


Source-Transfer Application Guide

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Qualified Persons

 **WARNING**

Only qualified persons knowledgeable in the installation, operation, and maintenance of overhead and underground electric distribution equipment, along with all associated hazards, may install, operate, and maintain the equipment covered by this publication. A qualified person is someone trained and competent in:

- The skills and techniques necessary to distinguish exposed live parts from nonlive 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 special precautionary techniques, personal protective equipment, insulated 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.

Retain this Instruction Sheet

NOTICE

Thoroughly and carefully read this instruction sheet before installing or operating a 6802 Automatic Switch Control. Become familiar with the Safety Information on page 4 and Safety Precautions on page 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 the 6802 Automatic Switch Control. Designate a location where users 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 6802 Automatic Switch Control are listed in the ratings table in S&C Specification Bulletin 1045-31.

Special Warranty Provisions

The standard warranty contained in the seller's standard conditions of sale, as set forth in Price Sheet 150, applies to the 6801 Automatic Switch Control, 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 10 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 10 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 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 seller or repairs performed by 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 the 6801 Automatic Switch Control is contingent upon the installation, configuration, and use of the control 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.

Safety Information

Understanding Safety-Alert Messages

Several types of safety-alert messages may appear throughout this instruction sheet and on labels and tags attached to the product. Become familiar 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 any portion of this instruction sheet is unclear and assistance is needed, contact the 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 Support and Monitoring Center at 1-888-762-1100.

NOTICE

Read this instruction sheet thoroughly and carefully before installing the 6802 Automatic Switch Control.



Replacement Instructions and Labels

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

DANGER



The 6800 Series Automatic Switch Control line voltage input range is 93 to 276 Vac. 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 the 6800 Series Automatic Switch Control must be restricted only to qualified persons. See the "Qualified Persons" section 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. **MAINTAINING PROPER CLEARANCE.** Always maintain proper clearance from energized components.

The Model 6802 Automatic Switch Control can be easily configured for a source-transfer application operating two Scada-Mate®, Scada-Mate® SD, or Scada-Mate CX™ Switching Systems. Only one 6802 switch control is required for source transfer when peer-to-peer communication with other switch controls is not required.

IntelliTeam® SG Automatic Restoration System software can be used for the 6802 source-transfer application. The IntelliTeam SG system automatically handles multiple events, and can transfer multiple times, back and forth, to whichever source is available. Figure 1 shows the two FIC connectors on the bottom of the enclosure.



Figure 1. Dual FIC connectors on the Model 6802 Automatic Switch Control for source-transfer application.

Site Information

Before installation or configuration of a Model 6802 Automatic Switch Control, review S&C Instruction Sheet 1045-530, “6800 Series Automatic Switch Controls with IntelliTeam® SG Automatic Restoration System: *Setup*,” available at sandc.com. Become familiar with the features, procedures, warnings, settings, operation, and troubleshooting. The control can be configured in the shop before installation or after installation at the site.

Users must collect basic information about the circuit and location where the equipment will be installed.

- Obtain the total clearing curves for the preferred- and alternate-source circuit breakers or other upstream fault-clearing devices, along with other relay settings, such as reclose times, number of trips, type of trips (instantaneous or delayed), and reset times.
- Determine whether there are any capacity constraints on either source that should prevent transfer under certain loading conditions.
- Make sure the voltage sensors on both switches face the substation side of the line.
- Obtain the sensor calibration sheets shipped with the switches. Record the switch serial numbers.
- Verify having the correct software for this switch control application.

Complete the following steps to program the 6802 controls with software version SG6802DOInstaller-3.5.5 or later:

- STEP 1.** Install software version SG6802DOInstaller-3.5.5 or later on the computer that will be used to program the 6802 controls. The IntelliLink® Automatic Restoration System software will automatically install.
- STEP 2.** Connect the computer to the switch control with a serial or USB cable.

NOTICE

Always use battery power or a grounded, three-wire extension cord for the computer and the ac-powered switch control. The serial or USB port may be damaged if the computer or switch control is not grounded.

- STEP 3.** Start the IntelliLink software with *Start>Programs>S&C Electric>IntelliLink*. The IntelliLink software will automatically connect to the 6802 control and open the *Operation>Main* screen.
- STEP 4.** On the *Setup>General>Time* screen, configure the parameters for Daylight Savings Time Automatic Switchover, Time and Date. On the *Setup>General* screen configure the **Physical Location** and **Cabinet Heater** settings. Ignore the **Cabinet Heater** setting if the control is not powered from a 120-Vac source because the heater does not function with sensor power. Enter the serial number for each switch.
- STEP 5.** On the *Setup>General>Sensor Configuration* screen, enable **Visual Disconnect** state for Scada-Mate switch installations. Scada-Mate CX switches do not have a state contact for their optional visible disconnect. Enter the sensor calibration data provided for Switch 1 and Switch 2. Switch 1 is connected to the rear FIC near the mounting bracket, Switch 2 is connected to the front FIC near the enclosure door.
- STEP 6.** On the *Setup>General>Site-Related* screen enter the installation-dependent parameters for voltage. The **Loss-of-Voltage Threshold** setting can be increased as reliability and power quality dictate for a particular load. Review S&C Instruction Sheet 1045-530, “6800 Series Automatic Switch Controls with IntelliTeam® SG Automatic Restoration System: *Setup*.”

Instantaneous reclose of an upstream breaker or recloser must be considered when determining the **LOV** setting. A voltage loss lasting less than 15 cycles may not be detected by a 6802 control. To detect a 15-cycle voltage loss at the 6802 control, do not set the **Loss-of-Voltage Threshold** setting any lower than 60 Volts.

For a phase-to-neutral connected transformer, the **Phase Angle Offset** settings should be placed at zero degrees. For phase-to-neutral transformers, the **Phase Angle Offset** settings should be placed at 30 or 330 degrees. Verify the **Real-Time Data** setting is correct.

The correct settings will result in current in the normal direction and a reasonable power factor. See S&C Instruction Sheet 1045-530, “6800 Series Automatic Switch Controls with IntelliTeam® SG Automatic Restoration System: *Setup*” for more details.

- STEP 7.** On the *Setup>General>Fault Detection* screen, select the **Phase** and **Ground Fault** settings according to the time-current characteristic (TCC) curves of the upstream fault-clearing device. S&C Instruction Sheet 1042-572, “S&C 5800 Series Automatic Switch Controls: *Setting Phase and Ground Overcurrent Levels*,” can assist in determining these settings.

For most installations, the **Phase Fault Detection Current Level** setting should be set at 90% of the minimum trip setting of the upstream recloser or breaker, and the **Fault Duration Time Threshold** setting should be set according to the fastest clearing time for high-magnitude faults. The **Ground Fault Protection** setting should be set to coordinate with the TCC curve of the upstream fault-clearing device.

The usual setting is 100% of minimum to trip. Inrush settings should consider the connected transformer and motor kVA on the load side of the switch and follow ANSI/IEEE guidelines.

- STEP 8.** Return to the *Operation* screen and click on the **Change** button to enable automatic operation. On the *Setup>General>Automatic Operations* screen, set the **Features Enabled to Sectionalizing + Phase Loss** setting for both switches, or determine the most appropriate setting for the application, and enable the same feature set for both switches.

Enter settings for all the other parameters. Refer to S&C Instruction Sheet 1045-530, “6800 Series Automatic Switch Controls with IntelliTeam® SG Automatic Restoration System: *Setup*,” or press F1 for detailed information on each parameter. Go to the *Validate/Apply* screen and click on the **Apply** button.

- STEP 9.** Go to the *Setup>Communications>Comm. Setup>General Settings* screen. If SCADA communication is used, enter the required parameters. Also enter a non-zero RTU address for the 6802 control that matches the RTU address entered in the next step. See S&C Instruction Sheet 1045-530, “6800 Series Automatic Switch Controls with IntelliTeam® SG Automatic Restoration System: *Setup*” for more information about communication settings.

- STEP 10.** Go to the *Setup>Restoration>IntelliTeam SG/II>Team 1 Setup* screen. See Figure 2 on page 9. Enter a Team ID and set the Team Logic to the **IT-II** setting. Adjust the **Return to Normal Time** setting to use that function.

Setup - Restoration - IntelliTEAM SG/II

Team Summary | **Team 1** | Team 2 | Team 3 | Team 4 | Team 5 | Team 6 | Team 7 | Team 8 | External Loading | Misc.

Team 1 Setup

Team ID: Team Logic:

Team Setup: ☒ Running ☐ Stopped

Alternate Source Sequence

1st Alt Src: 2nd Alt Src: 3rd Alt Src: 4th Alt Src:

General Team Parameters

Line Segment Limit	N/A	Return to Normal Time	1 min
Contract Required:	No	Prohibit Restoration Time	Disabled
Team Load Priority	0: N/A		

Individual Team Member Parameters

	Rec 1	Rec 2	Rec 3	Rec 4	Rec 5	Rec 6	Rec 7	Rec 8
DNP/RTU Address	1	0	0	0	0	0	0	0
Comm Port to Use	Port B	Port B	Port B	Port B	Port B	Port B	Port B	Port B
Sw/Pos Number	Sw1	Sw1	Sw1	Sw1	Sw1	Sw1	Sw1	Sw1
Normal Open/Close	Closed	none	none	none	none	none	none	none
Normal Sw Func	Src/Sub	none	none	none	none	none	none	none
Rtn to Norm Mode	Closed	none	none	none	none	none	none	none
Maximum Capacity	600	600	600	600	600	600	600	600

*The switch function of a Closed Loop Team Member is periodically reevaluated and dynamically updated in response to changes in loading conditions.

Connected to: Location:

Snapshot5801.vrn 12:12 Main R/W Refresh: Once Auto Updated 12:12:30

Figure 2. IntelliTeam II Automatic Restoration System Setup for Team 1.

STEP 11. Configure Rec 1 for Sw 1 and Rec 2 for Sw 2. Switch 1 is connected to the rear connector next to the bracket mount; Switch 2 is connected to the front FIC near the enclosure door.

Enter the same RTU address for both Rec 1 and Rec 2; use the same RTU address entered in step 10. Specify which switch is normally closed and which is normally open.

For the normally closed switch, set the **Normal Switch Function** setting to “Src/Sub” and the **Return to Normal Mode** setting to “Close.” For the normally open switch, set the **Normal Switch Function** setting to “Tie/Sub,” and set the **Return to Normal Mode** setting to “Close.”

“Close” defines “Return to Normal” as a closed transition mode or make-before-break. At a **Return to Normal** mode, the normally closed switch will close and then the normally open switch will open. The feeders are temporarily tied together, but there is no outage.

STEP 12. Adjust the **Maximum Capacity** setting.

STEP 13. Set the **Team Setup** setting to “Stopped,” if not already at that setting. Click on the **OK** button. Then, set it back to **Running** mode and click on the **OK** button.

STEP 14. Wait for the control to go into the **Ready** mode by watching the LCD screen on the control.

STEP 15. Save a snapshot of the control data. The **Save Snapshot** command is in the **File** menu on the toolbar of the IntelliLink software screen.

For more assistance, contact the local S&C Sales Office.