



MFT20 Multifunction Transducer



Masibus MFT20 is a cost effective with versatile capabilities for electrical parameter monitoring and communication. It measures all sought of electrical parameters including voltage, current, PF, power and energy. All essential measuring values can be programmed to the output and are available through Modbus communication, the connection of the input signals can be freely programmed for 3 phase 3 wire as well as 3 phase 4 wire, for both balanced and unbalanced load.

High sampling rate and true RMS measurement gives accurate reading under all harmonic conditions; measured electrical parameters in MFT can be converted to equivalent current or voltage signals. These signals can be flexibly assigned upto two analog O/P channels. Any parameter can be assigned to any channel as well as single parameter can be assigned to multiple channels. MFT has isolated interface between device' internal electronics and field to ensure personal safety.

Based on field requirement MFT20 offers various accuracy class options like class 0.2 / class 0.5 accuracy as per IEC 60688.

MFT20 replaces a number of conventional single function transducers and thus reduces the inventory.

More than basic metering, it provides THD measurements, maximum demand and optionally a programmable pulse output.

Multifunction transducer stores energy and programmed parameters into non-volatile memory.

MFT can be further connected to SCADA network, PLC, other indicating instruments and monitoring systems via RS-485 Modbus RTU port.

Features

- Available in accuracy class 0.5 or 0.2 as per IEC 60688 standard
- Field programmable CT/PT ratio
- True RMS, microcontroller based transducer
- 28 Electrical parameters can be mapped to analogue O/P
- Field programmable up to two analogue output
- Long range, site-configurable inputs and outputs
- Load-independent accuracy on all outputs
- Four quadrant measurement
- RS-485 Modbus-RTU communication protocol
- User assignable Modbus registers
- Energy pulse output
- Maximum demand & THD measurement up to 31st harmonics
- Old register to store the previously cleared energy values
- Last day energy & min. max. value measurement
- Finger touch proof terminals
- DIN-Rail & wall mount
- GUI based site configuration software

Applications

- Interface with PLC / SCADA / RTU
- Remote monitoring and Indicating Instruments
- Energy monitoring management system (EMS)
- Process monitoring & control
- Electric utility-generation, transmission and distribution
- Control & relay panels
- Motor control center panels
- Power control center panels
- Process control
- DG set panels
- Original equipment manufacturers (OEMs)
- HVAC & building management system
- HV & LV switchgear panels

TECHNICAL SPECIFICATIONS

| Specification | Aux. - Powered Model | Self - Powered Model |
|---|--|--|
| Accuracy Class | Class 0.5, Class 0.2 | |
| System Type | 3Ph4W / 3Ph3W (Site selectable) | |
| Input Voltage | | |
| Direct Measuring Voltage | 20VL-N to 300VL-N (34VL-L to 520VL-L) | 63.5VL-N to 240VL-N |
| PT Secondary (Nominal Voltage) | 63.5VL-N to 240VL-N | 63.5VL-N to 240VL-N |
| Burden | <0.2 VA per phase | |
| PT Ratio | Programmable on site | |
| Max. Continuous Input Voltage | 1.3 x Nominal value | |
| Overload Withstand | 2 x Nominal value for 5 s | |
| Accuracy Range | 10% - Vn - 120% [Minimum voltage is 20V] | 50% - Vn - 120% [Minimum voltage is 57.8V] |
| Input Current | | |
| Direct Measuring Current | 0.01A to 6A | |
| Secondary Current (Nominal Current) | 1 to 5A | |
| Burden | <0.2VA per phase | |
| CT Ratio | Programmable on site | |
| Max. Continuous Input Current | 2 x Nominal value | |
| Overload Withstand | 20 x Nominal value for 1 s | |
| Accuracy Range | 10% -Vn-120% | |
| Frequency | 45 to 65Hz | |
| Display | | |
| LED Display (Optional) | 1 line 4 digit 0.32" RED 7-segment LED display | |
| LCD Display (Optional) | 16x2 Backlight LCD | - |
| Measured Parameters | | |
| Voltage | L1-L2, L2-L3, L1-L3 and average (3Ph3W & 3Ph4W) L1-N, L2-N, L3-N & average (1Ph & 3Ph4W) | |
| Current | All phase currents, average, sum, neutral current (3P4W) | |
| Frequency | System frequency | |
| Power Factor | Phase wise PF & Average PF | |
| Phase Angle | Phase wise | |
| Power (Phase Wise & Total) | Active power (W, KW & MW) Reactive power (VAR, KVAR & MVAR) Apparent power (VA, KVA & MVA) | |
| Energy (Phase Wise & Total) | Active energy for import & export (Separate) (KWh, MWh & GWh) Reactive energy for import & export (Separate) (KVARh, MVARh & GVARh) Apparent energy (KVAh, MVAh & GVAh) | |
| Demand | Maximum power demand on KW/KVA Maximum current demand (Block/Sliding for 15/30 minutes window) | |
| Power Quality | THD & Harmonics for each voltage and current (3rd to 31st odd) Phase wise DPF & average DPF (Displacement Power Factor) | |
| Percentage Voltage & Current Unbalance (Amplitude method) ON hour, RUN hour (Up to 65000 hours Recording) Last day Energy for Total, Old Energy for Total, Old Overflow Count & Old Load Hours, Min. - Max. Value (V, I, PF, Frequency, Total w, Total VAR, Total VA) 15 minute values (configurable 15 minute/1 hour) of Active Energy Import, Active Energy Export, Reactive Energy Import and Reactive Energy Export | | |
| Standard compliance | IEC 60688, IEC 61326-1 | |
| Electromagnetic Interference / Compatibility (EMI/EMC) | | |
| Electrostatic Discharge Test (ESD) [IEC 61000-4-2] | | |
| Electromagnetic Field [IEC 61000-4-3] | | |
| Burst Test [IEC 61000-4-4] | | |
| Surge [IEC 61000-4-5] | | |
| Conducted RF [IEC 61000-4-6] | | |
| Power Frequency Magnetic Field [IEC 61000-4-8] | | |
| Voltage Dip and Short Interruptions [IEC 61000-4-11] | | |
| Conducted Emission [CISPR 11] | | |
| Radiated Emission [CISPR 11] | | |
| RS-485 Modbus Communication | | |
| Interface Protocol | RS-485 Modbus-RTU | |
| Baud Rate | 2400, 4800, 9600, 19200, 38400 (Selectable) | |
| Parity Bit | None, with 1 or 2 stop bit Odd or Even, with 1 or 2 stop bit | |
| Pulse Output | | |
| Assigned Energy Parameter | WH/VARH/VAH | |
| Pulse Rate | Programmable from 1 to 60000 pulses per KWh[I] / 10KWh[I] / 100KWh[I] / MWh[I] / KWh[E] / 10KWh[E] / 100KWh[E] / MWh[E] / KVARh[I] / 10KVARh[I] / 100KVARh[I] / MVARh[I] / KVARh[E] / 10KVARh[E] / 100KVARh[E] / MVARh[E] / KVAh / 10KVAh / 100KVAh / MVAh of total. | |
| Pulse Duration | 20 mSec ± 10% | |
| Output Type | Open collector | |
| Ratings | 24VDC,20mA | |

TECHNICAL SPECIFICATIONS

Analog Output (Optional)

| | | |
|----------------|---------------------------------------|---|
| No. of Outputs | Up to 2 | - |
| Output Type | 4-20mA, 0-20mA, 0-10V, 0-5V, 1-5V DC | - |
| Response Time | <600 ms | - |
| Mapping | Field selected from inputs parameters | - |
| O/P Impedance | <550 Ω for mA O/P >2 KΩ for V O/P | - |
| Ripple | <0.4% Peak to peak | - |

Power Supply

| | | |
|-------------------|---|-------------------------------------|
| Power Supply | Standard: 85-265VAC, 50/60Hz or 100-300VDC Optional: 20-60 VDC | Self-powered from direct voltage/PT |
| Power Consumption | < 3VA (Without Analog O/P) < 7VA (With Analog O/P) | <3.0 VA |

Isolation (Withstanding voltage)

Between primary terminals* and secondary terminals**: **At least 3000 V AC for 1 minute**

Between primary terminals*: **At least 3000 V AC for 1 minute**

Between secondary terminals**: **At least 500 V AC for 1 minute**

* Primary terminals indicate aux power terminals, voltage input terminals and CT input terminals.

** Secondary terminals indicate pulse O/P, communication O/P, analog O/P-1 and analog O/P-2

Insulation resistance: 200MΩ or more at 500 V DC between power terminals and grounding terminal

Physical

| | |
|-------------------|--|
| Mounting Type | DIN-Rail mounting / Wall mounting |
| Dimension (in mm) | 70H x 100W x 112D |
| Case Material | ABS |
| Weight | 0.5 Kg |
| Terminations | Metal screw can accept up to two 2.5 mm ² wire or single 4.0 mm ² wire |

Environmental

| | |
|-----------------------|------------------------------|
| Operating Temperature | -10 to 60°C |
| Storage Temperature | -40° to 70°C |
| Usage Group | I as per IEC60688 |
| Relative Humidity | Up to 95% non-condensing |
| Warm Up Time | 5 minutes |
| Installation Category | CAT III for < 300V AC |
| Protection Class | II |
| Pollution Degree | 2 |
| Ingress Protection | Housing IP40, terminals IP20 |

Ordering Code

| Model | Accuracy | Analog Output | | | | Power Supply | Display | |
|-------|----------|---------------|---|---------------|---|--------------|---------|--|
| | | Output type | | No. of Output | | | | |
| MFT20 | X | X | | X | | X | | X |
| | 1 | Class 0.5 | N | None | N | None | | |
| | 2 | Class 0.2 | 1 | 4-20mA | 1 | One | U1 | Aux. Powered 85-265VAC/ 100-300VDC |
| | | | 2 | 0-20mA | 2 | Two | | LCD LED |
| | | | 3 | 0-5V | | | U2 | Aux. Powered 20-60VDC |
| | | | 4 | 1-5V | | | | |
| | | | 5 | 0-10V | | | U3* | Self Powered 57.5V AC to 520VAC |
| | | | S | Special | | | | |

†Consult Factory

Note*: Analog output option is not applicable in case of self-powered model