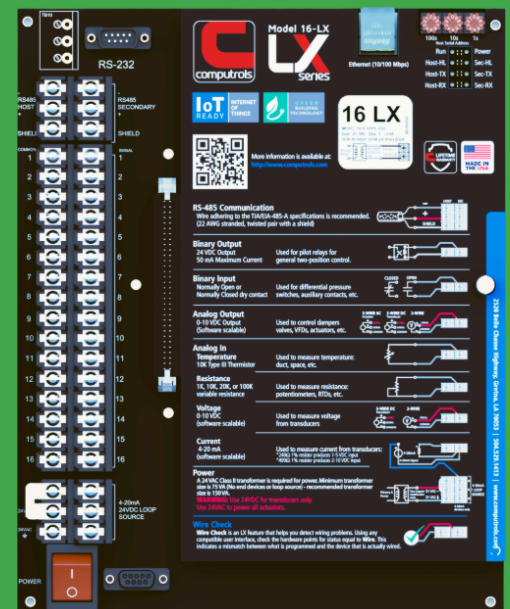




USER MANUAL

LX-Series Controllers

American-designed universal controllers in 8, 16, 32 and 64-point versions — drop-in replacements for the classic X-Line, with stronger security, a flexible USB port and WireCheck terminal verification.



Version: UM-LX-2026-09-24

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Quick Start Guide

Print these two pages to use for documentation.

- › Verify all mounting screws are tight.
- › Verify all terminations are tight.
- › Verify the brain board is seated and the thumb screw is tight.
- › Verify the transformer is sized properly.
- › Verify the power at the 24VAC terminal block is 24 Volts.
- › Verify 24VAC power is on and secondary is grounded.
- › Verify you have a good Ethernet connection.
- › Verify all communications trunks are labeled and wired to the terminal blocks provided.
- › Use the Handheld to set the address of the controller.

Model: 8 16 32 64

DHCP: Yes / No

Secure Connection: Yes / No

MAC Address: 00:09:14:_____:_____:_____

IP Address: _____._____._____._____

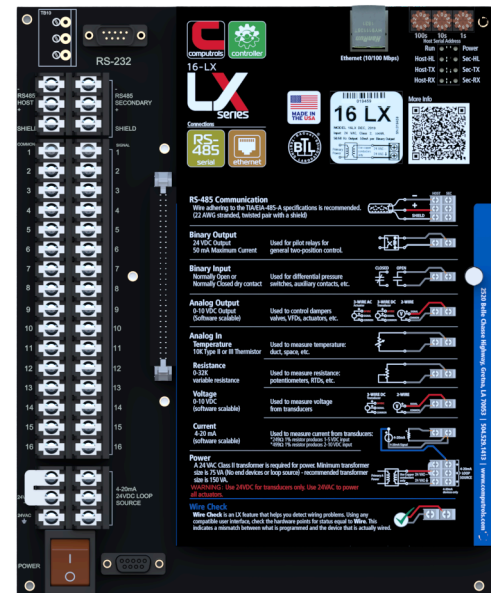
Subnet: _____._____._____._____

Default gateway: _____._____._____._____

Firmware Version & Date: _____

Host Protocol: _____

Secondary Protocol: _____



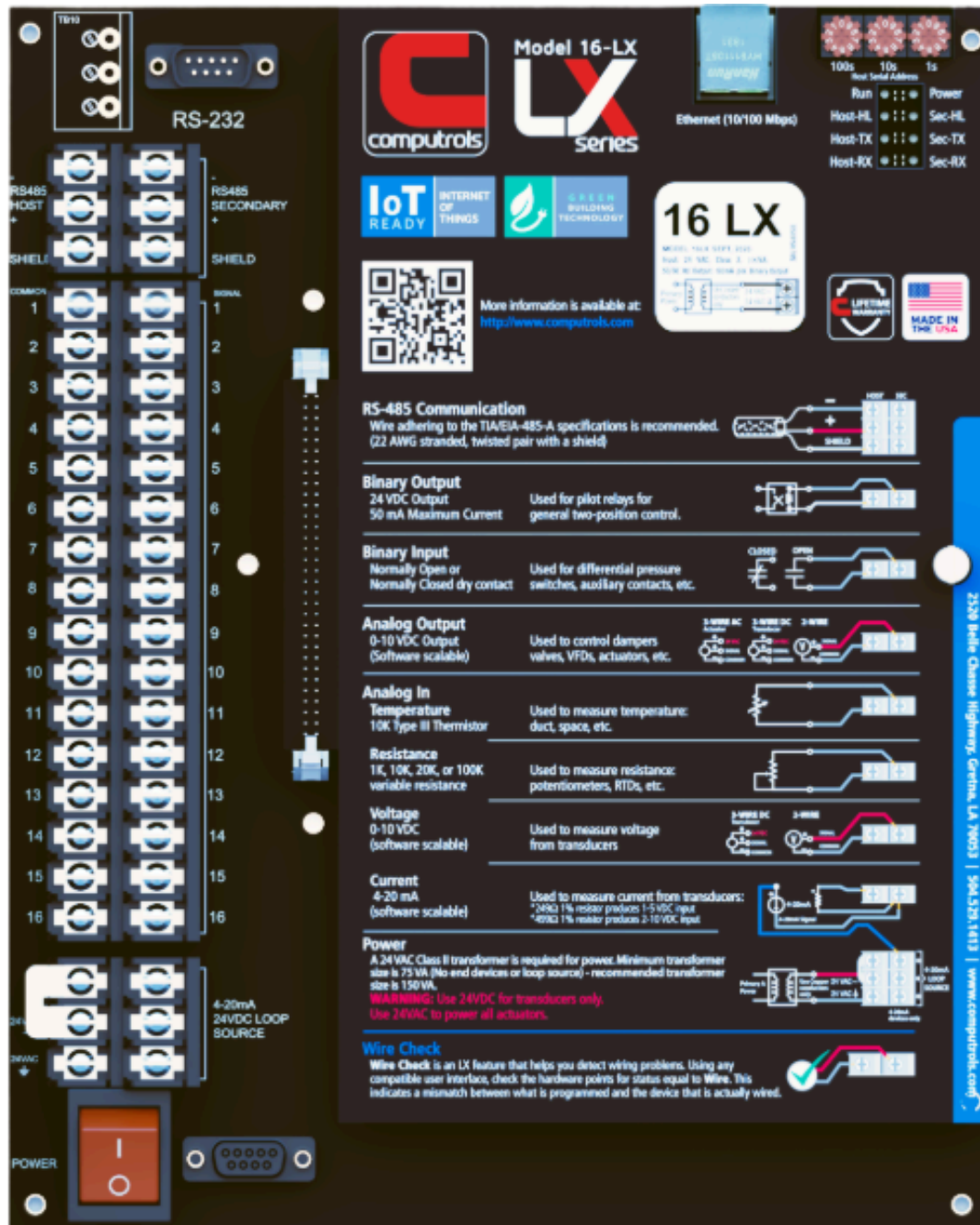
Use the Handheld to set up a Secure Connection if applicable. See Secure Controller Manual for instructions.

Points 1-8	Points 9-16	Points 17-24	Points 25-32

Points 33-40	Points 41-48	Points 49-56	Points 57-64

What is an LX Controller?

In 2017, Computrols introduced the LX controller line: American-designed and built, 100% backward-compatible drop-in replacements for the classic X-Line, offered in the same point-count versions (8, 16, 32, and 64). Beyond a complete leap in computing power, the LX brings stronger security, a flexible USB port, and Computrol's new WireCheck feature — which electrically probes every screw terminal connection before control begins, catching wiring mistakes before they become costly.

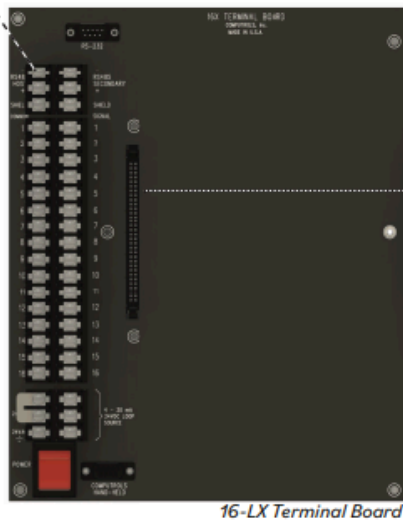


Separating the Brain Board from the Terminal Board

Computrol's innovative two-board design makes changing or upgrading these controllers simple, eliminating downtime. It's also how we effectively support our lifetime warranty.

The brain board will be connected to the terminal board when the controller arrives. You must locate the two locking clips indicated by the green arrows on the terminal board to separate the two. You also need to locate the thumb screw indicated by the red arrow on the brain board. Loosen the thumb screw by turning counterclockwise. Apply slight pressure on the two locking clips until the brain board is released from the terminal board.

Large and rugged
screw terminals.



The **"terminal board"** is used for (almost) all wire terminations and has no onboard electronics.



Easy-to-use address dials for LX to LX BASnet RS-485 communication.

The **"brain board"** houses all electronics, with the only wire termination being the single Ethernet connector.

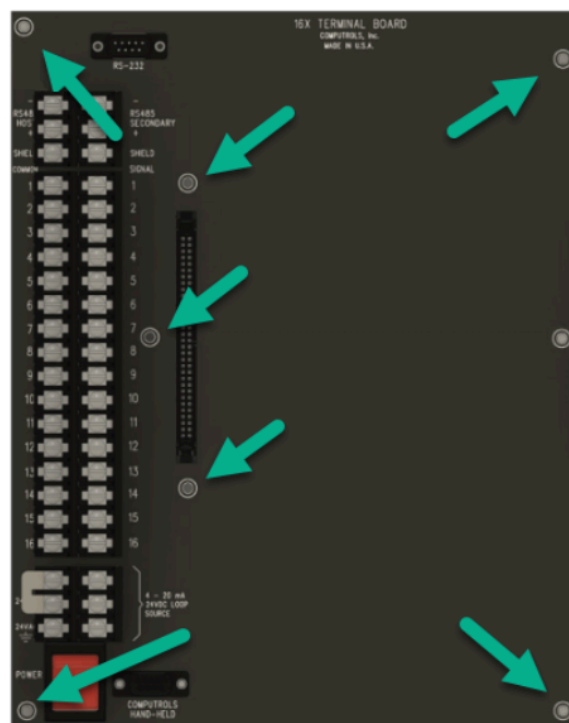
To replace the brain board on the terminal board, reverse the above procedure.

Mounting an LX Controller

Each LX controller comes with a two-board design. The brain board must be removed to mount the terminal board efficiently and effectively. As seen in the picture, each terminal board has multiple locations where standoffs are located. With each controller, Computrols provides the appropriate amount of sheet metal screws that should be used to mount the terminal board to the backplate of your choice. All screws must be used when mounting the terminal board. We also recommend that the backplate the terminal board is mounted to is grounded to good earth ground.

The following is the part number and quantity of screws needed to mount each terminal board.
For Replacement screws, order Computrols Part Number 31035.
#6-20 x 1-1/4" Phillips Pan Head Self Drilling Screw Zinc #2

8-LX	16-LX	32-LX	64-LX
Qty 5	Qty 5	Qty 8	Qty 14



16-LX Terminal Board

Wiring an LX Controller

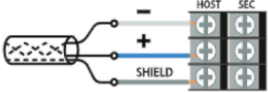
Below is a sample of each wiring configuration for the LX models.

Termination Type

RS-485 Communication

Wire adhering to the TIA/EIA-485-A specifications is recommended.
(22 AWG stranded, twisted pair with a shield)

Wiring Detail



Binary Output

24 VDC Output, 50mA Maximum Current
Used for pilot relays for general two-position control.



Binary Input

Normally Open or Normally Closed dry contact
Used for differential pressure switches, auxiliary contacts, etc.



Analog Output

0-10 VDC Output (Software scalable)
Used to control dampers, valves, VFDs, actuators, etc.



Analog Input

Temperature 10K Type II or III Thermistor (default)
Used to measure temperature: duct, space, etc.



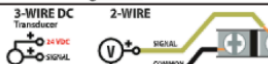
Resistance

0-32K Ohm resistive (scalable)
Used to measure resistance: potentiometers, RTDs, etc.



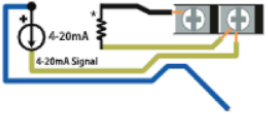
Voltage

0-10 VDC (software scalable) or 24VDC
Used to measure voltage from transducers



Current

4-20mA (software scalable)
Used to measure current from transducers:
*249Ω 1% resistor produces 1-5 VDC input
*449Ω 1% resistor produces 2-10 VDC input

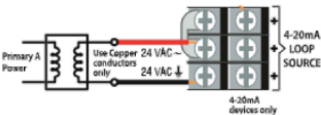


Power

A 24 VAC Class II transformer is required for power.
Minimum transformer size is (50,75,100,200) VA (No end devices or loop source)
Recommended transformer size is (100, 150, 250, 300) VA.

WARNING: Use 24 VDC for transducers only
Use a separate source to power all external 24VAC devices

Maximum Load 24 VDC power source provided for passive 4-20mA sensors
Controllers can accommodate each point being @ 20mA



8-LX	16-LX	32-LX	64-LX
8 inputs x 20ma = 160mA	16 inputs x 20ma = 320mA	32 inputs x 20ma = 640mA	64 inputs x 20ma = 1.28A

Wire Check

Wire Check is an LX feature that helps you detect wiring problems. Using any compatible user interface, check the hardware points for status equal to **Wire**. This indicates a mismatch between what is programmed and the device that is actually wired.



Transformer Recommendations

Power Requirements 24VAC (+/- 20%) 50/60Hz transformer

Minimum power requirements do not include end devices or loop source power requirements.

Provide Earth ground on 24vac secondary.

8-LX	16-LX	32-LX	64-LX
50VA Minimum 100VA Recommended	75VA Minimum 150VA Recommended	100VA Minimum 250VA Recommended	200VA Minimum 300VA Recommended

Onboard 24vdc for Loop Power

Each LX controller has enough DC power to drive a two-wire 4-20mA loop for each universal input if the recommended VA power is provided.

Each LX controller comes with a small number of 500 Ω resistors for your use.

Maximum Load

24 VDC power source provided for passive 4-20mA sensors.

8-LX	16-LX	32-LX	64-LX
8 inputs x 20mA = 160mA	16 inputs x 20mA = 320mA	32 inputs x 20mA = 640mA	64 inputs x 20mA = 1.28A

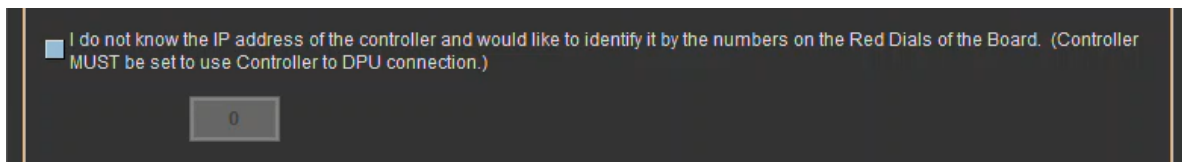
Addressing LX Controllers

Using the Red Dials to set the BASnet Address of a controller:



The Red addressing dials on an LX are only used to set the controller's address if it communicates via RS-485 as its primary communication method.

- › Set the dials to the correct serial address, with the numbers at 12 o'clock representing the dial's value.
- › When adding the controller to CBAS, use the address value from the dials, check the box shown below in the program screen of the controller, and input the address.



⚠ IMPORTANT ⚠

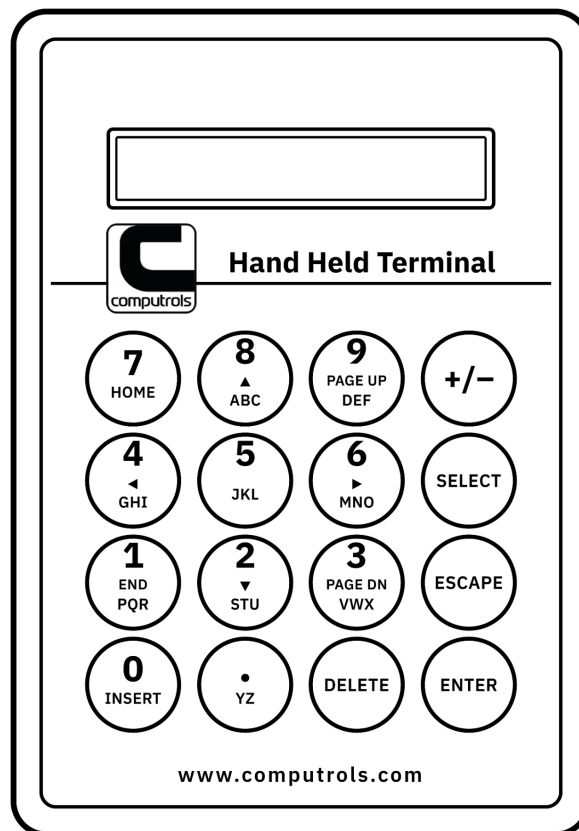
⚠ If you communicate via TCP/IP, nothing needs to be done with the dials.

Setting the IP Address on an LX Controller

By default, each controller comes with an IP address of 192.168.1.199.

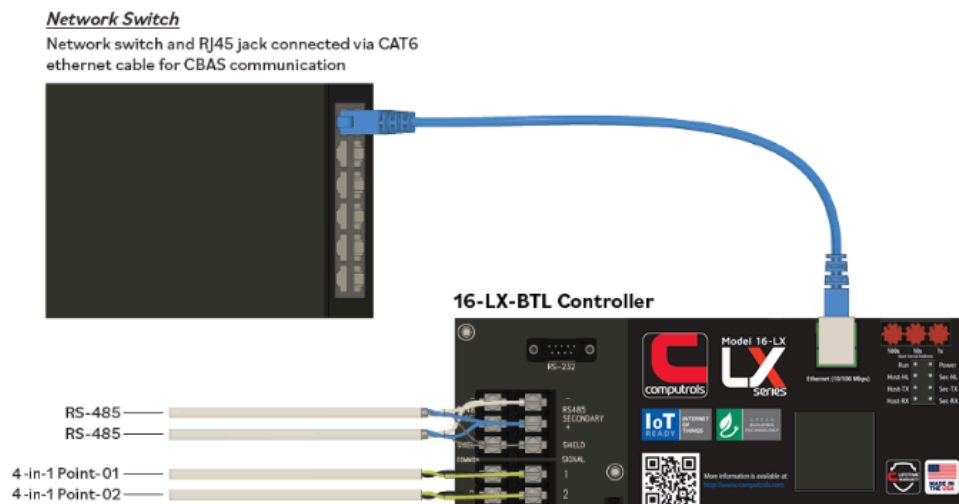
Using the Handheld to set the IP Address of a controller:

- › Connect the handheld device to the female serial port on the controller's terminal board. The firmware version and date will appear on the screen.
- › Press enter twice to see the Modes menu.
- › Press the number 3 for web, and press enter.
- › IP address is shown. Scroll down for other settings, like Subnet Mask and Default Gateway.
- › To change, press select. You will see a blank IP address.
- › Enter the IP address you would like this controller to be. When you enter a 3-digit number, the “dot” will be added for you. If you enter a 1- or 2-digit number, you will have to add the “dot” manually.
- › When you have finished entering the address, hit enter.
- › Follow the prompts to reboot for the changes to take effect.
- › Let the controller reboot.
- › Turn the power switch off and then back on.



Network Wiring

All LX line of controllers preferred communication via standard IP Protocols. All applicable ethernet cabling should be used to connect your LX controller to your IP network. All LX controllers communicate at 10/100 Mbps.



Using DHCP

For those sites which demand the use of DHCP for networked devices, Computrols Host controllers have the ability to use DHCP. Once the controller is setup as a DHCP device, the addressing must be done by using the MAC address of the controller.

- › Plug in the handheld device to the female serial port on the terminal board of the controller. You will see the firmware version and date on the screen.
- › Press enter twice to see the Modes menu.
- › Press the number 3 for web, and press enter.
- › Scroll down until you see “**NOT using DHCP.**”
- › To change, press enter. You will see “**Press SEL to use DHCP**”
- › Press Select and then Escape then the controller will be set to use DHCP.

How does CBAS communicate with an LX Controller?

DPU -> Controller

All controllers are factory-set as DPU to Controller. When the controller is in this mode, CBAS will always initiate communications with the parent controller.

This is the only mode that will allow CBAS to host any “over TCP/IP” aka “interface” communications channels. These channels are not ON Controller, such as BACnet over TCP/IP.

Controller -> DPU

The controller-to-DPU option is the option to use if a site does not allow you to use static IP addressing. When the controller is in this mode, it will always initiate communications with CBAS. CBAS, in turn, needs to know who to listen to, which is why it is critical to program the MAC address of the controller in CBAS. You can find the MAC address by using your handheld device and

- › Plug the handheld device into the female serial port on the terminal board of the controller. You will see the firmware version and date on the screen.
- › Press Enter twice to see the Modes menu.
- › Press the number 3 for web, and press enter.
- › Press the number 2 key to scroll down until you see MAC address.

The MAC address will look like this on the HandHeld screen: “0009:14:00:92:A5”.

The “0009” does not include a semicolon due to the screen's limited character count. All Computrols controllers will start with MAC address 00:09:14. This is the Organizationally Unique Identifier (OUI), which represents the manufacturer. The last three pairs identify specific controllers. In total, you will need to add all six pairs to CBAS when addressing the controller.

MAC Address: 00:09:14:_____:_____:_____

Select Address for Controller

Help

Address for Controller

☒ Enter the STATIC IP address of the Controller.

192 . 168 . 1 . 199

☐ I do not know the IP address of the controller and would like to reference the controller by its MAC address. This address is on a sticker placed on the controller or available via the Handheld. (Controller MUST be set to use Controller to DPU connection.)

00 : 00 : 00 : 00 : 00 : 00 Starts with 0.9.14.

☐ I do not know the IP address of the controller and would like to identify it by the numbers on the Red Dials of the Board. (Controller MUST be set to use Controller to DPU connection.)

0

☐ I do not know the IP address of the board and would like to assign the board an address at a later time.

⚠ IMPORTANT ⚠

- ⚠ You can NOT use any interface channel when doing Controller To DPU. Only OnController channels are allowed.
- ⚠ In this mode, if the controller is given an IP address, regardless of static or DHCP, the controller will only rely on the MAC address as its verification method, and the IP address does not matter but may be important as a troubleshooting tool.
- ⚠ The serial address in CBAS is the last three bytes of the MAC address in decimal format.

Secure Connections

At Computrols, we prioritize protecting building automation systems from unauthorized tampering by utilizing secure connections for LX and SC. Our TLS certificates guarantee encrypted communication between our devices and software applications. By implementing Computrols Secure Connections, we ensure data integrity, confidentiality, and authentication, safeguarding your system and data.

What do I need from Computrols?

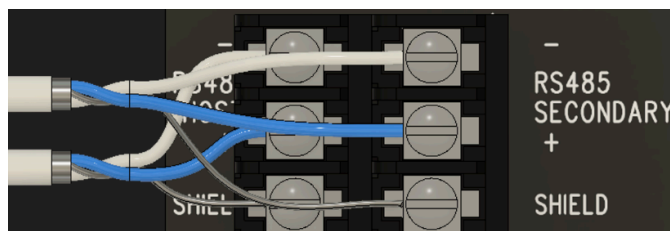
To use secure controllers, your site must have a Secure Certificate provided to you by Computrols. Contact Technical Support for assistance. This is only needed if you have yet to set up a secure channel within CBAS.

This guide is intended to be informative about secure connections. For instructions on securing your site and ensuring all your building automation controllers operate on a secure network, please refer to our Secure Controller Manual.

What Channel Types do LX Controllers have?

Wired Channels

An LX controller has three wired channel types. Two are standard channels, Host and Secondary, and either can run any of the protocols described above.



The third is the RS-232 port — rather than for general-purpose use, it should be reserved for snooping the Host and Secondary channels, making it a key tool for troubleshooting communication issues.

Snoop Channel

In 2019, Computrols added a Snoop channel option to the LX firmware.

Paired with a separate Snoop program, this channel listens in on the Host or Secondary channel and records its communications — a useful way to diagnose RS-485 network problems. Contact your local Computrols representative or Computrols Tech Support for the why's and how's of setting one up.

⚠ IMPORTANT ⚠

⚠ You cannot Snoop if the RS-232 port is being used as a physical communications port.

Ethernet Alternate

This channel type — Ethernet Alternate — lets an LX controller host points directly from Ethernet/IP devices. For example, a central plant controller might need to talk to a chiller over BACnet/IP to read and control its points; having the LX host that Ethernet channel lets it communicate directly with the chiller, with no dependency on anything else.

Can an LX talk to more than one device this way? Yes — each LX controller's IP channel can communicate with multiple Ethernet/IP devices at once. In the example above, a central plant with chillers, boilers, and VFDs all communicating over BACnet/IP could have every one of them added to the single channel hosted by the LX.

⚠ IMPORTANT ⚠

⚠ On large sites where there are multiple subnets using the LX and an Ethernet Alternate channel becomes very handy. Having the LX communicate with IP equipment and then communicate to CBAS via BASnet IP eliminates the need to use BBMD to pass information across those multiple subnets.

BLE Channels

This channel type is reserved for future support of devices that communicate over Bluetooth Low Energy (BLE) packets or beacons. Although the BLE channel option already exists in CBAS, it is currently only a placeholder and is not yet an active, functioning channel on the LX.

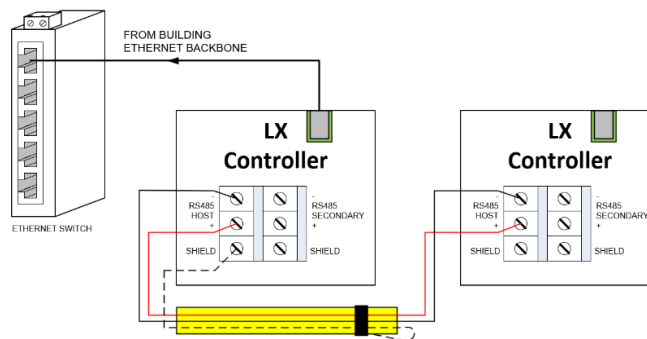
When available, the only BLE devices supported will initially be battery-operated units, often called "Passive" devices.

RS 485 as Primary Communications Method

Computrols has a long history of being 100% reverse compatible. Because of this commitment, the LX controller line was designed to be a drop-in replacement for the X-Line series of controllers. The X-Line was also designed to replace the original DDC line of products. This means that the LX can communicate primarily through its HOST RS-485 Communications port.

Here are three examples of why you might use RS-485 as a primary communication method for your LX controllers.

- › When TCP/IP communications are not available.
- › When the LX controllers need to be on a dedicated communications system.



When performing a retrofit, there is an existing RS-485 trunk, and its use is necessary.

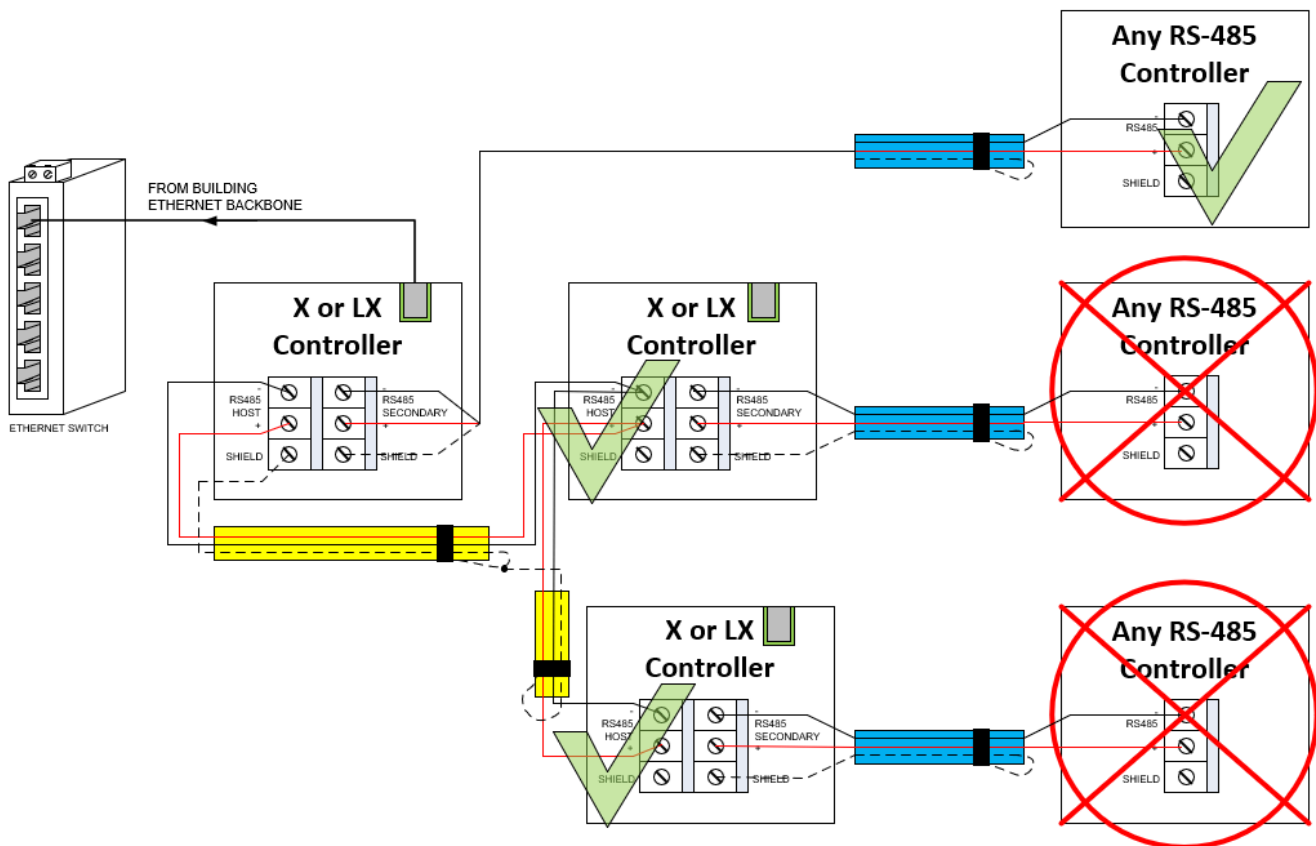
When powered up, the LX controller listens to both the Ethernet and the Host RS-485 ports for downloading activity. When it finds activity on either port, it defaults to the port with the activity. There is nothing within the LX to configure for this process.

IMPORTANT

- ⚠ All of the communications will be head-end dependent.
- ⚠ When this method of primary communication is used, CBAS must communicate with at least one LX controller through an Ethernet connection.
- ⚠ Once an LX gets a primary form of communication, it is set with that configuration. The only way to free it and allow it to take another configuration is to do 'Erase Everything' from the handheld. So, if you download a database to an LX from the 485 channel, then it will ONLY accept a 485 connection after that. It will not look for an IP connection.
- ⚠ The same is true for IP communications. Once the controller downloads a database from IP, it will ONLY look for IP connections after that.
- ⚠ Once you download a database with a controller configured as an LX controller, it will NOT accept a database with an old X controller after that w/o being factory reset with the HH.
- ⚠ Once you download the Access Control database to a LX, it will no longer accept a regular automation database. The only way to free it and allow it to take another configuration is to do 'Erase Everything' from the handheld.

Secondary Channel Limitations.

When LX or an X line controller communicates primarily via RS-485, some functionality is lost. When any controller's primary communication method is via a 485 channel, it cannot subsequently host a 485 channel. This means that the secondary channel cannot be used. Only controllers connected via IP can host 485 channels.



What should be checked before upgrading to an LX controller?

- › One precaution you need to take before upgrading to an LX controller is to review the database of the controller you are replacing and determine if it has any pulse points defined. These are also called floating points. See Using Pulse Points on LX Controllers.
- › If you have a 64X and you want to replace it with a 64 LX for any reason.
- › Determine if you have communications on the secondary channel. If you do, you MUST upgrade the CBAS database to an LX. Otherwise, you will have communication problems.
- › If you do NOT have secondary communications, you can use a 64LX in place of a 64x without upgrading the CBAS database to a 64LX.

How do I replace an X Controller with an LX Controller?

Dropping in an LX controller in place of an X is easy. Computrols recommends that you note all the IP information before you have any problems, so it can be easily retrieved. The IP information needed is the ADDRESS, Subnet MASK, TCP IP Gateway, and TCP/IP DNS.

How do I find all of the IP information?

While the controller is Normal.

- › Click on the controller.
- › Click on Show Controller Diagnostics.
- › Look at the bottom section of the pop-up window. There, you will see the controller's IP information along with other information.

16 Diagnostics

On Board Voltages

Supply Voltage	25.7 Volts	Internal Voltage	5.00 Volts	Low Power Lockout	NO
----------------	------------	------------------	------------	-------------------	----

Database Storage

		DBase Size	Stored at	Checksum
Database stored in FLASH?	YES	48280	Thursday 8/06/2026 16:28:56	2844018835
Status Table Stored in FLASH?	YES	24560	Monday 8/17/2026 15:31:45	

Memory Usage

Heap Used	355467	Heap Available	168820
-----------	--------	----------------	--------

Does NOT use CRC Connection BO Lockout

Stop Polling Controller Time: Thursday 9/10/2026 18:58:15 RunMinutes=0

Partnumber: 16 V17.15 160000 Feb 3 2020@16:08:49 NOWEB File System

TCP/IP Diagnostics

Load Received=101 Transmitted=47 Collided=0 TCPRetransmits=0 TCPEXpired=0
 ERRORS:Framing=0 CRC=0 HeaderIndexMismatch=0 InvalidPacketSize=0
 ERRORS:HeaderBadPacket=0 MissedPacket=0 PacketsDroppedOverflow=0 RxOverflow=0
 Reset PORT RXs: 12 0 0 0 0 10 PORT TXs: 11 0 0 0 0 13 WEB:TotalUse=0 ExcessTicTm=0

SerialNumber=000091414964 LotNumber=804002 MACAddr=00:09:14:00:39:21
 IP=192.168.1.200 Gateway=0.0.0.0 Subnet=255.255.255.0 DNS=0.0.0.0
 Model=16 TechsName=Brian D
 DPU to Controller
 NOT USING DHCP
 FilterMedian=21 Exp=2

21 2 SetAnalog Filter

I do not have any IP information, and my controller is LOST.

- › Use your handheld device to view the IP information of the controller.
- › Go to another controller with a similar IP address shown in the Hardware View and copy the Subnet MASK, TCP IP Gateway, and TCPIP DNS. All this information should be the same for your Lost controller. Only the IP Address will be different. Write down all of this information along with the IP address of the Lost controller which can be seen in the Hardware view.

Replacing the controller

Once you have all of the IP information you can replace the X controller that is Lost with the new LX controller. Once you have replaced it, leave the ethernet cable unplugged.

To set the address follow the procedure shown here [Setting the IP Address on an LX Controller](#).

When replacing an X controller with a LX, you do not have to change any setup or programming in CBAS. Once you set the IP address of the new LX controller to the address of the existing X line controller CBAS will recognize the new controller and download the database.

What is a keyed controller?

Keying a controller writes a special block of code into the controller so that ONLY the Dongle the controller is keyed to will be able to communicate with the controller. That prevents controllers from being taken from one job and moved to another job. It also uses public private key encryption so that ONLY CBAS will be able to communicate with a keyed controller. When a controller has not been keyed, CBAS will key it the first time it communicates to it. If a controller has previously been keyed to another Dongle, then CBAS will not talk to it and stay LOST within CBAS. In that case you must use DDCC or the handheld to unkey the controller.

What controllers get keyed?

VAV Controllers do NOT get keyed.

X line controllers running HVAC firmware do NOT get keyed.

X line controllers Access Control or FIRE firmware DO get keyed.

LX controllers get keyed when programmed as an LX in CBAS.

To make the LX controllers backward-compatible, there must be a way for CBAS to talk to them without keying. So, if you want to do a drop-in replacement of an X with an LX, then there are 2 options:

1- Leave the controller in CBAS as an X and just replace the controller. Doing it this way, the LX will NOT get keyed.

2- Change the type of controller in CBAS from X to LX. Doing it this way, and the LX will get keyed. Once an LX is keyed, it can only support keyed (authenticated) connections from CBAS.

The takeaway is that once an LX has been keyed, you can no longer use it as a drop-in replacement of an X without factory defaulting the controller.

The handheld display will tell you if your LX has been keyed if you know what you are looking for. The version number displayed in the handheld will be one of the following: LX, Lx, LA, and LF. A is for Access Control. F is for FIRE. Upper case X is for Authenticated (keyed) HVAC. Lower case x is for non-authenticated HVAC. So, if the handheld is displaying LX then you know your LX controller has previously been keyed. If it is displaying Lx then it has NOT been keyed and therefore can be used as a drop-in replacement for an X line controller.

IMPORTANT

 X-Line controllers that need authentication with DDCC will need to be Keyed to pass the authentication check. Contact Computrols Tech Support.

Factory Defaulting

There is only one method to clear out an LX controller and set it back to factory defaults, which will erase any key assigned to the controller.

Using the Handheld

Using the Handheld to Factory Reset the Controller

- › Power up the controller.
- › Connect to the controller using your Computrols Hand-Held.
- › Press **“Enter”** twice to view configuration options.
- › Choose the hidden menu by pressing **“5”** then **“ENTER”**.
- › Press down on the **“2”** key, and you will see **“ERASE EVERYTHING and RESTART.”**
- › Press **“Select”**
- › You will see **“2=factory default”**
- › Press **“2”** and then **“ENTER”**
- › You will see **“WIPED OUT !!! REBOOTING!!! ”**
- › You will see **“FACTORY RESET.. please wait...”**

This menu item will erase everything, including the key from an LX controller. The handheld should return to **L?** after resetting.

This procedure erases the database, IP Address, and key, clears all BACnet Information, and clears the information that locks a controller into a specific communication method, either RS-485 or IP.

Wire Check

There are 2 types of WireCheck functionality. The first one is performed only once when the board is first powered on, and the second one is performed continuously while the board is running.

Power On WireCheck runs while the LX Processor is starting up. By the time the processor is ready to run there is a list of points that could be locked out according to what values are measured on those points. Below is a list of possible error conditions that the board checks for.

Binary Outputs (Ohms)– If a point has more than 3000 Ohms and is configured as a Binary Output, it will be locked out from functioning. The relays that Computrols use measure approximately 500 Ohms. This BO lockout is intended to protect against putting 24V on a thermistor and, therefore, breaking it.

WARNING

 A 10K Type 3 thermistor would read around 135 DegF at 3000 Ohms. Therefore, any 10K type III temp sensor reading ≥ 135 DegF could be configured as a Binary Output. This will not protect 10K temp sensors.

The second Power On check that is performed is looking for a voltage being present at the screw terminals, when CBAS is not applying a voltage. Currently, if there are more than 1.5 volts present, the point can ONLY be configured as a Voltage Input. All other configurations will be locked out (Voltage Output, Binary Output, Temp Input, Ohm Input and Binary Input). This is to protect the LX board as well as the field device. For example, when sampling a temperature point the LX board will put out 5 volts, but if there is any voltage already present it would skew the readings, and the temperature read would not be correct. If there are more than 12 volts on the point then the point cannot be configured as anything.

These 2 Power On checks will lock out a point from functioning. There is nothing the user can do about it except to fix whatever is wrong with the wiring or disable WireCheck using the handheld.

These next WireCheck features run constantly and will inform a user of a problem, but they do NOT stop the point from functioning. These checks are NOT disabled by the 'Disable WireCheck setting'.

Binary Output (Voltage) – If a Binary Output is ON but the feedback voltage is below 16 volts this point will read WireCheck.

Voltage Output – If the voltage feedback is off from the Voltage Output by more than 0.33 volts the point will go into WireCheck. Another feature of the new Voltage Outputs is that the Output command will be automatically adjusted until the voltage feedback matches the voltage output

Binary Input – No Runtime WireCheck checking on this type of point. When the controller is operating normally and the if the Voltage Feedback is 1-4 volts or > 6 volts then CBAS reports a problem. A Binary Input should read 5 volts when Open and 0 Volts when shorted.

Voltage Input – If the voltage present is more than 12 volts, this point will read WireCheck.

Temperature Input – If the temperature is less than 0 or more than 200 DegF, this point will read WireCheck.

If all points go WireCheck after approximately 4 hours of running, that is not a WireCheck condition. Instead, that is a licensing issue. The brain board is not licensed with the sub-processors. The brain boards are not interchangeable.

If a point is in ALARM, the WireCheck will be ignored. A point can ONLY be in ALARM or WireCheck, not both. ALARM condition takes precedence over WireCheck.

Please note that if you disable the WireCheck feature, you are ONLY disabling the Startup WireCheck point validation. You are only disabling the WireCheck functionality that runs at startup, which will prevent a point from working. The other WireCheck features do not affect the way a point works so it is not disabled.

INFORMATION

 For process variables (temperature inputs) that need to or possibly read equal to or above 200 deg F, consider using an active input such as a 2-10vdc input or a 4-20mA converted to a 2-10vdc signal.

Disabling Wire Check – To disable the wire check you must contact Computrols Technical Support and ask for a wire check disable code. This code is only good for the day the request is made.



1=HARD 2=DATE
3=WEB 4=SERIAL

Once entered through the handheld, the wire checks will be disabled. To disable wire check, use your Computrols Hand Held device and navigate to the main menu with items 1-4.



SELECT TO
Disable WireChec

Press #5. This is a hidden Menu Item.



Enter Passcode
0

Press Select

Enter the code Tech Support sends you.



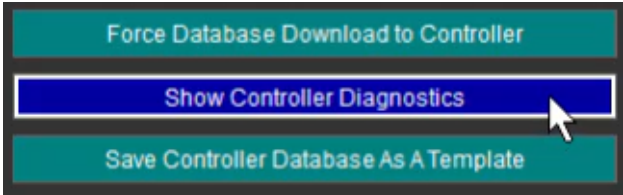
WireCheck
Updated

This will disable the Startup WireCheck point validation

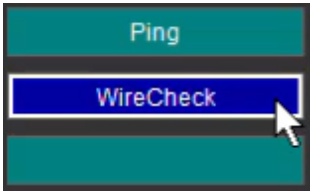
Re-Enabling WireCheck – To re-enable WireCheck, the controller must be factory-defaulted using the HandHeld device.

Wire Check Menu – To view the WireCheck information for each point, follow the steps below. This will allow you to see the current value of the point and other diagnostic information at the bottom of the window.

- › Open CBAS in Real Mode.
- › Click on the LX controller in your Controller Channel View.
- › Click on Show Controller Diagnostics.
- › When the diagnostics dialog screen pops open, click on the WireCheck Button on the right.



Within this menu, you can click on each point for its details.



LX WireCheck for Ramping				
1	1242 RADIATOR VALVE TARD	ok	Volt Out	0.0 %OPEN with Feedback of 10.1 volts
2	1242 RADIATOR VALVE POSI	ok	Volt In	100.00 %OPEN
3	1242 RADIATOR STEAM TEMP	ok	DegF	-35.0 DEG F
4	1242 RADIATOR STEAM PRES	ok	Volt In	0.00 PSI
5	1242 RADIATOR SPACE TEMP	ok	DegF	-35.0 DEG F
6				
7				
8				

⚠ Important ⚠

⚠ The LX's protection circuitry is designed to shut down on overheating rather than fail. If the protection chip gets too hot — typically from a dangerous voltage condition — it shuts down to protect the board. It stays shut down until it cools, so simply removing the dangerous voltage isn't enough to restart it; the controller must be powered off long enough to cool before it will restart on its own.

The RS-485 transceiver has similar built-in overheat protection, triggered by excessive communication load. Unlike the main protection chip, the 485 chip can be power-cycled in software: the firmware can turn it off, let it cool, and turn it back on without powering down the whole controller.

Lights on LX and using them to troubleshoot 485 comm

The LX controllers are a much more powerful drop-in replacement for the X controllers, and there are some differences in the lights on the controllers. The X controllers had Local Area Network lights on the controller, but the LX version has lights on the network adapter jack. Additionally, the Run light blinks differently and the 485 Channel lights are labeled better. Here are the details.

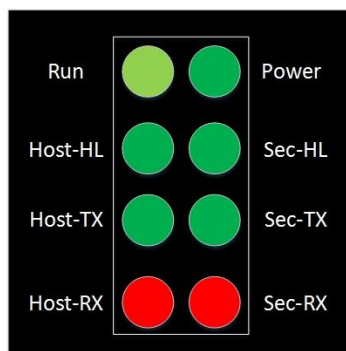
On startup: The 485 lights come on solid when the brain is not running. The run light is supposed to blink red on startup. Then once the brain gets up and running it starts blinking light green. So, there is a time when the light is blinking both red and green at the same time. That gives you some mixed colors. Once running: It blinks a double green blink if there is no database; Steady green blink means it has database and is running.

So that means, if the Run LED on a LX blinks twice it means it does not have a database.

The RUN LED stays on SOLID when downloading a database. For Ethernet you probably will not notice, but on 485 downloads it goes on solid for a long time.

If it blinks 3 times it means the controller has downloaded its database and is initializing.

Network: With X line controllers, the IP Network lights were on the front, but with the LX you have to look at the RJ45 jack on the top of the controller. On the left there is a yellow light that will be lit when you have a connection to the network switch that the LX is plugged into. On the right, the green light will blink whenever a network packet reaches the controller. These lights can be useful when troubleshooting communication with CBAS. There are also some blue lights that relate to the computer running the controller. You can disregard those.



The picture shows the lights on the LX controllers.

Power light will be green when sufficient 24VAC power is applied to the controller.

Run light is described in the first paragraphs of this article.

485 Comm lights: Host-HL will blink green when a High-Level packet is sent out on the Host Channel.

A High-Level packet is a command from the CBAS head-end through the LAN.

Host-TX will blink green when the LX transmits a packet to a controller on the Host Channel.

Host-RX will blink when the LX receives a packet from a controller on the Host Channel. On X controllers, this light was labeled Activity.

The lights labeled Sec work the same and apply to the Secondary Channel.

Troubleshooting comm: The TX and RX lights are a basic troubleshooting feature and should always be consulted first when a 485 channel will not work. If your controller is transmitting (TX light blinking), then the LX is trying to communicate with a controller on the channel. The TX light will not blink if there is no controller programmed on the channel, the channel is not licensed, or the channel was created in CBAS but never downloaded to the Host Controller.

If the channel was not downloaded, the controller doesn't know it has a channel much less a controller on it. Hardware View will show Not Connected on the channel statistics. Try erasing the database on the LX and letting it download. Give it a minute after rebooting before checking the lights.

If the channel is not licensed, you should get a yellow Trouble in CBAS stating "Channel Not Started". Contact Sales to purchase the channel Protocol and get a new license.

If there is no controller programmed on the channel, you will likely get a Trouble stating that a channel is locked up. Program a controller and one valid point and that should go away. If it's an "On Controller" channel, then you need to erase the database again so it will download. In the case of BACnet protocol, you don't need to program a point and the controller will show Normal Comm for a minute, in which time you can start a Probe and get information from the controller.

If the RX is not blinking, then this is a clear indication that the controller or meter is not getting the transmissions or just not communicating back. It could be that the wire is not landed on the correct terminals on the device, and I have also seen cases where the device was not configured by the installer to communicate with a BAS system. If the device has RX and TX lights on it, you can see if the TX from CBAS is getting there by checking the RX light on it.

Using Pulse Points on LX Controllers

Pulsing points (floating control) are a great way to use lower-cost field devices, but be diligent about where you place them in your controller.

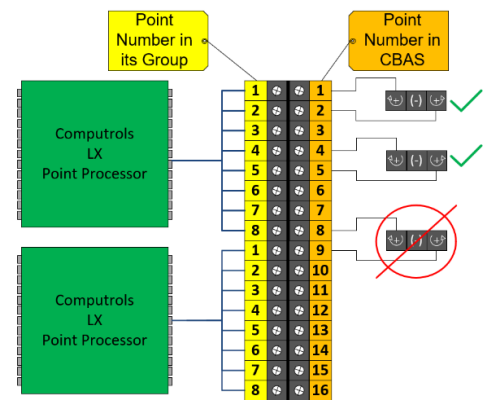
Pulses are not supported on points 8, 16, 24, 32, 40, 48, 56, and 64. The reason is that each bank of 8 points is a separate processor. So, the first bank of 8 points doesn't know about the second bank of 8 points. Because of this, you can't split a Binary Output with a Negative command between different processors.

Why?

The original X-line controllers only had 1 processor, so point placement was not limited.

What should be done before replacing an X-line controller with an LX controller?

- Review your database and determine if there are any floating control points within the controller you are replacing. These will be labeled as **“Pulse (Actuator) and Neg Pulse Space Holder “** in the two-point configuration column in CBAS.
- If you do, write down the point numbers each point resides on. Compare those point numbers to each point group your controller has. If one or more points cross processors (as explained below), you must make wiring and programming changes. Contact technical support for assistance.
- If you do not have any floating control points or the points fall within the point group parameters, continue with the use of the LX controller.
- If you DO have floating control points that do not adhere to the guidelines below, do not replace the X-line controller and contact Computrols Technical Support.



LX Point Processing:

LX Devices control points in groups of 8.

8LX has one group and one processor for points.

16LX has two groups and two processors.

32LX has four groups and four processors.

64LX has 8 groups and 8 processors.

Point Configuration:

- › Negative Pulse MUST be right after Positive Pulse.
- › Both the Positive and Negative sides must be in the same bank of 8.
- › Pulse (Actuator) point type can only be on the first 7 points of a group of each 8-point group.
- › The Neg Pulse Place Holder can reside on the 8th point of a group of each 8-point group.

Example of what will not work:

16LX – Putting the positive point on eight (8) and the negative on nine (9) will not work.

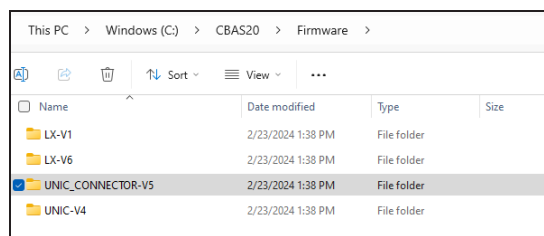
Burning Firmware

Keeping updated firmware on an LX controller is important and easy to do. There are two methods available to you on how to burn new firmware to an LX. The first is by allowing CBAS to do it for you. The second is by using DDCC and updating manually.

⚠ IMPORTANT ! ⚠

⚠ All firmware versions for LX's can be used on all LX hardware back to the first one manufactured..

Using CBAS



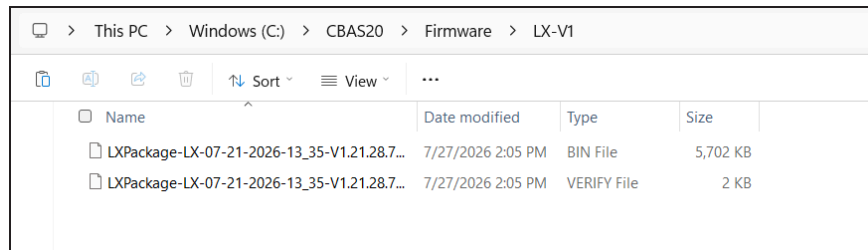
All CBAS 20 versions after 20 February 2024 have a feature that will automatically update the firmware on all LX, UNI-C and Serial Connector controllers. To verify you have a version of CBAS that has this feature, navigate to the CBAS20 root folder and check for a folder named "Firmware". Inside this folder you will see folders like the picture shown here.

Each folder represents a specific controller that you may have in your Computrols building automation network.

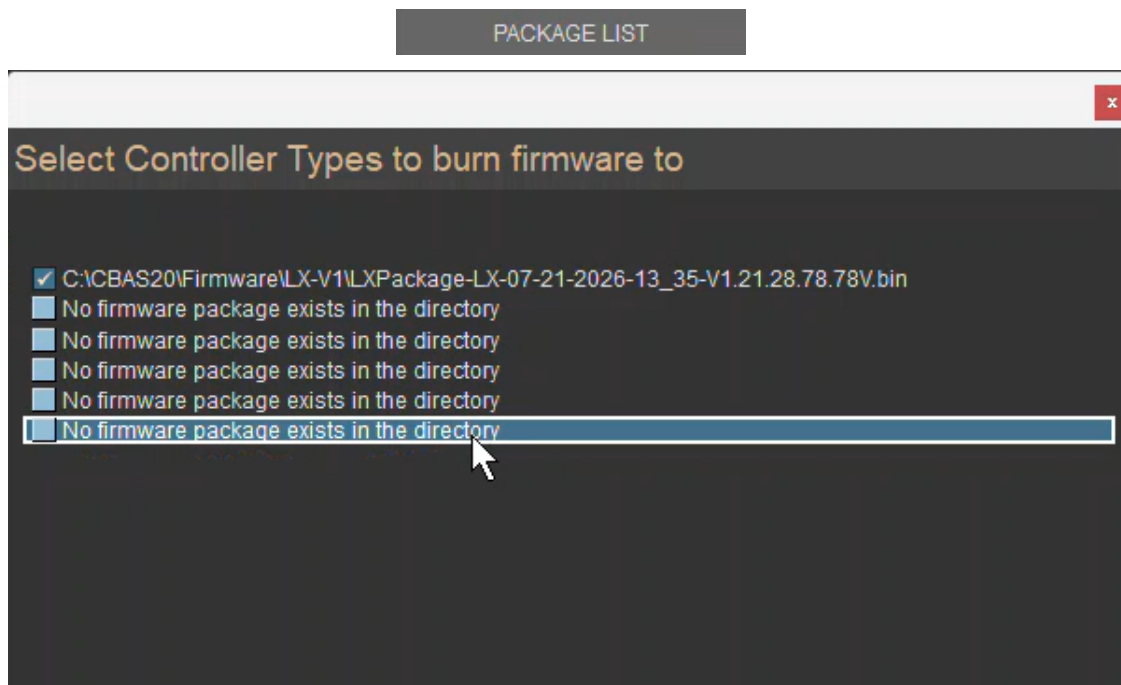
⚠ IMPORTANT ⚠

- ⚠ CBAS will only check for new firmware revs on the hard drive once an hour.
- ⚠ CBAS waits 5 minutes after it is started to continue any firmware burns and you will not see anything in the firmware update screen for 5 minutes after CBAS is started.
- ⚠ If there are 2 packages in the same directory then there will be no download. There can only be 1 .bin file and 1 .verify file in each folder.
- ⚠ CBAS will only burn firmware from the folders if it is newer (version number is bigger) than what is already on the controllers.
- ⚠ To automatically burn firmware to an IP based controller w/CBAS, that controller must already have firmware version 21.21 or later. This is around February 2024. To manually burn firmware to a 485 controller it must already have version 20.20 or later. That is around 2017.

- › Download the latest .zipped firmware and extract the contents.



Copy the .bin and a .verify file and place them in the “LX-V1” folder. Your folder will look like the picture shown here.



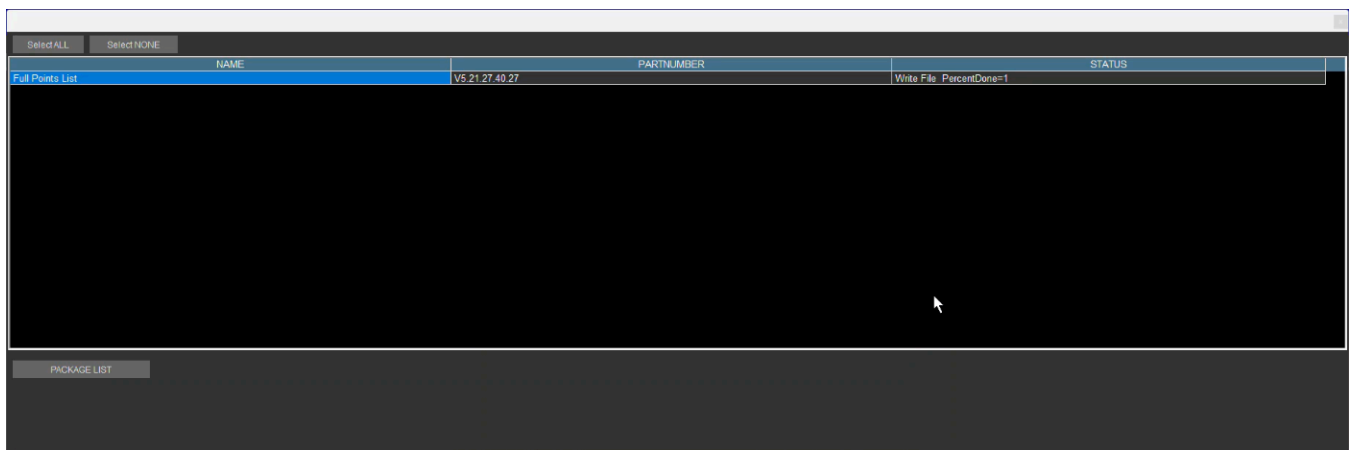
Navigate to “System > Firmware Download.” There, you will see a button named “PACKAGE LIST”. Click it to see which packages are on the hard drive and if those packages are valid. There must be a checkbox next to each package name, or the package will not be downloaded automatically.

- › At this point, you are done. You must wait for CBAS to search the folder for files and run a comparison against the controllers on the network.

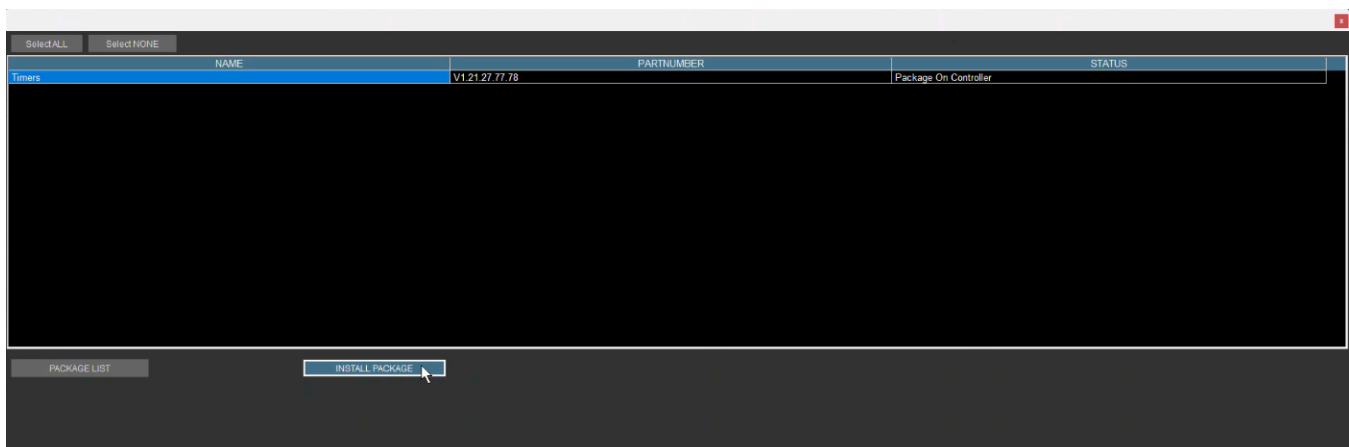
⚠ IMPORTANT ⚠

- ⚠ Once the updating process is started and CBAS is shut down, it will restart the updating process every time it is restarted and picks up where it left off.
- ⚠ When completed, CBAS will only place the updated firmware on each controller but will not install it. This is an action that must be performed by the user.
- ⚠ There is no notification that the firmware updating process is complete.

To check if your controllers have been downloaded, navigate to the Firmware Download screen in CBAS by clicking “System > Firmware Download.” There you can see the status (% Done) of each download in progress. The grid has Sort capability. Just click the top bar in the grid (Name, Part number, Status), and it will sort by that column. Click the same column again and it will reverse the order. You can sort by all 3 columns.



When the text in the 'STATUS' column of a controller says 'Package On Controller' that means the package on the local hard drive is also in that controller. But the package is not installed, it is just sitting there. A user must then select the controller and click 'INSTALL'. This will send a message to the controller to install the package. The controller will then reboot with the new firmware. The controller should eventually come back with a status of 'No Download necessary'.



Using DDCC

If this is the only method available to you given the version of CBAS you are using, contact your local Computrols representative or Computrols Technical Support for assistance. You can reach technical support at **504-529-1413**.

⚠ IMPORTANT ⚠

- ⚠ Once an LX controller's firmware is updated past xx.xx.2021, then it can never be downgraded to its original firmware version.
- ⚠ To automatically burn firmware to an IP based controller w/CBAS, that controller must already have firmware version 21.21 or later. This is around February 2024. To manually burn firmware to a 485 controller it must already have version 20.20 or later. That is around 2017.

Peer to Peer

Peer-to-Peer (P2P) is the process of sharing data directly with other controllers on a network without having to pass it through the head-end DPU. The intent is to share point information from one controller to one or more Host controllers on the network.

The most common use of P2P communication is the sharing of outside air temperature for setpoint resets. Another everyday use is occupancy status and emergency shutdowns.

Peer-to-Peer Setup is accessible only in Editor Mode.

To use P2P, your network administrator must open inbound UDP port 8778.

Limitations:

- › Peer points can only be Analog or Binary Hardware or Software
- › Peer-to-Peer will not work across a Router on TCP/IP networks
- › Peer points can only be shared between X Line, LX, Serial Connectors and Wireless UNI-C's.
- › You cannot share a point from an IP controller to a 485 channel on another IP controller.
- › An IP controller can share its points with 485 controllers that are only connected to it.
- › UNI-B's & C's communicating via RS-485 can only send and receive peer messages through its Host controller.
- › X line controller the peer points will always show up as failed (11) in Hardware View. This is due to X line controllers don't support the sharing of Peer Status points with the DPU. So the Peer points will most likely be working even though the point reports as failed(xx). The work around is to add a software point and set its value to the Peer point with logic to be able to see if the value changes.

Alarms:

LX controller with firmware 6-02-2025 and newer will alarm CBAS if there is a P2P failure. If a point fails to receive status changes between controllers, it will generate CBAS Alarms indicating that the Peer points are not functioning.

lost	Alarm
lost	Alarm

⚠ IMPORTANT ⚠

⚠ The lost alarm for Peer points cannot be turned off. These alarms are hard coded within CBAS.

Communications:

Legacy P2P communications relied on Broadcast messaging as its form of communications. The new protocol supporting P2P messaging for non X line Host controller is Singlecast. This method allows for one-on-one (IP to IP) messaging, lower bandwidth usage, and providing a more secure and reliable environment.

LX Series Diagnostics

BACnet Server	YES with Protocols				
BACnet Router	NO				
HOST	not used (1,1)				
SECONDARY	not used (1,1)				
HANDHELD	Handheld LICENSED(1)				
RS232	RS232 LICENSED(1)				
-----ValuesB-----					
Diag Count	0				
Memory Usage Free(%)	19				
Disk Usage(%used)	9				
Programs Running	65				
Peer Protocols supported	Broadcast - Singlecast				
Red Knob address	0				
Internal Temp	643				
Internal Voltage	256				
Internal Gnd	1804				
Controller Time	9/11/2026 11:48:31 (1000208911)				
Run Time	16 Hours 45 Minutes				
Total Run Time	16 Hours 46 Minutes				
Point	Config	Value	Feedback	Value	Name
1	none	0	0		

Stop Polling

Load SYSTEM Diags

Open Burn Port

Ping

WireCheck

Wifi Setup

Bluetooth Setup

WiFi/BLE/App Setup

BACnet Router Config

Save To File

59.5 Percent Done

For Host controllers to use the new Singlecast method their firmware needs to be Oct 2024 or after.

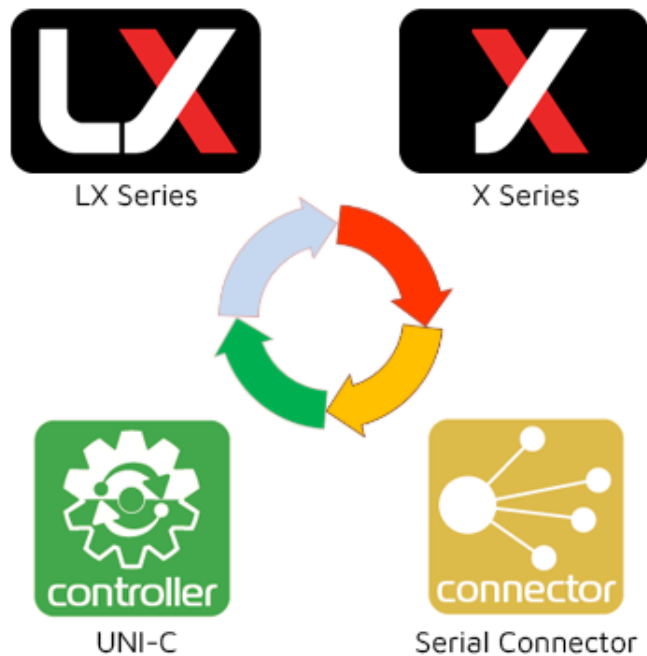
To check if a controller does have Singlecast abilities navigate to the controller’s diagnostics menu and look for what Peer Protocols are Supported.

CBAS:

If CBAS is open in Real Mode it will handle P2P communications between controllers as “normal” communications. The Host controllers know this and work with CBAS to pass information. When CBAS is not present the Host controllers will communicate directly with each other to maintain the P2P status and values. The takeaway is that there is an extra layer of communication and supervision when CBAS is active.

Allow a couple of minutes after a CBAS start or controller reboot before Peer Alarm messages begin generating.

CBAS is used to set up and test peer points.



LX Diagnostics Screen

LX Series Diagnostics

Job	Computrols Support HVAC
Controller	Timers
Current CBAS Date-Time	9/11/2026 11:48 AM
Partnumber	16LX V21.27 16010 Mar 18 2026@18:24:20 SN-

VOLTAGES -----	
AC Power	24.8 Volts (1617)
Cap Good	YES 5.1 Volts (3323)
Cap Midpoint	2.5 Volts (1615)
Brain Power	YES 3.4 Volts (2235)
Binary Enable	ON (3335)

ValuesA -----	
Firmware Version	1.21.27.77.78
Fiberglass Rev	4
Isolated 485 Host	New 485 Chip (Gold)
Isolated 485 Secondary	New 485 Chip (Gold)
Factory Licensed	YES
WiFi Mode	Client
Ethernet	eth0
Distro	wheezy
Kernel	3.8
ProcessorType	Seeed BeagleBone Green-AM335x 1GHz ARM Cortex
TLS Encrypted	Ready for Secure Connection

Stop Polling

Load SYSTEM Diags

Open Burn Port

Ping

WireCheck

Wifi Setup

Bluetooth Setup

WiFi/BLE/App Setup

BACnet Router Config

Save To File

100.0 Percent Done

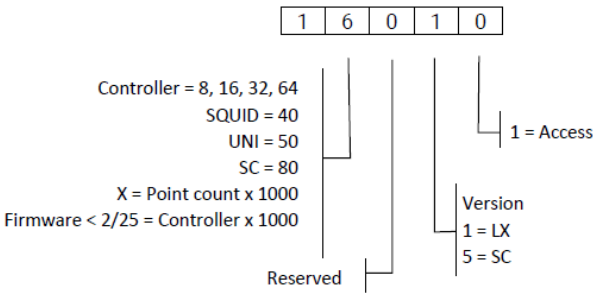
ALL Diagnostic data has been loaded.

Controller Diagnostics can be a useful tool for troubleshooting problems with the following controllers: 8X, 16X, 32X, 64LX. To access Controller Diagnostics, find the controller in Hardware View. Click once on the controller and then click Controller Diagnostics.

One of the most common uses of this screen (see the next page) is to check the firmware version. When calling Tech Support for help with a problem, you might be asked for this information.

The firmware version is listed as “Partnumber”. In our example, “16LX V21.22” means that the controller is an 16LX, the firmware is version 21.22, device version is 16010, and the build date of the firmware is Aug 27 2024.

Other common uses for the information found in diagnostics is verifying all of the IP information, the communications protocols selected, the serial, and the MAC address.



On the right side of the diagnostics screen there will be thirteen buttons. Some of these are blank and some are reserved for future use. The others are explained below.

Stop Polling – Just as the name suggests this will stop the polling of the controllers diagnostics information.

Load SYSTEM Diags – Reserved.

Open Burn Port – This is used when firmware updating is needed and the LX controller is a secured controller.

Ping – This is a convenient way to ping any controller on the network.

WireCheck – This will popup a new window with all of the wire check information of each hardware point in the controller.

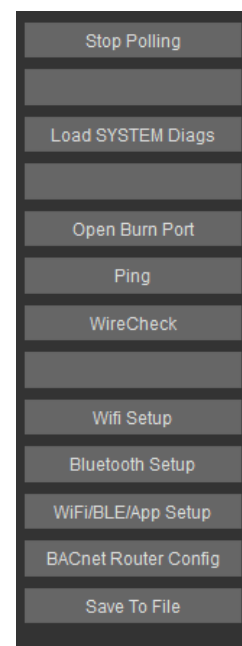
WiFi Setup – Reserved

Bluetooth Setup – Reserved

Wifi/BLE/App Setup – Reserved

BACnet Router Config – This window is used to configure all BACnet routing and server settings.

Save To File – Use this button when you need to save a copy of the diagnostics information. This file is saved in your “CBAS20\Sites\{your site name}\Data” folder.



BACnet Router Config

- ☐ BACnet Server: Exposes all LX controller points, all Computrols Opto RS485 controller points, and all Computrols Basnet RS485 controller points via BACnet IP Read/Write
- ☐ BACnet Protocol Server: Exposes all RS485 controller points, both open and proprietary, via BACnet IP Read/Write
- ☐ BACnet Router: Exposes RS485 BACnet controllers using BACnet Routing features via BACnet IP Read/Write

Each LX controller can work as a BACnet Server and or Router. There are three check boxes that you must select when setting up you LX controller to function as a server and or router. For in-depth explanations of BACnet communications see our complete BACnet Guide.

LX BACnet Server - Our BACnet BTL-listed LX BACnet Server resides within the LX controller and exposes Hardware, Software, and any OPTO or BASnet Computrols products (VAV-B, UNI-C) as a single large BACnet IP device for read/write access. This is a license-controlled feature, currently free. Contact your sales representative about licensing the current policy.

LX BACnet Protocol Server - Functions as a Read & Write server. When licensed, this exposes all Hardware, Software, and all RS-485 controller points from both open and proprietary protocols. This exposes any third-party protocols (Siemens, JCI, etc.) as one large BACnet IP device for R/W. This is a license-controlled feature that is currently chargeable.

LX BACnet Router – Allows BACnet MSTP devices to be seen as individual controllers. This is a no cost, license-controlled feature. This feature is mostly used with our VAV-B controllers when they are communicating with BACnet protocols. This will allow the VAV-B-Utility to connect to the controllers via the DPU.

×

BACnet Router / Server setup for LX Controller

You are licensed for an infinite number of BACnet Servers.
You are licensed for an infinite number of BACnet Protocol Servers.
You are licensed for an infinite number of BACnet Routers.

- ☐ BACnet Server: Exposes all LX controller points, all Computrols Opto RS485 controller points, and all Computrols Basnet RS485 controller points via BACnet IP Read/Write
- ☐ BACnet Protocol Server: Exposes all RS485 controller points, both open and proprietary, via BACnet IP Read/Write
- ☐ BACnet Router: Exposes RS485 BACnet controllers using BACnet Routing features via BACnet IP Read/Write

Instance, Port and Network number are ALL required if Router or Server is selected.

4194303	Instance Number 0 - 4,194,302. Must be unique.
47808	Port Number. BACnet default is 47,808. Do not change unless you have a good reason to do so.
10	Ethernet Network number. 10 - 250. Must be unique but there should only be 1 Ethernet network.

☐ Yes, the HOST channel is BACnet and I would like to route messages to it. Only if Router is selected.

126	My Serial Address on this 485 channel.
1	Host 485 Network number. 1 - 9 or 246-65,000. Must be unique.

☐ Yes, the SECONDARY channel is BACnet and I would like to route messages to it. Only if Router is selected.

126	My Serial Address on this 485 channel.
2	Secondary 485 Network number. 1 - 9 or 256-65,000. Must be unique.

Troubleshooting

1. My controller will not connect to CBAS, why?

- › Check to see if the controller is keyed to another dongle. Re-key with DDCC or Factory Reset.
- › Ensure that all IT addresses are accurate and unique.
- › The controller's name MUST be at least three (3) characters long or it will never come online.
- › Did the controller previously use RS-485 as its primary means of communication?

2. Channel Locked Up Alarm

- › Do a backup first.
- › Look for Channels without any controllers if a channel is empty, close Real Mode. Open editor Mode and delete those Channels. Open Real Mode.
- › If you still have the same alarm after a few days, call Tech Support. Ask them to look up Solution 838.

3. Why won't my PID work?

- › Check your lockout point and ensure it is not enabled, which will prevent the PID from functioning.
- › If the PID is not in lockout and it will not function unless it is put in Auto, then a firmware version and CBAS version will need to be updated. Contact Technical Support for assistance.

Contacting Technical Support

Tips for contacting Computrols Technical Support

At some point, we've all found ourselves in a situation where we desperately need assistance, feeling like we're sitting on a metaphorical bucket with our heads in our hands. To streamline the tech support process and get the help you need more efficiently, we've compiled a few tips to help you get the most out of your interaction with Computrols Technical Support.

Hours of Operation: Technical Support phones are staffed Monday through Friday from 8a-5p CST. Any calls outside those hours will be held until the next business day. After-hours Emergency calls should be directed to our main line: 504.529.1413.

Your Contact Information: Please let us know the best way to reach you should the call get disconnected, as well as an email address in case we need to send you links or files via email.

Site Info: Sites may be referred to by different names or consist of multiple buildings. If unsure, please have the site address handy – this helps us track issues by site.

Hardware Product Name: All Computrols hardware products should have a label or sticker with a part number – having this info during your call will allow the support team to identify steps in the troubleshooting process more quickly and ensure proper handling if an RMA is deemed necessary.

Software Version: Knowing which “major” version of CBAS (CBAS19, CBAS20, etc.) can also help the support team understand your issue and provide guidance more quickly. You can find examples of how to find this information at [this link](#).

Tips for Emailing Computrols Technical Support

In addition to the above tips for Phone Calls, email allows for an even greater range of support options. Some additional notes:

Your Contact Information: Please let us know of a good number to reach you in the event an issue can be best resolved with a telephone call. Please be sure to note any office hours or preferred times for a call.

Backup Database: Create a backup copy of the database and attach it to your email. This creates a great “restore point” before making any changes and also allows the support team to review your database on their workstations.

Remote Access: Remote access tools can be a great way for the support team to “see” what you're seeing at the site. LogMeIn access is included along with many of our service agreements, and other remote access methods can be supported. Please be sure to include any necessary credentials or login information.

Capture Tools: If remote access can not be arranged, screen capture tools such as Windows Snip to take screenshots or Windows Game Bar to capture videos can be a great alternative to help convey something you see.

History Graphs/Reports: To reduce file size, CBAS Database backups do not contain historical data. If relevant to your issue, you can generate history charts or reports that can be conveniently attached to your email.

At Computrols, Free Technical Support is one of the many benefits we offer our valued customers and partners. By following the above tips, we hope to make your interaction with our support team as efficient as possible and get you a quick resolution to your issue.

techsupport@computrols.com

504.365.1163 x245 (Direct) (M-F, 8a-5p CST)

504.529.1413 (Main Line)

<https://www.computrols.com/resources/>

Appendices

Hardware Specifications

System Compatibility	Compatible with all versions of CBAS
Microprocessor	Sitara ARM Cortex-A8; 4GB non-volatile memory (expandable to 32GB); 512MB RAM
Communication Ports	10/100 Mbps RJ-45 Ethernet (100m max distance); Two multi-protocol RS485 serial ports; Local hand held terminal
Internet Protocols	TCP; UDP; DHCP; Ping; SNMP; HTTP; HTTPS; FTP
BAS Protocols	BASnet; BACnet; Modbus; OPTO-22
Mounting	Mount in NEMA rated enclosure
Environmental	32°F to 167°F, 20% to 90% RH (Non-condensing)
Electrical Connections	Barrier terminal block 18 - 24 AWG 24 VDC loop source terminals (650 mA maximum)

Point Configuration	All points software configurable as analog inputs, binary inputs, analog outputs, or binary outputs.
Analog Output Specifications	0-10 VDC voltage type
Binary Output Specifications	24VDC@50 mA
Analog Input Specifications	10K Type II or Type III sensor; 0-10 VDC; 4-20 mA; 0-32K Ohm resistive (scalable)
Binary Input Specifications	Dry contact - switch closure; Pulse dry contact 6Hz max repetition rate; 150 ms minimum pulse width
4-20 mA Loop Source	24 VDC power source provided for passive 4-20 mA sensors. Max load : 8LX = 160mA 16LX = 320mA 32LX = 640mA 64LX = 1.28A <i>See LX Controller Installation Guide for 4-20mA wiring details.</i>
Point Protection	250 VAC on each point terminal

RS-485 Protocols Available

Every LX Controller natively supports both our industry's open protocols and many competitors' legacy, proprietary protocols, giving building owners a migration path away from proprietary systems while protecting the investment they've already made in existing hardware. Some of the supported protocols are shown below; contact your local Computrols Representative or Computrols Tech Support for the complete list.

If you're using an existing BASnet protocol for VAV controllers, first identify which VAV controller versions are on site. Don't add new hardware to an existing trunk that includes VAV controllers older than VAV-B — newer VAV controllers and other BACnet hardware may require their own dedicated network.

Protocol	Interface over TCP/IP	On Controller	8LX / 16LX / 32LX / 64LX	Stand Alone LX (No Ethernet)	Secure LX (SECURE TCP/IP for Controllers)	Baud Rate	RS-232 port (RS-232, or 3rd RS-485 on newer boards)	Ethernet Alternate
Access Control		✓	✓			9600 (fixed)	✓ (1)	
Andover Infinet		✓	✓	✓	✓ On Controller Only	9600 & 19.2k		
ASI	✓		✓			1200, 9600 & 19.2k		
Automatrix PUP	✓		✓			9600 (fixed)		
BACnet MS/TIP	✓	✓	✓	✓	✓ On Controller Only	9600 to 115.2k (On Controller); 4800 to 115.2k (over TCP/IP)	✓ (1)	
BACnet IP		✓	✓			N/A (Ethernet)		✓
BACnet IP Router		✓	✓			N/A (Ethernet)		✓
Barber Colman	✓	✓	✓	✓	✓ On Controller Only	1200 to 38.4k (On Controller); 1200, 9600 & 19.2k (over TCP/IP)	✓ (1)	
BASnet	✓	✓	✓			9600 (fixed)		
BLE Sensors		✓	✓			N/A (Bluetooth)		NO (BLE port)
Burglar Alarm		✓	✓			4800, even parity (dialog resets to this)	✓ (1)	
CSI		✓	✓			19200 (fixed)		
CSI Sublan		✓	✓			9600 (fixed)		
Handheld		✓	✓		✓ On Controller Only	9600 (fixed)		
Honeywell Delta 2000	✓		✓			9600 (fixed)		
Johnson 8500	✓		✓			9600 (fixed)		
McQuay - OPM		✓	✓			2400 to 38.4k	✓ (1)	
McQuay Native		✓	✓	✓	✓ On Controller Only	9600 (fixed)	✓ (1)	
Modbus IP (On Controller)		✓	✓			N/A (Ethernet)		✓
Modbus RTU (485)	✓	✓	✓	✓	✓ On Controller Only	2400 to 38.4k	✓ (1)(2)	
OPTO 22	✓	✓	✓	✓	✓ On Controller Only	9600 (fixed)	✓ (1)(2)	
Pulsar-M (EU)	✓		✓			9600 & 19.2k		
SECURE BASNet 485	✓ (over the secure link)		✓		✓ On Controller Only	9600 (fixed)		
Siebe DMS	✓	✓	✓			n/a (device runs 51.2k; no selector, CBAS stores 9600)		
Siemens BLN		✓	✓	✓	✓ On Controller Only	2400 to 115.2k		
Siemens FLN		✓	✓			2400 to 38.4k	✓ (1)	
Siemens Interface		✓	✓			19200 (fixed)		
Siemens IP		✓	✓			N/A (Ethernet)		✓
Siemens RBLN		✓	✓			N/A (Ethernet)		✓
Snoop	✓		✓			4800 to 115.2k	✓ (1)	
Stulz	✓	✓	✓	✓	✓ On Controller Only	9600 fixed (On Controller); 4800 to 115.2k (over TCP/IP)		
Teletrol			✓			19200 (fixed, mark parity)		
TRANE COM4	✓		✓	✓	✓ On Controller Only	1200 to 38.4k		
Trane Chiller	✓		✓			9600 & 19.2k		

Legend:

- (1) = an RS-485 protocol on the RS-232 port: only works on a board whose RS-232 port can switch to RS-485 (see Notes)
(2) = Can be an interface channel (over TCP/IP) or On Controller

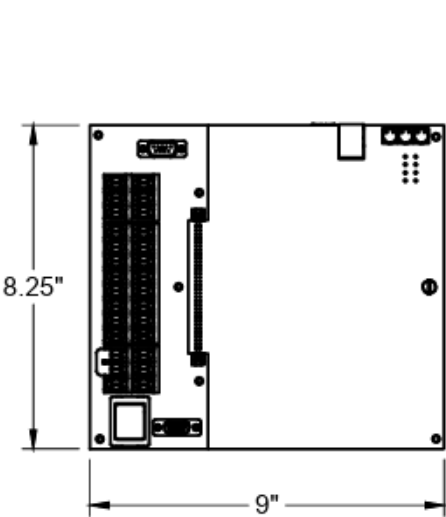
Protocol	Notes
Access Control	Interface / On Controller / baud were blank.
Andover Infinet	Added to CBAS and LX firmware Oct 2024; released
ASI	9600 was missing from the baud list.
Automatrix PUP	
BACnet MS/TP	RS-232 was BOTH. The 'BACnet 485 over TCP/IP' (interface) flavour is offered on the RS-232 port in CBAS but the LX firmware will not start it there (Connector only).
BACnet IP	On Controller since LX firmware Jun 2021. (CBAS-side BACnet IP also exists; see DPU-level sheet.)
BACnet IP Router	
Barber Colman	Available on LX Host/Secondary (since Oct 2021).
BASnet	Non-secure only; see SECURE BASNet 485 for the secure equivalent.
BLE Sensors	
Burglar Alarm	
CSI	
CSI Sublan	
Handheld	Hand Held port only; the only channel type that port accepts.
Honeywell Delta 2000	
Johnson 8500	
McQuay - OPM	Parity is also selectable.
McQuay Native	
Modbus IP (On Controller)	Available to the LX Feb 2024 ('On Controller Modbus IP', Ethernet Alternate port).
Modbus RTU (485)	Parity is also selectable on the On Controller flavor.
OPTO 22	
Pulsar-M (EU)	
SECURE BASNet 485	The Secure LX equivalent of 'BASNet 485 over TCP/IP': the LX relays BASNet 485 to CBAS over the secure connection. Only offered on a Secure LX.
Siebe DMS	CBAS hides the baud selector and notes that the Siebe device only supports 51.2k, which is not a CBAS option.
Siemens BLN	
Siemens FLN	
Siemens Interface	
Siemens IP	
Siemens RBLN	
Snoop	
Stulz	
Teletrol	
TRANE COM4	CBAS channel name is 'Trane over TCP/IP'.
Trane Chiller	

⚠ IMPORTANT ⚠

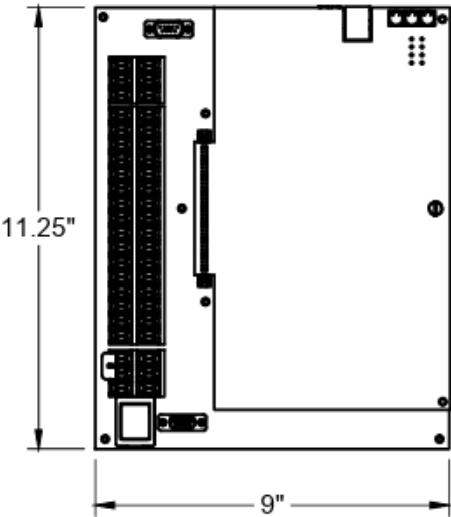
⚠ To program any TCPIP channels within a controller, an IP address must be assigned to it.

LX Board Dimensions

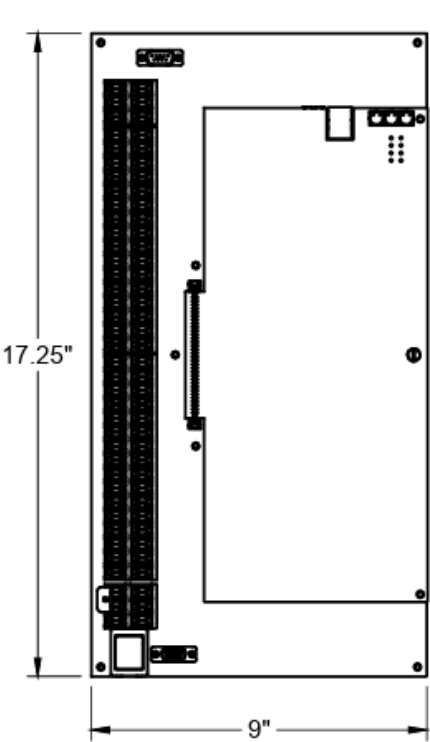
8-LX	16-LX	32-LX	64-LX
Height-1.875" Width-9.00" Length-8.25"	Height-1.875" Width-9.00" Length-11.25"	Height-1.875" Width-9.00" Length-17.25"	Height-1.875" Width-12.70" Length-18.00"



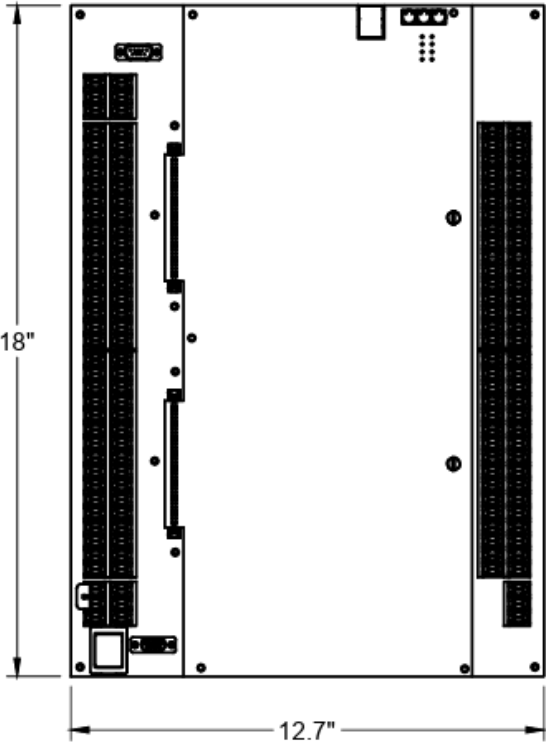
8-LX



16-LX



32-LX



64-LX

Upgrading to an LX in CBAS from an X-Line Controller?

To change a controller to an LX in Editor Mode, click the controller, go to Program, and on the Program screen's bottom-left dropdown, select your new LX version in place of the X version you currently have.

Programming the controller as an LX unlocks new features like Wire Check and Advanced Diagnostics.

Once an LX is programmed in the database, it must be "keyed" before CBAS can communicate with it. CBAS keys it automatically as soon as it recognizes the controller; if that doesn't happen, use DDCC to scan for the controller and set the key manually.

After the database is updated to an LX, export the Scale Database and compare your report's values against those below (they represent all 8–64LX controllers). If your values differ, consider adjusting the first column, Num Records, to match.

CBAS Scale Database Desc	Value	Exported Report Column Header Desc.
Points	2048	Points Total
Panels	128	Panels Total
Channels	6	Channels Total
Schedules	128	Schedules Total
Optimal Start	48	Optimal Start Total
Schedule Cycles	1024	Schedule Cycles Total
Interlocks	1	Interlocks Total
Logic	256	Logic Total
Logic Cells	4096	Logic Cells Total
PTriggers	512	PTriggers Total
Alarms	256	Alarms Total
PIDs	128	PIDs Total
NLL Tables	1	NLL Tables Total
NLL Points	1	NLL Points Total
Holidays	32	Holidays Total
Sequencers	4	Sequencers Total
Sequencer Cycles	40	Sequencer Cycles Total
Attributes	1	Attributes Total
Areas	1	Areas Total
Cards	1	Cards Total
Card Areas	1	Card Areas Controller Total
Company	1	Company Total
Gen Purpose Small	512	General Small Total
Gen Purpose Medium	256	General Medium Total
Gen Purpose Large	128	General Large Total
Cards Expanded	1	n/a

USB & Micro SD Card

All LX controllers include one USB port and one Micro SD card slot. Plugging in a USB flash drive or SD card provides an onboard duplicate backup of the controller's point histories — an important tool for facilities that require environmental documentation. This backup runs independently of CBAS: the controller keeps sending history to CBAS as usual, and history is recorded to external memory only while a drive is plugged in.

Every 15 seconds, the controller checks each point's value, condition, and priority; if any of the three has changed, the point is saved to a CSV file (in the same format CBAS uses when exporting history). A new CSV file is started each hour, so a normal day produces 24 history files. The first save of each day captures every point, changed or not, so each day starts with a complete snapshot.

Once a drive is mounted, the controller organizes history into a folder structure: a year folder (e.g., 2024), containing month folders (1–12), containing day folders (1–31). Each day's folder holds that day's hourly CSV files, named for the controller and the hour, minute, and second the file was opened, plus a Points CSV file listing every point in the database. Point names aren't stored in the hourly history files themselves — to save space, points are referenced by index instead — so cross-reference against the Points file to identify them.

The history information is raw and needs to be processed by the user when backup information is needed. Within the folders, the history files are named after the controller with the hour_minute_second that they were opened.

To retrieve the historical information you need.

- › Retrieve the USB or SD Card.
- › Find the date of the information you want and open the folder.
- › Open the file with Points in the name.
- › Find the point name you want history information on. Record the Parent and Child Index numbers.
- › Open the history file. Sort all the columns.
- › Sort the column by the parent and child index.
- › Use the information as needed.

Examples:

16LX_Points_20_13_16_11

parentIndex	childIndex	name	units	commandable	pointType	decimals
31	28	Relay 1	<u>STOP,START</u>	1	2	0

16LX_20_13_16_12

year	month	day	hour	minute	second	parent index	child index	value	condition	priority
2024	10	2	0	0	9	31	28	0	3	11
2024	10	2	0	0	24	31	28	1	3	11
2024	10	2	0	0	39	31	28	0	3	11

Saving history in plain text uses up to 40 bytes per point, per save. As a benchmark: a database of 100 points, all saving every 15 seconds, would fill a 16 GB card in about 600 days — or a 256 GB card in about 10,000 days (roughly 29 years).

Because of this constant write activity, Computrols recommends external storage rated to handle sustained, heavy writing.

Comparison Charts

X / LX Comparison Chart – General			
Feature Set	X-Line	LX-Line	Comparison
On-Board Hardware			
Main Processor	386EX	Sitara ARM Cortex-A8	
Processor Clock Speed	25 MHz	1GHz	40 X
Million Instructions/Sec (MIPS)	≈11	2000	180 X
Non-volatile memory	1M	4G	4,098 X
RAM	512KB	512MB	1,024 X
Additional Memory Type	Clock Chip	Micro SD Card	
Additional Memory	1 MB	32+ GB	32,768 X
USB Ports	-	1	
Other Processors	-	SiLabs 8051 F580	
On-Board Software			
Access/HVAC Function	Different Firmware	All Inclusive	
Sunrise / Sunset	External/Computer	Internal/DDC	
X-Line Classic Firmware	✓	✓	
Hand Held Server	✓	✓	
On-board Web Server		✓	
Android Device Server		✓	
Secure File System		✓	
Networking & Communication			
Ethernet Speed	10 Mbps	10/100 Mbps	10 X
Ethernet Network Security	CBAS Authenticated Socket Connection	Secure Sockets (SSL)	
Max Serial Comm Speed	38.4 Kbps	115 Kbps	3 X
Serial Protocols	Different Firmware	All Inclusive	
Internet Protocols			
TCP	✓	✓	
UDP	✓	✓	

X / LX Comparison Chart – General

Feature Set	X-Line	LX-Line	Comparison
DHCP	✓	✓	
Ping	✓	✓	
SNMP		✓	
HTTP		✓	
HTTPS		✓	
FTP		✓	
...	...	✓	
BAS Protocols/IP			
BACnet/IP		✓	
Modbus/IP		✓	

X / LX Comparison Chart – Points and Control

Feature Set	X-Line	LX-Line	Comparison
Point Types			
Binary Input (Dry Contact)	✓	✓	
Binary Output (24 VDC)	✓	✓	
Voltage Input (0-10 VDC)	✓	✓	
Voltage Output (0-10 VDC)	✓	✓	
Temperature Input (10K)	✓	✓	
Resistance Input	✓	✓	
30 Volt Input (0-30 VDC)		✓	
Pulse Count (6Hz)		✓	
Pulse Width (150 msec)		✓	
Point Features			
Overvoltage Protection	24 VAC	250 VAC	10 X
Point Sampling Rate	3 / sec	224 / sec	75 X
Noise Filtering	Median	Median Filter	
A/D Resolution	12-bit	12-bit	
Max Points *	500	5000+	10 X
Wire Check **		✓	
DDC Speed			
PID Loop Speed	100 msec	≤ 1 msec	100 X
% Time used on DDC	75%	3%	25 X

* **Max Points** and other resources vary with application. This benchmark is for typical point usage in an HVAC application.

** **Wire Check** is a system of automatic tools for determining wiring problems.

X / LX Comparison Chart – Accessories

Feature Set	X-Line	LX-Line	Comparison
Supported Accessories			
Computrols Hand Held	✓	✓	
Android Device		✓	
USB Memory Stick		✓	
Micro SD Card		✓	
Webcam		✓	
Keyboard		✓	
Mouse		✓	
HDMI Monitor		✓	
More to Come		...	
Accessory Features			
Local Control (Hand Held)	✓	✓	
Local Control (Android Device)		✓	
DB Backup (Micro SD Card)		✓	
View Equipment (Webcam)		✓	
Local Printer (USB Printer)		✓	
WiFi Access (USB Access Point)		✓	
Bluetooth Access (USB Bluetooth)		✓	
Local Display (HDMI Monitor)		✓	
More to Come		...	

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Management Of Change Log

Date:	Responsible	Subject	Description
9.24.26	KV	LX User Manual Update	Release of the LX User Manual
2020	GH	Initial Creation	Initial creation of the LX manual