

SNAP-LCSX AND LCSX-PLUS INSTALLATION GUIDE

Form 1061-121101—November 2012

OPTO 22

43044 Business Park Drive • Temecula • CA 92590-3614
Phone: 800-321-OPTO (6786) or 951-695-3000
Fax: 800-832-OPTO (6786) or 951-695-2712
www.opto22.com

Product Support Services

800-TEK-OPTO (835-6786) or 951-695-3080
Fax: 951-695-3017
Email: support@opto22.com
Web: support.opto22.com

SNAP-LCSX and LCSX-PLUS Installation Guide

Form 1061-121101—November 2012

Copyright © 1997–2012 Opto 22.

All rights reserved.

Printed in the United States of America.

The information in this manual has been checked carefully and is believed to be accurate; however, Opto 22 assumes no responsibility for possible inaccuracies or omissions. Specifications are subject to change without notice.

Opto 22 warrants all of its products to be free from defects in material or workmanship for 30 months from the manufacturing date code. This warranty is limited to the original cost of the unit only and does not cover installation, labor, or any other contingent costs. Opto 22 I/O modules and solid-state relays with date codes of 1/96 or later are guaranteed for life. This lifetime warranty excludes reed relay, SNAP serial communication modules, SNAP PID modules, and modules that contain mechanical contacts or switches. Opto 22 does not warrant any product, components, or parts not manufactured by Opto 22; for these items, the warranty from the original manufacturer applies. These products include, but are not limited to, OptoTerminal-G70, OptoTerminal-G75, and Sony Ericsson GT-48; see the product data sheet for specific warranty information. Refer to Opto 22 form number 1042 for complete warranty information.

Wired+Wireless controllers and brains and N-TRON wireless access points are licensed under one or more of the following patents: U.S. Patent No(s). 5282222, RE37802, 6963617; Canadian Patent No. 2064975; European Patent No. 1142245; French Patent No. 1142245; British Patent No. 1142245; Japanese Patent No. 2002535925A; German Patent No. 60011224.

Opto 22 FactoryFloor, Optomux, and Pamux are registered trademarks of Opto 22. Generation 4, ioControl, ioDisplay, ioManager, ioProject, ioUtilities, *mistic*, Nvio, Nvio.net Web Portal, OptoConnect, OptoControl, OptoDataLink, OptoDisplay, OptoEMU, OptoEMU Sensor, OptoEMU Server, OptoOPCServer, OptoScript, OptoServer, OptoTerminal, OptoUtilities, PAC Control, PAC Display, PAC Manager, PAC Project, SNAP Ethernet I/O, SNAP I/O, SNAP OEM I/O, SNAP PAC System, SNAP Simple I/O, SNAP Ultimate I/O, and Wired+Wireless are trademarks of Opto 22.

ActiveX, JScript, Microsoft, MS-DOS, VBScript, Visual Basic, Visual C++, Windows, and Windows Vista are either registered trademarks or trademarks of Microsoft Corporation in the United States and other countries. Linux is a registered trademark of Linus Torvalds. Unicenter is a registered trademark of Computer Associates International, Inc. ARCNET is a registered trademark of Datapoint Corporation. Modbus is a registered trademark of Schneider Electric. Wiegand is a registered trademark of Sensor Engineering Corporation. Nokia, Nokia M2M Platform, Nokia M2M Gateway Software, and Nokia 31 GSM Connectivity Terminal are trademarks or registered trademarks of Nokia Corporation. Sony is a trademark of Sony Corporation. Ericsson is a trademark of Telefonaktiebolaget LM Ericsson. CompactLogix, MicroLogix, SLC, and RSLogix are trademarks of Rockwell Automation. Allen-Bradley and ControlLogix are registered trademarks of Rockwell Automation. CIP and EtherNet/IP are trademarks of ODVA.

All other brand or product names are trademarks or registered trademarks of their respective companies or organizations.

Table of Contents

OPTO 22

Chapter 1: Introduction	1
Software	2
What's In This Guide	2
For Help	3
Chapter 2: Quick Start	5
What You Will Need	5
Instructions	6
Chapter 3: Setting the Faceplate Jumpers	9
Setting Faceplate Jumpers	10
Setting the Controller Address	10
Setting the Host Port	11
Setting the Host Port Baud Rate	12
Setting the Communication Mode	12
Setting the Boot Mode	12
AUTO and E/R Jumpers	12
X1 Jumper	13
Chapter 4: Configuring the Serial Ports	15
Opening the Controller	16
Identifying the Serial Card and Jumpers	17
Configuring COM Port 0	17
COM0 RS-485 Configuration and Wiring	18
COM0 Modem Configuration and Wiring	19
Configuring COM Port 1	19
Configuring COM Port 2 (SNAP-LCSX-PLUS Only)	20
COM2 RS-232 Configuration	20
COM2 RS-485 Configuration	20
Pin Connections for COM2	21
Configuring COM Port 3 (SNAP-LCSX-PLUS Only)	21
COM3 RS-232 Configuration	21
COM3 RS-485 Configuration	22
Pin Connections for COM3	22

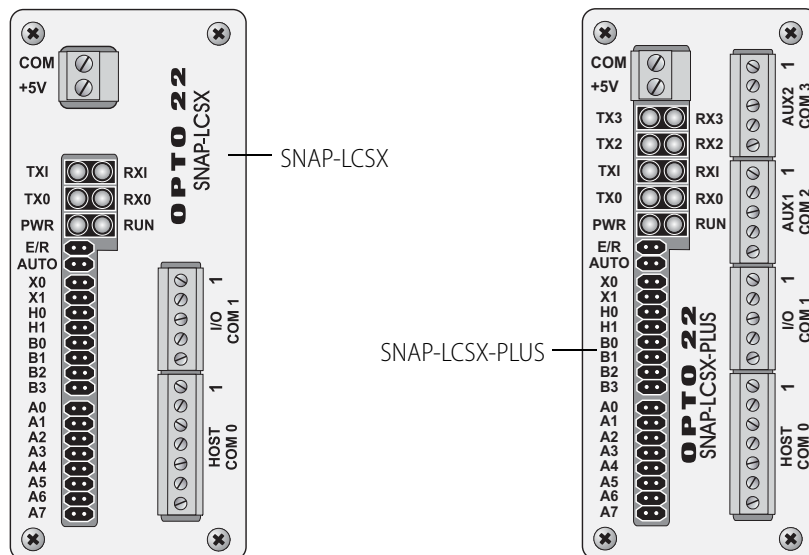
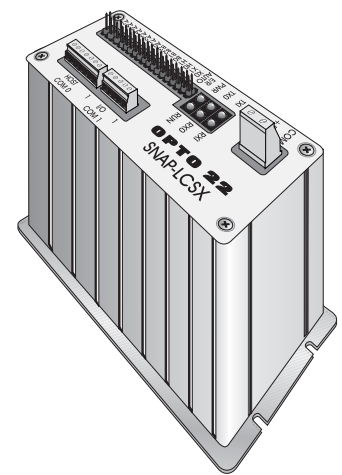
Chapter 5: Mounting and Connecting the Controller	23
Panel Dimensions	23
Panel Mounting	24
DIN-Rail Dimensions	24
DIN-Rail Mounting	25
Connecting the Controller to Remote I/O	25
Chapter 6: Specifications and Troubleshooting	27
Specifications	27
Power Supply Recommendations	28
LED Descriptions	28
Troubleshooting	28

Introduction

The SNAP-LCSX and SNAP-LCSX-PLUS controllers are designed for use with Opto 22's SNAP or Mystic remote I/O systems and Opto 22's FactoryFloor software for industrial automation. The SNAP-LCSX and LCSX-PLUS controllers provide powerful real-time industrial control in a compact package.

The SNAP-LCSX and LCSX-PLUS controllers have identical dimensions and share similar features, such as a single 5-volt power supply requirement and DIN rail and panel mounting options. Both contain powerful 32-bit processors capable of a wide range of computing functions. A SNAP-LCSX controller (shown at right) is the same size as a SNAP power supply.

The difference in the two controllers is shown below. The SNAP-LCSX has two serial communication (COM) ports, and the SNAP-LCSX-PLUS has four.



Software

The SNAP-LCSX and LCSX-PLUS controllers are designed to work in combination with Opto 22's FactoryFloor[®] software suite, which consists of four integrated components:

- OptoControl[™], a graphical, flowchart-based development environment for machine control and process applications
- OptoDisplay[™], an intuitive human-machine interface (HMI) and trending package
- OptoServer[™], a robust, OPC-compliant data server that connects the controller network with the PC network
- OptoConnect[™], a bi-directional link between the SNAP controller database and Microsoft's SQL Server and Access databases.

The SNAP-LCSX and LCSX-PLUS controllers are programmed using OptoControl on a PC workstation. OptoControl is easy to use and self-documenting. It uses a plain English command set and a long tagname database shared by all FactoryFloor components.

These controllers also work with Opto 22's 16-bit software: Cyrano[®], Mystic[®] MMI, and Mystic Data Server (MDS).

What's In This Guide

This guide includes:

Chapter 1: Introduction provides Product Support information.

Chapter 2: Quick Start describes how to install a generic SNAP-LCSX controller using factory settings.

Chapter 3: Setting the Faceplate Jumpers provides detailed instructions for changing factory faceplate settings.

Chapter 4: Configuring the Serial Ports provides detailed instructions for changing factory serial port settings.

Chapter 5: Mounting and Connecting the Controller shows how to mount the controller and then connect it to I/O.

Chapter 6: Specifications and Troubleshooting provides specifications, power supply recommendations, LED descriptions, and troubleshooting information.

For Help

If you have problems installing or using the SNAP-LCSX or LCSX-PLUS controller and cannot find the help you need in this guide, contact Opto 22 Product Support Monday through Friday, 8 a.m. to 5 p.m. Pacific Time.

Phone:	800-TEK-OPTO (800-835-6786) 951-695-3080 (Hours are Monday through Friday, 7 a.m. to 5 p.m. Pacific Time)	<i>NOTE: Email messages and phone calls to Opto 22 Product Support are grouped together and answered in the order received.</i>
Fax:	951-695-3017	
Email:	support@opto22.com	
Opto 22 website:	www.opto22.com	

When calling for technical support, be prepared to provide the following information about your system to the Product Support engineer:

- Software and version being used
- Firmware versions
- PC configuration (type of processor, speed, memory, and operating system)
- A complete description of your hardware and operating systems, including:
 - type of power supply
 - types of I/O units installed
 - third-party devices installed (for example, barcode readers)
- Specific error messages seen.

Quick Start

This section gives quick instructions for installing a generic SNAP-LCSX controller using factory-default settings, which are shown in the table on [page 10](#). If you are not using the factory defaults, see [“Setting the Faceplate Jumpers” on page 9](#) and [“Configuring the Serial Ports” on page 15](#) for additional information.

What You Will Need

- SNAP-LCSX or LCSX-PLUS controller and box kit
- +5 VDC power supply
- PC with OptoControl and a free RS-232 serial port
- RS-232 cable
- multimeter
- small flathead screwdriver
- pair of wire strippers/cutters.

Instructions

1. With the power supply off or unplugged, connect it to the controller.

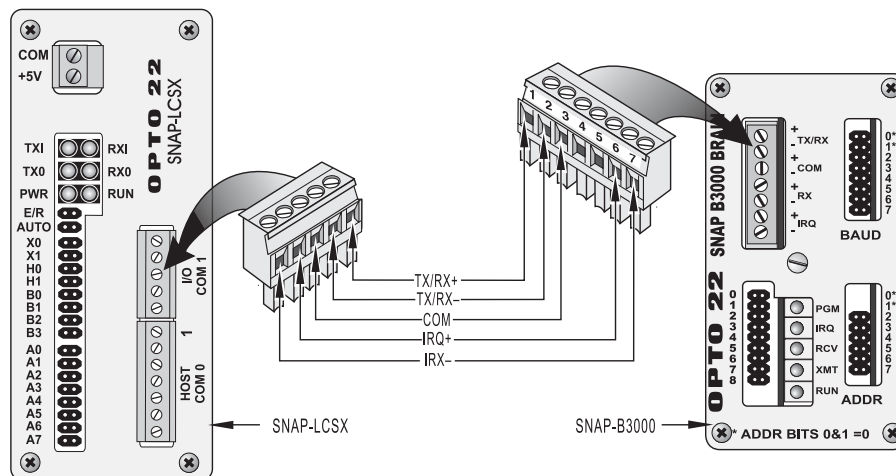
The SNAP-LCSX controller requires a power supply capable of delivering at least 500mA at 5V \pm 5 percent. The controller does not have a power switch; to turn it off, switch off the power supply.

CAUTION: Reversing wire polarity may cause damage to your controller. This damage is not covered by Opto 22's warranty. If in doubt about which wire is which on your power supply, check with a meter.

- a. With the power supply off or unplugged, connect the +5V lead from the power supply (normally red) to the +5V terminal on the face of the SNAP-LCSX.
- b. Connect the COM wire from the power supply (normally black) to the COM terminal on the face of the SNAP-LCSX.

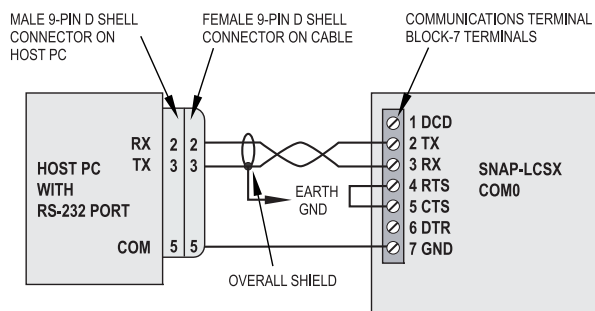
2. Connect the SNAP-LCSX controller to Opto 22 I/O units.

Use the built-in COM1 port to communicate with Opto 22 digital or analog (or both) I/O. Set up the I/O unit as shown in its installation guide. The diagram on the next page illustrates connection with a B3000 brain board.



3. Connect the SNAP-LCSX controller to a personal computer (PC).

You can start with a pre-wired RS-232 cable that you don't mind cutting, or you can make your own cable. Cut off the end of the cable that DOES NOT plug into the computer and wire the cable as shown in the diagram below:



4. Configure the controller using OptoControl.

In order to be useful with a SNAP-LCSX or LCSX-PLUS controller, a PC must have at least one element of Opto 22's FactoryFloor software suite installed: OptoControl, OptoDisplay, OptoServer, or OptoTerm. This guide assumes that you will configure the controller using OptoControl. For instructions, see the *OptoControl User's Guide*.

Your SNAP-LCSX or LCSX-PLUS controller is now ready to run OptoControl strategies. The rest of this guide gives detailed instructions in case you need to use non-factory settings.

Setting the Faceplate Jumpers

This chapter shows how to configure the controller's faceplate jumpers.

For help with	See page
Setting the Controller Address	10
Setting the Host Port	11
Setting the Host Port Baud Rate	12
Setting the Communication Mode	12
Setting the Boot Mode	12

Setting Faceplate Jumpers

The following table summarizes faceplate jumper settings. Shaded entries show default settings.

Jumper(s)	Description	Position	Setting			
E/R	EEPROM/RAM	In	Run from RAM			
		Out	Run from EEPROM			
Auto	Autoboot	In	Autoboot enabled			
		Out	Autoboot disabled			
X0	Communication	In	Binary			
		Out	ASCII			
X1	Boot Loader	In	Boot to kernel			
		Out	Boot to loader			
H0, H1	Host Port	H0	H1			
		In	In	COM0		
		Out	In	COM1		
Baud 0–3	Baud Rate	B0	B1	B2	B3	
		Out	In	In	In	115.2 KBd
		In	Out	In	In	76.8 KBd
		Out	Out	In	In	57.6 KBd
		In	In	Out	In	38.4 KBd
		Out	In	Out	In	19.2 KBd
		In	Out	Out	In	9600 Bd
		Out	Out	Out	In	4800 Bd
		In	In	In	Out	2400 Bd
		Out	In	In	Out	1200 Bd
		In	Out	In	Out	600 Bd
		Out	Out	In	Out	300 Bd
Address 0–7	Address Bits	Bit 0 In		1		
		Bit 1 In		2		
		Bit 2 In		4		
		Bit 3 In		8		
		Bit 4 In		16		
		Bit 5 In		32		
		Bit 6 In		64		
		Bit 7 In		128		

Setting the Controller Address

Each Opto 22 controller connected to a host computer must have a unique address between 1 and 255 (1 and FF hexadecimal).

The table on the following page shows possible addresses and their corresponding jumper settings. The factory default is 1. The most significant bit is 7 and the least significant bit is 0.

NOTE: Zero is not a valid address.

Setting the Host Port Baud Rate

The factory setting for the host port baud rate is 38.4 KBd, but baud rates from 300 Bd to 115 KBd are selectable using jumpers B0 through B3. In general, it is best to choose the fastest baud rate the host computer and the controller will both support. Lower baud rates may be necessary for long cable runs, in high-noise environments, or for compatibility with modems or other data transmission equipment. The table at right shows jumper settings for available baud rates. The shaded entry is the default setting.

Baud Rate	B0	B1	B2	B3
115.2 KBd	Out	In	In	In
76.8 KBd	In	Out	In	In
57.6 KBd	Out	Out	In	In
38.4 KBd	In	In	Out	In
19.2 KBd	Out	In	Out	In
9600 Bd	In	Out	Out	In
4800 Bd	Out	Out	Out	In
2400 Bd	In	In	In	Out
1200 Bd	Out	In	In	Out
600 Bd	In	Out	In	Out
300 Bd	Out	Out	In	Out

Setting the Communication Mode

You can select ASCII or binary communications mode using jumper X0. The factory default is binary, which is generally faster than ASCII. ASCII is typically used only for compatibility with modems or other data transmission equipment, or with host devices that for some reason cannot support binary mode. The table at right shows jumper settings for the communication mode.

Communication Mode	X0
Binary	In
ASCII	Out

Setting the Boot Mode

The boot mode jumpers determine how the controller acts when it is turned on. The AUTO, E/R, and X1 jumpers set the boot mode.

AUTO and E/R Jumpers

The AUTO jumper determines whether the controller automatically starts running your strategy (autoboot) or waits until instructed to do so by the host computer. The E/R jumper determines whether the strategy is executed from battery-backed RAM or from Flash ROM. The factory settings are non-autoboot and execute from RAM.

There is no operational difference between execution from battery-backed RAM or ROM, except that the SNAP-LCSX and LCSX-PLUS have significantly more space available in RAM for program storage. The drawback to execution from RAM is that the program will be lost when the backup battery dies. (Battery life typically exceeds three years.)

Before the controller will execute a program from ROM, you must have stored the program in Flash ROM by selecting that download function in OptoControl. In general, it is best to wait until program development is complete to use the autoboot feature or store the program in Flash ROM.

X1 Jumper

Typically, this jumper is needed only if the firmware in the controller has somehow been corrupted, and the controller cannot execute its full kernel properly. The X1 jumper sets the controller to “boot to loader” mode, which will prepare it for a kernel (firmware) download. Under normal conditions, however, you can update the controller firmware using one of Opto 22’s firmware update utilities, without needing to set this jumper

The following table shows Auto, E/R, and X1 jumper settings. Default settings are shaded.

Boot Mode	Auto	E/R	X1
Autoboot enabled	In		
Autoboot disabled	Out		
Run from RAM		In	
Run from EEPROM		Out	
Boot to kernel			In
Boot to loader			Out

Configuring the Serial Ports

This chapter shows how to configure the controller's serial ports.

For help with	See page
Opening the Controller	16
Identifying the Serial Card and Jumpers	17
Configuring COM Port 0	17
Configuring COM Port 1	19
Configuring COM Port 2 (SNAP-LCSX-PLUS Only)	20
Configuring COM Port 3 (SNAP-LCSX-PLUS Only)	21

The SNAP-LCSX comes with two serial ports:

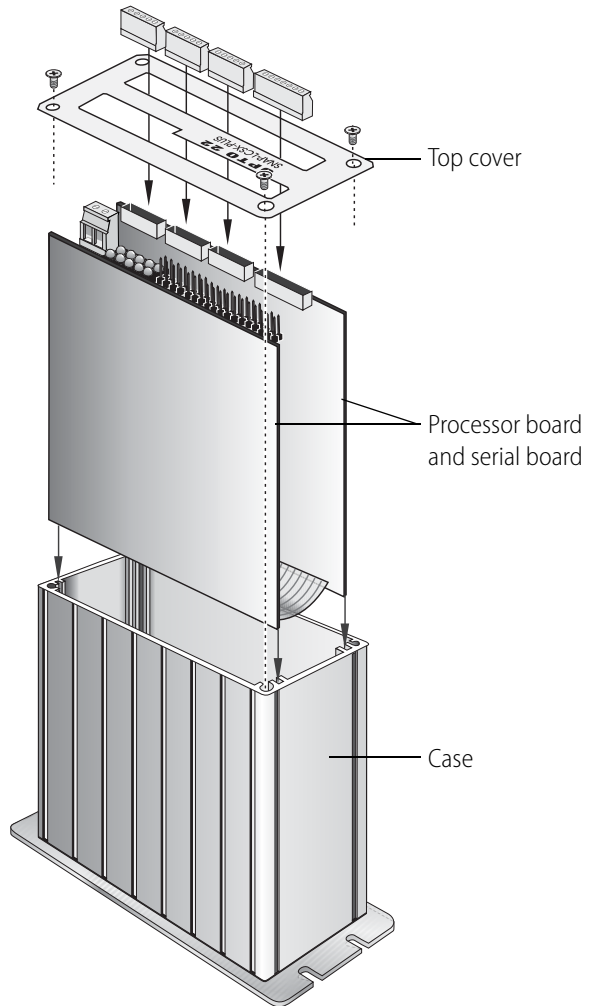
- **COM0** is selectable as RS-232, RS-485 half-duplex (2-wire), or RS-485 full duplex (4-wire). The default mode is RS-232 for connection to a PC. In RS-232 mode, COM0 also supports RTS and DTR/DCD flow control for use with modems.
- **COM1** is an Opto 22 remote I/O port (half-duplex RS-485 only).

The SNAP-LCSX-PLUS has two additional serial ports, both configurable either as RS-232 or as half- or full-duplex RS-485. The default mode is RS-232. In RS-232 mode, COM2 and COM3 support RTS flow control only. Interrupt (IRQ) functionality is available in RS-485 2-wire mode only.

Since most systems use the default modes, it's not normally necessary to configure serial ports. However, if you need to change the serial port configuration, you must open the controller and set configuration jumpers on the serial card inside.

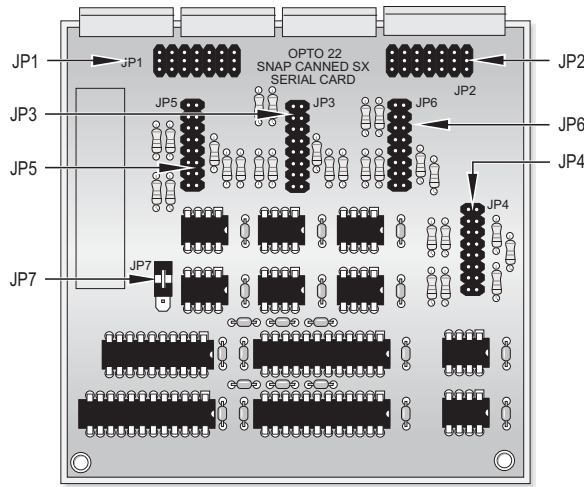
Opening the Controller

1. Following the illustration below, remove the SNAP-LCSX top cover and take the processor board and serial board out of the case.



Identifying the Serial Card and Jumpers

The serial card is the card with the port connectors. Its jumpers (JP) are shown in the diagram below.



To change the serial port configuration, set jumpers on the serial card for each port as illustrated in the following sections.

NOTE: JP7 must remain in its default position as shown above. Other positions are reserved for future use.

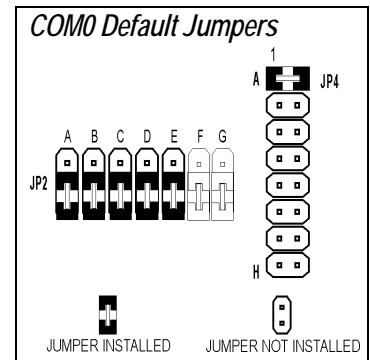
Configuring COM Port 0

The default mode for COM0 is RS-232, and the wiring diagram is shown in [step 3 on page 6](#). Pinouts are also shown below. Jumper groups 2 and 4 control COM0. Default jumper settings are shown in the diagram at right. (Jumpers F and G in JP2 are shown for reference but grayed out, as they do not affect COM0.)

COM0 can also be configured for RS-485 two- or four-wire or for use with a modem. See the following page for details.

Pinouts for COM0

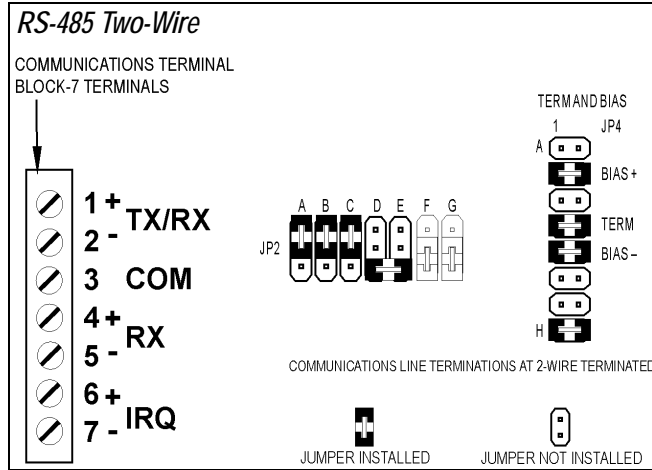
Pin	RS-232
1	DCD
2	TX
3	RX
4	RTS
5	CTS
6	DTR
7	GND



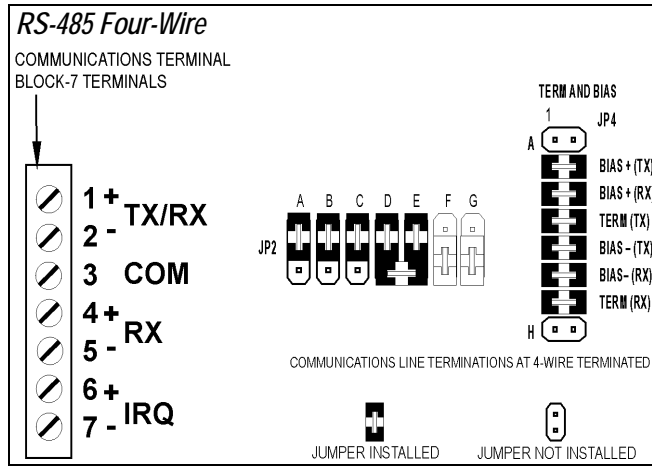
↑ Port connectors would be at the top of this diagram.

COM0 RS-485 Configuration and Wiring

The following diagrams illustrate jumper settings and wiring for RS-485 two-wire and RS-485 four-wire. (Jumpers F and G in JP2 are shown for reference but grayed out, as they do not affect COM0.)



↑ Port connectors would be at the top of this diagram.



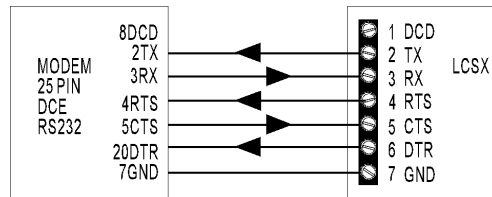
↑ Port connectors would be at the top of this diagram.

COM0 Modem Configuration and Wiring

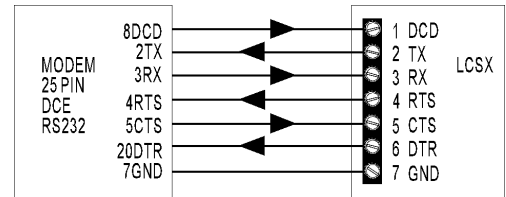
In RS-232 mode, COM0 also supports RTS and DTR/DCD flow control for use with modems, either with or without a carrier detect. Check your modem documentation for additional wiring information, possible jumper configuration, and initialization setup. You may also want to read Opto 22's communication application notes, available on the Opto 22 Web site or through our Bulletin Board Service. See [page 3](#) for details.

The following diagrams illustrate wiring for modems. Use the COM0 default jumper settings for modems (shown in the diagram on [page 17](#)).

Wiring to a Modem without Carrier Detect



Wiring to a Modem with Carrier Detect



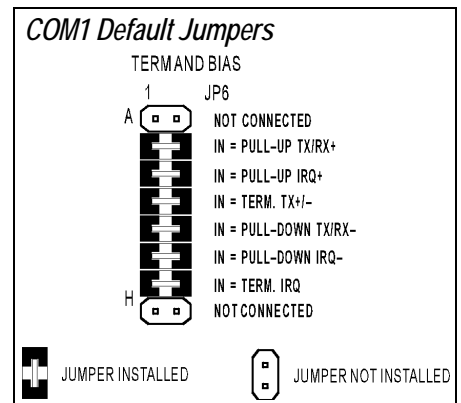
Configuring COM Port 1

COM1 comes from the factory set up for communicating with Opto 22 remote I/O. COM1 is a two-wire RS-485 port only. It will not typically require configuration unless you are using it with devices that are not Opto 22 remote I/O.

Jumper group 6 controls COM1. Default jumper settings are shown in the diagram at right. Pinouts are shown below.

Pinouts for COM1

Pin	RS-485 2-wire
1	TX/RX +
2	TX/RX -
3	COM
4	IRQ +
5	IRQ -



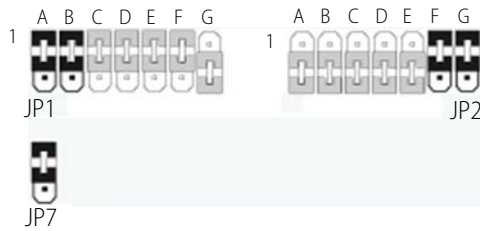
Configuring COM Port 2 (SNAP-LCSX-PLUS Only)

The default for COM2 is RS-232, but this port can also be configured as RS-485 two-wire or four-wire. Jumpers 1A, 1B, 2F, and 2G control the mode for COM2. The grayed-out jumpers are shown for reference only.

NOTE: The mode may be shown incorrectly on the board itself. Use the diagrams below to set the mode.

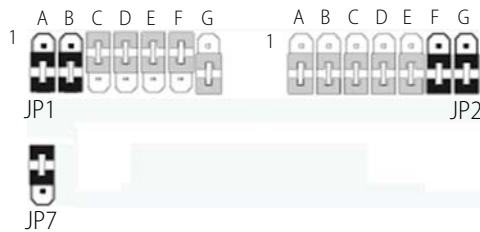
COM2 RS-232 Configuration

RS-232 Mode (default)



COM2 RS-485 Configuration

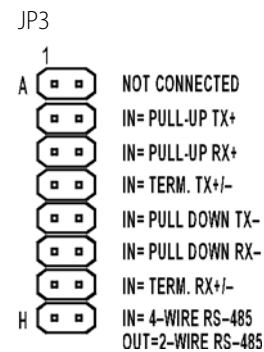
RS-485 Mode



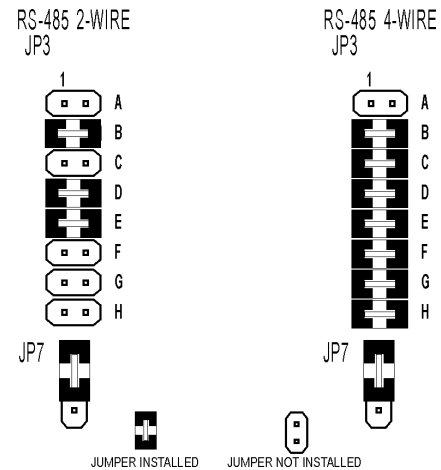
Jumper functions and two-wire and four-wire jumper settings are shown below. Use jumper group 3 (JP3) for COM2. Make certain that the JP7 jumper remains in its default position, as shown.

RS-485 Jumper Functions

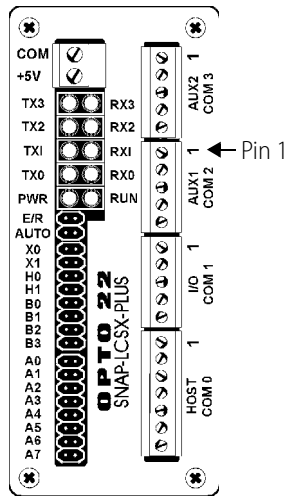
TERMINATION/MODE: COM 2



Two-Wire and Four-Wire Jumper Settings



Pin Connections for COM2



Pin	RS-232	RS-485 2-wire	RS-485 4-wire
1	TX	TX/RX +	TX +
2	RX	TX/RX -	TX -
3	COM	COM	COM
4	RTS	IRQ +*	RX +
5	CTS	IRQ -*	RX -

TX = Transmit
 RX = Receive
 COM = Common
 Ground
 RTS = Request to Send
 CTS = Clear to Send
 IRQ = Interrupt

*NOTE: For 2-wire, use pins 4 and 5 only if you are using an interrupt (IRQ). The IRQ function is supported in 2-wire mode only. Use pins 4 and 5 for the IRQ wires and leave jumper H out.

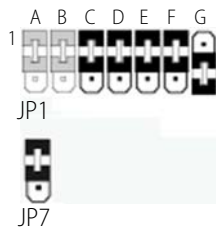
Configuring COM Port 3 (SNAP-LCSX-PLUS Only)

The default for COM3 is RS-232, but this port can also be configured as RS-485 two-wire or four-wire. Jumpers 1C–1G control the mode for COM3. The grayed-out jumpers are shown for reference only.

NOTE: The mode may be shown incorrectly on the board itself. Use the diagrams below to set the mode.

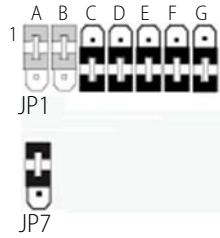
COM3 RS-232 Configuration

RS-232 Mode (default)



COM3 RS-485 Configuration

RS-485 Mode

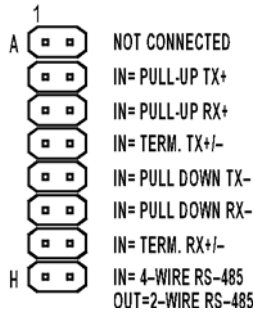


Jumper functions and two-wire and four-wire jumper settings are shown below. Use jumper group 5 (JP5) for COM3. Make certain that the JP7 jumper remains in its default position, as shown.

RS-485 Jumper Functions

TERMINATION/MODE: COM3

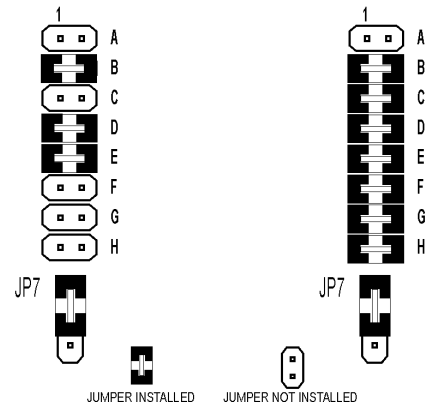
JP5



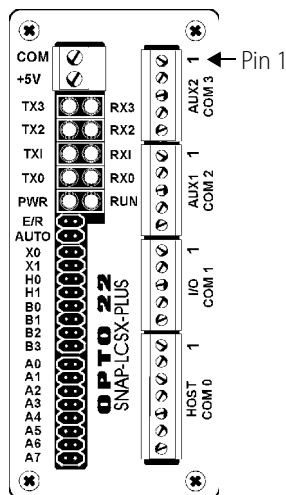
Two-Wire and Four-Wire Jumper Settings

RS-485 2-WIRE
JP5

RS-485 4-WIRE
JP5



Pin Connections for COM3



Pin	RS-232	RS-485 2-wire	RS-485 4-wire
1	TX	TX/RX +	TX +
2	RX	TX/RX -	TX -
3	COM	COM	COM
4	RTS	IRQ +*	RX +
5	CTS	IRQ -*	RX -

TX = Transmit
 RX = Receive
 COM = Common
 Ground
 RTS = Request to Send
 CTS = Clear to Send
 IRQ = Interrupt

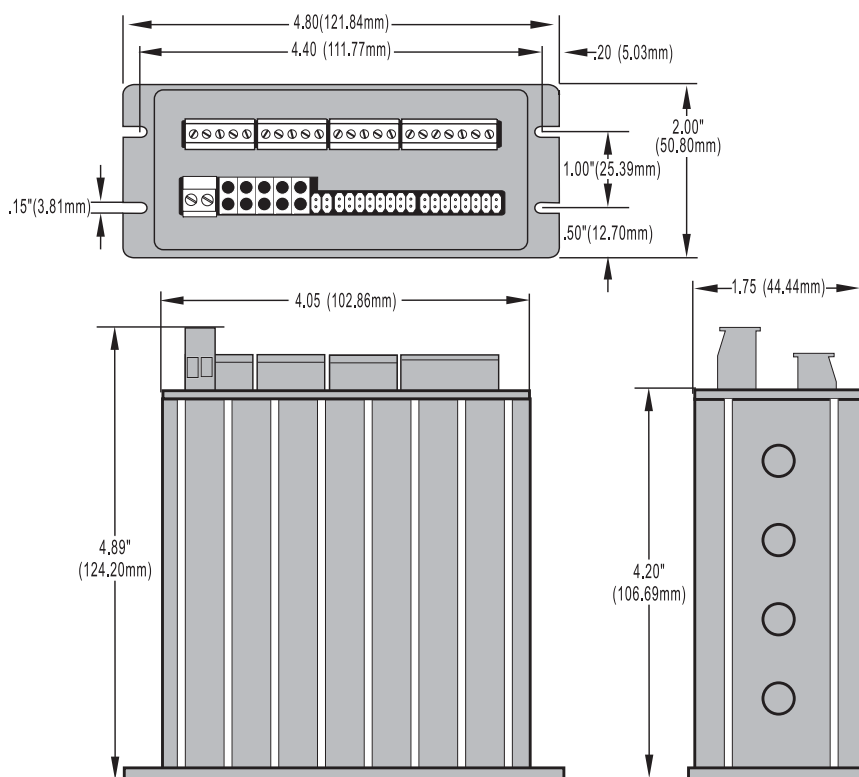
*NOTE: For 2-wire, use pins 4 and 5 only if you are using an interrupt (IRQ). The IRQ function is supported in 2-wire mode only. Use pins 4 and 5 for the IRQ wires and leave jumper H out.

Mounting and Connecting the Controller

This chapter shows you how to mount the controller and then connect it to I/O.

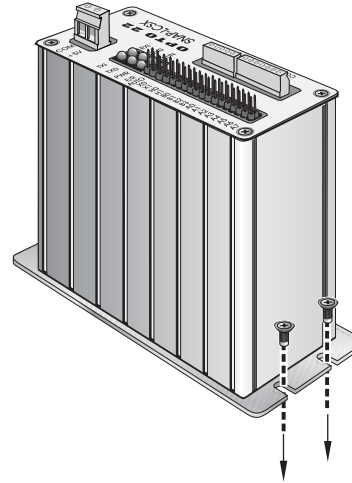
The SNAP-LCSX controllers can be panel mounted or mounted on a DIN rail. DIN-rail mounting requires an adapter clip, part number SNAP-PSDIN (not included). The controllers are the same size and shape as a SNAP power supply.

Panel Dimensions

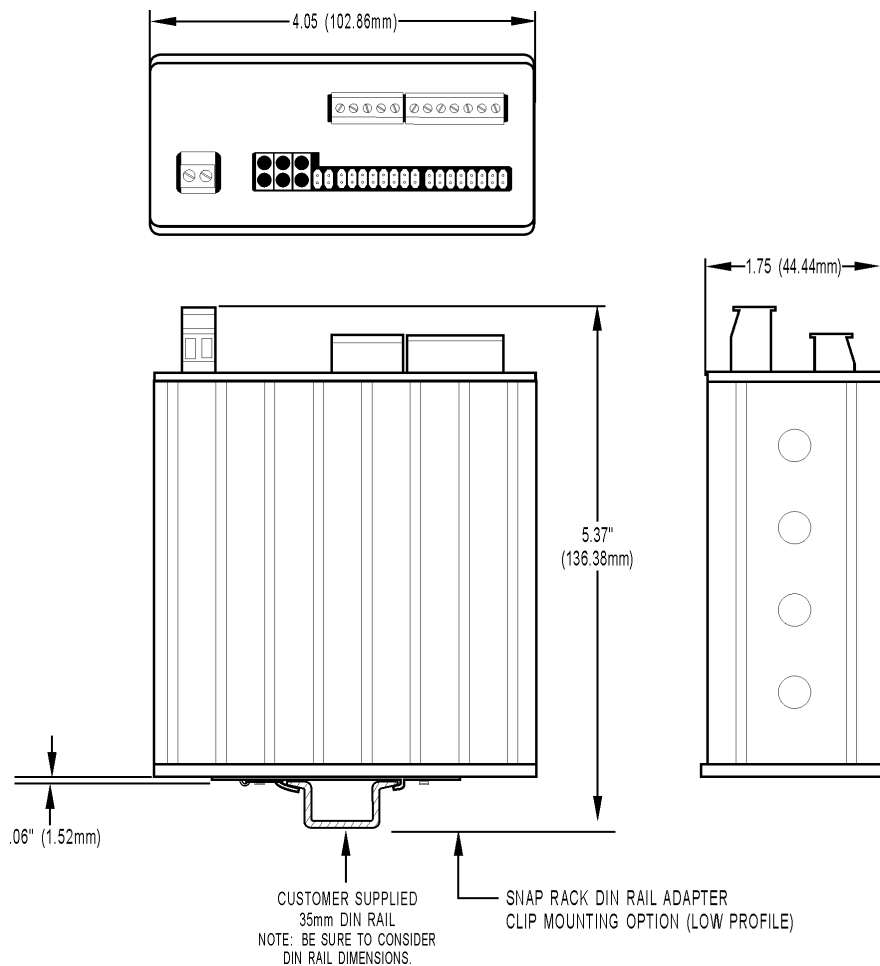


Panel Mounting

Use two screws on each side of the SNAP-LCSX controller to mount it to a panel.



DIN-Rail Dimensions

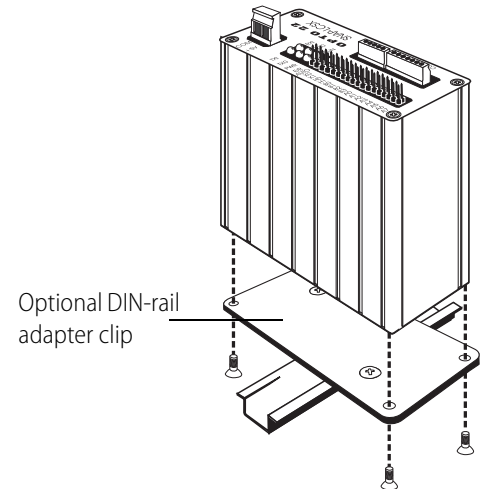


DIN-Rail Mounting

DIN-rail mounting requires an adapter clip, part number SNAP-PSDIN (not included).

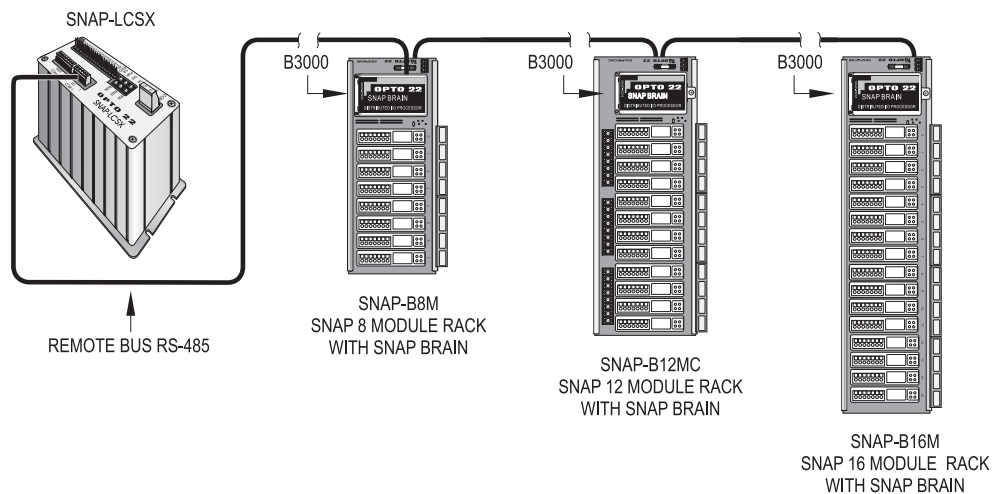
For DIN-rail mounting, remove the four screws that fasten the panel mounting base plate to the controller. **Do not lose screws.** Remove the base plate.

Use the four screws to fasten the DIN-rail adapter clip to the controller.

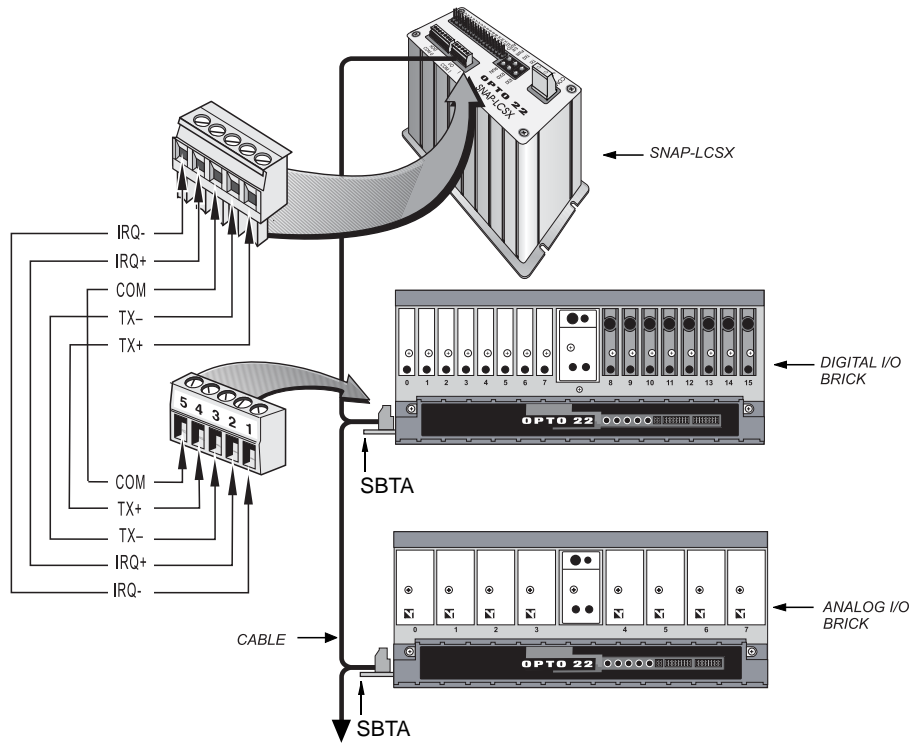


Connecting the Controller to Remote I/O

The controller fits into the SNAP system as illustrated below:



Connections from a SNAP-LCSX controller to a SNAP brain board are shown on [page 6](#). If you are connecting the controller to Mystic I/O, follow the diagram below:



Specifications and Troubleshooting

Specifications

Item	Specification
CPU	32-bit Motorola 68EC020 processor
CPU clock frequency	16.67 MHz
Memory RAM Flash ROM	1 MB with battery backup 256 KB
RAM/clock battery	3.6-volt lithium, non-rechargeable, user replaceable, p/n G4BATT32
I/O	Opto 22 remote I/O using RS-485
Communication	COM 0: jumper selectable as RS-232 or RS-485, 2-wire or 4-wire. Modem control signals are present for RS-232 (RTS, CTS, DTR, DCD, and R). Pull-up, pull-down, and termination are jumper selectable for RS-485 operation, allowing multidrop operation. COM 1: dedicated Opto 22 remote I/O port (2-wire RS-485 with interrupt capability) COM 2 and COM 3 (LCSX-PLUS only): jumper selectable RS-232 or RS-485. RS-232 signals include TX, RX, RTS, and CTS. RS-485 is either 2-wire or 4-wire, with selectable termination and biasing. Note: All ports use low-noise slew-rate-limited drivers and are transient protected to 400 W.
Real-time clock	Clock/calendar, Epson 64613 with battery backup
Power requirements	5 VDC \pm 5% at 500 mA (maximum)
Typical operating temperature	0 °C to 70 °C
Storage temperature	-40 °C to 85 °C
Humidity	5% to 95% relative humidity, non-condensing
Software	FactoryFloor (OptoControl, OptoDisplay, OptoServer, and OptoConnect) and Classic software (Cyrano, Mystic MMI, and MDS)
System monitor	Processor and power watchdog timers

Power Supply Recommendations

Opto 22 recommends that the SNAP-LCSX or LCSX-PLUS be powered with an Opto 22 SNAP-PS5 power supply. The SNAP-PS5 can provide sufficient power for the controller, a B3000 brain board, 32 digital I/O points, and up to eight analog I/O points.

In lieu of the SNAP-PS5, Opto 22 recommends a 5-volt linear supply with adequate current ratings for the load.

LED Descriptions

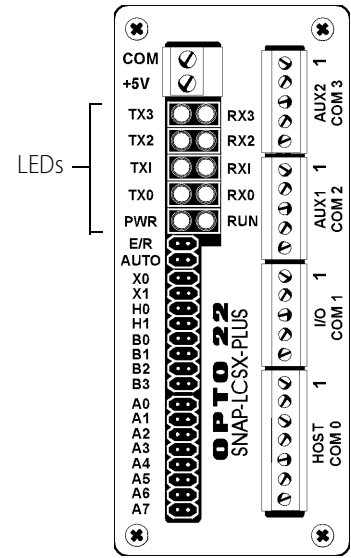
The SNAP-LCSX and LCSX-PLUS include the following LEDs:

PWR — If the PWR LED is on, power is applied to the controller.

RUN — If the RUN LED is on, the controller is working properly. If the RUN LED blinks (or is off when the PWR LED is on), contact Opto 22 Product Support.

TX — Each communication port has a TX LED, which is on whenever the controller is actively transmitting data through that port.

RX — Each communication port also has an RX LED. It is on whenever the controller is actively receiving data through that port.



Troubleshooting

If you encounter a problem while installing or using the SNAP-LCSX or LCSX-PLUS controller, check this section for suggestions. See [“For Help” on page 3](#) if you need to contact Opto 22 Product Support.

If you see this	It means	Try this
RUN LED stays off.	Power is incorrectly applied to the controller.	Check power supply connections.
PWR LED stays off.	Power is incorrectly applied to the controller.	Check for voltage. Check wiring polarity.
RUN LED is off but PWR LED is on.	The controller has an internal problem.	Call Opto 22 Product Support.
RUN LED blinks.	Voltage is outside specifications.	Check power supply voltage at the controller input terminals.
RUN LED blinks.	There is a kernel or boot error. Kernel (firmware) may be corrupted.	Remove jumper X1 and cycle power to the controller. If the RUN LED is solid, download new firmware. If the RUN LED still blinks, call Opto 22 Product Support.
RX LED is stuck on.	Wiring polarity problem.	Try swapping the TX+ and TX- wires.

If you see this	It means	Try this
Controller cannot transmit to PC.	Configuration jumpers were changed without cycling power.	<ul style="list-style-type: none"> • Cycle power and retry transmission. • If using RS-232 port on SNAP-LCSX, make sure pin 4 (RTS) and pin 5 (CTS) are jumpered.
No communication to host PC and no TX/RX LEDs.	Communication problems.	Check the PC serial port.
No communication to host PC. RX LED is on, but TX LED is off.	Communication problems.	Check controller address, baud rate, and ASCII/binary settings. See “Setting the Faceplate Jumpers” on page 9.
No communication to host PC. Both TX and RX LEDs are on.	Communication problems.	Try a lower baud rate.
No communication to I/O. TX LED is off while trying to communicate.	Communication problems.	<ul style="list-style-type: none"> • Check that I/O port software is configured for correct port. • If RX LEDs on I/O are off while trying to communicate, check wire for loose connections, shorts, or breakage. • If RX LEDs on I/O are on, check I/O address, baud, and protocol settings in software. • Also check voltage at I/O units to make sure the power supply voltage is within specs.
Digital output is not working.	Bad module fuse.	Replace fuse.
	Wrong module type or incorrect wiring.	Make sure module is 5V logic. Match the output module with the load.
Digital input is not working.	Input device is not working properly.	Check input device wiring and power source. Rewire, replace, or fix power source as needed.
	Wrong module type.	Make sure module is 5V logic.
	Voltage on input is not compatible with module voltage range.	Change voltage to match module, or change module to match field voltage.
	I/O or brain board may be bad.	See brain board manual.
Analog output is not working.	Output is wired incorrectly.	Check wiring to output device.
	Device is not properly matched to module type.	Change voltage to match module or module to match voltage.
	I/O or brain board may be bad.	Measure output with a multi-meter.
Analog input is not working.	Voltage input device is wired incorrectly.	Check device and wiring. Connect voltage source or current source, depending on input type, and use multi-meter to see whether input is functioning.
	Thermocouple has a break.	For a thermocouple, check for continuity across test points next to module.
	RTD has open or incorrect wiring.	For an RTD input, check resistance across test points next to module.
	I/O or brain board may be bad.	Contact Opto 22 Product Support if you find the following: <ul style="list-style-type: none"> • If value in software does not change with input when testing input voltage or current with multi-meter • If thermocouple has continuity across test points • If resistance across test points is about 100 ohms for RTD input.

