

Specifications

Conditions of Sale

STANDARD: The seller's standard conditions of sale set forth in Price Sheet 150 apply, except as modified by the "SPECIAL WARRANTY PROVISIONS," and "WARRANTY QUALIFICATIONS" sections in this specification bulletin.

SPECIAL TO THIS PRODUCT:

INCLUSIONS: 6801M Automatic Switch Operators are fully integrated, microprocessor-based operators that apply sophisticated automatic control schemes and SCADA functionality to a variety of overhead distribution switches. By combining electromechanical components with remote terminal unit (RTU) functionality, control circuitry, and communications into a single package, installation flexibility and reliability are increased, and cost is reduced. 6801M switch operators monitor the operation of the switching cycle and can automatically take corrective action in the event of stuck, frozen, or welded contacts, thus protecting the switch from partial operation.

6801M Automatic Switch Operators are suitable for automating all Alduti-Rupter® Switches and S&C Convertible Disconnects in all voltage ratings up to 69 kV and current ratings, and they provide full normal operating life for these devices.

6801M switch operators have been mechanically tested with, and determined suitable for operating with, some devices not manufactured by S&C—both overhead-distribution switches and disconnects. Other switches and disconnects also may be suitable for power operation with 6801M switch operators. Please contact the nearest S&C Sales Office for details regarding the fault-closing ratings of non-S&C switches.

6801M switch operators are available for both reciprocating and rotating-drive switches. IntelliLink® Setup Software provides fast, easy, and precise setup. The efficient power supply delivers temperature-compensated battery charging to maximize battery life. Detailed information on battery and power-supply status is available at the faceplate display and is accessible at remote locations in communication device-equipped controls.

Radio Faulted Circuit Indicators

When equipped with optional radio-faulted circuit indicators, 6801M switch operators can isolate faults without the need for line post current and voltage sensors. Sectionalizing is based on a signal from the faulted circuit indicators, followed by loss of control power.

Automatic Sectionalizing

When voltage and current sensors are installed, a 6801M switch operator can automatically sectionalize a feeder based on such factors as overcurrent, loss of voltage, and phase unbalance. One control can automate one switch, and multiple controls can be programmed to communicate with each other using the optional IntelliTeam® SG Automatic Restoration System, which allows multiple switch controls and switch operators to work together in teams using peer-to-peer communication and quickly transfers load to minimize the number of customers affected by a fault or outage. The system uses distributed intelligence; no central processing or SCADA is required (though fully supported). Different types of switches, reclosers, and controls can be included in the same team.

Utility personnel can communicate with 6801M switch operators to identify and isolate faults and restore service—with or without a SCADA master station. Distributed Network Protocol (DNP) 3.0 is the supported protocol, and two S&C-approved radios can be installed inside the enclosure—one for the automation network and one as a SCADA getaway radio. An approved radio or a fiber-optic modem are the recommended communication devices for use with the IntelliTeam SG Automatic Restoration System.

6801M switch operators provide true RMS voltage and current readings. Over the operating temperature range of -40°F (-40°C) to 158°F (70°C), current readings are accurate to $\pm 0.5\%$ full scale, with a resolution of 1 ampere, RMS; voltage readings are accurate to $\pm 0.5\%$ full scale, with a resolution of 0.1 Vac. Phase-angle readings are accurate to $\pm 1^{\circ}$ at 5% of full-scale current, with a resolution of $\frac{1}{2}^{\circ}$. The current sensor input range is 0 to 800 amperes, RMS. 6801M switch operators are configured specifically for fault detection. The overcurrent fault detection range is 0 to 4000 amperes, RMS, and overcurrent readings are accurate to $\pm 0.5\%$ full scale, with a resolution of 1 ampere, RMS.

6801M switch operators continuously monitor control voltage and enclosure temperature. Daily maximum and minimum values are logged, as are time-averaged values at user-selected intervals.

In 6801M switch operators furnished with optional voltage and current sensing, voltage, current, kvars, kW, and phase angles are included in the daily maximum and minimum and time-averaged records. Overcurrent, loss-of-voltage, fault-magnitude and duration data and equipment diagnostics are also recorded. A crystal-controlled, temperature-compensated real-time clock



provides time-stamping of the data. The optional GPS feature provides time-stamp accuracy to 1 ms. With IntelliTeam SG system-equipped controls, data logging is especially useful for determining the sequence of events during a team reconfiguration and for comparing switch information with substation data.

A PC operating Windows® 10 can be connected via a DB9 or USB faceplate connector. IntelliLink Setup Software is used to view real-time data, manage setpoints, troubleshoot, and download historical data for reports. Setpoints and data can also be accessed remotely using IntelliLink Setup Software.

Shots to Lockout

The selectable **Shots-to-Lockout** feature prevents the source-side protective device from reclosing into a fault multiple times.

Single-Phase Voltage-Loss Protection

6801M switch operators protect three-phase loads from single phasing by automatically opening the switch or disconnect if the phases become unbalanced. The operators can be programmed to automatically close when stable three-phase voltage returns.

Three-Phase Voltage-Loss Protection

6801M switch operators automatically open the switch or disconnect upon extended three-phase voltage loss.

Hot Line Tag

A Hot Line Tag can be set with either a SCADA command or with a configurable button on the faceplate. It can only be cleared by the command type used to set it.

EXCLUSIONS: A 6801M Automatic Switch Operator does not include voltage or current sensors, a communication device, an antenna, or antenna connections.

For non-IntelliTeam SG system applications, S&C may be able to furnish and install in a 6801M Automatic Switch Operator, or make a provision for, a customer-specified communication device not listed in Table 3 on pages 4 through 8. S&C will need to evaluate the physical and electrical requirements of the communication device and its performance characteristics and conduct qualification testing to verify its suitability for the desired application. Refer to the nearest S&C Sales Office for scheduling information. S&C cannot furnish or install any communication device for which the supplier requires S&C to offer Tier I (i.e., “help desk”) support.

Only Omni-Rupter® Switches with option “-R4” can be installed with 6801M switch operators. The Omni-Rupter Switch option “-M” requires use of the “-R4” option.

SPECIFICATION DEVIATIONS: Refer to Table 3 on pages 4 through 8.

SPECIAL WARRANTY PROVISIONS: The standard warranty contained in seller’s standard conditions of sale, as set forth in Price Sheet 150, applies to 6801M Automatic Switch Operators, except that the first paragraph of said warranty is replaced by the following:

(1) General: The seller warrants to the immediate purchaser or end user for a period of two years from the date of shipment that the equipment delivered will be of the kind and quality specified in the contract description and will be free of defects of workmanship and material. Should any failure to conform to this warranty appear under proper and normal use within two years after the date of shipment, the seller agrees, upon prompt notification thereof and confirmation that the equipment has been stored, installed, operated, inspected, and maintained in accordance with the recommendations of the seller and standard industry practice, to correct the nonconformity either by repairing any damaged or defective parts of the equipment or (at the seller’s option) by shipment of necessary replacement parts. The seller’s warranty does not apply to any equipment that has been disassembled, repaired, or altered by anyone other than the seller. This limited warranty is granted only to the immediate purchaser or, if the equipment is purchased by a third party for installation in third-party equipment, the end user of the equipment. The seller’s duty to perform under any warranty may be delayed, at the seller’s sole option, until the seller has been paid in full for all goods purchased by the immediate purchaser. No such delay shall extend the warranty period.

Replacement parts provided by the seller or repairs performed by the seller under the warranty for the original equipment will be covered by the above special warranty provision for its duration. Replacement parts purchased separately will be covered by the above special warranty provision.

WARRANTY QUALIFICATIONS: Warranty of 6801M Automatic Switch Operators is contingent upon the installation, configuration, and use of the operator or software in accordance with S&C’s applicable instruction sheets. This warranty does not apply to major components not of S&C manufacture, such as batteries, communication devices, and remote terminal units. However, S&C will assign to the immediate purchaser or end user all manufacturers’ warranties that apply to such major components. S&C does not warrant that the switching-device ratings will be unaffected by the use of the 6801M Automatic Switch Operator. Contact S&C to discuss possible limitations. S&C’s Power Systems Solutions can provide validation testing services if desired. Contact S&C for a quotation.

END USER LICENSE AGREEMENT: The end user is granted a nontransferable, non-sublicensable, nonexclusive license to use the LinkStart Connection Management Software, IntelliLink Setup Software, IntelliTeam SG Automatic Restoration Software, automatic sectionalizing software, and/or other software furnished with 6801M Automatic Switch Operators only upon acceptance of all the terms and conditions of the seller's end user license agreement set forth in Price Sheet 155.

How to Order

Complete the following steps to build a 6801M Automatic Switch Control catalog number. Included with the steps are fill-in boxes to help keep track of the various components of the final catalog number.

Note: Pay strict attention to the various footnotes, which identify constraints and considerations regarding the selection of the various options.

STEP 1. Obtain the switch operator catalog number from Table 1.

Catalog Number:

STEP 2. (Optional) Obtain the catalog number for software from Table 2.

Catalog Number:

STEP 3. (Optional) Select desired options from Table 3 on pages 4 through 8.

Suffix(es):

STEP 4. Select the gateway applications, if required, from Table 4 on pages 9 and 10.

Suffix(es):

STEP 5. (Optional) Obtain the catalog numbers for any desired accessories from Table 5 on page 10.

Catalog Number:

Note: If retrofit kits for front panels are required, obtain the appropriate catalog number suffix for any options for front panel field retrofit kits from Table 6 on page 11.

Example: The catalog number for a motorized 6801M Automatic Switch Operator with a reciprocating switch drive in a pole-mounted padlockable painted mild-steel enclosure, and a GPS module with a top-mounted factory-installed GPS antenna is:

Table 1. S&C 6801M Automatic Switch Operators

Device	Control Power	Switch Drive	Catalog Number
6801M Automatic Switch Operator	90 to 264 Vac, 50/60 Hz or 100 to 370 Vdc	Reciprocating	6801M-10
		Rotating	6801M-20

6801M Automatic Switch Operators

Table 2. Optional Software

Software	Catalog Number
IntelliTeam® II Automatic Restoration System software license. Use this license for 6801M Automatic Switch Operators operating in an IntelliTeam II system with IntelliRupter® PulseCloser® Fault Interrupters, IntelliNode™ Interface Modules, 5800 Series Automatic Switch Controls, 6800 Series Automatic Switch Controls, and universal interface modules. This license includes an IntelliTeam® Designer slot at no charge that must be entered as a separate line item. The slot allows an easy upgrade to the IntelliTeam SG Automatic Restoration System at a later date. Requires an IntelliTeam II system-qualified communication device from Table 3.	008-007106-04●
IntelliTeam Designer slot. Included in above license.	008-007006-03

● The 008-007106-04 license should not be confused with an IntelliTeam SG Automatic Restoration System operating in **IntelliTeam II** mode. An IntelliTeam SG Automatic Restoration System operating in **IntelliTeam II** mode requires an IntelliTeam SG system-qualified communication device.

Table 3. Options

Item	Suffix to Be Added to Switch Operator Catalog Number
Wi-Fi module with antenna, for wireless setup (Not available outside the United States and Canada. Contact S&C for options in other countries)	-A3
GPS module (requires GPS antenna. See Footnote 4 in Table 5 on page 10. Antenna is included with Wi-Fi module with antenna, suffix "-A3")	-A4
Wi-Fi/GPS module with antenna, for wireless setup (Not available outside the United States and Canada. Contact S&C for options in other countries)	-A5
Software options	
Hydro Quebec	-H0
Standard (no sensing)	-H1
IntelliTeam SG Automatic Restoration System	-H9
Connector options	
No connectors (standard with no sensor inputs)	-M0
24-pin FIC connector (standard with sensor inputs)	-M1
Enclosure options	
Pole mounting, in a padlockable painted mild steel enclosure Rotating = 24 inch (610 mm) W×24 inch (610 mm) H×15 ⁵ / ₁₆ inch (389 mm) D Reciprocating = 24 inch (610 mm) W×24 inch (610 mm) H×16 ³ / ₄ inch (425 mm) D	-JB1
Pole mounting, in a padlockable corrosion-resistant stainless steel enclosure Rotating = 24 inch (610 mm) W×24 inch (610 mm) H×15 ⁵ / ₁₆ inch (389 mm) D Reciprocating = 24 inch (610 mm) W×24 inch (610 mm) H×16 ³ / ₄ inch (425 mm) D	-JB2

TABLE CONTINUED ►

Table 3. Options—Continued

Item	Suffix to Be Added to Switch Operator Catalog Number	
Sensors inputs (sensors not included)		
Three current/voltage CSV line post sensors①②③ (600 A: 10 V; 10000: 1)④	-K1	
Three S&C current/six voltage CSV / VS line post sensors①②③ (600 A: 10 V; 10000: 1)④	-K2	
Three Lindsey current/voltage CVMI sensors⑤⑥ (600 A: 10 V; 10,000: 1)⑦	-K4	
Three Lindsey current/six voltage CVMI/VMI sensors⑤⑥ (600 A: 10 V; 10,000: 1)⑦	-K5	
Three Trench current/one Trench voltage transformers For 69-kV voltage level applications (800 A: 5 A; 120 Vac)⑦	-K10	
Three Lindsey current sensors and three potential transformers (600 A:10 V or 600 A: 6 V, 120 V)⑦	-K15	
Three Lindsey current sensors and six potential transformers (600 A: 10 V or 600 A: 6 V, 120 V)⑦	-K16	
Three S&C CS line post current sensors ①②③ (600 A: 10 V)④	-K17	
Three Lindsey current CMI sensors⑤⑥ (600 A: 10 V)⑦	-K18	
Knife switch (visibly disconnects motor from batteries; padlockable)	-KS	
Six Lindsey VMI voltage sensors ①⑤⑥ (10000:1)⑦	-K19	
Three Lindsey VMI voltage sensors ①⑤⑥ (10000:1)⑦	-K20	
Indicator option, reversed colors for OPEN/CLOSED indicating lamps (green = closed, red = open)	-L1	
Key interlock options, lock in open position and disconnect motor-control circuit⑧		
Factory-installed key interlocks (Superior locks are standard)	-L2	
Provisions for key interlocks (Superior or Kirk locks)⑨	-L3	
Foreign language labels, front panel, and screens ⑩	French	-L5
	Spanish	-L6
	Portuguese	-L7
	Chinese	-L8
	Arabic	-L9
International crating —Wood products used in packaging are either hardwood or certified by the wood manufacturer as being "heat treated" (kiln dried) to a core temperature of 133°F (56°C) for a minimum of 30 minutes	-L71	
Protocols		
DNP 3 Level 2	-P0	
IntelliTeam SG, IntelliTeam II, and SCADA communication device and mounting (furnished by S&C, requires suffix "-R98")		
Factory-installed and wired iS5 Comm. Inc. - iES6-Slim with 2-SFP 100-Mbps multi-mode LC transceiver 550 m, 850 nm, low-voltage (Input 9-36 Vdc)	-R287	
Factory-installed and wired iS5 Comm. Inc. - iES6-Slim with 2-SFP 100-Mbps multi-mode LC transceiver 2 km, 1310 nm, low-voltage (Input 9-36 Vdc)	-R288	
Factory-installed and wired iS5 Comm. Inc. - iES6-Slim with 2-SFP 100-Mbps single mode LC transceiver 10 km, 1310 nm, low-voltage (Input 9-36 Vdc)	-R289	
Factory-installed and wired iS5 Comm. Inc. - iES6-Slim with 2-SFP 100-Mbps single mode LC transceiver 30 km, 1310 nm, low-voltage (Input 9-36 Vdc)	-R290	
Factory-installed and wired iS5 Comm. Inc. - iES6-Slim with 2-SFP 100-Mbps single mode LC transceiver 60 km, 1310 nm, low-voltage (Input 9-36 Vdc)	-R291	
Factory-installed and wired iS5 Comm. Inc. - iES6-Slim with 2-SFP 120-Mbps single mode LC transceiver 100 km, 1550 nm, low-voltage (Input 9-36 Vdc)	-R292	
Factory-installed and wired iS5 Comm. Inc. - iES6-Slim with 2-SFP 100-Mbps single mode LC transceiver 120 km, 1550 nm, low-voltage (Input 9-36 Vdc)	-R293	
IntelliTeam II and SCADA communication device and mounting (furnished by S&C, requires suffix "-R98")⑪		
Single-Mode Dymec 5843SHRT Fiber-Optic Modem⑫	-R44	
Multi-Mode Dymec 5843HRT Fiber-Optic Modem⑫	-R45	

See footnotes on page 8

TABLE CONTINUED ►

6801M Automatic Switch Operators

Table 3. Options—Continued

Item	Suffix to Be Added to Switch Operator Catalog Number
SCADA communication device and mounting (furnished by S&C, requires suffix “-R98”)Ⓣ	
MDS TransNET 900 Transceiver with diagnostics	-R19
MDS NR104L IP Radio (includes serial to Ethernet device server)	-R71
MDS SD9 Remote Radio	●
SpeedNet™ Cell Edge Gateway 4G LTE cellular modem with removable SIM card for USA and Canada (shipped without SIM card)Ⓢ	-R352
IntelliTeam SG, IntelliTeam II, and SCADA communication device ready for (communication device furnished by customer)Ⓣ	
Provision only for iS5 Comm. Inc. - iES6-Slim - Customer must provide iES6-Slim with 2-SFP LC transceivers.	-R285
Provision only for Itron Bridge 5 (Gen 5) radio - Customer must provide/install Itron Bridge 5 radio	-R401
IntelliTeam II and SCADA communication device ready for (communication device furnished by customer)Ⓣ	
Single-Mode Dymec 5843SHRT Fiber-Optic ModemⓈ	-R42
Multi-Mode Dymec 5843HRT Fiber-Optic ModemⓈ	-R43
SCADA communication device ready for (communication device furnished by customer)Ⓣ	
MDS 9810 Radio	-R02
MDS 9710A Radio (for new systems)	-R03
MDS 9710B Radio (for existing systems)	-R04
MDS TransNET 900 Radio	-R07
MDS 2710D Radio	-R27
FreeWave FGR-115RC Radio	-R30
MDS 2710 Radio	-R32
Internal MDS iNET 900 Dual Gateway: Ethernet and serial remote	-R34
FreeWave DTR-115RU Radio	-R35
FreeWave FGR-09CSU Radio	-R36

See footnotes on page 8.

TABLE CONTINUED ►

Table 3. Options—Continued

Item	Suffix to Be Added to Switch Operator Catalog Number	
H&L Model 570 single-mode ST connectors ^④	-R137	
H&L Model 570 multi-mode ST connectors	-R138	
MDS SD9 Remote Radio	-R188	
Factory installation of communication device		
Furnished by S&C	-R98	
Furnished by customer	-R99	
Voltage options^⑤		
15 kV	-V15	
25 kV	-V25	
34.5 kV	-V34	
46 kV	-V46	
69 kV	-V69	
Antenna connections (multiple types may be specified)		
N-type connector, bottom mounted, for remote antenna installation	-S2	
PolyPhaser [®] Surge Suppressor, N-type connector, bottom mounted, for remote antenna installation	-S3	
Ethernet surge suppressor	-S10	
PolyPhaser Surge Suppressor for LTE with N-type female connector (698 - 2700 MHz)	-S14	
Antenna		
900-MHz 5-dB gain antenna, N-type male connector	-T2	
Lo Pro [®] Transit Antenna	-T5	
Factory-installed top-mounted GPS	-T9	
Antenna, high efficiency MLPV LTE (698-2700 MHz), permanent mount, 3dB gain, no ground plane	-T25	
Factory-installed radio-faulted circuit indicators^{⑬⑭}		
Fisher-Pierce (Joslyn), 1548 series overhead RFCIs, 1560-3 RTU/SCADA radio receiver ^{⑱⑲}	-U1	
Horstmann, Smart Navigator RFCIs, smart receiver, for use up to 46 kV ^{⑱⑲}	-U2	
Schneider Electric, Flite116 RFCIs, G200 receiver ^{⑱⑲}	-U3	
Device ready for customer-installed radio-faulted circuit indicators^⑬		
Fisher-Pierce (Joslyn), 1548 series overhead RFCIs, 1560-3 RTU/SCADA radio receiver ^{⑱⑲}	-U4	
Horstmann, Smart Navigator RFCIs, smart receiver, for use up to 46 kV ^{⑱⑲}	-U5	
Schneider Electric, Flite116 RFCIs, G200 receiver ^{⑱⑲}	-U6	
Remote operation I/O		
8 NO and 8 NC relay outputs, plus one open and one close inputs (wetting voltage not provided)	-W0	
8 NO and 8 NC relay outputs, plus one open and one close inputs, wetting voltage to remote contacts from PS/IO board	-W4	
Power options		
Ac surge protector (nominal voltage: 120 Vac, nominal discharge surge current asymmetrical: 20 kA)	-W1	
Control power input connector, with 36-foot (11-meter) external cable supplied ^⑱	-W3	
Operating rod shrouds		
Shroud for rotating-drive switch operator	-X1	
Shroud for reciprocating-drive switch	-X2	
Universal joint for retrofitting 6801M-20 Automatic Switch Operators to a pre-existing manual switch fitted with a pipe-drive operating mechanism	For 1 ½-inch (38-mm) IPS vertical operating pipe	-Y1
	For 2-inch (51-mm) IPS vertical operating pipe	-Y2

See footnotes on page 8.

TABLE CONTINUED ►

6801M Automatic Switch Operators

- ① Clamp-type conductor keeper (up to 38-kV maximum).
- ② Voltages up to 38-kV maximum.
- ③ Refer to S&C Specification Bulletin 1061-31 for electrical and mechanical ratings.
- ④ S&C sensors only available with listed ratios.
- ⑤ Voltages up to 48.3 kV maximum.
- ⑥ Busbar style is the standard top configuration (for 48.3-kV maximum only). For other top configurations, contact S&C.
- ⑦ For other sensor ratios, contact S&C.
- ⑧ 6801M Automatic Switch Operators specified with IntelliTeam system automation (suffix “-H9”) cannot be furnished with a **Key Interlock** option (suffix “-L2” or “-L3”) because the IntelliTeam software cannot know a key interlock had been applied.
- ⑨ For other manufacturers, contact your local S&C Sales Office.
- ⑩ French is available now. Labels for the remaining language options will add 4 weeks to the lead time. Contact factory for front panel and screen availability.
- ⑪ Total maximum continuous power is 12 watts. This is the available power for all communication equipment installed in the switch operator. A maximum peak transmit of 27 watts for up to 250 milliseconds is allowed, but the average power draw must not exceed 12 watts, including a transmission peak.
- ⑫ Two Dymec fiber-optic modems are required for use with an IntelliTeam II system, with one modem connected to each serial port. In a SCADA system only one modem is required.
- ⑬ Please see S&C Specification Bulletin 1076-31 for SpeedNet Cell Edge Gateway antenna options.
- ⑭ H&L Model 570 single-mode fiber-optic transceiver can be used for IntelliTeam II system applications that do not include IntelliRupter PulseCloser Fault Interrupters. Refer to the nearest S&C Sales Office for more information.
- ⑮ Voltage options are required when specifying software options “-H0” and “-H9.” Do not specify a voltage option when ordering software option “-H1.”
- ⑯ For radio-faulted circuit indicator by other manufacturers, contact S&C to arrange for a functional evaluation.
- ⑰ Add suffix “-U0” after “-U1,” “-U2,” or “-U3” to indicate the customer supplies the RFCl, and only the receiver is provided and installed with the “Factory-installed radio-faulted circuit indicators.”
- ⑱ For custom cable lengths, contact your local S&C Sales Office.
- ⑲ Top-mount low-profile, anti-vandal, antenna included for the radio faulted circuit indicator. If an alternate antenna configuration is needed, contact S&C.

● Specify the appropriate catalog number suffix based on the frequency band range and application for the radio from the table below. For example, for a 928- to 960-MHz MDS SD9 Radio for Ethernet and Serial application, specify catalog number suffix “-R216CL.” Refer to the nearest S&C Sales Office if more than one communication device is to be installed in the switch operator.

Frequency Band Range, MHz	Application	Suffix to be Added to Catalog Number
820 to 870	Serial	-R216AK
928 to 960		-R216CK
928 to 960, 50-kHz Channel		-R216DK
880 to 915		-R216EK
880 to 915, 50-kHz Channel		-R216FK
850 to 860 / 926 to 936, Transmit Low		-R216GK
850 to 860 / 926 to 936, Transmit High	-R216HK	
820 to 870	Ethernet and Serial	-R216AL
928 to 960		-R216CL
928 to 960, 50-kHz Channel		-R216DL
880 to 915		-R216EL
880 to 915, 50-kHz Channel		-R216FL
850 to 860 / 926 to 936, Transmit Low		-R216GL
850 to 860 / 926 to 936, Transmit High	-R216HL	
820 to 870	9710 Emulation	-R216AM
928 to 960		-R216CM
928 to 960, 50-kHz Channel		-R216DM
880 to 915		-R216EM
880 to 915, 50-kHz Channel		-R216FM
850 to 860 / 926 to 936, Transmit Low		-R216GM
850 to 860 / 926 to 936, Transmit High	-R216HM	

Table 4. Options for Gateway Applications

Item	Suffix to Be Added to Switch Operator Catalog Number
Communication protocol	
DNP 3.0	-XP0
Communication device (furnished by S&C, requires catalog number suffix “-XR98”)	
Single-Mode Dymec 5843SHRT fiber-optic modem	-XR44
Multi-Mode Dymec 5843HRT fiber-optic modem	-XR45
MDS SD9 Remote Radio	●
Communication device ready for (communication device furnished by customer)	
MDS 9810 Radio	-XR02
MDS 9710A Radio (for new systems)	-XR03
MDS 9710B Radio (for existing system)	-XR04
MDS 2710D Radio	-XR27
FreeWave FGR-115RC Radio	-XR30
Single-Mode Dymec 5843SHRT fiber-optic modem	-XR42
Multi-Mode Dymec 5843HRT fiber-optic modem	-XR43
MDS SD9 Remote Radio	-XR188
Factory installation of communication device	
Furnished by S&C	-XR98
Furnished by customer	-XR99
Antenna connections	
N-type connector, bottom mounted, for remote antenna installation	-XS2
PolyPhaser Surge Suppressor, N-type connector, bottom mounted, for remote antenna installation	-XS3
Antenex NMO mounting	-XS4
PolyPhaser Surge Suppressor, N-type connector, 800-2300 MHz, for dual-band cellular antenna	-XS6
Two N-type connectors, bottom mounted; includes suppressor	-XS11

● Specify the appropriate catalog number suffix based on the frequency band range and application for the radio, from the following table. For example, for a 928- to 960-MHz MDS SD9 Radio for Ethernet and serial application, specify catalog number suffix “-XR216CL.”

Frequency Band Range, MHz	Application	Suffix to be Added to Catalog Number
820 to 870	Serial	-XR216AK
928 to 960		-XR216CK
928 to 960, 50-kHz Channel		-XR216DK
880 to 915		-XR216EK
880 to 915, 50-kHz Channel		-XR216FK
850 to 860 / 926 to 936, Transmit Low		-XR216GK
850 to 860 / 926 to 936, Transmit High		-XR216HK

Frequency Band Range, MHz	Application	Suffix to be Added to Catalog Number
820 to 870	Ethernet and Serial	-XR216AL
928 to 960		-XR216CL
928 to 960, 50-kHz Channel		-XR216DL
880 to 915		-XR216EL
880 to 915, 50-kHz Channel		-XR216FL
850 to 860 / 926 to 936, Transmit Low		-XR216GL
850 to 860 / 926 to 936, Transmit High	-XR216HL	
820 to 870	9710 Emulation	-XR216AM
928 to 960		-XR216CM
928 to 960, 50-kHz Channel		-XR216DM
880 to 915		-XR216EM
880 to 915, 50-kHz Channel		-XR216FM
850 to 860 / 926 to 936, Transmit Low		-XR216GM
850 to 860 / 926 to 936, Transmit High		-XR216HM

TABLE CONTINUED ►

6801M Automatic Switch Operators

Table 4. Options for Gateway Applications—Continued

Item	Suffix to Be Added to Switch Operator Catalog Number
Antenna	
900-MHz 5-dB gain antenna, N-type male connector	-XT2
LoPro transit antenna	-XT5
Dual-band LoPro cellular antenna (824-896 and 1850-1990 MHz), 3 dBi	-XT7

Table 5. Accessories

Description	Catalog Number
Spare 12-Vdc, 34.6-ampere-hour battery (the 6801M uses two of these batteries in series to provide the required 24 Vdc)	SDA-10911
Battery charger for up to eight 24-Vdc batteries (catalog number SDA-10911)	591-000190-01
Fixture for setting operator Open/Close limits (use when 6801M switch operator is not connected to a switch)①	SDA-11472
Replacement front panel circuit board kit	
For voltage/current sensing	SDA-11222
For non-voltage/current sensing	SDA-11223
Replacement PS/IO circuit board kit	SDA-11376
6801M front panel field retrofit kit, for use in M Series Switch Operator②③	SDA-11213
6801M front panel field retrofit kit with GPS, for use in M Series Switch Operator. Does not include Wi-Fi antenna and cable②③	SDA-11214
Wi-Fi module retrofit kit, for use with 6801M Automatic Switch Operator. Includes Wi-Fi antenna	SDA-11215
Wi-Fi module retrofit kit, for use with 6801M panel field retrofit kit, for use in M Series Switch Operator.	SDA-11516
6801M front panel replacement kit③	SDA-11548
6801M front panel replacement kit with GPS③	SDA-11548-GPS
iS5 Comm. Inc. - iES6-Slim industrial Ethernet switch (fully enclosed). Comes with panel mount bracket, low-voltage (input 9-36 Vdc), LC connector	110-003800-01
SFP 100-Mbps multimode LC transceiver 550 m, 850 nm	110-003774-01
SFP 100-Mbps multimode LC transceiver 2 km, 1310 nm	110-003774-02
SFP 100-Mbps single-mode LC transceiver 10 km, 1310 nm	110-003774-04
SFP 100-Mbps single-mode LC transceiver 30 km, 1310 nm	110-003774-05
SFP 100-Mbps single-mode LC transceiver 60 km, 1310 nm	110-003774-06
SFP 100-Mbps single-mode LC transceiver 100 km, 1550 nm	110-003774-07
SFP 100-Mbps single-mode LC transceiver 120 km, 1550 nm	110-003774-08
iS5 Comm. Inc. – iES22GF industrial Ethernet switch. High voltage (input 130-370 Vdc or 90-264 Vac), 8 - 10/100/1000 Base TX RJ45 ports, 4 - GSFP	110-003777-01
iS5 Comm. Inc. – iES22GF industrial Ethernet switch. Low voltage (input 9-36 Vdc), 8 - 10/100/1000 Base TX RJ45 ports, 4 - GSFP	110-003778-01
iS5 Comm. Inc. – iDS3 industrial single port RS232/422/485 to Ethernet serial device server. Low voltage (input 9-36 Vdc), 1-serial port, 2-10/100 Base TX RJ45 ports	110-003779-01

① Must be included as an option on all quotes for 6801M rotating operators.

② Note this kit is only a front panel upgrade kit and cannot convert an operator without sensing to an operator with sensing. To add sensing to an operator contact your local S&C Sales Office.

③ A software option suffix must be specified from Table 3 starting on page 4.

④ Use GPS antenna, surface mount, catalog number 007-001615-01, or Pole-mounted antenna kit for GPS, catalog number 903-002344-01. Top-mounted surface-mount GPS antenna must be installed by S&C.

Table 6. Options for Front Panel Field Retrofit Kits^①

Item	Suffix to Be Added to Front Panel Catalog Number	
Standard software (no sensing)	-H1	
IntelliTeam SG Automatic Restoration System (required for sensing)	-H9	
Knife switch ^{①②}	-KS	
M Series Operator with a key interlock ^②	-L	
Indicator option, reversed colors for OPEN/CLOSED indicating lamps (green = closed, red = open)	-L1	
Foreign language labels, front panel, and screens ^③	French	-L5
	Spanish	-L6
	Portuguese	-L7
	Chinese	-L8
	Arabic	-L9
DNP protocol	-P0	
PS/IO board field upgrade kit to be included with retrofit front panel field retrofit kit	-Q1	
Ac surge protector	-W1	

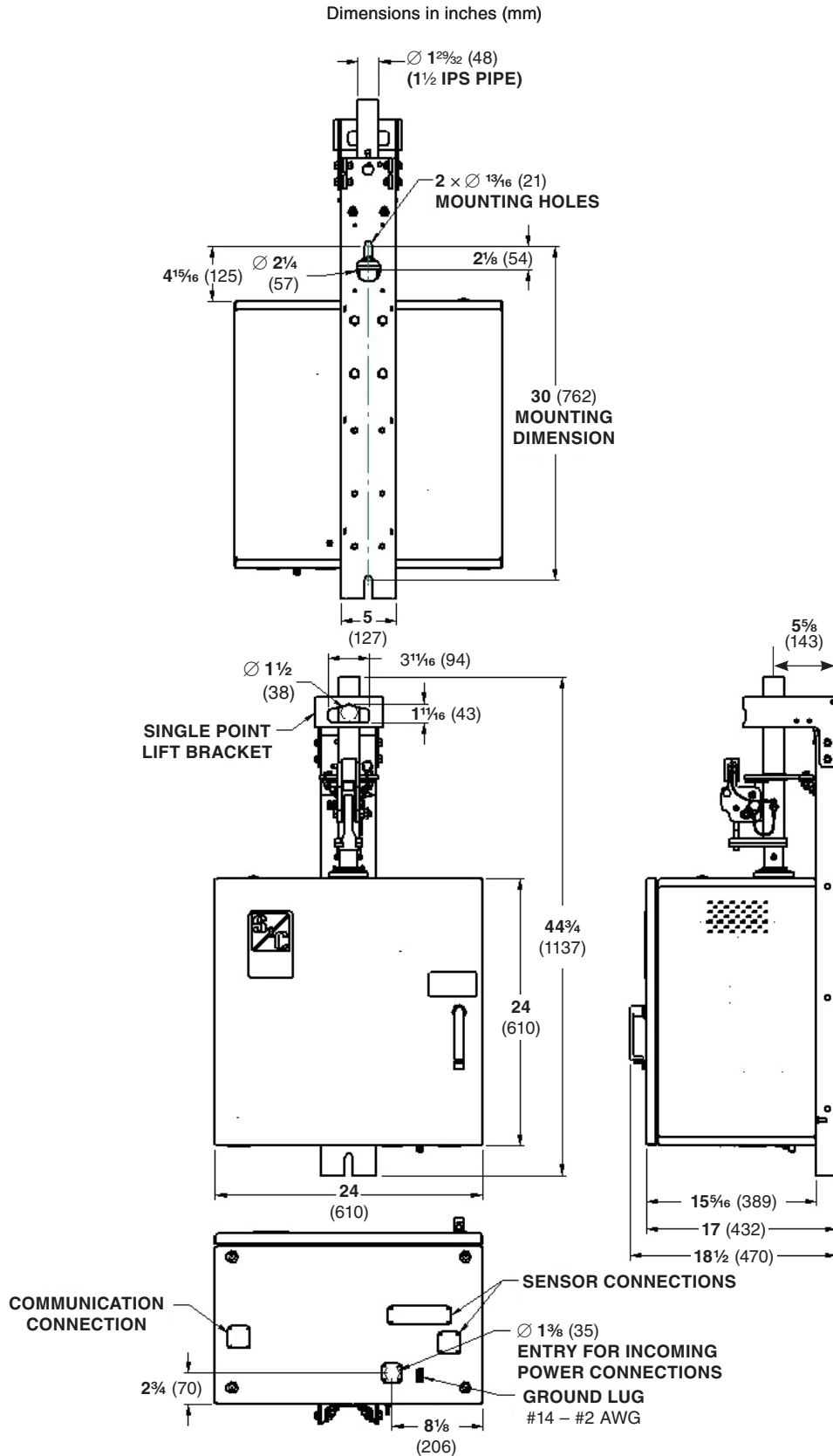
^① If the existing M-Series Operator has this option suffix, add it to the 6801M upgrade kit. Note this suffix does not provide material to modify the operator.

^② A PS/IO board field upgrade kit will allow monitoring of this option through DNP. Add suffix “-Q1” to the front panel field retrofit kit to add the remote monitoring capability.

^③ French is available now. Labels for the remaining language options will add 4 weeks to the lead time. Contact the nearest S&C Sales Office for front panel and screen availability.

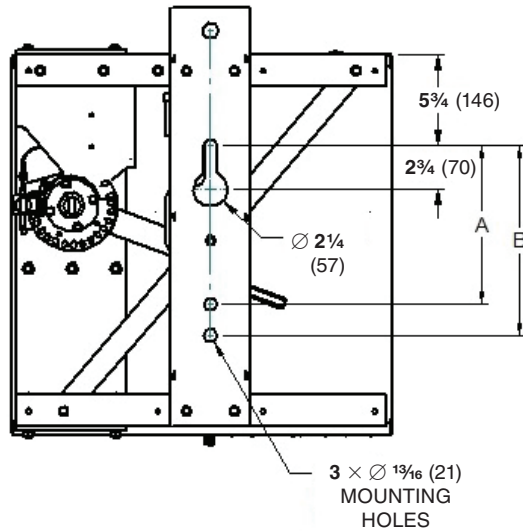
6801M Automatic Switch Operators

6801M-20 Rotating 6801M Automatic Switch Operator



6801M-10 Reciprocating 6801M Automatic Switch Operator

Dimensions in inches (mm)



MOUNTING DIMENSION	DISTANCE (inches)
A	10 (254)
B	12 (305)

