HC900 Control Station

900CR Series

Installation

Document Number: 51-52-33-172
Revision: 2.0
Effective: January 2022

Summary

These instructions explain how to install your Control Station. Once installed, the unit must be configured. Configuration is a detailed process described in other documents.

The overall steps for getting your Control Station up and running are as follows.

Step	Action
1	Install the unit per this instruction sheet.
	Refer to other documentation for details on the following steps.
2	After completing installation, configure the HC900 controller for your application using Hybrid Control Designer software and save the .cde file.
3	Using Station Designer software, create data tags from your .cde file, create your operator interface configuration and save the .sds file.
4	Download the .sds file to the 900 Control Station and verify operation.

Note: Configuration of the 900 Control Station may be performed prior to mounting if found to be more convenient when using the USB port since once loaded the configuration is maintained in non-volatile memory, but doing so requires the station to be connected to a 24Vdc power supply.

Contents of package

Check that you received the following items:
- 900CR Control Station Operator Interface
- Hardware packet and plate for mounting unit into panel
- Terminal block for connecting power
- Panel gasket

Supplied separately:

- SD Card (optional)

Safety Summary

	WARNING - EXPLOSION HAZARD
⚠️	DO NOT DISCONNECT EQUIPMENT WHILE THE CIRCUIT IS LIVE OR UNLESS THE AREA IS KNOWN TO BE FREE OF IGNITABLE CONCENTRATIONS

	WARNING - EXPLOSION HAZARD
⚠️	SUBSTITUTION OF ANY COMPONENT MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2

	WARNING - EXPLOSION HAZARD
⚠️	BATTERIES MUST ONLY BE CHANGED IN AN AREA KNOWN TO BE NON-HAZARDOUS.
	BATTERY: LITHIUM COIN CELL. TYPICAL LIFETIME OF 5 YEARS, NOMINAL.
	TO MAINTAIN UL RATING, REPLACEMENT BATTERY MUST BE: RED LION CRA000 BT3V0 00000, RAYOVAC BR1225X-BA OR PANASONIC BR1225A/BN.

	WARNING - EXPLOSION HAZARD
⚠️	DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION

	WARNING - EXPLOSION HAZARD
⚠️	THE AREA MUST BE KNOWN TO BE NON-HAZARDOUS BEFORE SERVICING / REPLACING THE UNIT AND BEFORE INSTALLING OR REMOVING I/O WIRING.

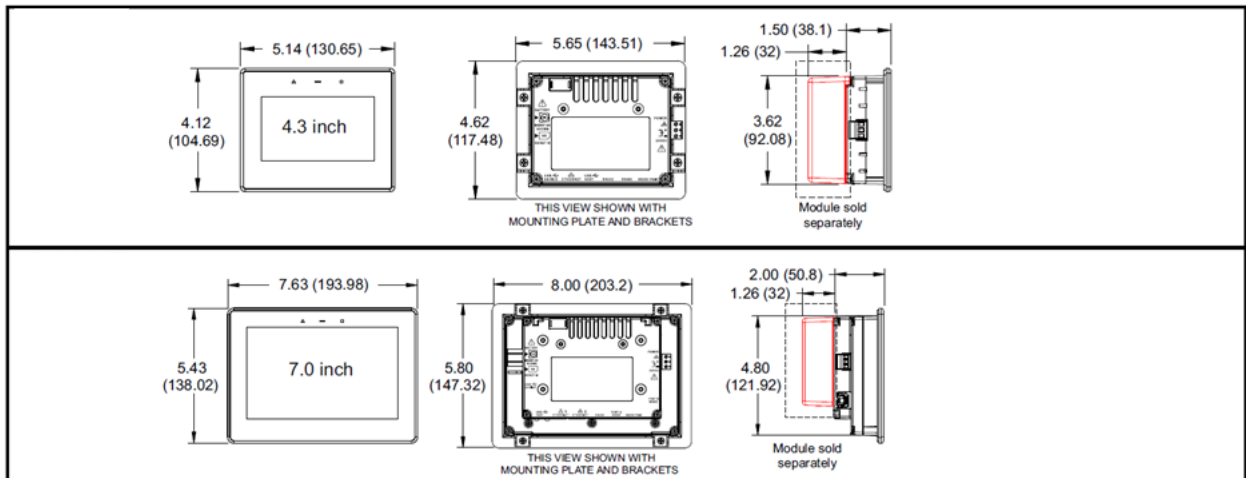| **ATTENTION**	Failure to follow these installation instructions could result in diminished performance and/or invalidate the UL approvals.

Approvals

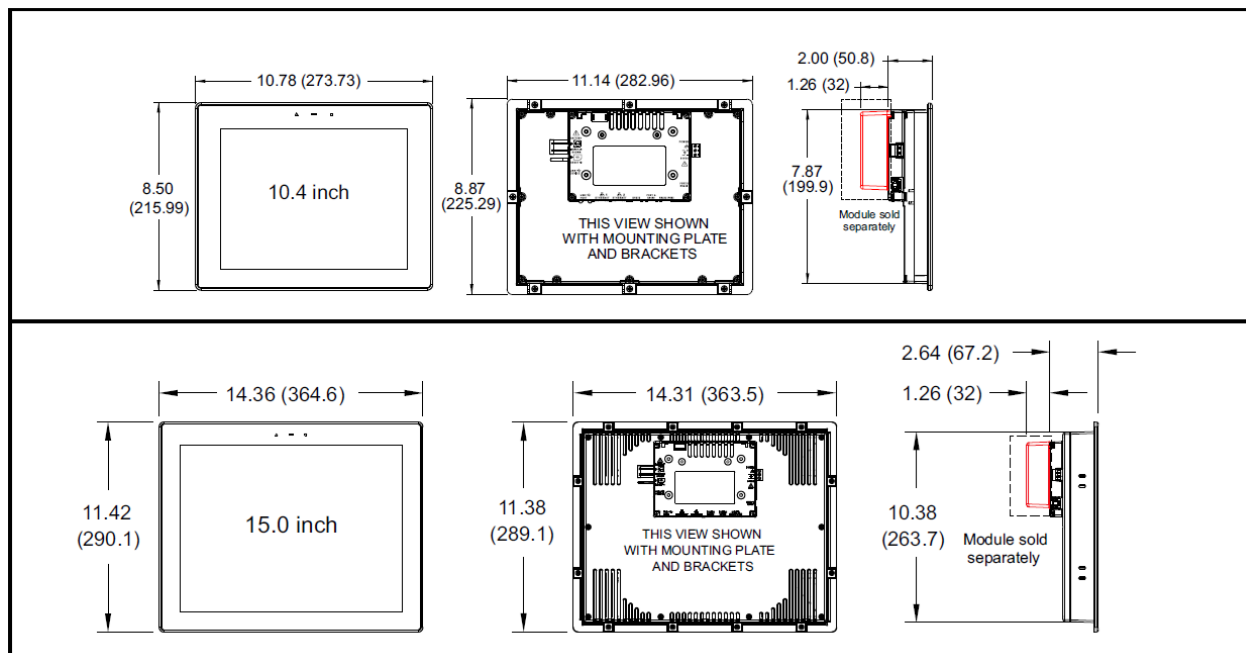| UL Listed	for use in Hazardous (Classified) locations – Class I, Division 2, Groups A, B, C and D.

Dimensions

900CR04-xx / 900CR07-xx

900CR10-xx / 900CR15-xx
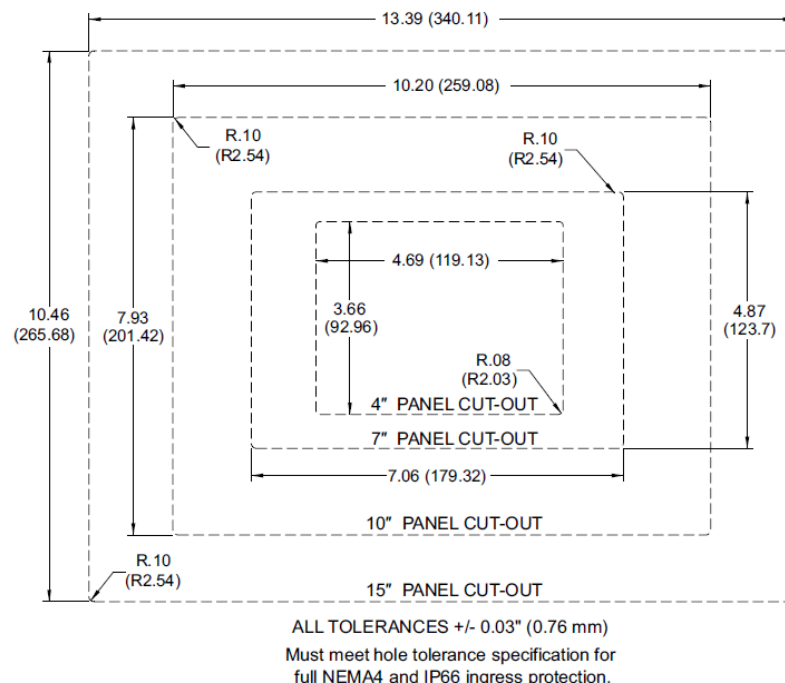
INSTALLING AND POWERING 900CR CONTROL STATION

MOUNTING INSTRUCTIONS

This operator interface is designed for through-panel mounting. The 7, 10 and 15 inch HMIs can be VESA mounted with the addition of a VESA mount adapter plate. This plate allows mounting to a standard 75 x 75 mm VESA bracket. The mounting surface should have a minimum thickness of 0.06" (1.53 mm) and maximum thickness of 0.375" (9.53 mm). Cut the mounting hole per the dimensions shown in the diagram. Care should be taken to remove any loose material from the mounting cut-out to prevent that material from falling into the operator interface during installation.

Caution: *Only the screws provided with the VESA adapter plate should be used to mount the 900Control Station (900CR). Unit cannot be VESA mounted if an expansion module will be used.*

For hazardous location installation, the following shall be taken into consideration:

- This device is open-type and must be mounted in a suitable dust-tight end-enclosure in accordance with articles 500 and 502 of the NEC and positioned so only the face of the display is exposed.

- Must be wired using Division 2 wiring methods as specified in article 501-4(b), 502-4(b), and 503-3(b) of the National Electric Code, NFPA 70 for installation within the United States, or as specified in section 19-152 of Canadian Electrical Code for installation in Canada.

- Combinations of equipment in your system are subject to investigation by the local Authority having jurisdiction at the time of installation.


ALL TOLERANCES +/- 0.03" (0.76 mm)
Must meet hole tolerance specification for
full NEMA4 and IP66 ingress protection.

Follow these steps to install the unit:

- Make sure the bezel gasket is properly in place.

- Place the unit into the front of the panel cutout.

- Install stiffener plate over unit on the inside of the panel. This ensures the mounting surface is stiff enough for a proper seal.

- The plate is required to meet NEMA 4X and IP66.

- Insert clamps into the slots provided on the sides, top and/or bottom of the unit.

- Make sure the clamp's screw sits in the "U" shaped feature. This will prevent the screw from "walking". Tighten the clamping screws in an even pattern until the unit is secured in the panel. To seal to Type 4X/IP66 specifications, all supplied mounting clamps must be used and be torqued as follows:

  - 4, 7, and 10 inch: 4.0 lbf-in (0.45 Nm)
 - 15 inch: 2.0 lbf-in (0.23 Nm)

CAUTION: DO NOT OVERTIGHTEN THE CLAMPS. The panel must not flex more than 0.010" for proper sealing. The safety of any system incorporating the equipment is the responsibility of the assembler of the system.
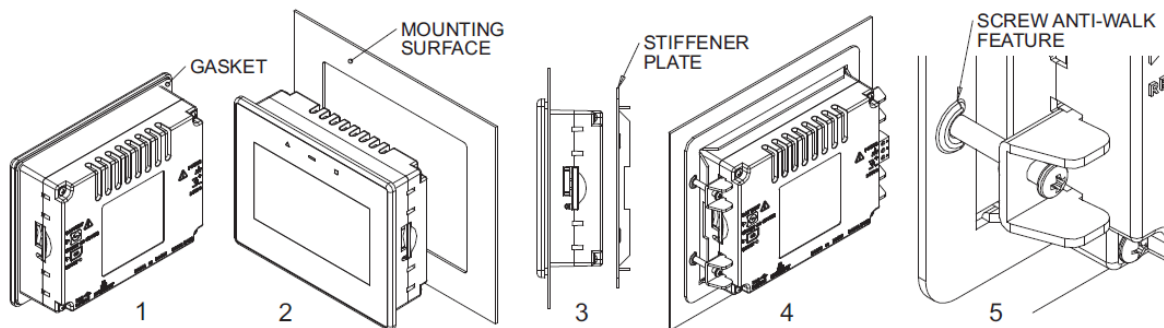
CONNECTING POWER

The 900CR requires a 10-30 VDC power supply. A pluggable power block is provided to connect the 24 VDC. There are three screw terminals. Strip and connect the wire according to the terminal block specifications on Page 2. Connect the positive lead to the plus (+) screw and the negative lead to the minus (-) screw.
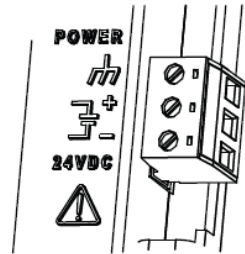
Please take care to observe the following points:

- – Mount the power supply close to the unit, with usually not more than 6 feet (1.8 m) of cable between the supply and the operator interface. Ideally, the shortest length possible should be used.

- – The wire used to connect the operator interface's power supply should be at least 22-gage wire suitably rated for the temperatures of the environment to which it is being installed. If a longer cable run is used, a heavier gage wire should be used. The routing of the cable should be kept away from large contactors, inverters, and other devices which may generate significant electrical noise.

– A power supply with an NEC Class 2 or Limited Power Source (LPS) and SELV rating is to be used. This type of power supply provides isolation to accessible circuits from hazardous voltage levels generated by a mains power supply due to single faults. SELV is an acronym for "safety extra-low voltage." Safety extra-low voltage circuits shall exhibit voltages safe to touch both under normal operating conditions and after a single fault, such as a breakdown of a layer of basic insulation or after the failure of a single component has occurred. A suitable disconnect device shall be provided by the end user.

CONNECTING TO EARTH GROUND

Each operator panel has a chassis ground terminal on the back of the unit. Your unit should be connected to earth ground. Steps should be taken beyond connecting to earth ground to eliminate the buildup of electrostatic charges.

The chassis ground is not connected to signal common of the unit. Maintaining isolation between earth ground and signal common is not required to operate your unit. But, other equipment connected to this unit may require isolation between signal common and earth ground. To maintain isolation between signal common and earth ground care must be taken when connections are made to the unit. For example, a power supply with isolation between its signal common and earth ground must be used. Also, plugging in a USB cable may connect signal common and earth ground.[1]

[1] USB's shield may be connected to earth ground at the host. USB's shield in turn may also be connected to signal common.

MODULE INSTALLATION

Remove module plug and attach module to 900CR. Torque screws to 6.0 pound-force inch [96 ounce-force inch] (0.68 Nm).

REMOVE MODULE PLUG

WARNING: Disconnect all power to the unit before installing or removing modules.
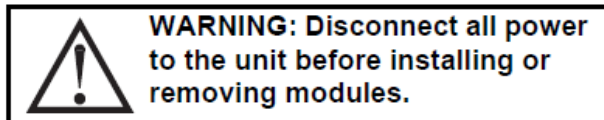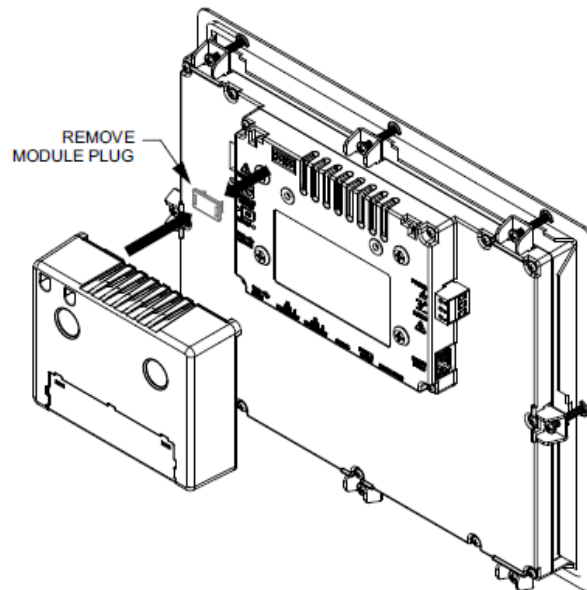
EMC INSTALLATION GUIDELINES

Although Control Station products are designed with a high degree of immunity to Electromagnetic Interference (EMI), proper installation and wiring methods must be followed to ensure compatibility in each application. The type of the electrical noise, source or coupling method into a unit may be different for various installations. Cable length, routing, and shield termination are very important and can mean the difference between a successful or troublesome installation. Listed are some EMI guidelines for a successful installation in an industrial environment.

A unit should be mounted in a metal enclosure, which is properly connected to protective earth.

Use shielded cables for all Signal and Control inputs. The shield connection should be made as short as possible. The connection point for the shield depends somewhat upon the application. Listed below are the recommended methods of connecting the shield, in order of their effectiveness.

a. Connect the shield to earth ground (protective earth) at one end where the unit is mounted.

b. Connect the shield to earth ground at both ends of the cable, usually when the noise source frequency is over 1 MHz.

Never run Signal or Control cables in the same conduit or raceway with AC power lines, conductors, feeding motors, solenoids, SCR controls, and heaters, etc. The cables should be run through metal conduit that is properly grounded. This is especially useful in applications where cable runs are long and portable two-way radios are used in close proximity or if the installation is near a commercial radio transmitter. Also, Signal or Control cables within an enclosure should be routed as far away as possible from contactors, control relays, transformers, and other noisy components.

Long cable runs are more susceptible to EMI pickup than short cable runs.

In extremely high EMI environments, the use of external EMI suppression devices such as Ferrite Suppression Cores for signal and control cables is effective. The following EMI suppression devices (or equivalent) are recommended:

Fair-Rite part number 0443167251

Line Filters for input power cables:

Schaffner # FN2010-1/07

To protect relay contacts that control inductive loads and to minimize radiated and conducted noise (EMI), some type of contact protection network is normally installed across the load, the contacts or both. The most effective location is across the load.

a. Using a snubber, which is a resistor-capacitor (RC) network or metal oxide varistor (MOV) across an AC inductive load is very effective at reducing EMI and increasing relay contact life.

b. If a DC inductive load (such as a DC relay coil) is controlled by a transistor switch, care must be taken not to exceed the breakdown voltage of the transistor when the load is switched. One of the most effective ways is to place a diode across the inductive load. However external diode protection at the load is always a good design practice to limit EMI. Although the use of a snubber or varistor could be used.

Care should be taken when connecting input and output devices to the instrument. When a separate input and output common is provided, they should not be mixed. Therefore, a sensor common should NOT be connected to an output common. This would cause EMI on the sensitive input common, which could affect the instrument's operation.

COMMUNICATING WITH THE 900CR CONTROL STATION

CONFIGURING A 900CR

The 900CR is configured using Station Designer 3.1.7000 software. The 900CR has three or four serial ports, a USB device port, one or two USB Host ports, and an Ethernet port as shown below.

The serial ports are available via RJ connectors. There are two RS232 ports. The port labeled RS232 (PGM) can be used as a Programming Port or you can assign a protocol to it. The RS485 ports can be used for both RS485 or 422 communications. All the serial ports are isolated.

Note: If you assign a protocol to the Programming Port, you will no longer be able to download to that port. You should create a means to call the StopSystem () function from the HMI touchscreen, such that the Programming Port activity can be halted on command. Alternatively, the HMI's memory can be cleared to restore download functionality.
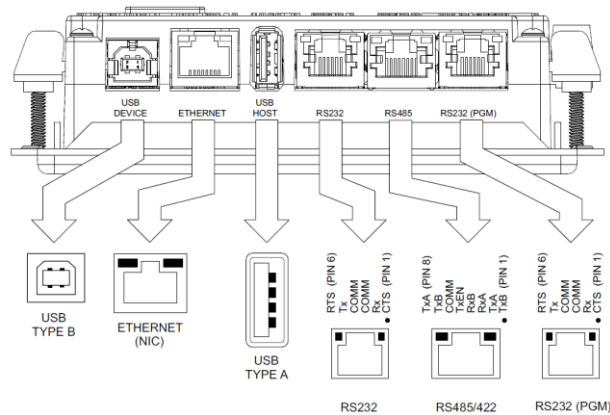
Ethernet port(s) can be programmed to communicate via ten protocols simultaneously. For more information on protocol support, please refer to the Station Designer 3.1.7000 programming software.

The USB device port is a standard device port with a Type B connector, and is used as the programming port. The driver needed to use the USB port will be installed with Station Designer.
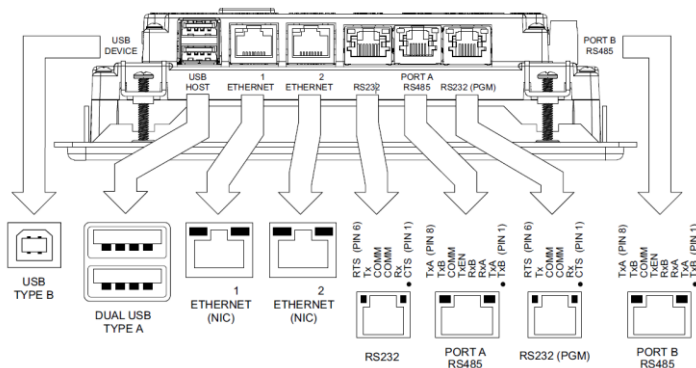
The USB host port(s) are standard host ports with Type A connector(s) and can be used to interface to USB enabled peripherals. These ports supply 5 V power per the USB standard.

The SD card can be used to program a 900CR by placing an image file on the SD card. The card is then inserted into the target 900CR and powered. Refer to the Station Designer 3.1.7000 User Manual for more information on the proper names and locations of this file.
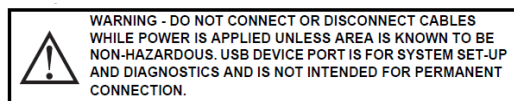
900CR-04 PORT PIN OUTS


900CR-07/10/15 PORT PIN OUTS

USB, DATA TRANSFERS FROM THE SD CARD

⚠ WARNING - DO NOT CONNECT OR DISCONNECT CABLES WHILE POWER IS APPLIED UNLESS AREA IS KNOWN TO BE NON-HAZARDOUS. USB DEVICE PORT IS FOR SYSTEM SET-UP AND DIAGNOSTICS AND IS NOT INTENDED FOR PERMANENT CONNECTION.

To transfer data from the SD card via the USB port, a driver must be installed on your computer. This driver is installed with Station Designer. This may have already been accomplished if your 900CR was configured using the USB port.

INSERTION/REMOVAL OF THE SD CARD

Insert the SD card into the slot provided with the card oriented as shown. The card is inserted properly when the end of the card is flush with the 900CR case. To remove the SD card, push in slightly on the card.
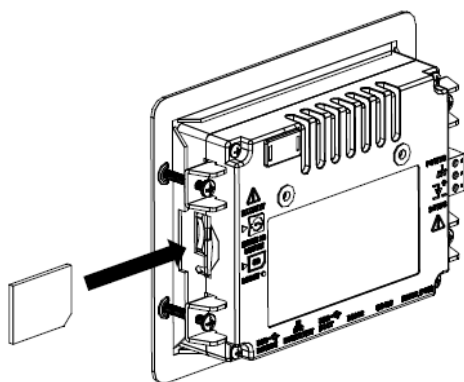
ETHERNET COMMUNICATIONS

Ethernet communications can be established at either 10 BASE-T or 100 BASE-TX. The unit's RJ45 jack is wired as a NIC (Network Interface Card). It auto-detects remote transmit and receive pairs and correctly assigns the transmit and receive pairs. This feature enables the user to use whichever type of cable (cross-over or straight) is available.

The Ethernet connector contains two LEDs representing the following statuses:

LED COLOR	DESCRIPTION
YELLOW solid	Link established.
YELLOW flashing	Data being transferred.
GREEN (OFF)	10 BASE-T Communications
GREEN (ON)	100 BASE-TX Communications

On the rear of each unit is a unique 12-digit MAC address. Refer to the User manual for additional information on Ethernet communications.

RS232 PORTS

The 900CR has two RS232 serial ports. Although only one of these ports can be used for programming, both ports can be used for communications with a PLC. The serial ports can be used for either modbus host or device protocols with any 900CR configuration. Each serial port has a pair of LEDs to indicate transmit and receive activity. The pinouts are shown below.

900CR RS232 TO A PC			
HMI: RJ12	Name	PC: DB9	Name
4	COMM	1	DCD
5	Tx	2	Rx
2	Rx	3	Tx
	N/C	4	DTR
3	COMM	5	GND
	N/C	6	DSR
1	CTS	7	RTS
6	RTS	8	CTS
	N/C	9	RI

RS232/RS422/485 COMMS PORT

The RS485 port(s) of the 900CR can be used for RS485 or RS422 communication. There is a separate RJ connector for each option. Each serial port has a pair of LEDs to indicate transmit and receive activity.
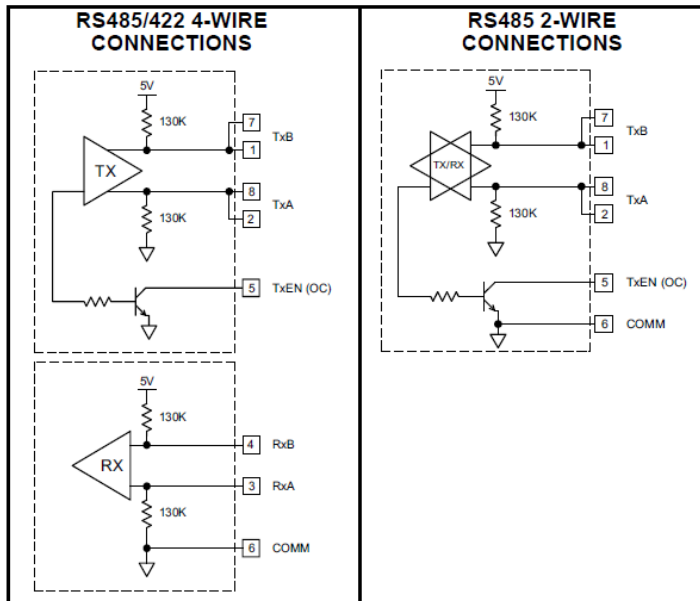
Examples of RS485 2-Wire Connections

900CR TO RJ11			
HMI:RJ45	Name	RLC:RJ11	Name
5	TxEN	2	TxEN
6	COMM	3	COMM
1	TxB	5	B-
2	TxA	4	A+

900CR TO RJ45			
HMI	Name	RLC:RJ45	Name
1,4	TxB	1,4	TxB
4,1	RxB	4,1	RxB
2,3	TxA	2,3	TxA
3,2	RxA	3,2	RxA
5	TxEN	5	TxEN
6	COMM	6	COMM
7	TxB	7	TxB
8	TxA	8	TxA

DISPLAY

This operator interface uses a liquid crystal display (LCD) for displaying text and graphics. The display utilizes an LED backlight for lighting the display. The backlight can be dimmed for low light conditions.

The LED backlight has a limited lifetime. Backlight lifetime is based upon the amount of time the display is turned on at full intensity. Turning the backlight off when the display is not in use can extend the lifetime of your backlight. This can be accomplished through the software when configuring your unit.

FRONT PANEL LEDs

There are three front panel LEDs that can be configured using Station Designer. Shown below is the default status of the LEDs.

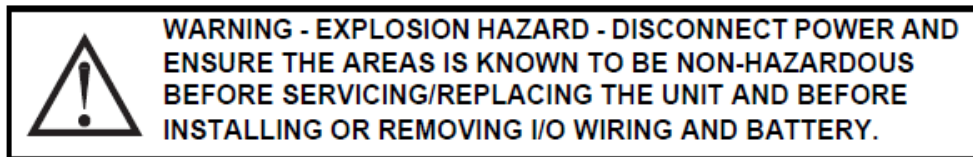| LED	INDICATION
GREEN ( )	
STEADY	Unit is powered.
BLUE ()	
FLASHING	Unit is in the boot loader
OFF	No SD card is present.
STEADY	Valid SD card present.
FLASHING RAPIDLY	SD card being checked.
FLICKERING	SD card accessed.
FLASHING SLOWLY	Incorrectly formatted SD card present.
RED ()	
FLASHING	Data tag is in an alarm active state.
STEADY	Data tag is in an alarm accepted state.

FACTORY RESET BUTTON

The factory reset button located in the lower right area of the rear panel can be used to access the system menu. For procedure, please refer to Manual: 51-52-25-160 900CR Series Control Station User's Guide (Maintenance > Performing a cold start).
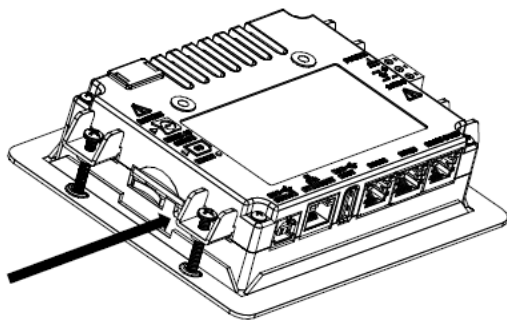
TOUCHSCREEN

This operator interface utilizes a resistive analog touchscreen for user input. The unit will only produce an audible tone (beep) when a touch on an active touchscreen cell is sensed. The touchscreen is fully functional as soon as the operator interface is initialized, and can be operated with gloved hands.

> ⚠ WARNING - EXPLOSION HAZARD - DISCONNECT POWER AND ENSURE THE AREAS IS KNOWN TO BE NON-HAZARDOUS BEFORE SERVICING/REPLACING THE UNIT AND BEFORE INSTALLING OR REMOVING I/O WIRING AND BATTERY.

BATTERY & TIME KEEPING

A battery is used to keep time when the unit is without power. The battery of a 900CR unit does not affect the unit's memory, all configurations and data is stored in non-volatile memory.

Changing the Battery

To change the battery of a 900CR, first remove power to the unit. Remove the SD card if one is installed. Insert a small screwdriver into the slot provided on the battery holder and pry the battery holder with battery out of the unit. Remove the old battery from the plastic holder and replace it with a new battery. Make sure the orientation of the battery is correct and as shown in the diagram.

Re-install the battery holder with battery into the Control Station unit. Using Station Designer or the unit's keypad, enter the correct time and date.

To maintain UL rating, battery must be replaced with one listed in the Specifications.
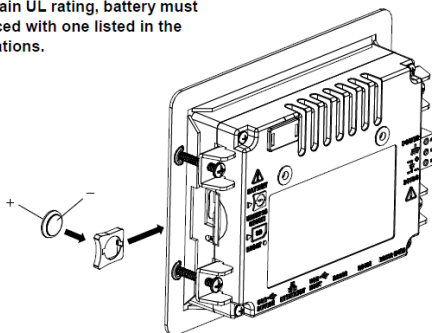
⚠ CAUTION: Lithium battery. Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer.

⚠ Please note that the old battery must be disposed of in a manner that complies with your local waste regulations. The battery must not be disposed of in fire, or in a manner whereby it may be damaged and its contents could come into contact with human skin.

TRADEMARK ACKNOWLEDGMENTS

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Warranty/Remedy

Honeywell warrants goods of its manufacture as being free of defective materials and faulty workmanship. Contact your local sales office for warranty information. If warranted goods are returned to Honeywell during the period of coverage, Honeywell will repair or replace without charge those items it finds defective. The foregoing is Buyer's sole remedy and is **in lieu of all other warranties, expressed or implied, including those of merchantability and fitness for a particular purpose**. Specifications may change without notice. The information we supply is believed to be accurate and reliable as of this printing. However, we assume no responsibility for its use.

While we provide application assistance personally, through our literature and the Honeywell web site, it is up to the customer to determine the suitability of the product in the application.

Sales and Service

For application assistance, current specifications, pricing, or name of the nearest Authorized Distributor, contact one of the offices below.

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