

ICS

Intelligent Circuit Sensor

Installation and Instruction Manual



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Warnings, Cautions, and Important Information

DANGER

THE EQUIPMENT COVERED IN THIS MANUAL SHOULD BE HANDLED, INSTALLED, AND MAINTAINED BY TRAINED PERSONNEL ONLY. IMPROPER HANDLING, INSTALLATION, OPERATION OR MAINTENANCE OF THIS EQUIPMENT MAY CAUSE IMMEDIATE HAZARDS WHICH WILL LIKELY RESULT IN SERIOUS PERSONNEL INJURY OR DEATH.

WARNING

The equipment covered by this publication must be handled, installed, operated and maintained by qualified persons who understand any hazards involved and are thoroughly trained in the handling, installation, operation and maintenance of high voltage transmission and distribution equipment. These instructions are meant for only such **Qualified Persons**. They are not intended to be a substitute for adequate training and experience in safety procedures for this type of equipment.

A **Qualified Person** is one who is trained in and has skills necessary:

- to develop and implement a proper rigging, lifting, and installation plan along with all safety precautions required to insure safe and proper lifting and installation of the equipment.

The user accepts that this instruction book has general suggestions regarding lifting, handling, and installation of this equipment. The user takes full responsibility and warrants they have the expertise in handling this equipment and fully indemnifies Southern States LLC for any incidents related to the handling and installation of this equipment by the user, their employees, contractors or any other third parties.

- to distinguish between energized and non energized parts
- to determine proper approach distances to energized parts
- to determine proper approach to energized or de-energized equipment that may be pressurized with gas
- proper use of personal protective equipment, insulating and shielding materials, insulated tools for working near energized and /or pressurized electrical equipment
- Knowledge of special purpose equipment that may be unbalanced, pressurized or may have other special attributes that require precautions in handling, installation, operation and maintenance

The instructions in this manual are general guidelines for this type of equipment and not specific to the equipment supplied. Portions of it may not be applicable or may not have complete instructions for your specific equipment.

If you do not understand any part of these instructions or need assistance, contact Southern States Service Division at 770-946-4562 during normal business hours (EST) or 770-946-4565 after normal business hours.

This Device complies with Part 15 of the FCC rules. Operation is subject to the following two conditions:

1) This device may not cause harmful interference, and 2) This device must accept any interference received, including interference that may cause undesired operation.

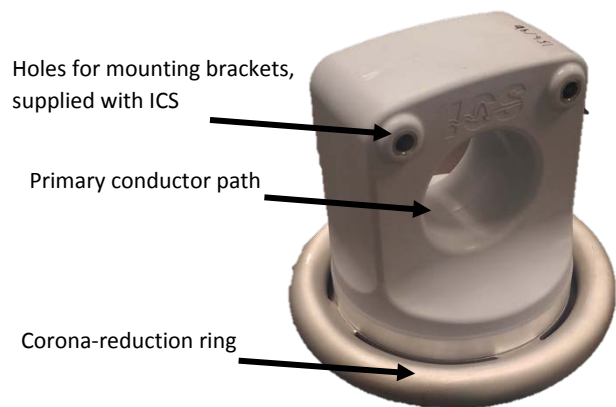
The Grantee is not responsible for any changes or modifications not expressly approved by the party responsible for compliance. Such modifications could void the user's authority to operate the equipment.

System Overview

The purpose of the ICS is to measure high-voltage power system data (e.g. current and voltage), digitally transmit that data via a local RF connection to the ground, where it is analyzed and acted upon. The ICS system is comprised of a **Sensor Module**, a **Receiver Module**, an **Interface Module**, and an optional **Analog Output Module**. Each Module plays an important role in the system and is described below.

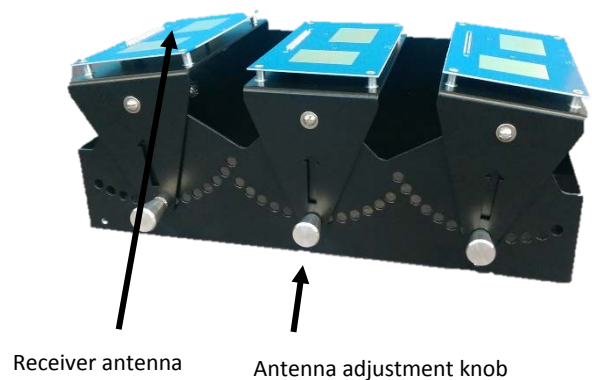
Sensor Module

The **Sensor Module** measures line current and voltage and transmits the data to the **Receiver Module**. Each **Sensor Module** has redundant power supply, measurement, and radio circuits to ensure maximum reliability.



Receiver Module

The **Receiver Module** receives data from three **Sensor Modules** and converts that data into a digital format that may be used by the **Interface Module**. The **Receiver Module** allows the user to adjust the three receiver antennae in order to maximize the received signal strength from each **Sensor Module**.

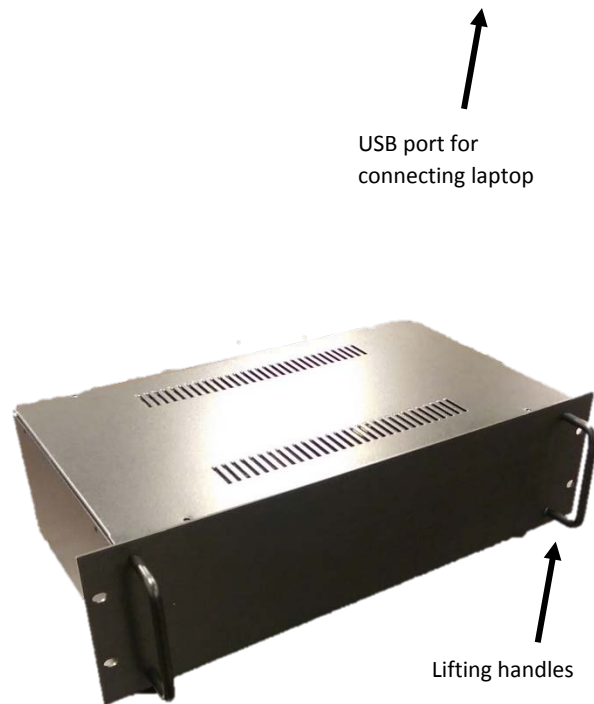


Interface Module

The **Interface Module** receives digital data from the **Receiver Module** and processes that data for two important functions: 1) user interface to ICS configuration, and 2) optional digital output to **Analog Module**,

Analog Output Module

The **Analog Output Module** receives digital data from the **Interface Module** and outputs that data to the user's other equipment, i.e. protective relays.



Installation

Mounting and Wiring

1. Mount ICS Sensors in line with the primary bus, per engineering drawings. Pay attention to the polarity indicator on the Sensor label to ensure Sensor is installed with the correct orientation.
2. Mount ICS Receiver, Interface, and Analog Modules per engineering drawings.
3. Wire the respective Modules according to appropriate engineering drawings.

Configuration

1. Use the provided network cable to connect a laptop to the Interface module. Or download the Southern States ICS App to connect to the Interface module via Bluetooth. Be sure that the Interface module is powered on properly.
2. Follow the User Interface instructions to configure the ICS.
3. Energize the Bus

Maintenance

The ICS is designed to operate with zero maintenance until end of useful life.

Specifications

Specification	Rating
Minimum Turn-On Current	20 A
Maximum Steady State Current	2,000 A
Maximum Fault Current	40,000 A for 50 milliseconds
Ambient Temperature	-40 C to 100 C
Turn-On Time at 20 A	25 microseconds
Turn-Off Time after Line De-Energizes	20 milliseconds
Latency	16.66 milliseconds
Sampling Rate	1,000 Hz
Radio Frequency Band	2.4 GHz

Troubleshooting

For support, please call the Automation and Sensors Division of Southern States, LLC at 770-946-4562.