Grid Solutions

MULTILIN™ MM300

Integrated Automation and Protection for Low Voltage Motors

The MM300 integrates protection, control, automation, metering, diagnostics and multiple communication protocols in a rugged compact device for low voltage motor applications. Designed for NEMA and IEC Motor Control Centers, the MM300 delivers superior protection and control to extend equipment life and maximize process uptime.

Key Benefits

- Full-featured protection for low voltage AC motors
- Advanced automation capabilities for providing customized protection and integrated process control
- Advanced FlexLogic™ reduces requirement for local controllers
- Reduced space requirements through integration of multiple devices
- Application flexibility with multiple I/O options and programmable logic options (FlexLogic™)
- Enhanced troubleshooting tools including sequence of event records and waveform capture
- Powerful communications including Serial, Ethernet, Profibus, and DeviceNet protocols
- Small form factor and remote display options designed to fit in MCC buckets of various types
- Universal device for all motor power ratings
- No CTs required for less than 5A motor ratings
- Thermistor input to monitor the ambient or motor temperature
- Support for Hand Held Display (HHD) that provides a graphical color local interface allowing local operators to view and change setting files and quickly access relay diagnostic information

Applications

- Low Voltage three phase AC motors
- MCC or stand alone panel mount applications
- Process control and applications requiring Automation or Control i.e. conveyor systems or well recovery pumps
- IEC or NEMA class motors and Motor Control Centers (MCCs)
- System architecture requiring multiple simultaneous communications
- Applications require full-voltage reversing or non-reversing, two-speed, wye-delta open transition, inverter, soft starter or autotransformer motor starting

Protection and Control

- Enhanced Thermal Modeling
- Mechanical Jam & Stalled Rotor
- Undercurrent & Underpower
- Acceleration Time & Current Unbalance
- Ground & Sensitive Ground Fault
- Phase Overvoltage / Undervoltage
- Thermistor & RTD Overtemperature

Automation

- Programmable Flexlogic™ option
- Starter Control & Process Interlocks
- Programmable inputs and outputs
- Undervoltage Auto-restart

Metering & Monitoring

- Metering - current, voltage, power, energy, frequency, RTD & Thermistor
- Oscillography (analog values at 32 samples/cycle and digital states) & Event Recorder (256 events)
- Advanced device health diagnostics

Communications

- Two Wire RS485, RJ45 Ethernet
- Programming Ports - USB, RS485
- Multiple Protocols (Modbus RTU or TCP/IP, Internally powered Profibus, ODVA compliant DeviceNet) & NPT

EnerVista™ Softwares

- Simplify setup and configuration
- Strong document archive/ management system
- Strong maintenance and troubleshooting tool

GE VERNOVA

Protection and Control

The MM300 is a digital motor protection and control system, designed for Low Voltage motor applications. Flexible and powerful, the MM300's protection can be scaled to the specific requirements of your system.

Motor Thermal Model

To provide optimal protection and maximize run time, the MM300 employs an advanced thermal model, consisting of six key elements:

- Overload Curves
- Unbalance Biasing
- Hot/Cold Safe Stall Ratio
- Motor Cooling Time Constants
- Start Inhibit and Emergency Restart
- RTD Biasing (Optional)

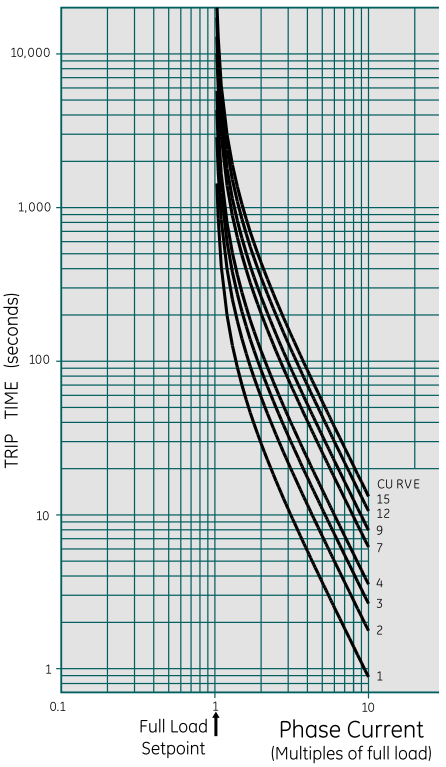
Overload Curves

The MM300 thermal model can be programmed with one of 15 standard overload curves.

When properly selected to match the motor manufactures thermal damage curves, the MM300 overload curve and Overload Pickup Level will determine the thermal capacity accumulated within the motor.

Unbalance (Negative Sequence) Biasing

Negative sequence current, which causes additional rotor heating, is not accounted for in the thermal limit curves provided by the manufacturer. The MM300 measures current unbalance as a ratio of negative to positive sequence current. The thermal model is then biased to reflect the additional rotor heating.



15 Standard Curves available in the MM300

A programmable K factor setting allows the amount of derating to be adjusted.

Hot / Cold Safe Stall Ratio

This ratio defines the steady state level of thermal capacity used (TCU) by the motor. This level corresponds to normal operating temperature of a fully loaded motor and will be adjusted proportionally if the motor load is lower than rated.

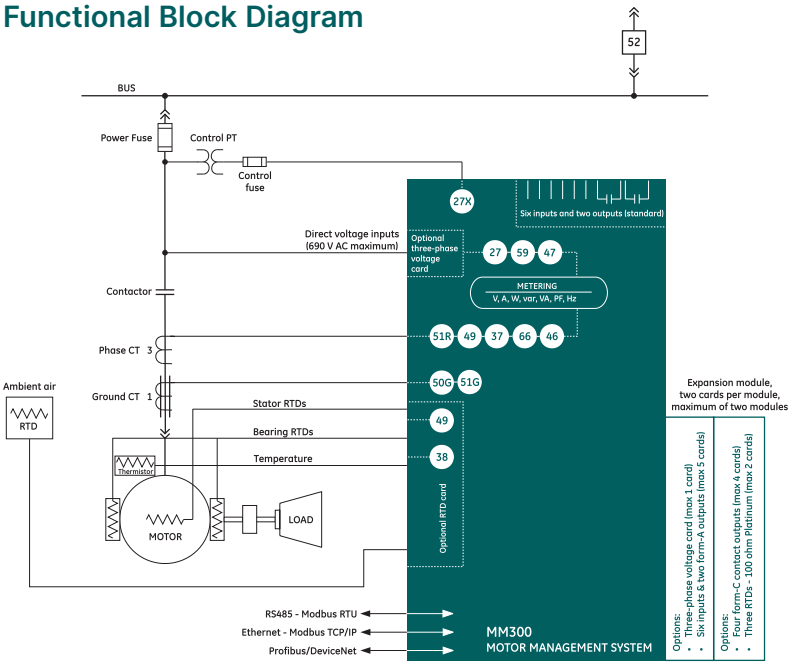
Motor Cool Time Constants

When the MM300 detects that the motor is running at a load lower than the overload pickup setpoint or the motor is stopped, it will start reducing the TCU value exponentially, based on the programmed cool time constants. As cooling occurs at different rates for stopped and running motors, two separate constants are used.

RTD Biasing

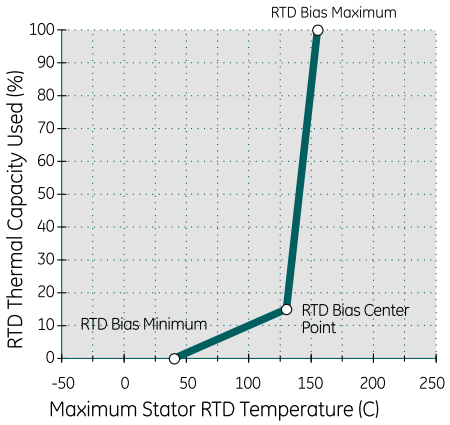
The Thermal Model relies solely on measured current to determine motor heating, assuming an ambient temperature of 40°C and normal motor cooling. The actual motor temperature will increase due to abnormally high ambient temperatures or if the motor cooling systems have failed. RTD Biasing enhances the motor thermal model by calculating the thermal capacity used based on available Stator RTD temperatures.

Functional Block Diagram



ANSI® Device Numbers & Functions

DEVICE NUMBER	FUNCTION
27AUX	Undervoltage - Auxiliary Input
27	Undervoltage - Three Phase
37	Undercurrent/Underpower
38	Bearing Temperature RTD
46	Current Unbalance
47	Voltage Phase Reversal
49	Thermal Overload
50G	Ground Instantaneous Overcurrent
51G	Ground Time Overcurrent
51R	Locked/Stalled Rotor/Mechanical Jam
59	Overvoltage - Three Phase
66	Starts/Hour & Time Between Starts



RTD Biasing curve

RTD Biasing does not replace the TCU calculated using the motor current. It provides a second and independent measure of thermal capacity used. Based on a programmable curve, the MM300 will calculate the TCU at any given temperature. This TCU is then compared to that of the thermal model, and the larger of the two will be used.

To protect against faulty stator RTD's, a TCU of 100% based on RTD Biasing will not cause a trip to be issued unless the motor current has exceeded the Overload Pickup Level.

Motor Start Supervision

Motor Start Supervision consists of the following features: Time-Between-Starts, Start-per-Hour, Restart Time.

These elements guard the motor against excessive starting duty, which is normally defined by motor manufacturer in addition to the thermal damage curves.

Mechanical Jam and Acceleration Time

These two elements are used to prevent motor damage during abnormal operating conditions such as driven load jams and excessively long acceleration times.

Ground Fault

This function is designed to protect motors against phase to ground faults. The MM300 comes with two separate ground CT inputs intended for one of two different ground protection:

- Core balance (Zero sequence)
- Residual

Voltage Protection

The MM300 comes standard with a single phase voltage input, providing single phase underpower, auxiliary undervoltage and optional undervoltage auto-restart functionality.

Optional 3 phase voltage inputs offer the additional following protection elements:

- Undervoltage
- Overvoltage
- Phase Reversal
- Three Phase Underpower
- VT Fuse Failure

Current Unbalance

In addition to Thermal model biasing, current unbalance is available in the MM300 relay as independent element with a built-in single phasing detection algorithm.

Thermistor

A single input from a motor winding thermistor is provided with the MM300. The MM300 can accept both positive temperature coefficient (PTC) and negative temperature coefficient (NTC) sensors. A thermistor level can be selected for both alarm and trip.

Advanced Automation

The MM300's powerful I/O and programmable flexlogic options offer advanced automation control, reducing the need for additional programmable controllers or discrete control relays.

FlexLogic™

The MM300 optionally includes a control logic engine called FlexLogic™. This provides the ability of creating customized protection and control schemes thereby minimizing the need and the associated costs, of auxiliary components and wiring.

Using FlexLogic™, the MM300 can be configured to specify what actions will be taken based on the status of protection or control elements, as well as inputs driven by connected sensors and equipment.

Scalable Hardware

The MM300 is available with a multitude of I/O configurations to suit most application needs. The expandable modular design allows for easy configuration and future upgrades.

- Up to 30 digital inputs (voltage rating up to 300V) and up to 18 digital outputs are available and can be used to monitor and control a wide range of auxiliary equipment
- Types of digital outputs include trip-rated Form-A and Form-C

Monitoring and Metering

The MM300 includes high accuracy metering for all AC signals. Voltage, current, power metering, and temperature all available options. Current and voltage parameters are available as total RMS magnitude and angle.

Fault and Disturbance Recording

The advanced disturbance diagnostic features within the MM300 can significantly reduce the time needed for troubleshooting power system events and reconstruction. Recording functions include:

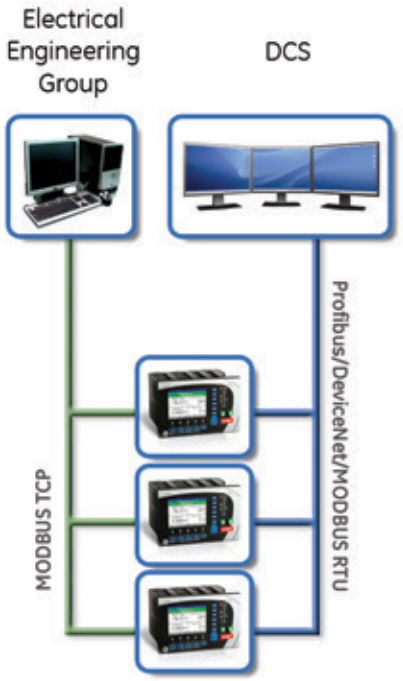
- Sequence of Event Recorder (SOE) - 256 time stamped events
- Optional enhanced diagnostics with:
- Waveform capture with up to 10 Analog Channels
- Data Logger with 10 channel RMS recorder

Advanced Device Health Diagnostics

The MM300 performs comprehensive device health diagnostic tests during startup and continuously at runtime to test its own major functions and critical hardware. These diagnostic tests monitor for conditions that could impact the MM300's performance, evaluate the criticality of this impact and present device status via SCADA communications and front panel display. Providing continuous monitoring and early detection of possible issues helps improve system availability by employing predictive maintenance.

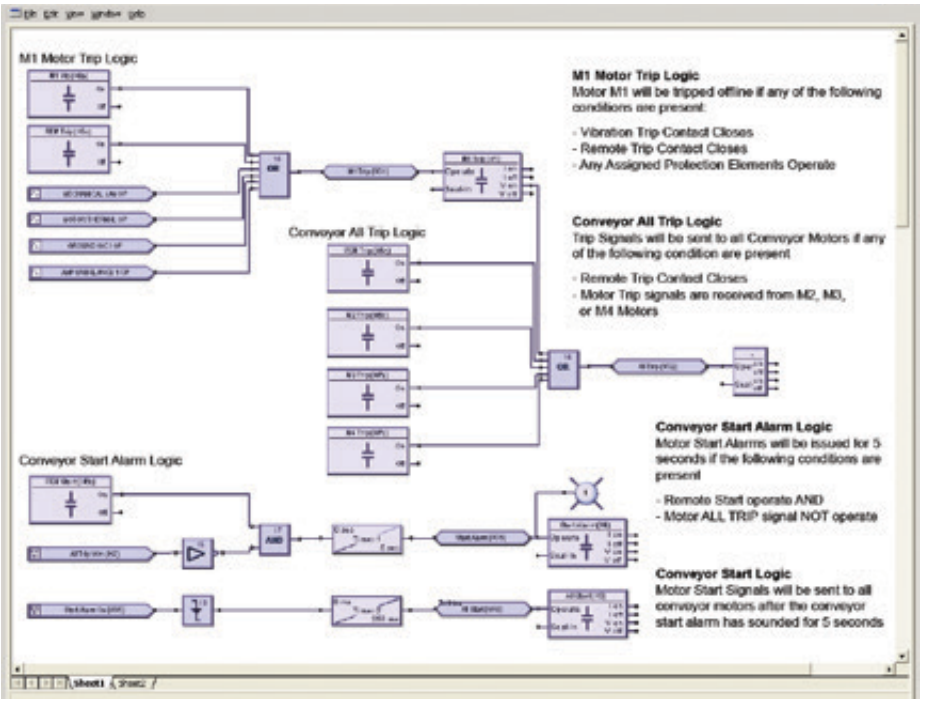
Communications

The MM300 utilizes the most advanced communications technologies available today making it the easiest and most flexible motor protection relay to use and integrate into new and existing infrastructures. Multiple communication ports and protocols allow control and easy access to information from the MM300. All communication ports are capable of communication simultaneously.



MM300 Dual Architecture Communication

FlexLogic™ Designer



Flexlogic™ and additional I/O options allow the MM300 to replace local programmable controllers in LV applications, like conveyor belts as in this example

The MM300 supports the most popular industry standard protocols enabling easy, direct integration into HMI and electrical SCADA systems. Modbus RTU is provided standard with a RS485 networking port. The following optional protocols and communication ports are available:

- Fieldbus Protocol with dedicated port
  - ODVA Compliant DeviceNet
  - Internally powered Profibus
- Modbus TCP/IP with RJ45 10/100baseT Ethernet port

Profibus DP

Providing a high degree of communication flexibility, the MM300 supports both Profibus DP-V0 and DP-V1. Profibus DP-V0 provides high-speed cyclic data exchange between distributed field devices and the Profibus master. In addition to the high-speed cyclic data communication with DP-V0, DP-V1 provides communication of acyclic data information between the slaves and the engineering workstation, which allows for independent diagnosing and fine-tuning of each slave on the network.

Rapid Device Replacement

The MM300 supports Rapid Device Replacement, which is compatible with DeviceNet scanners that use Automatic Device Replacement (ADR) functionality. When Rapid Device Replacement is used in DeviceNet networks, this allows rapid change of MM300 devices with minimum process interruption.

When using Rapid Device Replacement, the MM300 can be replaced without the need to manually configure settings. The DeviceNet scanner will automatically recognize a new device and download the key protection, control and communication settings from the original MM300, reducing process downtime and manual setting file configuration.

EnerVista™ Software

The EnerVista™ Suite is an industry-leading set of software programs that simplifies every aspect of using the MM300 relay. The EnerVista™ suite provides all the tools to monitor the status of the protected asset, maintain the relay, and integrate information measured by the MM300 into DCS or SCADA monitoring systems. Convenient COMTRADE and Sequence of Events viewers are an integral part of the MM300 Setup software included with every MM300 to carry out postmortem event analysis to ensure proper protection system operation.

EnerVista™ Launchpad

EnerVista™ Launchpad is a powerful software package that provides users with all of the setup and support tools needed for configuring and maintaining Multilin products. The setup software within Launchpad allows configuring devices in real-time by communicating using serial, Ethernet, or modem connections, or offline by creating setting files to be sent to devices at a later time.

Included in Launchpad is a document archiving and management system that ensures critical documentation is up-to-date and available when needed. Documents made available include:

- Manuals
- Application Notes
- Guideform Specifications
- Brochures
- Wiring Diagrams
- FAQs
- Service Bulletins

Viewpoint Monitoring

Viewpoint Monitoring is a simple-to-use and full-featured monitoring and data recording software package for small systems. Viewpoint Monitoring provides a complete HMI package with the following functionality:

- Plug & Play Device Monitoring
- System Single-Line Monitoring & Control
- Annunciator Alarm Screens
- Trending Reports
- Automatic Event Retrieval
- Automatic Waveform Retrieval

Viewpoint Engineer

Viewpoint Engineer is a set of powerful tools that will allow the configuration and testing of MM300 relays at a system level in an easy-to-use graphical drag-and-drop environment. Viewpoint Engineer provides the following configuration and commissioning utilities:

- Graphical Logic Designer
- Graphical Logic Monitor

Viewpoint Maintenance

Viewpoint Maintenance provides tools that will create reports on the operating status of the relay, simplify the steps to download fault and event data, and reduce the work required for cyber-security compliance audits. Tools available in Viewpoint Maintenance include:

- Settings Security Audit Report
- Device Health Report
- Single Click Fault Data Retrieval

EnerVista™ Integrator

EnerVista™ Integrator is a toolkit that allows seamless integration of Multilin devices into new or existing automation systems. Included in EnerVista™ Integrator is:

- OPC/DDE Server
- Multilin Drivers
- Automatic Event Retrieval
- Automatic Waveform Retrieval

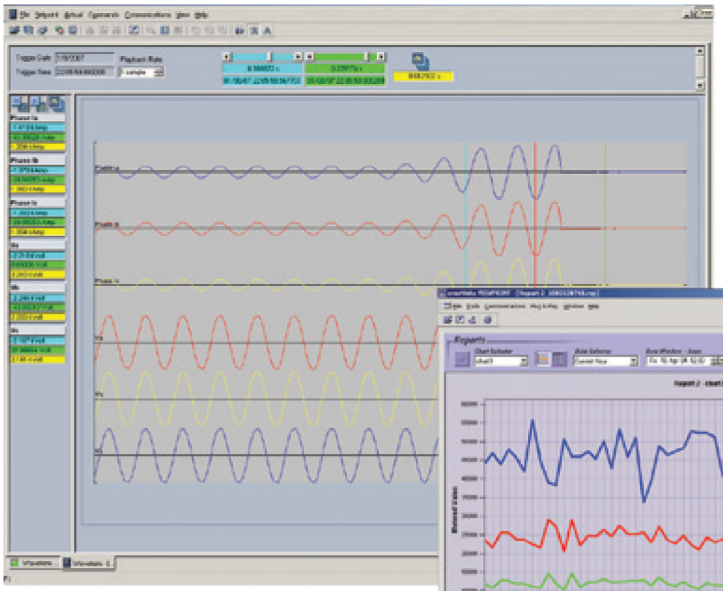
User Interface

The MM300 can be ordered with or without a control panel or display. If local control or monitoring is required, there are two available options:

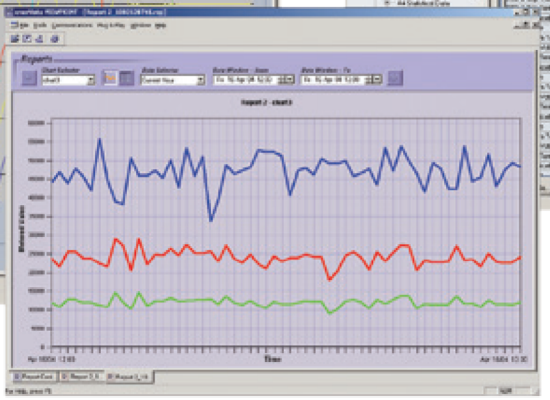
1. Control Panel
2. Color HMI Display

Power System Troubleshooting

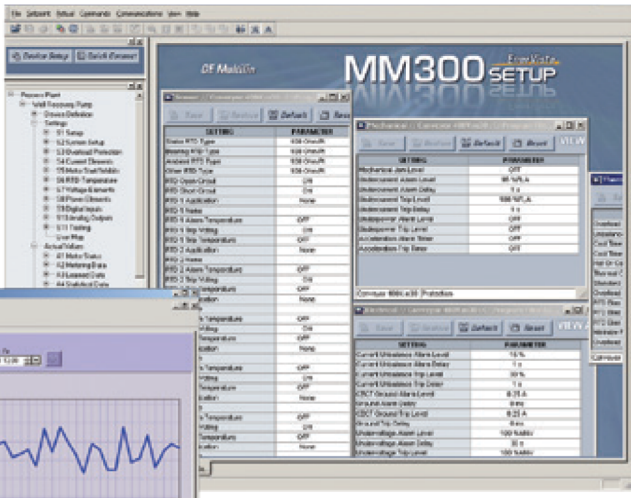
The MM300 contains many tools and reports that simplify and reduce the amount of time required for troubleshooting power system events.



Analyze motor faults using both analog and digital power system quantities that are measured and recorded up to a rate of 32 samples per cycle.



Log motor operating parameters to allow for analyzing motor loading and performance over prolonged periods of time.



Configure the MM300 using the intuitive EnerVistaTM MM300 setup program.

Technical Specifications

PROTECTION

ACCELERATION TIMER

Pickup	$I_{av} > I_{cutoff}$
Dropout	$I_{av} < I_{pu}$ or timer expired
Time delay	0.5 to 250.0 seconds in steps of 0.1
Timing accuracy	±500 ms or 1.5% of total time

AUXILIARY UNDERVOLTAGE

Pickup level	60 to 90% of NCV
Time delay	1 to 60 seconds in steps of 1
Timing accuracy	± 500 ms

CURRENT UNBALANCE

Range	4 to 40% in steps of 1
Accuracy	±2%
Time delay	1 to 60 seconds in steps of 1 s
Timing accuracy	±500 ms

FUSE FAILURE (RUNNING STATE ONLY)

Timing	<500 ms

GROUND FAULT (CBCT OR RESIDUAL)

Pickup level	0.5 to 15.0 A in steps of 0.1 (CBCT); 10 to 100% of FLA in steps of 1% (residual)
Trip time delay on start	0 to 10 s in steps of 0.1 s
Trip time delay on run	0 to 5 s in steps of 0.1 s
Alarm time delay on start/run	0 to 60 s in steps of 1 s
Timing accuracy	±50 ms or ±0.5% of total time

LOAD INCREASE

Pickup level	50 to 150% of FLA in steps of 1%
Timing accuracy	±500 ms

MECHANICAL JAM

Pickup level	1.01 to 4.50 × FLA in steps of 0.01
Time delay	0.1 to 30.0 seconds in steps of 0.1
Timing accuracy	±500 ms

PHASE UNDERVOLTAGE

Pickup level	101 to 120% of rated in steps of 1%
Time delay	1 to 60 seconds in steps of 1 s
Timing accuracy	±500 ms

PROTECTION

PHASE OVERVOLTAGE

Pickup level	60 to 99% of rated in steps of 1
Time delay	1 to 60 seconds in steps of 1 s
Timing accuracy	±500 ms

RTD PROTECTION

RTD types	three-wire (100 ohm Platinum)
Range	–50 to 250°C in steps of 1
Hysteresis	2°C

THERMAL MODEL

Standard curve time multiplier	1 to 15 in steps of 1
Thermal overload pickup	1.01 to 1.25 in steps of 0.01
Motor full load current (FLA)	0.5 to 1000 A in steps of 0.1
Motor rated voltage	100 to 690 V AC
Elements	trip and alarm

THERMISTOR

Sensor types	PTC (RHOT = 100 to 30 kohms); NTC (RHOT = 100 to 30 kohms)

UNDERCURRENT

Pickup level	1 to 100% of FLA in steps of 1
Time delay	1 to 60 seconds in steps of 1

UNDERPOWER

Pickup level	1 to 100% of kW in steps of 1
Time delay	1 to 60 seconds in steps of 1

VOLTAGE PHASE REVERSAL

Configuration	ABC or Rev starter

METERING AND MONITORING

EVENT RECORDER

Capacity	256 events
Time tag	1 ms
Data storage	non-volatile memory

FREQUENCY METERING

Range	40.00 to 70.00 Hz in steps of 0.01

POWER METERING

Real power range	–2000.0 to 2000.0 kW in steps of 0.1

METERING AND MONITORING

Apparent power range	0.0 to 2500.0 kVA in steps of 0.1

POWER FACTOR METERING

Range	–0.99 to +0.99 in steps of 0.01

CONTROL

UNDERVOLTAGE RESTART

Dropout/ Pickup Level	60 to 100% NCV in steps of 1%
Short Dip Time	100 to 500 ms or OFF in steps of 10 ms
Medium Dip Time	0.1 to 10.0 s in steps of 0.1 s
Medium Dip Delay	0.2 to 60 s in steps of 0.2 s
Long Dip Time	0.5 to 60.0 min or OFF in steps of 0.5 min
Long Dip Delay	1.0 to 1200.0 s in steps of 1.0 s
Time Accuracy	±1 s or ±5% of total time

Please refer to the Multilin MM300 Motor Management System Instruction Manual for complete technical specifications

USER INTERFACE

GRAPHICAL CONTROL PANEL

Size	height 102mm, width 153mm, depth 35mm
LCD	3.5-inch colour, 320 by 240 pixels
LED Indicators	10 LEDs
Pushbuttons	Start A, Start B, Stop, plus 11 LCD screen display control keys
Ports	USB 2.0 port for laptop computer connection

INPUTS

CONTROL VOLTAGE INPUT (UNDERVOLTAGE RESTART SOURCE)

External VT primary	110 to 690 V AC in steps of 10 (if used)
Input range	60 to 300 V AC
Nominal frequency	50 or 60 Hz
Accuracy	±5% of reading

INPUTS

DIGITAL INPUTS

Fixed pickup	65 V AC
Recognition time	2 cycles
Current draw at rated voltage	60 mA @ 120 V; 75 mA @ 240 V Momentarily sampled every cycle
Input impedence	1.7 kΩ
Type	opto-isolated inputs
External switch	wet contact
Maximum input voltage	300 V AC

GROUND CURRENT INPUT (50:0.025)

CT primary	0.5 to 15.0 A
Nominal frequency	50 or 60 Hz
Accuracy (CBCT)	±0.1 A (0.5 to 3.99 A) ±0.2 A (4.0 A to 15 A)

PHASE CURRENT INPUTS (INCLUDING RESIDUAL GROUND CURRENT)

Range	0.2 to 40 A (8 × CT), direct connection up to 5 A FLA
Input type	combined 1 A / 5 A
Frequency	50 or 60 Hz
Accuracy	ExtCT: ±2% of reading or ±1% of 8× CTPrimary, whichever is greater Direct: ±2% of reading or ±0.1 A, whichever is greater Withstand (at 5A nominal) 0.2 s at 100× 1.0 s at 50× 2.0 s at 40× continuous at 3× rated current

PHASE VOLTAGE INPUTS (THREE-PHASE VOLTAGE)

Input range	208 to 690 V
Nominal frequency	50 or 60 Hz
Accuracy	±2% of reading, or ±1 V, whichever is greater

RTD INPUTS

Sensor type	Three-wire RTD (100 ohm Platinum)
Sensing current	5 mA
Accuracy	±3°C

INPUTS

THERMISTOR INPUTS

Sensor type	Positive temperature coefficient PTC (RHOT = 100 to 30000 ohms), negative temperature coefficient PTC (RHOT = 100 to 30000 ohms)
Accuracy	±6% of reading or ±100 ohms, whichever is greater

OUTPUTS

OUTPUT RELAYS

Configuration	electromechanical form-A (IO_C) and form-C (IO_D)
Contact material	silver-alloy
Operate time	10 ms
Minimum contact load	10 mA at 5 V DC
Maximum switching rate	300 operations per minute (no load), 30 operations per minute (load)
Mechanical life	10 000 000 operations
Continuous current	10 A
Make and carry for 0.2s	30 A per ANSI C37.90

OUTPUT RELAY BREAK CAPACITY (FORM-A RELAY)

AC resistive, 120 V AC	10 A
AC resistive, 240 V AC	10 A
AC inductive, PF = 0.4 pilot duty	2 A
DC resistive, 30 V DC	10 A

OUTPUT RELAY BREAK CAPACITY (FORM-A RELAY)

AC resistive, 120 V AC	10 A normally-open, 5 A normally-closed
AC resistive, 240 V AC	10 A normally-open, 8 A normally-closed
AC inductive, PF = 0.4 pilot duty	2.5 A
DC resistive, 30 V DC	10 A

POWER SUPPLY

POWER SUPPLY

Nominal	120 to 240 V AC 125 to 250 V DC

POWER SUPPLY

Range	60 to 300 V AC (50 and 60 Hz) 84 to 250 V DC 24 to 48 V DC

ALL RANGES

Power consumption	16 W typical, 25 W maximum

COMMUNICATIONS

DEVICENET (COPPER)

Modes	slave (125, 250, and 500 kbps)

ETHERNET (COPPER)

Modes	10/100 MB (auto-detect)
Connector	RJ-45
Protocol	Modbus TCP

PROFIBUS (COPPER)

Modes	DP V0 slave, up to 1.5 Mbps

RS485 PORT

Protocol	Modbus RTU

USB PORT (GRAPHIC CONTROL PANEL ONLY)

Standard specification	Compliant with both USB 2.0 and USB 1.1

TYPE TESTS

Dielectric voltage withstand:	EN60255-5
Impulse voltage withstand:	EN60255-5
Damped Oscillatory:	IEC 61000-4-18/ IEC 60255-22-1
Electrostatic Discharge:	EN61000-4-2/ IEC 60255-22-2
RF immunity:	EN61000-4-3/ IEC 60255-22-3
Fast Transient Disturbance:	EN61000-4-4/ IEC 60255-22-4
Surge Immunity:	EN61000-4-5/ IEC 60255-22-5
Conducted RF Immunity:	EN61000-4-6/ IEC 60255-22-6
Voltage interruption and Ripple DC:	IEC 60255-11
Radiated & Conducted Emissions:	CISPR11/CISPR22/ IEC 60255-25
Sinusoidal Vibration:	IEC 60255-21-1
Vibration: Shock & Bump:	IEC 60255-21-2
Power magnetic Immunity:	IEC 61000-4-8
Pulse Magnetic Immunity:	IEC 61000-4-9A

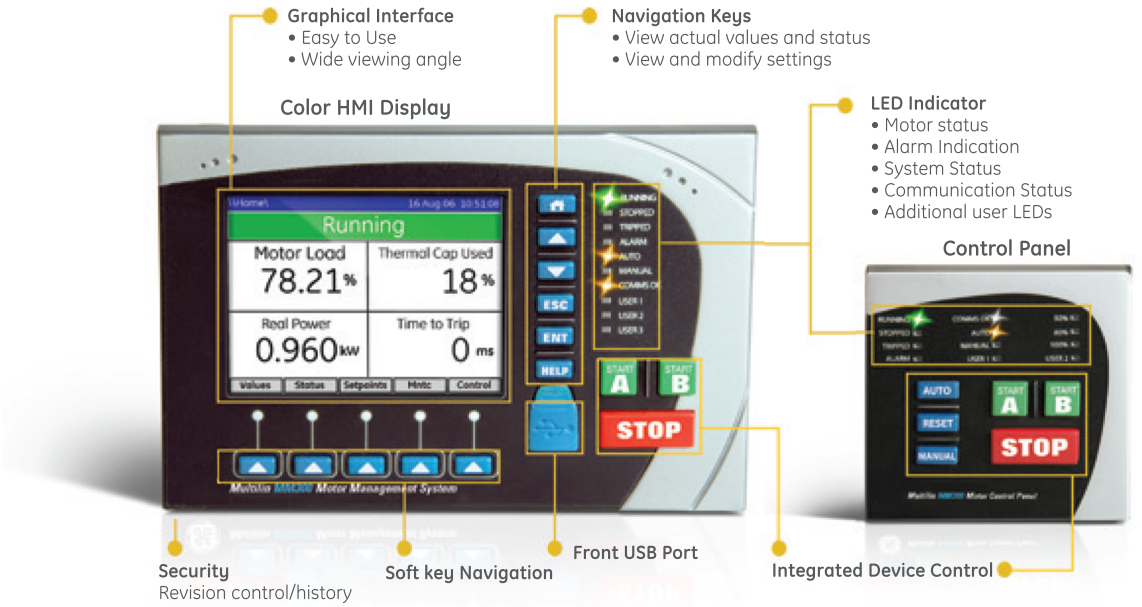
TYPE TESTS	
Voltage Dip & interruption:	IEC 61000-4-11
Damped Oscillatory:	IEC 61000-4-12
Harmonics & Interharmonics:	IEC 61000-4-13
Voltage Ripple:	IEC 61000-4-17
Ingress Protection:	IEC 60529
Environmental (Cold):	IEC 60068-2-1
Environmental (Dry heat):	IEC 60068-2-2
Relative Humidity Cyclic:	IEC 60068-2-30
Safety:	UL508/UL C22.2-14/UL1053

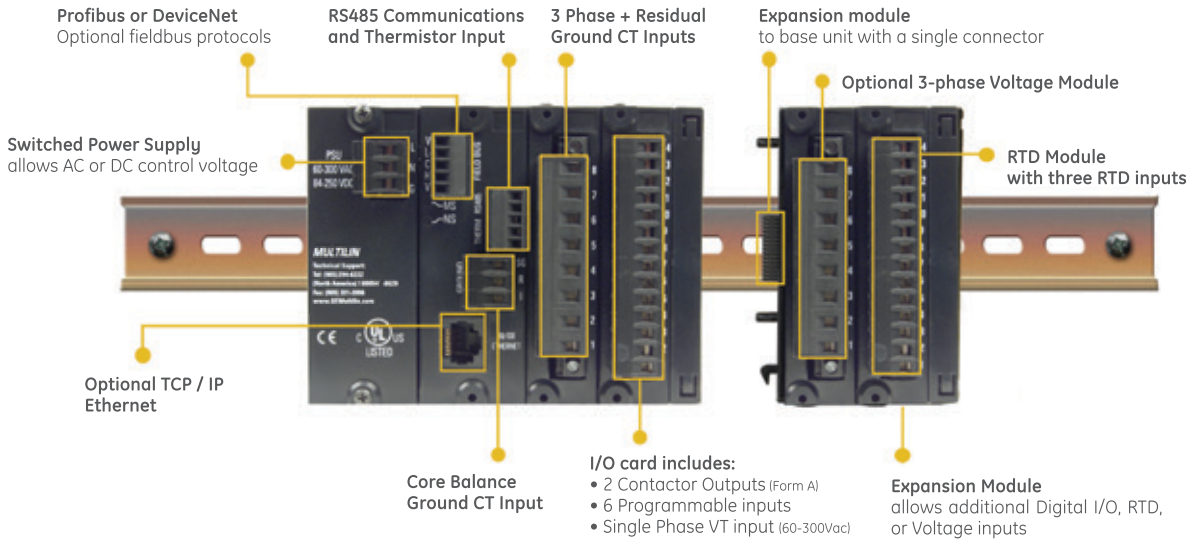
TESTING AND CERTIFICATION	
CERTIFICATION	
ISO	Manufactured under an ISO9001 registered program
CE	EN60255-5, EN61010-1, EN50263, EN61000-6-2, EN61000-6-4
cULus	UL508, UL1053, C22.2. No 14

PHYSICAL SPECIFICATIONS	
DIMENSIONS	
Size	Base: 120 mm (W) × 90 mm (H) × 113 mm (D) [+ terminals 10mm] Expansion: 62 mm (W) × 90 mm (H) × 113 mm (D) GCP: 153 mm (W) × 102 mm (H) × 35 mm (D) BCP: 75 mm (W) × 75 mm (H) × 31 mm (D)
Weight (Base)	0.75 kg

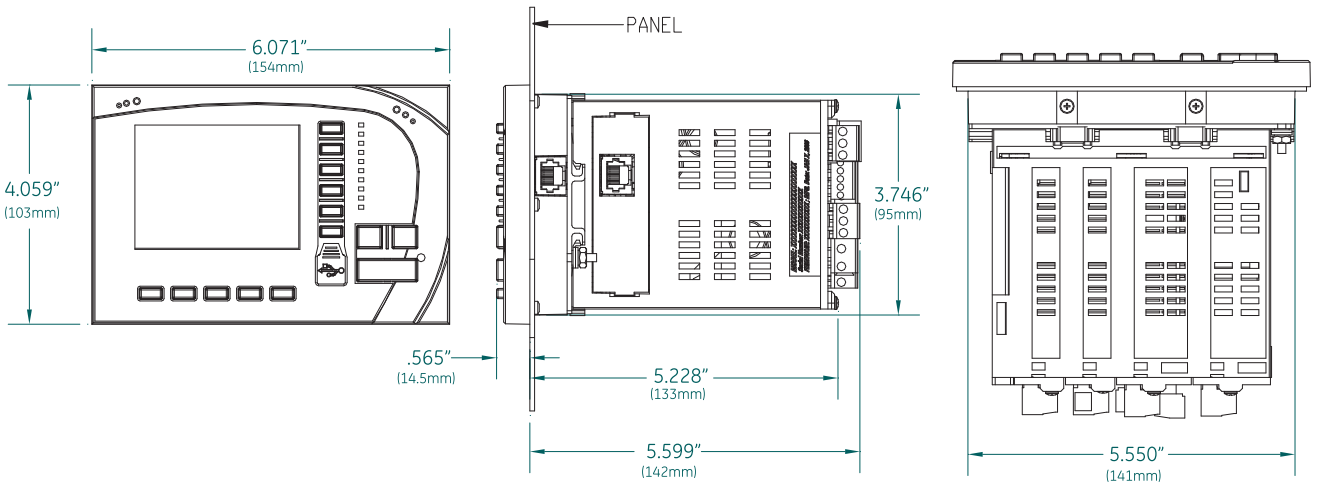
ENVIRONMENTAL	
OPERATING ENVIRONMENT	
Ambient temperature:	Storage/Shipping: -40C to +90C* Operating: -20C to +60C* *based on 1" around base unit
Humidity	up to 95% non-condensing
Polution degree	2
IP rating	IP20 (base unit), IP54 (control panel)

User Interface

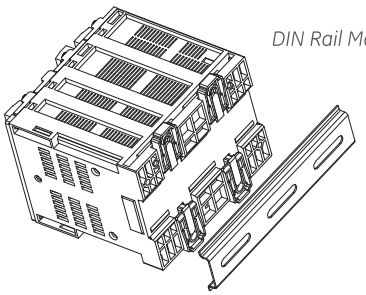


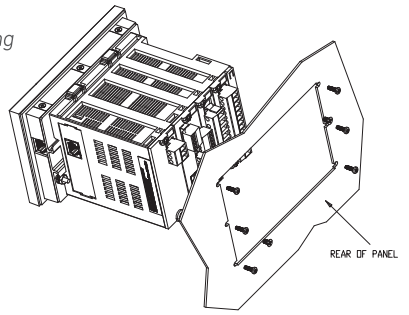


Dimensions



Mounting





The Hand Held Display (HHD) provides a rugged local interface for MM300 Motor Protection Systems where a local display is not used in the MCC.

The HHD provides a graphical color local interface to the MM300 Motor Protection Systems allowing local operators to view and change setting files and quickly access relay diagnostic information.

The HHD provides a clear and detailed view of all motor settings, diagnostic information and metering data available in the MM300 allowing local operators to make informed decisions on the motors operation.

Ordering

						Base I/O		Expansion Module 1		Expansion Module 2		
MM300	*	*	*	*	*	*	*	*	*	*	*	**Description**
Control Panel	X											None
	B											Basic Control Panel, no USB
	G											Graphical Control Panel inc USB
Language		E										English (Standard)
		C										Chinese *
Power Supply			H									High (60-300 Vac/80-250Vdc)
			L									Low (24-48 Vdc)
Communication				S								RS485 Modbus RTU (Standard)
				D								RS485 + DeviceNet Slave + 10/100 Modbus TCP
				P								RS485 + Profibus DP Slave + 10/100 Modbus TCP
Options					S							Standard Control and Event Recorder
					1							+ Undervoltage Auto-restart
					2							+ Waveform Capture, Data Logger
					3							+ FlexLogic
I/O Modules								X	X	X	X	None
							A					3 Phase Current + Thermal O/L, Under Current, Single Phase Under Power
								B				3 Phase Voltage Metering + 3 Phase Under Power, Under/Over Voltage, Phase reversal
								G	G	G	G	3 x RTD: 100PT - max 2
						C		C	C	C	C	2 × 10A Relay Form A and 6 x Digital Input 60-300ac/ (Standard) - max 5
								D	D	D	D	4 × 10A Relay Form C - max 4
						E		E	E	E	E	6 x Digital Inputs 20-60 VDC, 2 × 10A Relay Form A (max 4)

For more information, visit
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