Honeywell

Honeywell LCBS Connect

WELCOME

Please use this document as a resource to help you plan and complete the LCBS Connect system installation. As a contractor, please consult with your LCBS Connect distributor to help you with technical details, estimating support, system training, and enabling/commissioning the LCBS Connect remote user interface. There is a large amount of backup presale and technical documentation that will augment this documentation.

Outline

This document will cover the following topics at a high level.

1. **Important Tips**
2. **Controls:** Determining controls that you need to construct complete LCBS Connect system
3. **Network:** What you need to know to install the controller network
4. **Wiring:** Requirements and how to wire the system components to controllers
5. **Gateway Installation**
6. **Web App:** LCBS Connect remote user interface installation

Important Tips

Research gateway installation with your customer before installing.
If you wait to do the research during general system installation, you will find that your installation time will be unacceptable to you. Use the "Introduction to LCBS

Connect — Information Technology Background" as a resource tool with your customers in advance of your general installation.

Do not mount the C7400S, C7250A "Grey Sensors" directly against mounting surface.
We've found that sensors do not read the proper temperature and humidity readings if they are mounted directly on a surface. This is due to the radiant and convective temperature coupling of the metal surfaces to the sensor case, which causes the sensor to accurately measure an average of the surface and the air. Use the 50053060-001 sensor mounting bracket if you apply these sensors.

Address grey sensors via addressing settings before installation.
Refer to this document and other technical information to set these switches correctly before installation. If these switches are not set correctly, the sensor will fail to function properly.

Set jumpers and scale sensors.
It is essential to set physical jumper Honeywell current sensors. You need to match this scaling, either via LCBS Connect wall module or LCBS Connect Web UI. If you don't, CT output will read incorrectly.

Set differential pressure sensors, set switches.
Make sure that you set the physical switches on the Honeywell P7640 device to measure 0 to 2.5 inches of water column. Please check this setting on the sensor. Further, you will need polyethylene tubing running to the high pressure side of the filter. Please refer to installation information if you need help determining proper poly tube positioning relating to the filter.

Controls

Determining controls that you need to develop a complete system

At bare minimum, an LCBS Connect controller and wall module are necessary to provide control of a standard constant volume air handling unit. Both devices are provided in the box and are "matched" to operate together. A 24 VAC power supply is required to power the LCBS Connect control system. In most cases this power is available from the constant volume air handling unit, in the low voltage control panel of the HVAC system.

Basic Controller. Select One for Each RTU, Split System, Heat Pump		
Part Number	**Description**	**Detail**
YCRL6438SR1000	LCBS Controller, Wall Module Package. This is the base, mandatory requirement to start LCBS Connect site installation.	LCBS Controller and Wall Module, Matched Pair. This is the mandatory, set of products required to start your customers LCBS Connect system. Wiring needed to power device, to connect low voltage control, and drop from HVAC unit to wall module.
Data to Cloud. Select One for up to 30 Controllers		
Part Number	**Description**	**Detail**
LGW1000, WPM-8000	Gateway. This device is needed to collect site data and deposit the data in the Cloud for downstream processing and retrieval.	The LGW1000 needs a 24 VAC power supply OR the WPM-8000 transformer (plugs into 120 VAC handy box). Connect LCBS Controller network to the Gateway Connect RJ45 connector from customer switch, router to the Gateway.
Network Termination. One per Network		
Part Number	**Description**	**Detail**
209541B FTT	Network Termination Device.	This device is used to bias LCBS Connect controller network. One device is typically used to bias network. This is described in "Network construction" Look at diagram attached to this document. Install this device as shown ONLY!
Economizer. One per Constant Volume Air Handling System		
Part Number	**Description**	**Detail**
M7215A1008	Economizer Actuator, Foot Mount... the Black Motor	Replace actuator if over ten years old. This actuator form factor is typically in place in about 80% of installed actuators in North America. Technical Specification: 25 lb-in, SR Black Motor, 2 - 10 VDC control, 24 VAC power 8 VA
-OR- MS7503A2030	Economizer Actuator, Direct Coupled	Functional replacement for the Black Motor. Need crank arm kit. Technical Specification: 24 lb-in, SR Direct Coupled Actuator, 2 - 10 VDC Control, 24 VAC Power 6 VA
STRN-CRK-01	Crank Arm Kit for Direct Coupled Actuator	Order with MS7503A2030 to Replace M7215A or M7215B Actuator

Economizer Discharge, Mixed, Return Air, Duct Sensors		
Part Number	**Description**	**Detail**
C7400S1000	Duct Mount Temperature, Humidity Sensor. Sensor network is called the "Sylk" Network.	Required for LCBS Connect economizer control. Each device as one humidity and one temperature sensor. Two (2) required for Differential Enthalpy control. Grey plastic enclosure, must use Duct Mount offset.
C7250A1001	20K Duct Mount, Outdoor Temperature Sensor. Grey enclosure form factor.	This form factor is NOT RECOMMENDED for mixed air sensing. Grey plastic enclosure, use Duct Mount Kit
50053060-001	Duct Mount Sensor Offset bracket	Required where C7400S1000 and C7250A1001 are mounted to keep sensing device in air stream.
Economizer Discharge, Mixed, Return Air, Duct Sensors		
Part Number	**Description**	**Detail**
C7041B2005/U	20K Temperature Sensor	Duct, Mixed, Coil Temperature Sensor. Six (6) inch stainless steel probe on mounting bracket. Temperature sensor -40 to 250 °F
C7770A1040/U	20K Temperature Sensor	Duct, Mixed, Coil Temperature Sensor. Six (6) foot plenum rated cable. Temperature sensor -40 to 250 °F
C7041B2013/U	20K Temperature Sensor	Duct, Mixed, Coil Temperature Sensor. Twelve (12) foot plenum rated cable. Temperature sensor -40 to 250 °F
C7041J2007	20K Temperature Sensor	Duct, Mixed, Coil Temperature Sensor. Twelve (12) foot plenum rated cable with J-Box Style Wiring Enclosure, plenum rated cable, Temperature Sensor -40 to 250 °F
C7041R2000	20K Temperature Sensor	Duct, Mixed, Coil Temperature Sensor. Twelve (12) foot J-Box Style Wiring Enclosure, flexible copper element, Temperature Sensor -40 to 250 °F
C7041R2018	20K Temperature Sensor	Duct, Mixed, Coil Temperature Sensor. 24 foot J-Box Style Wiring Enclosure, flexible copper element, Temperature Sensor -40 to 250 °F
C7041F2006	20K Temperature Sensor	Outdoor Air Temperature sensor. Weatherproof enclosure, connects to 1/2 in. conduit. "Lollypop" form factor.

Temperature, Humidity, CO2 Wall Sensors		
Part Number	**Description**	**Detail**
TR40	Sylk Wall Module Sensor	Wall temperature sensor only 32°F – 110°F
TR40-H	Sylk Wall Module Sensor	Wall temperature and humidity sensor 32°F – 110°F; 5-95% RH noncondensing
TR40-CO2	Sylk Wall Module Sensor	Wall temperature and CO2 sensor 32°F – 110°F; 0 – 5,000 PPM
TR40-H-CO2	Sylk Wall Module Sensor	Wall mount, temperature, humidity sensor and CO2 sensor 32°F – 110°F; 5-95% RH; 0 – 5,000 PPM
Pressure, Current Transformer Sensors		
Part Number	**Description**	**Detail**
P7640A1034	Differential Air Pressure Transducer	Required for variable air flow sensing across air filters. Panel Differential Pressure Transmitter, 0-1 in., 0-2.5 in., 0-5 in., 0-10 in. Selectable, 12-30 VDC power, 24 VAC power.
CTP-10-050-VDC-001	Analog Current Sensor	Required for analog proof of fan, compressor, or electric heat operation. Split Core Current Sensor w/ 0 - 10 VDC Output, 0-10/ 0-20 / 0-50 Amps Selectable Ranges
MCSP-A	Digital Current Sensor	Required for digital proof of fan, compressor, or electric heat operation. Split Adjustable 0.70 - 150 Amps 1.00 Amp @ 36 VAC/VDC contact rating

Sylk Sensor Network

What you need to know to install the Sylk sensor network

The Honeywell "Sylk" Network and Sensors
The Honeywell C7400S and TR40, TR40-H, TR40-CO2, TR40-H-CO2 and LCBS Connect wall module are two-wire sensors that attach to a single bus. We call it the Honeywell "Sylk" network.
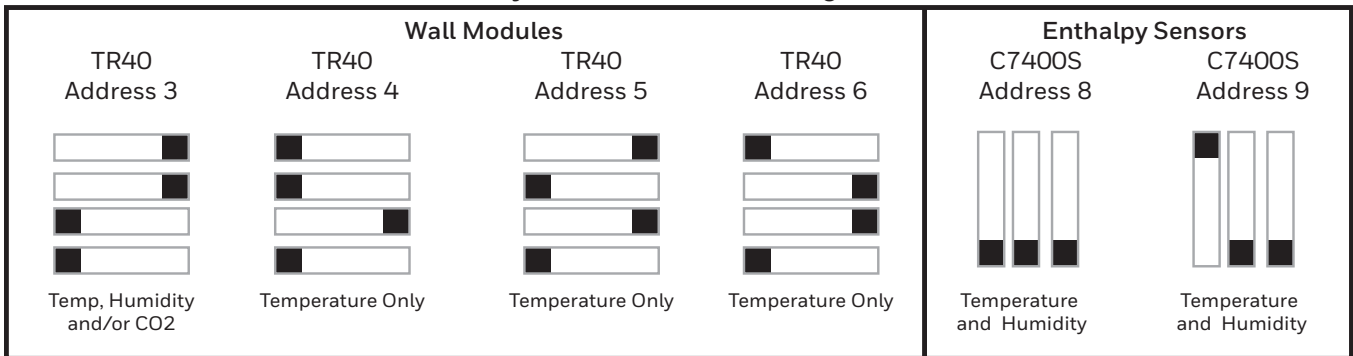
Benefits and details of Sylk network:
• The total length of the Sylk network should not exceed 150 feet. There is nothing you can do about this issue. No additional power supplies can be added. The addition of additional wire capacitance (larger wire AWG), could help extend the length of the network by 20–40 feet.
• It is polarity insensitive. You don't have to connect sensors to "plus" and "minus" consistently.
• It is powered with voltage to power the sensor. No external power supply is required. This leads into a trade-off, simply put the current available to power the sensors is limited. So, please see the table below. This represents the MAXIMUM sensors that can reside on a single Sylk network coming from a single LCBS Connect controller.

Sensor Model Number	Sensor Network Configuration – Maximum
TR40 C7400S	Four TR40, C7400S maximum per Sylk network per LCBS Connect controller. Two C7400S sensors are required to perform differential enthalpy economizer controls.
TR40 TR40-H C7400S TR40-H-CO2 TR40-CO2	One TR40-H, TR40-H-CO2 or TR40-CO2 takes up power of two TR40, C7400S sensors. If you intend to do differential enthalpy control, there is only power for ONE TR40-CO2.

• Sylk sensors must be "addressed" via small switches on the device. If you don't "address" these sensors properly, the sensors WILL NOT WORK properly.

NOTE: If the LCBS Connect wall module stops at the "90% Loading" screen upon power up, there is a Sylk Bus addressing issue. Review the additional Sylk sensor addresses before proceeding.

Sylk Sensor Network Settings


Wall Modules				Enthalpy Sensors	
TR40 Address 3	TR40 Address 4	TR40 Address 5	TR40 Address 6	C7400S Address 8	C7400S Address 9
Temp, Humidity and/or CO2	Temperature Only	Temperature Only	Temperature Only	Temperature and Humidity	Temperature and Humidity

WIRING

Requirements and how to wire the system components to controllers

Description	Wire Description
24 VAC power to controller, actuator, powered devices,	14 AWG 2 to 18 AWG 2. Important to determine potential line loss if long wire run is deployed.
Connection to low voltage system control	24 AWG 5+ to 18 AWG 5+. Terminate Y, G, R, W and multistage terminations to LCBS Connect controller.
Sylk wire. Wall module to controller, sensors	24 AWG 2 to 18 AWG 2. Larger wire size can mitigate length of wire run. Don't exceed 150 foot wire length restriction.
Sensors to controllers	24 AWG 2 to 18 AWG 2. All thermister sensor based sensors, self powered sensors. Use 18 AWG for maximum reliability.
Power sensors to controllers	24 AWG 3 to 18 AWG 3. Sensors requiring DC power need external power supply. Observe LCBS controll power output if selecting other powered sensors.
Network cable	22 AWG 2. Preferred Network IV cable rating. Solid, stranded preferred.

Important. If cable runs through air stream, it must be "plenum rated." Non plenum rated cable can emit noxious, deadly gas into air space.

Gateway and controller wiring
Power the controller ❶ with existing 24 VAC from the RTU, heat pump, or split system. Reconnect terminations ❷ to heating, cooling, fan control on LCBS Connect controller. Reuse ❸ two of the existing wires from the wire drop from RTU to thermostat to connect wall module to controller via the S-Bus terminals. Additionally, install new wires, per specification ❹ to "Sylk" bus connection, to install TR40, C7400S Sylk sensors.
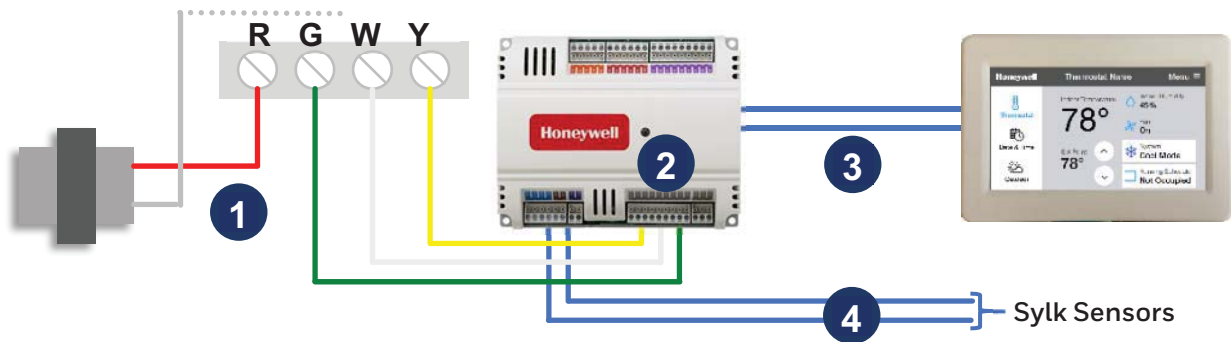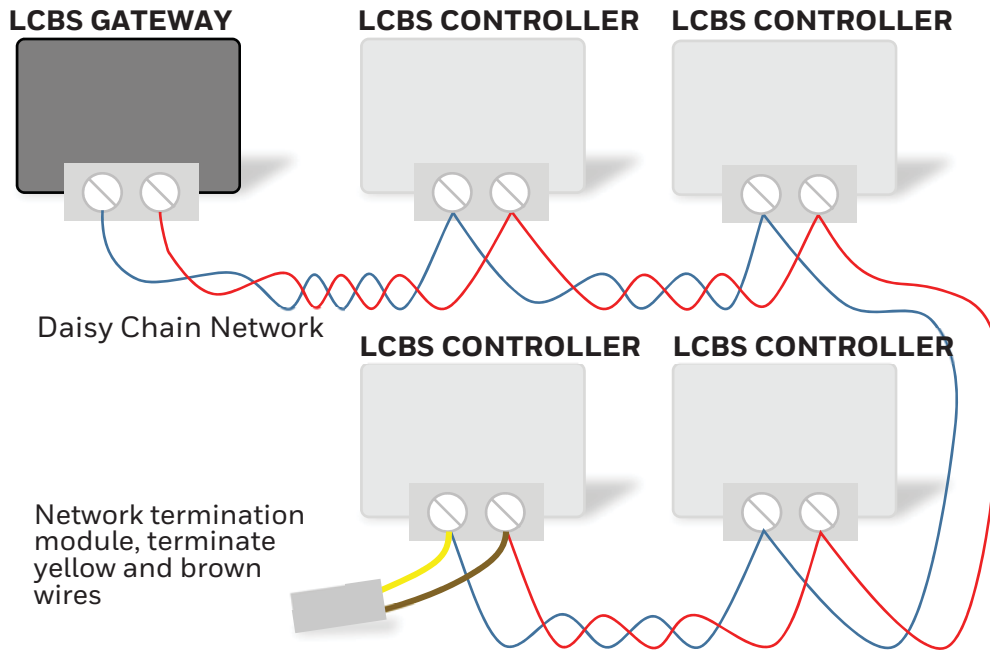

Installing the LCBS Controller Network
The LCBS Connect controller network is based on the robust LonWorks™ network. Honeywell adopted this technology in 1988 and has developed core engineering competency creating controls that use this technology, making it a popular choice for contractors. There are a few key things to remember as you develop your installation plan.

While the Echelon FTT-10 technology is quite robust and supports many different topology options, Honeywell recommends standard "daisy chain" wiring, as shown in this guide.

We recommend "single terminated network" approach for LCBS control networks. With our 30 year experience with LON building control networks, most small networks (250 feet in length) will function without the termination module. We recommend that you add this device to keep network message reliable at high at all times. Further, make sure that you wire the termination module correctly, per drawing below. If you don't, controller network failure can occur.

LCBS GATEWAY   **LCBS CONTROLLER**   **LCBS CONTROLLER**

Daisy Chain Network   **LCBS CONTROLLER**   **LCBS CONTROLLER**

Network termination
module, terminate
yellow and brown
wires

Gateway Installation

The LCBS Connect Gateway takes data from LCBS Connect controllers, via the controller network, and sends that data over the internet to the Honeywell Cloud. Proper planning will make installation of this device very simple.
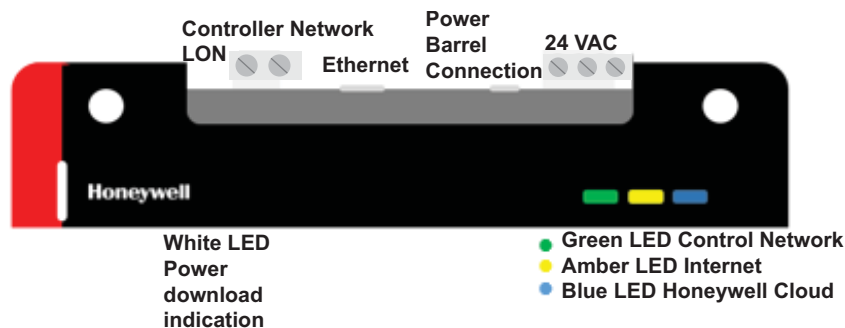
Tips before installing
- Make sure you tell your customer and/or end user business sponsor what you are going to do. In many cases, the customer will express concern that the "IT Manager" will have an issue with the installation of such a device.
- If the customer is concerned, give them the Honeywell white paper "Introduction to LCBS Connect — Information Technology Background". If the customer has questions about this data, call Honeywell customer service at 1–888–793–8188, or your Honeywell Product Management professional.

Physical installation
1. Record the MAC ID before mounting and save it in a safe place. It is on the back of the device and mounting it using installation eyeholes could conceal it.
2. Mount the gateway one of three ways
   a. Using the eyeholes in the corners of the device, screw the gateway into a suitable metal or wood surface. Make sure to record MAC ID before you do so.
   b. Mount the gateway on a standard DIN rail.
   c. Place the gateway on a desktop. The device features rubber mounting feet that will prevent knocking the gateway off a surface.
3. Provide power to the device using the Honeywell power supply (see parts list) or standard 24 VAC power. Device needs 10 VA to be continuously powered.
4. Connect the gateway to the internet via ethernet cable.

Please refer to gateway specification sheet for specific installation instructions.

Controller Network   **Power**
LON   **Ethernet**   **Barrel**   **24 VAC**
                             Connection

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White LED   ● **Green LED Control Network**
Power   ● **Amber LED Internet**
download   ● **Blue LED Honeywell Cloud**
indication

Register the Gateway

If you have specific instructions, grab the "Building Registration Process" document. Log onto the LCBS Connect Web UI with the user name and password that you have received sometime in the past. You can't proceed without this information.

1. Log in to the LCBS Connect web app on any computer, tablet, or smartphone at **lcbs.honeywell.com**
2. Select "BUILDINGS" from the black navigation bar. Select the blue **+** icon.

Add Building
1. Fill in the information about the building.

NOTE: You do not have to assign technicians at this point in time.

2. Select SAVE after completing this task.

Building Information, Assign Owner
After you have saved the building, the Web UI moves to "Building Information" screen.
1. The interface will show "No Building Owner Assigned."
2. Select "Assign Owner" button.

Assign Building Owner

After selecting the Assign Owner button, you will see a list of existing building owners.

1. Select the building owner you want by clicking the "Assign" button.
2. If the building owner you wish to assign is not listed, use the **+** button to add them.
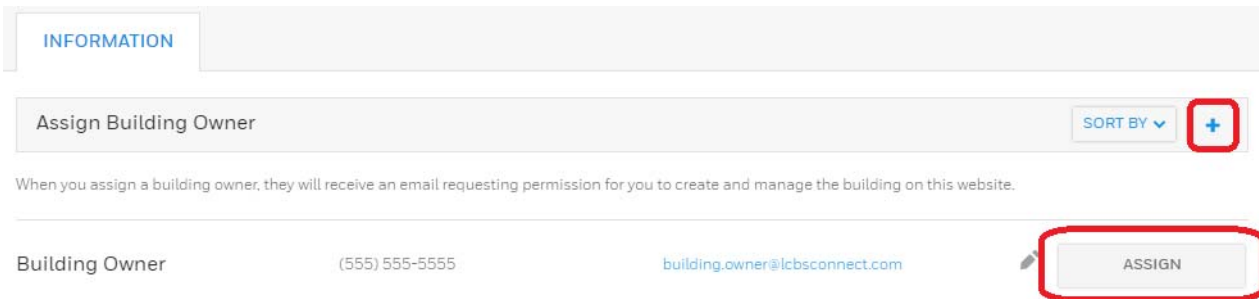
Invitation Sent to Owner

It is essential that you, as your customer's supplier, let your building owner know that this correspondence is coming to them. An "End User License Agreement" is sent to them for their approval. Once they have done this, you can register the controller.

1. Notify building owner they will be receiving an "End User License Agreement" that **must be accepted** before the gateway registration can be complete.

Register gateway

1. Navigate to the CONTROLS tab of the newly created building.
2. Click the **+** button to add a gateway.
3. Type the eight digit code found on the gateway
4. Wait for device registration confirmation. This may take up to 5 minutes.
5. Observe the gateway directly or call your customer and determine status of the four LEDs. The white, amber, green, and blue LEDs should be on and steadily lit.

• If flashing, consult the gateway documentation "Gateway Installation Instructions," found in the box, or under the ⑦ icon in the web application.

Controller connections

1. If the controllers have already been connected to the LCBS controller network, they will auto–discover and display without any additional actions.
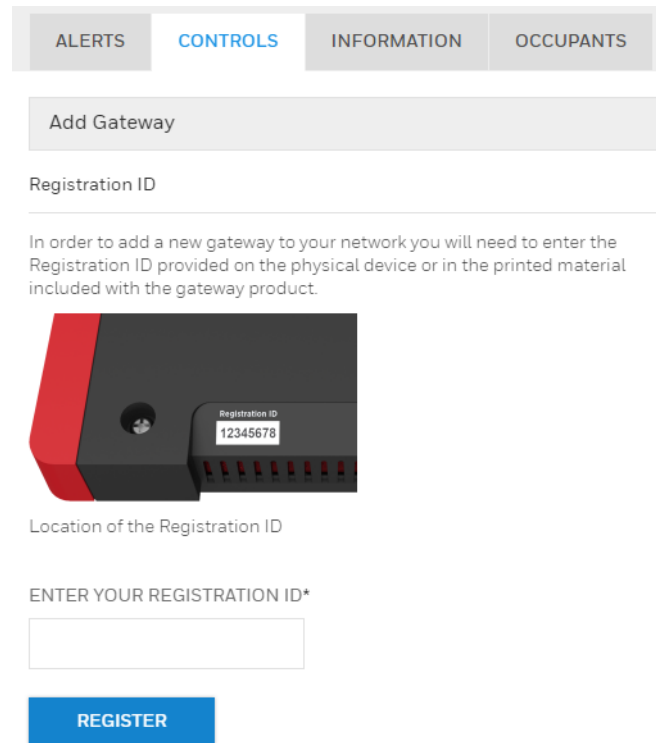
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