

Overload Relays

Monitoring, control, and protection are critical and necessary functions in motor and pumping applications. SymCom's single-phase and three-phase UL listed enhanced overload relays monitor for both line-side voltage problems and load-side current faults, providing an added layer of protection over voltage monitors and other basic overload relays. All SymCom overload relays are user configurable and cover a wide range of voltages and currents, making them the most versatile in the industry. A standard feature of the entire family of SymCom overload relays is a communications port which provides easy connectivity to a SCADA system, PLC, or virtually any network through the use of a communications module. The communications port allows remote monitoring of motor operations and fault conditions through easy connectivity to SymCom's Remote Monitors, aiding compliance with arc flash safety regulations.

Product Selection Matrix

MODEL	High Voltage	Low Voltage	Phase Loss	Phase Reversal	Voltage Unbalance	Contact Failure	Low Current Trip	Low Power Trip	High Power Trip	Overcurrent Trip	Linear Overcurrent Trip (Trip Class)	Current Unbalance	Subtrol High Temp. Trip*	10-800A with CTs	1-9 Amps without external CTs	2-90 Amps without external CTs	2-800 Amps full range	100-2240 VAC	200-480 VAC	300-480 VAC	500-600 VAC	277V Relay	600V Relay	Use with rotary phase converter
777-P2	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777 (replaced by 777-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-P (replaced by 777-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-P1 (replaced by 777-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-LR-P2	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-LR-P (replaced by 777-LR-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-LR (replaced by 777-LR-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-HVR-LR-P2	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-HVR-LR (replaced by 777-HVR-LR-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-HVR-P2	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-HVR (replaced by 777-HVR-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-MV-P2	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-MV (replaced by 777-MV-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-575-P2	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-575 (replaced by 777-575-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-575-P (replaced by 777-575-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-575-P1 (replaced by 777-575-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-575-FT (replaced by 777-575-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-575-LR-P2	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-575-LR (replaced by 777-575-LR-P2)	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-HRG-P2	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-LR-HRG-P2	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-575-HRG-P2	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-575-LR-HRG-P2	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-FT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-575-FT	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-TS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-LR-TS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-575-TS	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777VA-02	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777VA-03	•	•	•	•	•	•	**	**	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
77C	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
77C-LR	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	
777-HVR-SP	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	

* Subtrol is a registered trademark of Franklin Electric Co., Inc.
 ** Network programmable ONLY

Overload Relay

Model 777 Product Line single-phase and 3-phase current & voltage monitor, on-board display, optional communications to PLC/SCADA/monitoring systems



The Model 777 / 77C

is a fully programmable electronic overload relay designed to protect any motor drawing 2-800 full load amps (external CTs are required above 90 amps). The 77C (family of products) is for single-phase 100-240VAC applications and the 777 (family of products) is for 3-phase 200-480VAC applications, with several specialized units for other voltage ranges and unique applications. Common applications include conveyor systems, HVAC equipment, saws and grinders, fan motors, and almost any pumping application. Some unique applications include use with a Subtrol® equipped Franklin submersible motor to detect high motor temperatures and applications where a fast linear trip is required.

All of the overload relays provide unsurpassed protection by combining overload, underload, voltage and power monitoring functions in one package. The overload relays have a 3-digit display for viewing real-time voltage and current and for displaying the last or active fault code (to simplify diagnostics) when tripped for a fault condition. The units can be used as a stand-alone product or the communications port can be used to form a Modbus, DeviceNet™, Profibus, or Ethernet network to monitor up to 99 units from a PC, PLC, or SCADA system, and for data logging through a PC with SymCom's Solutions software (see page 15).




The communications port can also be used for remote monitoring (see SymCom's remote monitors on page 13) to improve safety for personnel by allowing them to monitor and control motor operation without opening the electrical cabinet. This capability allows for a simple, cost-effective way to meet new requirements for arc-flash safety.

For more information see:

See Appendix A, page 66, Figure 1 for dimensional drawing.

See Appendix B, page 71, Figures 1-4 for typical wiring diagrams.

Features:

- Built-in 3-digit display for programming, real-time info, and diagnostics
- Programmable voltage and current settings/parameters
- Programmable restart control (automatic, semi-automatic, or manual)
- 3 separate programmable restart delay timers (rapid-cycle protection, motor cool down and dry-well recovery)
- Run-hour meter (available via network or remote displays)
- Reset pushbutton (and optional remote reset pushbutton)
- Current/last fault indication on 3-digit display
- Last four faults (with characteristics) available via network or remote displays
- Network communications (Modbus, DeviceNet™, Profibus, or Ethernet)
- Optional remote displays aid compliance with arc-flash safety regulations
- Approvals:   

Auxiliary Products:

- Communication Modules (see pgs. 10-12)
- RM-1000/RM-2000 (remote displays) (see pgs. 13-14)
- Solutions Software (see pg. 15)
- Manual Remote Reset Kit (see pg. 65)

Available Models:

77C
77C-LR
777-HVR-SP
777-P2
777-LR-P2
777-HVR-P2
777-HVR-LR-P2
777-575-P2
777-MV-P2
777-575-LR-P2
777-HRG-P2
777-LR-HRG-P2
777-575-HRG-P2
777-575-LR-HRG-P2
777-FT
777-575-FT
777-IS
777-LR-IS
777-575-IS
777VA-02
777VA-03

DEMOS:

777-P2-DEMO (777-P2 Demo only)
777-P2-DEMO-1 (777-P2 demo with CIO-EN Ethernet Module)
777-P2-DEMO-2 (777-P2 demo, CIO-EN and RM-1000 Remote Monitor)
777-P2-DEMO-3 (777-P2 demo, CIO-EN, RM-1000 and RM-2000 Remote Monitors)

Overload Relay

Model 777 Product Line

single-phase and 3-phase current & voltage monitor, on-board display, optional communications to PLC/SCADA/monitoring systems

Specifications

Input Characteristics

Line Voltage

777-P2, 777-LR-P2, 777-HRG-P2	200-480VAC
777-TS, 777-LR-TS, 777-LR-HRG-P2	200-480VAC
777VA-02, 777VA-03	200-480VAC
77C, 77C-LR, 777-MV-P2	100-240VAC
777-HVR-P2, 777-HVR-LR-P2, 777-HVR-SP	340-480VAC
777-575-P2, 777-575-LR-P2, 777-575-HRG-P2	500-600VAC
777-575-TS, 777-575-LR-HRG-P2	500-600VAC

Frequency 50/60Hz

Motor Full Load Amp Range

77C-LR, 777-LR-TS	1-9A
777-LR-P2, 777-575-LR-P2, 777-HVR-LR-P2	1-9A & 10-800A with external CTs
777-LR-HRG-P2, 777-575-LR-HRG-P2	10-800A (external CTs required, external zero-seq. CT required)
777-HRG-P2, 777-575-HRG-P2	2-90A only
777-MV-P2	10-800A with CTs
77C, 777-P2, 777-575-P2	2-800A (external CTs required above 90A)
777-HVR-P2	2-800A (external CTs required above 90A)
777-TS, 777-575-TS, 777VA-02	2-800A (external CTs required above 90A)
777VA-03, 777-HVR-SP	2-800A (external CTs required above 90A)

Functional Characteristics

TC- Overcurrent Trip Class (777 Plus Series units)	02-60, J02-J60, L00-L60 or Off
TC- Overcurrent Trip Class (77C, 777 non-Plus Series units)	5, 10, 15, 20, 30 (J prefix enables jam protection feature)

Output Characteristics

Output Contact Rating (SPDT - Form C)

Pilot duty rating	480VA @ 240VAC, B300
General purpose	10A @ 240VAC
Pilot duty rating for HVR models	470VA @ 600VAC, B600

General Characteristics

Ambient Temperature Range

Operating	-20° to 70°C (-4° to 158°F)
Storage	-40° to 80°C (-40° to 176°F)

Accuracy

Voltage	±1%
Current	±3% (<100 amps direct)
GF Current	±15%
Timing (777 Plus Series units)	±0.5 second
Timing (77C, 777 non-Plus Series units)	5% ±1 second

Repeatability

Voltage	±0.5% of nominal voltage
Current	±1% (<100 amps direct)

Maximum Input Power 10 W

Pollution Degree 3

Class of Protection IP20

Relative Humidity 10-95%, non-condensing per IEC 68-2-3

Terminal Torque 7 in.lbs.

Standards Passed

Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 3, 6kV contact, 8kV air
Radio Frequency Immunity (RFI), Conducted	IEC 61000-4-6, Level 3 10V/m
Radio Frequency Immunity (RFI), Radiated	IEC 61000-4-3, Level 3 10V/m
Fast Transient Burst	IEC 61000-4-4, Level 3, 3.5kV input power

Short Circuit 100kA

Surge

IEC	61000-4-5, Level 3, 2kV line-to-line; Level 4, 4kV line-to-ground
ANSI/IEEE	C62.41 Surge and Ring Wave Compliance to a level of 6kV line-to-line

Hi-potential Test Meets UL508 (2 x rated V +1000V for 1 minute)

Vibration IEC 68-2-6, 10-55Hz, 1mm peak-to-peak, 2 hours, 3 axis

Shock IEC 68-2-27, 30g, 3 axis, 11ms duration, half-sine pulse

Safety Marks

UL	UL508, UL1053 (File #E68520)
CE	IEC 60947-1, IEC 60947-5-1
CSA	C22.2

Maximum Conductor Size (with insulation) through 777/77C 0.65"

Dimensions 3.05 H x 3.85 W x 5.05 D in. (77.47 x 97.79 x 128.27 mm)

Weight 1.56 lbs. (24.96 oz., 707.6 g)

Mounting Method Surface mount (4 - #8 screws) or DIN rail mount

-P2 The 777-P2 protects 200-480VAC, 2-800 full load amp (FLA) motors and provides protection from overvoltage and undervoltage, overcurrent and undercurrent and unbalanced voltage or unbalanced current through adjustable setpoints. Provides adjustable Trip Class (TC) settings that include settings from 2-60, with or without "jam" protection, and linear TC from <1 second to 60 seconds. The fast linear TC is ideal for applications where very short trip delays are needed to prevent chain drives and other drive linkages from breaking in an overload or jam situation (ex. sewage clarifiers, mixers, augers, conveyors). This family of products also includes network programmable alarm setpoints and high and low power trip points (programmable through a network or SymCom's Solutions Software).

-LR (Low Range) The 777-LR-P2 is specifically designed for use with 1-9 FLA motors to ease installation when wired directly, or for 10-800 FLA motors with use of external CTs.

-HVR The 777-HVR-P2 or 777-HVR-LR-P2 is required when a CPT (control power transformer) is not used on a 480V system. They have a 340-480VAC range, a relay rated at 470VA @ 600VAC pilot duty, and is commonly used in pumping applications to save the cost and extra wiring associated with a CPT.

-HRG The 777-HRG-P2 / 777-LR-HRG-P2 are overload relays, designed for a high resistance ground system, that incorporates an internal zero-sequence CT (HRG) or an external zero-sequence CT (LR-HRG) to detect ground faults. The HRG is only for 2-90 FLA and is wired directly. The LR-HRG is only for 10-800 FLA and requires the use of external CTs that correspond with the built-in multipliers.

-MV The 777-MV-P2 is specifically designed for medium voltage applications where both PTs (potential transformers) and CTs (current transformers) are used. It has a 115-230VAC nominal voltage range and built-in multipliers for 25:5, 50:5, 100:5, ...CTs. The voltage unbalance, single-phase and reverse-phase protection can be disabled to accommodate applications where only one PT is used.

-575 The 777-575-P2 has a nominal 500-600VAC range and 240V relay. They are commonly used in Canada and the Northeast US where 575V utility power services are common.

-VA-02 The 777VA-02 has RD1 setpoints of 2-500 minutes and UCTD setpoints of 2-60 minutes. (Replaced 777-RD1M-UCTDM).

-VA-03 The 777VA-03 is specifically designed for use with static and rotary single to 3-phase converters. Voltage unbalance protection is disabled and the high and low voltage trip features apply only to the utility supplied power. This allows the 777 to ignore the severely unbalanced voltages that are inherent to unloaded phase converters. (Replaced 777-PH.)

-SP The 777-HVR-SP is specifically designed for single-phase, 480VAC applications. It has a high voltage relay rated at 480VA @ 600VAC pilot duty to handle systems with no control power transformer.

-FT The 777-FT is intended for applications where a fast linear trip is required. It has an overcurrent trip delay that can be set to less than 500ms, to be used in applications where very short trip delays are needed to prevent chain drives and other drive linkages from breaking in an overload or jam situation. Often times these are referred to as shock relays. Some applications include sewage clarifiers, mixers, augers and conveyors. The trip delay can be set to as long as 70 seconds, so the 777-FT can also be used in certain applications when a slower than normal trip is desired, such as motor test panels in a rewind shop. The 777-FT also features an adjustable motor acceleration time and overcurrent trip delay time when using the fast linear trip mode.

-TS The 777-TS is specifically designed for use with a Subtrol[®]-equipped Franklin submersible motor to detect high motor temperatures.

-DEMO SymCom offers demo packages for the Model 777 family and remote monitors. These demos are powered via one power adapter (included) and are very easy to set up for use as sales tools or for training purposes. Four packages of the MotorSaver[®] and four of the PumpSaver[®] versions are available ranging from the basic model 777 up to a complete package including the Ethernet module and both remote monitors. Which package to choose will depend on your markets and/or product focus.)

Power Monitors

Many pumping applications require advanced power monitoring and control. SymCom enhanced power monitors provide all of the protections and features included with an enhanced overload relay, but are designed specifically for applications where there is not much change in current between a load and no load condition. This family of enhanced power monitors provides optimum protection in these adverse situations by monitoring for subtle changes in voltage, current and power factor to distinguish between changing load conditions.

Product Selection Matrix

MODEL	High Voltage	Low Voltage	Phase Loss	Phase Reversal	Voltage Unbalance	Contactors Failure	Low Current Trip	Low Power Trip	High Power Trip	Overcurrent Trip	Linear Overcurrent Trip (Trip Class)	Current Unbalance	10-800 A with CTs	1-9 Amps	0.5-21 and 40-740 Amps w/ CTs	2-800 Amps	200-480VAC	340-480VAC	500-600VAC	277V Relay	600V Relay	Displays Output Shaft Power
777-KW/HP-P2	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-KW/HP (replaced by 777-KW/HP-P2)	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-KW/HP-P (replaced by 777-KW/HP-P2)	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-LR-KW/HP-P2	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-LR-KW/HP (replaced by 777-LR-KW/HP-P2)	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-LR-KW/HP-P (replaced by 777-LR-KW/HP-P2)	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-MLR-KW/HP-P2	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-MLR-KW/HP (replaced by 777-MLR-KW/HP-P2)	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-HVR-KW/HP-P2	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-HVR-KW/HP (replaced by 777-HVR-KW/HP-P2)	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-575-KW/HP-P2	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-575-KW/HP (replaced by 777-575-KW/HP-P2)	•	•	•	•	•	•	**	•	**	•	•	•	•	•	•	•	•	•	•	•	•	•
777-AccuPower	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•	•

** Network programmable ONLY.

Power Monitors

Model 777-KW/HP-P2 Product Line

3-phase current & voltage monitor, on-board display, optional communications, **underpower trip for more accurate/faster motor protection versus undercurrent trip**



The Model 777-KW/HP-P2 Series

has the underload trip, adjustable on the face of the unit, based on power, while all the other products in the 777 family provide an undercurrent trip.

The underpower trip feature is desirable anytime the current vs. load characteristic is non-linear or has little change. In general terms, smaller motors and slow speed motors have little change in current over the normal load range. Larger motors that are running light loads will also show small current changes over the operating load range.

KW/HP products should be used with all small centrifugal motors and fractional horsepower motors when underload protection is needed and with most motors under 3hp. Also use KW/HP products when the motor is derated (Ex: Coal bed methane well with a 7.5hp submersible pump on a

10hp motor.) Other typical applications are mixer motors up to 50hp and beyond that run at less than 1800 rpm, magdrive pumps and can pumps. If in doubt, underpower can be used anytime in place of undercurrent protection.

The 777-KW/HP-P2 can display kilowatts and horsepower and a high power trip feature that can be enabled over a network. The high power trip is useful added protection for positive displacement pumps in a restricted flow (dead-head) condition.

-LR (Low Range) The 777-LR-KW/HP-P2 is specifically designed for use with 1-9 FLA motors to ease installation when wired directly, or for 10-800 FLA motors with use of external CTs.

-HVR The 777-HVR-KW/HP-P2 is required when a CPT (control power transformer) is not used on a 480V system. It has a 340-480VAC range, a relay rated at 470VA @ 600VAC pilot duty, and is commonly used in pumping applications to save the cost and extra wiring associated with a CPT.

-575 The 777-575-KW/HP-P2 has a nominal 500-600VAC range and 240V relay. They are commonly used in Canada and the Northeast US where 575V utility power services are common.

-MLR The 777-MLR-KW/HP-P2 is used in applications that have a 0.5-21 and 40-740 full load amp range. It is wired directly without the need to loop conductors for 5-21 amps (under 5 amps requires looping of conductors), and can be used with external CTs for 40-740 amps.




For more information see:

See Appendix A, page 66, Figure 1 for dimensional drawing.

See Appendix B, page 71, Figures 1 & 2 for typical wiring diagrams.

Features:

- Low power protection
- High power protection
- Overcurrent (overload)
- High voltage
- Low voltage
- Current unbalance
- Voltage unbalance
- Ground fault detection
- Modbus communication
- Built-in 3-digit display for setup and diagnostics
- Network communications

Approvals:   

Auxiliary Products:

- Communication Modules (see pgs. 10-12)
- RM-1000/RM-2000 (remote displays) (see pgs. 13-14)
- Solutions Software (see pg. 15)
- Manual Remote Reset Kit (see pg. 65)

Available Models:

777-KW/HP-P2

777-LR-KW/HP-P2

777-HVR-KW/HP-P2

777-575-KW/HP-P2

777-MLR-KW/HP-P2

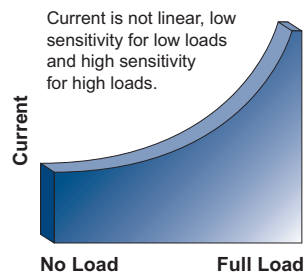
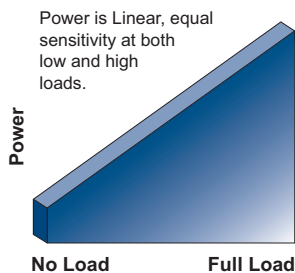
DEMOS:

777-KW/HP-P2-DEMO (777-KW/HP-P2 Demo only)

777-KWHP-P2-DEMO1 (777-KW/HP-P2 demo with CIO-EN Ethernet Module)

777-KWHP-P2-DEMO2 (777-KW/HP-P2 demo, CIO-EN and RM-1000 Remote Monitor)

777-KWHP-P2-DEMO3 (777-KW/HP-P2 demo, CIO-EN, RM-1000 and RM-2000 Remote Monitor)



Power Monitors

Model 777-KW/HP-P2 Product Line

3-phase current & voltage monitor, on-board display, optional communications, underpower trip for more accurate/faster motor protection versus undercurrent trip

Specifications

Input Characteristics

Line Voltage	
777-KW/HP-P2	200-480VAC (3-phase)
777-LR-KW/HP-P2, 777-MLR-KW/HP-P2	200-480VAC (3-phase)
777-HVR-KW/HP-P2	340-480VAC (3-phase)
777-575-KW/HP-P2	500-600VAC (3-phase)
Current	
777-KW/HP-P2	2-800A (external CTs required above 90A)
777-HVR-KW/HP-P2, 777-575-KW/HP-P2	2-800A (external CTs required above 90A)
777-LR-KW/HP-P2	1-9A & 10-800A with external CTs
777-MLR-KW/HP-P2	0.5-21A and 40-740A with external CTs
Frequency	50/60Hz

Functional Characteristics

TC-Overcurrent Trip Class	02-60, J02-J60, L00-L60 or OFF
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Output Characteristics

Output Contact Rating (SPDT - Form C)	
Pilot duty rating	480VA @ 240VAC, B300
General purpose	10A @ 240VAC
Pilot duty rating for HVR model	470VA @ 600VAC, B600

General Characteristics

Ambient Temperature Range	
Operating	-20° to 70°C (-4° to 158°F)
Storage	-40° to 80°C (-40° to 176°F)
Accuracy	
Voltage	±1%
Current	±3% (<100 amps direct)
Power	±4% (<100 amps direct)
GF Current	±15%
Timing	±0.5 second
Repeatability	
Voltage	±0.5% of nominal voltage
Current	±1% (<100 amps direct)
Power	±2%
Maximum Input Power	10 W
Pollution Degree	3
Class of Protection	IP20
Relative Humidity	10-95%, non-condensing per IEC 68-2-3
Terminal Torque	7 in.-lbs.
Standards Passed	
Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 3, 6kV contact, 8kV air
Radio Frequency Immunity (RFI), Conducted	IEC 61000-4-6, Level 3 10V/m
Radio Frequency Immunity (RFI), Radiated	IEC 61000-4-3, Level 3 10V/m
Fast Transient Burst	IEC 61000-4-4, Level 3, 3.5 kV input power
Short Circuit Rating	100kA
Surge	
IEC	61000-4-5, Level 3, 2kV line-to-line; Level 4, 4kV line-to-ground
ANSI/IEEE	C62.41 Surge and Ring Wave Compliance to a level of 6kV line-to-line
Hi-potential Test	Meets UL508 (2 x rated V +1000V for 1 minute)
Vibration	IEC 68-2-6, 10-55Hz, 1mm peak-to-peak, 2 hours, 3 axis
Shock	IEC 68-2-27, 30g, 3 axis, 11ms duration, half-sine pulse
Safety Marks	
UL	UL508, UL1053 (File #E68520)
CE	IEC 60947-1, IEC 60947-5-1
CSA	C22.2
Maximum Conductor Size (with insulation) through 777	0.65"
Dimensions	3.05 H x 3.85 W x 5.05 D in. (77.47 x 97.79 x 128.27 mm)
Weight	1.56 lbs. (24.96 oz., 707.6 g)
Mounting Method	Surface mount (4 - #8 screws) or DIN rail mount

Power Monitors

3-phase current & voltage monitor, on-board display, calculates motor output power with optional 4-20mA communications

Model 777-AccuPower






The Model 777-AccuPower

is a fully-programmable 3-phase motor and pump protection relay. It allows motor hp rating, full load amps, efficiency and power factor to be entered and will accurately calculate motor output power. This is most useful with mag-drive pumps or process applications where the process power is desired over the utility power. Voltage, current and power measurements can be displayed as well as fault information and setpoints. The built-in display simplifies troubleshooting and allows the user to easily and precisely configure setpoints. The 777-AccuPower can be used with SymCom's 4-20mA output module to give an analog signal proportional to output shaft power.

For more information see:
See Appendix A, page 66, Figure 1 for dimensional drawing.
See Appendix B, page 71, Figures 1 & 2 for typical wiring diagrams.

Features:

- Motor output power measurement
- 3 separate restart timers for rapid-cycle protection, motor cool down and dry-well recovery
- Built-in 3-digit display for setup and diagnostics
- Last fault indication on display
- Last 4 faults available on network or remote displays
- Optional remote displays (RM-1000 or RM-2000) via Modbus communications
- Limited Modbus capabilities
- Adjustable underload trip delay (network only)
- Power factor measurement (network readable)
- Run-hour meter (network readable)
- 4-20mA scalable output signal

Approvals:   

Auxiliary Products:

- Com 4-20mA (for 4-20mA output)
- RS485MS-2W (for limited Modbus capabilities)
- RM-1000/RM-2000 (remote displays)

Available Models:

777-AccuPower

Specifications

Input Characteristics	
Line Voltage	200-480VAC
Frequency50/60Hz
Motor Full Load Amp Range	2-800A (external CTs required over 90A)
Functional Characteristics	
TC- Overcurrent Trip Class5, 10, 15, 20, 30 (J prefix enables jam protection feature)
Output Characteristics	
Output Contact Rating (SPDT - Form C)	
Pilot duty480VA @ 240VAC
General purpose10A @ 240VAC
General Characteristics	
Ambient Temperature Range	
Operating	-40° to 70°C (-40° to 158°F)
Storage	-40° to 80°C (-40° to 176°F)
Accuracy	
Measured Horsepower/Kilowatt	
Typical	±3%**
Voltage	±1%
Current	±3% (<100 amps direct)
GF Current	±15%
Timing5% ±1 second
Repeatability	
Voltage	±0.5% of nominal voltage
Current	±1% (<100 amps direct)
Maximum Input Power10 W
Pollution Degree:	3
Class of Protection:	IP20, NEMA 1 (finger safe)
Relative Humidity:	10-95%, non-condensing per IEC 68-2-3
Terminal Torque7 in.-lbs.

Standards Passed	
Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 3, 6kV contact, 8kV air
Radio Frequency Immunity (RFI), Conducted	IEC 61000-4-6, Level 3 10V/m
Radio Frequency Immunity (RFI), Radiated	IEC 61000-4-3, Level 3 10V/m
Fast Transient Burst	IEC 61000-4-4, Level 3, 3.5 kV input power
Short Circuit Rating	100kA
Surge	
IEC	61000-4-5 Level 3, 2kV line-to-line; Level 4, 4kV line-to-ground
ANSI/IEEE	C62.41 Surge and Ring Wave Compliance to a level of 6kV line-to-line
Hi-Potential Test	Meets UL508 (2 x rated V + 1000V for 1 min.)
Vibration	IEC 68-2-6, 10-55Hz, 1mm peak-to-peak, 2 hrs, 3 axis
Shock	IEC 68-2-27, 30g, 3 axis, 11ms duration, half-sine pulse
Safety Marks	
UL	UL508, UL1053
CE	IEC 60947-1, IEC 60947-5-1
CSA	C22.2
Max. conductor size thru 777065" with insulation
Dimensions	3.05 H x 3.85 W x 5.05 D in. (77.47 x 97.79 x 128.27 mm)
Weight	1.3 lbs. (20.8 oz., 589.67 g)
Mounting Method	Surface mount (4 - #8 screws) or DIN rail mount

**On a well balanced system within recommended current range.

Communication Modules

Models RS485MS-2W / CIO-MB

communication link to PLC/SCADA/monitoring systems



The RS485MS-2W

is required to enable the Modbus communications function on Model 77x-type products. This module is required when the RM-1000, RM-2000 or other Modbus capable device is used with 77x-type products.

For more information see: See Appendix A, page 66, Figure 2 for dimensional drawing.

Features:

- Optical isolation from line potentials
- Powered by the 77x product
- RS-485 compliant bus drive capability
- Remote reset input connection
- Power connection for the Model RM-1000

Approvals:

Available Models:

RS485MS-2W

Specifications

Functional Specifications

Remote Reset (for use with optional 777 Series) . . . Normally open pushbutton rated 24VDC, 10mA (min.)

General Characteristics

Ambient Operating Temperature -20° to 50°C (-4° to 122°F)

Terminal (depluggable terminal block)

Torque 3 in.-lbs. (max.)

Wire AWG 12-20 AWG

Class of Protection IP20

Relative Humidity 10-95%, non-condensing per IEC 68-2-3

Standards Passed

Electrostatic Discharge (ESD) IEC 61000-4-2, Level 3, 6kV contact, 8kV air

Radio Frequency Immunity, Radiated 150 MHz, 10V/m

Fast Transient Burst IEC 61000-4-4, Level 3, 4kV input power

Hi-Potential Test Meets UL508 (2 x rated V + 1000V for 1 min)

Surge

Input Power IEC 61000-4-5, Level 1

Inputs/Data Lines IEC 61000-4-5, Level 2

Safety Marks

UL UL508 (File #E68520)

CE IEC 60947

Enclosure Polycarbonate

Dimensions 2.08"H x 2.776"W x 0.77"D

Weight 0.26 lb. (4.16oz., 117.93 g)

Mounting Method 9-pin D-Sub connector on the side of a 777-Series



The CIO-MB / CIO-120-MB Modules

are convenient and cost-effective Modbus-RTU interfaces capable of providing discrete control and monitoring of an overload relay over a Modbus network.

For more information see: See Appendix A, page 66, Figure 3 for dimensional drawing.

Features:

- Can be used in both new and existing installations
- Can be used as stand-alone or with a 777 Plus series unit
- Can be re-configured to work with standard 777 units
- Reduced field wiring. Unpluggable terminal block connection for network.
- Ease in system startup and commissioning
- Compact size
- DIN rail or surface mountable
- Additional remote reset input to reset 777 Plus series
- Flexible addressing standard

Approvals:

Available Models:

CIO-MB

CIO-120-MB

Specifications

Functional Specifications

Remote Reset (for use with optional 777 Series) Normally open pushbutton rated 24VDC, 10mA (min.)

Power Requirements

Voltage 24VDC ±10%

Current 95mA (max.) 70mA (typical)

Power 2.28 W (max.) 1.7 W (typical)

Ethernet Controller IEEE 802.3

Capability 10Base-T

Input Characteristics

General Purpose (4)

Voltage Range

CIO-MB 12-24VDC

CIO-120-MB 90-130VAC

Current 2mA (typical)

Output Characteristics

SPDT (1), SPST (1)

Pilot Duty 480VA & 240VAC, B300

General Purpose 5A @ 240VAC

General Characteristics

Ambient Operating Temperature -20° to 70°C (-4° to 158°F)

Terminal (depluggable terminal block)

Torque 3 in.-lbs. (max.)

Wire AWG 12-20 AWG

Class of Protection IP20, NEMA 1 (finger safe)

Relative Humidity 10-95%, non-condensing per IEC 68-2-3

Standards Passed

Electrostatic Discharge (ESD) IEC 61000-4-2, Level 3, 6kV contact, 8kV air

Radio Frequency Immunity, Radiated 150 MHz, 10V/m

Fast Transient Burst IEC 61000-4-4, Level 3, 4kV input power

Hi-Potential Test Meets UL508 (2 x rated V + 1000V for 1 min)

Surge

Input Power IEC 61000-4-5, Level 1

Inputs/Data Lines IEC 61000-4-5, Level 2

Safety Marks

UL UL508 (File #E68520)

CSA C22.2 (File #46510)

CE IEC 60947-6-2

Enclosure Polycarbonate

Dimensions 2.08"H x 2.776"W x 0.77"D

Weight 0.25 lb. (4 oz., 113.4 g)

Mounting Methods DIN Rail or surface mount (w/ two #8 screws)



Communication Adapters

- RS485-RS232 converter with cable & plug
- RS485-USB converter with cable & plug/RS232:USB converter

Specifications match industry standard.





The CIO-DN-P / CIO-120-DN-P are convenient and cost-effective Devicenet™ interfaces capable of providing discrete control and monitoring of motor starters, drives and other devices over a Devicenet™ network.

For more information see: See Appendix A, page 66, Figure 3 for dimensional drawing.

Features:

- Can be used in both new and existing installations
- Can be used as stand-alone or with a 777 Plus series unit
- Reduced field wiring. Unpluggable terminal block connection for network.
- Ease in system startup and commissioning
- Compact size
- DIN rail or surface mountable
- Additional remote reset input to reset 777 Plus series
- Flexible addressing standard

Approvals:  

Available Models:

CIO-DN-P
CIO-120-DN-P

Specifications

Input Characteristics		
Power Requirements		
Voltage (nominal).....	24VDC	Relative Humidity
Current	137mA (max.)	Wire Gauge
Power	3.28 W (max.)	Terminal Torque
Digital Inputs		Hi-Potential Test (relays to other circuits)
Voltage Range		EMC Standards
CIO-DN-P	12-24 VAC	Electrostatic Discharge (ESD)
CIO-120-DN-P	90-130VAC	Radio Frequency Immunity, Radiated
Frequency	50/60Hz	Fast Transient Burst
Maximum Current	2mA (typical)	Safety Marks
Remote Reset	24VDC, 10mA (min.), NO pushbutton	UL, ULC Listed
Output Characteristics		CSA
Form A & Form C Contactors		Enclosure
Pilot Duty	480VA @ 240VAC, B300	Dimensions
General Purpose	5A @ 240VAC	Weight
General Characteristics		Mounting Methods
Temperature Range	-20° to 70°C (-4° to 158°F)	





The CIO-777-PR Module is a convenient and cost-effective Profibus interface capable of providing discrete control and monitoring of motor starters, drives and other devices over a Profibus network.

For more information see: See Appendix A, page 66, Figure 3 for dimensional drawing.

Features:

- Can be used in both new and existing installations
- Can be used as stand-alone or with a 777 Plus series unit
- Reduced field wiring. Simple 9-Pin sub-D connection for network
- Ease in system startup and commissioning
- Compact size
- DIN rail or surface mountable
- Additional remote reset input to reset 777 Plus series
- Flexible addressing standard

Approvals:  

Available Models:

CIO-777-PR

Specifications

Input Characteristics		
Power Requirements		
Voltage (nominal).....	12-24VDC	Relative Humidity
Current	150mA (max.)	Wire Gauge
Power	3.6 W (max.)	Terminal Torque
Digital Inputs		Hi-Potential Test (relays to other circuits)
Voltage Range		EMC Standards
CIO-777-PR	12-24VAC	Electrostatic Discharge (ESD)
Maximum Current	2mA (typical)	Radio Frequency Immunity, Radiated
Remote Reset	24VDC, 10mA (min.), NO pushbutton	Fast Transient Burst
Output Characteristics		Safety Marks
Form A & Form C Contactors		UL, ULC Listed
Pilot Duty	480VA @ 240VAC, B300	CSA
General Purpose	5A @ 240VAC	Enclosure
General Characteristics		Dimensions
Ambient Temperature Range		Weight
Operating	-20° to 70°C (-4° to 158°F)	Mounting Methods
Storage	-40° to 80°C (-40° to 176°F)	



The CIO-EN Module (non-POE)

is a convenient and cost-effective Modbus-TCP and Modbus-RTU interface capable of providing discrete control and monitoring of an overload relay over a Modbus network.

For more information see: See Appendix A, page 66, Figure 3 for dimensional drawing.

Features:

- Can be used in both new and existing installations
- Can be used as stand-alone or with a 777 Plus series unit
- Can be re-configured to work with standard 777 units
- Reduced field wiring. Simple Ethernet™ jack connection for network
- 10 Base-T Ethernet™ compatible
- Additional Modbus port and Modbus message assembly feature for block reads
- Ease in system startup and commissioning
- Additional remote reset input to reset 777 Plus series

Approvals:   

Available Models:

CIO-EN

Specifications

Input Characteristics	
Power Requirements	
Voltage	24VDC ±10%
Current	95mA (max.) 70mA (typical)
Power	2.28 W (max.) 1.7 W (typical)
Digital Inputs	
General Purpose (4)	
Voltage Range	12-24VDC
Current	2mA (typical)
Functional Specifications	
Remote Reset (for use with optional 777 Series)	Normally open pushbutton rated 24VDC, 10mA (min.) IEEE 802.3
Ethernet Controller	10Base-T
Output Characteristics	
SPDT (1), SPST (1)	
Pilot Duty	480VA & 240VAC, B300
General Purpose	5A @ 240VAC
General Characteristics	
Ambient Operating Temperature	-20° to 70°C (-4° to 158°F)

Terminal (depluggable terminal block)	3 in.-lbs. (max.)
Torque	12-20 AWG
Wire AWG	IP20, NEMA 1 (finger safe)
Class of Protection	10-95%, non-condensing per IEC 68-2-3
Relative Humidity	Standards Passed
Electrostatic Discharge (ESD)	IEC 61000-4-2, Level 3, 6kV contact, 8kV air
Radio Frequency Immunity, Radiated	150 MHz, 10V/m
Fast Transient Burst	IEC 61000-4-4, Level 3, 4kV input power
Hi-Potential Test	Meets UL508 (2 x rated V + 1000V for 1 min)
Surge	
Input Power	IEC 61000-4-5, Level 1
Inputs/Data Lines	IEC 61000-4-5, Level 2
Safety Marks	
UL	UL508 (File #E68520)
CSA	C22.2 (File #46510)
CE	IEC 60947-6-2
Enclosure	Polycarbonate
Dimensions	2.08"H x 2.776"W x 0.777"D
Weight	0.25 lb. (4 oz., 113.4 g)
Mounting Methods	DIN Rail or surface mount (w/ two #8 screws)



The Com 4-20mA Output Module

is intended for use with ONLY the Model 777-AccuPower output power monitor. The module will send a 4-20mA signal proportional to the output power. It can also be used to send the input power by setting the efficiency setting on the 777-AccuPower monitor to one. This module allows communication to a PLC with an analog input and no Modbus input.

For more information see: See Appendix A, page 66, Figure 2 for dimensional drawing.

Features:

- Powered by the 777-AccuPower
- Scalable 4-20mA output proportional to Hp or kW
- Signal can be used for displays, controllers, or PLCs

Approvals:  

Available Models:

COM 4-20

Specifications

Output Characteristics	
Current	4-20mA
General Characteristics	
Temperature Range	-20° to 50°C (-4° to 122°F)
Terminal (depluggable terminal block)	
Torque	3 in.-lbs. (max.)
Wire AWG	12-20 AWG
Class of Protection	IP20
Relative Humidity	10-95%, non-condensing per IEC 68-2-3
Standards Passed	
Electrostatic Discharge	IEC 61000-4-2, Level 3, 6kV contact, 8kV air
Radio Frequency Immunity, Radiated	150 MHz, 10V/m
Fast Transient Burst	IEC 61000-4-4, Level 3, 4kV input power

Hi-Potential Test	Meets UL508 (2 x rated V + 1000V for 1 min)
Surge	
Input Power	IEC 61000-4-5, Level 1
Inputs/Data Lines	IEC 61000-4-5, Level 2
Safety Marks	
UL	UL508 (File #E68520)
CE	IEC 60947
Enclosure	Polycarbonate
Dimensions	2.08"H x 2.776"W x 0.777"D
Weight	0.25 lb. (4 oz., 113.4 g)
Mounting Method	#8 screws; mount to side of 777-AccuPower unit



The RM-1000

is a motor-monitoring device to be used in conjunction with SymCom's Model 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 RM-1000/777 motor management system combines unsurpassed electronic motor protection and critical, user-friendly, motor monitoring.

The RM-1000 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 RM-1000 acting as a repeater for any of its motor protectors. In addition to the monitoring functions, the RM-1000 can be used to reset a tripped MotorSaver® or PumpSaver®.

The RM-1000 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 RM-1000 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 RM-1000 and RM-1000 NEMA 4 also carry a UL Type 12 rating, whereas the RM-1000-3R does not carry the UL Type 12 rating due to added weep holes. The added weep holes in the RM-1000-3R make it suitable for applications subjected to condensing moisture/humidity.




For more information see:

See Appendix A, page 67, Figure 4 for dimensional drawing.

See Appendix B, page 72, Figure 5 for typical wiring diagrams.

Features:

- Displays:
 - Individual line currents and average current
 - Current unbalance
 - Individual phase voltages and average voltage
 - Voltage unbalance
 - Present fault trip reason and restart timer status
 - Last four faults
 - MotorSaver® and/or PumpSaver® setpoints
 - Run-hours on each motor
 - Warning of pending (imminent) faults
- Controls:
 - Reset run-hour meter
 - Reset MotorSaver® or PumpSaver®
 - Clear last fault in MotorSaver® or PumpSaver®
 - Change setpoints from the RM-1000
- Convenience:
 - Power from RS485MS-2W communications module
 - Monitor up to 16 777s with one display
 - NEMA 3R outdoor rated
 - Secondary steel enclosure available (see pg 65 for details)

Approvals:   

Auxiliary Products:

- 777-P2 / 777-KW/HP-P2 Series units
- Communication modules
- RM-1000-ENCL
- Solutions Software

Available Models:

RM-1000
RM-1000-3R
RM-1000 NEMA 4

Specifications

Input Characteristics	
Control Power	12-24VDC (Supplied by RS485MS-2W)
Functional Characteristics	
Communication	Port #1 for 777(s) Port #2 for PC, PLC, etc.
Baud Rate	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 (max 16 per RM-1000) Responds to all port #1 addresses
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	0.030" min, 0.120" 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	
RM-1000, RM-1000 NEMA 4	NEMA 3R and/or UL Type12, NEMA 4X (optional)
RM-1000-3R	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	3.619"H x 4.544"W x 0.9"D (91.92 x 115.42 x 22.86mm)
Weight	1.5 lbs. (24 oz., 680.39 g)
Mounting Method	Surface mountable on backplane using 4 screws



The RM-2000

is a motor-monitoring device to be used in conjunction with SymCom's Model 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 RM-2000/777 motor management system combines unsurpassed electronic motor protection and critical, user-friendly, motor monitoring.

The RM-2000 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 RM-2000 devices from a PLC, DCS, or SCADA system or a PC with Solutions software installed. The RM-2000 will act as a repeater for its motor

protector when accessed from the host computer or PLC. In addition to the monitoring functions, the RM-2000 can be used to reset a tripped MotorSaver[®] or PumpSaver[®].

The RM-2000 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 RM-2000 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.




For more information see:

See Appendix A, page 67, Figure 5 for dimensional drawing.

See Appendix B, page 72, Figure 6 for typical wiring diagrams.

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 RM-2000 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

Approvals:   

Auxiliary Products:

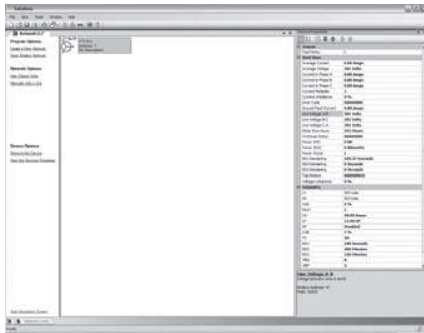
- 777-P2 / 777-KW / HP-P2 Series units
- Communication modules
- Solutions Software

Available Models:

RM-2000
RM-2000-CBM+
RM-2000-RTDW

Specifications

Input Characteristics			
Control Voltage	115VAC ±10%; 50/60Hz		Maximum Input Power
Transient Protection (Internal)	2500V for 10ms		3 W
Functional Characteristics			Class of Protection
Communication	Port #1 for 777	Port #2 for PC, PLC, etc.	NEMA 3R and/or UL Type 12
Baud Rate	1200-28800	1200-28800	Relative Humidity
Setup	Even Parity	None, Odd, or Even	Up to 85%, non-condensing
	1 Stop Bit	Parity 1 or 2 Stop Bits	Safety Marks
Protocol	Modbus RTU	Modbus RTU	UL
Serial Interface	RS-485	RS-485	UL508 (File #E68520)
Available Addresses	01	A01-A99	CSA
Real-time Clock			C22.2 No. 14 (File #46510)
Battery Back-up Life	10 years @ 25°C without external power		CE
Last fault memory	Stores up to 4 faults with time and date stamp, includes voltages and currents at time of trip		IEC 60947-6-2
Configuration	Two independent electro-mechanical Form C (SPDT)		Enclosure
Contact Material	Silver/Tin Oxide		Material
Output Characteristics (RM-2000-RTDW version only)			Black polycarbonate
Pilot Duty Rating	240VA @ 120VAC		Display
General Purpose Rating	5A @ 120VAC		Liquid crystal with extended temp. range
General Characteristics			Size
Ambient Temperature Range			2 rows x 20 characters
Operating	-20° to 70°C (-4° to 158°F)		Lighting
Storage	-30° to 70°C (-22° to 158°F)		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
			6.4" H x 6.1" W x 1.1" D (162.56 x 154.94 x 27.94mm)
			Weight
			1.2 lbs. (19.2 oz., 544.31 g)
			Mounting Method
			Surface mountable on backplane using 4 screws



Solutions

is a software application that provides the ability to configure and monitor Modbus (Solutions-M) or DeviceNet™ (Solutions-D) networks. SymCom's Solutions Software features include data logging, real-time data monitoring and fault and event monitoring. Devices can be added and configured manually or the software can scan an existing network to identify devices which can be used as is or reconfigured by the user. Setpoints for each device can be uploaded and downloaded for easy monitoring and reconfiguration. Solutions-M supports both RS-485 and TCP/IP networks. Solutions-D provides support for all DeviceNet™ capable SymCom devices and most other DeviceNet™ devices, including DeviceNet™ scanners.

Requirements:

- Microsoft Windows XP or higher
- Microsoft .net Framework 2.0 (provided with Solutions)
- 300 MB of hard drive space
- RS-485 to RS-232 converter (with 1 available serial port) for Solutions-M **OR**
- RS-485 to USB converter (with 1 available USB port) for Solutions-M
- USB to CAN converter (with 1 available USB port) for Solutions-D

Auxiliary Products:

- 777-P2 / 777-KW/HP-P2 Series units
- Communication modules
- Remote Monitors

Available Models:

Solutions-D
Solutions-M