masibus

MFT

Multi-Function Transducer

Masibus MFT has 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 / Modnet 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 to four 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.

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

It provides 2 digital pulse o/p for Energy and RS485 port supporting Modbus-RTU protocol for communication, and optional RJ45 port supporting Modnet protocol is also available

With a wide range of analog, digital output and communication options MFT can be used in many applications from a simple analog transducer to an Ethernet transducer.

MFT can be further connected to SCADA network, PLC, other indicating instruments and monitoring systems.

Features

- Four Analog & Two Digital Outputs [Isolated to each other]
- Up to 30 parameters can be mapped to Analog Output
- Din Rail Mount
- Fully Programmable
- Analog o/p accuracy as per IEC60688
- Accuracy class 0.5s / 0.2s as per IS14697/ IEC 62053-22 for Energy
- PC based Configuration software
- 1-Ph, 3Ph3W, 3Ph4W configurations
- Measures V, I, Hz, PF, KW, KVA, KWh and KVARh
- True RMS measurement
- <350msec Response time
- Sampling frequency better than 3.9 KHz
- Isolated RS485 (Modbus-RTU protocol) / Modnet
- Backlight LCD to display various parameters (optional)

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

System type

3Ph4W/ 3Ph3W (Site configurable)

Input

Voltage	
Direct Voltage	20V to 350V (L-N) or 34V to 620V (L-L) @ 240V Nominal
PT Secondary (Nominal Voltage)	63.5V L-N, 110V L-N or 240V L-N (Site selectable) Configurable for 3Ph3W or 3Ph4W system
PT Ratio	1 to 9999.999 Programmable (Site selectable)
Burden	<0.2VA per phase
Overload	1.2 x Nominal Voltage (Continuous)
Current	
Direct Current	1 or 5A (Site selectable)
Burden	<0.2VA per phase
CT Ratio	Site selectable
Measurement range	1 to 9999.999 Programmable
Overload	For 5A CT: 8A Continuous/ 20A for 1Sec For 1A CT: 2A Continuous/ 20A for 1Sec
Starting current	0.1% of Nominal Current
Frequency	45 to 65Hz
Display (Optional)	16x2 Backlight LCD
Keys	PROG/Enter, Esc/Shift. UP, Down

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 & their average
Frequency	System Frequency
Power Factor	Phase wise PF & Average PF
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) (WH, KWh, MWh & Gwh)
	Reactive Energy for lagging & leading (Separately) (VARh, KVARh, MVARh & GVARh)
	Apparent Energy (VAh, KVAh, MVAh & GVAh)

Accuracy (Class 0.5)

	Class 0.5 (Standard)	Class 0.2 Optional
Analog O/P	± 0.5% as per IEC60688	±0.2% as per IEC60688
Instantaneous Parameters on Communication and Display	± 0.5 % or better	± 0.2 % or better
Active Energy	Class 0.5s as per IS14697/ IEC 62053-22	Class 0.2s as per IS14697/ IEC 62053-22
Reactive Energy	Class 0.5s as per IS14697	Class 0.2s as per IS14697
Apparent Energy	Class 0.5s	Class 0.2s

(Applicable PF Range = 0.5Lag - 1.0 - 0.8Lead, for Power & Energy Parameters)

Power Supply

Power Supply	90-270VAC, 50/60Hz or 110-370VDC
Burden	Less than 10 VA

Output

Analog Output

No. of Outputs	4
Output type (factory set) [Current/ Voltage]	0/4-20mA, 0/1-5V, 0-10V DC
Response time	<350mS (except frequency)
Output Impedance	<750 Ω for 4-20mA O/P >2 KΩ for 0-10V O/P

Pulse output

No. of Outputs	2 digital outputs
Rating	24VDC, 20mA
Type	WH/VARH/VAH
Pulse rate	Programmable from 1to 65000 pulses per KWh[I]/ KWh[E]/ KVARLh/ KVARCh/ KVAh/ MWh[I]/ MWh[E]/ MVARLh/ MVARCh/ MVAh of total.
Pulse Duration	40 mSec ± 10%

Communication Output

	Modbus (Standard)	Ethernet (Optional)
Interface	RS485	RJ45
Baud rate	9600, 19200, 38400 (Selectable)	10/100 Mbps
Protocol	Modbus-RTU	Modnet

Safety

Impulse voltage tests: 5 kV, 1.2/50 uS as per IEC60688

Isolation (Withstanding voltage)

- Between primary terminals* and secondary terminals** and Earth:
  At least 2500 V AC for 1 minute
- Between primary terminals*:
  At least 2500 V AC for 1 minute
- Between secondary terminals**:
  At least 2500 V AC for 1 minute
- Between secondary terminals Pulse o/p***:
  At least 1500 V AC for 1 minute

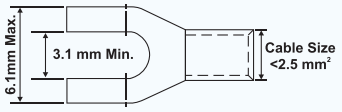
* Primary terminals indicate Aux power terminals, Voltage i/p terminals and CT terminals.
** Secondary terminals indicate Analog o/p A1, Analog o/p A2, Analog o/p A3, Analog o/p A4, pulse o/p [D1 & D2] and Communication o/p.
*** Between secondary terminals Pulse o/p: Pulse o/p D1 & Pulse o/p D2

Insulation resistance: 20MΩ or more at 500 V DC between power terminals and grounding terminal

Environmental

Operating temperature	0…15…30…45…55ºC
Storage temperature	-10 to 70ºC
Usage Group	II as per IEC60688
Relative humidity	30-95% non-condensing
Warm up time	10 minutes
Installation Category	CATIII (Refer to measuring and auxiliary inputs ⩽ 300VAC versus earth)
Protection Class	II
Pollution Degree	2

Physical

Mounting Type	DIN Rail
Dimensions	100 x 78 x 110 mm
Weight	0.5 Kg
Terminal [I/P and Aux]	Barrier Type Terminal < 2.5mm^2
Cable Size	
Terminal [O/P and Earth] Cable Size	MKDS 2.5mm^2

Ordering Code

Model	Accuracy		Analog Output: Output Type		Analog Output: No. of Output		Digital Output		Display (LCD)		Ethernet	
MFT	X		X		X		X		X			
	1	Class 0.5	1	0-5V	1	One	N	None	N	None	N	None
	2	Class 0.2	2	1-5V	2	Two	Y	Two	Y	Required	1	Yes
			3	0-10V	3	Three						
			4	4-20mA	4	Four						
			5	0-20mA								
			6	Special*								

* Consult Factory

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