⚏®Simplex

*UL, ULC Listed**

Features

CCUNET integrates multiple fire alarm control panel platforms into an XL Graphics Command Center based network to provide:

- System-wide annunciation and limited control of multiple fire protection systems, both addressable and conventional

- Dual redundant communication loops deliver transparent information routing around breakages and failures in the network

- A flexible network design with support for multiple loop topologies

CCUNET provides interconnection using Communications Control Unit (CCU) Modules:

- CCU modules implement CCUNET data communications via RS-422 full-duplex operation

- Each CCU module is self-contained with pluggable terminal block connections, LED status indication, and provides a local Form C relay output

- Mounting is in dedicated box model 4190-9810 that can be easily located close to the connected control panel

- Up to 105 CCUNET modules are supported per network

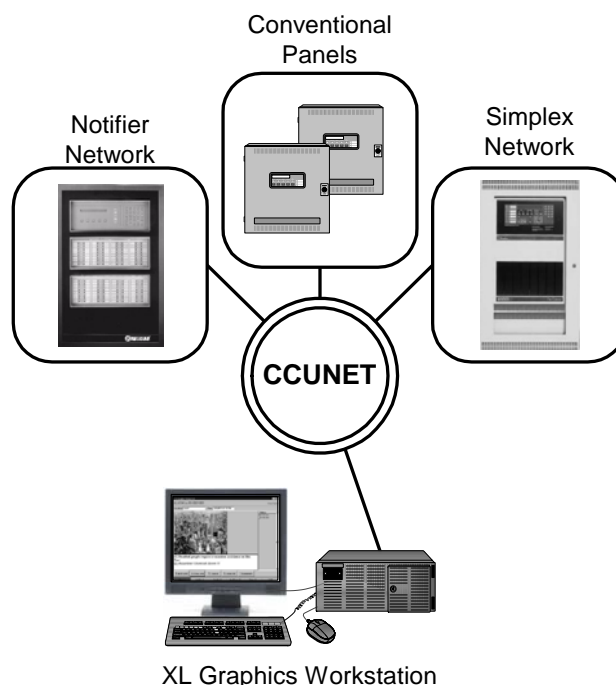**Supported Fire Alarm Panels and Networks include:**

- Simplex® 4100U stand-alone and Network connected fire alarm control panels

- Notifier® AM2020 and INA fire alarm control panels including SIBNET and INA interfaces

- Conventional fire alarm control panels using HUB connection modules with I/O Expansion modules

Description

CCUNET products, combined with XL Graphics color graphics software, provide fire network integration for differing fire networks protocols. This Network integration approach results in rapid and effective monitoring and limited control to replace stand-alone fire alarm control panel performance.

Multi-point, Point-to-Point Operation. CCUNET is a multi-point, point-to-point network, which allows different data to be simultaneously transmitted between points on the network. All network segments transmit and receive simultaneously which greatly increases network capacity.

Routing and Packet Processing. Each CCUNET node has routing and packet processing capability which allows Network segment failure isolation and fast data transfer via routing tables.

CCUNET Interface Modules Provide Network Interconnection Compatibility for a variety of Fire Alarm Panels and Networks

Operation

XL Graphics Command Center Workstations annunciate Alarms, Supervisories, Troubles, Disarmed Devices, etc. for each connected fire alarm control panel connected to the CCUNET Network. It provides controls to the connected panels such as for Acknowledge, Alarm Silence, Reset, initiate diagnostic testing, etc.

Fire Network Event annunciation information from the fire panels is routed via direct paths through the CCUNET. The XL Graphics Workstation acts on the first event to arrive, discarding subsequent duplicate event packets. Under normal operation, XL Graphics will receive the event message from two paths. This ensures that in the event of a fatal network error (cable break), or a non-fatal error (packet corrupted), event annunciation is not impacted or postponed.

A Single Operator located at the XLG Workstation can supervise the fire systems individual fire panels via CCUNET modules. The modules interpret and transfer information from the panels and facilitate limited fire panel control based upon safety agency restrictions and panel interface functionality.

CCUNET FACP connections support both high level (software) and low level (printer port or hard contacts). This allows the XL Graphics Workstation to provide a full range of fire alarm control panel monitoring and limited control.

CCUNET Product Selection/Ordering Information

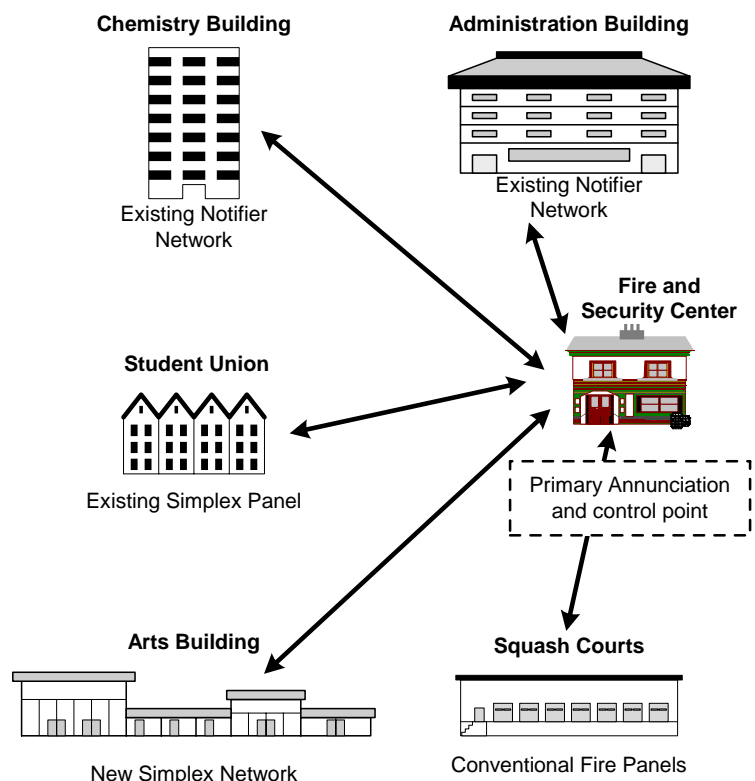| Ordering PID	Description	Application	
CCU3-C4-4100*	CCU3/C Module with 4100 Firmware	Interface to Simplex 4100U fire alarm control panel	Each module includes a local Form C relay output with operation programmable to indicate loss of communication and/or ground fault on ports 1, 2, 3, & 4.
CCU3-C4-ISIB*	CCU3/C Module with ISIB Firmware	Interface to Notifier AM2020 Interface fire alarm control panel	
CCU3-C4-INA*	CCU3/C Module with INA Firmware	Interface to Notifier INA fire alarm control panel/network	
CCU3-C4I-HUB*	1, CCU3/C Module with HUB Firmware 1, CCU3-IO-UL I/O Expansion Module 4, Output Connectors 10, Input Connectors	Hub Connection Module **with** I/O Expansion Module for 4-20 mA interface to non-addressable/conventional fire alarm control panels; can accept up to one additional CCU3-IO-UL module	
CCU3-C4-HUB*	CCU3/C Module with HUB Firmware	Replacement Hub Connection Module	
CCU3-IO-UL	1, I/O Expansion module for Hub connection 1, Installation and Configuration Module 10, Input Connectors 4, Output Relay Connectors 4, Mounting Screws	For CCU3-C4I-HUB I/O expansion or service replacement; Up to 2 maximum per CCU3-C4-HUB module, provides 10 supervised inputs, and 4 relay outputs, selectable as NO or NC	
CCU3-C4-XLG*	1, CCU3/C Module with XLG Firmware 1, CCU3 Programming Cable 1, Interface Adaptor with harness 1, Audible Supervision Module with harness	Interfaces XLG Workstation to the CCUNET Network; For detailed XLG (XLGraphics) information, refer to data sheet S4190-0014	
4190-9810	Mounting Box, red, surface mount, **one required to mount each CCU module**; box dimensions = 9-1/2" W x 7-1/2" H x 3-1/4" D (241 mm x 191 mm x 83 mm)		

* Common Parts Included with these modules:

- 1x Power connector;
- 1x Supervision relay connector
- 1x Alarm input connector
- 4x Communication port connectors
- 1x Installation and Configuration Manual
- 1x Complimentary screwdriver

Typical Application

CCUNET Application, University Example.

Existing Simplex, Notifier, and Conventional, non-addressable fire alarm systems are located in the Administration, Squash Courts, and Student Union buildings as shown in the diagram to the right. Previous supervision was performed by individual terminals housed in the respective buildings. In addition, the new Arts building is desired to be supervised using a new Simplex Network. It is a very large building and will require multiple 4100U fire alarm control panels for proper coverage.

All buildings are to be monitored and controlled from the Fire and Security Center as indicated by the arrows.

Chemistry Building

Existing Notifier Network

Administration Building

Existing Notifier Network

Fire and Security Center

Student Union

Existing Simplex Panel

Primary Annunciation and control point

Arts Building

New Simplex Network

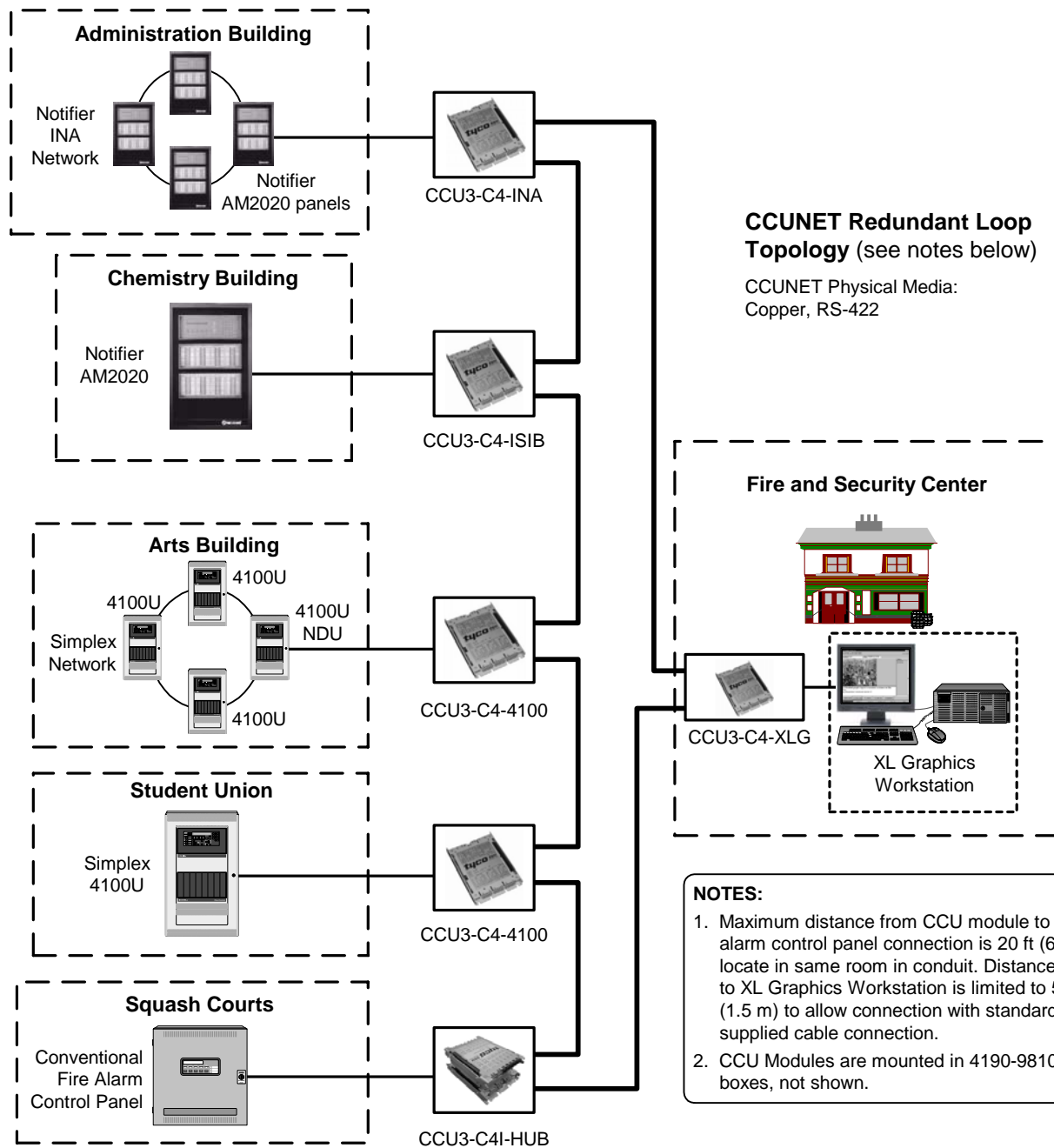**Squash Courts**

Conventional Fire Panels

Typical Application - CCUNET Solution

For this application, the CCUNET solution (shown below) integrates the following:

- A Notifier AM2020 fire alarm control panel based Network in the Administration Building with INA communications, requiring one CCU3-C4-INA module; One Notifier AM2020 fire alarm control panel in the Chemistry Building with ISIB communications, requiring one CCU3-C4-ISIB module

- A new Simplex 4100U based Network in the Arts Building, connecting at a 4100U NDU (Network Display Unit), and one Simplex 4100U FACP in the Student Union Building, each requiring one CCU3-C4-4100 module

- The Squash Courts are equipped with conventional non-addressable fire alarm control panels and will connect using the contact closure interface CCU3-C4I-HUB (CCU3-C4-HUB module with I/O expansion module CCU3-IO-UL)

- Each interface module would be housed in a model 4190-9810 box, located within 5 ft (1.5 m) of the connected fire alarm control equipment

Simplex 4100U Fire Alarm Control Panel Point Capacity. When connected to a Simplex 4100U fire alarm control panel, up to 2000 CCUNET Network points can be annunciated. When connected to a Simplex 4100U NDU, up to 12,000 network points can be annunciated.

Administration Building

Notifier INA Network

Notifier AM2020 panels

CCU3-C4-INA

Chemistry Building

Notifier AM2020

CCU3-C4-ISIB

CCUNET Redundant Loop Topology (see notes below)

CCUNET Physical Media: Copper, RS-422

Arts Building

4100U

4100U

Simplex Network

4100U NDU

4100U

CCU3-C4-4100

Fire and Security Center

CCU3-C4-XLG

XL Graphics Workstation

Student Union

Simplex 4100U

CCU3-C4-4100

Squash Courts

Conventional Fire Alarm Control Panel

CCU3-C4I-HUB

NOTES:

1. Maximum distance from CCU module to fire alarm control panel connection is 20 ft (6 m), locate in same room in conduit. Distance to XL Graphics Workstation is limited to 5 ft (1.5 m) to allow connection with standard supplied cable connection.

2. CCU Modules are mounted in 4190-9810 boxes, not shown.

CCU Module Specifications

Common Specifications for CCUNET Modules:
CCU3-C4-4100, CCU3-C4-ISIB, CCU3-C4-INA, CCU3-C4-HUB, CCU3-IO-UL, and CCU3-C4-XLG

Environmental	Operating Temperature Range = 32° F to 120° F (0° C to 49° C)
Module Package	Each interface module is packaged in a protective aluminum enclosure sized at 4-1/4" x 5-11/16" (108 mm x 144 mm); see page 6 for additional module details
4190-9810 Box	Dimensions = 9-1/2" W x 7-1/2" H x 3-1/4" D (241 mm x 191 mm x 83 mm) (see page 7 for illustration)
Input Voltage	18 to 30 VDC (nominal 24 VDC) supplied from fire alarm control panel
Power	5 W maximum; 278 mA maximum @ 18 VDC; 208 mA maximum @ 24 VDC nominal
Communications	Four Isolated Communication Ports
Local Relay	Form C contacts with LED indicators; green LED operates when relay is active and can be used to indicate processor or communication failure, alarm annunciation, or via CCUNET programmable logic; Maximum ratings = 1 A resistive at 24 VDC
Status Indications	Transmission status green LED, one per Communication Port Supervision Fault status yellow LED, one per Communication Port Relay Output status per above

CCUNET Cabling Recommendations; RS-422 Communications Protocol

Wiring Distance	Up to 3280 ft (1 km) between CCUNET Modules (wire and environmental condition dependent)
Electrically Noisy Environments	Cables run through noisy environments (such as power stations, near heavy machinery, or close to high power cables) may require shielding to ensure low error rate communication If shielded cable is used, connect the shield to the Earth pin at one end of the cable run
Suggested Cables	CAT 5e LAN cable, STP (Shielded Twisted Pair) or UTP (Unshielded Twisted Pair) Belden- 3107A Paired RS-485 Belden- 9562 Paired Telephone cable (unshielded) Belden- 7838A Paired - T1/DS1 Central Office Interconnect/Cross Connect Cable Belden- 88723 Paired - Audio, Control and Instrumentation Cable Belden- 9729 Paired - Low Capacitance Computer Cable for EIA RS-422 Applications Alpha Wire Company- 6072C Alpha-Byte Low Capacitance Data Cables

P/N CCU3-C4-4100, Interface for Simplex 4100U Fire Alarm Control Panels and Fire Alarm Network

Connections	COM 1 provides the RS-232 connection to 4100U COM 2 and COM 3 are CCUNET RS-422 Ports
Maximum Network Points	Up to 2000 Annunciation points for 4100U fire alarm control panel Up to 12,000 Annunciation points for a 4100U, NDU

P/N CCU3-C4-ISIB; Notifier SIB-NET/SIB-2048A Interface

Connections	COM 1 connects to the Notifier Primary Signaling CRT port COM 4 connects to the Notifier Primary Signaling Printer port COM 2 and COM 3 are CCUNET RS-422 ports

P/N CCU3-C4-INA; Notifier INA Control/Display Panel Interface, Annunciate Only

Connections	COM 1 connects to the Notifier CRT port COM 4 connects to the Notifier PRINTER port COM 2 and COM 3 are CCUNET RS-422 ports

P/N CCU3-C4-XLG; Interface to XL Graphics Workstation

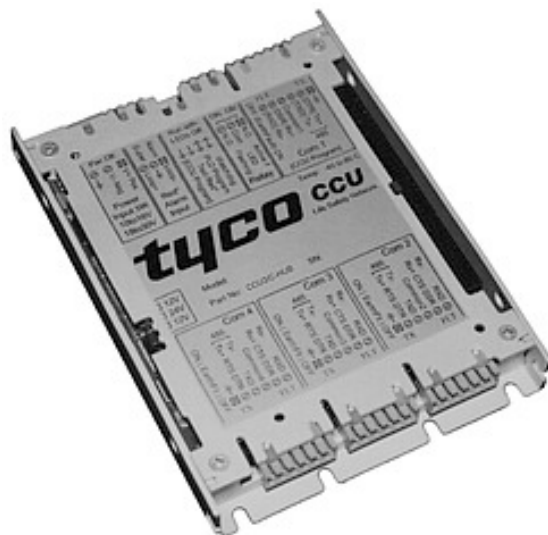|	
Description	Interface Module with XLG firmware, includes Audible Supervision Module with harness, and Interface Adaptor with USB computer cable; all to be mounted in a 4190-9810 box, ordered separately **NOTE:** Locate box 5 ft (1.5 m) maximum from computer and 20 ft (6 m) maximum from 24 VDC power source
Connections	COM 1 connects to the Interface Adapter Module which connects to the XL Graphics computer COM 2 and COM 3 are CCUNET RS-422 ports COM 4 connects to the Audible Supervision Module
Additional Reference	Refer to data sheet S4190-0014 for additional XL Graphics Workstation information

P/N CCU3-C4I-HUB; Interface to Conventional Fire Alarm Control Panels using IDC and NAC connections
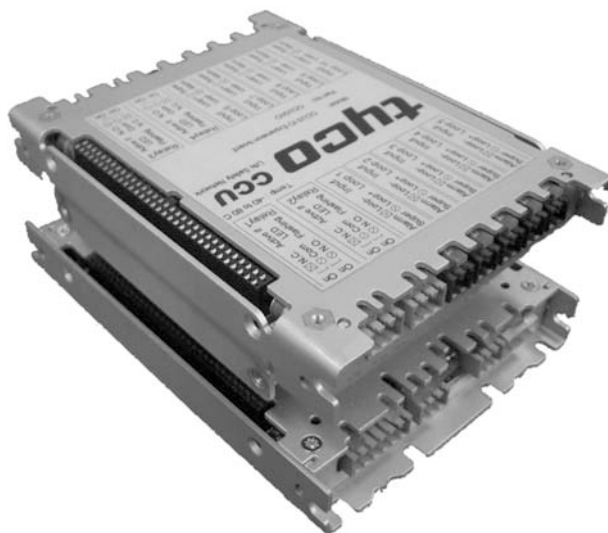
Description	CCUNET Network Hub, used to connect CCUNET loops and as a processor for IO Expansion Modules (one CCU3-IO-UL module is included with CCU3-C4I-HUB)
Connections	COM 2 and COM 3 are CCUNET RS-422 ports
	Expansion socket for connection to up to 2, CCU3-IO-UL Expansion Modules

P/N CCU3-IO-UL; I/O Expansion Module (one is included with CCU3-C4I-HUB)

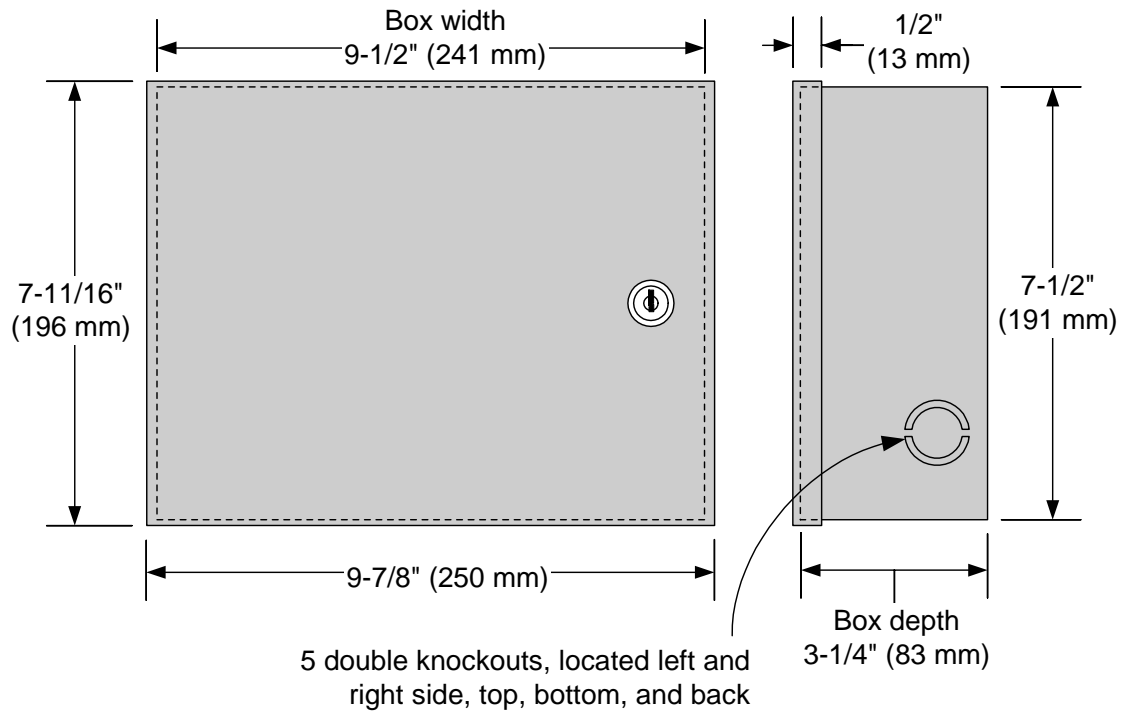|			
Interfaces	Four (4) Form C Relay Outputs; connections for Common, Normally Open (NO), and Normally Closed (NC); active state is programmable		
	Ten (10) Supervised un-powered inputs, 4-20 mA loop		
	Activation current is individually selectable for each input		
LED Status Indicators	**Input Active:** One red Active Status LED per input; LED is on when input current is above the active state selectable trip point I_{Trip} (initial factory set point is 10 mA)		
	Input Fault: One yellow Supervision Fault LED per input; LED is on when the input current is below the supervision point of 4 mA		
	Relay Status: Two (2) green LEDs per Relay Output; LEDs turn on to indicate the terminal is connected to common: <u>steady</u> = connected to common, <u>inactive</u> state <u>flashing</u> = connected to common, <u>active</u> state		
Input Specifications	Current	< 4 mA	Supervision Failure
		4 mA to I_{Trip} mA	Supervised Normal; I_{Trip} = selectable activation current, initial factory set point is 10 mA
		> I_{Trip} mA	Active Alarm
		> 35 mA	Current Limited to prevent damage (Loop shutdown)
	Voltage	30 VDC	Maximum voltage on any input pin with respect to Earth
Relay Output Specifications	Configurable for NC or NO operation; LED indications are per above		
	Operation can be used to indicate processor or communication failure, alarm annunciation, or via CCUNET programmable logic		
Relay Ratings	1 A Resistive maximum @ 24 VDC		
Mounting	Up to 2, CCU3-IO-UL Expansion Modules may be plugged on top of a single CCU3-C4-HUB module		
Module Dimensions	4-1/4" x 6" x 3/4" (108 mm x 152 mm x 19 mm), with pluggable terminal connections attached		

Typical CCU Module; Dimensions = 4-1/4" x 6" x 3/4" Deep (108 mm x 152 mm x 19 mm), with pluggable terminal connections attached (not shown)

CCU3-C4I-HUB Module with Standard CCU3-IO-UL Expansion Module;
Dimensions = 4-1/4" x 6" x 1-1/2" Deep (108 mm x 152 mm x 38 mm), with pluggable terminal connections attached (not shown)

With a Second, Optional CCU3-IO-UL Module Connected;
Dimensions = 4-1/4" x 6" x 2-1/4" Deep (108 mm x 152 mm x 57 mm), with pluggable terminal connections attached (not shown)

Box width
9-1/2" (241 mm)

1/2"
(13 mm)

7-11/16"
(196 mm)

7-1/2"
(191 mm)

9-7/8" (250 mm)

Box depth
3-1/4" (83 mm)

5 double knockouts, located left and
right side, top, bottom, and back

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