



User Guide

WIU Current Sensor, A80850

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FCC RULES COMPLIANCE

The equipment covered in this manual has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his expense.

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NOTES, CAUTIONS, AND WARNINGS

Throughout this manual, notes, cautions, and warnings are frequently used to direct the reader's attention to specific information. Use of the three terms is defined as follows:

NOTE

Generally used to highlight certain information relating to the topic under discussion.

CAUTION

REFERS TO PROPER PROCEDURES OR PRACTICES WHICH IF NOT STRICTLY OBSERVED, COULD RESULT IN A POTENTIALLY HAZARDOUS SITUATION AND/OR POSSIBLE DAMAGE TO EQUIPMENT. CAUTIONS TAKE PRECEDENCE OVER NOTES AND ALL OTHER INFORMATION, EXCEPT WARNINGS.

WARNING

INDICATES A POTENTIALLY HAZARDOUS SITUATION WHICH, IF NOT AVOIDED, COULD RESULT IN DEATH OR SERIOUS INJURY. WARNINGS ALWAYS TAKE PRECEDENCE OVER NOTES, CAUTIONS, AND ALL OTHER INFORMATION.

If there are any questions, contact Siemens Mobility, Inc. Application Engineering

ELECTROSTATIC DISCHARGE (ESD) PRECAUTIONS

Static electricity can damage electronic circuitry, particularly low voltage components such as the integrated circuits commonly used throughout the electronics industry. Therefore, procedures have been adopted industry-wide which make it possible to avoid the sometimes invisible damage caused by electrostatic discharge (ESD) during the handling, shipping, and storage of electronic modules and components. Siemens has instituted these practices at its manufacturing facility and encourages its customers to adopt them as well to lessen the likelihood of equipment damage in the field due to ESD. Some of the basic protective practices include the following:

- Ground yourself before touching card cages, assemblies, modules, or components.
- Remove power from card cages and assemblies before removing or installing modules.
- Remove circuit boards (modules) from card cages by the ejector lever only. If an ejector lever is not provided, grasp the edge of the circuit board but avoid touching circuit traces or components.
- Handle circuit boards by the edges only.
- Never physically touch circuit board or connector contact fingers or allow these fingers to come in contact with an insulator (e.g., plastic, rubber, etc.).
- When not in use, place circuit boards in approved static-shielding bags, contact fingers first. Remove circuit boards from static-shielding bags by grasping the ejector lever or the edge of the board only. Each bag should include a caution label on the outside indicating static-sensitive contents.
- Cover workbench surfaces used for repair of electronic equipment with static dissipative workbench matting.
- Use integrated circuit extractor/insertion tools designed to remove and install electrostatic-sensitive integrated circuit devices such as PROM's (OK Industries, Inc., Model EX-2 Extractor and Model MOS-40 Insertion (or equivalent) are highly recommended).
- Utilize only anti-static cushioning material in equipment shipping and storage containers.

For information concerning ESD material applications, please contact the Siemens Technical Support Staff at 1-800-793-7233. ESD Awareness Classes and additional ESD product information are also available through the Technical Support Staff.

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SECTION 1 INTRODUCTION

1 INTRODUCTION

1.1 General

The WIU (Wayside Interface Unit) current sensor is a component of the VIU and iVIU product lines. The WIU current sensor monitors signal lamp current to report if the lamp is off, on, or flashing. In PTC applications the current sensor monitors the energized state of the wayside signal lamps, and the signal aspect information is transmitted by the WIU to the locomotive.

1.1.1 Current Sensor Board

The current sensor board is designed to monitor up to three lamps. The main board contains all the circuit components needed to create the digital outputs that represent the state of the lamps, including the sensors themselves. A Current Sensor Adapter board may be used to interface the lamp circuit to the current sensor board. Figure 1-1 displays the current sensor module.



Figure 1-1 Current Sensor Module

1.1.2 Current Sensor Adapter Board

The current sensor adapter board enables easy rerouting of the existing lamp wires through the sensors. By disengaging a single wire from its terminal and installing the small current sensor adapter board in its place, an extension loop (pre-wired through the sensor) is added to that lamp wire. This is accomplished in a relatively simple, easy, and minimally disruptive manner. Figure 1-2 shows the current sensor adapter board.



Figure 1-2 Current Sensor Adapter Board

1.2 Ordering Information

The following is the ordering information for the WIU Current Sensor:

Part Number	Description
8000-80850-0001	Current Sensor Module
62199	Current Sensor Adapter Board

SECTION 2 INSTALLATION

2 INSTALLATION

2.1 Installation Overview

The current sensor system consists of two components, the current sensor and an optional current sensor adapter board. A typical three lamp signal installation is shown in Figure 2-1.

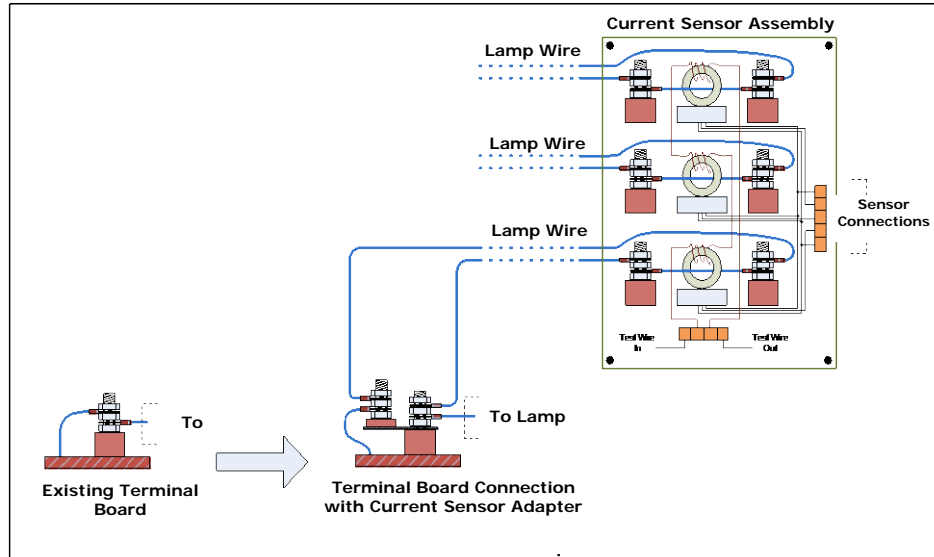


Figure 2-1 Typical Three Lamp Signal Current Sensor Installation

WARNING

VERIFY ALL COMPONENTS AND WIRING ARE PROPERLY INSTALLED AND MEET THE RAILROAD'S OR AGENCY'S APPROVED WIRING OR INSTALLATION DIAGRAM. FAILURE TO DO SO MAY LEAD TO INCORRECT OR UNSAFE OPERATION OF THE SIGNAL SYSTEM.

CAUTION

SIEMENS MOBILITY, INC. STRONGLY RECOMMENDS INSTALLING PRIMARY SURGE PROTECTION ON EXTERNAL LINES CONNECTING TO THE VIU.

NOTE

The VIU Current Sensor is not intended to be used for current sensing of Pulse Width Modulated (PWM) lamp detection.

2.1.1 Current Sensor Adapter Installation

The current sensor adapter is designed to retrofit existing signal control points and make them PTC-ready with minimal effort. Figure 2-1 shows the comparison of an existing terminal board and a modified terminal board with the current sensor adapter installed. Figure 2-2 displays a current sensor adapter mounted on a signal terminal block. The optional current sensor adapter can be installed on each lamp terminal.



Figure 2-2 Installed Current Sensor Adapter

2.1.2 Current Sensor Wiring

The wiring installation of the current sensor is shown in Figure 2-3 below. Lamp wiring is connected to the current sensor input connector J1. The input wires may be existing lamp wires or wires from the optional adapter board. Battery and the Vital Test Current Output are connected to J3. The vital test current output is picked up from the WIU device. The current sensor output (J2) is connected to the WIU device I/O using shielded cable.

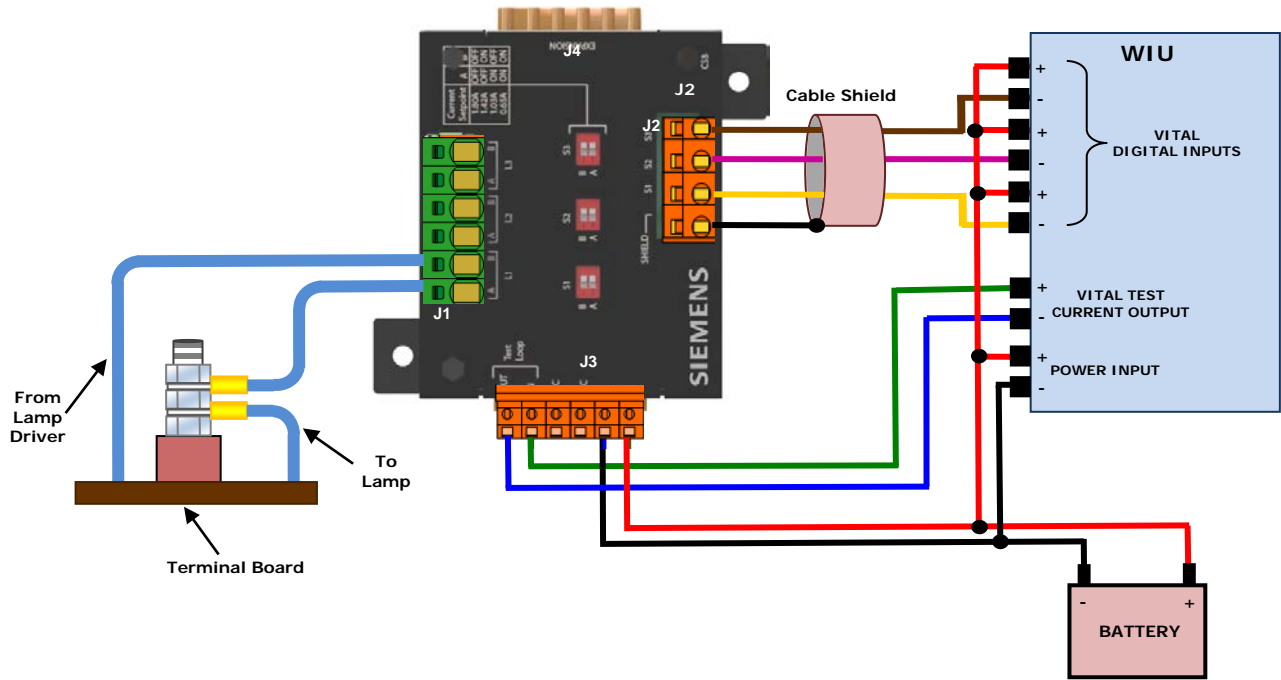


Figure 2-3 Current Sensor Wiring without Terminal Board Adapter

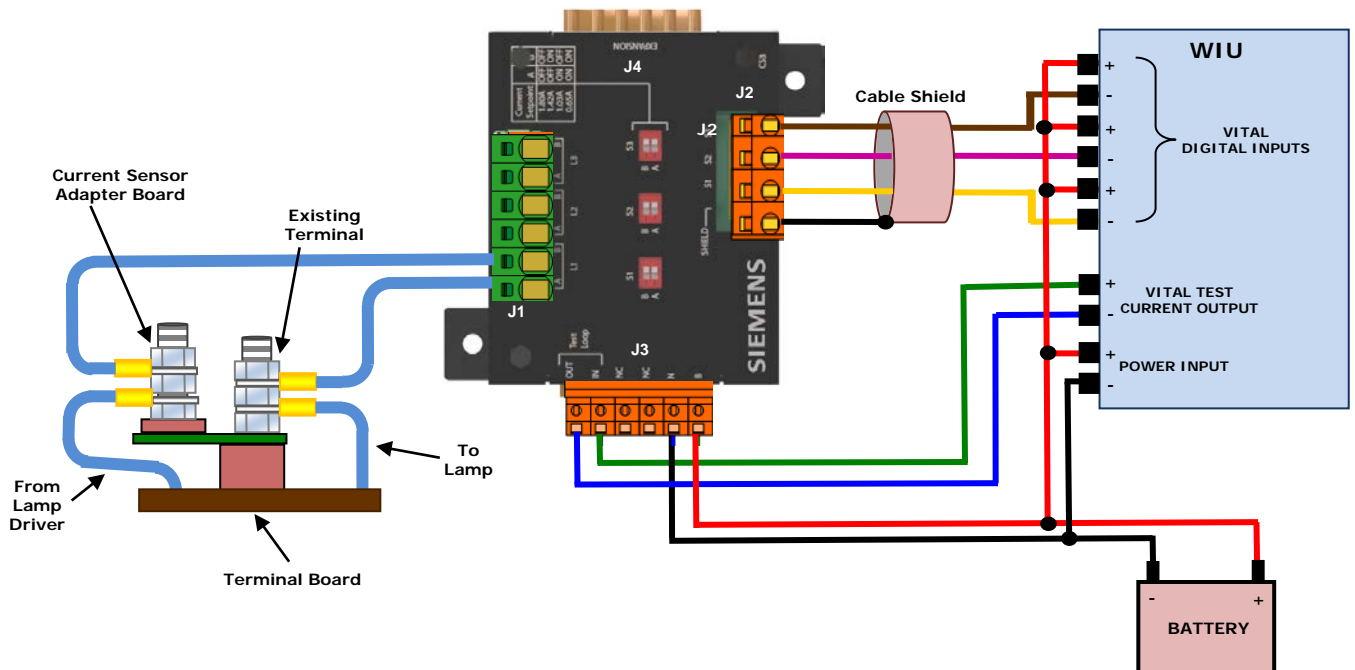


Figure 2-4 Current Sensor Wiring with Terminal Board Adapter

2.1.2.1 Current Sensor Output Connection

The current sensor output (J2) is connected using a shielded cable. The shield is terminated at the current sensor output only as shown in Figure 2-5. Belden 9939 or equivalent cable is recommended.

CAUTION

USE CARE TO ENSURE THE ELIMINATION OF ANY FOREIGN ENERGY SOURCES.

CAUTION

ENSURE THAT THERE ARE NO SHORT CIRCUITS IN THE WIRING BETWEEN THE CURRENT SENSOR AND THE WIU.

NOTE

The shielded cable used in connecting the current sensor output to the WIU device I/O input has the shield terminated at the output source (current sensor). The shield is **NOT** connected at the WIU I/O to avoid creating a ground loop. Trim any excess shield wire flush with the wire insulation. Belden 9939 or equivalent cable is recommended.

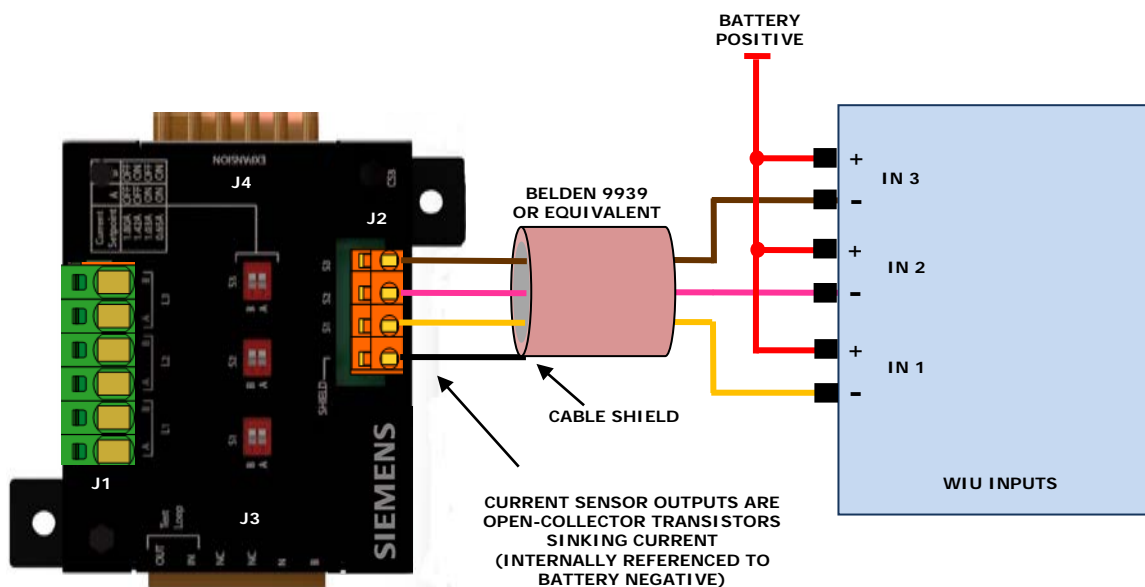


Figure 2-5 Shielded Current Sensor Output Connections

2.1.3 Surge Protection

Siemens Mobility, Inc. strongly recommends installing primary surge protection on external lines. A typical installation incorporating a surge suppressor on the wiring going to the signal lamp is shown in the figure below. Siemens Mobility, Inc. strongly recommends this type of installation.

CAUTION

SIEMENS MOBILITY, INC. STRONGLY RECOMMENDS
INSTALLING PRIMARY SURGE PROTECTION ON
EXTERNAL LINES CONNECTING TO THE VIU

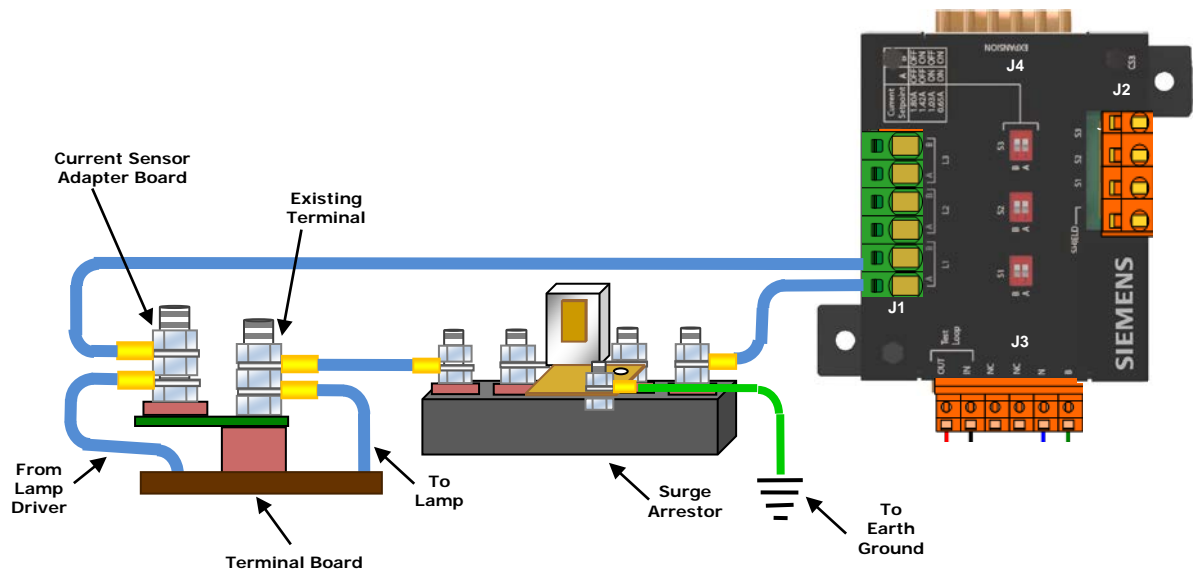


Figure 2-6 Typical Installation with Surge Suppression

2.1.4 Current Sensor Module Expansion

Multiple Current Sensor modules may be connected together to provide more inputs while reducing the number of individual power and test wire connections. To install an expansion module, insert J3 of the expansion module into J4 of the main module as shown in Figure 2-7. Up to nine additional expansion modules (**maximum of 10 interconnected units**) may be installed as shown in Figure 2-8.

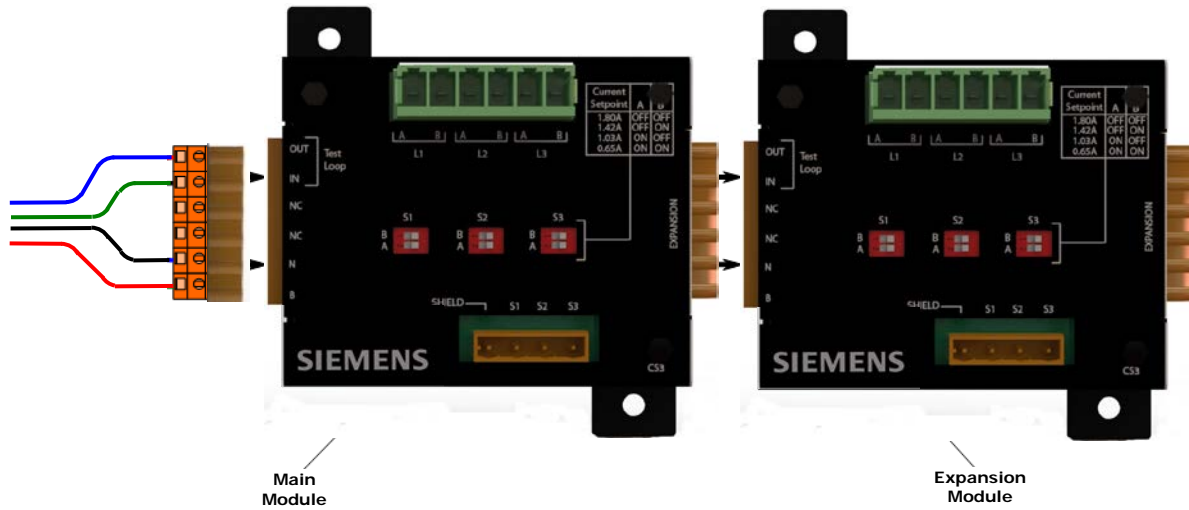


Figure 2-7 Current Sensor Module Expansion

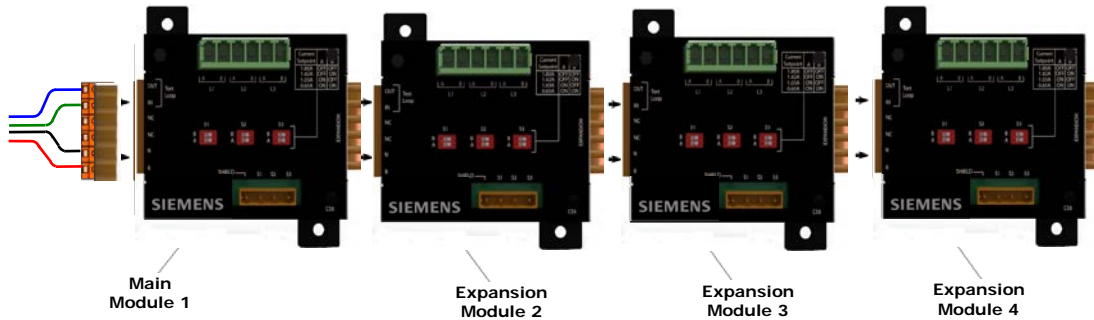


Figure 2-8 Multiple Expansion Modules (10 maximum)

2.1.5 Threshold Settings

The current sensor module has adjustable threshold settings for each input. The settings are adjusted via DIP switches located on the front of the unit. The DIP switch settings are shown in Figure 2-9.

WARNING

IT IS THE RAILROAD'S OR AGENCY'S RESPONSIBILITY THAT THE INSTALLATION IS FULLY OPERATIONALLY TESTED TO ENSURE SAFETY. SYSTEM OPERATION MUST BE VERIFIED PRIOR TO PLACING SYSTEM IN SERVICE.

WARNING

UNDER LIMITED CONDITIONS, LOW VOLTAGE FOREIGN ENERGY MAY TRIGGER A CURRENT SENSOR. WHEN THIS OCCURS, THE CURRENT SENSOR INDICATES THAT THE LAMP IS LIT EVEN THOUGH IT IS NOT. THIS HAZARD OCCURS MOST OFTEN WHEN USING INCANDESCENT LAMPS.

TO AVOID THIS HAZARD, USE VOLTAGE SENSING COMBINED WITH CURRENT SENSING TO DETECT THE LAMP STATE.

NOTE

± 1.03 Amps is the recommended setting for standard lamps and is the factory default setting. The ± 0.65 Amps setting is reserved for future use.

NOTE

Ensure the threshold setting is set for **ALL** outputs.

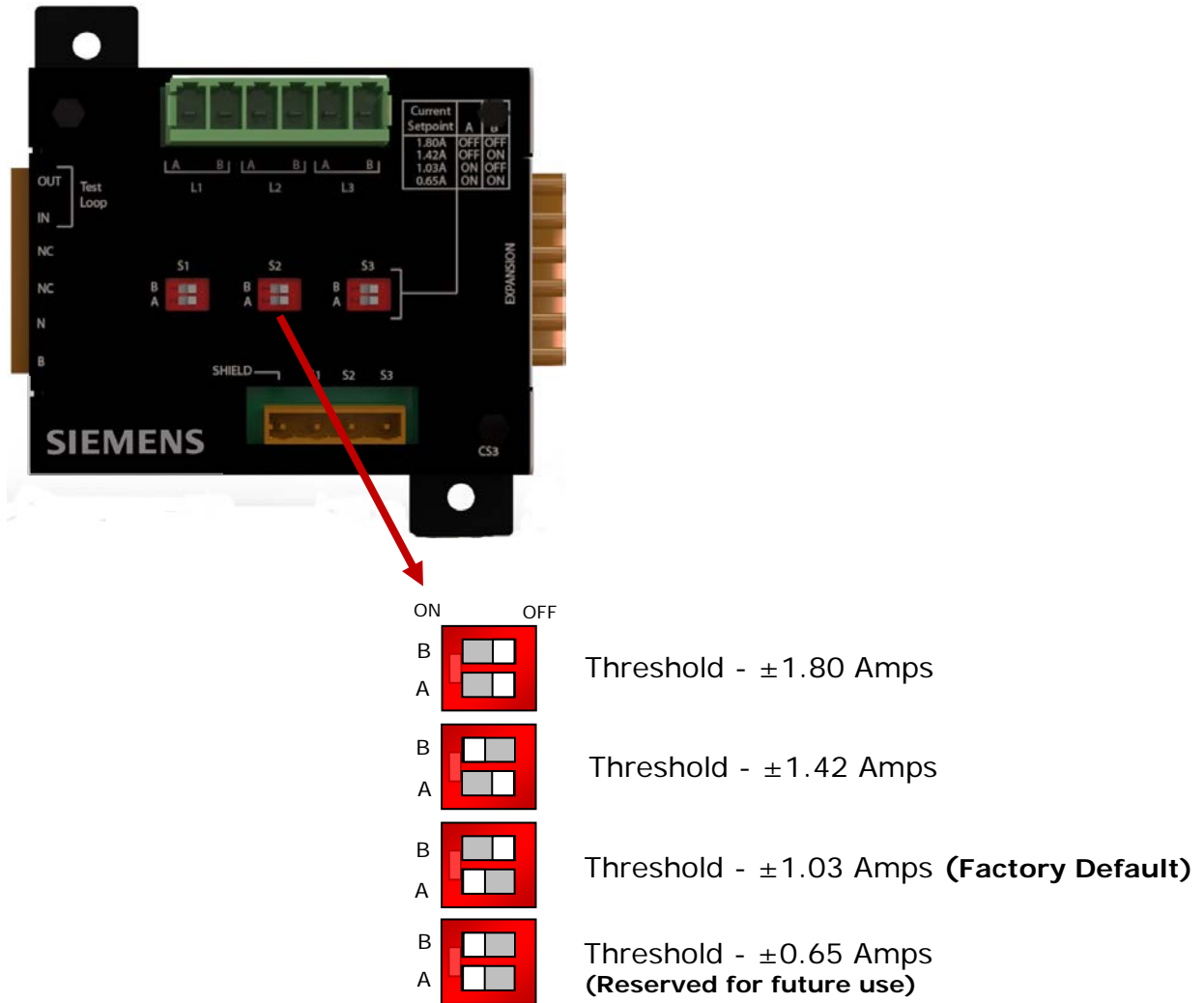


Figure 2-9 Threshold Settings

2.1.6 Example Installations

An example installation of a current sensor is shown in Figure 2-10 below. The installation includes a current sensor module and an expansion module. Six current sensor adapters are installed to provide the six lamp current to the sensor modules. Six surge suppressors are installed to protect the equipment from power and lightning surges. The current sensor modules are fed into an Siemens Mobility, Inc. VIU 16i that will supply data to a network via hardwire or data radio.

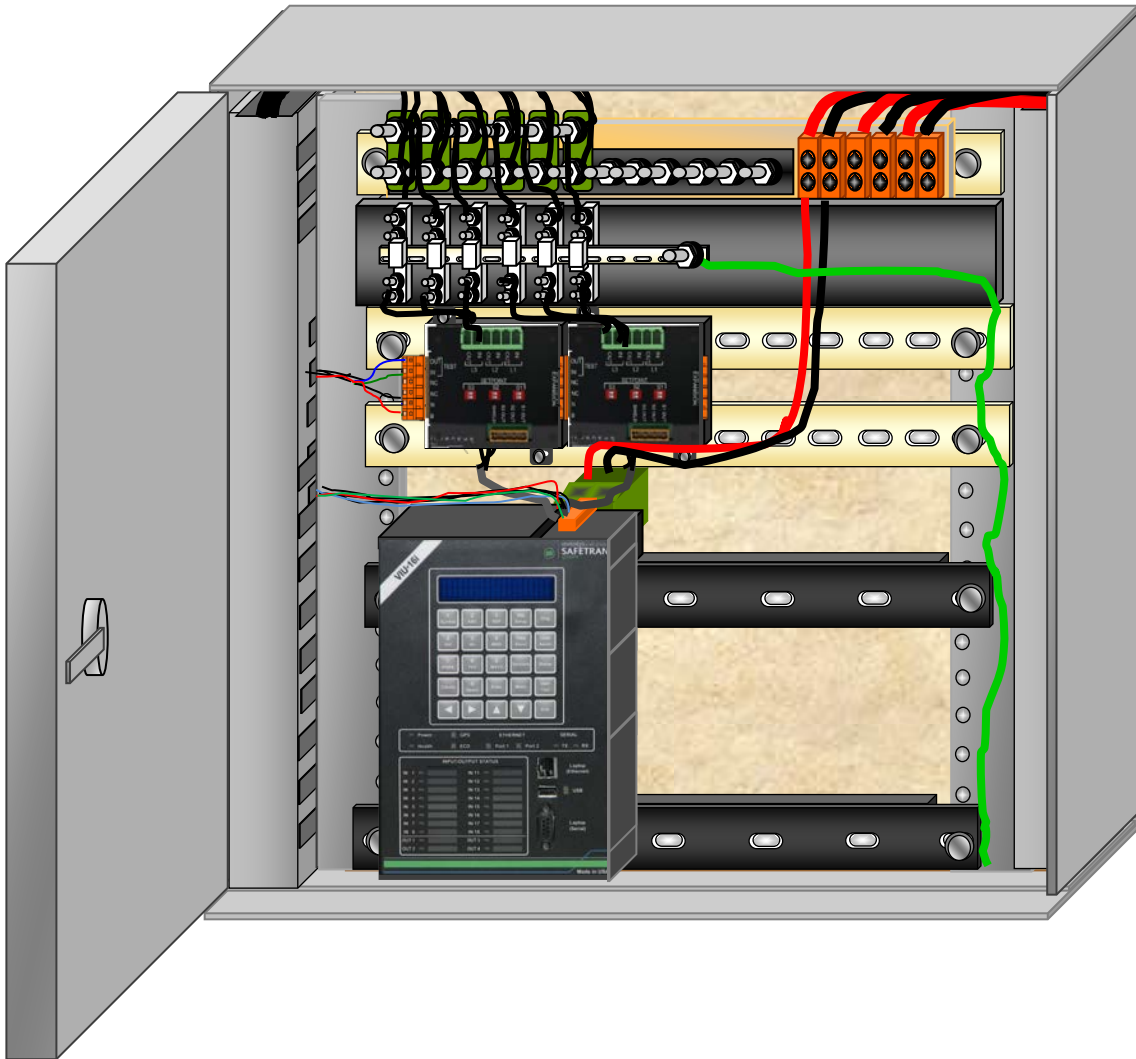


Figure 2-10 Example Current Sensor Installation

An example drawing of a current/voltage sensing installation where current sensing is used on the lamp common and voltage sensing is used on the individual signal lamps is shown in Figure 2-12. The Siemens Mobility, Inc. VIU and surge suppression equipment is used in the installation.

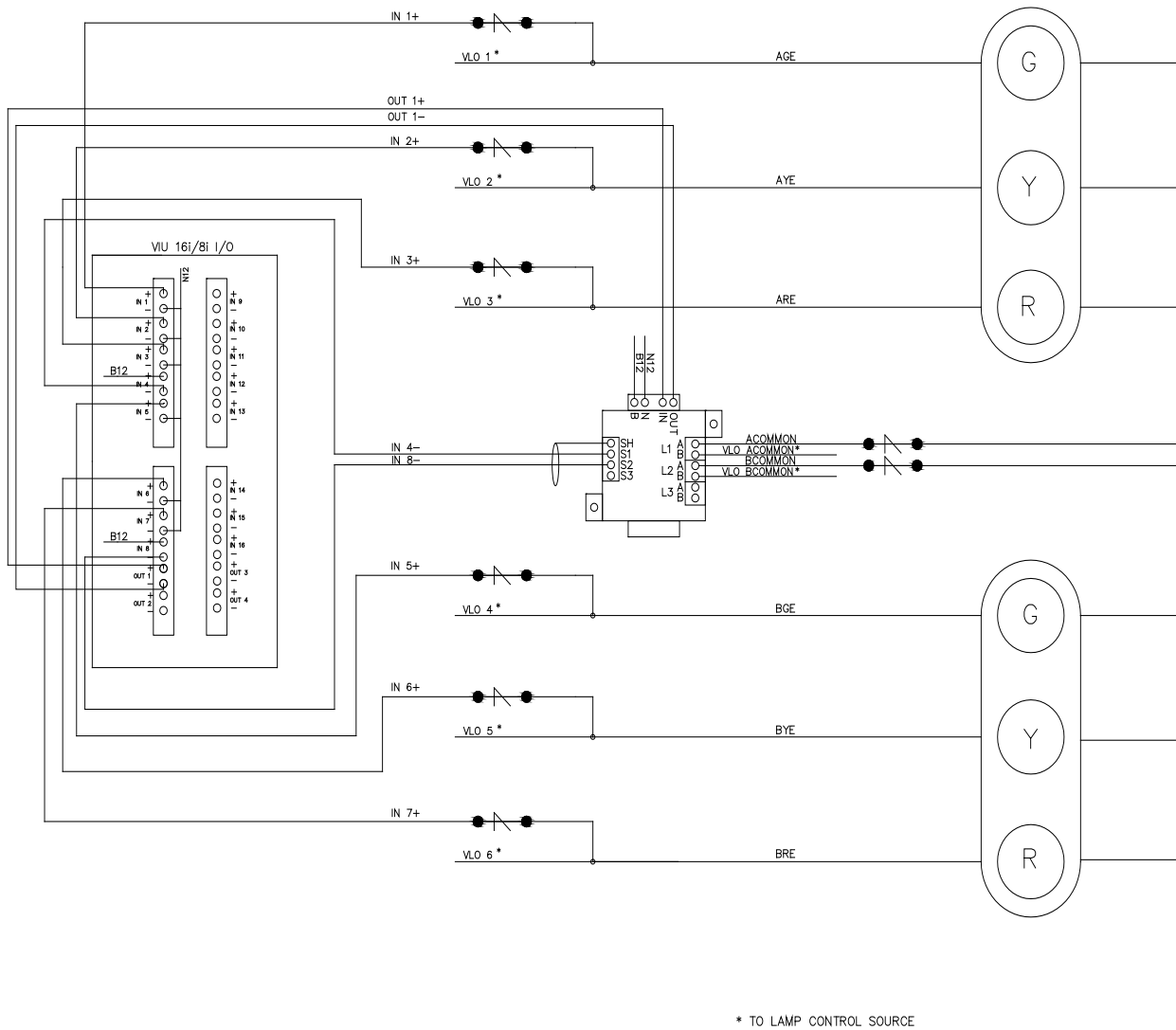


Figure 2-12 Example of Current/Voltage Sensing

SIEMENS

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