NAPCO®
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INSTALLATION INSTRUCTIONS

GEM-X10KIT X-10 INTERFACE KIT

WI781C 6/96

GENERAL DESCRIPTION

The GEM-X10 module is designed to interface X-10® modules to Napco GEM-Series and MA3000 control panels for home-automation applications. X-10 modules receive commands from the panel through existing 110Vac house wiring to turn on (or off) such electrical devices as lamps, appliances, bells, etc. throughout the premises. A "group" comprising several devices may be activated simultaneously if all respective modules are configured with the same X-10 address (i.e., same HOUSE code and UNIT code).

The GEM-X10 board is wired onto the panel's 4-wire bus along with such other accessories as keypads, relay modules and zone-expansion modules. Four HOUSE codes are provided; these are set by Jumpers JP1–JP4, respectively, on the GEM-X10. Each is selectable for one of 16 combinations ("A"–"P") and each comprises 16 UNIT codes, enabling the GEM-X10 to control up to 64 X-10 devices or groups of devices.

Functionally, the GEM-X10 appears to the panel as up to 8 RM3008 relay modules. However, when it receives a relay command from the panel, the GEM-X10 transmits the command, via the power line, to the X-10 module having the respective HOUSE code and UNIT code (see *HOUSE CODE CONFIGURATION*) to turn the device on or off.

PSC04. An X-10 Power-Line Interface (PSC04, supplied) is required to connect the GEM-X10 to the power line (see Wiring Diagram). The PSC04 transmitter interface forwards commands from the GEM-X10 to the X-10 device. It cannot receive data from the device, thus it cannot monitor the device to verify the integrity of the transmission. (Transmissions are vulnerable to corruption due to noise or other transmitting devices.)

SPECIFICATIONS

Voltage: 12V nominal
Current Draw: 30mA
Control Outputs: Active low (< 1V), 25mA (External Relays 1–4 only)
Control Inputs: Active low (< 1V), (devices 5–8 only)

INSTALLATION

The GEM-X10 is self contained and therefore may be located anywhere within the premises. Secure the rear case using 4 screws appropriate to the mounting surface.

WIRING

1. Wire Terminals 1–4 to the control panel's 4-wire bus as shown in the Wiring Diagram. The maximum wiring run is 1000 feet using #22AWG wire.

2. Connect the GEM-X10 to the power-line interface using a 4-wire RJX cable (not supplied). Limit cable length to 50 feet. Plug the power-line interface into a nearby ac outlet.

3. Connect up to 64 configured X-10 devices to remote ac outlets throughout the premises. **Note**: (1) Some X-10 devices may require installation by a qualified electrician. (2) For reasons of economy and safety, control of production equipment, chillers, refrigeration equipment and life-support systems is not recommended.

MODULE ASSIGNMENTS

The GEM-X10 must be able to identify which of the RM3008 Relay Modules it should respond as. This is accomplished by the jumper placement of Jumper Block JP5 (RB NUMBERS, see Wiring Diagram). Install a jumper across each relay board number that is being replaced by the GEM-X10. Any combination of RB1–RB8 may be used.

If using relays in combination with X-10 devices, the RM3008 should be assigned the next higher module number after the GEM-X10. (While the GEM-X10 may be intermixed with RM3008 modules, relays and X-10 devices cannot share a common module number.)

Note: The CONFIG Jumper Block (JP6) is reserved for possible future applications.

PROGRAMMING

In designing the system, the GEM-X10 should be treated as up to 8 RM3008 Relay Modules, each comprising 8 relays. Relays dedicated for X-10 devices should be grouped in "banks" of 8; that is, 1–8; 9–16; 17–24, etc., up to 57–64. Relays may also be in the system, but they may not be assigned to the same relay bank as X-10 devices.

Using Napco's PCD3000 Software, one or more X-10 devices can be programmed for recurring timed outputs (Event Scheduler), or to follow monitored conditions, such as output on alarm (External Relay Control).

- (*Except for the MA3000.*) Program the total number of modules (GEM-X10 + RM3008s) into the panel (*# RELAY BOARDS*).
- Program the panel as if each X-10 device were an external relay. Therefore, program each device (or group of devices configured the same) for *EXTERNAL RELAY.*

® X-10 (USA), Closter, NJ

ENCODING X-10 DEVICES

The mapping of up to 64 external relays to specific X-10 devices is accomplished through the proper selection of 4 HOUSE codes in conjunction with 16 UNIT codes at each device. Refer to *HOUSE CODE CONFIGURATION* and example below.

House codes are employed not only to allow operation of more than 16 devices, but also to prevent interference from other nearby systems on the same electrical circuit. Referring to the House-Code Configuration chart in the Wiring Diagram, up to 16 different combinations can be selected for each house code, however House Code "A", the factory-default setting, is not recommended for use.

Note: If two or more devices are to operate simultaneously, both the House code and the Unit code of each should be set alike.

CONTROL INPUTS

The GEM-X10 includes four active-low inputs that are associated with X-10 devices 5, 6, 7 and 8. These terminals are normally at about 9Vdc. A low (about 1 volt) at any of these terminals will cause the respective X-10 device to turn on.

If any of these inputs are utilized, the related External Relay (5–8) is typically not programmed to activate. However, if the relay *is* programmed, the X-10 device will turn on when either the input is low or the relay activates, and the device will remain on until the input returns high *and* the relay deactivates.

CONTROL OUTPUTS

The GEM-X10 also features four active-low outputs that follow External Relays 1–4, respectively. Remote X-10 devices (or groups) encoded as 1, 2, 3 and 4 will simultaneously be activated if they are in the system. These terminals are normally at 12Vdc. They will go low (about 1 volt) when the respective X-10 device turns on and will remain low until the device turns off.

With no output device connected, a voltmeter placed across a control output terminal and Remote Power (–) (Terminal 2) will read 0 volts. When troubleshooting the output (with no device connected), connect the positive (+) voltmeter lead to Remote Power (+) (Terminal 1) and the negative (–) lead to the output terminal. If the meter reads 0 volts, the terminal is *off*. If it reads approximately 12 volts, the terminal is *on*.

The control output terminals cannot drive devices that require much current. Applications exceeding 25mA will require an external low-current relay (Napco RB1000 or equivalent), which is available as an optional accessory.

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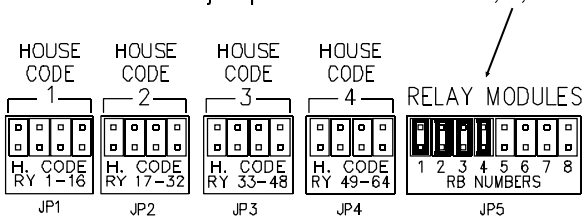
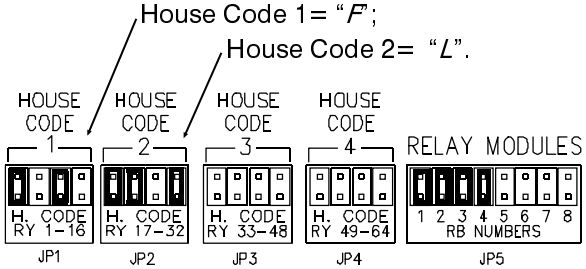
Example. Configure a system for 30 individually-addressed X-10 devices and 10 relays.

Thirty X-10 devices require that the GEM-X10 respond as four relay modules (8 devices on first three modules, 6 on fourth). Ten relays require two RM3008 modules (8 relays on first module; 2 on second).

1. Configure JP5 on GEM-X10 to identify relay module numbers: Install jumpers on RB NUMBERS *1, 2, 3* and *4*.

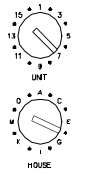


2. Configure RM3008 Relay Modules as numbers *5* and *6* (refer to RM3008 Installation Instructions WI609: *BOARD/MODULE ASSIGNMENT*).
3. Configure House Code #1 (JP1) and House Code #2 (JP2). From the House-Code Configuration Chart (see Wiring Diagram), for this example, we'll select House Code 1= "*F*"; House Code 2= "*L*".

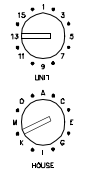


Note: House Code "*A*" is the factory setting and therefore not recommended for use.

4. Set X-10 Modules 1–16 for HOUSE Code 1. Set modules' UNIT Codes for 1–16, respectively (so that each has a unique Unit Code).

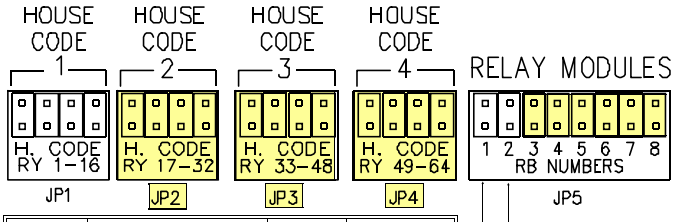


5. Set X-10 Modules 17–30 for HOUSE Code 2. Set modules' UNIT Codes for 1–14, respectively (so that each has a unique UNIT Code).



6. Program panel's External Relays 1–30 as required for the 30 X-10 Modules.
7. Program panel's External Relays 33–43 as required for the 10 relays.
8. Except for MA3000, enter a "*6*" (4+ 2) as the number of modules (# RELAY BOARDS).

HOUSE CODE CONFIGURATION



EXT. RLY.	HOUSE CODE 1 ("B"–"P")[1]	UNIT CODE	JP5 RB#
1	( )	1	1
2	AS ABOVE	2	
3	AS ABOVE	3	
4	AS ABOVE	4	
5	AS ABOVE	5	
6	AS ABOVE	6	
7	AS ABOVE	7	
8	AS ABOVE	8	
9	AS ABOVE	9	2
10	AS ABOVE	10	
11	AS ABOVE	11	
12	AS ABOVE	12	
13	AS ABOVE	13	
14	AS ABOVE	14	
15	AS ABOVE	15	
16	AS ABOVE	16	

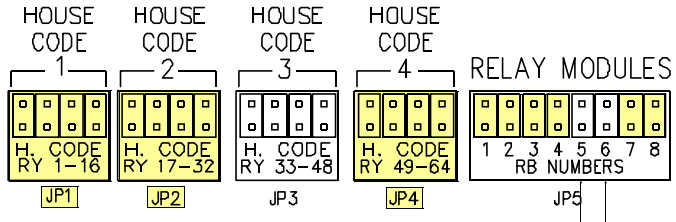
HOUSE CODE 1

[1]Select code "B"–"P" (different from House Codes 2, 3 and 4) using JP1. Code "A" not recommended. See configuration chart on page 4.

EXT. RLY.	HOUSE CODE 2 ("B"–"P")[2]	UNIT CODE	JP5 RB#
17	( )	1	3
18	AS ABOVE	2	
19	AS ABOVE	3	
20	AS ABOVE	4	
21	AS ABOVE	5	
22	AS ABOVE	6	
23	AS ABOVE	7	
24	AS ABOVE	8	
25	AS ABOVE	9	4
26	AS ABOVE	10	
27	AS ABOVE	11	
28	AS ABOVE	12	
29	AS ABOVE	13	
30	AS ABOVE	14	
31	AS ABOVE	15	
32	AS ABOVE	16	

HOUSE CODE 2

[2]Select code "B"–"P" (different from House Codes 1, 3 and 4) using JP2. Code "A" not recommended. See configuration chart on page 4.



EXT. RLY.	HOUSE CODE 3 ("B"–"P")[3]	UNIT CODE	JP5 RB#
33	( )	1	5
34	AS ABOVE	2	
35	AS ABOVE	3	
36	AS ABOVE	4	
37	AS ABOVE	5	
38	AS ABOVE	6	
39	AS ABOVE	7	
40	AS ABOVE	8	
41	AS ABOVE	9	6
42	AS ABOVE	10	
43	AS ABOVE	11	
44	AS ABOVE	12	
45	AS ABOVE	13	
46	AS ABOVE	14	
47	AS ABOVE	15	
48	AS ABOVE	16	

HOUSE CODE 3

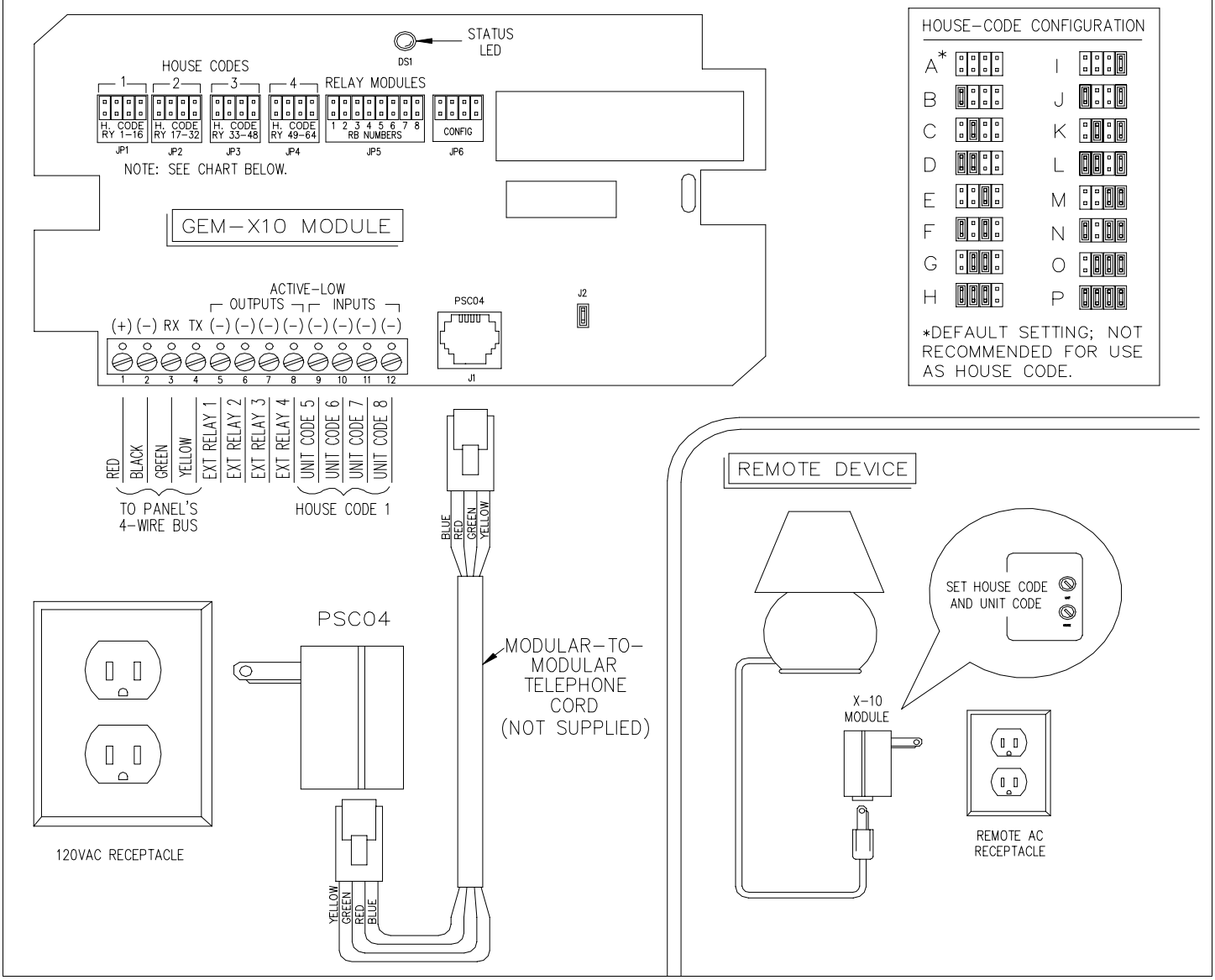
[3]Select code "B"–"P" (different from House Codes 1, 2 and 4) using JP3. Code "A" not recommended. See configuration chart on page 4.

EXT. RLY.	HOUSE CODE 4 ("B"–"P")[4]	UNIT CODE	JP5 RB#
49	( )	1	7
50	AS ABOVE	2	
51	AS ABOVE	3	
52	AS ABOVE	4	
53	AS ABOVE	5	
54	AS ABOVE	6	
55	AS ABOVE	7	
56	AS ABOVE	8	
57	AS ABOVE	9	8
58	AS ABOVE	10	
59	AS ABOVE	11	
60	AS ABOVE	12	
61	AS ABOVE	13	
62	AS ABOVE	14	
63	AS ABOVE	15	
64	AS ABOVE	16	

HOUSE CODE 4

[4]Select code "B"–"P" (different from House Codes 1, 2 and 3) using JP4. Code "A" not recommended. See configuration chart on page 4.

GEM-X10 WIRING DIAGRAM



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NAPCO RECOMMENDS THAT THE ENTIRE SYSTEM BE COMPLETELY TESTED WEEKLY.

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