Testing Indicated Voltage and Current

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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.

Read this Instruction Sheet

Thoroughly and carefully read this instruction sheet before programming, operating, or maintaining your S&C 5800/6800 Series Automatic Switch Control. Familiarize yourself with the safety information on page 3. The latest version of this instruction sheet is available online in PDF format at **sandc.com/Support/Product-Literature.asp**

Retain this Instruction Sheet

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

Warranty

The standard warranty contained in S&C's standard conditions of sale, as set forth in Price Sheets 150, and 181, applies to the S&C 5800/6800 Series Automatic Switch Control, except that the first paragraph of said warranty is replaced by the following:

(1) General: Seller warrants to 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 ten 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 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.

For equipment/services packages, seller warrants for a period of one year after commissioning, that the 5800/6800 Series Automatic Switch Controls 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 until the desired result is achieved.

Warranty of the S&C 5800/6800 Series 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, and communication devices. However, S&C will assign to immediate purchaser or end user all manufacturer's warranties that apply to such major components.

Warranty of equipment/services packages is contingent upon receipt of adequate information on the user's distribution system, sufficiently detailed to prepare a technical analysis. Seller is not liable if an act of nature or parties beyond S&C's control negatively impact performance of equipment/services packages; for example, new construction which impedes radio communication, or changes to the distribution system that impact protection systems, available fault currents, or system loading characteristics.

Understanding Safety-Alert Messages

There are several types of safety-alert messages which may appear throughout this instruction sheet as well as on labels attached to the S&C 5800/6800 Series Automatic Switch Control. Familiarize yourself with these types of messages and the importance of the various signal words, as explained below.

⚠ DANGER

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

⚠ WARNING

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

⚠ CAUTION

"CAUTION" identifies hazards or unsafe practices which *can* result in minor personal injury or product or property damage 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 S&C Headquarters at (773) 338-1000; in Canada, call S&C Electric Canada Ltd. at (416) 249-9171.

NOTICE

Read this instruction sheet thoroughly and carefully before installing or operating your S&C 5800/6800 Series Automatic Switch Control.

Replacement Instructions and Labels

If you need 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.

To validate the accuracy of indicated values, voltage and current sensor inputs can be simulated in the shop for S&C 5800 and 6800 Series Automatic Switch Controls. These instructions also describe a procedure for simulating an over-current fault event.

Please carefully follow all instruction details. Current above 0.5 ampere applied to the switch control sensor input will destroy the voltage sensing and power collecting circuitry. Circuit damage caused by testing is not covered by the warranty.

NOTICE

The output from S&C Switchgear Voltage Sensors is a current source. Any current over 0.5 ampere applied to the switch control sensor input will destroy the voltage sensing and power collecting circuitry.

Control Setup

Step 1

Verify that a Wye jumper is installed in the switch control. See Figure 1.

Step 2

Ground the enclosure at the ground lug on the bottom. Energize the switch control with 120 Vac. Connect the ac line to the AC LINE terminal and ac neutral to the AC NEUTRAL terminal. The control power terminals are located in the lower right corner of the enclosure.

NOTICE

Always use battery power or a grounded, 3-wire extension cord for your computer when connecting to an ac powered switch control. Your computer serial port may be damaged if your computer or the switch control is ungrounded.

Step 3

Connect your computer to the USB port or the DB9 connector on the front panel of the switch control with a straight-through serial cable. Always use battery power or a grounded, 3-wire extension cord for your computer.

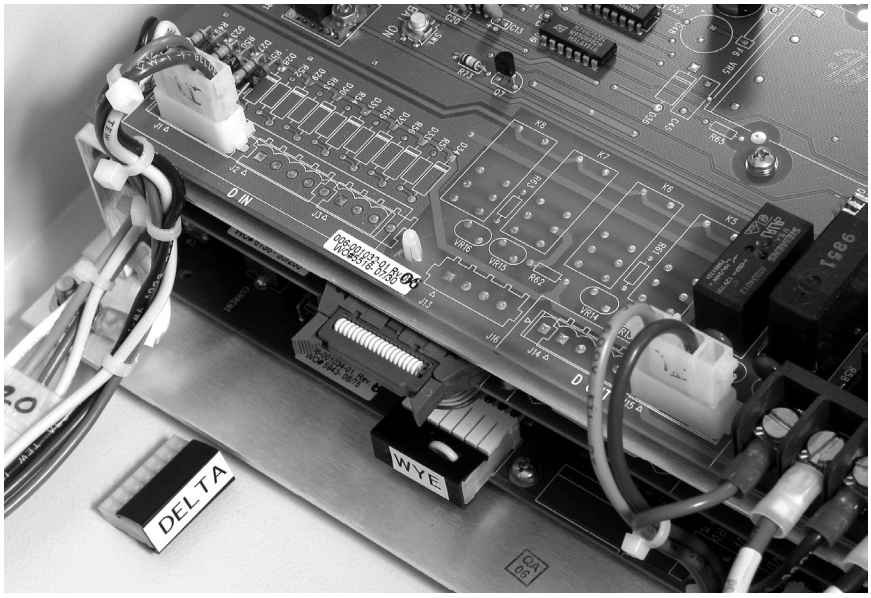

Figure 1. Wye jumper installed in a 6801 Switch Control.

Step 4

The voltage sensor input to the control is a current source. You need to provide approximately 150 milliamperes. You can use a small 120/2.5-volt filament transformer and a 16-ohm resistor to supply current for each phase. Connect the 16-ohm resistor in SERIES with the transformer's 2.5-volt output and connect this to the voltage sensing input. The resistor must be in the circuit to prevent damage to the switch control.

Step 5

Connect your computer to the USB port or the DB9 connector on the front panel of the switch control with a straight-through serial cable. Always use battery power or a grounded, 3-wire extension cord for your computer.

Step 6

Connect to the control with IntelliLink Software and go to the *SETUP* > *General* > *Sensor Configuration* screen. Configure the *Sensor Magnitude Ratios* at 120 for *Current* and 1400 for *Voltage* at each pole. See Figure 2.

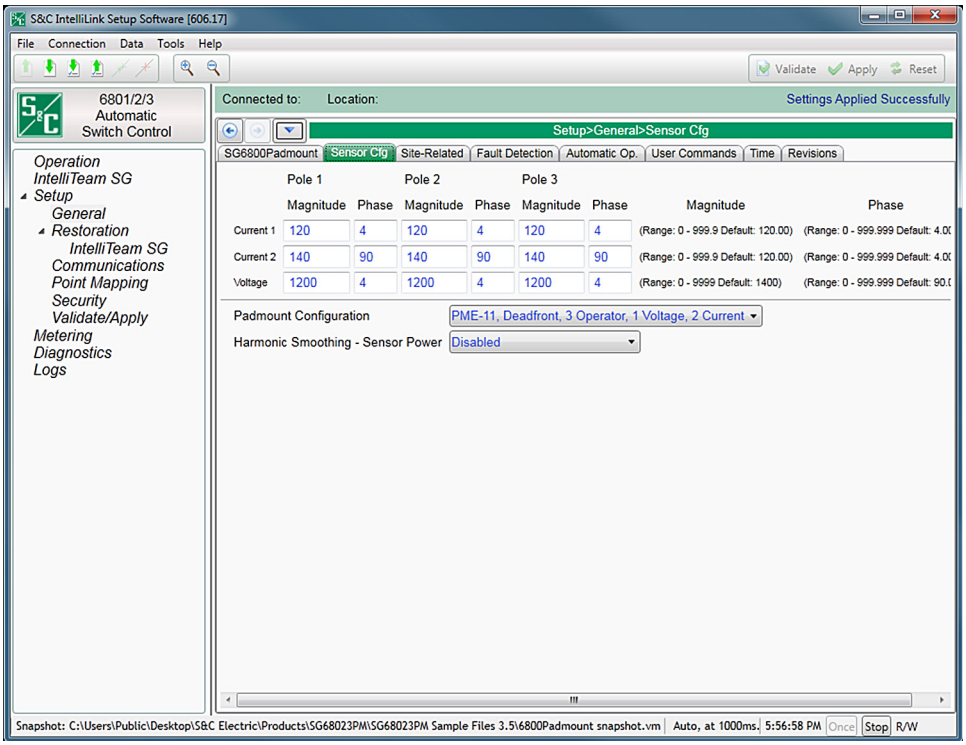

Figure 2. Sensor Configuration screen for a 6801 Switch Control.

Step 7

Go to the *SETUP* > *General* > *Site-Related* screen. Refer to Figure 3, and configure these setpoints:

- *Line kV to 120 VAC Base Ratio* = 57.8
- *Voltage Transformer Wiring* = Phase-to-Neutral
- *Voltage Sensors Present* = Phases A, B, & C

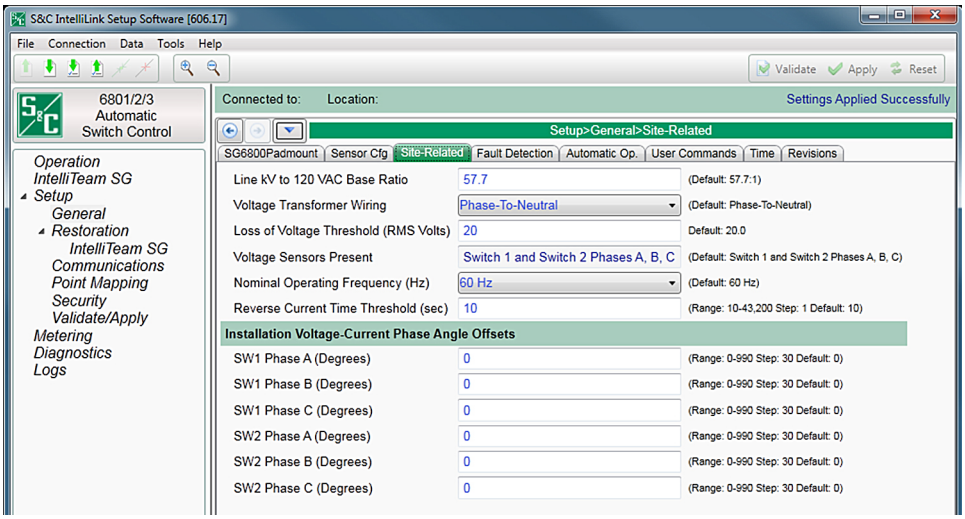

Figure 3. Site-Related screen for a 6801 Switch Control.

Step 8

If you have changed any setpoints, go to the *Setup* > *Validate/Apply* screen and click the **Apply** button. See Figure 4.

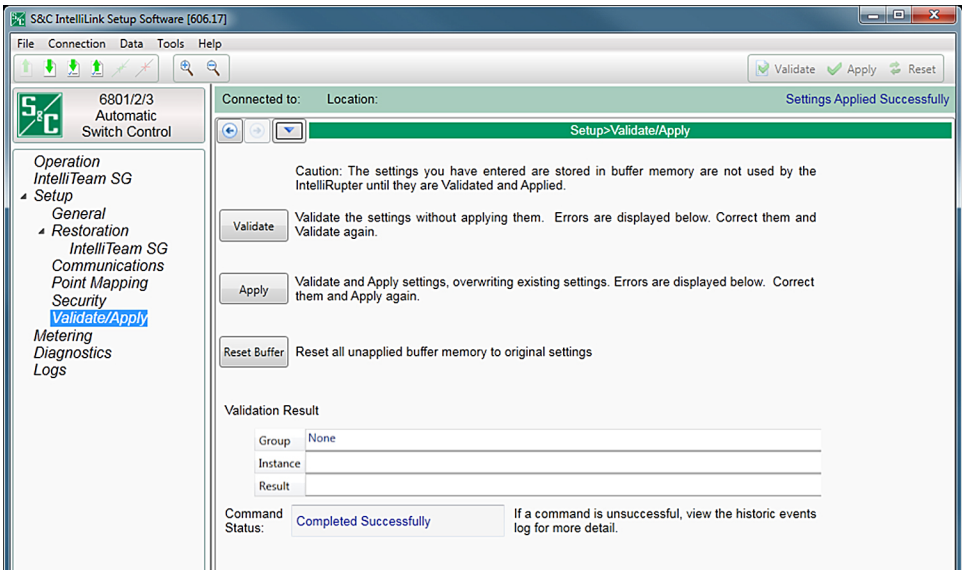

Figure 4. Setup > Apply/Validate screen for a 6801 Switch Control.

Voltage

To test the control voltage readings, apply 150 milliamperes to the voltage sensing circuits. On the FIC connector the voltage sensor input pins are #13, #14, #15 for A, B, C Phases, and pin #16 is the common return.

- 149.5 milliampere input current will read 120 volts

Current

To test the current readings, apply 0–5 amperes to the current sensing circuits. On the FIC connector the current sensor input pins are #9, #10, #11 for A, B, C Phases, and pin #12 is the common return.

- A 0–5 Ampere input equals 0–600 Line Amperes (600 to 5 ratio)

Fault Current

Fault current can be simulated in the field by programming the control to see a fault at a current level less than regular load current.

1. Measure the present load current with the control on the *Metering* screen. See Figure 5.
2. Remove the FIC connector or the sensor cable for a Pad-Mounted Gear Control.
3. Reconfigure the control to sense a fault at a value less than the present load current. See Figure 6 on page 8.
4. Simulate a fault by reconnecting the FIC or sensor cable and then quickly disconnect control power.
5. Connect control power and remove it again to simulate the second breaker trip. Repeat until the switch trips.

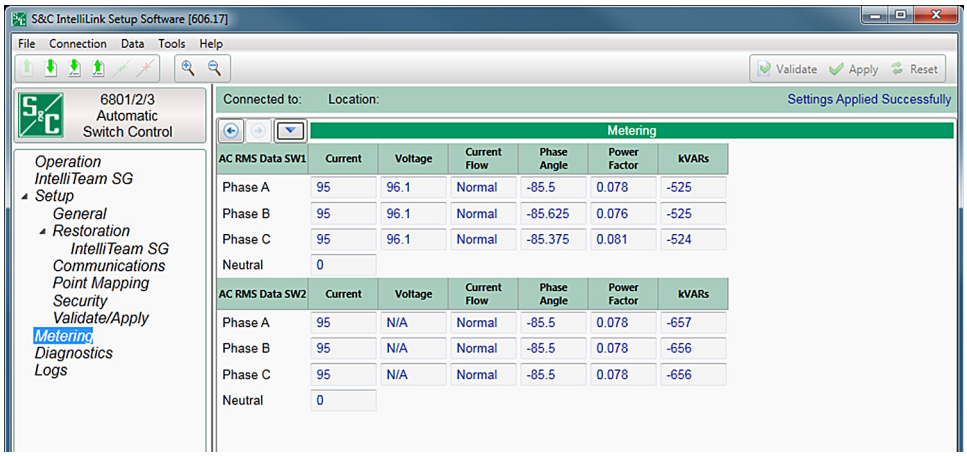

Figure 5. Operation-Main screen for a 6801 Switch Control.

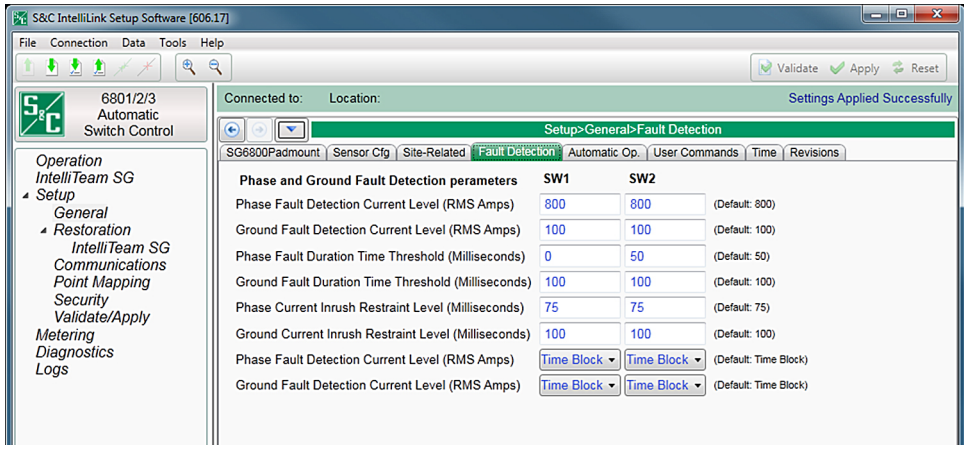

Figure 6. Setup > General > Fault Detection screen for a 6801 Switch Control.

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