shock withstand	300 g, 8 ms pulse 6 shocks in each of three axes
Mounting Rail	mounting 35 × 15 mm according to DIN EN 50 022
Enclosure material	PC/ABS
Housing protection	IP20
Weight	370 g

ENVIRONMENTAL CONDITIONS

Ambient temperature	usage group III / -10 ... 0 ... 45 ... 55 °C / According to IEC/EN 60 688
Operating temperature	-30 to +70 °C
Storage temperature	-40 to +70 °C
Average annual humidity	≤ 93% r.h.
Altitude	≤ 2000 m

ELECTRICAL CONNECTIONS

Connection 1b (1W)	Single phase connection
Connection 3b (1W3b)	Three phases, three wire connection with balanced load
Connection 3u (2W3u)	Three phases, three wire connection with unbalanced load
Connection 4b (1W4b)	Three phases, four wire connection with balanced load
Connection 4u (3W4u)	Three phases, four wire connection with unbalanced load