Docking Station Instructions

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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.

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Read this Instruction Sheet

Thoroughly and carefully read this instruction sheet before programming, operating, or maintaining your S&C IntelliRupter PulseCloser Fault Interrupter. 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](http://sandc.com/Support/Product-Literature.asp)

Retain this Instruction Sheet

This instruction sheet is a permanent part of your S&C IntelliRupter PulseCloser Fault Interrupter. Designate a location where you can easily retrieve and refer to this publication.

Special Warranty Provisions

The standard warranty contained in S&C’s standard conditions of sale, as set forth in Price Sheet 150, applies to IntelliRupter® fault interrupter and its associated options except for the control group (the protection and control module and communication module) and S&C SpeedNet™ Radio, as applicable. For these devices 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.

Replacement control groups and S&C SpeedNet Radios 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 control groups and S&C SpeedNet Radios purchased separately will be covered by the above special warranty provision.

This warranty does not apply to major components not of S&C manufacture, such as batteries and communication devices, as well as hardware, software, resolution of protocol-related matters, and notification of upgrades or fixes for those devices. However, S&C will assign to immediate purchaser or end user all manufacturers’ 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 IntelliRupter fault interrupter. 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 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 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 IntelliRupter PulseCloser Fault Interrupter.

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.
Overview

These instructions cover the procedure for operating the IntelliRupter PulseCloser Fault Interrupter Docking Station. This device powers the protection and control module when it is removed from the IntelliRupter fault interrupter, and permits uploading and downloading configuration settings, by using a dedicated base memory module. The docking station can also be used with a communication module when it is removed from the IntelliRupter fault interrupter and installed in the docking station with a protection and control module. The protection and control module provides the power for the communication module and permits programming the radio, verifying radio operation, and charging the communication module battery.

The docking station may be used to monitor serial communication traffic between the protection and control module and the communication module, using either a secure Wi-Fi connection to your personal computer or a direct connection to your serial-port-equipped personal computer. A user-furnished DNP test set, such as manufactured by ASE, may be connected to the docking station to monitor DNP messages.

The docking station includes a Wi-Fi radio antenna. Connectors are provided for a user-furnished SCADA radio antenna and a user-furnished GPS receiver antenna.

The docking station may be powered from 88 to 264 V, 50/60 Hz. It is intended for indoor use only.

**NOTICE**

To ensure that previously programmed settings in the protection and control module are not lost when the module is installed in the docking station, you must unplug the base memory module from the docking station. If the base memory module is not unplugged from the docking station when the docking station is powered up, the protection and control module will upload the most recently applied settings stored in the base memory module.
Step 1
Set up the docking station on a sturdy work surface. If Global Positioning System operation is to be checked, place the docking station near a window, so that satellite signals can be received by the user-furnished GPS antenna.

Step 2
Connect the power cord to the docking station. Then plug the power cord into an ac outlet.

Step 3
If a SpeedNet Radio is installed: Insert the “Radio Ethernet to Control / Radio Ethernet to Comm” jumper into the docking station.

Step 4
If you wish to directly connect your personal computer to the docking station to communicate with the protection and control module, instead of using the Wi-Fi connection:
   a. Remove the factory-installed “Wi-Fi Serial to Control / Wi-Fi Serial to Comm” jumper from the docking station.
   b. Plug the computer into the “Wi-Fi Serial to Control” port.

Step 5
Carefully attach the protection and control module to the docking station. Make sure that the connector guide pins are aligned properly, then insert them fully.

Step 6
Carefully attach the communication module to the docking station. Make sure that the connector guide pins are aligned properly, then insert them fully.

Step 7
If serial traffic between the protection and control module and the radio is to be monitored through a DNP test set: Plug the DNP test set into the “RX” port.
Step 8

To preserve previously programmed settings in the protection and control module:
Unscrew the locking ring of the base memory module and unplug the module.

**NOTICE**

If the base memory module is not unplugged from the docking station when the docking station is powered up, the protection and control module will upload the most recently applied settings stored in the base memory module.

Step 9

Turn on the docking station power switch. The red lamp on the docking station will light. And the status indicator on the protection and control module will start flashing, for 1/2 second every 30 seconds.

**NOTICE**

The Global Positioning System requires up to 5 minutes to “lock on” and provide timing signals. If desired, the protection and control module clock can be set manually in IntelliLink Setup Software. Select **Setup > General, Tab: Time**. See Figure 1. Follow the instructions provided on the screen.

![Figure 1. Setup—General—Time screen.](image-url)
Establishing Wi-Fi Connection

The Wi-Fi transceiver provides secure wireless point-to-point communication to a wireless-equipped personal computer operating under IEEE 802.11b standard. Transmission range is typically 150 feet or less.

Click the Intellilink software or LinkStart icon or select Program Start > S&C Electric > LinkStart V3 on the personal computer. The LinkStart connection screen will appear. See Figure 2.

![Figure 2. LinkStart connection screen.](image)

If the base memory module is unplugged: The default universal access serial number (00-0000000) will be used. If the base memory module is plugged in: Type in its serial number (in this example 08-9000014).

Click Connect. The Wi-Fi connection process will begin. See Figure 3.

![Figure 3. Wi-Fi connection in progress.](image)
Establishing Wi-Fi Connection

The secure connection device driver will begin transmitting an encrypted, invisibly addressed “wake-up” message to the communication module. Progress is noted on the horizontal indicator bars. In addition, the status indicator on the protection and control module pulsates, dim to bright, while Wi-Fi connection is being established.

After IntelliRupter fault interrupter recognizes the wake-up message and its source, it will proceed with authentication. Encrypted messages are exchanged that require correct decryption keys in both the personal computer and the protection and control module. When the link is successfully established, the Active status indicator becomes green.

Signal strength is continuously shown on the vertical indicator bars. See Figure 4.

![Figure 4. Successful Wi-Fi connection screen.](image)
Click the **IntelliLink** button. IntelliLink Setup Software will open.

After logging in, you can review the settings in the protection and control module, and change them as appropriate. You can also review and download event logs and diagnostic screens. Refer to S&C Instruction Sheet 766-530, “IntelliRupter PulseCloser Protection and Communication Setup” Instructions.

**NOTICE**

Settings suitable for radial, IntelliTeam® II Automatic Restoration System, and loop restoration can be entered into the protection and control module while it is connected to the docking station. But only the settings actually suitable for the control group—specified by the IntelliRupter fault interrupter catalog number suffix (“-C0” through “-C6”)—can be used when the protection and control module is installed in the IntelliRupter base.

**NOTICE**

Commands to open or close IntelliRupter fault interrupter will result in errors because the docking station does not provide operation feedback. To clear the errors, select **Diagnostics > Errors**. See Figure 5.

Click the **Clear Errors** button.

![Figure 5. Error Diagnostics screen.](image)
If you have programmed new settings in the protection and control module and wish to use them when the module is installed in the IntelliRupter fault interrupter base, select **Setup > General, Tab: IntelliRupter**. See Figure 6.

Select “**On Next Power-up, Use Settings From Control.**”

Remember to select **Setup > Validate/Apply** and click the **Apply** button before shutting down.

![Figure 6. Setup—General—Validate/Apply screen.](image-url)
Serial Connection with a Docking Station

In the event that communication with an IntelliRupter Control cannot be established over the Wi-Fi link, a direct serial connection can be made to an IntelliRupter Control when it is installed in the IntelliRupter Docking Station. The serial connection will permit inspection of control operation, and if necessary, allow reloading control firmware.

To establish a serial connection you will need:

- IntelliRupter Docking Station, Communication Module, and the Control Module.
- Straight-Through 9-Pin Serial Cable
- PC Computer loaded with the latest IntelliRupter Fault Interrupter Software

**Step 1**

Power the Docking Station and check that the red LED is on.

**Step 2**

Locate the serial jumper cable on top of the docking station. It should connect the two ports labeled *Wi-Fi Serial to Control* and *Wi-Fi Serial to Comm*. Unplug the end of the jumper connected to *Wi-Fi Serial to Comm*, and plug the male end of your serial cable into the jumper. See Figure 7. The jumper functions as a gender changer.

**Step 3**

Plug the other end of the serial cable into the serial port on your computer, and make note of the COM Port number. If you do not have a serial port on the computer, use a Serial to USB adapter cable.
Serial Connection—Rev. 3.4.x and Earlier

**NOTICE**
The following procedure is used with IntelliRupter Installer versions 3.4.x and earlier. For newer installer revisions see the next section, that starts on page 17.

**Step 1**
IntelliLink Setup Software is installed by default in the C:\Program Files\S&C Electric\IntelliLink folder. Double click the application ilink.exe to launch the IntelliLink software. The location of this file is shown in Figure 8.

![Figure 8. Location of the IntelliLink Setup Software application file.](image)

**Step 2**
When the IntelliLink software is launched, it is configured by default to connect to the control over a wireless link. It automatically attempts to establish this connection. Wait for the connection attempt to time-out. Messages in the Connect dialog window should be approximately the same as Figure 9.

![Figure 9. IntelliLink Connect dialog window.](image)
Step 3

Select the **Change Setup...** button. This will launch the *IntelliLink Options* menu. Navigate to the **Communications** tab, shown in Figure 10. Change the connection from **UDP/IP** to **Serial** and then select the correct **COM Port**. In this case the port is COM1. The Baud Rate should be set at 57600. No other options should be changed.

![IntelliLink Options dialog window.](image)

**Figure 10. IntelliLink Options dialog window.**

Step 4

When you have set the communications parameters on the *Options* window, click the **Save & Exit** button.

Step 5

After the *Options* window closes, the *Connect* window will be visible. Click the **Retry** button. See Figure 9. The IntelliLink software will attempt to establish a connection using the new communication parameters.

Depending on the state of firmware in the control, you may receive a warning or an error message once a connection has been established.

If you receive an error message or were unable to download firmware through the Wi-Fi connection to upgrade your control, follow the instructions for **Reloading Firmware with Download Utility**.

If you performed this procedure to determine if your control is operational and did not receive warnings or errors, please contact S&C Electric Company for support. Your problem is probably not related to control firmware.

### Reloading Firmware with Download Utility

Reloading control firmware should only be started after an attempt to connect to the control with the IntelliLink software has generated errors or warning messages that indicate incorrect versions or maintenance mode conditions.

**Step 1**

In order to avoid communication conflicts, close any open instances of the IntelliLink software before launching *Download Utility (DU).*
Step 2

The DU application, by default, is installed in the `C:\Program Files\S&C Electric\IntelliLink` folder shown in Figure 11.

![Figure 11. Download Utility (DU) file location.](image1)

The Download Utility will try to automatically establish communication with the control, but will eventually time-out. The connection status for DU is displayed in the lower left hand corner. See Figure 12.

![Figure 12. Download Utility connection status, shown on the Control Software Loader window.](image2)
Step 3

When DU connection status changes from *Trying connection on 127.0.0.1* to *Not connected*, select the *Communications Setup* tab at the top center of the window. The new tab window is shown in Figure 13.

![Figure 13. Download Utility (DU) file location.](image)

Step 4

Your settings may not exactly match Figure 13, but the important parameters are shown there. Set the *Conn. Type* to *Serial* and that the correct *Comm Port* is selected. The *Baud Rate* should be set to *57600*.

Do not change the *DNP Settings*: the *Peer Addr*, or *Our Addr* settings. Use the settings configured in Download Utility.

Step 5

When you have set all parameters on the *Control Software Loader Communication Setup* tab, click the *Connect* button.

Step 6

When status indicates that *Download Utility* is connected, navigate to the *Download/Upload* tab and click the *Start Download* button. When prompts appear asking whether or not to *Skip a Download*, you should click the *No* button.

Step 7

When download is complete, do not exit *Download Utility*. Navigate back to the *Communication Setup* tab and change the *Conn. Type* back to *UDP/IP*. Then click the *Exit* button to close the Download Utility.
After control firmware has been successfully loaded, it is recommended that you verify that the control is operating correctly, by using the IntelliLink software.

**Step 1**

After closing the update window the IntelliLink software will prompt you to log in. Enter the appropriate *Use Name* and *Password*.

**Step 2**

On the IntelliRupter *Operation* screen, check the *Control Status* in the upper right hand corner. Verify that the control is in the *Okay* state. If there are any alarms, warnings, or errors—please contact S&C Electric Company.

**Step 3**

Check the *Setup > General > Revisions* screen, shown in Figure 14, to see that the correct firmware has been installed.

![IntelliRupter Setup > General > Revisions screen.](image)

Figure 14. The IntelliRupter Setup > General > Revisions screen.

After you complete verification, change the communication parameters of IntelliLink back to the default settings.

**Step 4**

Locate the *Tools* menu option at the top of the screen. The communication parameters are on the *Tools > Options* menu. See Figure 15. Change the *Connection Type* to UDP/IP and then click the *Save & Exit* button. Close the IntelliLink software.

**Step 5**

Disconnect the serial cable from the jumper, and reconnect the jumper to the *Wi-Fi Serial to Comm* connector on the Docking Station.

The Control and Communication Modules should now correctly respond to a *LinkStart* connection attempt.
Connect with IntelliLink Setup Software

Step 1

IntelliLink Software is installed in the C:\Program Files (x86)\S&C Electric\IntelliLink6 folder. Double Click the ILink6.exe application to launch the IntelliLink software. The location of the file is shown in Figure 15.

![Figure 15. Location of the IntelliLink Setup Software application file.](image)

Step 2

When the IntelliLink software is launched, it is configured by default to connect to the control over a wireless link. It automatically attempts to establish this connection. Wait for the connection attempt to time-out. Messages in the Connect dialog window should be approximately the same as Figure 16.

![Figure 16. IntelliLink Connect dialog box.](image)

NOTICE

The following procedure is used with IntelliRupter Installer versions 3.5.x and later. For earlier installer revisions see the previous section, starting on page 12.
Serial Connection—Rev. 3.5.x and Later

Step 3

Click the **Cancel** button. Then select **Tools > Options...** on the main menu. See Figure 17.

![Figure 17. Location of the Tools—Options button.](image)

Step 4

This will launch the **S&C IntelliLink Options** menu. Navigate to the **Connection** tab, shown in Figure 18. Make sure the Protocol is **DNP**. Change if needed. Change the RTU: to **self** or **65532**. Change the connection from **UDP/IP** to **Serial** and then select the correct **COM Port**. In this case the port is **COM5**. The **Baud Rate** should be set at **Auto**. Verify the **Timeout ms:** is set for **1000**, and **Retries:** 5. Make changes as necessary. Click the **OK** button. Refer to Figure 18.

![Figure 18. S&C IntelliLink Options—Connection tab.](image)

Step 5

Select **Connection > Connect to Device...** from the main menu. See Figure 19.

![Figure 19. Menu selection Connect to Device....](image)
Reloading Firmware with Download Utility

Reloading control firmware should only be started after an attempt to connect to the control with the IntelliLink software has generated errors or warning messages that indicate incorrect versions or maintenance mode conditions.

**Step 6**

Login with your *User Name* and *Password* or use the default *User Name: admin* and *Password: 1135Atlantic* if you haven’t change the defaults.

**Step 1**

Connect with the IntelliLink software as shown in the previous section.

*Select Tools > Firmware Update...* from the main menu. See Figure 20.

**Step 2**

Click the *Yes* button in the *Confirmation* dialog box. See Figure 21.
Step 3

The **Firmware Update** dialog box opens. See Figure 22.

![Firmware Update dialog box](image)

Figure 22. Firmware Update dialog box.

Step 4

If any of the software components installed in the control have the same or higher version number as the versions being downloaded a message similar to that shown in Figure 23 will appear. It is recommended that you select the **Yes** button unless instructed otherwise by an S&C representative.

![Confirmation dialog box](image)

Figure 23. Confirmation dialog box.

Step 5

After the software components have been installed the control will automatically be restarted and the **Enter your credentials** dialog will open. See Figure 24.

![Enter your credentials dialog box](image)

Figure 24. Enter your credentials dialog box.

Step 6

Enter your **User Name** and **Password** or the factory default **User Name:** admin and **Password:** 1135Atlantic if you have not changed them.

After the process has completed click the **Close** button to proceed.
After control firmware has been successfully loaded, it is recommended that you verify that the control is operating correctly, by using IntelliLink.

**Step 1**
After closing the update window the IntelliLink software will prompt you to log in. Enter the appropriate User Name and Password.

**Step 2**
On the IntelliRupter *Operation* screen, check the *Control Status* in the upper right hand corner. Verify that the control is in the *Okay* state. If there are any alarms, warnings, or errors—please contact S&C Electric Company.

**Step 3**
Check the *Setup > General > Software Versions* screen, shown in Figure 25, to see that the correct firmware has been installed.

![Figure 25. The IntelliRupter Setup > General > Software Versions screen.](image)

After you complete verification, change the communication parameters of the IntelliLink software back to the default settings.

**Step 4**
Locate the *Tools* menu option at the top of the screen. The communication parameters are on the *Tools > Options* menu. See Figure 18 on page 18. Change the *Connection Type* to *UDP/IP* and then click the *Save & Exit* button. Close the IntelliLink software.

**Step 5**
Disconnect the serial cable from the jumper, and reconnect the jumper to the Wi-Fi Serial to Comm connector on the Docking Station.

The Control and Communication Modules should now correctly respond to a LinkStart connection attempt.
NOTICE
Always turn off the docking station power switch before disconnecting the modules.

The docking station includes an inrush current limiter. It requires about 2 minutes to reset after the power switch is turned off. . . . power cannot be turned on during that time.

Step 1
Turn off the docking station power switch.

Step 2
Carefully disconnect the protection and control module and the communication module from the docking station.

Step 3
If applicable, disconnect the directly connected computer and/or DNP test set.

Step 4
Disconnect the power cord from the docking station. Then unplug the power cord from the ac outlet.
Early in 2010 a **Ground Trip Block** lever was added to the IntelliRupter fault interrupter. Software revision 2.2.9 (and later revisions) detects whether a Ground Trip Block lever is installed. If a Ground Trip Block lever is present its configuration parameters are shown on the **Setup-General-User Commands** screen, and its **On-Off** state is shown on the **Operation-Main** screen. If software 2.2.9 is used with an older IntelliRupter fault interrupter (that does not have a Ground Trip Block lever), the Ground Trip Block lever configuration commands are not displayed, and there is no Ground Trip Block lever indication shown on the **Operation-Main** screen.

The original Docking Station, Catalog Number SDA-4650R1, was shipped with Base Memory Module (BMM) SDA-4781, which simulates the older IntelliRupter fault interrupter without a Ground Trip Block lever. The latest Docking Station revision, Catalog Number SDA-4650R2 is the same device, but is shipped with the new BMM SDA-4781R2 that simulates an IntelliRupter fault interrupter with a Ground Trip Block lever. BMM SDA-4781R2 can also be used with the original Docking Station SDA-4650R1 to simulate the Ground Trip Block lever.

When the control module has **software 2.2.9 or later:**

- Using BMM SDA-4781—the software will not show Ground Trip Block lever configuration parameters or the lever position state.
- Using BMM SDA-4781R2—the software will display Ground Trip Block lever configuration settings, and the Ground Trip Block lever indication on the **Operation-Main** screen will always be “**On.**”