REMOTE INDICATION & MONITORING

Improve safety for service and operations personnel by allowing control and monitoring of the relay without opening the electrical cabinet.

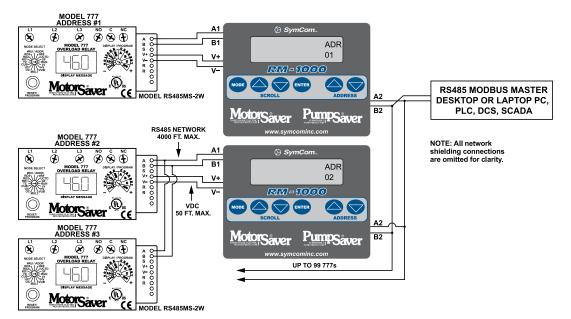**10**

REMOTE INDICATION & MONITORING

RM1000 SERIES

Remote Monitor

Description

The RM1000 Series is a motor-monitoring device to be used in conjunction with the 777 family of products (excluding the P1 Series), 77C family of products and the 601 voltage monitors, via Modbus protocol with a communications module. The RM1000/777 motor management system combines unsurpassed electronic motor protection and critical, user-friendly, motor monitoring.

The RM1000 Series can monitor up to 16 MotorSaver® and/or PumpSaver® units through an RS-485 network using Modbus RTU protocol. A second communication port allows monitoring and control of up to 99 MotorSaver® and/or PumpSaver® units from a computer, PLC, DCS or SCADA system and can be accessed from the host computer or PLC with the RM1000 acting as a repeater for any of its motor protectors. In addition to the monitoring functions, the RM1000 can be used to reset a tripped MotorSaver® or PumpSaver®.

Wiring Diagram

For dimensional drawing see: Appendix, page 508, Figure 4.

The RM1000 Series is easily mounted remotely and improves safety for service and operations personnel by allowing them to control and monitor the device without opening the electrical cabinet. Using the RM1000 is a simple, cost-effective method for aiding compliance with arc flash safety regulations. The enclosure and keypad assembly is water and ultraviolet light resistant. The enclosure is NEMA 3R or NEMA 4X (optional) rated. The RM1000 and RM1000 NEMA 4 also carry a UL Type 12 rating, whereas the RM1000-3R does not carry the UL Type 12 rating due to added weep holes. The added weep holes in the RM1000-3R make it suitable for applications subjected to condensing moisture/humidity.

Ordering Information

MODEL	DESCRIPTION
RM1000	NEMA 3R and/or UL Type 12
RM1000-3R	NEMA 3R
RM1000 NEMA 4	NEMA 4X

RM1000 SERIES

Features

Displays:

- Individual line currents and average current
- Current and voltage unbalance
- Individual phase voltages and average voltage
- Displays last four faults, trip reason, and restart timer status
- MotorSaver® and/or PumpSaver® setpoints
- Run-hours on each motor
- Warning of pending (imminent) faults

Controls:

- Reset run-hour meter
- Reset MotorSaver® or PumpSaver®
- Change setpoints from the RM1000

Convenience:

- Power from RS485MS-2W communications module
- Monitor up to 16 777s with one display
- NEMA 3R outdoor rated
- Secondary steel enclosure available

Accessories

RS485-RS232 Converter with cable & plug
Allows RS485 devices to be connected to a PC via the RS232 (serial) port. Provides convenient terminal blocks for making signal and DC power supply connections. Pre-wired.

RS485-USB
Converter with cable & plug/RS232:USB
Allows RS485 devices to be connected to a PC via the USB port. Provides convenient terminal blocks for making signal and DC power supply connections. Pre-wired.

RM1000 ENCL
Steel enclosure for protecting the RM1000 remote communications monitor from adverse affects of weather and vandalism, while allowing normal communications connections to the RM1000 unit.

Solutions Software: Solutions-M
Software features include data logging, real-time data monitoring and fault and event monitoring.

Specifications

Input Characteristics

Control Power	12-24VDC (Supplied by RS485MS-2W)	

Functional Characteristics

	Port #1 for 777(s)	**Port #2 for PC, PLC, etc.**
Communication		
Baud Rate	1200-28800	1200-28800
Setup	None, Odd, or Even Parity	None, Odd, or Even Parity
	1 or 2 Stop Bits	1 or 2 Stop Bits
Protocol	Modbus RTU	Modbus RTU
Serial Interface	RS-485	RS-485
Available Addresses	1-99 addresses (max 16 per RM1000)	Responds to all port #1
Mechanical Life	100,000 actuations	
Overlay Material	Polyester	
UV Exposure w/o degradation	2000 hrs	
Terminal Torque (depluggable terminal block)	3 in.-lbs.	
Panel Thickness	0.03" min, 0.12" max	

General Characteristics

Ambient Temperature Range	
Operating	-40° to 70°C (-40° to 158°F)
Storage	-40° to 80°C (-40° to 176°F)
Maximum Input Power	100mA
Class of Protection	
RM1000, RM1000 NEMA 4	NEMA 3R and/or UL Type12, NEMA 4X (optional)
RM1000-3R	NEMA 3R only
Relative Humidity	Up to 85%, non-condensing
Safety Marks	
UL	UL508 (File #E68520)
CSA	22.2 No. 14 (File #46510)
CE	IEC 60947-6-2
Enclosure Material	Black polycarbonate
Display	Liquid Crystal with extended temp. range
Size	2 rows x 16 characters
Keypad	Six 0.5" stainless steel dome buttons for tactile feedback
Dimensions	**H** 91.92 mm (3.62"); **W** 115.42 mm (4.54"); **D** 22.86 mm (0.9")
Weight	1.5 lbs. (24 oz., 680.39 g)
Mounting Method	Surface mountable on backplane using 4 screws

RM2000 SERIES

Remote Monitor

Description

The RM2000 Series is a motor-monitoring device to be used in conjunction with the 777 family of products (excluding the P1 Series), 77C family of products and the Model 601 voltage monitors, via Modbus protocol with a communications module. The RM2000/777 motor management system combines unsurpassed electronic motor protection and critical, user-friendly, motor monitoring.

The RM2000 has membrane keypad controls which allow both monitoring and control of a 777 MotorSaver® through an RS-485 network using Modbus RTU protocol. A second communication port allows monitoring and control of up to 99 RM2000 devices from a PLC, DCS, or SCADA system or a PC with Solutions software installed. The RM2000 will act as a repeater for its motor protector when accessed from the host computer or PLC. In addition to the monitoring functions, the RM2000 can be used to reset a tripped MotorSaver® or PumpSaver®.

The RM2000 is easily mounted remotely and improves safety for service and operations personnel by allowing them to control and monitor the device without opening the electrical cabinet. Using the RM2000 is a simple, cost-effective method for aiding compliance with arc flash safety regulations. The enclosure and keypad assembly is water and ultraviolet light resistant.
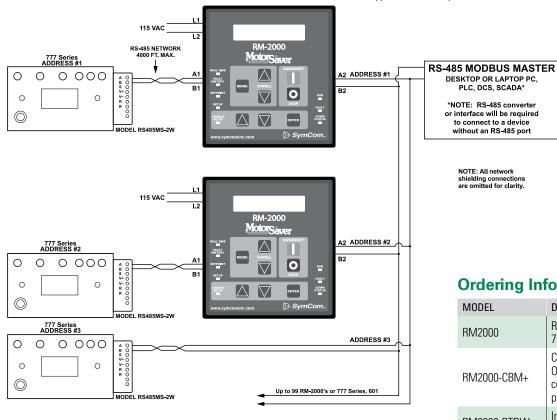
Wiring Diagram

Ordering Information

MODEL	DESCRIPTION
RM2000	Remote display monitor for 777 family relays
RM2000-CBM+	Coal Bed Methane Special. Optimizes gas production from coal bed methane wells while protecting submersible pump
RM2000-RTDW	Includes additional input for ground-fault module

For dimensional drawing see: Appendix, page 508, Figure 5.

REMOTE INDICATION & MONITORING

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RM2000 SERIES

Features

Displays:

- Average current, individual line currents and current unbalance
- Current to ground
- Average voltage, line-line voltages and voltage unbalance
- Instantaneous power
- Power factor
- Last four faults
- All parameters programmed into 777 MotorSaver®
- Remaining restart delay times

Controls:

- Start and stop buttons
- Key lock input to prevent setpoint changes
- Change 777 setpoints from keypad

The RM2000 is also equipped with a real-time clock, which allows access to the following motor management information (most readings can be reset):

- Total motor run-time
- Time and date of last four faults, along with voltage and current at time of trip
- Time and date of last 10 motor starts
- Total number of motor restarts
- Minimum time between any two starts with time and date
- Run-time since last start
- kWh consumed
- kVARs consumed

Accessories

RS485-RS232 Converter with cable & plug
Allows RS485 devices to be connected to a PC via the RS232 (serial) port. Provides convenient terminal blocks for making signal and DC power supply connections. Pre-wired.

RS485-USB Converter with cable & plug/RS232:USB
Allows RS485 devices to be connected to a PC via the USB port. Provides convenient terminal blocks for making signal and DC power supply connections. Pre-wired.

Solutions Software: Solutions-M
Software features include data logging, real-time data monitoring and fault and event monitoring.

Specifications

Input Characteristics

Control Voltage	115VAC ±10%; 50/60Hz
Transient Protection (Internal)	2500V for 10ms

Functional Characteristics

Communication	**Port #1 for 777**	**Port #2 for PC, PLC, etc.**
Baud Rate	1200-28800	1200-28800
Setup	Even Parity	None, Odd, or Even Parity
	1 Stop Bit	1 or 2 Stop Bits
Protocol	Modbus RTU	Modbus RTU
Serial Interface	RS-485	RS-485
Available Addresses	01	A01-A99

Real-time Clock

Battery Back-up Life	10 years @ 25°C without external power
Last fault memory	Stores up to 4 faults with time and date stamp, includes voltages and currents at time of trip
Configuration	Two independent electro-mechanical Form C (SPDT)
Contact Material	Silver/Tin Oxide

Output Characteristics (RM2000-RTDW version only)

Pilot Duty Rating	240VA @ 120VAC
General Purpose Rating	5A @ 120VAC

General Characteristics

Ambient Temperature Range	
Operating	-20° to 70°C (-4° to 158°F)
Storage	-30° to 70°C (-22° to 158°F)
Maximum Input Power	3 W
Class of Protection	NEMA 3R and/or UL Type 12
Relative Humidity	Up to 85%, non-condensing
Safety Marks	
UL	UL508 (File #E68520)
CSA	C22.2 No. 14 (File #46510)
CE	IEC 60947-6-2

Enclosure

Material	Black polycarbonate
Display	Liquid crystal with extended temp. range
Size	2 rows x 20 characters
Lighting	LED Backlight
Keypad	Eight 0.5" stainless steel dome buttons for tactile feedback
Mechanical Life	100,000 actuations
Overlay Material	Polyester
UV Exposure w/o degradation	2000 hrs.
Terminal Torque (depluggable terminal block)	3 in.-lbs.
Dimensions	**H** 162.56 mm (6.4"); **W** 154.94 mm (6.1"); **D** 27.94mm (1.1")
Weight	1.2 lbs. (19.2 oz., 544.31 g)
Mounting Method	Surface mountable on backplane using 4 screws

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REMOTE INDICATION & MONITORING

INFORMER

Remote Diagnostic Tool for use with Single-Phase Pump Relays

For dimensional drawing see: Appendix, page 510, Figure 9.

Description

The Informer is a hand-held diagnostic tool designed for use with single-phase models equipped with infrared LED transmitters (111-Insider-P; 231-Insider-P; 232-Insider; 111P; 233P; 233P-1.5; 234-P and 235P).

The Informer uses an infrared receiver to access information sent from the relay which can be helpful for troubleshooting the system.

Each Littelfuse single-phase model listed above is equipped with an infrared LED that transmits valuable information from the device. To retrieve this information, the Informer's receiver must be directed toward the unit's LED transmitter and be within 8 feet of the unit. The green COMM STATUS light indicates when the Informer is receiving data from the unit. If communication is lost, the Informer will display the last values it received. The Informer will automatically shut off after 2 minutes of non-use.

An infrared adapter (IR Kit-12) is included with all new and updated Informers. This adapter allows communication with the unit without opening the panel door (for select models).

Features & Benefits

The Informer displays:

- Model number
- Real-time voltage, current, and power
- Drywell and overload trip points
- Calibration voltage
- Restart delay setpoint and restart delay time remaining
- CT size (if applicable)
- Number of pump starts
- Total run-time
- Fault history for last 20, most recent, faults
- Voltage, current, power, and run-time for each fault at time of the fault
- Highest and lowest voltage and current since last calibration

Accessories

Informer IR Kit-12
12" infrared adapter cable attaches to the face of the unit to provide remote diagnostics without opening the panel. Included with the Informer

INFORMER

Specifications

Functional Characteristics

Power

Input	9 Volts DC (requires one 9-volt alkaline battery)
Auto Shut-off	2 minutes

Communication

Signal	Infrared
Range	1-8 ft. (approx. 0.25 ft. when using IR Kit)
Data Update	4 seconds

General Characteristics

Temperature Range	0 to 60°C (32° to 140°F)

Accuracy

Voltage	±2%
Current	±2%
Power	±4%
Maximum Input	0.25 W

Resolution

Voltage	1.0VAC
Display	Liquid crystal
Size	2 rows x 16 characters
Keypad	Three 0.5" diameter buttons
Mechanical Life	100,000 actuations min.
Overlay Material	Polyester

Enclosure

Dimensions	**H** 139.70 mm (5.50"); **W** 91.44 mm (3.60"); **D** 28.70 mm (1.13")
Weight	0.375 lb. (6 oz., 170.10 g) (w/out battery); 0.70 lb. (11.2 oz., 317.51 g) (total package)
Material	Black ABS 94HB

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REMOTE INDICATION & MONITORING

INFORMER-MS

Remote Diagnostic Tool for use with the 455
3-Phase, Dual-Range Voltage Monitor

For dimensional drawing see: Appendix, page 510, Figure 9.

Description

The Informer-MS is a hand-held diagnostic tool designed for use with the Littelfuse 455.*

The Informer-MS uses an infrared receiver to read valuable information transmitted from the 455*, which can be helpful for troubleshooting the system. A green communication status light indicates the Informer-MS is receiving data from the 455. If communication is lost, the Informer-MS will display the last values it received.

*Model 455s manufactured after 03/01/06 are equipped with the infrared LED transmitter. Models manufactured prior to this date are not compatible with the Informer-MS.

An infrared adapter (IR Kit-36) can be purchased to allow communication with the Model 455 without opening the panel door.

Features

The Informer-MS displays:

- Real-time, line and load side voltage
- Real-time, line and load side voltage unbalance
- Motor run hours
- Last 20 faults
- Last 32 motor starts
- High and low voltage trip points
- Voltage unbalance trip point
- Restart and trip delay settings
- Voltage at last fault
- Communication status LED
- Auto shut off
- Last fault with trip conditions

Accessories

Informer IR Kit-36
36″ infrared adapter cable attaches to the face of the model 455 to provide remote diagnostics without opening the panel.

Specifications

Functional Characteristics
Power

Input	9 Volts DC (requires one 9-volt alkaline battery)
Consumption	0.25 Watt (max.)
Auto Shut-off	2 minutes

Communication

Signal	Infrared
Range	1-8 ft. (approx. 0.25 ft. when using IR Kit)
Data Update	4 seconds

General Characteristics

Temperature Range	0 to 60°C (32° to 140°F)

Accuracy

Voltage	±2%
Maximum Input	0.25 W

Resolution

Voltage	1.0VAC
Voltage Unbalance	1%
Time	1 minute increments
Trip Delay	2 second increments
Restart Delay	2 second increments

Display (liquid crystal)

Size	2 rows x 16 characters

Keypad (three 0.5″ dia. buttons)

Mechanical Life	100,000 actuations min.
Overlay Material	Polyester

Enclosure

Dimensions	**H** 139.70 mm (5.50″); **W** 91.44 mm (3.60″); **D** 28.70 mm (1.13″)
Weight	0.375 lb. (6 oz., 170.10 g) (w/out battery); 0.70 lb. (11.2 oz., 317.51 g) (total package)
Material	Black ABS 94HB

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REMOTE INDICATION & MONITORING