

"HOMECONTROL" AUTOMATION KIT

MKHOME1 rev. 2

GENERAL DESCRIPTION

The purpose of automation is to help make our lives easier and less complex by performing some of the more repetitive tasks that we do day-in and day-out. Naturally each task must be examined for its value and a determination made as to when or under what conditions one would want to automate the task.

HomeControl (MKHOME1) was developed as an easy to install automation controller kit communicating with the data bus of a Caddx "NX" Security Control. The equipment included with HomeControl is factory pre-programmed so that it works out of the box. The factory pre-programming focuses on the interaction of the security system operation to automate tasks associated with its operation. Existing security sensors along with the control's arming status are utilized to trigger true automation operations such as setback of heating, cooling, and lighting subsystems when the building is not occupied, voice announcement of key events, plus the added safety and security deterrent that automatic lighting can provide during the crucial moments of exiting and entry.

The HomeControl Kit includes a Magic Module Controller (MM443), 400 Channel Recordable Voice Annunciator (MV480), Caddx Link Interface (ML8), Two-Way X-10 Transceiver (PSC05) with cord, and ECHO Speaker (ELK-73). By connecting this to a Caddx NX8, NX6, or NX4 Security Control and some X-10 modules, it's possible to have a powerful lighting control and voice messaging automation system up and running in less than one hour. Energy savings are but a short step away with the addition of an electric Water Heater controller such as the ELK-9100, or an HVAC Setback Thermostat such as the ELK-MTHT communicating thermostat. Many of the automation functions are controlled by time and day utilizing the clock/calendar from the NX Security Control.

The Magic Module board communicates with the NX Security Control via the Link Interface. There are 16 event conditions from the control which are monitored by the Magic Module. These events are assigned to perform one or more of the following: 1) Transmit X-10 commands, 2) Activate one of 6 scene macros, 3) Activate 1 of 4 onboard relays, 4) Announce a message from any of the 400 recordable channels.

Although the kit is pre-programmed and ready to install, changes can be made with "push-button" ease from a Windows 95/98 PC using our new "Application Writer" software included in the ELK-MK485 Programming Kit (sold separately).

INSTALLATION

1. Mount the Link Interface Card in the NX cabinet and connect it to the keypad input (3 wires: Red, Green, and Black). See Figure 1 Hookup Diagram. This will centrally power all HomeControl components from the NX Control. If you prefer (or need) to power HomeControl from another source, leave off the Red +V wire from the keypad input to the ML8 and connect another DC power source to the +12V and Neg terminals of the Magic Module. Magic Module also has a power receptacle **J3** which accepts a plug-in 12Vdc (center pin positive) power supply such as the ELK-P1216 (sold separately).
2. Mount the Magic Module & Voice Annunciator and connect them to the ML8 using four (4) wires (Red, Green, White, and Black).
3. Mount the ECHO Speaker near the entry/exit keypad and connect it to the Voice Annunciator speaker terminals using two (2) wires.
4. Connect the four (4) wire modular telephone cord from the Magic Module J5 to the X-10 Transceiver Module (PSC05).

NOTE: You need 1 or more X-10 or Leviton brand powerline modules (Lamp or Appliance type) in order to utilize the lighting/energy savings modes programmed in HomeControl.

Congratulations, your HomeControl automation kit is now ready for test and demonstration.

PO Box 100 • Hildebran, NC 28637 USA • 828-397-4200 Voice • 828-397-4415 Fax
<http://www.elkproducts.com> • email: info@elkproducts.com

ELK
PRODUCTS, INC.

OPERATION OVERVIEW

To understand the automation processes of HomeControl it is necessary to know the parameters and conditions it uses to "Cause" each action, along with the "Effects" of each action. The following text and diagrams explain HomeControl in detail.

FACTORY PRE-PROGRAMMED PARAMETERS

CADDX EVENTS

HomeControl is programmed to monitor the following sixteen (16) events (conditions) from the NX Control. When an event first occurs it is said to be "activated". When that event resets it is said to be "deactivated."

Activated		Deactivated		Activated		Deactivated	
1.	Armed		Disarmed	9.	Zone 1 Fault		Zone 1 Restored
2.	Armed (Home Mode)		Away Mode	10.	Zone 2 Fault		Zone 2 Restored
3.	Chime Mode On		Chime Mode Off	11.	Zone 3 Fault		Zone 3 Restored
4.	Entry Delay Active		Expired	12.	Zone 4 Fault		Zone 4 Restored
5.	Exit Delay Warning		End	13.	Zone 5 Fault		Zone 5 Restored
6.	Alarm Active		Silenced	14.	Zone 6 Fault		Zone 6 Restored
7.	AC Failure		Restored	15.	Zone 7 Fault		Zone 7 Restored
8.	Error Beep (3 beep)		End	16.	Zone 8 Fault		Zone 8 Restored

HARDWARE INPUTS

The four (4) hardwire inputs on the Magic Module are not assigned in the factory default programming.

RELAY OUTPUTS

The four (4) dry contact relay outputs on the Magic Module are assigned for use as:

- 1 Control of a high voltage electrically actuated water heater contactor. (Not needed if using an X-10 water heater module)
- 2 Control of an HVAC setback thermostat.
- 3 [available]
- 4 Optional control of the speaker(s) wires to the Voice Annunciator for selective muting of voice messages.

LINE CARRIER (X-10) TRANSMISSIONS

X-10 House and Unit codes are pre-assigned to correspond to areas of a typical home. These are transmitted in response to the activated/deactivated events described above. For example: HomeControl transmits a C1 ON during arming or entry delay activation. If you want lights to be turned on, connect them to X-10 modules programmed to C1.

House Unit			House Unit		
Code	Code	Assignment	Code	Code	Assignment
C	1	Main Entry Light	C	9	Nightlight(s)
C	2	Hall Light(s)	C	10	Bathroom Light(s)
C	3	Living Room Light(s)	C	11	Other (User Defined) Light(s)
C	4	Dining Room Light(s)	C	12	Other (User Defined) Light(s)
C	5	Family Room Light(s)	C	13	Walkway Light(s)
C	6	Kitchen Light(s)	C	14	Porch Light(s)
C	7	Master Bedroom Light(s)	C	15	Flood Light(s)
C	8	Bedroom 2 Light(s)	C	16	Heavy Duty Module for Electric Water Heater

TABLE 1 FACTORY RECORDED VOCABULARY

1 One	81 Condition	158 Indicator	235 Pound	312 Warning	318 What	
2 Two	82 Connect	159 Input	236 Power	313 Water	319 When	324 Yard
3 Three	83 Container	160 Inside	237 Press	314 Way	320 Where	
4 Four	84 Control	161 Interior	238 Program	315 Wednesday	321 Will	325 Zero
5 Five	85 Cool	162 Intruder	239 Programming	316 Welcome	322 Window	326 Zone
6 Six	86 Curtain	163 Intrusion	240 Protected	317 West	323 With	
7 Seven		164 Is	241 Pump			
8 Eight	87 Data					
9 Nine	88 Day	165 Keep	242 Ready	327 AC Power Loss, Check Transformer and Power Circuit		
10 Ten	89 Defective	166 Key	243 Record	328 " "		
11 Eleven	90 Degrees	167 Keypad	244 Relay	329 " "		
12 Twelve	91 Delay	168 Kitchen	245 Repeat	330 Enter Code to Disarm		
13 Thirteen	92 Delivery		246 Report	331 " "		
14 Fourteen	93 Denied	169 Lamp	247 Reporting	332 Enter Code		
15 Fifteen	94 Department	170 Laundry	248 Reserved	333 Enter Function Number		
16 Sixteen	95 Detector	171 Leak	249 Reset	334 " "		
17 Seventeen	96 Device	172 Leave	250 Return	335 Exit Expires In Ten Seconds		
18 Eighteen	97 Dial	173 Less	251 Room	336 " "		
19 Nineteen	98 Digits	174 Level	252 Running	337 Exit Immediately		
20 Twenty	99 Dim	175 Light		338 " "		
21 Thirty	100 Dining Room	176 Line	253 S (plural)	339 Not Secure		
22 Forty	101 Door	177 Living Room	254 Saturday	340 Record Message After The Beep		
23 Fifty	102 Down	178 Load	255 Second	341 " "		
24 Sixty	103 Drive	179 Location	256 Secure	342 System is Armed		
25 Seventy		180 Locked	257 Security	343 " "		
26 Eighty	104 East	181 Log	258 Select	344 System is Disarmed		
27 Ninety	105 Emergency	182 Low	259 Sensor	345 " "		
28 Hundred	106 Empty		260 Sent	346 Then Call The Monitoring Station		
29 Thousand	107 Enabled	183 Machine	261 Service	347 " "		
30 200ms silence	108 End	184 Macro	262 Set	348 A C Power Loss / h		
31 800hz Tone	109 Energy	185 Mail	263 Setting	349 " "		
	110 Enter	186 Main	264 Shunted	350 " "		
32 A	111 Entry	187 Malfunction	265 Side	351 Access Denied / h		
33 Access	112 Equals	188 Manual	266 Sign	352 " "		
34 Account	113 Erase	189 Master	267 Silence	353 Access Granted /h		
35 Activate	114 Error	190 Medical	268 Sliding	354 " "		
36 Activated	115 Evacuate	191 Memory	269 Smoke	355 Activated / h		
37 Activation	116 Event	192 Menu	270 Someone	356 Alarm, Unauthorized Access /h		
38 Active	117 Exhaust	193 Message	271 South	357 " "		
39 Address	118 Exit	194 Minus	272 Stairs	358 Alarm / h		
40 Adjust	119 Exterior	195 Minute	273 Stairway	359 Bedroom 2 / h		
41 Air		196 Missing	274 Star	360 DiningRoom / h		
42 Alarm	120 Fahrenheit	197 Mode	275 Start	361 Enter Code to Disarm / h		
43 All	121 Fail	198 Module	276 Status	362 " "		
44 A M	122 Failure	199 Monday	277 Stay	363 Exit Expires in 10 seconds / h		
45 An	123 Family Room	200 More	278 Stop	364 " "		
46 And	124 Fan	201 Motion	279 Storage	365 Exit Immediately / h		
47 Answer	125 Feed	202 Motor	280 Summary	366 " "		
48 Any	126 Feet		281 Sunday	367 Family Room / h		
49 Appliance	127 Fire	203 Negative	282 Switch	368 Hallway / h		
50 Are	128 Followed	204 Next	283 System	369 Kitchen / h		
51 Area	129 Friday	205 Night		370 Living Room / h		
52 Arm	130 Front	206 Normal	284 Tank	371 Main Entry / h		
53 At	131 Full	207 North	285 Telephone	372 Master Bedroom / h		
54 Authorities	132 Function	208 Not	286 Temperature	373 Not Secure / h		
55 Authorized	133 Furnace	209 Notified	287 Temporarily	374 Please Close the Door /h		
56 Automatic	134 Fuse	210 Number	288 Test	375 " "		
57 Auxiliary			289 Thank You	376 System is Armed / h		
58 Away	135 Garage	211 Of	290 That	377 " "		
	136 Gas	212 Off	291 The	378 Then Call The Monitoring Station / h		
59 Back	137 Gate	213 Office	292 Thee	379 " "		
60 Bad	138 Glass	214 O K	293 Thermostat	380 Window / h		
61 Basement	139 Go	215 On	294 Thursday	381 At 5 5 5 - 1 2 3 4 / h		
62 Battery	140 Good	216 Online	295 Time	382 " "		
63 Bedroom	141 Greeting	217 Only	296 Toggle	383 " "		
64 Been		218 Open	297 Transformer	384		
65 Break	142 Hallway	219 Or	298 Trouble	385		
66 Bright	143 Hangup	220 Output	299 Tuesday	386		
67 Building	144 Has	221 Outside	300 Tum	387		
68 By	145 Have	222 Oven	301 Twice	388		
	146 Heat			389		
69 Call	147 Help	223 Parking	302 Undefined	390		
70 Cancel	148 High	224 Partition	303 Unit	391		
71 Carbon Monoxide	149 Home	225 Patio	304 Unlocked	392		
72 Card	150 Hot	226 Percent	305 Up	393		
73 Change	151 Hour	227 Personnel	306 Utility	394		
74 Check	152 House	228 Play		395		
75 Chime	153 Humidity	229 Please	307 Valve	396		
76 Circuit		230 Plus	308 Violated	397		
77 Clear	154 If	231 P M	309 Visitor	398		
78 Closed	155 Immediately	232 Police	310 Volts	399		
79 Code	156 In	233 Pool		400		
80 Cold	157 Inches	234 Porch	311 Warehouse			

Phrases

Locations 384 - 400 were intentionally left blank so that custom words, phrases, greetings, etc. may be recorded.

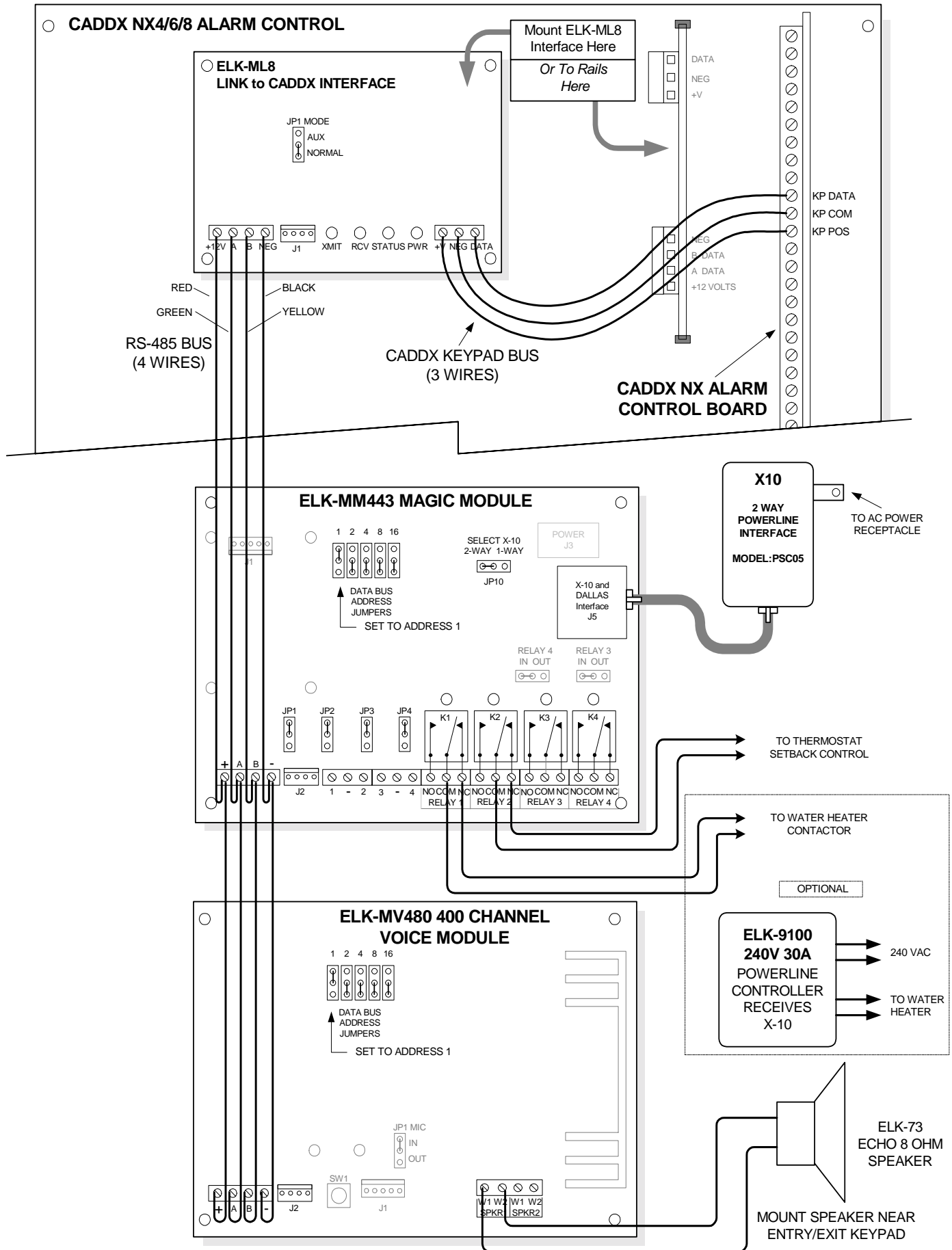


Figure 1: HomeControl Hookup Diagram

"HomeControl" (MKHOME1 rev. 2) Programming for Event Cause and Effects

Events received from NX8 Security Control	NX8 Zone No.	Name assigned to Zone	Powerline Carrier (X-10) Code Transmissions (House and Unit Code)	Relay1 Water Heater	Relay2 HVAC Setback	Relay 3	Relay 4	Scene	Voice Message when event occurs	Voice Message when arming with a zone fault	Voice Message during an alarm	Voice Message at disarm after alarm
Common & Normally Closed contacts												
Armed Away	n/a	n/a	C1 Timed ON for 30 seconds - C16 (Water Heater) Off	Open	Open	-	-	3	System is armed - exit immediately	-	-	-
Disarmed	n/a	n/a	C16 (Water Heater) On	Closed	Closed	-	-	5	-	-	-	-
Armed Home	n/a	n/a	C16 (Water Heater) On	Closed	Closed	-	Open	5	-	-	-	-
Armed Away	n/a	n/a	C16 (Water Heater) Off	Open	Open	-	Closed	-	-	-	-	-
Chime Mode On	n/a	n/a	-	-	-	-	Open	-	-	-	-	-
Off	n/a	n/a	-	-	-	-	Closed	-	-	-	-	-
Entry Delay Active	n/a	n/a	C1 Timed ON for 30 seconds	-	-	-	-	-	System is armed - Enter code to disarm	-	-	-
Expired	n/a	n/a	-	-	-	-	-	-	-	-	-	-
Exit Delay Warning	n/a	n/a	-	-	-	-	-	-	Exit expires in 10 seconds	-	-	-
Expired	n/a	n/a	-	-	-	-	-	-	-	-	-	-
Alarm Active	n/a	n/a	C all lights ON, all lights OFF at approximately 2 sec. rate	-	-	-	Closed	-	Alarm activated - Enter code to disarm	-	-	-
Disarmed	n/a	n/a	-	-	-	-	-	-	-	-	-	-
AC Failure	n/a	n/a	-	-	-	-	-	-	AC power Loss - check transformer and power circuit	-	-	-
Restored	n/a	n/a	-	-	-	-	-	-	-	-	-	-
Error Beep (see note 1 below)			-	-	-	-	-	-	-	-	-	-
Zone 1 Faulted	1	Main Entry	C1 Timed ON for 30 seconds	-	-	-	-	-	-	Main Entry not secure	Alarm - Main Entry	Alarm activated - Main Entry
Restored			-	-	-	-	-	-	-	-	-	-
Zone 2 Faulted	2	Hallway	C2 Timed ON for 30 seconds	-	-	-	-	-	-	Hallway not secure	Alarm - Hallway	Alarm activated - Hallway
Restored			-	-	-	-	-	-	-	-	-	-
Zone 3 Faulted	3	Living Room	C3 Timed ON for 30 seconds	-	-	-	-	-	-	Living Room Window not secure	Alarm - Living Room	Alarm activated - Living Room
Restored			-	-	-	-	-	-	-	-	-	-
Zone 4 Faulted	4	Dining Room	C4 Timed ON for 30 seconds	-	-	-	-	-	-	Dining Room not secure	Alarm - Dining Room	Alarm activated - Dining Room
Restored			-	-	-	-	-	-	-	-	-	-
Zone 5 Faulted	5	Family Room	C5 Timed ON for 30 seconds	-	-	-	-	-	-	Family Room not secure	Alarm - Family Room	Alarm activated - Family Room
Restored			-	-	-	-	-	-	-	-	-	-
Zone 6 Faulted	6	Kitchen	C6 Timed ON for 30 seconds	-	-	-	-	-	-	Kitchen not secure	Alarm - Kitchen	Alarm activated - Kitchen
Restored			-	-	-	-	-	-	-	-	-	-
Zone 7 Faulted	7	Master Bedroom	C7 Timed ON for 30 seconds	-	-	-	-	-	-	Master Bedroom not secure	Alarm - Master Bedroom	Alarm activated - Master Bedroom
Restored			-	-	-	-	-	-	-	-	-	-
Zone 8 Faulted	8	Bedroom 2	C8 Timed ON for 30 seconds	-	-	-	-	-	-	Bedroom 2 not secure	Alarm - Bedroom Two	Alarm activated - Bedroom Two
Restored			-	-	-	-	-	-	-	-	-	-

Note1: The purpose of the error beep event is to instruct Magic Module to scan the zones for possible faults.

[011501]

"HomeControl" (MKHOME1 rev. 2) Programming for Scenes

Scenes are like macros. Multiple X10 Devices, Magic Module Relays, and Magic Voice Messages may be triggered by simply activating any one of the 6 scenes. A scene may be activated at a specific time and day of the week via 2 different schedules (A or B), by any of the 16 NX received events, or by any of the 4 Magic Module inputs. It is important to understand that scenes are one-way (activate only) actions. Scenes can be activated, but they cannot be turned on or off. Therefore, a second scene is required to reverse or change the state of a light or group of lights controlled by a previous scene. For example: at 5:30am Mon-Fri the pre-dawn scene (1) will be activated and the Mstr Bdrm light (C7) will be turned on. This light will be turned off by the Day/Away scene when the alarm system is armed. By the same token, this light or a group of lights may also be controlled by an NX event, a Magic Module input, or by another X-10 controller.

		Powerline Carrier (X-10) Signal Transmissions HOUSE CODE=C																			
No.	Name	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11	C12	C13	C14	C15	C16	Relay1	Relay2	Relay3	Relay4
		Main Entry Light	Hall Lights	Living Room Lights	Dining Room Lights	Family Room Lights	Kitchn Lights	Mstr Bdrm Lights	Bdrm 2 Lights	Night Light	Bathrm Lights	Other Lights	Other Lights	Walk Way Lights	Porch Lights	Flood Lights	X10 Water Heater	Water Heater	HVAC		
																		Common & N/C contacts			
1	Pre-Dawn	-	-	-	-	-	-	ON	-	-	ON	ON	OFF	-	-	-	ON	Closed	Closed		
2	Dawn	-	-	-	ON	-	ON	-	-	OFF	-	OFF	ON	-	ON	-	-				
3	Day/Away	-	-	-	OFF	-	OFF	OFF	-	-	OFF	OFF	OFF	-	OFF	-	OFF	Open	Open		
4	Dusk	ON	-	-	-	ON	ON	-	-	ON	-	ON	OFF	ON	ON	ON	-				
5	Home	-	ON	ON	-	ON	ON	-	-	-	-	OFF	ON	-	-	-	ON	Closed	Closed		
6	Bedtime	OFF	OFF	OFF	OFF	OFF	OFF	OFF	OFF	-	OFF	OFF	OFF	OFF	OFF	OFF	OFF	Open	Open		

Note: Water heater may be controlled either by an X10 powerline type device ie: ELK-9100 or by an electrical isolation contactor triggered from Relay 1.

	SCENE	Schedule A Scene Activation by Time of Day								Schedule B Scene Activation by Time of Day							
		Sun	Mon	Tue	Wed	Thu	Fri	Sat	Time 24hr	Sun	Mon	Tue	Wed	Thu	Fri	Sat	Time 24hr
1	Pre-Dawn	-	Yes	Yes	Yes	Yes	Yes	-	5:30a	Yes	-	-	-	-	-	Yes	6:30a
2	Dawn	-	Yes	Yes	Yes	Yes	Yes	-	7:00a	Yes	-	-	-	-	-	Yes	8:00a
3	Day/Away	-	Yes	Yes	Yes	Yes	Yes	-	9:00a	-	-	-	-	-	-	-	-
4	Dusk	Yes	Yes	Yes	Yes	Yes	Yes	Yes	17:30p		-	-	-	-	-	-	5:30p
5	Home	-	-	-	-	-	-	-	-		-	-	-	-	-	-	-
6	Bedtime	-	Yes	Yes	Yes	Yes	Yes	-	23:00p	Yes	-	-	-	-	-	Yes	00:30a

Note: The purpose of Schedules A & B are to allow each scene to be activated at different times on different days.

[011501]