

WARRANTY

Steffes Corporation (“Steffes”) warrants that the Steffes Power Line Carrier Mini Receiver is free from defects in materials and workmanship under normal use and service. Steffes’ obligation under this Warranty is limited to the repair or replacement of the appliance or parts only which prove to be defective under normal use within one (1) year of the date of installation and which Steffes’ examination of the returned device or part(s) shall verify to Steffes’ satisfaction that it is defective. The user shall be responsible for any labor costs associated with the repair or replacement of the device or part(s) including the cost of returning the defective appliance or part(s) to Steffes Corporation.

This Warranty is void if the device is moved from the premises in which it was originally installed. This Warranty shall not apply to a device or part which has been altered in any respect, or improperly installed, serviced or used, or has been subject to accident, negligence, abuse or misuse.

THE ABOVE WARRANTY BY STEFFES IS EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN OR ORAL, EXPRESS OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR OF FITNESS FOR A PARTICULAR PURPOSE.

The user assumes all risk and liability whatsoever resulting from the use of this device. In no event shall Steffes be liable for any indirect, special or consequential damages or lost profits.

This Limited Warranty contains the complete and exclusive statement of Steffes’ obligations with respect to this device and any parts thereof. The provisions hereof may not be modified in any respect except in writing signed by a duly authorized officer of Steffes.



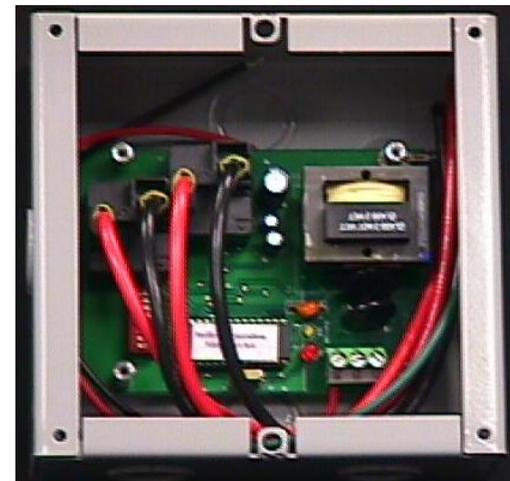
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“Commitment to Innovation”

DOCUMENT #1200057



Operation & Installation Guide for Power Line Carrier Mini Receiver (Applicable to Software Version 15.0 - 15.9)



“Manufactured in North America”

Off-Peak System Control





WARNING

HAZARDOUS VOLTAGE: Risk of electric shock. Can cause injury or death. This device may be connected to more than one branch circuit. Disconnect all branch circuits before servicing.



IMPORTANT

- ◆ The equipment described herein is intended for installation by a qualified technician in accordance with applicable local, state, and national codes and requirements.
- ◆ This manual should be retained by the owner upon completion of the installation and made available to service personnel as required.
- ◆ **Disclaimer:**
 - Conditions may occur which cause the power line carrier transmitter and receivers to have difficulties communicating; therefore, not operating properly. In no event shall Steffes Corporation be liable for any indirect, special, or consequential damages or lost profits.
 - In compiling this manual, Steffes Corporation has used its best judgement based upon information available, but disclaims any responsibility or liability for any errors or miscalculations contained herein, or any revisions hereof, or which result, in whole or in part, from the use of this manual or any revisions hereof.
 - Steffes Corporation does not guarantee effective communication of the PLC system in all applications and is not responsible for any communication issues outside normal operating malfunctions.

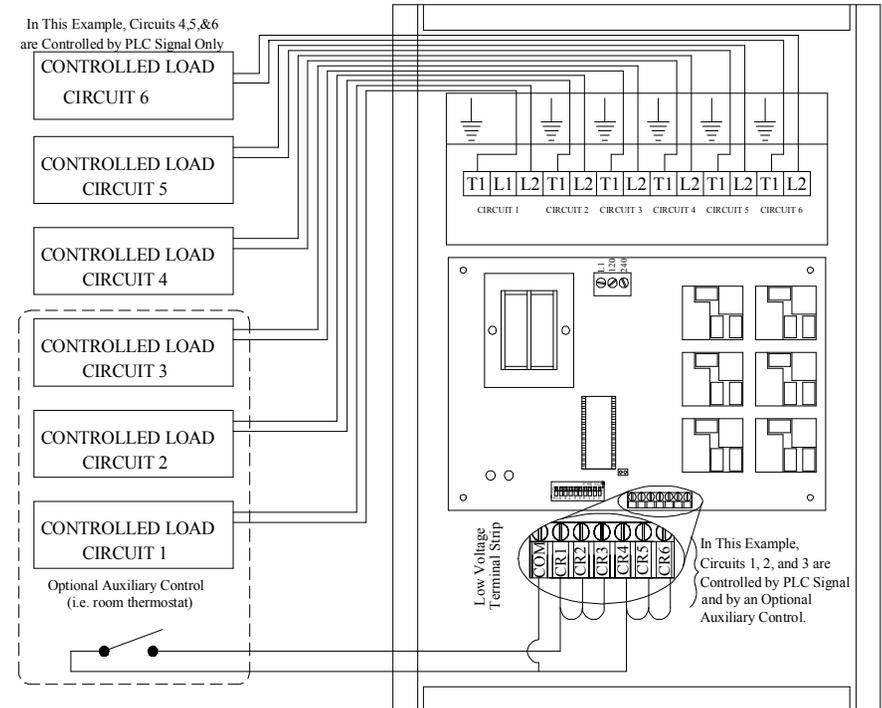
FOR CUSTOMER USE

Please record the serial number of the mini receiver below. This information is located inside the mini receiver enclosure. Retain this information for future reference.

Serial No. _____

SPECIALTY APPLICATION WIRING DIAGRAM (six pole configuration utilizing power line carrier signal and an auxiliary control device)

This Device MUST be Grounded.
Grounding and Bonding is not shown in this Diagram.



NOTES

(For reference to these notes, refer to the wiring diagrams on Pages 6 and 7 in this manual.)

- NOTE 1:** For more information on the dip switches, refer to the Dip Switch Settings section in this manual.
- NOTE 2:** Mini receiver configuration must be specified at the time of factory order.
- NOTE 3:** The mini receiver operates on 120V or 208V/240V, single phase. In the single and double pole configuration mini receivers, line voltage connections must be made in the terminal block to configure it to the voltage input being connected to. The six pole configuration mini receiver is factory configured to operate on 208V/240V. If connecting it to 120V, the line voltage connections in the terminal block must be reconfigured and L1 must be the ungrounded leg.
- NOTE 4:** All line voltage wiring in this device must remain below and in front of the line voltage barrier inside the mini receiver enclosure.
- NOTE 5:** In the 6-pole mini receiver, circuit 1 feeds both output circuit 1 and the mini receiver's internal controls.
- NOTE 6:** With the 6-pole mini receiver, loads connected between L1 & L2 on circuit 1 will be uninterrupted. Loads connected between T1 & L2 on circuit 1 will be interrupted.
- NOTE 7:** Circuit 1 maximum fuse size is 20 amps. Maximum load is 16 amps. Any loads requiring greater than a 20 amp circuit **MUST** never be connected to circuit 1.
- NOTE 8:** Circuits 2-6 maximum fuse is 30 amps. Maximum load is 24 amps.

Maximum Fuse Size (6-pole)	Total Input Circuit Ampacity (6-pole)
Circuit 1 = 20 AMP (16 AMP Load, Max)	Surface Mounted = 120 AMPS Flush Mounted = 80 AMPS
Circuit 2-6 = 30 AMP (24 AMP Load, Max)	

- NOTE 9:** To ensure proper communications between the PLC Mini Receiver and its correlating transmitter, the mini receiver **MUST** be grounded. The system grounding and bonding must be sized and installed in compliance with all applicable codes.

GENERAL OPERATION

The Steffes Power Line Carrier (PLC) Mini Receiver is designed to provide wireless control of one electrical circuit (single pole configuration), two electrical circuits (double pole configuration), or six electrical circuits (six pole configuration). It receives signals through the existing power lines from the Steffes Power Line Carrier (PLC) Transmitter or Comfort Control Relay Panel (CCRP). The built-in 30 AMP relay(s) are capable of controlling devices such as: ETS heaters, water heaters, baseboards, electric furnaces, dryers, dishwashers, hot tubs, ceiling cables, or other electrical equipment. When the mini receiver receives a signal, its relay(s) are activated to control the device(s) connected to them. This type of control can minimize the overall cost of controlling electrical devices.

PLC Communication is very reliable in most applications but can be affected and hindered by connection method used, electrical layout of the application, operation of other equipment in the same electric system, dirty power, etc. Steffes Corporation does not guarantee effective communication of the PLC system in all applications and is not responsible for any communication issues outside normal operating malfunctions.

FEATURES

- ◆ One, two, or six DC held, 30 AMP, board mounted relay(s) pre-wired with 10 AWG leads. (Configuration must be specified at the time of factory order.)
- ◆ Receives peak and anticipated peak (pre-peak) control signals via the power lines from the Steffes PLC transmitter system.
- ◆ Fifteen selectable communication channels.
- ◆ Capable of controlling a device on a rate/control strategy separate from the master control.
- ◆ All configurations are available in metal, flush or surface, indoor mounted enclosures with power company seal/lockout provision.
 - Single and Double Pole Configurations: 6" x 6" x 3" (Outdoor enclosure available as special factory order.)
 - Six Pole Configuration: 10" x 16" x 4.25"

Maximum Fuse Size (6-pole)	Total Input Circuit Ampacity (6-pole)
Circuit 1 = 20 AMP (16 AMP Load, Max)	Surface Mounted = 120 AMPS Flush Mounted = 80 AMPS
Circuit 2-6 = 30 AMP (24 AMP Load, Max)	

- ◆ Controls 120V or 208V/240V, single phase devices connected to single or three phase systems.
- ◆ Indicator lights to monitor PLC operation or relay status.
- ◆ Optional 90-minute peak override module available.

INDICATOR LIGHTS

In its standard configuration, when the mini receiver is first energized, a red light on the circuit board will begin to flash slowly. This indicates the receiver is waiting for a signal. When valid bits of information are received, the light will begin flashing more rapidly. There may be occurrences where the light will switch from a fast flash back to a slow flash. After several minutes, the mini receiver will synchronize with the transmitter, and the light will illuminate continuously to indicate complete information is being received. This red light monitors power line carrier (PLC) communication as follows:

Slow Flash: Mini receiver is waiting for PLC communication.

Fast Flash: Mini receiver is receiving partial PLC communication.

Continuous Illumination: Mini receiver is receiving complete PLC information

There is also an amber indicator light on the circuit board. This light is used to indicate whether the relays are open or closed. It will also indicate if a peak override has been initiated. The amber light monitors the status of the relays as follows:

No Illumination: relay(s) open

Flashing: override enabled

Continuous Illumination: relay(s) closed

These lights can only be seen when the mini receiver enclosure is open. They are not accessible to the user in normal operation.

OVERRIDE OPTION (Power Company Permitting)

The mini receiver is available with a 90-minute override option. If the override is incorporated, it allows the use of a normally controlled device(s), such as a water heater, during a peak control time. It allows for a single override of either all connected circuits or a one zone override of circuits 1, 3, 5, and 6. This feature works well in areas using a Time-of-Use rate/control strategy. (Installation instructions for this feature are provided with the override module, item #1302070.)

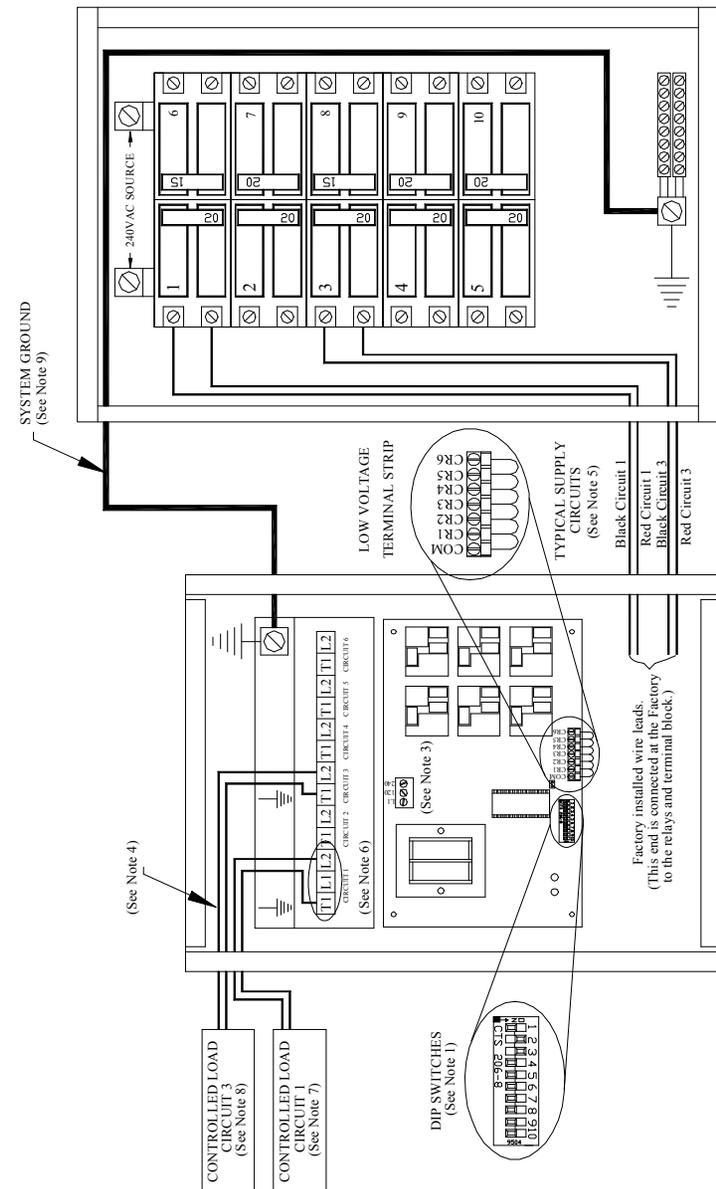
An override period can be initiated during a “peak” period or if communication between the transmitter and mini receiver is lost. To do so, press and hold the override button for 2 seconds. A new 90-minute override period can be initiated any time during a current override cycle. When an override is initiated, it cannot be cancelled manually. The override will cancel itself at the end of the 90-minute override cycle or at the start of the next off-peak period, whichever comes first.



The position of dip switch #8 on the mini receiver circuit board will determine which relays are enabled when an override is initiated. (For more information, refer to the Dip Switch Settings section in this manual.)

TYPICAL SYSTEM WIRING DIAGRAM

(six pole configuration)

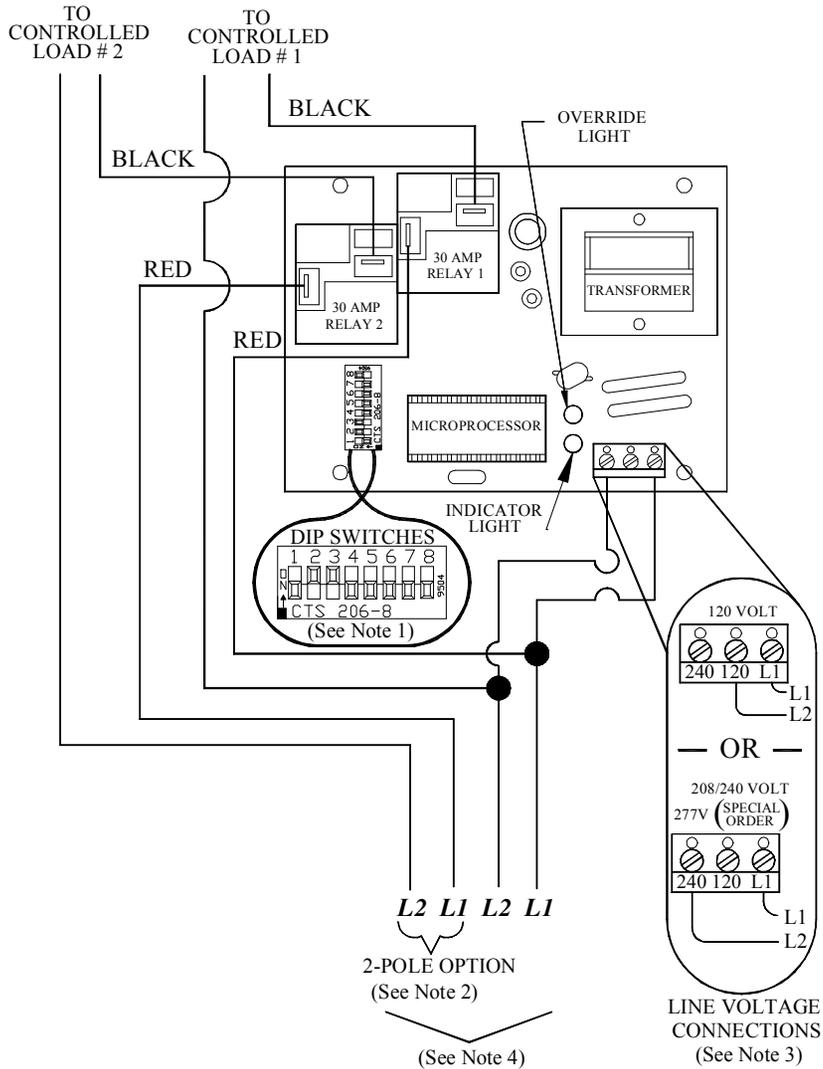


For reference to the “NOTES” listed in this diagram, refer to the Notes section on page 8 in this manual.

LINE VOLTAGE WIRING AND CIRCUIT BOARD CONFIGURATION DIAGRAM

(single pole or double pole configuration)

This Device MUST be Grounded.
Grounding and Bonding is not shown in this Diagram.



For reference to the “NOTES” listed in this diagram, refer to the Notes section on page 8 in this manual.

DIP SWITCH SETTINGS

DIP SWITCH 1: ANTICIPATED PEAK (PRE-PEAK) OPERATION MODE

This dip switch determines how an anticipated peak (pre-peak) signal will affect the mini receiver’s relay(s). For power companies desiring to control loads separately using multiple signals, this dip switch can be used to do peak control of devices on a separate rate/control strategy.

FACTORY DEFAULT SETTING = OFF

- Off = Relay(s) will not respond to an anticipated peak (pre-peak) signal.
- On = Relay(s) will be activated by an anticipated peak (pre-peak) signal.



The peak signal is priority signal. When a peak signal is being received, no other signal will be recognized.

DIP SWITCH 2, 3, 4 & 5: PLC CHANNEL SELECTION

The mini receiver can receive information on one of fifteen channels, depending on which channel the transmitting device is set to transmit on. The mini receiver and the transmitting device MUST be set to the same channel for proper communication to occur.

To select the Power Line Carrier channel desired, use the chart below and set dip switches 2, 3, 4, and 5 to the proper positions.

FACTORY DEFAULT SETTING = Channel 3 (2 ON, 3 ON, 4 OFF, 5 OFF)



A specific channel must be selected at time of installation.

CHANNEL	DIPSWITCH 2	DIPSWITCH 3	DIPSWITCH 4	DIPSWITCH 5
0	OFF	OFF	OFF	OFF
1	ON	OFF	OFF	OFF
2	OFF	ON	OFF	OFF
3	ON	ON	OFF	OFF
4	OFF	OFF	ON	OFF
5	ON	OFF	ON	OFF
6	OFF	ON	ON	OFF
7	ON	ON	ON	OFF
8	OFF	OFF	OFF	ON
9	ON	OFF	OFF	ON
10	OFF	ON	OFF	ON
11	ON	ON	OFF	ON
12	OFF	OFF	ON	ON
13	ON	OFF	ON	ON
14	OFF	ON	ON	ON
15	ON	ON	ON	ON

**DIP SWITCH 6: AUTOMATIC SHOULDER CHARGE
(Specialty Applications Only)**

This dip switch allows for a shoulder charge period for the device controlled on relay #1. Five (5) hours after a peak signal is received, relay #1 will close for four (4) hours. The relay will then open again and will remain open until an off-peak or anticipated peak signal is received. If an off-peak or anticipated peak signal is received during the five hour period, the timer will reset.

FACTORY DEFAULT SETTING = OFF

- Off = Shoulder charging disabled
- On = Shoulder charging enabled



The duration of the delay and the outdoor temperature settings are preset at the factory. If you have an application which requires a change to these settings, please contact the factory.

DIP SWITCH 7: DEFAULT RELAY STATUS

This dip switch determines how the relay(s) will respond when the power line carrier control system is first energized or if the mini receiver loses signal from the transmitter.

FACTORY DEFAULT SETTING = OFF

- Off = The relay(s) will open until a signal is received from the PLC transmitter.
- On = The relay(s) will close until a signal is received from the PLC transmitter.

DIP SWITCH 8: PEAK CONTROL OVERRIDE

With the addition of the override module to the mini receiver, peak override of some or all of the circuits is possible. Depending upon the position of this dip switch, either all circuits in the mini receivers or just those connected to relays 1, 3, 5, and 6 can be used in 90-minute intervals during a peak control period, if desired.

FACTORY DEFAULT SETTING = ON

- Off = Circuits connected to relays 1, 3, 5, and 6 are enabled during a peak control time when an override cycle is initiated.
- On = All circuits in the mini receiver are enabled during a peak control time when an override cycle is initiated.

**DIP SWITCH 9: RELAY 3 AND 4 FUNCTION SELECTOR
(Six Pole Configurations Only)**

This dip switch is used in conjunction with dip switch 6. If dip switch 6 is in the on position, the position of dip switch 9 will determine how relays 3 and 4 will respond.

FACTORY DEFAULT SETTING = OFF

- Off = Relays 3 and 4 will function like relay 2
- On = Relays 3 and 4 will function like relay 1

**DIP SWITCH 10: RELAY 5 AND 6 FUNCTION SELECTOR
(Six Pole Configurations Only)**

This dip switch is used in conjunction with dip switch 6. If dip switch 6 is in the on position, the position of dip switch 10 will determine how relays 5 and 6 will respond.

FACTORY DEFAULT SETTING = OFF

- Off = Relays 5 and 6 will function like relay 2
- On = Relays 5 and 6 will function like relay 1

INSTALLER'S FINAL CHECK OUT PROCEDURE

1. Prior to energizing the electrical circuit feeding the mini receiver, inspect all field installed electrical connections to ensure they are tight and that all wires are routed correctly. All line voltage wiring must remain below and in front of the line voltage barrier inside the mini receiver. To ensure proper communication with the PLC transmitter, the mini receiver must be grounded.
2. Check the settings of the dip switches on the mini receiver board to ensure they are in the correct positions for the application.



The desired PLC channel MUST be selected for communication to occur.

3. Check to ensure that the red indicator light on the mini receiver circuit board is illuminated continuously indicating communication is occurring between the transmitter and the mini receiver.

Communications between the transmitter and the mini receiver occur on a continuous basis. Upon energizing a system, there will be some delay in a receiver's response to transmitter signals. It takes approximately seven (7) minutes for the transmitter to establish initial communication. Subsequent communication will occur more rapidly.



4. Once good communication is established, verify that the mini receiver responds correctly to the corresponding utility peak signal status. The amber indicator light will illuminate when the relay(s) are closed and should remain off when the relay(s) are open.