Installation

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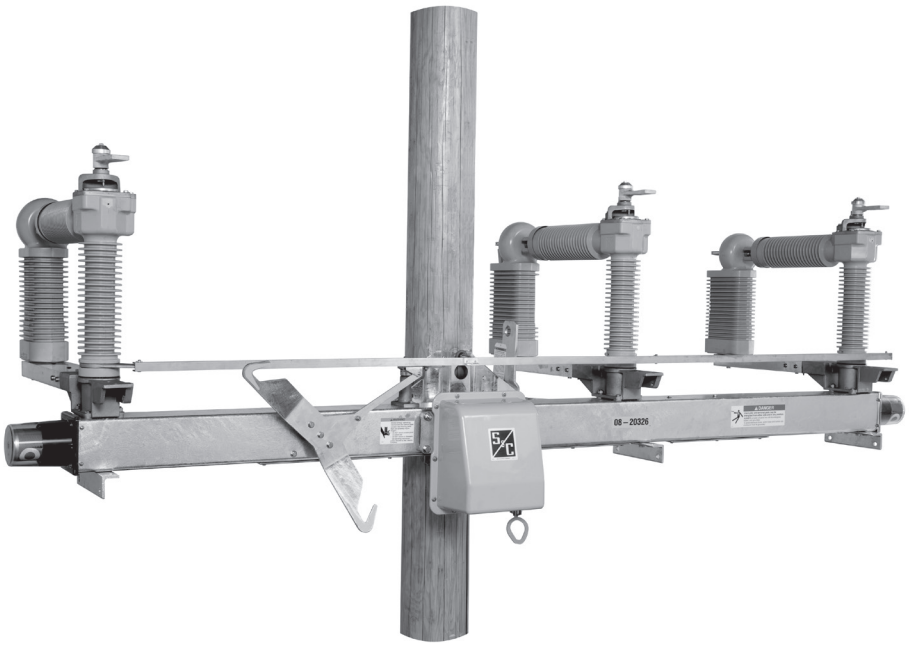


July 22, 2019

Qualified Persons

⚠ WARNING

The equipment covered by this publication must be installed, operated, and maintained by qualified persons who are knowledgeable in the installation, operation, and maintenance of overhead electric power distribution equipment along with the associated hazards. A qualified person is one who is trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from non-live parts of electrical equipment
- The skills and techniques necessary to determine the proper approach distances corresponding to the voltages to which the qualified person will be exposed
- The proper use of the special precautionary techniques, personal protective equipment, insulating and shielding materials, and insulated tools for working on or near exposed energized parts of electrical equipment
- These instructions are intended only for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment

These instructions are intended only for such qualified persons. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

Read this Instruction Sheet

NOTICE

Thoroughly and carefully read this instruction sheet and all materials included in the product's S&C Instruction Handbook before installing or operating your S&C Scada-Mate Switch. Familiarize yourself with the Safety Information and Safety Precautions on pages 3 through 5. The latest version of this publication is available online in PDF format at **sandc.com/en/support/product-literature/.**

Retain this Instruction Sheet

This instruction sheet is a permanent part of your S&C Scada-Mate Switch. Designate a location where you can easily retrieve and refer to this publication.

Proper Application

⚠ WARNING

The equipment in this publication is only intended for a specific application. The application must be within the ratings furnished for the equipment. Ratings for the Scada-Mate Switch are listed in the ratings table in Specification Bulletin 768-31. The ratings are also on the nameplate affixed to the product.

Special Warranty Provisions

The standard warranty contained in the seller's standard conditions of sale, as set forth in Price Sheets 150 and 181, applies to Scada-Mate Switching Systems.

For equipment/services packages, the seller warrants, for a period of one year after commissioning, that the Scada-Mate Switching Systems will provide automatic fault isolation and system reconfiguration per agreed-upon service levels. The remedy shall be additional system analysis and reconfiguration of IntelliTeam SG system until the desired result is achieved.

Warranty Qualifications

The standard warranty contained in the seller's standard conditions of sale, as set forth in Price Sheets 150 and 181, does not apply to major components not of S&C manufacture, such as customer-specified remote terminal units and communication devices, including hardware, software, resolution of protocol-related matters, and notification of upgrades or fixes for those devices.

The seller's standard warranty does not apply to any components not of S&C manufacture that are supplied and installed by the purchaser, nor to the ability of the seller's equipment to work with such components.

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to your S&C Scada-Mate Switch. Familiarize yourself with these types of messages and the importance of these various signal words:

⚠ DANGER

"DANGER" identifies the most serious and immediate hazards that will likely result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ WARNING

"WARNING" identifies hazards or unsafe practices that can result in serious personal injury or death if instructions, including recommended precautions, are not followed.

⚠ CAUTION

"CAUTION" identifies hazards or unsafe practices that can result in minor personal injury if instructions, including recommended precautions, are not followed.

NOTICE

"NOTICE" identifies important procedures or requirements that can result in product or property damage if instructions are not followed."

Following Safety Instructions

If you do not understand any portion of this instruction sheet and need assistance, contact your nearest S&C Sales Office or S&C Authorized Distributor. Their telephone numbers are listed on S&C's website **sandc.com**, or call the S&C Global Monitoring and Support Center at 1-888-762-1100.

NOTICE

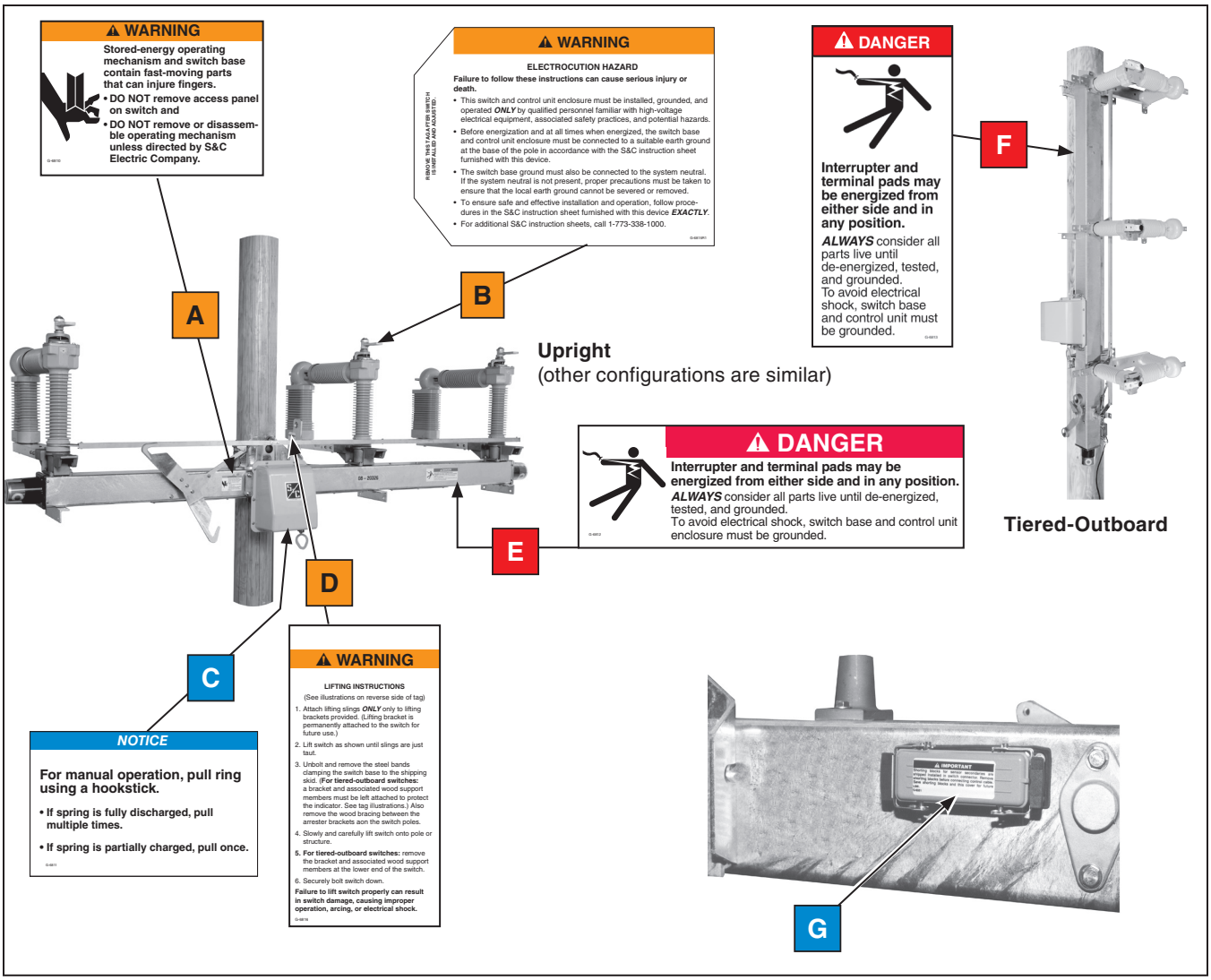
Read this instruction sheet thoroughly and carefully before installing your S&C Scada-Mate Switch.

Replacement Instructions and Labels

If additional copies of this instruction sheet, contact your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

It is important that any missing, damaged, or faded labels on the equipment be replaced immediately. Replacement labels are available by contacting your nearest S&C Sales Office, S&C Authorized Distributor, S&C Headquarters, or S&C Electric Canada Ltd.

Location of Safety Labels



Reorder Information for Safety Labels

Location	Safety-Alert Message	Description	Number
A	⚠ WARNING	Stored-energy operating mechanism and switch base contain fast-moving parts . . .	G-6810
B	⚠ WARNING	Electrocution Hazard—Switch and control unit enclosure must be installed and grounded ONLY by qualified personnel . . .	G-6815●
C	NOTICE	For manual operation, pull ring using a hookstick.	G-6811●
D	⚠ WARNING	Lifting Instructions	G-6816■
E	⚠ DANGER	Interrupter and terminal pads may be energized from either side and in any position.	G-6812▲
F	⚠ DANGER	Interrupter and terminal pads may be energized from either side and in any position.	G-6813▲
G	NOTICE	Shorting blocks for sensor secondaries are shipped installed in switch connector…	G-6351

● Available only on switches bearing catalog number supplement “-R2,” except for vertical mounting configuration.

■ This label is placed on both sides of switch base on opposite ends.

▲ This tag is to be removed and discarded after the switch is installed and adjusted.

⚠ DANGER

Scada-Mate Switches operate at high voltage. Failure to observe the precautions below will result in serious personal injury or death.

Some of these precautions may differ from your company's operating procedures and rules. Where a discrepancy exists, follow your company's operating procedures and rules.

1. **QUALIFIED PERSONS.** Access to switches and controls must be restricted only to qualified persons. See "Qualified Persons" on page 2
2. **SAFETY PROCEDURES.** Always follow safe operating procedures and rules
3. **PERSONAL PROTECTIVE EQUIPMENT.** Always use suitable protective equipment, such as rubber gloves, rubber mats, hard hats, safety glasses, and flash clothing in accordance with safe operating procedures and rules.
4. **SAFETY LABELS.** Do not remove or obscure any of the "DANGER," "WARNING," "CAUTION," or "NOTICE" labels
5. **OPERATING MECHANISM AND BASE.** Stored-energy operating mechanism and switch base contain fast-moving parts that can severely injure fingers. Do not remove or disassemble operating mechanism, or remove access panel on switch base unless directed by S&C Electric Company
6. **ENERGIZED COMPONENTS.** Always consider all parts live until de-energized, tested, and grounded.
7. **GROUNDING.**
   - Before energization and at all times when energized, the switch base and control unit enclosure must be connected to suitable earth ground at the base of pole in accordance with the S&C instruction sheet furnished with this device.
   - The switch base ground must also be connected to the system neutral. If the system neutral is not present, proper precautions must be taken to ensure the local earth ground cannot be severed or removed
8. **LOAD-INTERRUPTER SWITCH POSITION.**
   - Always confirm the **Open/Close** position of load-interrupter switches by visually observing the indicator.
   - Interrupters and terminal pads may be energized from either terminal.
   - Interrupters and terminal pads may be energized with the interrupters in any position.
9. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.

Packing

The S&C Scada-Mate Switch will include the following items:

- A three-pole group-operated integer-style Scada-Mate Switch, complete with an interphase drive, a stored-energy operating mechanism, and sensors factory-assembled on a single base
- A shielded control cable with a multi-pin connector for low-voltage electrical connection of the switch to the control unit
- Miscellaneous mounting hardware (less through-bolts) for securing the Scada-Mate Switch to the utility pole
- Optional features that are shipped unassembled, such as wildlife protection components

An "as-built" drawing of the switch and wiring diagrams are in a water-resistant envelope shipped with the switch. Study these drawings carefully and check the parts lists to verify all parts are at hand.

Also included in the water-resistant envelope is a yellow card containing magnitude ratios and phase-angle measurements for S&C Current Sensor and S&C Current/Voltage Sensors. These values must be programmed into the remote terminal unit (RTU) installed in conjunction with this switch, if applicable, to offset unit-to-unit variations in the sensors. Refer to the S&C instruction sheet provided with the control unit for further details.

Inspection

Examine the shipment for external evidence of damage as soon after receipt as possible, preferably before removal from the carrier's conveyance. Check the bill of lading to make sure the listed shipping skids, crates, and containers are present.

If there is visible loss and/or damage:

1. Notify the delivering carrier immediately.
2. Ask for a carrier inspection.
3. Note condition of shipment on all copies of the delivery receipt.
4. File a claim with the carrier.

If concealed damage is discovered:

1. Notify the delivering carrier within 15 days of receipt of shipment.
2. Ask for a carrier inspection.
3. File a claim with the carrier.

Also, notify S&C Electric Company in all instances of loss and/or damage.

Handling—Upright Mounting Configuration

⚠ WARNING

Lift the switch using the lifting bracket or brackets provided. Avoid sudden stops and starts which may cause the switch to swing.

Lifting the switch by the pole-unit bases, interrupters, the sensors, or open/closed indicators will damage the switch.

Failure to lift the switch properly can damage the switch, causing improper operation, arcing or electrical shock. Personal injury may result.

⚠ WARNING

DO NOT use the Scada-Mate Switch's lifting bracket to lift the crate.

The switch lifting bracket will ONLY hold the weight of the switch and will NOT hold the weight of the crate and associated packing material. The crate is designed to be moved and lifted using a lift truck.

Failure to properly lift the **switch can cause property damage, serious injury or death**.

Switches in the upright mounting configuration are provided with a lifting bracket permanently attached to the switch. Make certain the disconnect portion of the switch is fully closed. Attach a hoisting sling to the pole-saddle and slowly raise the sling so it becomes taut. Unbolt and remove the steel bands clamping the switch base to the shipping skid. Also remove the wood bracing between the arrester brackets on the switch poles. Slowly and carefully hoist the switch as shown in Figure 1.

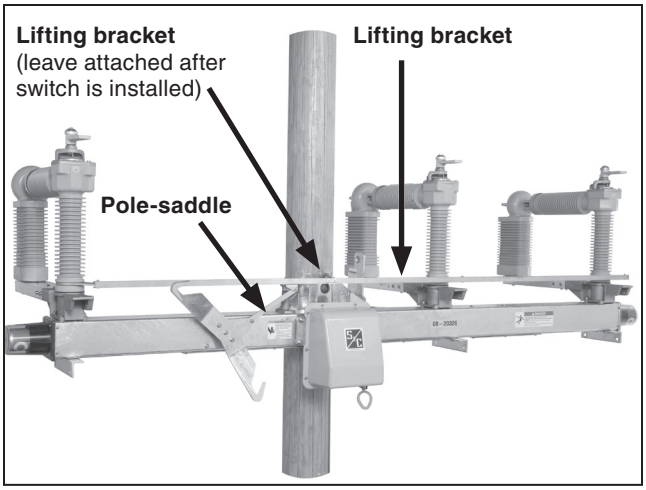


Figure 1. Hoisting the Scada-Mate Switch (upright mounting configuration) into position.

Handling—Pole-Top Mounting Configuration

⚠ WARNING

Lift the switch using the lifting bracket or brackets provided. Avoid sudden stops and starts which may cause the switch to swing.

Lifting the switch by the pole-unit bases, interrupters, the sensors, or open/closed indicators will damage the switch.

Failure to lift the switch properly can damage the switch, causing improper operation, arcing or electrical shock. Personal injury may result.

⚠ WARNING

DO NOT use the Scada-Mate Switch's lifting bracket to lift the crate.

The switch lifting bracket will ONLY hold the weight of the switch and will NOT hold the weight of the crate and associated packing material. The crate is designed to be moved and lifted using a lift truck.

Failure to properly lift the **switch can cause property damage, serious injury or death**.

Switches in the pole-top mounting configuration are provided with two lifting brackets permanently attached to the switch. Make certain the disconnect portion of the switch is fully closed. Attach hoisting slings to the lifting brackets and slowly raise the slings so they become taut. Unbolt and remove the steel bands clamping the switch base to the shipping skid. Also remove the wood bracing between the arrester brackets on the switch poles. Then, slowly and carefully hoist the switch as shown in Figure 2.

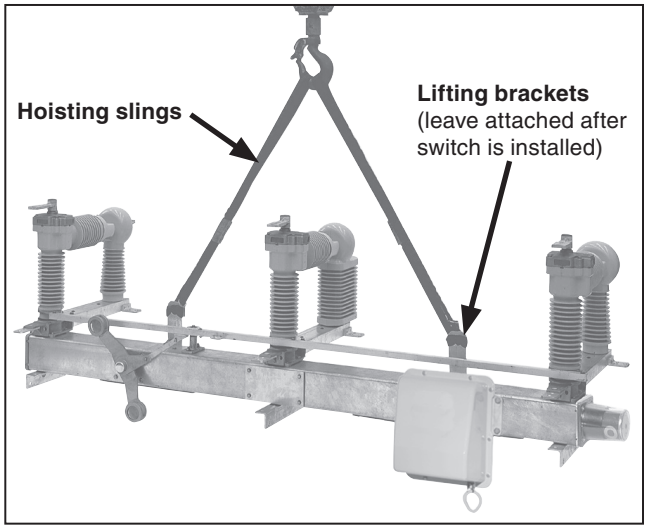


Figure 2. Hoisting the Scada-Mate Switch (pole-top mounting configuration) into position.

Handling—Vertical Mounting Configuration

⚠ WARNING

Lift the switch using the lifting bracket or brackets provided. Avoid sudden stops and starts which may cause the switch to swing.

Lifting the switch by the pole-unit bases, interrupters, the sensors, or open/closed indicators will damage the switch.

Failure to lift the switch properly can damage the switch, causing improper operation, arcing or electrical shock. Personal injury may result.

⚠ WARNING

DO NOT use the Scada-Mate Switch's lifting bracket to lift the crate.

The switch lifting bracket will ONLY hold the weight of the switch and will NOT hold the weight of the crate and associated packing material. The crate is designed to be moved and lifted using a lift truck.

Failure to properly lift the **switch can cause property damage, serious injury or death**.

Switches in the vertical mounting configuration are provided with a lifting bracket permanently attached to the switch. Make certain the disconnect portion of the switch is fully closed. Attach a hoisting sling to the lifting bracket and slowly raise the slings so it becomes taut. Unbolt and remove the steel bands clamping the switch base to the shipping skid. Slowly and carefully hoist the switch as shown in Figure 3.

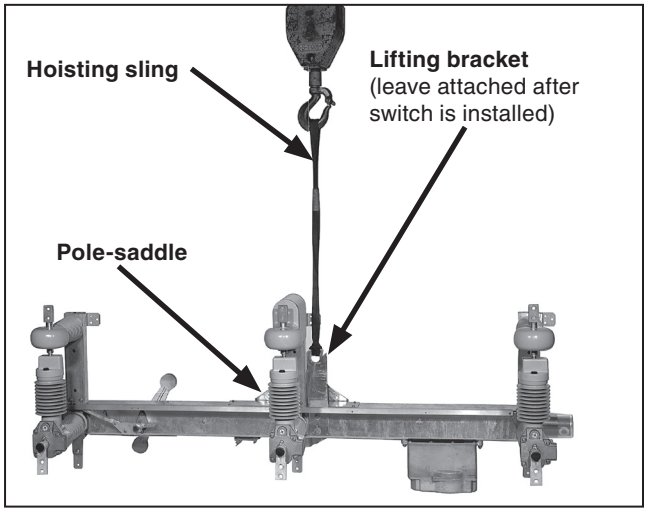


Figure 3. Hoisting the Scada-Mate Switch (vertical mounting configuration) into position.

Handling—Tiered-Outboard Mounting Configuration

⚠ WARNING

Lift the switch using the lifting bracket or brackets provided. Avoid sudden stops and starts which may cause the switch to swing.

Lifting the switch by the pole-unit bases, interrupters, the sensors, or open/closed indicators will damage the switch.

Failure to lift the switch properly can damage the switch, causing improper operation, arcing or electrical shock. Personal injury may result.

⚠ WARNING

DO NOT use the Scada-Mate Switch's lifting bracket to lift the crate.

The switch lifting bracket will ONLY hold the weight of the switch and will NOT hold the weight of the crate and associated packing material. The crate is designed to be moved and lifted using a lift truck.

Failure to properly lift the **switch can cause property damage, serious injury or death.**

Switches in the tiered-outboard mounting configuration are provided with a lifting bracket permanently attached to the switch. Make certain the disconnect portion of the switch is fully closed. Attach a hoisting sling to the lifting bracket and slowly raise the sling so it becomes taut. At the end of the switch near the lifting bracket, unbolt and remove the steel band clamping the switch base to the shipping skid. *Do not remove the steel band from the switch base at the indicator end of the switch.* This bracket is banded to wood support members that protect the indicator when lifting the switch. Unbolt the protective wood support members from the remainder of the shipping skid. Also remove the wood bracing between the arrester brackets on the switch poles. Slowly and carefully hoist the switch, guiding it as it clears the skid, until the base is vertical. See Figure 4. Remove the bracket and wood support members used to protect the indicator before installing the switch.

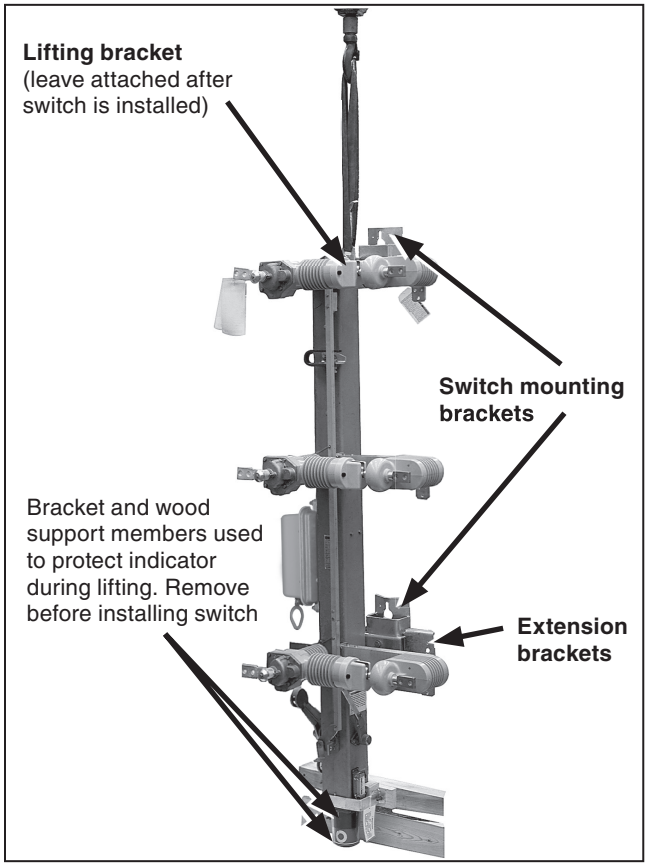


Figure 4. Hoisting the Scada-Mate Switch (tiered-outboard mounting configuration) into position.

Pole Drilling

STEP 1. Upright, Vertical, and Tiered-Outboard Mounting Configurations:

Drill two 11⁄16-inch (17-mm) diameter holes in the front of the utility pole at the desired height for mounting the switch. See Figure 5. Refer to the catalog drawing. The centerline-to-centerline distance of the holes must be as follows:

Mounting Configuration	Centerline-to-Centerline Distance of Mounting Holes, inches (mm)
Upright	14 (356)
Vertical	14 (356)
Tiered-Outboard, 14.4 kV	66 (1676)
Tiered-Outboard, 25 kV and 34.5 kV	90 (2286)

Pole-Top Mounting Configurations:

Drill two 11⁄16-inch (17-mm) diameter holes 9¾ inches (248 mm) apart through the side of the utility pole at the desired height for attachment of the pole-top switch-mounting brackets (furnished but shipped unassembled). Refer to the catalog drawing. The top hole should be 6 inches (152 mm) from the uppermost point of the utility pole.

Inserting Pole Mounting Hardware

STEP 2. Insert two 5⁄8-inch diameter through-bolts (not furnished) in the holes drilled in Step 1. Secure these bolts loosely with necessary washers and nuts in such a manner the heads of the bolts project sufficiently, approximately 3 inches (76 mm), from the face of the pole to engage the switch mounting bracket. For switches in the pole-top mounting configuration, the nuts must also project approximately 3 inches (76 mm) from the pole because switch mounting brackets must be mounted on both sides of the pole. See Figure 5.

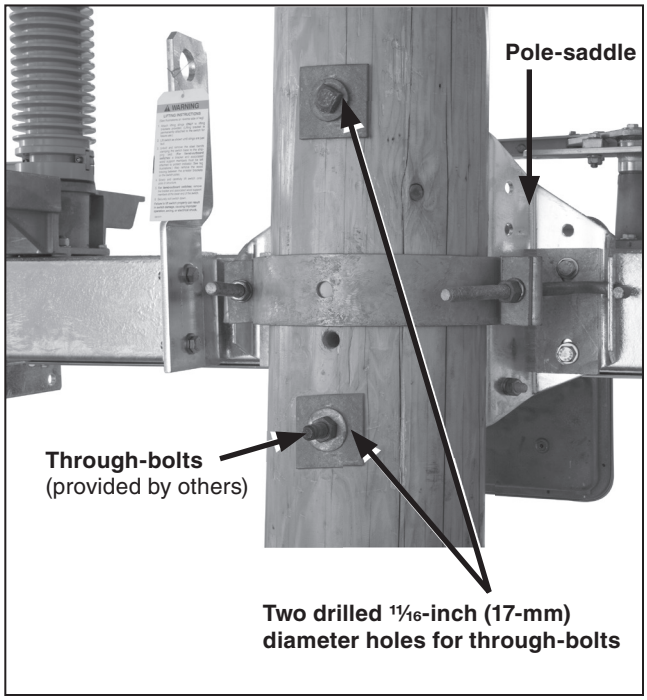


Figure 5. Drilling holes for mounting (upright mounting configuration shown).

NOTICE

When mounting the switch to a wood pole, S&C recommends suitable-sized square washers be placed under the nuts against the wood pole. S&C also recommends the use of spring-type washers between the square washers and nuts to compensate for wood-pole shrinkage and thus maintain fastener tightness.

Switch Installation

For upright mounting configuration, proceed to Step 3, below.

For vertical mounting configuration, proceed to Step 6 on page 13.

For tiered-outboard mounting configuration, proceed to Step 9 on page 15.

For pole-top mounting configuration, proceed to Step 12 on page 17.

Switch Installation—Upright Mounting Configuration

STEP 3.

⚠ WARNING

Lift the switch using the lifting bracket or brackets provided. Avoid sudden stops and starts that may cause the switch to swing.

Lifting the switch by the pole-unit bases, interrupters, the sensors, or OPEN/CLOSED indicators will damage the switch.

Failure to lift the switch properly can result in switch damage, causing improper operation, arcing or electrical shock.

Handle and lift the switch, per appropriate configuration, as described in the "Handling" section on pages 7 through 9. When the switch is hoisted to its mounting level, guide the assembly so the through-bolts projecting from the utility pole slip into the holes in the switch mounting bracket. (The bracket is provided with a keyhole and an open slotted hole for this purpose.) Lower the switch slightly so it bears on the through-bolts. Fully tighten the through-bolts, making sure the flat washer for each bolt is between the bolt head and the switch mounting bracket. See Figure 6.

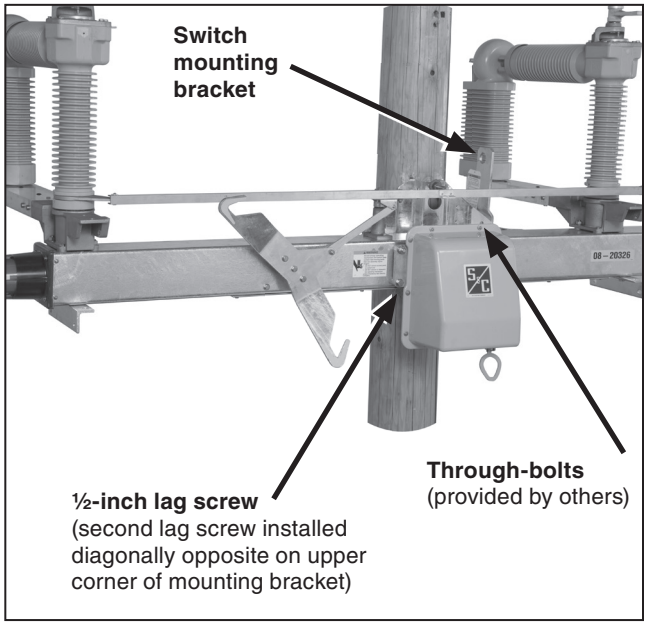


Figure 6. Guiding switch into through-bolts (vertical mounting configuration shown).

STEP 4. Secure the pole band (furnished) to the switch mounting bracket using the J-bolts provided. Two ¼×1×3-inch (6×25×76-mm) stiffening blocks are furnished to be used behind the pole-band flanges and underneath the J-bolt nuts. Fully tighten the nuts. Lag the pole band to the back side of the pole through the hole in the center of the band using one of the three ½-inch diameter lag screws provided. See Figure 7. Then, lag the switch mounting bracket to the pole using the two remaining ½-inch diameter lag screws. See Figure 6.

Once all of the nuts and lag screws have been fully tightened, remove the hoisting sling from the lifting bracket, *but do not remove the lifting bracket from the switch.* Optional extension link assemblies, if supplied, are shipped assembled to the switch.

⚠ WARNING

Ground the switch base and control unit before energizing the switch.

Connect the switch base and control unit to a suitable earth ground at the base of the pole or mounting structure. Connect the switch base ground to the system neutral. If no system neutral is present, take proper precautions to ensure the switch base ground cannot be severed or removed.

Failure to properly ground the switch can cause serious injury or death.

STEP 5. Ground the switch by solidly connecting the end of a number 2 AWG copper wire (or two number 6 AWG copper wires or copper wires having an equivalent cross-sectional area) to the grounding point on the switch mounting bracket. See Figure 8. Grounding lug is to be provided by others. Connect the other ends of the wires to a suitable earth ground at the base of the pole and bond them to the system neutral, if present. Proper precautions must be taken to ensure the local earth ground cannot be severed or removed.

Proceed to Step 15 on page 18.

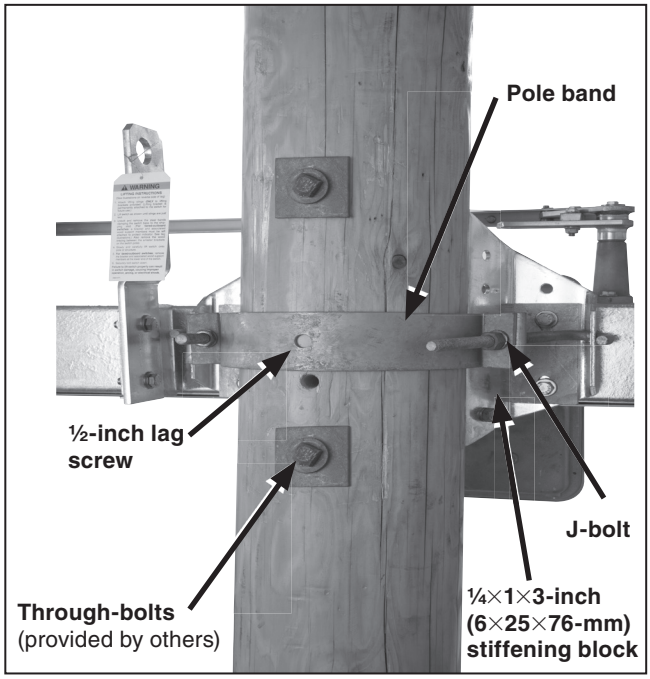


Figure 7. Securing pole band to mounting bracket (upright mounting configuration shown).

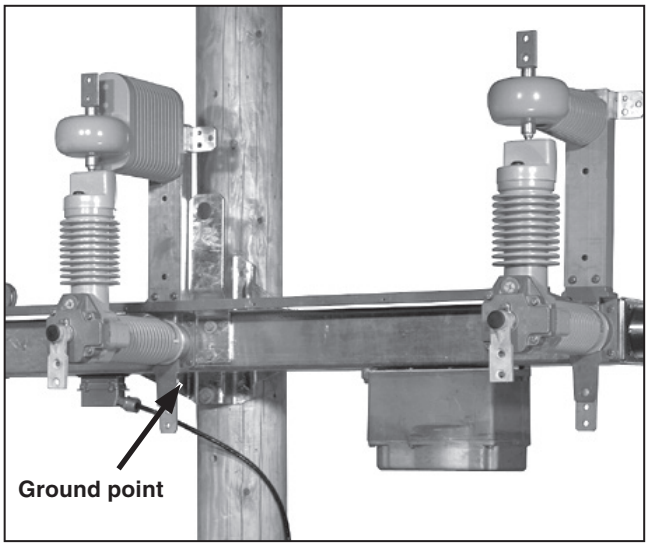


Figure 8. Grounding the switch (vertical mounting configuration shown).

Switch Installation—Vertical Mounting Configuration

STEP 6.

⚠ WARNING

Lift the switch using the lifting bracket or brackets provided. Avoid sudden stops and starts that may cause the switch to swing.

Lifting the switch by the pole-unit bases, interrupters, the sensors, or OPEN/CLOSED indicators will damage the switch

Failure to lift the switch properly can result in switch damage, causing improper operation, arcing or electrical shock.

Handle and lift the switch, per appropriate configuration, as described in the "Handling" section on page 7 through 9. When the switch is hoisted to mounting level, guide the assembly so the through-bolts projecting from the utility pole slip into the holes in the switch mounting brackets. (Each bracket is provided with a keyhole for this purpose.) Lower the switch slightly so it bears on the through-bolts. Fully tighten the through-bolts, making sure the flat washer for each bolt is between the bolt head and the switch mounting bracket. See Figure 9.

STEP 7. Secure the pole band (furnished) to the switch mounting bracket using the J-bolts furnished. Two ¼×1×3-inch (6×25×76-mm) stiffening blocks are furnished to be used behind the pole-band flanges and underneath the J-bolt nuts. Lag the pole band to the back side of the pole through the hole in the center of the band using one of three ½-inch diameter lag screws provided. See Figure 10. Then, lag the switch mounting bracket to the pole using the two remaining ½-inch diameter lag screws. See Figure 10.

Once all of the nuts and lag screws have been fully tightened, remove the hoisting sling from the lifting bracket, *but do not remove the lifting bracket from the switch.*

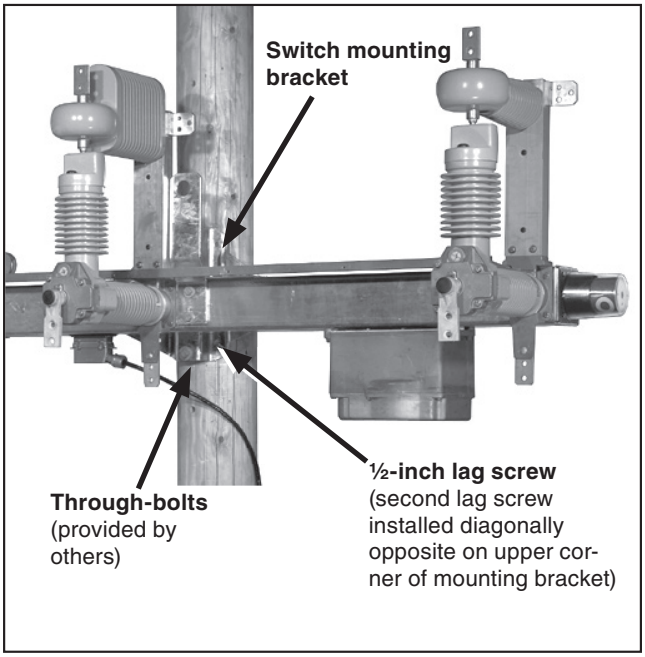


Figure 9. Guiding switch into through-bolts (vertical mounting configuration shown).

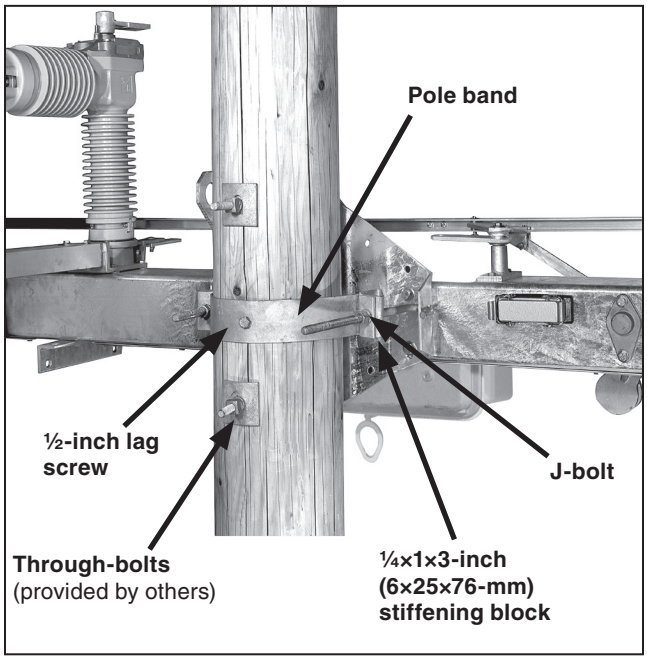


Figure 10. Securing pole band to mounting bracket (upright mounting configuration shown).

STEP 8. Ground the switch by solidly connecting the end of number 2 AWG copper wire (or two number 6 AWG copper wires or copper wires of equivalent cross-sectional area) to the switch mounting bracket. See Figure 11. Grounding lug is to be provided by others. Connect the other ends of the wires to a suitable earth ground at the base of the pole and bond them to the system neutral, if present. Proper precautions must be taken to ensure the local earth ground cannot be severed or removed.

⚠ WARNING

Ground the switch base and control unit before energizing the switch.

Connect the switch base and control unit to a suitable earth ground at the base of the pole or mounting structure. Connect the switch base ground to the system neutral. If no system neutral is present, take proper precautions to ensure the switch base ground cannot be severed or removed.

Failure to properly ground the switch can cause serious injury or death.

Proceed to Step 15 on page 18.

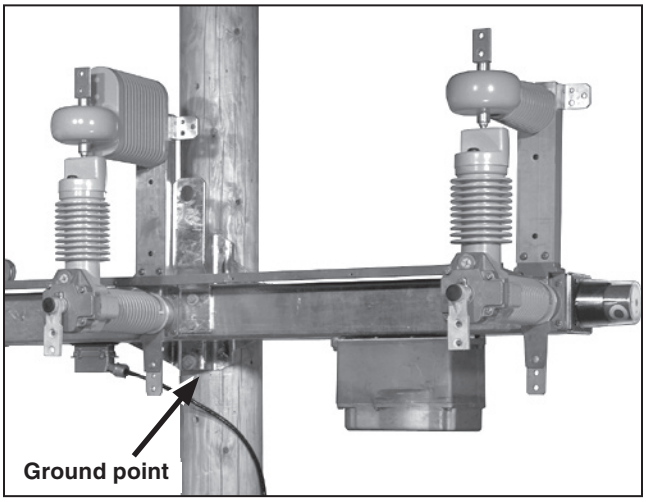


Figure 11. Grounding the switch (vertical mounting configuration shown).

Switch Installation—Tiered-Outboard Mounting Configuration

STEP 9.

⚠ WARNING

Lift the switch using the lifting bracket or brackets provided. Avoid sudden stops and starts that may cause the switch to swing.

Lifting the switch by the pole-unit bases, interrupters, the sensors, or OPEN/CLOSED indicators will damage the switch.

Failure to lift the switch properly can result in switch damage, causing improper operation, arcing or electrical shock.

Handle and lift the switch, per appropriate configuration, as described in the "Handling" section on page 7 through 9. When the switch is hoisted to mounting level, guide the assembly so the through-bolts projecting from the utility pole slip into the holes in the switch mounting brackets. (Each bracket is provided with a key-hole for this purpose.) Lower the switch slightly so it bears on the through-bolts. Fully tighten the through-bolts, making sure the flatwasher for each bolt is between the bolt head and the switch mounting bracket. See Figure 12.

STEP 10. Secure a pole band (two furnished) to the extension brackets attached to each mounting bracket, using the J-bolts furnished. Four ¼×1×3-inch (6×25×76-mm) stiffening blocks are furnished to be used behind the pole-band flanges and underneath the J-bolt nuts. Lag each pole band to the back side of the pole through the hole in the center of the band using the ½-inch diameter lag screws provided. See Figure 13. Then, lag each switch mounting bracket to the pole using the four remaining ½-inch diameter lag screws. See Figure 13.

Once all of the nuts and lag screws have been fully tightened, remove the hoisting sling from the lifting bracket, *but do not remove the lifting bracket from the switch.*

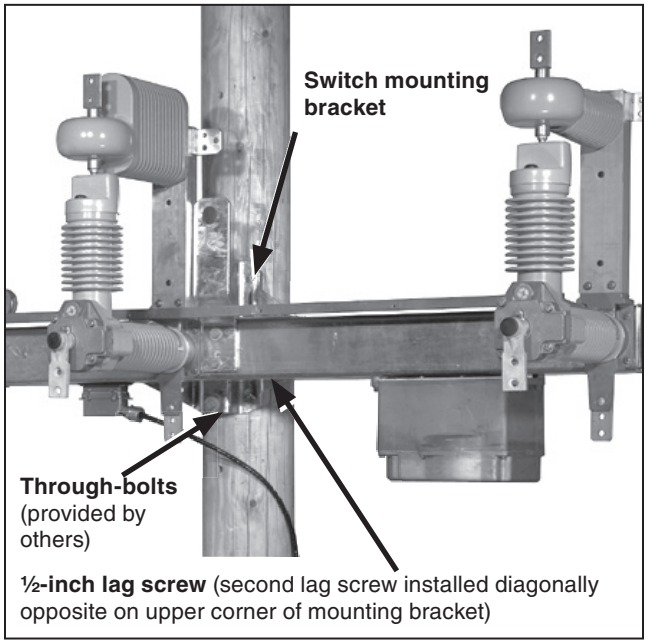


Figure 12. Guiding switch into through-bolts (vertical mounting configuration shown).

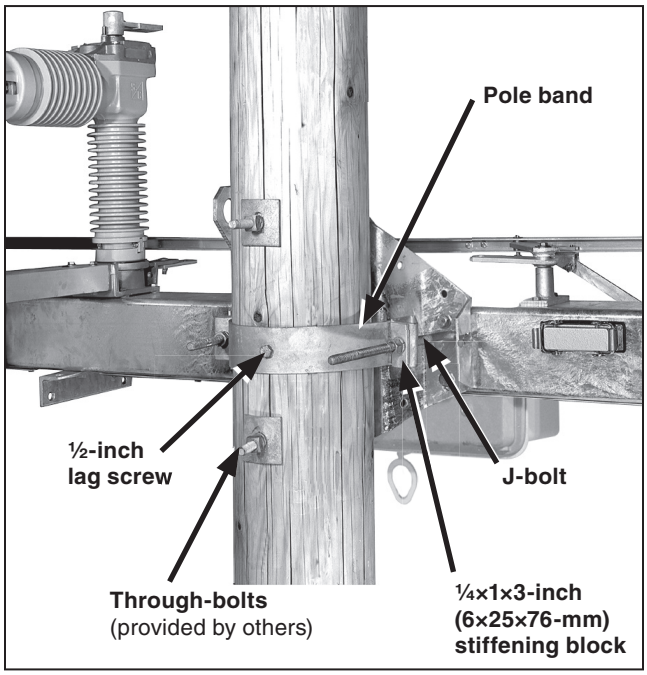


Figure 13. Securing pole band to mounting bracket (upright mounting configuration shown).

STEP 11. Ground the switch by solidly connecting the end of number 2 AWG copper wire (or two number 6 AWG copper wires or copper wires of equivalent cross-sectional area) to the switch mounting bracket. See Figure 14. Grounding lug is to be provided by others. Connect the other ends of the wires to a suitable earth ground at the base of the pole and bond them to the system neutral, if present. Proper precautions must be taken to ensure the local earth ground cannot be severed or removed.

⚠ WARNING

Ground the switch base and control unit before energizing the switch.

Connect the switch base and control unit to a suitable earth ground at the base of the pole or mounting structure. Connect the switch base ground to the system neutral. If no system neutral is present, take proper precautions to ensure the switch base ground cannot be severed or removed.

Failure to properly ground the switch can cause serious injury or death.

Proceed to Step 15 on page 18.

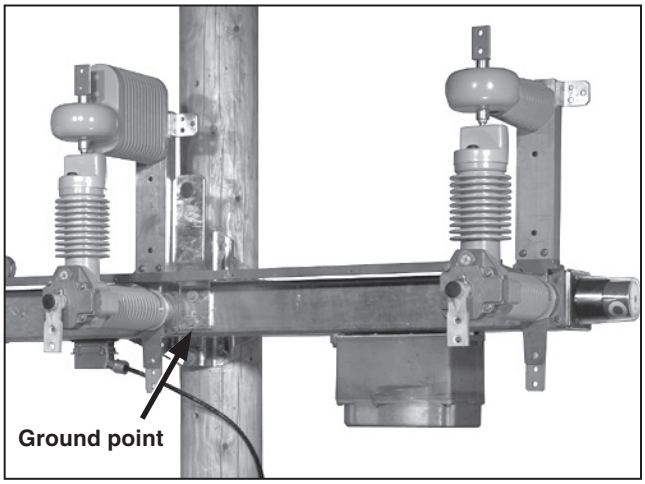


Figure 14. Grounding the switch (vertical mounting configuration shown).

Switch Installation—Pole-Top Mounting Configuration

STEP 12. Position each switch mounting bracket on the side of the utility pole so the through-bolts slip into the holes in the brackets. (Each bracket is provided with a keyhole and an open slotted hole for this purpose.) Lower the brackets so they bear on the through-bolts and so the top of the brackets are approximately 3 inches (76 mm) above the top of the utility pole. Make sure the flat washers for each bolt are between the bolt head (or nut) and the switch mounting bracket. Adjust the brackets so the top surfaces are on the same level. Then, tighten the through-bolts. See Figure 15.

STEP 13.

⚠ WARNING

Lift the switch using the lifting bracket or brackets provided. Avoid sudden stops and starts that may cause the switch to swing.

Lifting the switch by the pole-unit bases, interrupters, the sensors, or OPEN/CLOSED indicators will damage the switch.

Failure to lift the switch properly can result in switch damage, causing improper operation, arcing or electrical shock.

Handle and lift the switch, per appropriate configuration, as described in the "Handling" section on page 7 through 9. Position the switch base on top of the two switch mounting brackets with the middle switch pole centered with the utility pole. Make sure the switch base is level. If the switch base is not level, loosen the through-bolts, adjust the switch mounting brackets as necessary, and retighten the through bolts. Position the mounting brackets as necessary, and retighten the through-bolts. Position the mounting bracket clamps (shipped unassembled from the switch) over the switch base and bolt them to the switch mounting brackets using the ½–13×1¼-inch hex head galvanized steel cap screws, flatwashers, and hex nuts furnished. See Figure 16. Finally, remove the hoisting slings from the lifting straps *but do not remove the lifting brackets from the switch.*

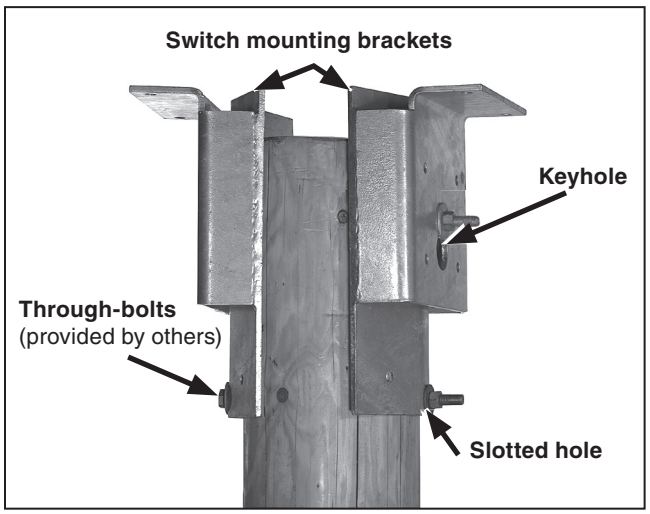


Figure 15. Positioning the switch mounting brackets (pole-top mounting configuration shown).

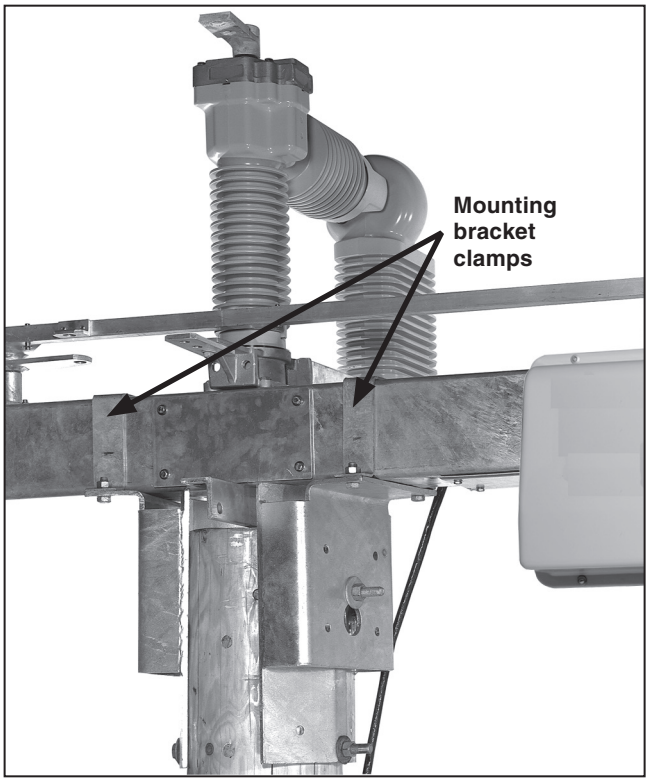


Figure 16. Positioning the switch on top of mounting brackets (pole-top mounting configuration shown).

STEP 14. Ground the switch by solidly connecting the end of a number 2 AWG copper wire (or two number 6 AWG copper wires or copper wires of equivalent cross-sectional area) to the switch mounting bracket. See Figure 17. Grounding lug is to be provided by others. Connect the other ends of the wires to a suitable earth ground at the base of the pole and bond them to the system neutral, if present. Proper precautions must be taken to ensure the local earth ground cannot be severed or removed.

⚠ WARNING

Ground the switch base and control unit before energizing the switch.

Connect the switch base and control unit to a suitable earth ground at the base of the pole or mounting structure. Connect the switch base ground to the system neutral. If no system neutral is present, take proper precautions to ensure the switch base ground cannot be severed or removed.

Failure to properly ground the switch can cause serious injury or death.

Installing Surge Arresters

STEP 15. Install surge arresters (provided by others), if applicable, using the mounting provisions provided. Each surge arrester bracket is provided with two 9/16-inch (14-mm) diameter unthreaded holes and one threaded hole. Mount the surge arrester using one of the unthreaded holes and connect the surge arrester ground to one of the other holes. The threaded hole is sized to accept a distribution transformer ground connector with a ½–13-inch stud, such as Burndy Corporation Part Numbers KC22B2 and EQC632C. When properly installed and connected, the surge arresters are grounded through the switch base. A separate ground wire can be run between the arresters at the user's discretion. See Figure 18.

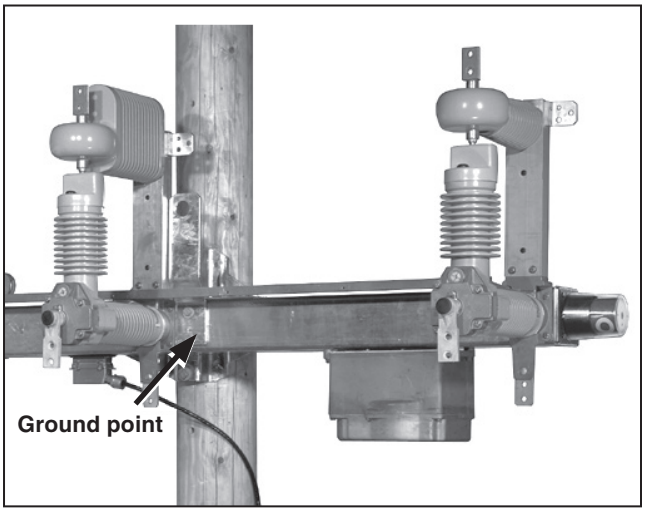


Figure 17. Grounding the switch (vertical mounting configuration shown).

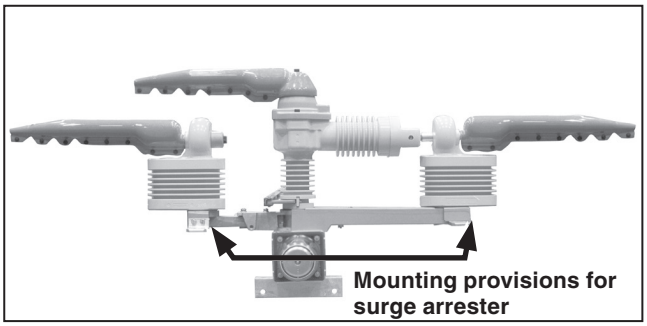


Figure 18. Installing surge arresters.

Preparing the Connector and Terminal Pad Surfaces

STEP 16. Prior to installation of connectors to terminal pads, use the following procedure to prepare their surfaces:

(a) Thoroughly wire-brush the current-transfer surfaces of each connector and immediately apply a liberal coating of NO-OX-id"E"® (available from Sanchem Inc.) or other suitable aluminum connector compound to the brushed surfaces.

(b) Wire-brush each Scada-Mate Switch sensor terminal pad and apply a coating of NO-OX-id"E" before securing the connectors to the terminal pads. See Figure 19.

(c) *Do not wire-brush Scada-Mate Switch hinge terminal pads.* Apply a coating of NO-OX-id"E" to these pads before securing the connectors to the terminal pads. See Figure 19.

(d) Prepare the conductors using established procedures before clamping them in their respective connectors.

⚠ CAUTION

DO NOT apply excessive load to the terminal pads.

The jumper connections should be in line with and level to the terminal pad bolt holes before securing the jumper fasteners to the terminal pad. Large pull-off forces may misalign the blades with the stationary contacts or prevent proper closing. Do not exceed 90 lbs. in line and 30 lbs perpendicular to the terminal pad. (IEEE Standard ANSI C37.32-1996, Section 8.8.2.2.

Misaligned contacts may overheat causing arcing and damage to the switch. Damage to equipment and injury to operating personnel may result.

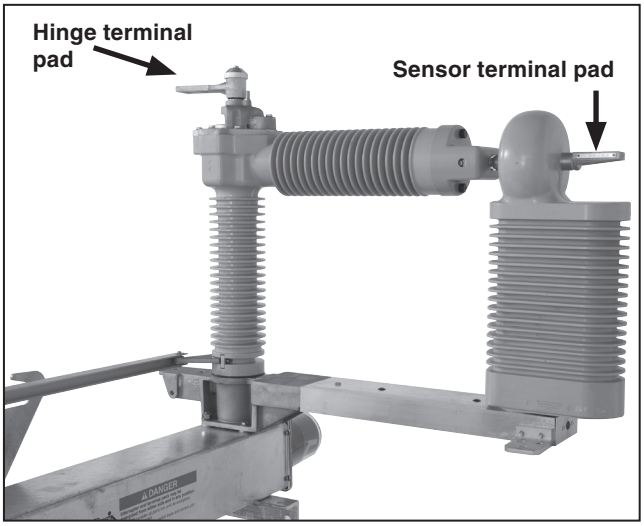


Figure 19. Preparing terminal pad surfaces (vertical mounting configuration shown).

Installing Wildlife Protection Components

⚠ DANGER

De-energize the switch and ground all six terminals before installing the wildlife protection option.

The wildlife protection is not designed to be installed on energized equipment.

Failure to de-energize the switch before installing wildlife protection could lead to serious injury or death.

STEP 17. If the Scada-Mate Switch is supplied with optional wildlife protection (catalog number suffix "-A1"), all protective components are assembled to the switch except those for the terminal pads. These components are shipped unassembled from the switch and must be installed when conductors are attached to the terminal pads.

First, prepare the surfaces of terminal pads and connectors as described in the "Preparing the Connector and Terminal Pad and Surfaces" section on page 18. Then, attach the connectors to the terminal pads and connect the conductors or cables.

Note: Only S&C connectors catalog numbers 4740R1, 4741R2, and 4581, as well as compression connectors, can be used with optional wildlife protection.

Remove the 5⁄16–16×3⁄4-inch Delrin® Acetal Resin shoulder bolt from the terminal pad pivot at the interrupter end of each phase. Place the wildlife protection covers over the terminal pads and cables. Screw the Delrin shoulder bolt through the top of the cover into the terminal pad pivot at the interrupter end of each phase. Finally, secure the covers in place by "snapping" the fasteners provided. See Figure 20.

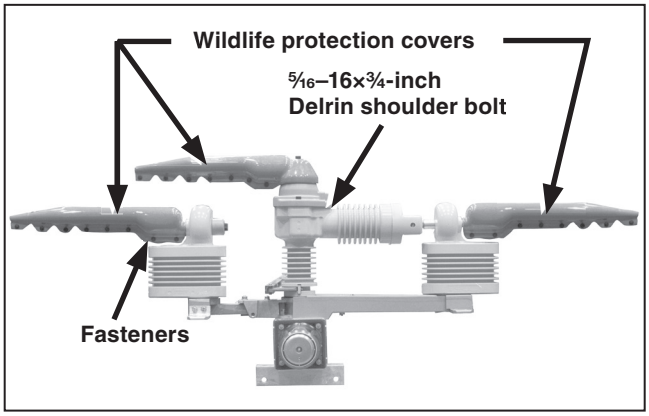


Figure 20. Installing wildlife protection components.

Connecting the Control Cable

STEP 18. A shielded control cable is included with the Scada-Mate Switch for connection of the switch to the control unit. Remove the control cable from its shipping carton. The control cable is provided with a multi-pin connector plug (male) for connection to the switch and a multi-pin connector receptacle (female) for connection to the control unit. Locate connector receptacle on the back of the switch base and remove the dust cover.

STEP 19. Remove the sensor shorting blocks from the receptacle and attach the plug from the control cable. Secure the connection with the connector clips. Retain the dust cover and sensor shorting blocks for future use. See Figures 21 and 22.

NOTICE

Shorting blocks for sensor secondaries are shipped installed in the switch connector. Remove the shorting blocks before connecting the control cable. Save the shorting blocks and cable plug cover for future use.

STEP 20. Locate the connector plug on the back of the control unit enclosure, remove the dust cover, and attach the receptacle from the control cable. Secure the connection with the connector clips. See Figure 22. Retain the dust cover for future use.

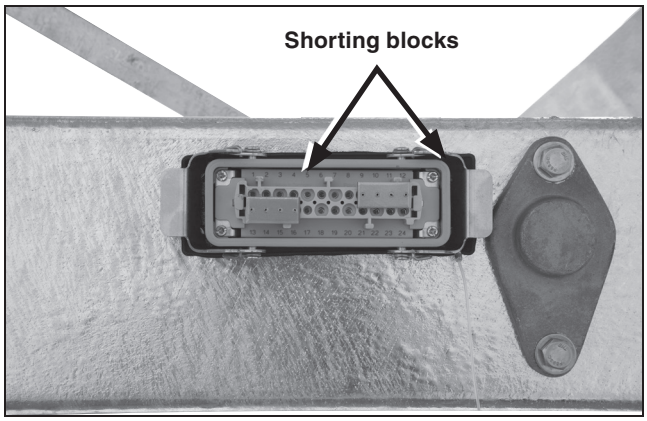


Figure 21. Shorting blocks.

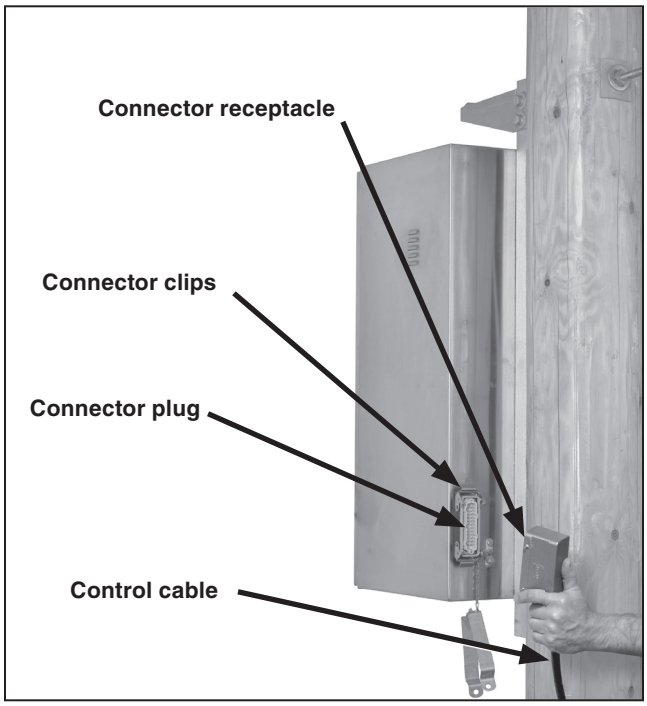


Figure 22. Connecting the control cable to the control unit enclosure.

STEP 21. Form a drip loop with the control cable where it attaches to the control unit. *Maintain a 9-inch (229-mm) minimum radius when bending the control cable at the drip loop and at the switch connection.* Adjust the control cable along the length of the utility pole and secure the control cable to the utility pole using suitable guards or clamps. Form a coil with any excess control cable, maintaining a 9-inch (229 mm) minimum radius, and secure to the utility pole. See Figure 23.

STEP 22. A stainless steel security belt is included with the control unit for padlocking the multi-pin connector at the control unit. See Figure 38. Place the security belt around the panel-mount-style connector between the connector clips and the enclosure, and insert a padlock (not furnished) through the holes provided. See Figure 24.

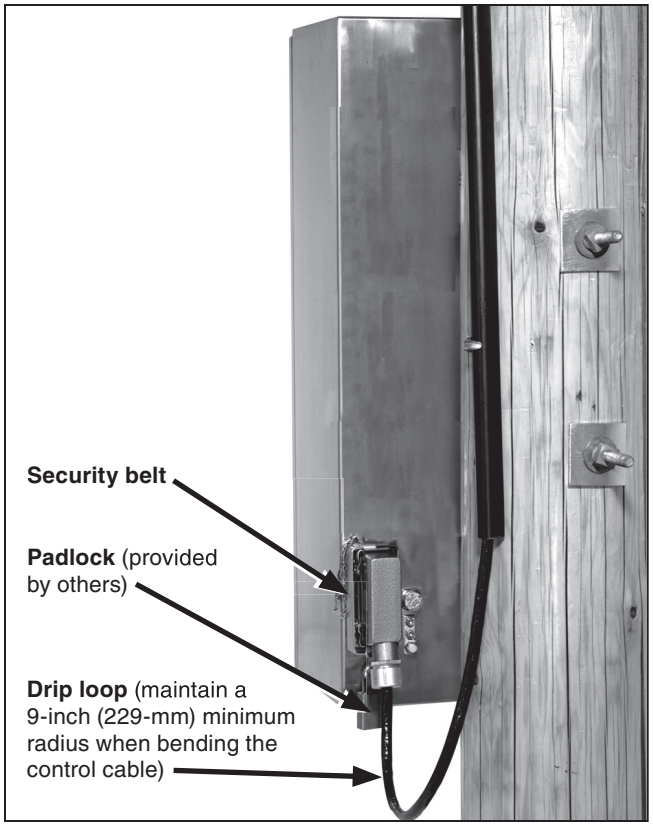


Figure 23. Connecting the control cable to the control unit enclosure.

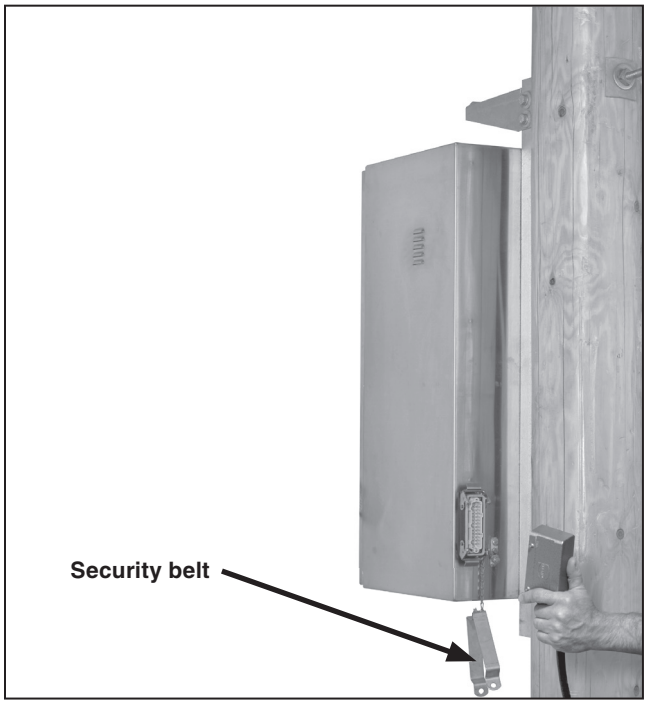


Figure 24. Securing the connector at the control unit.

Switch Energization

⚠ WARNING

Ground the switch base and control unit before energizing the switch.

Connect the switch base and control unit to a suitable earth ground at the base of the pole or mounting structure. Connect the switch base ground to the system neutral. If no system neutral is present, take proper precautions to ensure the switch base ground cannot be severed or removed.

Failure to properly ground the switch can cause serious injury or death.

⚠ WARNING

Stored-energy operating mechanism and switch base contains fast-moving parts that can severely injure fingers.

DO NOT disassemble operating mechanism unless directed by S&C Electric Company.

STEP 23. After making all user connections to the control unit in accordance with the S&C instruction sheet covering the applicable control unit, energize the Scada-Mate Switch according to standard operating practices. Confirm the appropriate power and selector switches are in the proper positions and the appropriate LEDs are illuminated as detailed in the instruction sheet for the applicable control unit. See Figure 25.

⚠ DANGER

DO NOT inspect service, repair, or work on the conductors on either side of the switch without de-energizing and grounding the switch at all six terminals. Consider ALL PARTS LIVE until de-energized, tested and grounded.

Interrupters and terminal pads may be energized from either side and in any position. Test for voltage using proper high-voltage test equipment and install suitable grounding equipment.

Failure to observe these precautions may result in serious injury or death.

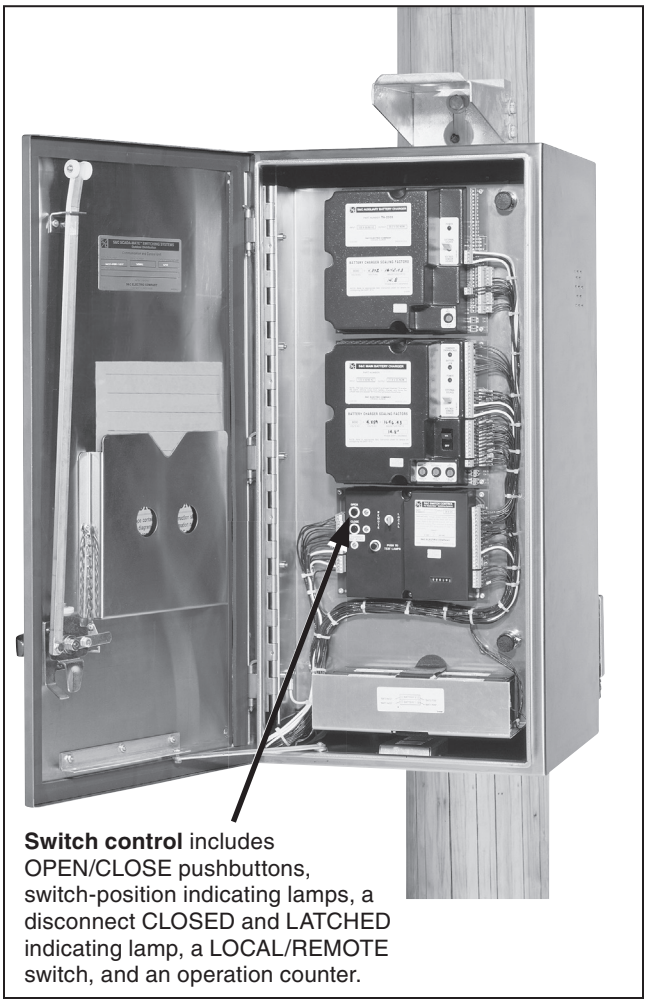
Figure 25. S&C Model 6801 Automatic Switch Control.

Pushbutton Operation

STEP 24. Place the local/remote switch inside the control unit to the **Local** position. Refer to the instruction sheet furnished with the control unit. The switch can now only be operated locally. Then, press the OPEN or CLOSE pushbutton. See Figure 26. The interrupter OPEN/CLOSED indicator on the end of the Scada-Mate Switch base indicates interrupter contact position: The target with an "O" indicates the interrupters are open; the target with a "C" indicates the interrupters are closed. The indicator does not denote the status of the disconnect.

Remote Operation

STEP 25. Place the LOCAL/REMOTE switch inside the control unit in the **Remote** position. Refer to the instruction sheet furnished with the control unit. The Scada-Mate Switch can now only be operated by remote supervisory control. In using the SCADA system, the dispatcher can test not only the electrical operation of the switch, but the entire SCADA control path, including communications. See Figure 26. The interrupter OPEN/CLOSED indicator on the end of the Scada-Mate Switch base indicates interrupter contract position: The target with an "O" indicates the interrupters are open; the target with a "C" indicates the interrupters are closed. The indicator does not denote the status of the disconnect.



Switch control includes OPEN/CLOSE pushbuttons, switch-position indicating lamps, a disconnect CLOSED and LATCHED indicating lamp, a LOCAL/REMOTE switch, and an operation counter.

Figure 26. Operating the switch using the LOCAL/REMOTE switch inside the control unit.

Emergency Manual Operation

STEP 26. Scada-Mate Switching Systems are capable of manual interrupter operation in the upright, pole-top, and tiered-outboard mounting configurations. In the event of electrical power loss, a standard or extendible hookstick is used to open and close the interrupters. If the spring is fully discharged, pull on the operating mechanism pull-ring with the hookstick seven to nine times to effect a change of state. If the spring is partially charged, just a single pull will change interrupter position. See Figure 27.

Scada-Mate Switching Systems in the vertical mounting configuration, or switches with catalog number supplement R1 or earlier, can be opened by operating the hookstick operated disconnect towards the **Open** position. The interrupters on these switches are sequenced to mechanically trip before the disconnect opens, preventing the operation of the disconnect when the interrupter contacts are in the **Closed** position.

On switches with the R2 or later catalog number supplement, this feature has been replaced with an interlock that will not allow the disconnect to be opened when the interrupter contacts are in the **Closed** position.

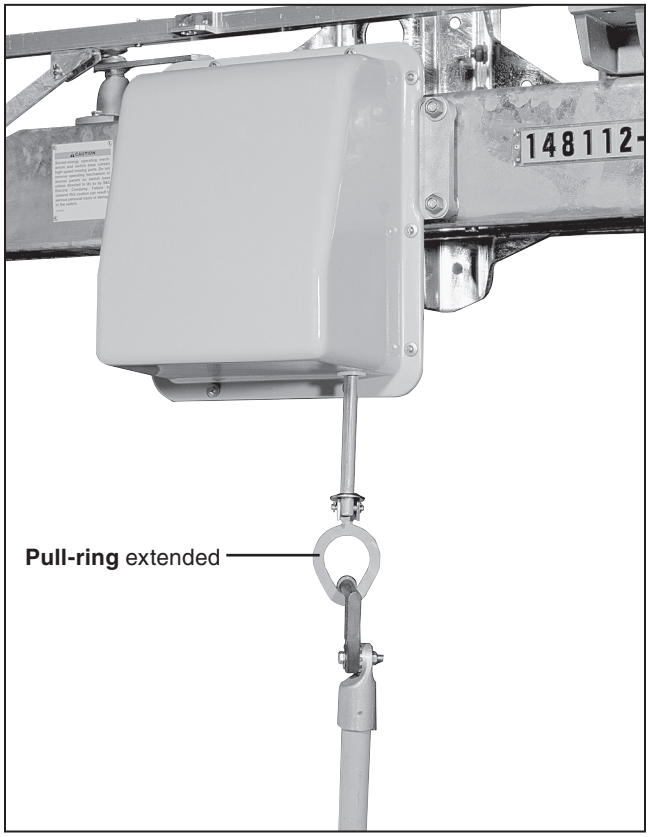


Figure 27. Operating the switch manually using a hookstick.

Disconnect Operation

STEP 27. An integral hookstick-operated three-pole disconnect is built into the Scada-Mate Switch to provide visible air-gap isolation of switched-open circuits. Place the LOCAL/REMOTE switch inside the control unit in the **Local** position before operating the disconnect. Refer to the instruction sheet furnished with the control unit. The switch can now only be operated locally.

Opening the Disconnect

STEP 28. Open the interrupter contacts first by pressing the OPEN pushbutton in the control unit.

Then, open the disconnect by pulling down on the disconnect operating lever using a conventional hookstick or S&C Universal Pole and pole extension (if required) fitted with a heavy-duty hook-tool such as the S&C Substation Prong or equivalent. See Figure 28. Provisions for tagging or padlocking the disconnect are provided when the disconnect is in the **Open** position. See Figure 29.

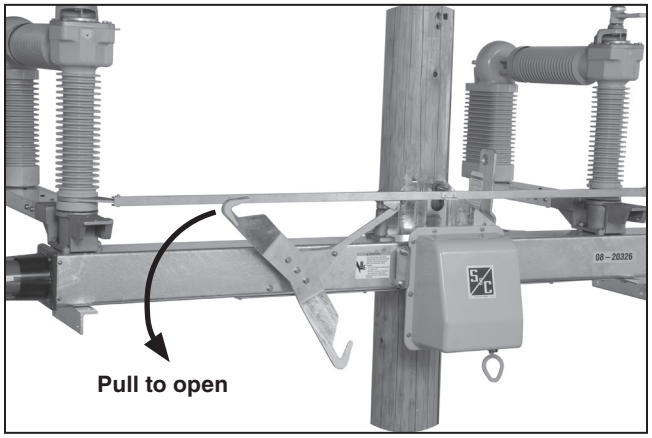


Figure 28. Opening the three-pole disconnect for switches rated 14.4 kV and 25 kV.

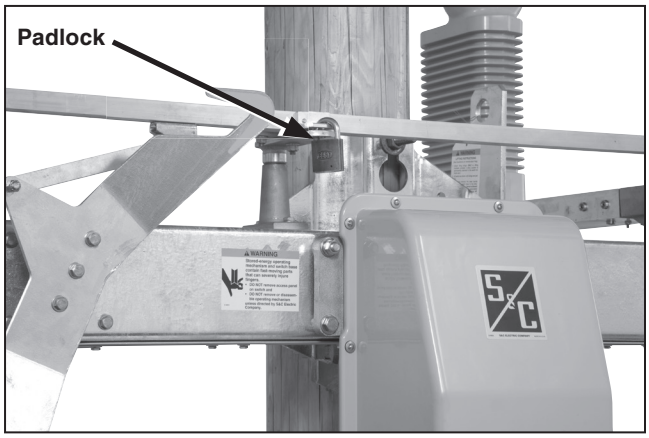


Figure 29. Padlocking the disconnect in the Open position (lock or tag provided by customer).