

WireLynx

Reliable Powerline Carrier Controls



LX-1010
LX-1022
LX-1031

PowerLine Carrier Installation and Operation Instructions



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PowerLine Carrier Installation and Operation Instructions

Section 1: Installation of Transmitter Model LX-1010A

Note: When mounting the Wirelynx Model LX-1010A Transmitter, it is important to locate the transmitter as close to the building's service entrance as possible. In most cases this will be at or near the building's switchgear, main distribution panel or load center (circuit breaker panel). In commercial buildings with many circuit breaker panels, mount the transmitter at the circuit breaker panel which is closest to the incoming electrical service.

1. Mount transmitter chassis or LX-1010A transmitter board in desired location according to the note above. Set the House Code Switch in the upper right corner of the LX-1010A transmitter to either "A" or "B" house code.
2. Set the House Code Switch in the upper right corner of the LX-1010A transmitter to either "A" or "B" house code.
3. Connect the LX-1010A's green wire on the lower right corner of the 1010A transmitter board to Neutral using #14 AWG or #16 AWG wire. If no Neutral exists, connect the green wire to Ground. This wire must be connected to Neutral or Ground. If connected to Neutral, put White electrical tape on the Green wire to be compliant with NEC.A. On 120/240VAC single-phase applications, wire two of the LX-1010A's three red wires, one to each phase, using #14AWG or #16AWG wire. Cap the third red wire which will not be used. Each red wire is intended to be wired to one of the 120VAC voltage phases. See the wiring detail on the following pages.
4. A. On 120/240VAC single-phase applications, wire two of the LX-1010A's three red wires, one to each phase, using #14AWG or #16AWG wire. Cap the third red wire which will not be used. Each red wire is intended to be wired to one of the 120VAC voltage phases. See the wiring detail on the following pages.
B. On 120/208VAC Wye and 120/240VAC Delta 3-phase applications connect, one of the three red wires to each of the voltage phases. It does not matter which red wire goes to each phase. Insure that the red wires have proper current limiting such as a circuit breaker, fused disconnect switch or in-line fuse.
C. On 277/480VAC Wye (4-Wire) or 480VAC Delta (3-Wire) 3-phase applications, use the LX-2299A 480VAC adapter to connect the LX-1010A to the Power line. Insure that proper current limiting is used, i.e.: Circuit breakers, fused disconnect switch or inline fuses.
5. Wire 16VAC to "P1" of the LX1010A transmitter board using the yellow wire harness supplied. If you purchased the LX-1010A transmitter mounted on a chassis, it includes a 16VAC power transformer with green wires on the transformer's secondary. Plug the transformer's white plug (secondary with green wires) into the white jack on the transmitter board labeled "P1" in the lower left-hand corner of the LX-1010A board. Wire the transformer's black wire to 120VAC "hot" phase through a 15A single-pole breaker. Wire the white wire to neutral. Some transformers may have 2 black wires on primary. If this is the case, wire one to hot, one to neutral.
6. Wire the transformer's black wire to 120VAC "hot" phase through a 15A single-pole breaker. Wire the white wire to neutral. Some transformers may have 2 black wires on primary. If this is the case, wire one to hot, one to neutral. The green LED on board should come on steady indicating that the transmitter is transmitting commands to the power lines.
7. Turn on power to the Wirelynx LX 1010A Transmitter. On single-phase applications, make sure that the two red wires are connected to the same double-pole breaker. On three-phase applications, insure that all three red signal-coupling wires of the transmitter are each connected to the same three-pole breaker. Turn "on" this breaker. On 480VAC 3-phase applications using the LX2299A adapter, insure that a double-pole breaker is used.

The green LED on board should come on steady indicating that the transmitter is transmitting commands to the power lines.

Note: The intensity of this LED will vary depending on powerline loading. Under heavy loading, this LED may be very dim and difficult to see.

Section 2: Receiver Programming

One-Channel Receivers: Model LX-1031x

One-channel LX-1031x receivers have a six-position dip switch for programming. The switches from left to right are defined as follows:

Switches 1 thru 4 set the control point address of the receiver using a four-bit binary code.

The “D” indicates that the switch is in the **down** position and “U” indicates that the switch is in the **up** position.

Table 1

Control Point Address	SW 1	SW 2	SW 3	SW 4
1	D	D	D	D
2	D	D	D	U
3	D	D	U	D
4	D	D	U	U
5	D	U	D	D
6	D	U	D	U
7	D	U	U	D
8	D	U	U	U
9	U	D	D	D
10	U	D	D	U
11	U	D	U	D
12	U	D	U	U
13	U	U	D	D
14	U	U	D	U
15	U	U	U	D
16	U	U	U	U

Switch 5 sets the house code. The **down** position is House “A” and the **up** position is House “B.” This allows two buildings served by the same utility power transformer to each have a PLC system operating without one affecting the other. If House “A” is selected on the Model LX-1010A PLC Transmitter, all receivers in the same building must be set to House “A.”

Switch 6 enables or disables the five (5) minute minimum-energize time. If Switch 6 is in the down position, the minimum-energize time delay of 5 minutes is disabled and energize commands received from the transmitter are immediately implemented when received. If Switch 6 is in the up position, the minimum-energize time delay of 5 minutes is enabled. This means that the receiver will ignore any normal (de-energize) commands for at least five minutes after the receiver receives an energize command. This time delay is for short cycle protection of inductive loads like compressors using normally-closed relay contacts.

OTHER FEATURES: Receivers also contain a time-out feature. If no command is received from the transmitter for one minute, relay will go to the default state (normal) until a valid command is received.

Two-Channel Receivers: Models LX1022x

The LX-1022x two-channel receivers can be operated in 1-channel mode or 2-channel mode. If in the 2-channel mode, receivers are designed so that its relay addresses are sequential. It is necessary to set the address of the first relay only. The second channel is the first channel's address plus one. In 1-channel mode, the specific address is set in the same manner as one-channel receivers, using all of the first four dip switches.

The two-channel receivers use an eight-position dip switch. The definitions of the first six switches of the dip switch are the same as the single-channel receiver.

Switches 1 thru 3 set the control point address of the first relay in the receiver using a three-bit binary code. Thus, the address of the first relay is always an odd number: 1, 3, 5, 7, 9, 11, 13, or 15. Because the first relay's address is an odd number, relays in the LX-1022x receiver are assigned addresses as 1&2, 3&4, 5&6, 7&8, 9&10, 11&12, 13&14, or 15&16. This is because the second relay's address is the address immediately following the first relay's address.

Switch 4 This switch is not used in 2-channel mode for the reasons just explained. However, in 1-channel mode, it is used along with switches 1 through 3 to set the address or channel # of BOTH relays.

The "D" indicates that the switch is in the down position and "U" indicates that the switch is in the up position.

Table 2

Control Point Address		SW 1	SW 2	SW 3	Sw 4
Relay 1	Relay 2				
1	2	D	D	D	D
3	4	D	D	U	D
5	6	D	U	D	D
7	8	D	U	U	D
9	10	U	D	D	D
11	12	U	D	U	D
13	14	U	U	D	D
15	16	U	U	U	D

Switch 5 sets the house code. The **down** position is house "A" and the **up** position is house "B." This allows two buildings served by the same utility power transformer to each have a PLC system operating without one affecting the other. If House "A" is selected on the Model LX-1010A PLC Transmitter, all receivers in the same building must be set to House "A."

Switch 6 & 7 In 2-channel mode, these switches enable or disable the five-minute minimum-energize time on relay #1 & #2, respectively. If the switch is in the down position, the minimum-energize time delay of 5 minutes is disabled and energize commands received from the transmitter are immediately implemented when received. If the switch is in the up position, the minimum-energize time delay of 5 minutes is enabled. This means that the receiver will ignore de-energize commands for at least five minutes after the receiver receives an energize command. This time delay is for short cycle protection of inductive loads like compressors.

Switch #8 This switch selects the channel mode, either 1-channel or 2-channel. If the switch is in the down position, the 1-channel mode is selected and operates as a DPDT relay. If the switch is in the up position, the 2-channel mode is selected and the receiver operates as two independent relays. The addressing details of the 2-channel mode are outlined above. In 1-channel mode, the receiver's address is set according to Table 1. When operated in this mode, both relays operate in tandem, thereby creating a DPDT relay. The only exception to this is if dip switch #7 is up. In this configuration, once the command is received to energize the relay, the receiver's first relay will energize immediately, while the second relay will delay for one minute and then energize. This feature is designed to work with air conditioner compressors on relay 1 and the air handler blower on relay 2, using the normally-closed contacts of each relay.

Section 3 – Operation

1. Turn on circuit breakers for the Wirelynx PLC transmitter and for all the controlled loads. This assumes that each PLC receiver is powered by the same circuit as the load it is controlling.
2. The GREEN LED on the LX-1010A transmitter should light indicating that the transmitter is transmitting data on to the power lines. The brightness of this LED will vary depending on powerline loading, although it should be on steady and not blinking.
3. Each receiver's GREEN LED should flash about once per second indicating that complete data packets are being received from the LX-1010A transmitter.
4. The RED receiver LED's should be lit when relay is energized. The normally-closed contacts should be open and normally-open contacts will closed when the Red LED is on.
5. When the input switch closure is opened, the RED LED should go out and relay coil should de-energize.
6. Expect about a 1 to 3 second delay between the time that the switch closure input switches state and the receiver's relay switches.
7. Verify under actual operating conditions that the RED LED in the receiver lights up when the transmitter's switch closure inputs are closed and goes out when the input is open.

Troubleshooting

1. The transmitter and all receivers with a home or building must have the same house code – either A or B.
2. If two buildings adjacent to each other are on the same utility transformer, each building must have a unique house code. Only two PLC transmitter/receiver systems may be used for buildings on the same utility transformer.

If two systems are operating in the same building, ensure that the house codes are correctly set for each transmitter and each transmitter's intended receivers.
3. Make sure to mount the Model LX-1010A PLC transmitter as close to the service entrance as possible to ensure that maximum signal strength on all branch circuits within the building.
4. There is no limit to the number of receivers set for each address. All receivers set for the same address will operate together, except when the minimum energize times are in force. If enabled, that may cause the receivers with the same address to de-energize their relays at different times from those with minimum times disabled.

5. Make sure that the 5-minute minimum-energize time is enabled when controlling compressors or other motor loads to eliminate short cycling. This minimum-energize time always times out upon power-up if this feature is enabled.
6. If the transmitter loses power for one minute, all receivers will default their relay(s) to the normally-closed (normal) position. This eliminates loads controlled by the PLC system from being “hung up” in either is on or off state.
7. All two-channel receivers operating in the 2-channel mode must have an odd numbered address. This will be insured by keeping dip switch #4 in the down position.

Notes

** For 480VAC applications, use the LX-2299A 480V Transmitter Adapter if Receivers are to be 480V “H” models. This is generally the case where there may or may not be a neutral wire and the receivers must be connected, and receive their signal from, phase to phase. Identify two of the three phases that will be used, Phase A and B for example, which will be used for the transmitted signal from the LX-1010A/LX-2299A and all receivers. There will be no connections to Phase C.

For 277/480VAC applications, if the receivers will be 277V “M” models, then the LX-2299A adapter is not required. The “M” model receivers would be wired between any phase and neutral. Make sure that Transmitter’s red wires are coupled to the powerline through appropriate current limiting such as in-line fuses, a fused disconnect switch or 3-pole circuit breakers.

Technical Support

For Technical Support, call Brayden Automation Corp. at 1-888-BRAYDEN (272-9336).

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