Software House

iSTAR Edge G2 Controller
Installation and Configuration Guide

Johnson Controls

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Preface

This guide is designed for experienced security system users. The guide describes procedures for installing and configuring the iSTAR Edge G2 controller.

The guide assumes that you are a certified C•CURE 9000 technician and have already installed C•CURE 9000.

In this preface

Finding More Information

The C•CURE 9000 manuals are available from the Software House Member Center website (http://www.swhouse.com/TechnicalLibrary/TechLibSW.aspx).

You can access C•CURE 9000 Help by pressing **F1** or clicking Help from the menu bar in the Administration/Monitoring Station applications.

Software House Customer Support Center

Technical Support Portal

The Technical Support Portal provides articles, technical documents, and tips to install and use Software House products.

Qualified Integrators can register to access the Technical Support Portal at http://www.swhouse.com. Click **Support** and select **Support Portal** to access the Support Portal log in page.

The email address you use to register for access to the portal must be the same one you used for the certification course.

If the request is approved, log in credentials are emailed twenty-four to forty-eight hours after received.

Telephone Technical Support

During the period of the Agreement, the following guidelines apply:

- Software House accepts service calls **only** from employees of the Systems Integrator of Record for the installation associated with the support inquiry.

Before Calling

Ensure that you:

- Are the Dealer of record for this account.
- Are certified by Software House for this product.
- Have a valid license and current Software Support Agreement (SSA) for the system.
- Have your system serial number and certification number available.

Hours	Normal Support Hours	Monday through Friday, 8:00 a.m. to 8:00 p.m., EST. Except holidays.
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- Costa Rica: + 506 4000-1655
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Overview

This chapter provides an overview of the iSTAR Edge G2 features and specifications.

This guide assumes you are a certified dealer or installer who has attended iSTAR Edge G2 training and that you are familiar with networking concepts and hardware installations.

In this chapter:

iSTAR Edge G2 Overview

The iSTAR Edge G2 is a cost-effective, 4-door controller that can be powered using Power-over-Ethernet (PoE/PoE+/PoE++) and is suitable for installation above or near controlled doors. The iSTAR Edge G2 can be clustered with other iSTAR Edge G2 controllers. C•CURE 9000 v2.80 SP2 or newer is required for the iSTAR Edge G2.

Main Features and Specifications

The iSTAR Edge G2 includes the following features and associated specifications.

Processor

- iMX7 Processor.

Storage

- 2 GB of RAM.
- 16 GB of onboard flash memory.

NOTE Refer to the card storage capacity calculator on www.swhouse.com for precise card storage capacity.

Power

The iSTAR Edge G2 is powered by a UL 603 or UL 2610 External Power Supply, such as the Software House apS or a Power over Ethernet (PoE/PoE+/PoE++) injector with a UL listed surge protector, evaluated to UL 1449. The iSTAR Edge G2 can automatically determine whether it is running on 12 VDC or 24 VDC power.

- Provides power to relays:
  - The PoE+ /PoE++ module must be configured to supply 24VDC. Relays can still be configured for 12VDC or 24VDC. Relays are configurable as wet or dry by jumper.
  - Wet relays provide current at main input voltage.
  - Wet relays are limited to 0.75A (at 12 or 24VDC).
  - Dry relays are limited to 3.0A (at 12 or 24VDC).
- If external power is lost, data is written to the onboard flash memory and the system is shut down.

NOTE Full backup operating power is not supplied by the board. Use apS, external UPS, or back up the Power Sourcing Equipment in your PoE system to ensure backup power can be supplied.

Table 1: iSTAR Edge G2 Power Ratings

Product	Circuit	Voltage	Current
Edge G2 Series	Input		
	DC input	12 or 24 VDC	5A
	PoE/PoE+ Input	--	2A
	PoE/PoE+/PoE++ Input	--	2A
			2A
	Output		
	Wiegand (2 provided)	12 VDC	750mA each
	RM/RS485 (4 provided)	12 VDC	1.2A each
	Relay (configured for wet)	12 or 24 VDC per input voltage	750mA each
	Relay (configured for dry)	30 VDC	3A inductive
	Aux Power (2 provided)	12 VDC	350mA combined

NOTE
- When powered by 12/24VDC, total output is limited to 4.5A combined.
- When powered by supported PoE injectors, total output is limited to 2A combined.
- To source 24VDC the Edge G2 must be powered by 24VDC.

Readers

- x2 Wiegand connectors are included.
- x2 RMs can be configured to provide 4 Wiegand connectors.
- x4 RM serial ports are included on 2 modules (Port 1 and 2 support full duplex mode).
- Readers can be any combination of 2 Wiegand ports and/or RMs on any of the 4 serial ports (the same type of reader must be used on the same port).

Table 2 shows the maximum ratings for iSTAR Edge G2 Wiegand direct reader ports.

Table 2: iSTAR Edge G2 Wiegand Port Rating

Port	Rating
Reader output control (red, green, yellow, beeper)	Low = 0V to 0.8V High = 4.0V to 5.25V 20 mA maximum
Reader input data lines	Low = 0V to 0.8V High = 4.0V to 5.25V
Reader output voltage	+12 VDC
Reader current	Wiegand reader current is 750mA per port. AUX power is 350mA total for the two connectors provided.

I/Os

NOTE Power limit of the port cannot be exceeded when configuring the ports.

- x8 general purpose inputs.
- x4 general purpose relays.
  - Dry or wet contact settable per relay by jumpers.
- x8 I8s and x8 R8s can be configured on any of the 4 RM ports.
- Special purpose inputs:
  - Tamper (from enclosure door).
  - Main AC fail (from aPS).
  - Low external battery (from aPS).
- Large standard two-piece terminal blocks.
- x4 RM serial ports.
- x2 USB (Type A) host ports.

Communications

- x2 Ethernet ports (10/100/1000) - x1 port with PoE.
- Full 256-bit AES (FIPS 197 encryption).
- iSTAR Edge G2 can only cluster with other iSTAR units supporting TLS v1.3.

Onboard Controls

- LCD with backlight for diagnostics.
- Rotary switch for diagnostics.
- LEDs for serial, Ethernet, power, and relay state.
  - x2 power LEDs - 1 is on when the enclosure door is closed and 1 indicates the controller is powered.

NOTE Relay activation LEDs state is not affected by enclosure door position. All other LEDs light up when the enclosure door is open.

- Reset button.
- Switches for serial termination of RM ports.
- Jumpers for relay wet/dry control.

Housing

The iSTAR Edge G2 can be mounted in:

- apC/L enclosures.
- GSTAR-CAN enclosures to maintain UL-listing.

Compliance

- FCC, CE, EN50133, UL294, UL1076, UL2610, UL60950 by CB Scheme (International Safety) & RoHS.

Environmental Requirements

Table 3 shows the iSTAR Edge G2 environmental requirements.

Table 3: Environmental Requirements

Status	Range
Operation	32° F (0° C) to 120° F (48.9° C)
Storage	4° F (-20° C) to 158° F (70° C)

Enclosure Dimensions and Weight

Table 4 shows the iSTAR Edge G2 enclosure/can dimensions and weight.

Table 4: Enclosure Dimensions and Weight

Width	12 inches (30.48 x 30.48 cm)
Height	12 inches (30.48 x 30.48 cm)
Depth	4.5 inches (11.4 cm)
Upper Mounting Holes	9 inches (22.86 cm) center to center
Bottom Mounting Holes	10.5 inches (26.67 cm) below the upper mount holes.
Weight	<10lbs (<4.6 kg)

iSTAR Edge G2 Layout

The iSTAR Edge G2 board layout is displayed in .

Table 5: iSTAR Edge G2 Door Map

2
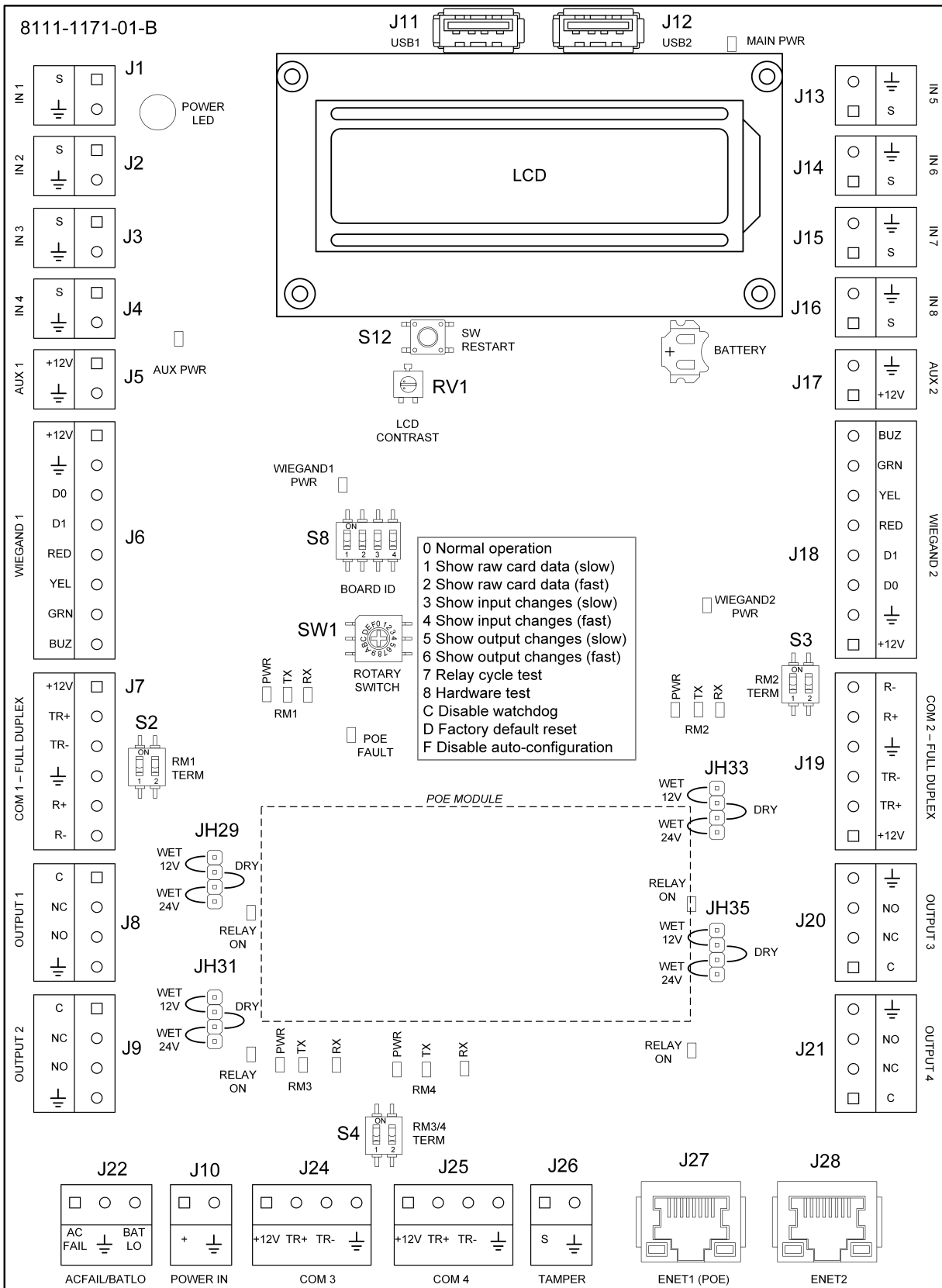
Installation Prerequisites

This chapter provides information on installation prerequisites for the iSTAR Edge G2.

In this chapter

Installation Planning

Check all equipment, power supply, wiring, clearances, and code compliance at the site before proceeding to install the iSTAR Edge G2.

Safety Information

Understand the information in the Life Safety Requirement note below before installing the iSTAR Edge G2.

Life Safety Requirement

- A fail-safe mechanism override must be installed at each card reader exit to allow people to leave the secure area in case of electromechanical device failure.
- Disconnect all power before modifying any jumper settings or wiring within, or to, the iSTAR Edge G2.

Equipment Check

Verify that all contents of the shipped boxes match the packing lists.

NOTE The iSTAR Edge G2 hardware does not include mounting hardware for an installation. Mounting hardware depends upon the site and must be approved by a structural engineer or other certified professional.

Site and Mounting Requirements

Ensure the mounting site has enough space to mount the enclosure and can support the weight of the enclosure. Check enclosure dimensions and weight in the iSTAR Edge G2 Overview.

- Ensure the site has been approved and all wiring complies with UL requirements and any other necessary codes.
- Ensure preliminary site work is complete.
- Ensure an appropriate power supply is accessible.
- Ensure the site is clean and free of dust or other contaminants.

Power Requirements

Ensure there is adequate power before installation by calculating the total power requirements of the iSTAR Edge G2 and its related hardware. Add the total current power for all component in the system (modules, relays, optional modules, readers, and wire resistance) to determine the total power requirement.

Table 6 displays the power requirements of the iSTAR Edge G2 components and attached boards.

Table 6: Components and Board Requirements

Component/Board	Current Draw at 12VDC
iSTAR Edge G2	500mA at 12VDC with LCD- no load 200mA at 24VDC with LCD- no load
RM-4 Board	80 mA without LCD - no load 180 mA with LCD - no load
RM-4E Board	125 mA - no load
I/8 Board	125 mA - no load
R/8 Board	150 mA - no active relays Add 20 mA per active relay
RM-4 boards have only been evaluated by UL with RM Series Readers. RM-4E boards have only been evaluated by UL for use with the RM-DCM-2 enclosure.	

For more information on iSTAR Edge G2 power requirements and voltage compatibilities, see Chapter 4: Power and Backup and the Port Voltage Compatibility on Page 83.

Wiring Distances

The iSTAR Edge G2 supplies 12V at its reader connectors. To determine the maximum wiring distance of a reader from an iSTAR Edge G2, check the voltage that reaches each reader and compare the voltage with the minimum requirements in the Minimum Reader Voltage table.

NOTE	USB connections must be wired within 25ft of the iSTAR Edge G2 to maintain UL compliance.

Table 7: Minimum Reader Voltage

Reader	Minimum Voltage
RM Series Reader or RM-4 board	7.5 V
RM-4E	11 V

If the voltage does not meet the minimum requirements for the reader, shorten the wire length, use a heavier gauge wire, or add a UL294-listed power-limited power supply. Refer to the wire resistance table to assist in choosing a different gauge of wire.

Table 8: Wire Resistance

Wire Gauge (AWG)	Resistance per 1000ft
24	26 Ohm
22	16.5 Ohm
20	10.2 Ohm
18	6.5 Ohm

NOTE   Number of devices on the bus, current draw of each device, wiring length between devices and controller, wire gauge, power supply tolerances, and battery state (for aPS) can impact on the actual voltage reaching the reader.

Host System Requirements

The iSTAR Edge G2 requires a host computer configured as a C•CURE server/host. For more information on hardware and software requirements for C•CURE, see the *C•CURE 9000 Installation and Upgrade Guide*.

Grounding Requirements

Ensure the iSTAR Edge G2 controller is connected to an earth ground at the ground stud in the cabinet using 16 AWG, or larger, wire. Ensure that the shield wires are also grounded to the nearest earth/ground connection at one end of the cable.

NOTE   When servicing, disconnect the ground wire last in order to provide maximum protection to the equipment and personnel from electrical current.

Installing the iSTAR Edge G2

The section describes how to install the iSTAR Edge G2 enclosure.

Mounting the Enclosure

The iSTAR Edge G2 module must be installed in a GSTAR-CAN to maintain UL listing.

NOTE	The system must be installed indoors within a protected premises in accordance with the National Electrical Code (NFPA70), and relevant local authority regulations. The iSTAR Edge G2 must be permanently wired to mains electricity without switches that could interrupt the power supply.

1. Ensure that the mounting site has been prepared. A certified installer or structural engineer should verify the upper mounting points.

2. Unpack the components while observing static electricity precautions.

3. Remove the appropriate knockouts for all wiring inputs and outputs.

4. Remove the enclosure door and place it on a soft surface.

5. Align the keyhole mounting slots at the upper back of the enclosure with the two upper mounting screws and lower the enclosure into position.

6. Install the two bottom mounting screws.

7. Attach conduit couplings to the knockout openings as needed to comply with local and national codes or regulations.

8. Reattach the enclosure door ensuring that any wires are not pinched by the door.

Network Topology

This chapter provides an overview of iSTAR Edge topology and configuration options. iSTAR Edge G2 configurations vary according to site requirements.

iSTAR Edge G2 supports communications over 10/100/1000 Base-T Ethernet networks using TCP/IP.

In this chapter:

LAN and WAN Configurations

The TCP/IP protocol transfers data across several networks. iSTAR Edge G2 controllers uses the TCP/IP protocol to communicate with each other within a LAN or across a WAN network.

Figure 1: Sample iSTAR Edge G2 network
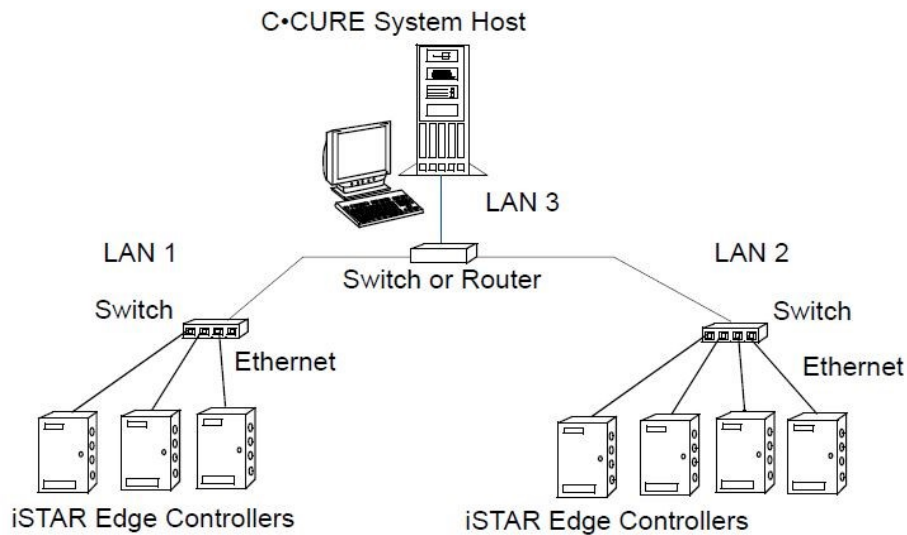
Gateways and Firewalls

iSTAR Edge G2 configurations provide access to remote C•CURE systems across firewalls and Network Address Translators. This is because the master controller automatically accepts a translated IP address if one is assigned from a remote host, or from an attached Network Address Translator.

Ensure that the correct TCP/IP ports, listed in the C•CURE 9000/iSTAR Ports Assignment Document (available on the Software House website) are open and unblocked by any firewall.

IP Management Tools

iSTAR Edge G2 controllers can be configured to accept IP addresses and device names from one of the following:

- Local Dynamic Host Configuration Protocol (DHCP) server.
- Windows Internet Naming Service (WINS).
- Domain Name System (DNS) servers.

DHCP servers simplify IP management by automatically distributing an IP address to clients when they broadcast to the DHCP server. DHCP servers can manage a range of IP addresses. WINS and DNS servers compliment DHCP address assignment by providing name-to-IP address mapping.

Using NetBIOS and Fully Qualified Domain Names

Configurations where IP addresses are subject to change (leased DHCP addresses, for example) can connect to the C•CURE system using the NetBIOS or fully qualified domain name (FQDN). The configuration must contain a WINS or DNS server, for name/address resolution.

If you are not using DHCP, use the iSTAR Web Page to configure NetBIOS and FQDNs. If you specify a NetBIOS or FQDN name for a C•CURE host, you must also use the iSTAR Web Page to supply the IP addresses of the DNS or WINS server.

Local Address Management

You can maintain local address management by configuring the iSTAR Edge G2 with locked IP addresses. Locked IP addresses retain the iSTAR Edge G2 address that is specified locally or by a local Dynamic Host Configuration Protocol (DHCP) server.

If you use locked IP addresses the iSTAR Edge G2 will only communicate across gateways using the configured IP address and translated addresses are not accepted.

| NOTE | Before locking an IP address, ensure it is not subject to translation and is accessible locally. |

The example displayed in shows a locked iSTAR Edge G2 configuration. The System Manager configures this cluster from the branch office.

1. Use PING to check communication to the exposed (translated) IP address from the Corporate Office.

2. Use the iSTAR Web Page to configure the master controller and lock the exposed C•CURE address.

3. Use the iSTAR Web Page to configure the member controllers and lock the local subnet address.

| NOTE | ICU is only used as a discovery device. Use the iSTAR Web Page to configure and setup your iSTAR Edge G2. |

Figure 2: Locked iSTAR Edge G2 Configuration Example
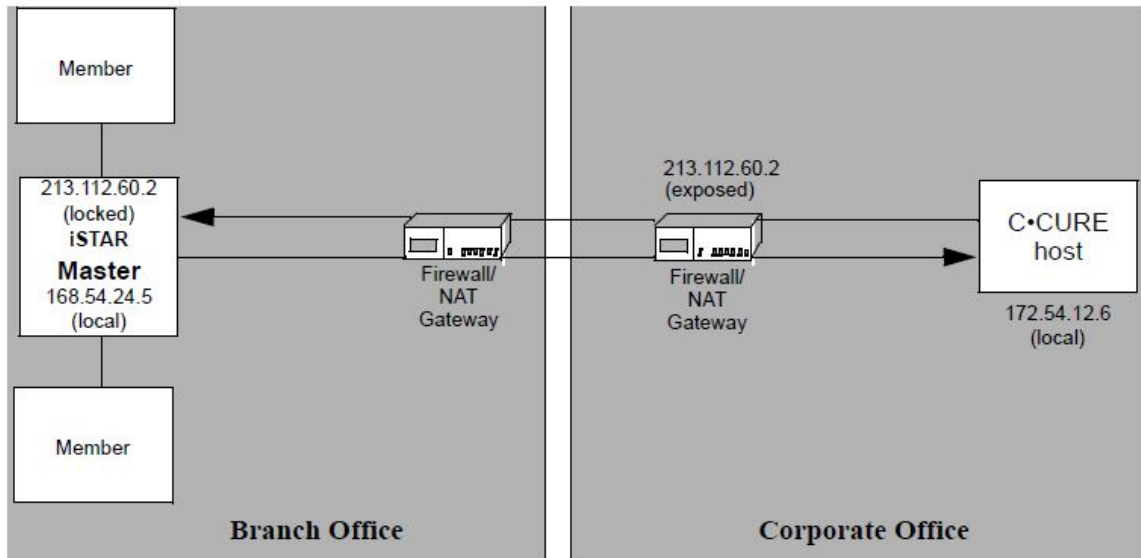
Cluster Configurations

iSTAR Edge G2 controllers use cluster configurations to distribute information and control actions to connected components without host intervention. iSTAR hardware in cluster configurations can perform many actions locally and share information with other cluster members even when the controller is not communicating with the host (for example, during a communications failure).

iSTAR controllers must belong to a user-defined group called a cluster. Clusters can contain 1 to 16 controllers with one of the controllers designated as the Master. The Master acts as a relay agent to the Host for all controllers in the cluster. There are two different types of clusters based on whether the data transfers are encrypted. Encrypted clusters employ the Advanced Encryption Standard (AES) utilizing 256-bit FIPS-197.

> **NOTE** iSTAR Edge G2 controllers must be used within a TLS 1.3 encrypted cluster.

Master and Member Configuration

Each cluster has one controller that serves as the master. All other controllers in the cluster are cluster members. The master manages all communications between the cluster and a C•CURE host computer.

Cluster members can communicate with each other via the master, over an Ethernet network. Cluster members cannot communicate with each other directly. In Cluster Member Communication figure, the diagram on the left shows how cluster member A communicates with the host via the master. The diagram on the right shows how cluster member A communicates with cluster member B via the master.

Figure 3: Cluster Member Communications
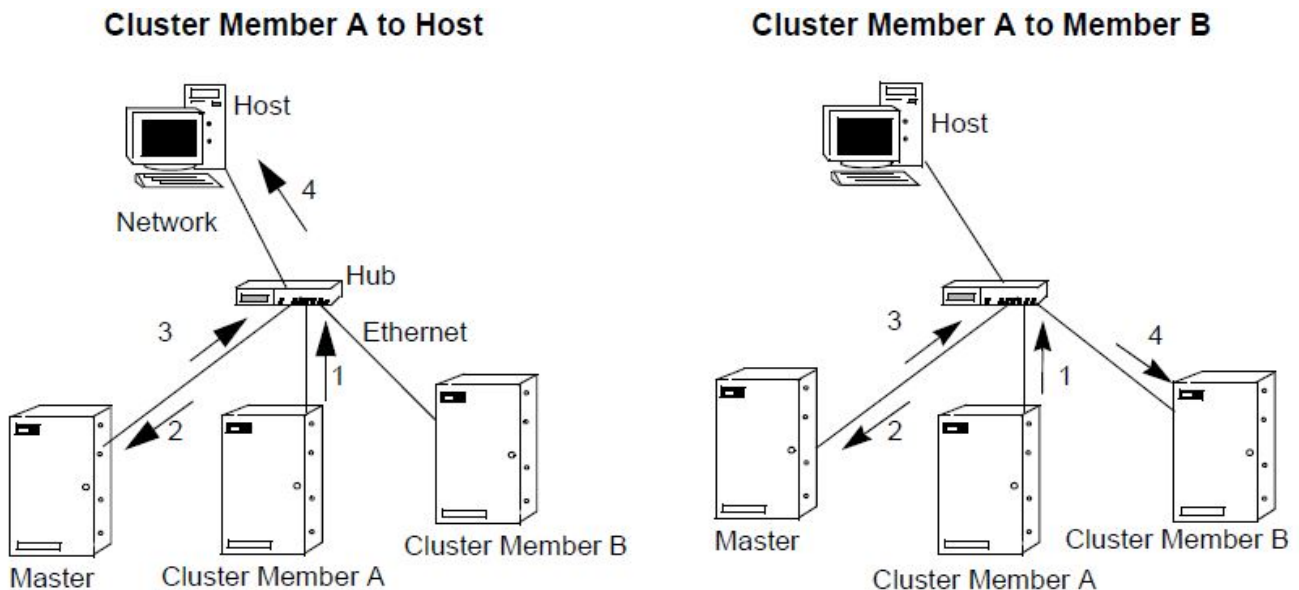
Single Master Configurations

To ensure continuous connection, the iSTAR Edge cluster can communicate with C•CURE using a primary and optional communication secondary path, configured on a single master controller.

The Single Master Configuration figure, below, shows primary and secondary communications using a single master.

Figure 4: Single Master Configuration
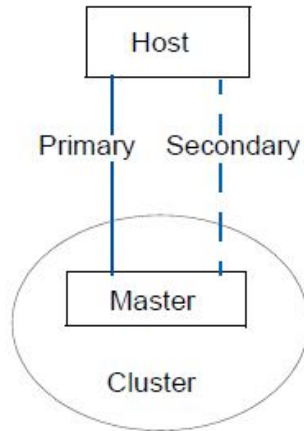
| NOTE | For UL listed products, UL has only evaluated the Primary communications path. |

Table 9 on Page 26 table, below, shows the configuration options for clusters that provide communication using a single master controller.

Table 9: Supported Communications Paths for Single Master Cylinder

Primary	Secondary
Network	None
Network	Network

Adding Controllers to the Cluster

Follow these guidelines when adding iSTAR Edge G2 controllers to a cluster.

- A controller must be assigned to a cluster before the controller can communicate with the host, master, or other controllers.

- Use the Cluster window in the C•CURE System Administration Application to add controllers to a cluster. When added to a cluster, the controller becomes a cluster member.

- One controller can comprise a cluster. You can configure a controller as its own cluster by configuring a cluster that includes only the controller and specifying that controller as the master.

- A cluster member communicates with other cluster members through the master.

- A cluster communicates with the C•CURE host via the cluster's primary or secondary path. There cannot be a secondary path to an iSTAR Edge G2 Master.

- A cluster communicates with other clusters and with apC panels via the C•CURE host.

- A cluster can communicate with the C•CURE server across a WAN. You can configure clusters that are spread across WAN topologies.

Communications Path

The master controller connects to the host over a primary communication path.

Primary Communications Path

The primary path is the first communication path that clusters use to establish communications with the host. The master is the only controller in a cluster that passes messages between the host and cluster members. Cluster members do not communicate with the host directly; they communicate with the host through the master. Connections are established in the following bottom-to-top order:

- Cluster members are responsible for establishing connections with the master.
- The master is responsible for establishing a connection with the host.

Figure 5 shows the primary path for cluster member A and the master/host connection type is a network.

Figure 5: Primary Communication Path
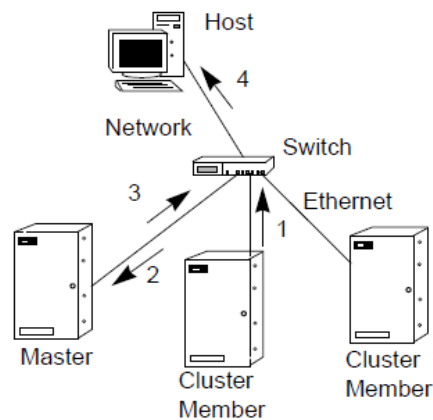
Primary Communications Guidelines

Follow these guidelines when configuring a primary path:

- Every cluster must have a master.
- Only one master is allowed per cluster.
- If a cluster contains only one controller, that controller is the master.
- Any controller in a cluster can be designated as the master.

Planning Primary Communications

Configuring a primary communication path involves:

- Specifying a master for the cluster.
- Specifying a communication method between the master and the C•CURE host.
- Specifying connection parameters for establishing and maintaining the primary path.

4

Power and Backup

This chapter gives information on powering, and backing up, the iSTAR Edge G2.

In this chapter

Power Input

The following are the iSTAR Edge G2 power input options.

12/24 VDC

The iSTAR Edge G2 can be powered by a UL 603 or UL 2610 External Power Supply, such as the Software House apS, for 12/24 VDC input. The iSTAR Edge G2 automatically determines whether it is running on 12 VDC or 24 VDC power.

Normal operating ranges are:

- 12V operation: 10.2 V to 14.4. V (-15/+20%)
- 24V operation: 20.4 V to 30.0 V (-15/+20%)

The iSTAR Edge G2 includes an AC/Mains Fail input and a Low Battery (Batt Low) input.

NOTE   The Tamper, Low Battery, and AC power fail inputs must be enabled and connected to report for compliance with UL requirements. Shielded cable must be used for AC power fail and power supply battery connections.

PoE, PoE+, PoE++

The iSTAR Edge G2 can be powered by a Power over Ethernet (PoE) injector with a UL listed surge protector, evaluated to UL 1449. The iSTAR Edge G2 automatically senses if a PoE module is attached and is visible to the user in the Status Tab of the iSTAR Edge G2 Controller Editor in C•CURE.

For a UL certified installation, a PoE module should be used with a UL 294 listed injector.

NOTE   When powering by PoE, PoE+, or PoE++ ensure the jumpers on the PoE board are set to 24 VDC input. Ensure the iSTAR Edge G2 is powered off before installing or removing a PoE module.

PoE splitters can be installed directly to CAT5/6 cabling to reduce installation costs. If spare PoE/PoE+/PoE++ ports are not available in the system, PoE injectors can be used at the source of the CAT5/6 cable.

Power Output

iSTAR Edge G2 has various ways of providing power to external devices. Table 10 displays information on power outputs for the different ports on the iSTAR Edge G2.

Table 10: Power Output Capabilities

Circuit	Voltage	Current
Wiegand (x2 provided)	12 VDC	750 mA each
RM/RS485 (x4 provided)	12 VDC	1.2 A each
Relay (configured for wet)	12 VDC or 24 VDC per input voltage	750 mA each
Relay (configured for dry)	30 VDC	3 A inductive
Aux Power (x2 Provided)	12 VDC	350 mA combined

NOTE The total number of peripherals you can connect per port is limited by the power specifications of the port with maximum loading of the board not to exceed 4.5A.

Total combined outputs are displayed in Table 11.

Table 11: Combined Total Power Output Capabilities

Circuit	Voltage	Total Output
DC Input	12/24 VDC	4.5 A combined
PoE Input	-	2 A combined

NOTE
- To source 24VDC the Edge G2 must be powered by 24VDC.
- For measured output ranges see the Port Voltage Compatibility table in the Appendix.

The power budget is modified by inserting the limits of the external DC supply to determine the appropriate equipment that can be attached to the iSTAR Edge G2.

PoE/PoE+/PoE++ power limits

- PoE provides 12.95W with 100 meters of cable between PSE (Power Sourcing Equipment) and iSTAR Edge G2.
- PoE+ provides 25.5W with 100 meters of cable between PSE and iSTAR Edge G2.
- PoE++ provides 60W with 100 meters of cables between PSE and iSTAR Edge G2.
- Cable length is part of the power budget, i.e., a shorter cable increases available power, e.g. PoE+ provides about 10% more power with 50 meters of cable between PSE and iSTAR Edge G2.

USB has the following power limits:

- USB provides 500mA at 5V for each device port. Each port has a resettable fuse meeting the USB standard.

Backup

If the iSTAR Edge G2 loses power, it automatically switches to temporary power from onboard supercapacitors. The firmware will stop all internal processes and writes the current data to the onboard flash memory. The controller then powers down.

5

Controls and Displays

This chapter explains the switches, buttons, jumpers, LEDs, and LCD display on the iSTAR Edge G2.

Visual Indicators

iSTAR Edge G2 contains several visual indicators. See the iSTAR Edge G2 door map in Chapter 1: Overview for more information on the location of the visual indicators detailed below.

NOTE	The iSTAR Edge G2 LCD display and associated diagnostic tests have not been evaluated by UL.

LCD

The LCD display displays status messages and diagnostic information, not access control information.

- Diagnostics are controlled by the rotary switch, SW1.
- LCD display contrast is controlled by the potentiometer, RV1.
- Backlight is on when door is open, off when door is closed, and during power-fail backups.

Common displays are:

- iSTAR boot information
- Firmware version
- Controller status information
- Master Connected or Host Connected
- IP address of Host or Master
- Name of iSTAR Edge G2 and MAC address
- IP address of iSTAR Edge G2
- Member or Master with date and time
- Configured Power and Measured Power
- Cluster Connected or Split
- Indication of whether a DB is restored.
- Diagnostic results

LEDs

The super-bright white Power LED is illuminated when the enclosure door is closed, i.e., when the tamper switch closes. The power LED has varying brightness from 12V to 24V and extinguishes at ~8V.

NOTE	The relay activation LEDs remain active regardless of the state of the enclosure door.

The remainder of the indicators are illuminated when the enclosure door is opened. The LCD backlight and all LEDs other than the power LED and the relay LEDs are under firmware control and are extinguished when the unit detects input power failure and enters sleep mode to minimize power consumption. Table 12 on Page 34 displays the operation of the LEDs.

Table 12: LED Operation

Indicator	Input power good, door closed	Input power good, door open	Input power lost, backing up/sleeping	Input power < 8V	Controlled by
Power LED	On	On	n/a	Off	Hardware
Bright White LED	On	Off	Off	n/a	Firmware
Relay Activation LEDs	On	On	Off	Off	Firmware
All other indicators, and LCD backlight	Off	On	Off	n/a	Firmware
All other indicators, and LCD backlight if configured OFF in host	Off	Off	Off	n/a	Firmware

NOTE

- You can use the C•CURE host to configure the LCD backlight and LEDs to remain off regardless of tamper state.
- The Power LED cannot be turned off through the host.

Table 13 displays the function and designation of each LED.

Table 13: LED functions

LED	Function	Comment
DS22	Main Power - Internal View	Always on if Voltage in > 8V
DS21	Main Power - External View	Super bright White LED, visible from outside of the enclosure when the door is closed. Off when the door is open.
Relay Outputs		
DS17	Output 1 NO Closed	Always on if Voltage in > 8V
DS18	Output 2 NO Closed	Always on if Voltage in > 8V
DS19	Output 3 NO Closed	Always on if Voltage in > 8V
DS20	Output 4 NO Closed	Always on if Voltage in > 8V
Serial		
DS8	RS-485-1 Tx	Off when door is closed
DS7	RS-485-1 Rx	Off when door is closed
DS11	RS-485-2 Tx	Off when door is closed
DS10	RS-485-2 Rx	Off when door is closed
DS14	RS-485-3 Tx	Off when door is closed
DS13	RS-485-3 Rx	Off when door is closed
DS25	RS-485-4 Tx	Power LEDs for each RS-485

| DS24 | RS-485-4 Rx | Power LEDs for each RS-485 |

Onboard Controls

iSTAR Edge G2 provides a number of a onboard controls. See the iSTAR Edge G2 door map in Chapter 1: Overview for more information on the location of the onboard controls detailed below.

Reset Button

The reset button performs a hard reset of the processor and erases the RAM memory. Flash memory, including backups and ICU configuration information, is not erased by pressing the reset button.

NOTE	Use Rotary switch position D to clear flash memory and restore factory defaults.

Switches and Jumpers

Table 14 describes the switches and jumpers on the iSTAR Edge G2 panel.

Table 14: Switches and Jumper Descriptions

Reference	Type	Description
SW1	Rotary	Diagnostics, restore factory default & other options
S1	Pushbutton	Reset
S12	Pushbutton	SW Restart
S2	DIP slide	RM port 1 termination
S3	DIP slide	RM port 2 termination
S4	DIP slide	RM port 3&4 termination
S8	DIP slide	Board ID
JH29	4-pin header	Relay #1 Wet12, Dry ,Wet24 configuration
JH31	4-pin header	Relay #1 Wet12, Dry, Wet24 configuration
JH33	4-pin header	Relay #1 Wet12, Dry, Wet24 configuration
JH35	4-pin header	Relay #1 Wet12, Dry, Wet24 configuration

Rotary Switch

There is an onboard 16 position rotary switch, SW1. Most of the positions are used to control LCD diagnostics. Table 15 on Page 37 details the functions of each switch position.

Table 15: Rotary Switch Functions

Position	Description
0	Normal operation
1	Display raw card data (slow mode)
2	Display raw card data (fast mode)
3	Display input changes (slow mode)
4	Display input changes (fast mode)
5	Display output changes (slow mode)
6	Display output changes (fast mode)
7	Relay cycle test
8	Hardware test Note: There needs to be an active 6.8.1 ICU for this.
9	Not used
A	Not used
B	Not used
C	Disable watchdog
D	Restore Factory Default (reset)
E	Not used
F	Disable auto-configuration

RM Port Termination Switches

Figure 6 on Page 38 shows the RM port termination switches. Each of the RM ports has a switch that controls whether there are 120 Ohm RS-485 termination resistors on the iSTAR Edge G2 end of the RM bus.

Full duplex ports have two termination switches, one for transmission and one for receiving. Half duplex ports have one switch.

Figure 6: Termination Switches
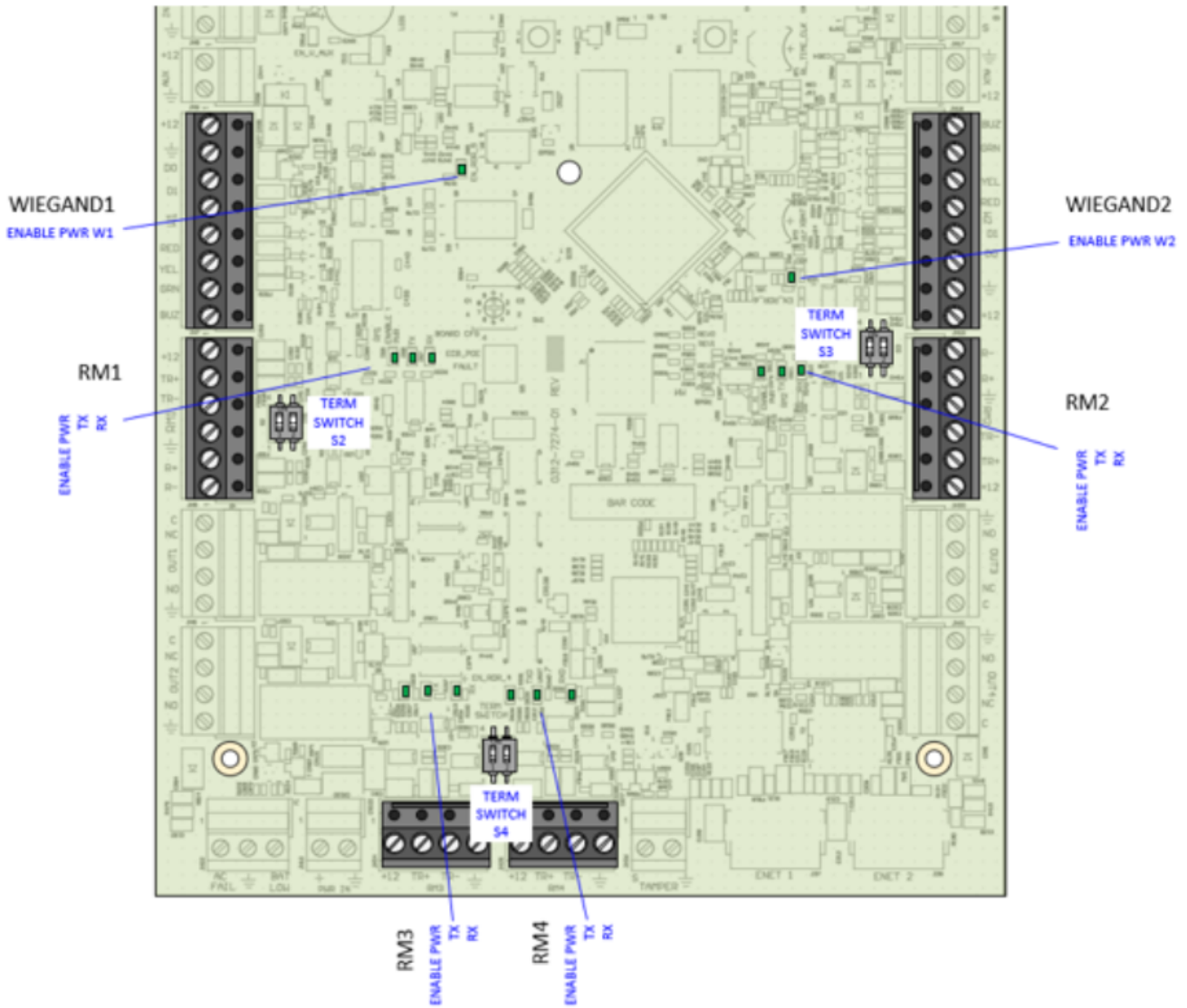
RS-485

RM1 and RM2 are full or half duplex. There is a termination switch for each port:

Position 1	Half Duplex RSTXD	Full Duplex TXD	ON=Termination applied
Position 2		Full Duplex RXD	ON=Termination applied

RM3 and RM4 are half duplex. There is a termination switch for each port:

Position 1	RM3	Half Duplex RXTXD	ON=Termination applied
Position 2	RM4	Half Duplex RXTXD	ON=Termination applied

Each RS-485 port has 3 LEDs to indicate Tx, Rx, and port enabled.

Output Relay (Wet or Dry Jumper)

The four output relays can be Dry or Wet based on the position of the jumpers.

- When Dry the integrator must supply the external power that the relay switches. When set to Dry, use the C, NO, and NC connections.

- When Wet the iSTAR Edge G2 sources the power. When set to Wet, use the GND, NO, and NC connections. Be sure to stay within the power budget when using the Wet setting and powering by PoE.
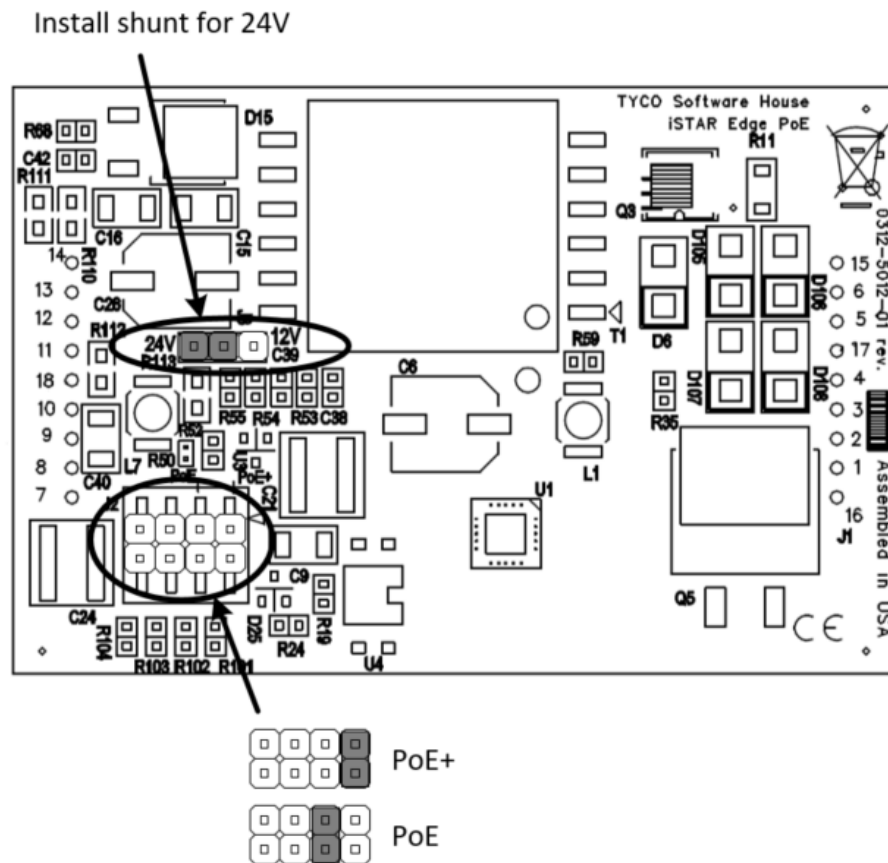
For more information, see Chapter 6: Connections.

PoE / PoE+ Jumpers

Figure 7 displays the jumpers available on the PoE board for PoE or PoE+.

There is also a jumper to select whether the PoE board supplies 12VDC or 24 VDC to the iSTAR Edge G2. The jumper must be configured for 24VDC. For more information, see Chapter 4: Power and Backup.

Figure 7: PoE / PoE+ jumper positions

C•CURE 9000 Status Tab

The C•CURE 9000 Controller Status tab displays information on the following items:

- iSTAR Edge G2 Model
- Installed PoE boards (if installed)
- Other information about the state of the iSTAR Edge G2.

6

Connections

This chapter explains the wiring of various components.

In this chapter:

Connections

iSTAR Edge G2 supports up to 4 readers, 8 I8 boards, and 8 R8 boards. The readers can be any combination of RM readers and direct connect Wiegand signaling devices. There are two Wiegand connectors and four RM ports. The RM readers can use any combination of Ports 1-4, including all readers on one port. The following figures illustrate some typical connection scenarios.

Four Wiegand Readers

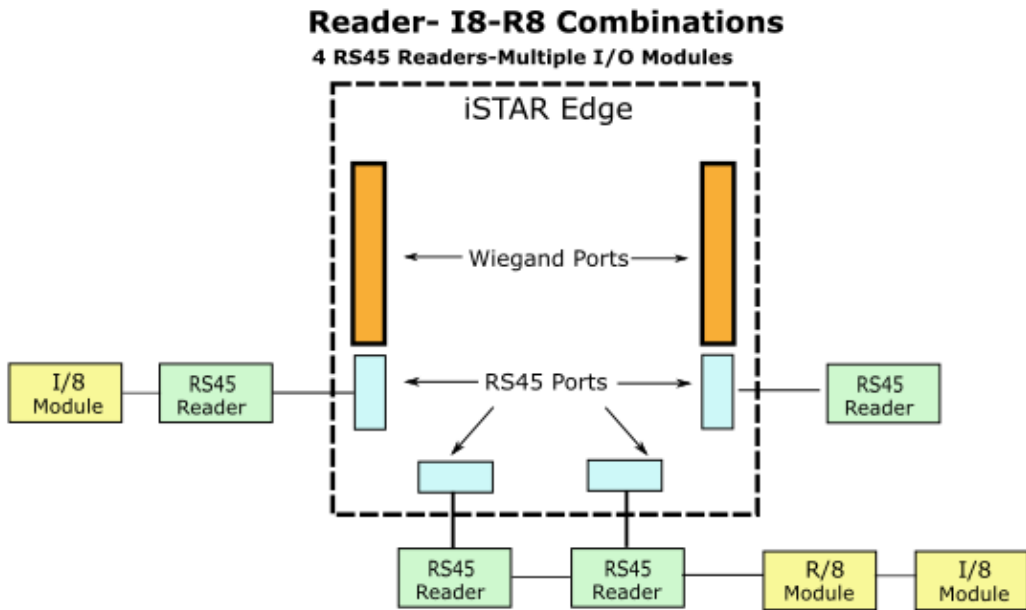displays 4 Wiegand signaling devices with multiple I/O modules.

Figure 8: Wiegand devices with multiple I/O modules
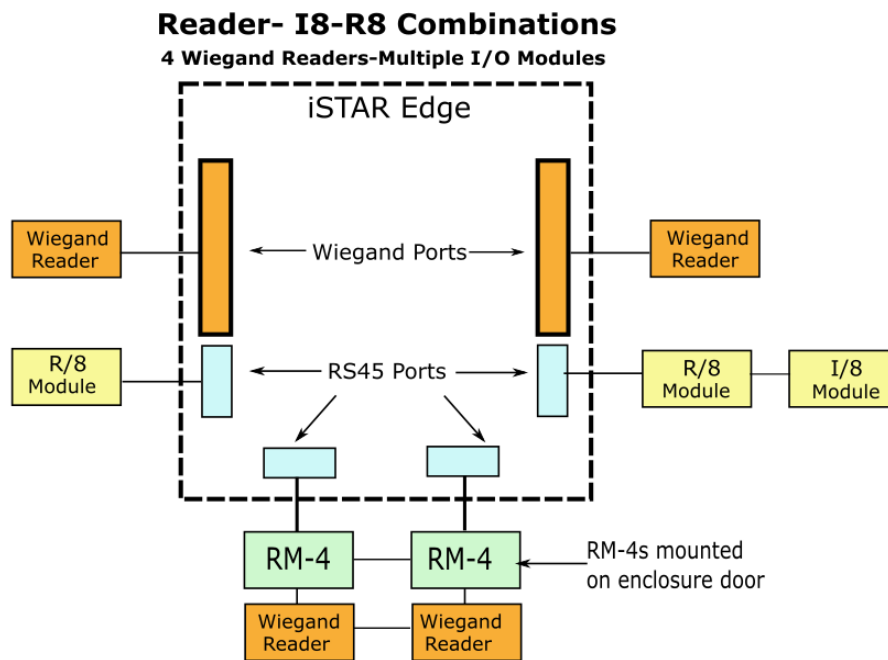
Four RM Readers

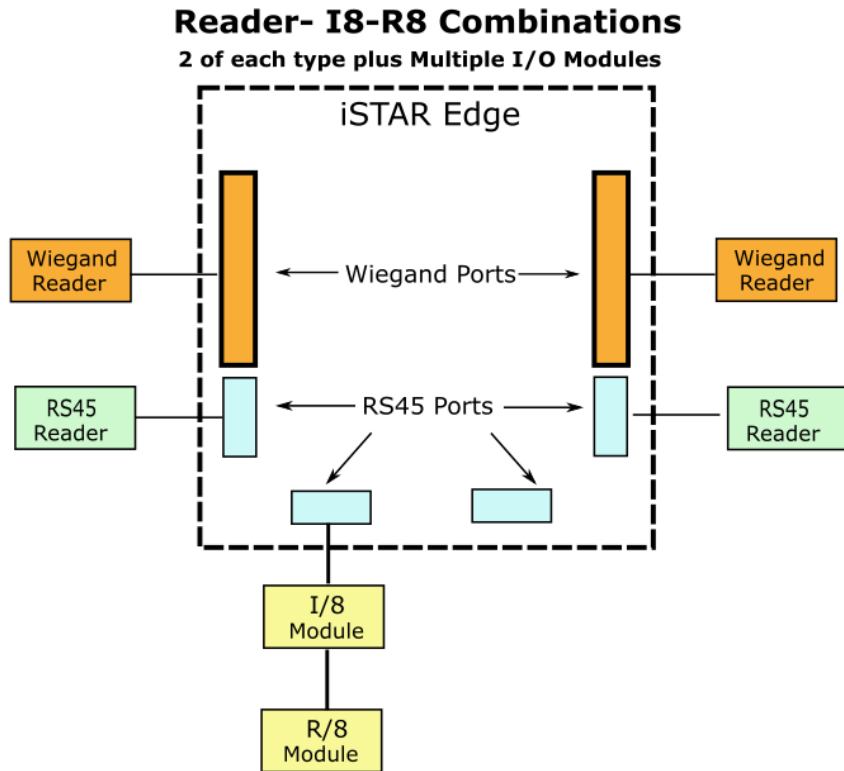Figure 9 shows four RM readers connected to RM1, RM2, RM3 and RM4.

Figure 9: I8-R8 Combinations

Two Wiegand and Two RM Readers

shows two Wiegand readers and two RM readers.

Figure 10: Two Wiegand readers and two RM readers

RM Port Terminators

The four RM ports have an RS-485 Terminator switch that is normally on. You will usually leave these switches in the default position. The RM reader bus is an RS-485 connection that must have terminators at each end of the bus. When the switch is on the iSTAR Edge G2 provides the 120-ohm terminators. The other end of the bus is terminated by a switch in the RM4, RM4E, I8, I8-CSI, or R8.
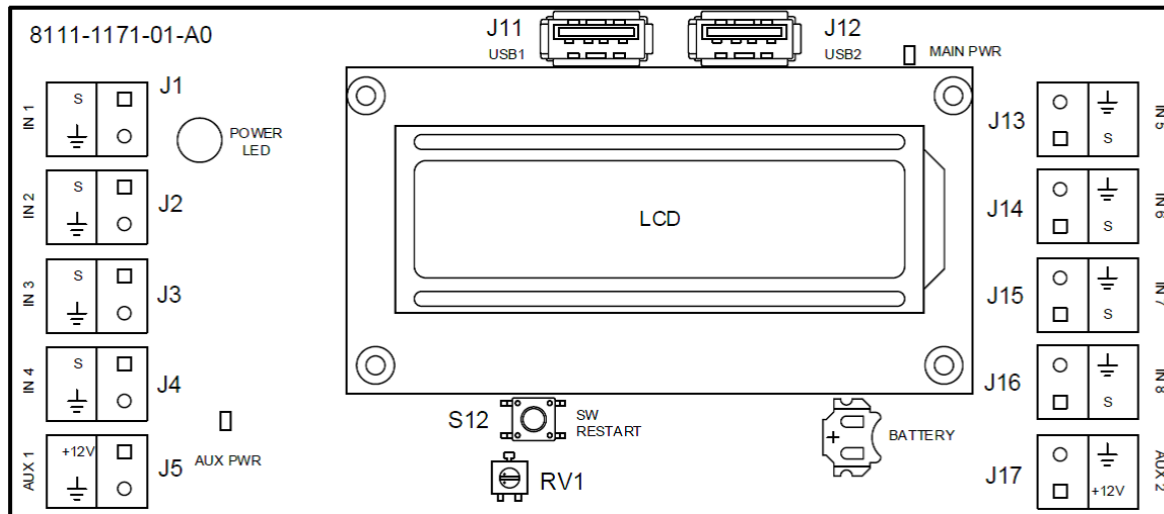
NOTE	In special cases, such as needing a star configuration in four directions, it is possible to turn off the Edge terminator and use a Y type connector from the RM port.

Inputs

There are 8 onboard inputs on the iSTAR Edge G2, shown in Figure 11. Pin 2 of the Input connectors is Ground.

Figure 11: Onboard Inputs

The supervision mode is configured in the host. Supervision modes are listed in Table 17 on Page 46.

Values for resistor configurations are described in terms of NC (Normally Closed) or NO (Normally Open), resistor placement, and supervising resistor value.

NOTE	For UL listed products, burglar alarms must be supervised.

Resistor placement refers to how many EOL (End Of Line) resistors are used and where they are placed in relation to the switch. Settings are described in Table 16.

Table 16: Resistor Settings

Non-Supervised	The user wires no external resistors.
Single EOL	The user wires a single EOL resistor.
Double EOL	The user wires 2 EOL resistors, 1 in parallel, and 1 in series with the switch.

Resistor values are labeled as 1k/5k/10k (in Ohms). In the Double EOL cases, both resistors have the same value.

Table 17: Supervision Mode

Mode	Comment
NO/NC Dual EOL 1K	Wire with Parallel/Serial for NO and Serial/Parallel for NC. • Normal = 1K • NO Alert = 0.5K • NC Alert = 2K NOTE: This the default value, and the traditional Software House method of supervision.
NO/NC Dual EOL 5K	Wire with Parallel/Serial for NO and Serial/Parallel for NC. • Normal = 5K • NO Alert = 2.5K • NC Alert = 10K
NO/NC Dual EOL 10K	Wire with Parallel/Serial for NO and Serial/Parallel for NC. • Normal = 10K • NO Alert = 5K • Alert = 20K
NC Single EOL 5K	Series Resistor • Normal = 5K Alert = open ($\infty\ \Omega$)
NO Single EOL 5K	Parallel Resistor • Normal = 5K Alert = short (0 Ω)
NC Single EOL 10K	Series Resistor • Normal = 10K Alert = open ($\infty\ \Omega$)
NO Single EOL 10K	Parallel Resistor • Normal = 10K Alert = short (0 Ω)
NC Non-Supervised	No Resistors • Normal = short (0 Ω) Alert = open (0 Ω)
NO Non-Supervised	No Resistors • Normal = open ($\infty\ \Omega$) Alert = short (0 Ω)
NC Double EOL 1K	Serial and Parallel Resistors • Normal = 1K Alert = 2K

Mode	Comment
NO Double EOL 1K	Parallel and Serial Resistors • Normal = 1K Alert = 0.5K
NC Double EOL 5K	Serial and Parallel Resistors • Normal = 5K Alert = 10K
NO Double EOL 5K	Parallel and Serial Resistors • Normal = 5K Alert = 2.5K
NC Double EOL 10K	Serial and Parallel Resistors • Normal = 10K Alert = 20K
NO Double EOL 10K	Parallel and Serial Resistors • Normal = 10K Alert = 5K
NO/NC Dual EOL 1K	Wire with Parallel/Serial for NO and Serial/Parallel for NC. • Normal = 1K • NO Alert = 0.5K • NC Alert = 2K NOTE: This the default value, and the traditional Software House method of supervision.

NO/NC Double EOL 1K

Figure 12shows the traditional Software House method of supervision where 1K Ω is considered Secure and 500 Ω or 2K Ω are considered Alert. Wiring is different for NO and NC.

Figure 12: NO/NC Double EOL 1K Supervision
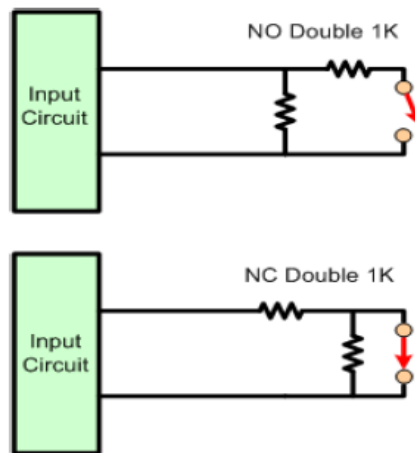

This method will report:

■ Short.

■ Alert (500 ohms)

■ Normal (1K)

■ Alert (2K)

■ Open (>30K)

■ Line Fault (Any unexpected value. This is usually due to incorrect value resistors or faulty resistors).

NO/NC Double EOL, 10K

Figure 13 shows a method similar to the traditional Software House method of supervision. The wiring for NO and NC is different.

- For 5K resistors - 5K = Normal. NO Alert = 2500 ohms, NC Alert = 10K

- For 10K resistors - 10K = Normal. NO Alert = 5K, NC Alert = 20K

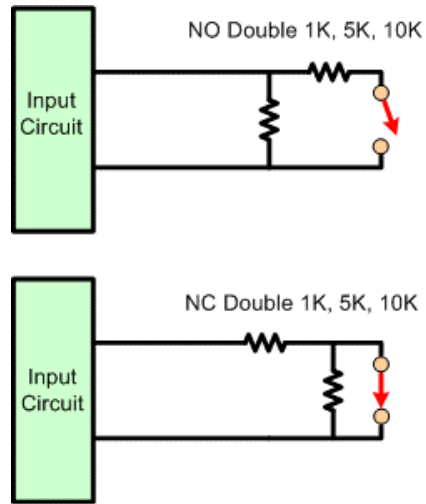**Figure 13:** NO/NC Double EOL 10K Supervision
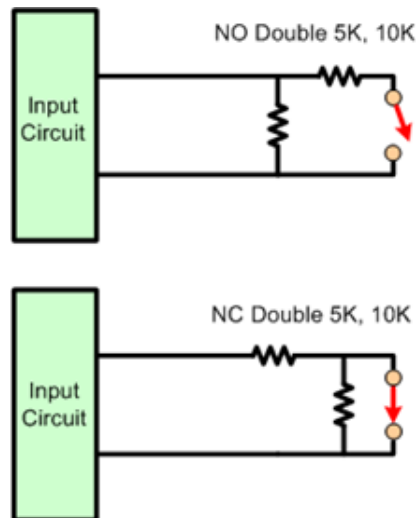
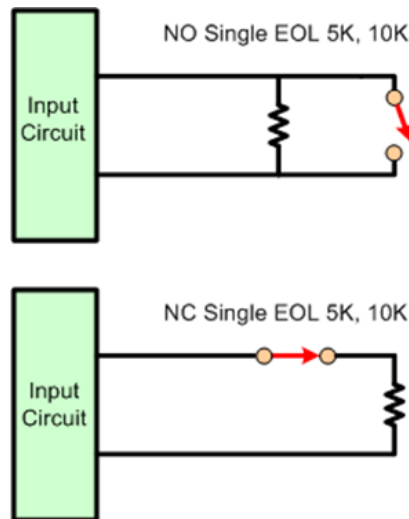For Double EOL, Single EOL, and non-supervised setups, select either NO or NC.

Double EOL 1K, 5K, 10K

Figure 14: Double EOL 1K, 5K, 10K - NO and NC
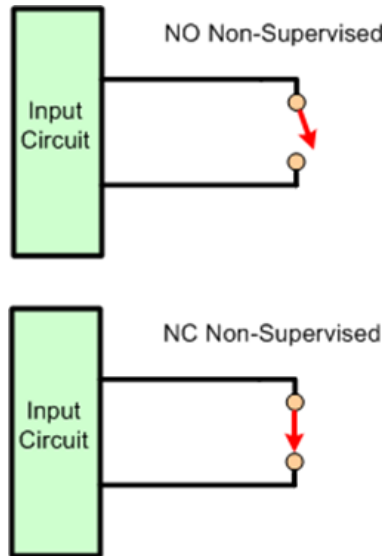

Single EOL 5K, 10K

Figure 15: Single EOL 5K, 10K - NO and NC
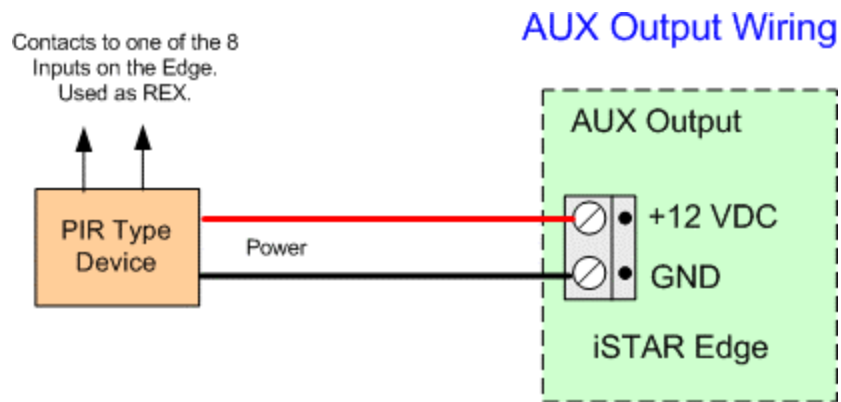
Non-Supervised

Figure 16: Non-supervised NO and NC

AUX Outputs

The AUX outputs can supply 350 mA for motion sensor or PIR-type devices. The voltage is 12 VDC.

Figure 17: AUX Output Wiring

Wire the switch contacts of the PIR to one of the iSTAR Edge G2 inputs, using the proper resistor supervision.

Relay Outputs

iSTAR Edge G2 relays can be used as DRY or WET. There is a jumper for each relay to set the mode.

Figure 18: Relay locations
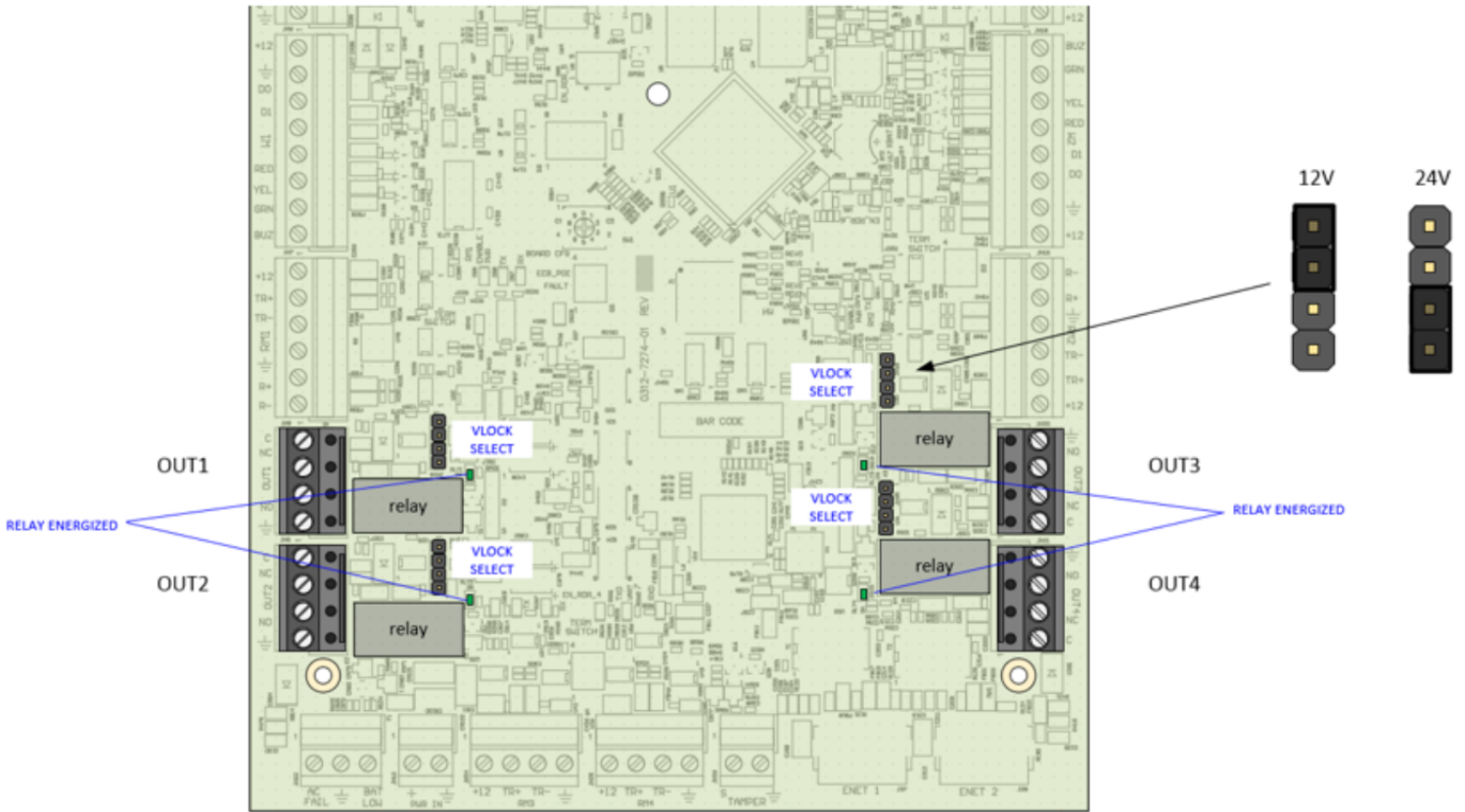
Each Relay has an LED to show whether the relay is being energized or not. Each relay has a 4-pin header to configure whether 12V, 24V or no power is being supplied to the output.

NOTE   To avoid placing a large current burden on the 24V-to-12V convertor on the board, avoid configuring the relay outputs for 12V if 24V power is supplied to the board.

Placing the shunt on the middle two pins configures the output as DRY (i.e. no power supplied), as shown in Figure 18.

Dry Relay Wiring

Figure 19 shows DRY relay wiring. Max current is 3A at 30 VAC/VDC. Use NO or NC as appropriate. Notice that jumper is in the DRY position.

Figure 19: Dry Relay Wiring
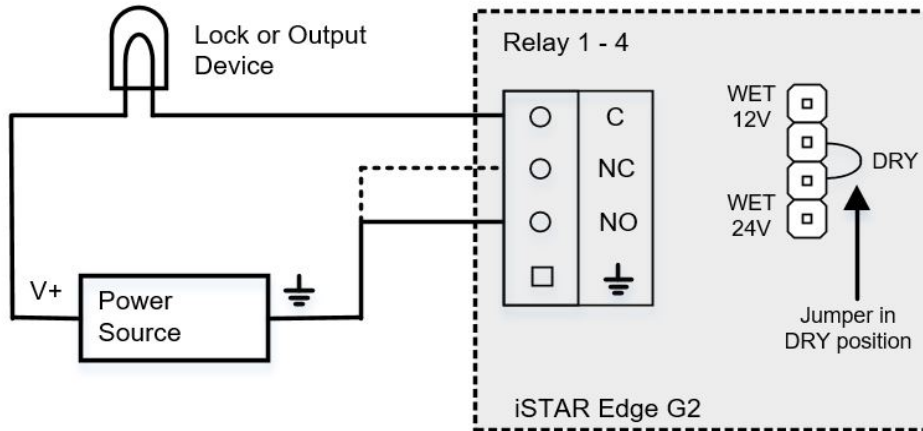
Wet Relay Wiring

Figure 20 shows WET wiring for a normal NO latch. The iSTAR Edge G2 will supply wither 12 VDC or 24 VDC depending on the input supply. Current is limited to 0.75 A. Figure 20 shows that GND is used for common, not the C pin, and that the jumper is in the WET position.

Figure 20: WET Relay Wiring
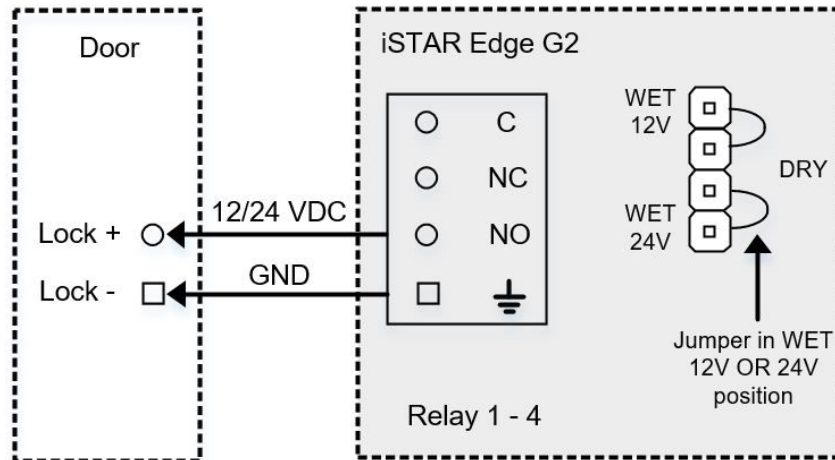
Wet Wiring for a MagLock

Figure 21 shows WET wiring for a MagLock. Mag Locks are normally energized so the GND and NC pins are used in this case. Figure 21 shows the jumper in the WET position.

Figure 21: Wet Wiring for a MagLock
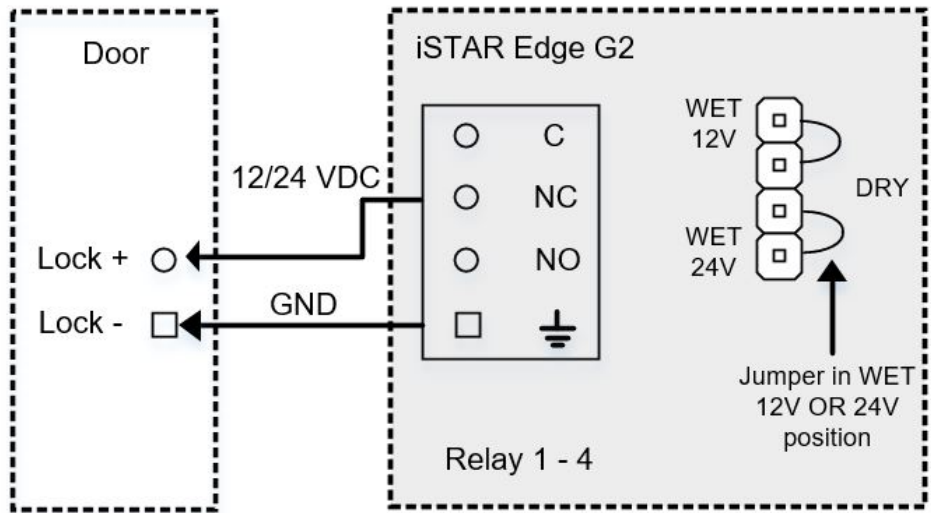
Wiegand Readers

Figure 22 shows direct Wiegand signaling read head connections.

Figure 22: Wiegand Reader Connections

RM Readers - I8s - R8s

Normal RM bus wiring is used for RM readers, I/8 boards, and R/8 boards. Figure 23 shows the connectors are oriented so that a connector taken from RM1 can be used on RM2, RM3 or RM4 without moving the wires.

Figure 23: RM Wiring

Special Purpose Inputs

Special purpose inputs are described in Table 18.

Table 18: Special Purpose Inputs

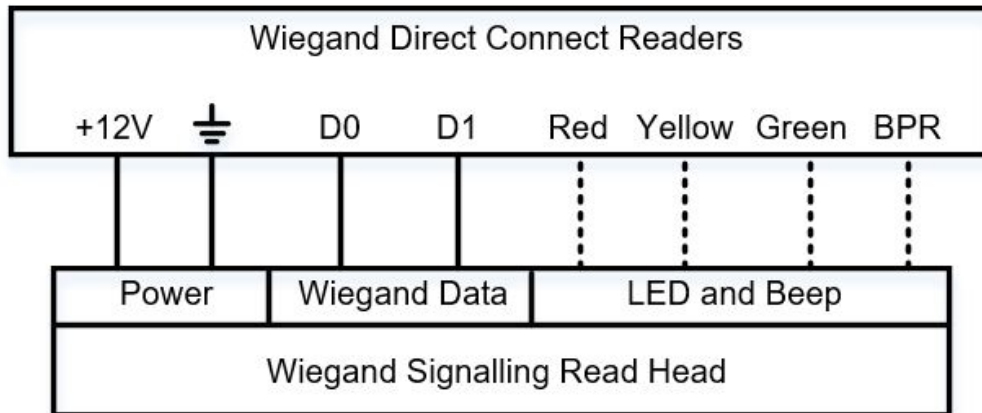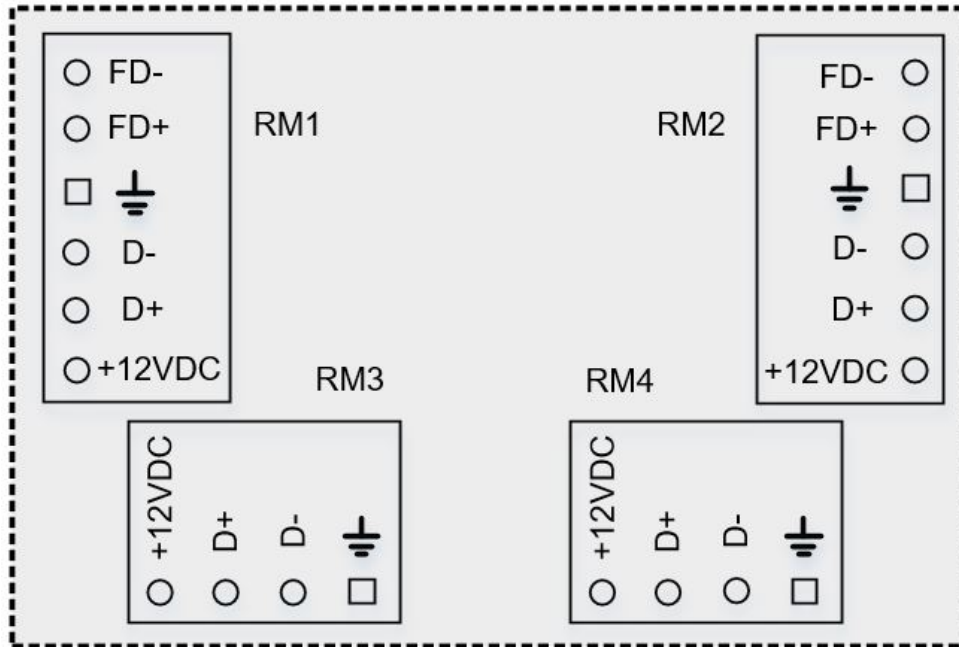| C•CURE 9000	C•CURE 800/8000	Description
Tamper	Tamper	Activates when the iSTAR Edge cabinet is opened.
Power Failure	AC power fail input	Indicates that the UPS (Un-interruptible Power Supply) or apS, had an AC power failure and is now supplying battery power to the iSTAR Edge.
Battery Low	Low battery input	The UPS or apS battery has reached a yellow warning level. Most UPS units have about 10 to 20 minutes of run time left when this condition occurs. Software House recommends that you shut down the unit being powered by the low battery. Do not confuse this input with the Onboard Battery Low input.

AC Fail - Low Battery

Figure 1 shows AC Fail and Low Battery wiring. They are NC connections and share a common ground pin.

Figure 24: AC Fail and Low Battery Wiring
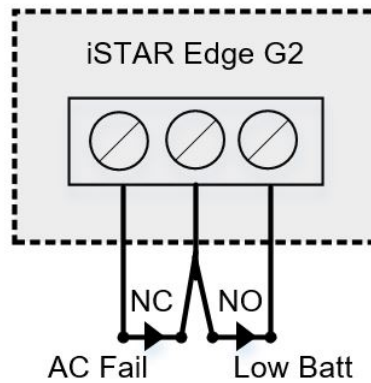
NOTE	The AC power fail and Low Battery inputs must be enabled and connected to report for compliance with UL requirements. Shielded cable must be used for AC Fail and Low Battery input connections.

Tamper

Tamper wiring is shown in and is NC. It is usually connected to the Tamper switch on the enclosure. If there is no standard enclosure, be sure that there is a jumper across the two pins.

Figure 25: Tamper Wiring
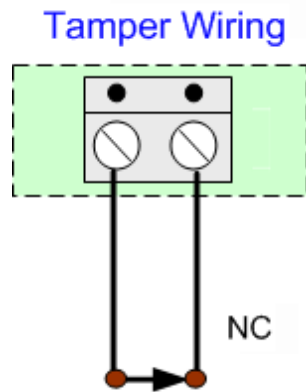
The tamper switch controls many of the panel LEDs. When the enclosure door is closed, the LCD and all LEDs, except the two power LEDs, are turned off.

NOTE The tamper input must be enabled and connected to report for compliance with UL requirements.

7

Using the iSTAR Configuration Utility

This chapter describes how to use the iSTAR Configuration Utility to discover iSTAR Edge G2 panels.

In this chapter:

Overview

Use the iSTAR Configuration Utility (ICU) for initial panel discovery on the same subnet.

NOTE	Use the iSTAR Web Page to configure, diagnose, and troubleshoot the iSTAR Edge G2. For more information, see Chapter 8: iSTAR Web Page.

For detailed information on how to use the ICU, see the *iSTAR Configuration Utility User Guide* available on www.swhouse.com or on the C•CURE installation media.

The ICU is included on C•CURE server and client installations in the following location:

- Program Files\Software House\SWSystemCrossFire\Server Components\iSTAR \ICU

If the ICU is not on a client or server, use the latest ICU installer to install the ICU on the PC.

ICU folder contents

The ICU folder contains the following items:

- ICU.exe - the executable file that runs the ICU.
- iSTARDiagConnection.dll - Dynamic link library to establish connections.
- icu.chm - the help file for the ICU.
- ICU release note and user guide.

Using the ICU

The ICU broadcasts a query across the subnet to controllers, requesting their configuration information. Powered controllers send configuration information back to the ICU, which then displays the information in the ICU window.

Initial Controller Discovery

The ICU window displays a list of controllers connected to the subnet.

- Click on the **E2** button on the ICU toolbar window to view a new window listing connected iSTAR Edge G2 controllers.

- The iSTAR identification bar, located at the top of the ICU window, displays the following information when a controller is selected in the window:

    – Name assigned to the controller.

    – iSTAR Controller type (except iSTAR Edge G2).

NOTE	Remember to click the **E2** button on the ICU window toolbar to open a separate window to view iSTAR Edge G2 controllers along with their identification information.

The ICU iSTAR Edge G2 window is updated whenever a controller connection status changes. Use the **Refresh** button on the toolbar to refresh the window for the latest connection information.

For more information on how to use the ICU, see the *iSTAR Configuration Utility User Guide* available on www.swhouse.com or on the C•CURE installation media.

8

iSTAR Web Page

Use the iSTAR Web Page to configure, diagnose, and troubleshoot iSTAR Edge G2 controllers.

In this chapter:

iSTAR Web Page Overview

Use the iSTAR Web Page for configuring, diagnosing, and troubleshooting iSTAR Edge G2 controllers.

You can use the iSTAR Web Page to designate the master controller, define master IP addresses, and define the IP address for the C•CURE host.

NOTE	Configuration information in C•CURE, downloaded to your iSTAR panel overwrites values specified in the iSTAR Web Page. Use the iSTAR Web Page for the initial setup of the master controller and troubleshooting and use C•CURE for further configuration.

Accessing the iSTAR Web Page

1. In a web browser window, enter the IP Address of the iSTAR controller and press **Enter**.

NOTE	• If using Internet Explorer and you receive a Certificate Error indicating "There is a problem with this website's security certificate", click **Continue to this website (not recommended)**. • If using Goggle Chrome and you receive an error indicating "Your connection is not private", click **ADVANCED** and then click **Proceed to x.x.x.x (unsafe)**.

2. Enter the default username and password.

   The default username is **iSTAR**. The default password is **iSTAR**.

3. At first log in, you are prompted to enter a new password. After the password is changed, the iSTAR Web Page is displayed.

4. Click on **Configure** to enter the Configuration page, or **Diagnostics**, to enter the Diagnostics page. See iSTAR Web Page Diagnostics on Page 72 for more information on running diagnostics on the iSTAR Edge G2.

Controlling the iSTAR Web Page

Table 19 describes the iSTAR Web Page icons used for common functions on the iSTAR Web Page.

Table 19: iSTAR Web Page Icons

Icon	Description
	Edit icon
	Exit icon
	Save icon
	Information icon
	Configuration page icon

	Diagnostics page icon
	Device icon
	iSTAR Controller icon
	Menu icon
	Refresh icon

Opening and Closing Edit Mode

Click the edit icon in the top-right corner of the iSTAR Web Page to open edit mode to edit fields on the iSTAR Web Page.

Click the save icon in the top-right corner to save any changes made. Click the close icon to exit edit mode.

Switching between Configuration and Diagnostic Mode

- Select **Configuration** or **Diagnostics** from the Home screen.
- Click on the menu icon in the top-right corner and select **Configuration** or **Diagnostics**.
- Click on the information icon on the top-right corner to open a dialog box displaying controller and build information and online help.

Navigating the iSTAR Web Page

Navigate by clicking on the tabs on the tab bar.

General

You can configure iSTAR panels from the General tab on the Configure page. See Configuring Clusters and Controllers on Page 66 for more information.

Advanced

You can perform the following actions in the Advanced tab:

- Reboot the panel.
- Check current firmware version.
- Request ECC Certificate.

802.1x

Select 802.1x authentication (PEAP, TLS, or none) by enabling edit mode, opening the dropdown box to select your preferred authentication method, then clicking the save icon to save your selection.

SNMP

You can enable SNMP, Security, SNMP Hosts, and configure a Trap Manager in the SNMP tab. You can also include contact information and location in the SNMP tab. See Configuring SNMP on Page 69 for more information.

Configuring Clusters and Controllers

Use the iSTAR Web Page to define the controller type (master), the controller IP address, the primary connection type, and the C•CURE address.

Configuring an iSTAR cluster

LAN Configurations

Requirements for LAN configurations vary from site to site. The following procedure describes most configurations:

1. Connect and power on all iSTAR Edge G2 controllers.

2. Open the **iSTAR Web Page** and select **Configuration**. The **General** tab of the Configuration page is displayed.

3. Click the pencil icon in the top-right of the screen to open the editing mode.

For master panels:

- Check the Master Controller checkbox to define the panel as a master.
- Specify the IP address of the host in the **Host Address** field.
- Specify the IP address of the master (DHCP is recommended).
- Define the host IP address or the FQDN (Fully Qualified Domain Name) with which the master will communicate.

For member panels:

- Ensure the Master Controller checkbox is not checked.
- Specify the IP address of the master panel in the **Master Address** field.
- Specify the IP address of the host in the **Host Address** field.
- Specify the IP address of the master (DHCP is recommended).

4. Use the C•CURE Administration application to configure:

- Master and member names.
- Master and member MAC addresses.

5. Use the C•CURE Administration application to configure the cluster and download cluster information. During the download, the following occurs:

- Master establishes a connection with the C•CURE host.
- C•CURE Host downloads member information.
- Members beacon a "request for service" message across the subnet.
- Master matches the "request for service" message with the member address information and downloads its own IP address.
- Members establish connection with the master.

WAN Configurations

1. Connect and power all iSTAR Edge G2 controllers.

2. Open the **iSTAR Web Page** and select **Configuration**. The **General** tab of the Configuration page is displayed.

3. Click the pencil icon in the top-right of the screen to open the editing mode.

For master panels:

- Check the Master Controller checkbox to define the panel as a master.
- Specify the IP address of the host in the **Host Address** field.
- Specify the IP address of the master (DHCP is recommended).
- Define the host IP address or the FQDN (Fully Qualified Domain Name) with which the master will communicate.

For member panels:

- Ensure the Master Controller checkbox is not checked.
- Specify the IP address of the master panel in the **Master Address** field.
- Specify the IP address of the host in the **Host Address** field.
- Specify the IP address of the master (DHCP is recommended).

4. Use the C•CURE Administration application to configure:

- Master and member names.
- Master and member IP and MAC addresses (Hardware Pane) to configure cluster and download cluster information across the network.

5. During the download, the following occurs:

- Master establishes a connection with the C•CURE host.
- C•CURE Host downloads member address information.
- Members beacon a "request for service" message across the subnet.
- Master matches the "request for service" message with the member address information and downloads its own IP address.
- Members establish connection with the master.

Configuring a Controller

1. Open the **iSTAR Web Page** and select **Configuration**. The **General** tab of the Configuration page is displayed.

2. Under the General tab, enter information into the fields described in Table 20.

Table 20: Controller Configuration Information

Field	Description
Set Network Mode IPv6 checkbox	Check this to enable IPv6 network mode. NOTE: IP Address, Subnet Mask, Default Gateway, and DNS Server field are disabled if IPv6 mode is selected.
DUID-Type	Select DHCP Unique Identifier type. This is only available when using DHCP.
Master Controller checkbox	Check the checkbox when this controller is the master. The controller is a member if this checkbox is unchecked.
Master Address	Enter the master controller address if configuring a member panel. This option is not displayed if the Master Controller checkbox is checked.

Host Address	Enter the host address when configuring either a master or a member panel.
Secondary Host Address	Defines a secondary connection to the host (optional).
MAC Address	MAC addresses are unique hardware addresses that identify controllers and other Ethernet devices. They are built into the iSTAR at production time. A controller's MAC address is printed on a label attached to the iSTAR. The first six nibbles of the MAC address are fixed for all controllers (set at 00-50-F9).
IP Allocation	Open the dropdown menu and select **Static** or **DHCP**. Software House recommends **DHCP**. NOTE: If you select **Static** you must configure the **IP address**, **Subnet Mask**, **Default Gateway**, **Primary DNS Server**, and **Secondary DNS Server** fields manually.
Lock IP	Click the Lock IP toggle to lock the panel IP address. If the toggle is in the unlock position the panel can accept translated addresses from a DNS server, C•CURE server, or other remote devices.

Configuring SNMP

You can enable and configure Simple Network Management Protocol (SNMP) communication on the iSTAR Edge G2.

1. Connect and power on all iSTAR Edge G2 controllers.

2. Open the **iSTAR Web Page** and select **Configuration**.

3. Select **SNMP** on the tab bar. The **SNMP** tab is displayed.

4. Click on the edit icon in the top-right corner to enable edit mode.

5. Click on the **Enable SNMP** toggle to enable SNMP.

6. Click on the **Enable Security** toggle to enable Community Name and Community Right fields.

Table 21 displays the SNMP and Security options available when the SNMP and Security toggles are enabled.

NOTE	Some options are only displayed when their respective toggle switch is in the enable position.

Table 21: SNMP Field Descriptions

Field	Description
Community Name	Set the SNMP communities to which this Controller belongs. An SNMP device or agent can belong to more than one SNMP community. A device does not respond to requests from SNMP management stations that do not belong to one of its communities. Obtain this information from your Network Administrator.
Rights	Set the access right for the specified community. When an SNMP message is received by the Controller, it is evaluated based on these rights. **No Access** - The SNMP message from a management system in this community is discarded. **Read Only** - Only GET, GET-NEXT, and GET-BULK requests are processed. SET requests are not processed from this community. **Read Create** - SET, GET, GET-NEXT, and GET-BULK requests are processed.
SNMP Trap Manager	Enter the IP address or host name of the SNMP Trap Manager for this iSTAR controller.
SNMP Hosts	**Only accept SNMP packets from this Host** - Select this option if you want the iSTAR controller to accept SNMP messages from a specified host only.
Contact	Specify the SNMP-contact, a 1-64-character string usually containing an emergency contact name and telephone number or email address.
Location	Specify the SNMP-location, a 1-64 character string usually containing information about the controller/panel.

Upgrading Firmware

Use the iSTAR Web Page to upgrade the iSTAR Edge G2 firmware to the latest version.

Installing the firmware over an Ethernet connection

1. Copy the iSTAR Edge G2 firmware to any folder accessible by your web browser.

2. Navigate to the Advanced tab on the iSTAR Web Page and select the correct firmware file to start the upgrade process.

3. You may have to log out of the iSTAR Web Page and log back in when the firmware upgrade process is complete.

9

Diagnostics

This chapter describes how to run diagnostic tests on the iSTAR Edge G2.

In this chapter:

iSTAR Web Page Diagnostics

You can use the Diagnostics page to check status information, download the iSTAR log file, and perform diagnostic tests.

See iSTAR Web Page Overview on Page 63 for information on how to access and navigate the iSTAR Web Page.

Diagnostics Page

Click on the device icon or the iSTAR controller icon on the left side of the screen to access the fields listed in Table 22.

Table 22: iSTAR Web Page Diagnostics Fields

Selected Icon	Options	Fields
Device	Status	Device
		Network
		Processing
		Time
		FICAM
	OS Components	Packages
	Network Status	ARP Table
		Routing Table
		IP
		ICMP
		TCP
		UDP
		UDPLite

	Cluster	Information on devices within the cluster.
	iSTAR Databases	iSTAR database contents. See iSTAR Databases on Page 73 for more information.
	High Assurance (FICAM)	Information on High-Assurance database contents.
iSTAR Controller	Level Control	General Controlled I/O
		Communication Server
		Event Manager
		Time Server
		Access Control
		Connected Devices
		Console
	Reader and I/O	Last Input Change
		Last Output Change
		Last Card Swipe
		Last Card Swipe for Reader
	Logs	Click the download icon to download the iSTAR log.

Level Control

You can enable the various fields listed in the **Level Control** section of Table 22 to be written to the serial/console log within the Level Control menu for the iSTAR controller.

NOTE	Contact Software House Technical Support before enabling level control options.

Reader and I/O

The Reader & I/O section displays information about devices, such as readers, that communicate with iSTAR Edge G2. The Reader and I/O section also displays diagnostic output for iSTAR readers and cards.

You can perform reader and input/output diagnostics from the Reader and I/O menu by checking the **Enable** checkbox and then clicking the save icon to display information from the fields listed in the **Reader and I/O** section of Table 22

NOTE	Enabling Reader and I/O diagnostics degrades iSTAR controller performance. Disable this when not in use.

iSTAR Databases

In the database table, you can click the following database names to display more details about the selected database:

- Personnel – Displays personnel records.

- Tracking – Displays anti-passback information.

- ACMClearanceDB – Displays all clearances that have been configured.

- EventLinkDB – Displays the Link ID, State, Activation Time, Start Time,and Link time for event links.

- TimeSpecDB – Displays all time specifications that have been configured.

- ConnectionPath – Displays all connection path information for the current controller.

Diagnostic Tests

iSTAR Edge G2 firmware provides diagnostic information for:

- Readers
- Cards
- Outputs
- Inputs
- Ethernet port

Use the rotary switch SW1 to activate diagnostic tests. Table 23 describes the action of each SW1 switch position. Diagnostic information displays on the iSTAR Edge G2 LCD display.

NOTE	Diagnostic tests add overhead to iSTAR Edge G2 processing and may degrade system performance.
	When the diagnostic tests are complete, deactivate the test by resetting SW1 to display status information.

Rotary Switch SW1 Diagnostic Tests

Table 23: Rotary Switch SW1 Diagnostic Test

Set SW1 to	Performs this Action	Notes
F	Displays general status messages.	
0	Displays general status messages.	
1	Displays most recent card swipe for 1 second	Fast Mode on
2	Displays most recent card swipe for 7 seconds	Slow Mode on
3	Tests and displays information about manual inputs for 1 second	Slow Mode Input Test
4	Tests and displays information about manual inputs for 2 seconds	Fast Mode Input Test
5	Activates output change display tests for manually activated outputs and displays information for 2 seconds	Slow Mode Output Test
6	Activates and tests all outputs attached to an iSTAR Edge through readers and R/8 boards for 1 second	Fast Mode Output test. LCD does not display all info.
7	Activates and tests all outputs attached to an iSTAR Edge, one by one. Test results are indicated by the LED associated with each output.	Displays results on LED
8	Tests and displays diagnostic information about Ethernet #1 and Ethernet #2 ports. NOTE: ICU must be running on the same subnet.	Ethernet Port and CF Slot Test

Card Reader Diagnostics

You can display the most recent card data processed by any reader on iSTAR Edge G2 in either fast mode or slow mode.

- **Fast Mode** (rotary switch position 1) - In this mode, the most recent card swipe data displays on the LED for approximately 1 second.

- **Slow Mode** (rotary switch position 2) - In this mode, the most recent card swipe data displays for 7 seconds.

You can also use the iSTAR Web Page Diagnostic Utility to view reader diagnostic information.

Output Diagnostics

The iSTAR Edge G2 provides three types of output tests:

- **Output Change Display (slow mode)** - tests a specific output that is activated manually by the technician.
- **Output Change Display (fast mode)** - activates and tests every output on the system.
- **Output Test Mode** - activates and tests outputs one by one.

Output Change Display (Slow Mode)

The manual output test is an end-to-end test that displays information about outputs activated manually by a technician. The outputs you are testing can be attached to iSTAR Edge G2 through readers and R/8 boards. Information displays on the LED for two seconds.

Activate the output change display test by setting the rotary switch SW1 to position 5.

Output Change Display (Fast Mode)

The output change display test is an end-to-end test that automatically activates all outputs attached to an iSTAR Edge G2. The outputs you are testing can be attached to the iSTAR Edge G2 through readers and R/8 boards. Output information displays on the LCD for approximately one second.

NOTE   The LCD does not display all output information as some outputs activate faster than the one-second refresh time of the LCD display.

To activate the output change display test, set rotary switch SW1 to position 6.

Output Test Mode

The output test mode activates all outputs, one by one. Test results are indicated by the LED associated with each output.

To activate the output change display test, set rotary switch SW1 to position 7.

Input Change Display Mode

The input change display mode tests and displays information about inputs that are activated manually. Inputs tested can be attached to iSTAR Edge G2 through the main board, RMs, and I/8 boards.

Information displays on the LED for either one second (Position 4, On) or two seconds (Position 3, On).

To activate input change display tests, set the SW1 rotary switch to 3 for a two-second LED input change display (slow mode) or position 4 for a one-second LED input change (fast mode).

Ethernet Port Test

The onboard Ethernet tests display diagnostic information about Ethernet connections.

To test the Ethernet port, set switch SW1 to 8 and observe the LCD display for test results.

If the Ethernet card passes the diagnostic test, the following is displayed on the LCD:

```
Ethernet PC Card
* Passed *
```

When the test is complete, set SW1 back to 0 or F to display status messages.

NOTE	The LCD only displays success messages. If no message displays, the circuit is defective, or the port is not communicating.

Digital Certificate Signing Troubleshooting

The iSTAR Edge G2 uses TLS 1.3 encryption and controller-based certificates for Panel-Host communications. To take advantage of this more secure method of communication, port 28013 on the Host, and port 28014 on the panel, in addition to the standard ports for Host and iSTAR communication, must be unblocked by firewalls to enable Certificate Signing Requests to be communicated between the panel and the Host after the initial configuration is complete.

Common Certificate Signing Request (CSR) Errors

Common CSR errors can often be rectified by troubleshooting the items in Table 24. Further troubleshooting steps for Host PCs are detailed in.

Table 24: CSR State and Troubleshooting

State ID	State	Description	LCD Error Message (If Error occurs)	Possible Causes	Common Solutions
1	Connect To CSR Port	Panel attempts to make a connection to host port 28013	• Err: Conn Refused • Invld IP or Port	1. Host IP and port is unreachable 2. Firewall is blocking communication (port) 3. Port 28013 may not be open. 4. Port 28013 may be blocked.	• Check your firewall status with Resource Monitor. • Ensure firewalls are not preventing CSR communications. • Ensure the correct ports are open and unblocked.
2	Send CSR	Panel sends CSR to host and wait for acknowledgment from host	• Err: CSR Sent! • No Ack from Host	1. Host does not receive CSR 2. Host internal error (See Troubleshooting the Host PC)	• Ensure firewalls are not preventing CSR communications.
3	Open Certificate Port	Panel tries to open certificate receive port 28014 for host's response	• Err: Open CSRcev • Port 28014 Fail!	1. Port 28014 may be blocked. 2. Panel internal error	• Ensure firewalls are not preventing CSR communications. • Collect panel log and send to SWH support.
4	Wait For Certificates	Panel successfully opens 28014 port and is waiting for connection from host to deliver certificates or reject	• Err: No Conn from • Host. Rcv Timeout	1. Firewall is blocking communication (port) 2. Cluster/Controller is disabled 3. Host and panel IP mode (IPv4/IPv6) or address do not match	• Ensure firewalls are not preventing CSR communications. • Ensure Host and panel IP modes and address match.

Troubleshooting the Host PC

Check that certificate files are in the following directory after the iSTAR driver runs:

```
Program Files (x86) > Tyco > CrossFire > Certificates_TLS1.3
```

Check the Stunnel_55.5 configuration file:

1. Stop the iSTAR driver.

2. Open Windows Task Manager

3. Navigate to Stunnel_5.55.exe in the Task Manager list.

4. Right click on Stunnel_5.55.exe and click "End Process".

5. Double-click on stunnel_5.55.exe. The log file opens. The Stunnel icon in the Windows Task Bar should be green. If the icon is red, check the Stunnel log for the reason of failure.

6. After troubleshooting, end the Stunnel_5.55.exe process. Restart the iSTAR driver.

Appendix

General Wiring Requirements

Table 25 displays the general wiring requirements for the iSTAR Edge G2 and its components.

Table 25: Equipment Wiring

Signal	From	To	AWG	Shield	Max Length
RS-485 Comm, two wire	iSTAR Edge G2	RM and I/O Modules	22	Yes	4000 ft (1212m)
Power	iSTAR Edge G2	RM and I/O Modules	22/18	No	Range of 600 ft to 1500 ft, depending on AWG used.
RJ-45-Ethernet	iSTAR Edge G2	Hub, Host	Cat 5e 24	N/A	328 ft (100m)
Supervised Input	iSTAR Edge G2	Input	22/18	No	2000 ft (606m)
Request-to-exit (REX or RTE)	iSTAR Edge G2	Switch	22/18	No	2000 ft (606m)
Door Contact (DSM)	iSTAR Edge G2	Contact	22/18	No	2000 ft (606m)
Supervised Input	iSTAR Edge G2	Input	22	Yes	2000 ft (606m)
Reader Input	iSTAR Edge G2	Proximity/Wiegand signaling read head	22 20 18	Yes	200 ft (60.96m) 300 ft (91.4m) 500 ft (152.4m)

There are 2 jumpers on the PoE module:

- x1 jumper to select PoE or PoE Plus (+). Ensure the jumpers are set correctly if using PoE.
- x1 jumper to configure the voltage used to power the Edge G2 and to supply the wet relays for door locks. Set the jumper to 24 VDC for the Edge G2.
  - Do not connect the PoE injector to a receptacle controlled by a switch.
  - The Tamper, Battery Low, and AC Power Fail inputs must be enabled and connected to report to comply with UL requirements.

For more information on PoE jumpers, see the .

NOTE
Shielded cable must be used for AC Fail in Low Battery input connections.

Supervised Inputs must use shielded, 22 AWG (minimum) stranded, twisted-pair cable, such as Belden 9462 or equivalent, for monitor points, DSMs, and REXs. Connections between PSE or power injector and the PD must use 26 AWG (0.13mm2) for patch cords and 24 AWG (0.21mm2) for horizontal or riser cables connected through standard 8-pin RJ-45 connectors.

Power Requirement for Readers

Table 26 shows the various power requirements for Software House readers compatible with the iSTAR Edge G2.

Table 26: Software House Reader Power Requirements

Reader	Model Numbers	Current Draw at 12 VDC
RM with Multi-Technology Reader	RM1-4000, RM2-4000	300 mA max
RM with Multi-Technology Reader and LCD	RM2L-4000	300 mA max
RM with mag stripe	RM1-MP, RM2-MP	80 mA max
RM with mag stripe and LCD	RM2L-MP	180 mA max
RM with mag stripe mullion	RM3-MP	80 mA max
RM with Indala proximity	RM1-P, RM2-PI	80 mA max
RM with Indala proximity and LCD	RM2L-PI	180 mA max
RM with HID proximity	RM1-PH, RM2-PH	250 mA max
RM with HID proximity and LCD	RM2L-PH	250 mA max
RM with HID proximity mullion	RM3-PH	250 mA max
RM with Wiegand	RM1-W	80 mA max
Multi-Technology Contactless Reader	SWH-4000, SWH-4100 SWH-4200, SWH-3000, SWH-3100	125 mA
Multi-Format Proximity Reader	SWH-5000, SWH-5100	125 mA
Contactless Smart Card Reader	SWH-2100	125 mA
Auxiliary Relay Module	ARM-1	20 mA (relay active)
RM with HID iClass	RM1-IC, RM2-IC	300 mA max
RM with HID iClass and LCD	RM2L-IC	300 mA max
TST-100 Reader	SWH-TST-100	180mA
HID RP40	920P and 920L	85mA
HID RPK40	921P and 921L	95mA
SWH 6000 Series	SWH-6000	200mA max

Port Voltage Compatibility

Table displays the compatibility ranges of various reader ports with the iSTAR Edge G2 operating on 12 VDC, 24 VDC, or PoE input power.

Table 27: Port Voltage Compatibility

12 VDC Input Power	
Component/Board	**Compatibility Range**
Wiegand Circuit	9.38 - 12 VDC
RM/RS485 Circuit	9.56 - 12 VDC
Relay (Wet, 12 VDC jumper setting) Circuit	8.99 - 12 VDC
Aux Output Circuit	9.71 - 12 VDC
NOTE: Reader ports are classified by UL as special application circuits when running on 12V DC in.	
24 VDC Input Power	
Component/Board	**Compatibility Range**
Wiegand Circuit	12 VDC
RM/RS485 Circuit	12 VDC
Relay (Wet, 12 VDC jumper setting)	12 VDC
Relay (Wet, 24 VDC jumper setting)	21.79 - 24 VDC
Aux Output Circuit	12 VDC
NOTE: Reader ports are classified by UL as special application circuits when running on 24V DC in.	
PoE Input Power	
Component/Board	**Compatibility Range**
Wiegand Circuit	12 VDC
RM/RS485 Circuit	12 VDC
Relay (Wet, 12 VDC jumper setting)	12 VDC
Relay (Wet, 24 VDC jumper setting)	24 VDC
Aux Output Circuit	12 VDC