

## X10 Low Voltage Controller

The X10 is a versatile component of INNCOM's In Room Automation System (IRAS) containing several low-voltage inputs and outputs that can be used for lighting control, drape control, guest annunciation inputs, occupancy detection, and 3rd Party switch and panel interfaces. The X10 interfaces with the IRAS using INNCOM's wired S5bus, to provide seamless integration of guestroom controls.

### Features

- Versatile hardware platform
- Software configurable digital inputs
- Software configurable digital outputs
- Software configurable 0-10VDC analog outputs
- 35mm DIN Rail mountable
- Optional in-room wireless network communications



### Specifications

Parameter	Specification
Input Voltage (H2/H3)	12VDC
Current Consumption	Typical 100mA. See the X10 Digital Output section for application specific current consumption.
Digital Inputs (H8)	8 digital Inputs
Digital Outputs (H9)	8 open-collector digital outputs
Analog Outputs (H6)	2 0-10VDC analog outputs
Indicator LED's	Diagnostic LED, Status indication for digital Inputs and digital outputs
Communications	S5bus, optional RS232 adapter
Dimensions	86.2mm L x 78.4mm W x 60mm H
DIN Rail Type	35mm W x 15MM H
Maximum Ambient Temperature	(0°C to 30°C)
Approvals	FCC Part 15B, IC, ICES-003 / EN61000-6-3, EN61000-6-1 immunity

### X10 System Overview

Function	Description
Lighting	Inputs for Dim Set, Dim Down, Dim Up, Dim Toggle, Scene Set, Scene Clear, Scene Toggle. Outputs for 0-10V dimming and relay driven lighting circuits.*
Drape Control	Inputs and outputs for Drape open, Drape close, Drape Stop, Drape Toggle, and Drape Position Set.*
Guest Annunciation	Inputs and Outputs for Door bell, Privacy, Service, Butler Call, Valet Call, Food Tray, Minibar switch, Safe Door Switch, Auxiliary 0, Auxiliary 1.*
Occupancy	Inputs PIR motion sensors, entry door switch, balcony/window switch, common / connected door logic.*

\*X10 can support many more features and functions optimized for complete guestroom control. Contact INNCOM Application Engineering for additional support.

## S5bus and DC Input

The X10 is designed to be powered by GND and +12VDC from pin 1 and 2 of H2 or H3. The X10's nominal current consumption is 100mA. INNCOM recommends the P564 (INNCOM PN: 01-9920) or the INNCOM P576 (INNCOM PN: 214-311) power supply with a 100-240VAC universal input and +12VDC output.

All X10 models are equipped with an on-board S5bus wired communication bus. Designing a reliably operating S5bus circuit depends on several factors such as the quality of cables, cable length, the number of devices, and the general segregation of the guestroom networks. For more information on how to properly design an S5bus network, refer to AN234 "S5-bus Electrical Design Guide".

## X10 Digital Inputs

The X10 digital inputs are versatile and can support several applications within the CBL32 software features set such as lighting, drape, motion sensors, and door switch contact inputs. The inputs can be momentary contact, normally open, normally closed or toggled. All inputs on H8 are 5 volt logic pins. A voltage near 5V is interpreted as logic zero, while a voltage near 0V is considered a logic one. The input pin should never be connected to a voltage source greater than 5V or less than 0V, as damage to the circuit may occur. INNCOM does not recommend sourcing current from an input pin on X10.

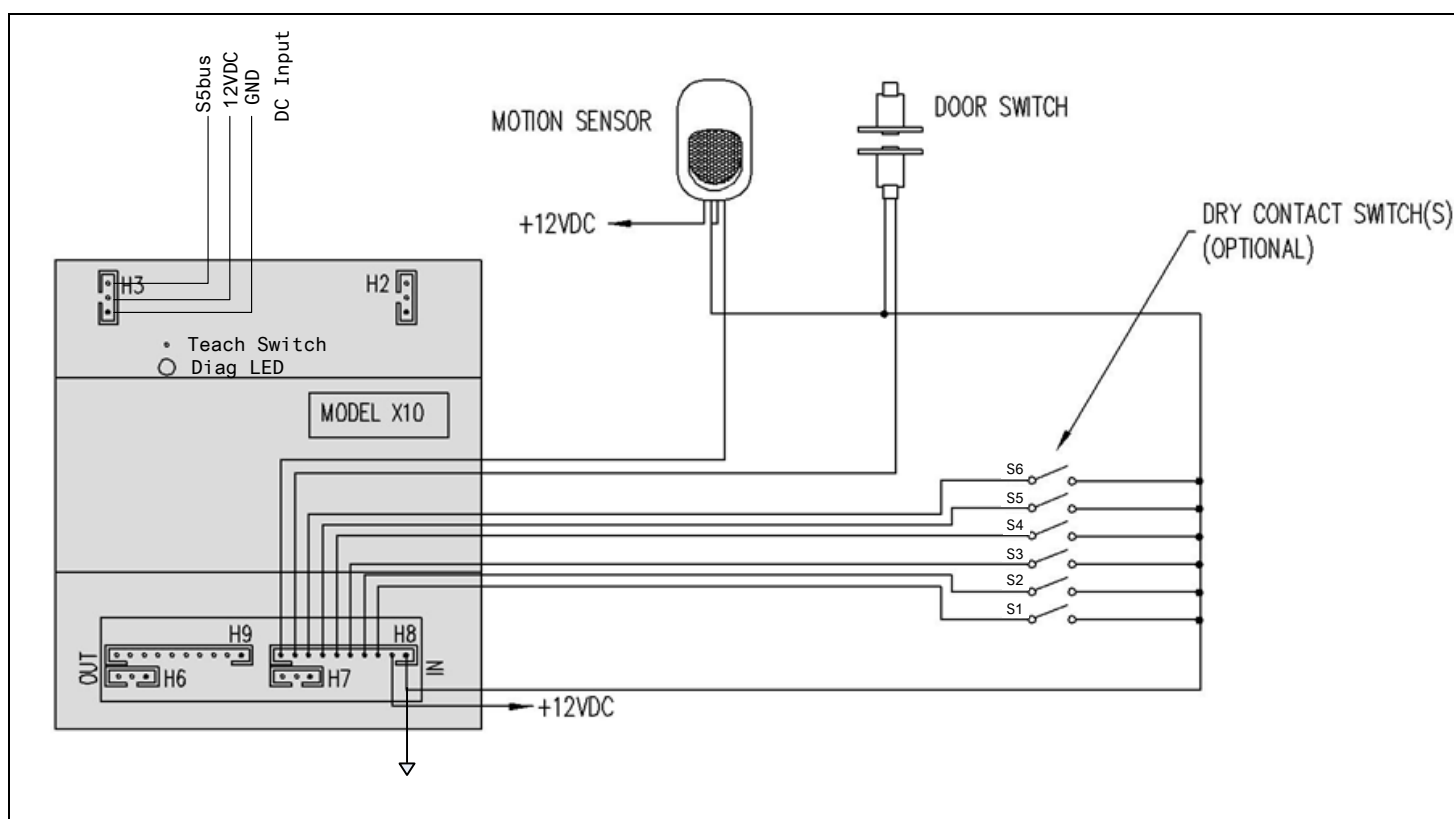


Figure 1 Example of X10 Digital Input Usages

In the diagram above a K594 motion sensor and an S241 door switch are connected to the digital inputs of the X10 to provide the door and motion status for the INNCOM occupancy detection logic. The six other inputs are connected to dry contact switches such as a 3rd party wall module or control panel.

### Running Long Cable Lengths

The X10 is typically installed in a load center or Room Control Unit (RCU) it is expected that the inputs and outputs tied to the unit will have long cable pulls. The X10 inputs are designed with a 10K Ohm pull-up to avoid EMI, RFI, or small changes in impedance from impacting the function or performance of the product. When used with properly shielded CAT 5 cable, one should expect reliable performance of cable pulls up to 10 meters. INNCOM does not recommend using long runs of unshielded cable. This will lead to noisy inputs, false state changes, and degradation of system performance.

## X10 Digital Outputs

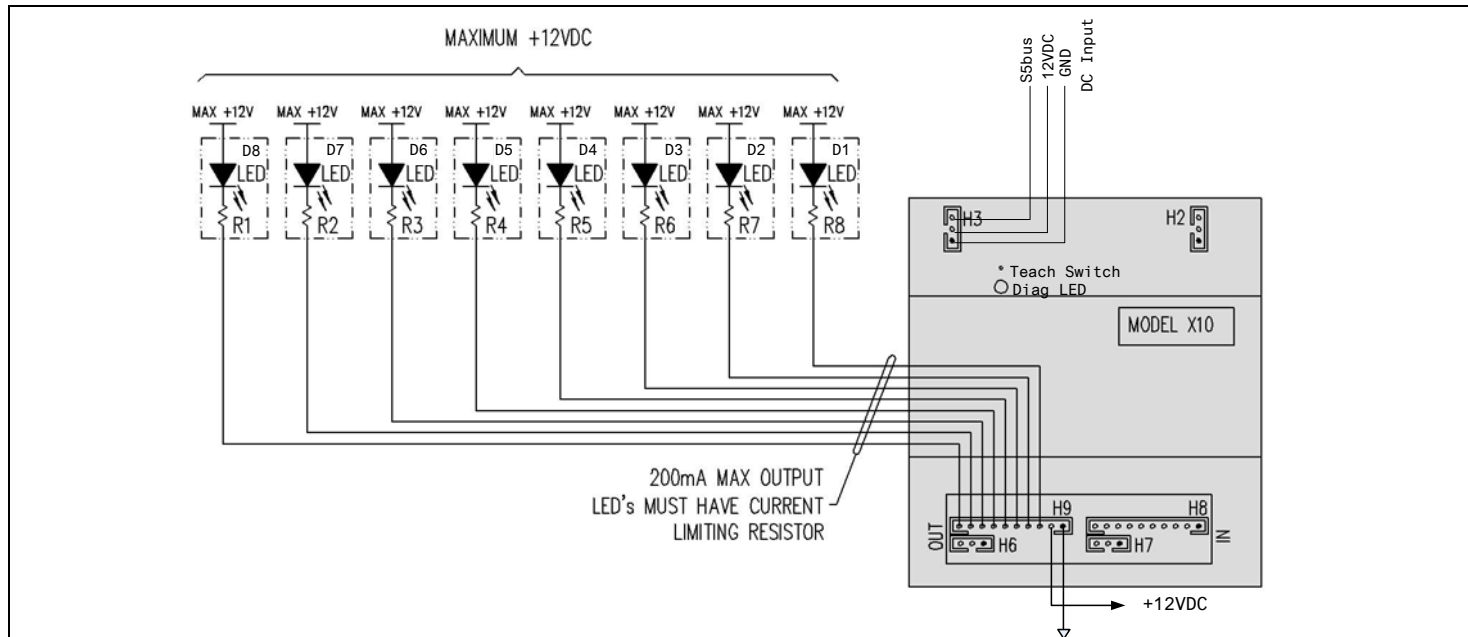


Figure 2X10 Status and Indicator LED Usage

The X10's digital outputs are designed to drive indicator and status LED's on third party devices for Privacy, Service, Butler Call, as well as a variety of other status indication and hotel service notifications. When using the X10 outputs for status or indicator LED's, ensure that the LED is equipped with a current limit resistor appropriate to the source voltage as shown above.

The outputs can also drive relays for drupe controllers and other state change driven devices within the specification noted in this section. INNCOM recommends that devices such as relays and drupe controllers are connected to the X10 outputs draw power from their own power supply, as shown below. Coil current flowing through H9 cannot exceed 100mA per pin, for a total combined current draw on H9 not to exceed 400mA.

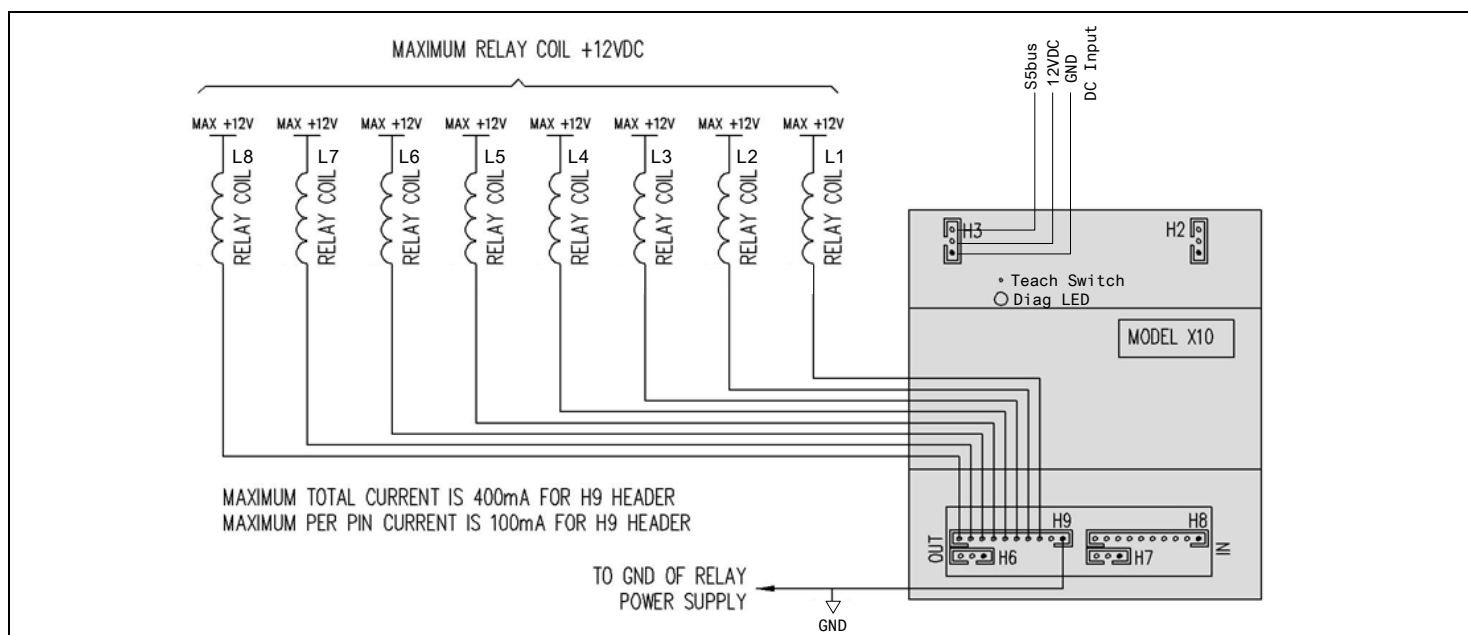


Figure 3 X10 Outboard Relay Usages

## X10 Analog Outputs

The X10 provides two channels of analog 0-10VDC control signals for various peripheral devices on H6. Each channel can sync or source current and drive multiple loads. Typical usage for these outputs is electronically dimming fluorescent or LED lighting ballasts. These outputs are controlled either from 3rd party control panels or 3rd party light switches connected directly to the X10's digital inputs, or from an S5bus device such as a MODEVA System Controller, or an MCM4 with a DS12.

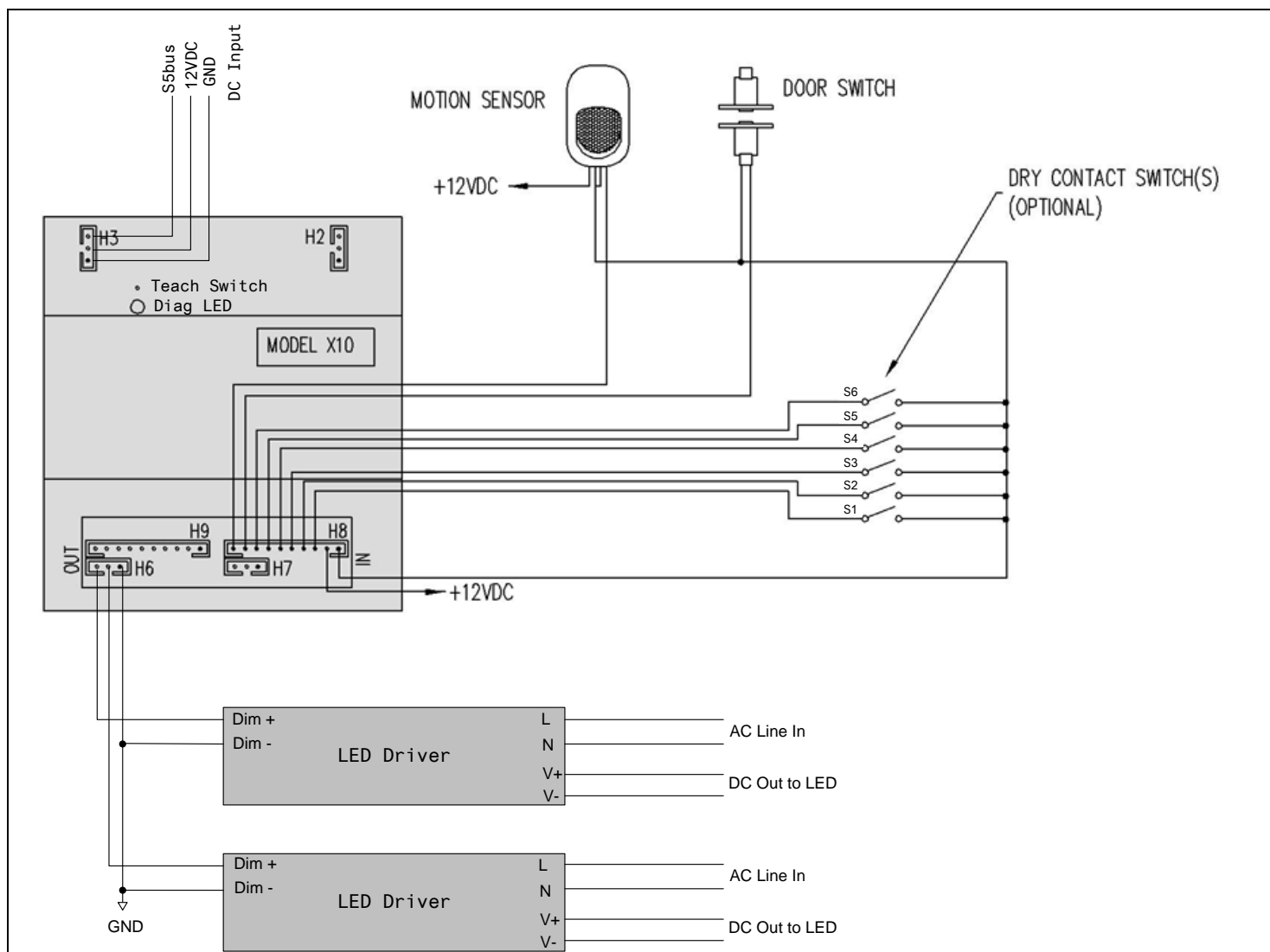


Figure 3 X10 Analog Output for LED Driver Usage

## X10 Address Teach Switch (SW1)

The following address teaches instruction assumes the product installer has a working knowledge of the INNCOM system, or is an INNCOM by Honeywell installer. For more help commissioning the X10, please go to our website at <https://www.inncom.com/en-us/resources/Pages/default.aspx>

Function
<ol style="list-style-type: none"> <li>SW1 is used for teaching the X10 a specific device address or function map.</li> <li>Using the INNCOM thermostat service mode or PC configuration tool, send a "Device Address Teach" or "IOMap Teach" command to X10.</li> <li>Observe the X10 Diag LED change to a Fast Blink Pattern indicating it is ready to accept the new configuration.</li> <li>Press SW1 on the X10 to accept the new configuration.</li> <li>The LED blink will change to a medium speed blink pattern and then the X10 will power cycle and reset.</li> <li>Listen for the thermostat piezo beep or read back information on PC configuration tool confirming the configuration was successfully changed on the X10.</li> </ol>

## X10 Diagnostic LED

Function
<b>Slow Blink Pattern</b> (once per second): Indicates the unit is in standard operation mode, is powered, and running.
<b>Fast Blink Pattern</b> (4x per second): Indicates the X10 is in teach-mode, and is ready to accept a new configuration upon SW1 press.
<b>Medium Speed Blink Pattern</b> : The X10 has accepted the teach-mode command, and will reset.
<b>Solid On Pattern</b> : X10 is in failure mode. The micro processor has latched up, or the firmware is incorrect or not running.
<b>Sold Off Pattern</b> : The X10 is not powered on, or if powered on, the unit has failed.

## X10 Power Outage and Restoration

All INNCOM devices have an onboard non-volatile memory, which is used to store the operating state of the X10 in case of a power outage. With restoration of communications or power, the unit will initiate a brief power-up sequence. After power-up is complete, the unit will return to the last know configuration state.

## X10 Headers

### H2, H3 S5bus In / S5bus Out

Pin	Signal	Function	Color
1	GND	Ground	Brown
2	VEE	12VDC	Red
3	S5bus	Communication bus	Orange

### H4 Optional Radio Module System Interconnect

Pin	Signal	Function
1-24	Various	System interconnects for optional radio or RS232 adapter.

### H5 In Circuit Programming Header – Main Micro

Pin	Signal	Function
1-8	Various	Programming header for programming the main micro. Use 03-0501

### H6 Analog Output

Pin	Signal	Function	Color
1	GND	Ground	Brown
2	Analog Out1	0-10V Output 1	Red
3	Analog Out2	0-10V Output 2	Orange

## H8 Digital Input

Pin	Signal	Function	Color	Indicator LED
1	GND	GND	Brown	-
2	VEE	12VDC	Red	-
3	In1	0-5VDC Dry Contact Input	Orange	D1
4	In2	0-5VDC Dry Contact Input	Yellow	D2
5	In3	0-5VDC Dry Contact Input	Green	D3
6	In4	0-5VDC Dry Contact Input	Blue	D4
7	In5	0-5VDC Dry Contact Input	Purple	D5
8	In6	0-5VDC Dry Contact Input	Grey	D6
9	In7	0-5VDC Dry Contact Input	Black	D7
10	In8	0-5VDC Dry Contact Input	White	D8

## H9 Digital Output

Pin	Signal	Function	Color	Indicator LED
1	GND	GND	Brown	-
2	VEE	12VDC	Red	-
3	Out1	Open-Collector Output	Orange	D9
4	Out2	Open-Collector Output	Yellow	D10
5	Out3	Open-Collector Output	Green	D11
6	Out4	Open-Collector Output	Blue	D12
7	Out5	Open-Collector Output	Purple	D13
8	Out6	Open-Collector Output	Grey	D14
9	Out7	Open-Collector Output	Black	D15
10	Out8	Open-Collector Output	White	D16

## Deep Mesh RF

INNCOM's Deep Mesh technology is a 2.4 GHz wireless RF network that is optimized for the hotel guestroom controls equipment. The X10 can be optionally equipped with a PC-502 (PN: 201-502.2.WH) wireless transceiver connected on the S5bus which allows it to send and receive commands from the guestroom devices on the Deep Mesh network.

## X10 Mounting

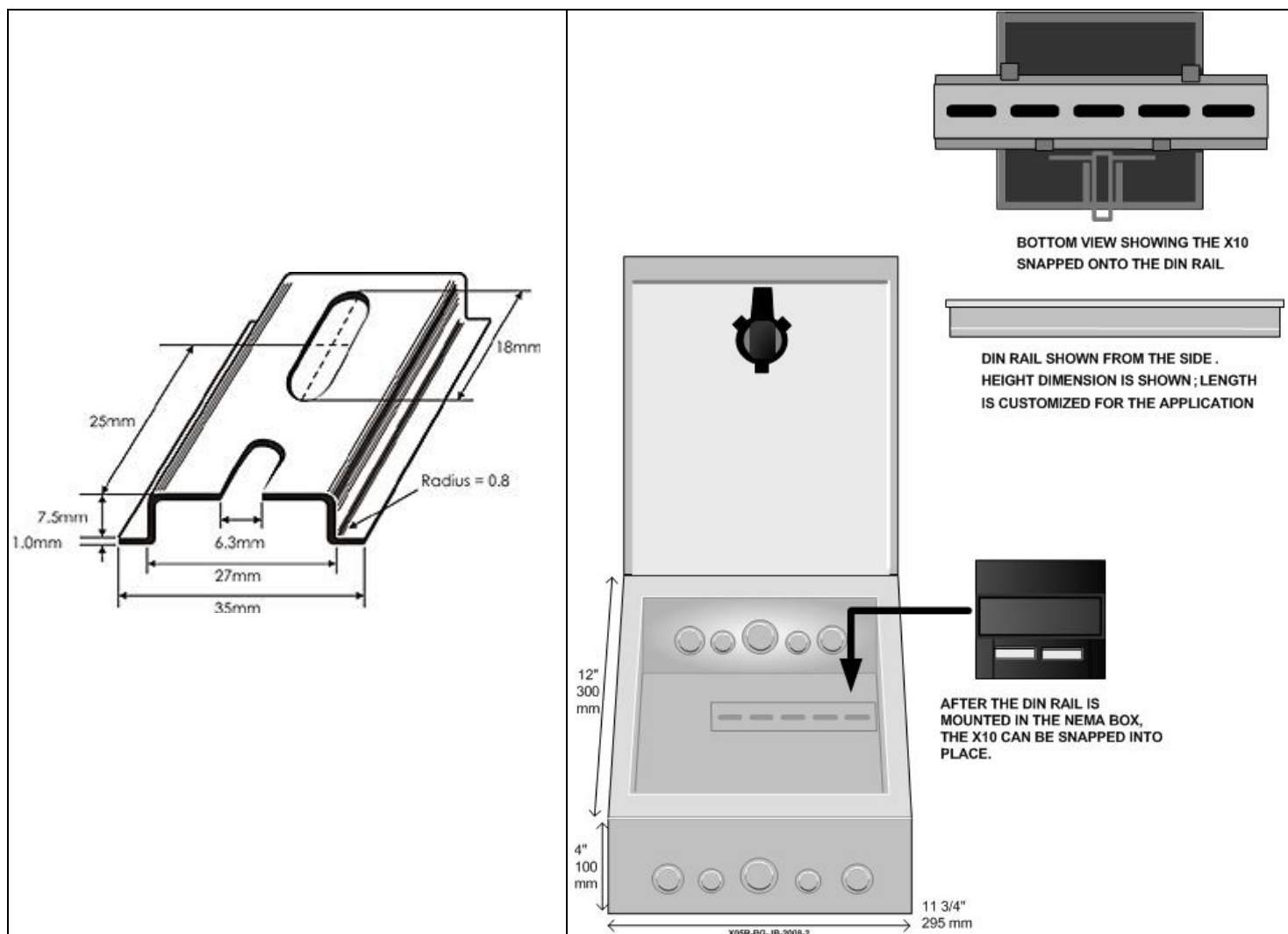


Figure 4 X10 DIN Rail Mounting and Installation

The X10 comes with a DIN rail snap assembly and screw mounts in the bottom housing for multiple installation environments.


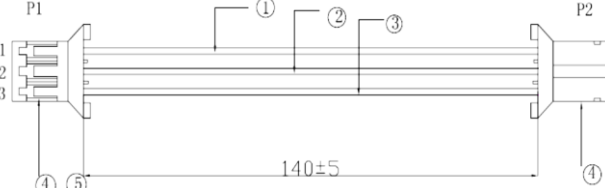
### DIN Rail Mounting

1. Mount the DIN rail (supplied separately) to the intended device (NEMA box, wall mount, etc).
2. On the bottom housing, pull the plastic tab out and mount the X10 on the DIN rail. Release the plastic tab. This locks the X10 the DIN rail mounting assembly.(1)

### Standard Mounting

3. Remove the top cover of the X10 by pressing in the tabs at both ends of the unit to release it.
4. Remove the PCBA by pulling back on the 4 tabs locking the PCBA onto the bottom housing.
5. After PCBA removal, use the 4 counter sunk mount posts in the base housing to screw the device to its intended application.
6. Place the PCBA back onto the bottom housing and confirm it snaps into place.
7. Replace the top housing.

## X10 Harnesses

Part Number	Drawing
262-116 (x 2)	
62-2033 (x 2)	

## X10 Ordering Information

Pin	Signal
01-9593.R0P	X10 ASSEMBLY NO RADIO - PROGRAMMED
01-9593.SRSP	X10 ASSEMBLY SRS MODULE - PROGRAMMED

## X10 Recommended Power Supplies

Pin	Signal
01-9920	P564 Power Supply, 100-240VAC Input, 12VDC 1A output
214-311	P567 (Meanwell DR-30-12) 100-240VAC Input, 12VDC 2A output