Product Description

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Introduction

Qualified Persons

Read this Instruction Sheet

Thoroughly and carefully read this instruction sheet before programming, operating, or maintaining your S&C Universal Interface Module. Familiarize yourself with the safety information on page 3. The latest version of this instruction sheet is available online in PDF format at www.sandc.com. Select: Support/Product Literature Library.

Retain this Instruction Sheet

This instruction sheet is a permanent part of your S&C IntelliRupter. 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 Sheet 150, applies to the Universal Interface Module, 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.

Warranty of the Universal Interface Module 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.

**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 Universal Interface Module. 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 www.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 Universal Interface Module.

**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.

Description

General

This instruction sheet provides an overview of:

The IntelliTEAM II® Automatic Restoration System (this page)

The S&C Universal Interface Module (page 5)

How to install and set up a team (page 8)

IntelliTEAM II System

S&C 5800 Series Automatic Switch Controls, and the IntelliTEAM II Universal Interface Module (used with a Protective Relay, Recloser Control, or RTU), let Scada-Mate® Switches, pad-mounted distribution switches, breakers, reclosers, or a mix of this equipment, form teams that provide fast, fully automatic fault isolation and service restoration. Up to two automatic switch positions of the pad-mounted gear can be utilized, and configured independently, to provide further flexibility for the transfer process. Using peer-to-peer communications and distributed intelligence, team members protect a line segment by monitoring the feeder(s) for voltage loss and fault conditions, sharing information (both within the team and between teams), and making decisions on how to pick up load safely and effectively. With the IntelliTEAM II system, you can implement complex configurations with multiple alternate sources.

IntelliTEAM II Features

Distributed intelligence – The team does not require a SCADA master station for circuit reconfiguration, though the IntelliTEAM II system is compatible with SCADA systems using DNP.

Automatic load transfer – Team members can transfer load from their normal source to an alternate source to provide power to as many customers as possible. Teams coordinate automatic operations to prevent overloading of a feeder during transfer operations. Each team can have multiple alternate sources.

"Return to Normal" – Team members can return the circuit to its normal configuration automatically once a stable 3-phase voltage has been restored to the faulted line segment.

"READY" status on LCD – The faceplate LCD reads "R" when the team is ready to take action, even if a transfer event has already taken place. It indicates that there are no errors, faults, or team communication problems present.

Safety and reliability features – The IntelliTEAM II system is designed to avoid operational problems, such as opening a switch when the current is above the load break rating. Features that help to insure team safety include the ability to limit the number of line segments picked up by a team, updated loading information, logic preventing extended parallel circuits, and the ability to lock out automatic operation so the control or line-switch can be operated manually.

Local setup of remote team controls – Once the team members have their RTU addresses set, you can use S&C IntelliLINK® software and a portable computer to enter or change setpoint values for any team member on the communications network from a single control – even members of other teams. IntelliLINK software can speak TTY, DNP, and ICP.

Critical team information available locally – The IntelliLINK software and local LCD can display critical data for all of the team members. Information is available for each team where the local control is a member.

Stand-alone operation fallback – If team operation is not possible, team members operate as stand-alone controls.

Universal Interface Module Overview

The IntelliTEAM II Interface Module enables a host protective relay or recloser control to operate as part of an IntelliTEAM II system, with all normal team-member logic and communications capabilities.

The Universal Interface Module is the actual team member (the device included in the IntelliTEAM II system), and it polls and controls the host "IED" Intelligent Electronic Device. The Interface Module does not interfere with the normal protective functions of the IED. The Interface Module must receive an "open and locked out" indication before it takes control of the IED. If the Interface Module is implemented with a switch control IED, it waits until it receives a "sectionalizer tripped" indication before it will issue any IntelliTEAM II commands.

The host IED initiates sectionalizing or protection on overcurrent and voltage, and optionally the IED can initiate sectionalizing on an extended loss of voltage.

Figure 1. Remote faceplate and main chassis of the Panel-Mounted Universal Interface Module.

Under operating conditions, the IntelliTEAM II Interface Module continually polls the IED for status and analog data. Collected data is used for the IntelliTEAM II process. In addition, the Interface Module exchanges information with the other team members as needed. When IntelliTEAM II action is required, the Interface Module provides the interface to, and operates the IED in response to IntelliTEAM II requirements.

The IntelliTEAM II Interface Module includes the following major components, as shown in Figure 1 and Figure 2.

Panel-mounted Interface Module – Corrosion resistant aluminum case with pivoting mounting brackets can be installed in most IED enclosures.

Rack-mounted Interface Module – Standard 19" wide, 3U high rack-mount case installs with protective relays in the substation, and in recloser control enclosures.

Faceplate LCD and Navigation Controls – Permit local, easy viewing of team status without a portable computer.

Faceplate LEDs and Switches – Clearly labeled LEDs display information about team readiness, automatic operation, and communication activity.

Faceplate Local Communication Access Port – Allows you to connect your computer to the Interface Module, and use IntelliLINK® software to view data, change set points, download logged data, and update Interface Module software.

IED Communication Port – Connects to the host control device and communicates using DNP 3.0 Protocol. The Interface Module is configurable to utilize DNP points as they are mapped in the host device to satisfy the data requirements of IntelliTEAM II.

Radio Communication Ports – Two Comm Ports for connecting to a UtiliNet® Radio or other IntelliTEAM II compatible communication system, and the SCADA system radio. The DNP points list is configurable.

Power Requirements – The Universal Interface Module can be ordered for a specific power requirement of: 12 Vdc, 24 Vdc, 48 Vdc, 125 Vdc, 120 Vac, or 240 Vac.

Communication equipment – The IntelliTEAM II system uses DNP 3.0 Protocol and a UtiliNet Radio, or fiber-optic modem for peer-to-peer communication. The UtiliNet Radio, or many other radio systems, or fiber-optic modem can be used for 2-way DNP 3.0 Protocol communication between the Interface Module/Host IED and the SCADA master station.

IntelliTEAM II software – Resides in the Universal Interface Module and manages the moment-by-moment functioning of the installation. Can be easily updated (using the IntelliLINK software's Update utility). Version upgrades are handled through software uploads, and you will never need to replace computer chips.

IntelliLINK software – Lets you verify and change all setup and configuration parameters, monitor real-time operating data, perform troubleshooting, create reports, and export data for use in spreadsheets. Resides on your portable computer and runs in the Microsoft® Windows® environment.

Figure 2. Rack Mounted Universal Interface Module.

Feature Comparison

5800 Series Automatic Switch Control compared with the IntelliTEAM II Interface Module:

Feature	5800 Series Controls	Universal Interface Module
Sensor Inputs	Current and voltage sensors.	No.
Faceplate Display	LCD displays team information, real-time data, automation parameters, event logs, maintenance information and fault settings.	LCD displays team name, status, real-time load, setup information, and maintenance information.
Line Monitoring	True RMS voltage and current.	Polled Host IED data for voltage and current.
Data Logging	Logs voltage, current, kVARs, power factor, overcurrent, loss of voltage, fault magnitude, fault duration, and equipment diagnostics.	Extensive diagnostic data logging.
Information Storage	Non-volatile battery backed RAM.	Non-volatile Compact Flash Card, and internal non-volatile RAM.
Overcurrent Protection	Coordinates with source-side protective device.	No - Host IED provides protection.
Loss of Voltage Protection	Opens switch at LOV, or coordinates with source-side protective device.	Host IED provides protection, and optionally provided by the UIM.
Phase Unbalance Protection	Opens switch on loss of phase or phase unbalance.	Host IED provides protection, and optionally provided by the UIM.
Fault Interrupting	Selectable shots-to-lockout prevents the source-side protective device from reclosing into a fault multiple times.	No - Host IED provides fault interruption.
Automatic Sectionalizing	Coordinating with source-side reclosing device, the control can help reduce loss of service and locate faulted line sections.	Host IED provides sectionalizing, optional 3-phase and single-phase sectionalizing.
IntelliTEAM II Automatic Restoration	IntelliTEAM II restores service to as many unfaulted line segments as can be supported by alternate sources.	Yes. IntelliTEAM II restores service to as many unfaulted line segments as can be supported by alternate sources.
Return to Normal	Teams can automatically return to normal starting with teams closest to the restored normal source.	Yes - Teams can automatically return to normal starting with teams closest to the restored normal source.
Sensor Powered	Optional.	Not available.
Battery Back-Up Power	Standard battery system with automatic charging and battery monitoring.	No.
SCADA Communications	DNP 3.0 Protocol using the UtiliNet Radio, or other radio systems, or fiber-optic modem.	DNP 3.0 Protocol using the UtiliNet Radio, or other radio systems, or fiber-optic modem.

Table 1. Feature comparison – 5800 Series Controls and the Universal Interface Module.

Description

Universal Interface Module Features

Dependable quality – Electronics manufactured in an ISO 9002-certified plant.

Toughness and reliability – Designed to withstand the difficult environmental and electrical conditions found in electric distribution applications.

Flexible communications capabilities – The Local Communications Port, on the faceplate, allows connection of your portable computer to access the UIM with IntelliLINK Software. Three chassis mounted serial ports allow DNP 3.0 Protocol communication with the Host IED, the IntelliTEAM II UtiliNet Radio, and the SCADA System Radio.

Setpoint control of IntelliTEAM II parameters – Automatic operation options, address information, and other operating parameters can be viewed and changed as needed.

Non-volatile memory – Programming, setpoint, and data are stored in non-vilatile RAM internal to the processor board. The Compact Flash Card is an optional location for storing longer term data logging information only.

Real-time clock – Crystal-controlled clock, with a back-up battery, provides accurate timestamping of real-time data.

Suggested Team Installation / Setup Procedure

Figures 3, 4, and 5 show the normal order for setting up an IntelliTEAM II System.

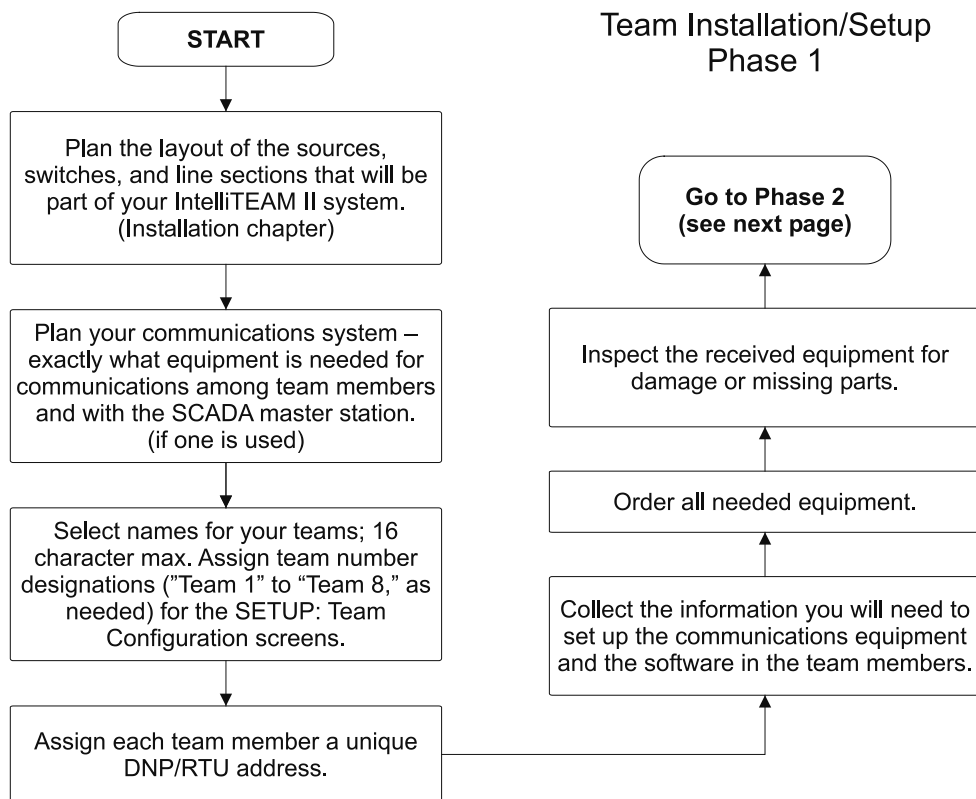| ⚠ NOTICE |
| --- |
| These flowcharts assume that the team consists entirely of IntelliTEAM II Interface Modules controlling a protective relay or recloser control. If your team includes S&C 5800 Series Automatic Switch Controls, refer to Instruction Sheet 1042-501. |

Team Installation/Setup
Phase 1

```
┌─────────────┐
│    START    │
└─────────────┘
       │
       ▼
┌──────────────────────────┐
│ Plan the layout of the   │
│ sources, switches, and   │
│ line sections that will  │
│ be part of your          │
│ IntelliTEAM II system.   │
│ (Installation chapter)   │
└──────────────────────────┘
       │
       ▼
┌──────────────────────────┐
│ Plan your communications │
│ system – exactly what    │
│ equipment is needed for  │
│ communications among     │
│ team members and with    │
│ the SCADA master station.│
│ (if one is used)         │
└──────────────────────────┘
       │
       ▼
┌──────────────────────────┐
│ Select names for your    │
│ teams; 16 character max. │
│ Assign team number       │
│ designations ("Team 1"   │
│ to "Team 8," as needed)  │
│ for the SETUP: Team      │
│ Configuration screens.   │
└──────────────────────────┘
       │
       ▼
┌──────────────────────────┐
│ Assign each team member  │
│ a unique DNP/RTU address.│
└──────────────────────────┘
```

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┌─────────────────────┐
│  Go to Phase 2      │
│  (see next page)    │
└─────────────────────┘
       ▲
       │
┌──────────────────────────┐
│ Inspect the received     │
│ equipment for damage or  │
│ missing parts.           │
└──────────────────────────┘
       ▲
       │
┌──────────────────────────┐
│ Order all needed         │
│ equipment.               │
└──────────────────────────┘
       ▲
       │
┌──────────────────────────┐
│ Collect the information  │
│ you will need to set up  │
│ the communications       │
│ equipment and the        │
│ software in the team     │
│ members.                 │
└──────────────────────────┘
```

Figure 3. Suggested team installation / setup procedure – Phase 1.
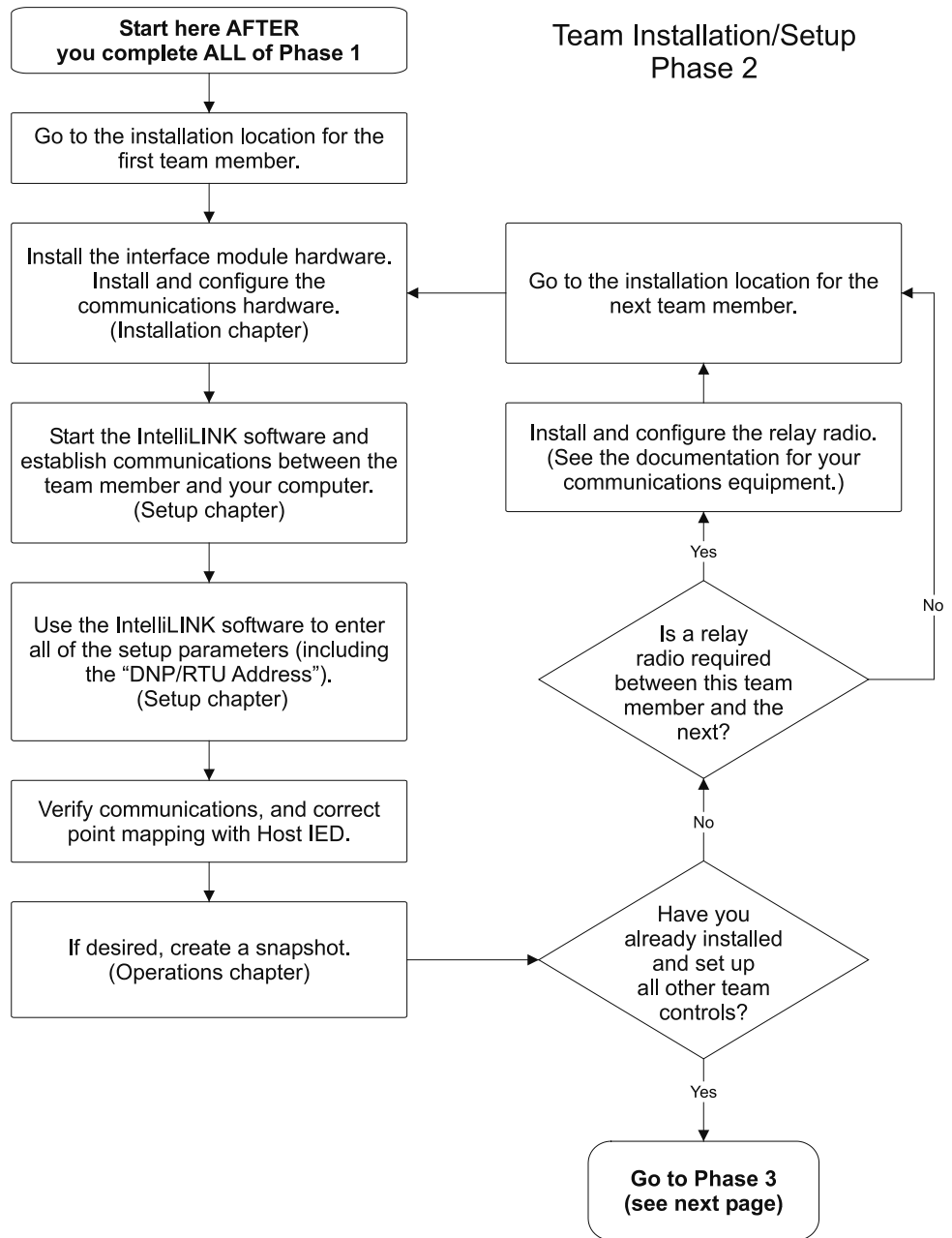
Description

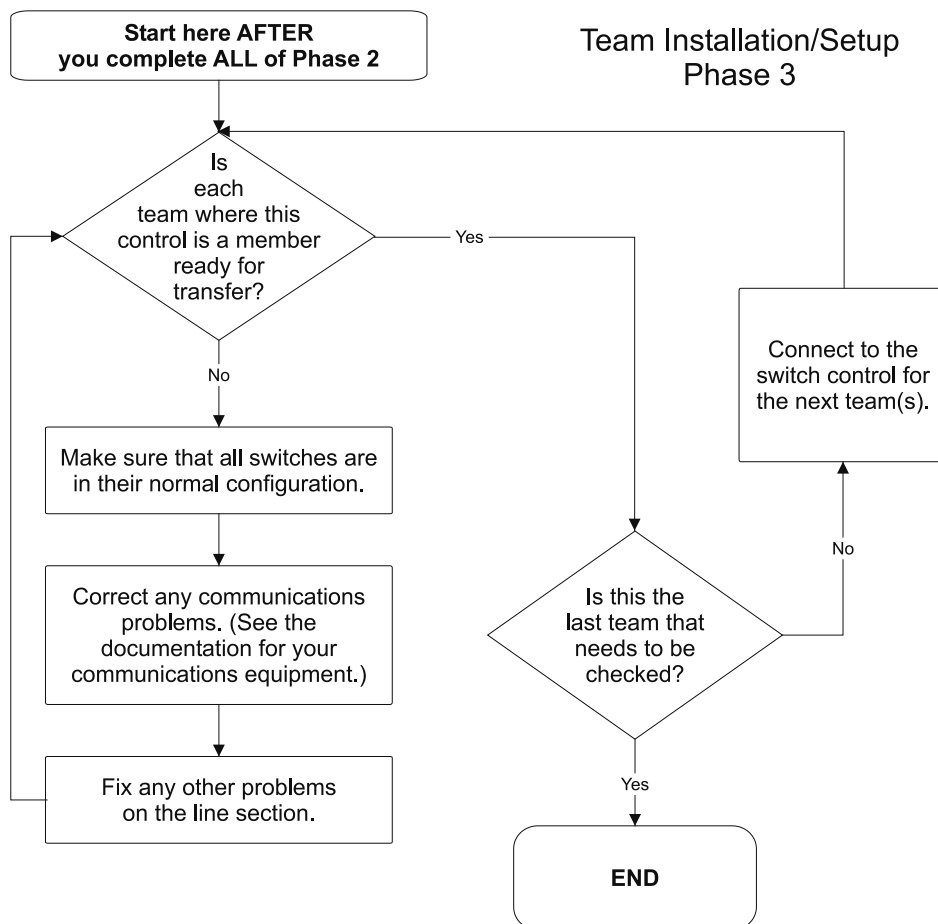**Figure 4. Suggested team installation / setup procedure – Phase 2.**

Figure 5. Suggested team installation / setup procedure – Phase 3.

This completes the IntelliTEAM II Product Description.

Go to *Installation Instructions 1043-510.*