ELK-M1XZW

Z-Wave™ Lighting Interface

INSTALLATION MANUAL

Z-Wave is a trademark of Zensys, Inc.

IMPORTANT INFORMATION

The ELK-M1XZW incorporates a Z-Wave factory produced transceiver module and currently supports lighting and thermostat device categories ONLY. The current generation of Z-Wave devices do not broadcast or update state changes back to any controller device other than the one that commanded the change. The results are that the M1 may not always accurately display the true state of the Z-Wave lighting devices. In addition, a M1 rule 'event' cannot be activated by the state change of a Z-Wave light other than lights changed by a command from the M1 itself. In other words; The ELK-M1XZW and the M1 Control do not know if the state of a device has been changed by another controller such as a handheld remote. Likewise, another controller or a handheld remote will not know if the device state has been changed by the M1 and M1XZW. This is a Z-Wave issue and it is hoped that Z-Wave will remedy this in the future.

ELK
PRODUCTS, INC.

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APPLICATION:

The **ELK-M1XZW** is a Z-Wave manufactured radio transceiver attached to an Elk Data Bus Interface. It is designed to allow an M1 Controller to interface with Z-Wave enabled devices. Z-Wave technology is a wireless bi-directional communications network consisting of devices such as: Plug-in Dimmer Modules, Wall Mount Switches and Dimmers, Plug-in Appliance Modules, etc. The M1XZW interface functions as a Z-Wave Secondary Controller OR as a Z-Wave Static Update Controller (SUC) for holding the Z-Wave system setup programming. The interface connects to the M1 RS-485 data bus and is enrolled and identified as a Type 5 Expander. As such, it may be remotely located anywhere along the RS-485 data bus within the maximum stated distance limits. The housing is designed for wall mounting and includes mounting screws and anch*ors*. *Z-Wave is a trademark of Zensys, Inc.*

FEATURES:

• Flash Memory for Firmware Updating
• Connects to the M1 Data Bus - RS-485
• LED Indicators for Status and Programming
• Push Button "Copy" Program Switch
• For Indoor Use Only

SPECIFICATIONS:

• Z-Wave Transceiver Frequency: 908.42 MHz
• Z-Wave Transceiver Range: Max. line of sight to nearest Z-Wave enabled product is 50 to 100 feet, based on no obstacles or interference.
• Operating Voltage: 12 Volts D.C.
• Operating Temperature Range: 32-105 degrees F (0 - 40 degrees C)
• Current Draw: approx. 60 mA
• Housing Dimensions: 4.25" x 6.375" x 2.125"
• Circuit Board Dimensions: 2.25" x 3.95"

FCC NOTICE

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instructions may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:
- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

ELK Products, Inc.
Model: M1XZW
FCC: TMA-GC263043
This device complies with Part 15 of the FCC Rules.
Operation is subject to the following two conditions:
(1) This device may not cause harmful interference, and
(2) this device must accept any interference received, including interference that may cause undesired operation.

Installation and Hookup of M1XZW

INSTALL UNIT * SET ADDRESS AND OPTION JUMPERS * ACTIVATE BUS ENROLLMENT PROCESS

The M1XZW is a Type 5 Expander device which may be remotely located anywhere along the RS-485 data bus within the maximum stated distance limits. The housing is designed for wall mounting and includes mounting screws and anchors.

DO NOT PRESS this button. For factory use only.

Address Switches →

STATUS LED
Blinking = Data Bus Communications OK
Off = No Communications on Data Bus

Program "Copy" Switch
Press & Hold until Set-Up LED comes on

SET-UP (PROGRAM) LED
ON = Z-Wave Ready to copy "receive" data from a Primary Controller
OFF = Normal Operation

XMIT (Transmit) LED
Blinks = When a Z-Wave Signal being transmitted
This LED not on older boards

JP1 RS-485 Data Bus Terminating Resistor Jumper

RS-485 Data Bus Connections
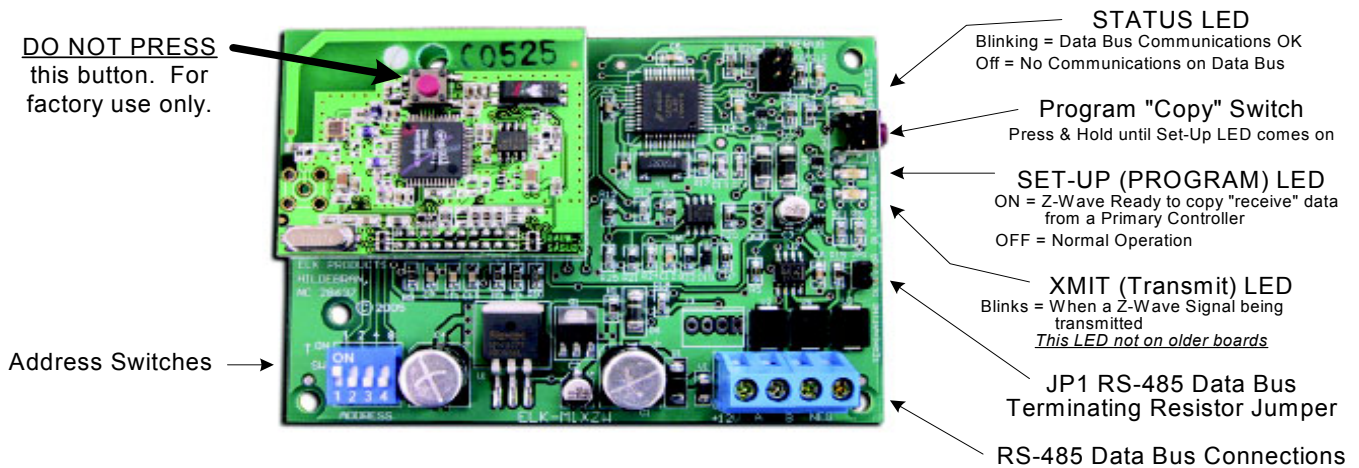
1. **Turn Off the Control Panel power** before making any connections.

2. **Wiring:** Make all wiring connections as follows:
   "+12V" connects to the "+VKP" 12 Volt data bus terminal on the Control
   "A" connects to the "Data A" data bus terminal on the Control
   "B" connects to the "Data B" data bus terminal on the Control
   "Neg" connects to the "NEG" negative data bus terminal on the Control

   NOTE: Refer to the Control Installation Manual about proper connections of data bus devices and EOL termination. If you are terminating the data bus at the M1XZW module, install the black jumper onto "JP1".

3. **Addressing:** Address switches are binary coded and must be set for a value of from 1 to 7 as shown in Table 1. Each switch has a position OFF or ON (binary value 0 or 1) and a decimal value of (1, 2, 4, or 8). The total decimal value for the "ON" switches equals the data bus address. The M1XZW is a Type 5 expander like the M1XSP. Each Type 5 Expander on the same RS-485 data bus must have a unique address. Therefore, the M1XZW must be set to an address that doesn't conflict with any other Type 5 expander(s). Sequential addresses (1,2, 3, etc) are suggested for organization purposes.

Table 1: Data Bus Address Switches

Data Bus Address	Switch Settings S1	S2	S3	S4
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

Other Jumper Settings
JP1   Used to engage a 120 Ohm resistor for terminating the M1 RS-485 Data BuS. See Data bus wiring instructions before use.

4. **Power On:** Turn the Control Panel power on after all connections are complete.

5. **Enrolling the M1XZW:** After connecting the M1XZW to the Control, it must be enrolled as a new bus module. From the Keypad access the Installer level programming. Select Menu 01-Bus Module Enrollment. Press the right arrow key to start the enrollment. When the keypad indicates enrollment complete, press the right arrow key to view the results. Among the displayed enrolled devices there should be a type 5 (T5) device at whatever address you just selected. Make sure the number of enrolled modules displayed matches the number of modules in the system. The Status LED on the M1XZW should start blinking about once per second.

   NOTE: If it becomes necessary to replace an already installed data bus device, set the new unit to the same address as the old unit and repeat the enrollment process. If a device is permanently removed, the enrollment process must be performed after removal in order to un-enroll the unit and thereby prevent a "missing" trouble condition.

Overview - Important Things to Know

There are numerous manufacturers of Z-Wave enabled devices and components such as: Handheld Primary Controllers, Plug-in Dimmer Modules, Wall Lighting Switches, Occupancy sensors, etc. The ELK-M1XZW interface is essentially a Z-Wave Secondary Controller or Static Update Controller (SUC), designed to allow an M1 Control to communicate with and operate the devices on an established Z-Wave network. The M1XZW cannot be used for setup or configuration of a Z-Wave network as this requires a Primary Controller. I.E. HomePro ZTH100 or equivalent. Using a Handheld Primary Controller, the Z-Wave devices are programmed and linked together to form a communications network. Once the network has been installed and configured with the Primary Controller, the configuration is then replicated or copied into the M1XZW Interface. The M1XZW will then be able to activate or operate the networked devices. Keep in mind that any changes or modifications to a Z-Wave network must be done using a Primary Controller and the changes then copied into the M1XZW.

☞ **Based on the current generation Z-Wave protocol, Z-Wave Transceivers (Devices) cannot broadcast or send status update changes back to any handheld or automation controller with the exception of a confirmation reply to a controller that just issued a command to change. Equally important, if a device (light switch, etc.) is manually operated it does not broadcast any status change at all. The obvious issues are that automation interfaces such as the Elk-M1XZW, including Elk Keypads, and Elk's Virtual Keypad software cannot remain in-sync with the true state of Z-Wave devices if their state is not broadcast or available. This is not unique to Elk. Other manufacturers of Z-Wave controllers face the same dilemma. One might think that a periodic polling command for status would provide a solution. However, the poll intervals and the potential detrimental loading effect on the radio network is uncertain. Even with polling, there would still be a time lag during which displayed status would be out of sync. It is hoped that Z-Wave will some day add Status Broadcast to their protocol.**

☞ **Since the Z-Wave protocol does NOT include Broadcasting of Status Changes, a rule in the M1 cannot use Z-Wave Devices as activators or conditionals. In other words, the M1 Control does not know if the state of a Z-Wave device has been manually changed or changed by another controller. Likewise, another controller such as a handheld remote will not know if the Z-Wave device state has been changed by the M1XZW and M1. As already stated, this is an issue with the Z-Wave protocol and it is hoped that Z-Wave will remedy this in the future.**

☞ **Be assured that the Z-Wave Protocol and devices have been designed to be very reliable, even though they do not provide broadcast for status updates. Consequently, a possible alternative to the issue of being out-of-sync would be to implement a "send only" policy, whereas the M1 only sends group or scene commands without regard to any current status. To accomplish this: a) do not select the "Show" option for any lighting device in the Elk-RP Programming Software. b) when writing a rule, only issue Group commands (Devices 01-64) or Scene commands (Devices 65-96). c) do not write any rule that attempts to use the lighting status of a Z-Wave device.**

Groups: There are 64 Z-Wave Groups. Each Group can have up to 232 units (individual switches) assigned to it. A Group can ONLY be turned on or off. When a Group command is issued, the controller that issued the command will receive a status message. Provided all units in that Group respond correctly, a Group "Success" status will be received. However, if any unit in that Group fails to respond, a Group "Fail" status will be received. **It is very important to note that a Group Status Message is a single reply that is ONLY sent to the Controller that originally sent the Group command. The status of each Unit within a Group IS NOT TRANSMITTED.**

In the M1 Control family the Z-wave Groups overlay lighting device addresses 01 to 64, or X10 address A01 to D16. I.E., Group # 1 = Lighting Device 01 (A01), etc.

Scenes: There are 32 Z-Wave Scenes. Each Scene can have up to 58 units assigned it. A Scene can be turned On, Off, or set to a Level (dim). When a Scene command is issued, the controller that issued the command will receive a status message. Provided all units in that Scene respond correctly, a single Scene "Success" status will be received. However, if any unit in that Scene fails to respond, a Scene "Fail" status will be received. **It is very important to note that a Scene Status Message is a single reply that is ONLY sent to the Controller that originally sent the Scene command. The status of each Unit within a Scene IS NOT TRANSMITTED.**

In the M1 Control family the Z-wave Scenes overlay lighting addresses 65 to 96, or X10 addresses E01 to F16. I.E., Scene # 1 = Lighting Device 65 (E01), etc.

Unit (Nodes): There are 160 addressable Z-Wave Units. Units can be turned On, Off, or set to a Level (dim). When a Unit command is issued, the controller that issued the command will receive a status message confirming either "Success or Fail". **It is very important to note that a Unit Status Message is ONLY sent to the Controller that originally sent the Unit command.**

In the M1 Control family the Z-wave Units overlay lighting addresses 97 to 256, (X10 addresses G01 to P16). I.E., Unit #1 = address 97 (G01), etc.

Programming and Operation

General

Depending on installation requirements, Z-Wave nodes can be configured and controlled in groups, scenes, or individual nodes (units). The maximum capacity of an M1 Controller is 256 Lighting devices and the capacity for Z-Wave operation is allocated within these 256 devices. Each lighting device number in the M1 has been assigned a corresponding Z-Wave Group, Scene, or Node number. For example, to turn ON all light(s) assigned to Z-Wave group 1 you would execute an M1 command to turn on Lighting Device 1 (Lighting Device 1 corresponds to Z-Wave group 1). A typical M1 rule command would be "THEN TURN Z-Wave Group 1 [1 (A1)] ON". Below is a brief description of Groups, Scenes, and Nodes. Refer to Table 2 for a complete reference of the Lighting Device to Z-Wave allocations. **NOTE: The M1 Lighting Device TYPE must be programmed as "Serial Expander" for every Lighting Device to be used with Z-Wave. In the above example, program the NAME for Lighting Device 1 as "Z-Wave Group 1".** This can easily be done through the ElkRP software.

Setup and Configuration

The M1XZW Z-Wave Interface can be used to operate and control an established Z-Wave network but it cannot be used to configure or setup a network. Only a Z-Wave Primary Controller such as the HomePro ZTH100 or equivalent can be used to setup a network. Please refer to the instructions that accompany the Primary Controller for detailed setup instructions. This manual details the procedures for replicating or 'Copying" the data from a Z-Wave Primary Controller into the M1XZW so that it may then be used to operate lighting and other networked devices.

For additional information on the capabilities and operation of a Z-Wave network, please refer to the individual manufacturer instructions that accompany your Z-Wave Modules and Z-Wave Primary Controller.

Programming the Lighting Device Attributes in the M1

Using the ElkRP software, program the Lighting Device Attributes for every light that will be controlled via Z-Wave. At a minimum, you must **"Format=Serial Expander"**, **"Type=On/Off Switch or Dimmer"** (depending on the device capability), and the Name=description of the device (group,scene,etc.).

Replicating 'Copying' Data from a Primary Controller into the M1XZW

Once the Z-Wave network has been configured using the Z-Wave Primary "Handheld" Controller, the data must be copied into the M1XZW Interface (Secondary Controller). **Note: These instructions reference the use of a HomePro ZTH100 Primary Controller. If using another brand of Primary Controller it may be necessary to cross reference these instructions to whatever brand you happen to be using.**

1. Remove the cover on the M1XZW Interface.
2. Locate the small push button along the edge of the larger circuit board. next to the blinking Status LED. This button is used in step 8 below. **DO NOT press the button on top of the smaller board.**
3. Hold the ZTH100 Primary Controller within 2 feet of the M1XZW Interface. (The transfer range is intentionally limited)
4. Press the MENU button on the ZTH100.
5. Press the Left Arrow on the ZTH100 until "SETUP" is displayed, then press OK.
6. Press the Left Arrow on the ZTH100 until "COPY REMOTE CTRL." is displayed. Then press OK several times until the display shows "SENDING…" .
7. Press and hold the PROGRAM switch on the M1XZW until the PROGRAM LED turns on with a solid glow.
8. Within 5 or 10 seconds the display should change from "Sending" to "Wait" then "Send Complete" when the download or copy has been successfully completed.
9. If the "Send Complete" message is not shown then it may be necessary to repeat the steps again.

Testing the Operation

Once the M1XZW has been successfully replicated from the ZTH100 it is time to do some testing. For the purpose of testing we will assume that Group 1 has been configured in the Primary Controller and this data has been replicated into the M1XZW. Referring to Table 2 we find that Z-Wave Group 1 corresponds to M1 Lighting Device 1.

1. On the M1 Keypad press the ELK key once.
2. Press the Right arrow key to select Menu 1-"View/Control Automation Fncts".
3. Press the Right arrow key. The top line should display "1-Tasks".
4. Press 2 or the Up arrow one time to display "2-Lighting".
5. Press the Right arrow key to select this option.
6. Depending on the M1's programming the top line may display one of two things:
   "[Light Name]"   OR   "Enter Light"
   "001:=OFF,#toChg"   "Light Number=000"

7. If the bottom line displays "001:=OFF,#toChg" it is indicating the current state of Light 001.
   If the bottom line displays "Enter Light" then it will be necessary to type in 001 to access Light 001.
8. Press the # key once to toggle the state from Off to On while observing any of the Z-Wave Group 1 lights to verify that they change from Off to On. Note: If the light was already On then no change will occur. Either way, press the # key again to toggle the state from On to Off.
9. You may continue to test other Groups, Scenes, or Nodes depending on the Z-Wave network setup. Simply cross reference the Z-Wave numbering scheme to the M1 Lighting numbers utilizing the information found on Table 2.

Using an ElkRP Rule to Control Z-Wave Device(s)

Using ELK RP Remote Programming Software, Automation Rules can be written to control Z-Wave network devices. These include but are not limited to Lights, Dimmers, Appliances, Thermostats, and more. The following are some typical rules utlizing Groups, Scenes, and Nodes.

WHENEVER [Area Name] ARMED STATE BECOMES DISARMED
    THEN TURN Living Rm Lights [1 (A1)] ON   NOTE: Light Device 1=Group 1 which can be turned On or Off.

WHENEVER SUNSET
    THEN TURN Mood Lighting [65 (E1)] ON   NOTE: Lighting Device 65=Scene 1 which can turn On,Off,Brighten, or dim one or more lights.

WHENEVER TIME IS 6:00am
    THEN TURN Bathroom Light [G1 (97)] ON   NOTE: Lighting Device 097=Node 1 which is a single Light unit.

Z-Wave Network Basics

System Description

In a Z-Wave radio network, all nodes (devices) are wirelessly linked together through the state of the art communications network featuring the patented Z-Wave technology. The Z-Wave protocol defines various device classes (types) such as Lighting, Thermostat, Remote Controller, Static Controller, Repeater Slave, Binary Sensor, Multilevel Sensor, Pulse Meter, Entry Control, and more to be announced or developed.
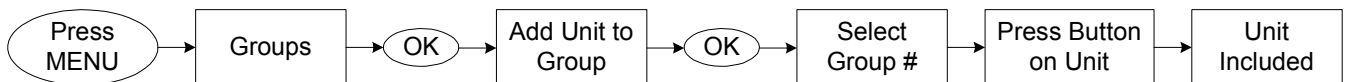
Repeaters

In the case of a controller, a Z-Wave Centralized controller such as the M1XZW, or a portable handheld controller such as the HomePro ZTH-100 (or equivalent), only needs to be in-range of a single device (max. range approximately 100 feet). The patented Z-Wave technology then automatically routes commands (signals) from one device to the next, effectively going around obstacles and radio dead spots in a building. This is possible because each device can act as a repeater, re-transmitting the commands that are sent through them to adjacent devices that might otherwise be out of range. _Regardless of the Manufacturer (Vendor) or the device class, all devices can act as repeaters._ For this reason, the more devices you have installed, the better the reliability and coverage becomes. The Z-Wave protocol provides for a command to be routed if necessary through as many as four different device in route to the intended device.

Important Note

While it is not within the scope of this document to fully explain the detailed operation of a Z-Wave handheld primary controller, it is possible to explain the general steps involved in the setup of a Z-Wave network. Of primary importance is how to setup a group, a scene, and to include or exclude devices within a group or scene. The following illustrations are based on the use of a HomePro ZTH-100 Handheld Controller. If another brand of controller is utilized, it may be necessary to modify the steps accordingly.

Groups - Adding (Inclusion) of Z-Wave Nodes into a Group

Press MENU → Groups → OK → Add Unit to Group → OK → Select Group # → Press Button on Unit → Unit Included

A group is an association of one or more nodes so that they operate together just like one device. All nodes in a group turn on and off as that group is turned on and off. Dimmers in a group return to their last dim level which can differ from node to node.

Follow each of these steps for every Node. When finished with a group press OK a second time. To exit or quit press C.

Scenes - Adding (Inclusion) of Z-Wave Nodes into a Scene

Press MENU → Groups → → → Scenes → OK → Add Unit to Scene → OK → Select Scene #

Choose Scene using: ◄ OR ► → OK → Press Button on Unit → Unit Included
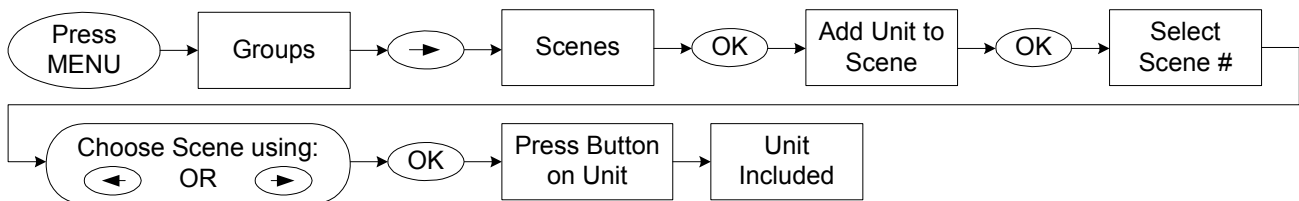
A scene is an association of one or more nodes, including the desired dim level based on the dim level at the time of inclusion. When a scene is activated, each associated dimmer node goes to its previously defined dim level, regardless of its recent dim level. Some nodes may get brighter, some dimmer, and some may turn off altogether. Appliance or switch nodes have a state of off or on within a scene.

Follow each of these steps for every Node. When finished with a scene press OK a second time. To exit or quit press the C key.

Removing (Exclusion) of Nodes from a Group or Scene

```
Press          Choose        Groups        OK      Add Unit to                      Remove Unit
MENU           Groups                               Group                            from Group
               or                                                                                    OK
               Scenes        Scenes        OK      Add Unit to                      Remove Unit
               Using:                               Scene                            from Scene
               ►
```

```
Select         OK      Are You         Press Button      Removed
Group                  Sure?           on Unit           From Group
or
Scene          OK      Are You         Press Button      Removed
Using:                 Sure?           on Unit           From Group
►
```

Resetting nodes

```
Press      ◄      Setup      OK      Set Time      ◄      ◄      Reset      OK
MENU                                                              Unit
```
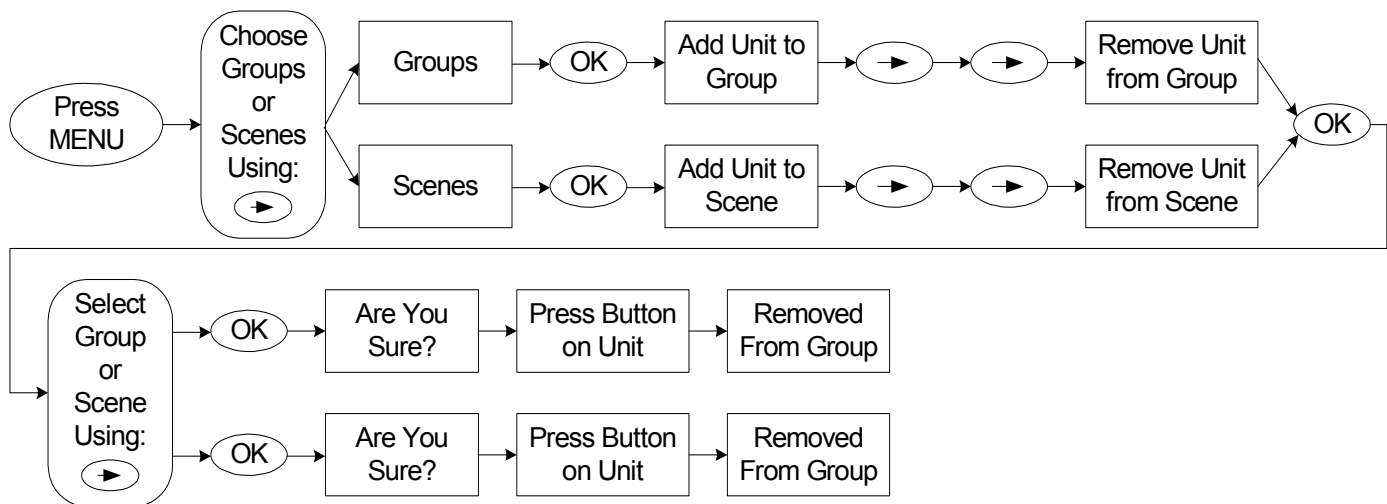
```
Are You      OK      Press Button      Press Button      Set Time
Sure?                on Unit           on Unit
```

If a Node is to be moved to a new position or added to a new network it has to be reset before doing so.

Resetting Wireless Controller

```
Press      ◄      Setup      OK      Set Time      ◄      Reset            OK
MENU                                                       Remote Ctrl.
```

```
Select          OK      Are You      Wait . . . . .      Reset
User Data               Sure?                            Completed
or
Factory Default OK      Are You      Wait . . . . .      Reset
Using:                  Sure?                            Completed
◄        ►
```
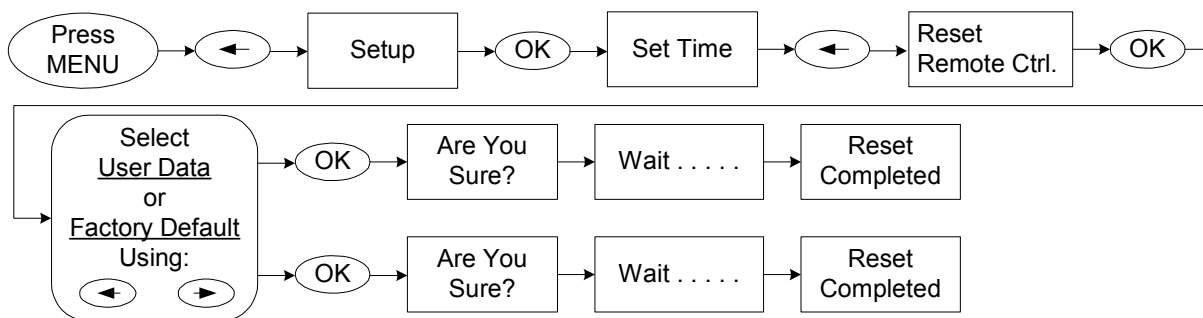
If a wireless controller has been used for demonstrations or bench testing it may be desirable to reset it prior to actual use on a 'real' installation. There are two ways to reset, "user data only" or "factory default". User data will only reset groups, scenes, and names. The controller will still retain information about the modules that have been added to the network. A factory default reset should be used with extreme care. It will clear groups, scenes, names, and will delete all modules from the network.

NOTE: The ELK-M1XZW does not need to be manually reset as it will automatically erase each time the data from a handheld controller is "replicated" or copied down to it.

M1 to Z-Wave Cross Reference Table

ELK Lighting Device #	PLC (X-10) Equiv.	Z-Wave Group # Equiv.	ELK Lighting Device #	PLC (X-10) Equiv.	Z-Wave Scene # Equiv.	ELK Lighting Device #	PLC (X-10) Equiv.	Z-Wave Node # Equiv.	ELK Lighting Device #	PLC (X-10) Equiv.	Z-Wave Node # Equiv.
1	A01	1	65	E01	1	97	G01	1	177	L01	81
2	A02	2	66	E02	2	98	G02	2	178	L02	82
3	A03	3	67	E03	3	99	G03	3	179	L03	83
4	A04	4	68	E04	4	100	G04	4	180	L04	84
5	A05	5	69	E05	5	101	G05	5	181	L05	85
6	A06	6	70	E06	6	102	G06	6	182	L06	86
7	A07	7	71	E07	7	103	G07	7	183	L07	87
8	A08	8	72	E08	8	104	G08	8	184	L08	88
9	A09	9	73	E09	9	105	G09	9	185	L09	89
10	A10	10	74	E10	10	106	G10	10	186	L10	90
11	A11	11	75	E11	11	107	G11	11	187	L11	91
12	A12	12	76	E12	12	108	G12	12	188	L12	92
13	A13	13	77	E13	13	109	G13	13	189	L13	93
14	A14	14	78	E14	14	110	G14	14	190	L14	94
15	A15	15	79	E15	15	111	G15	15	191	L15	95
16	A16	16	80	E16	16	112	G16	16	192	L16	96
17	B01	17	81	F01	17	113	H01	17	193	M01	97
18	B02	18	82	F02	18	114	H02	18	194	M02	98
19	B03	19	83	F03	19	115	H03	19	195	M03	99
20	B04	20	84	F04	20	116	H04	20	196	M04	100
21	B05	21	85	F05	21	117	H05	21	197	M05	101
22	B06	22	86	F06	22	118	H06	22	198	M06	102
23	B07	23	87	F07	23	119	H07	23	199	M07	103
24	B08	24	88	F08	24	120	H08	24	200	M08	104
25	B09	25	89	F09	25	121	H09	25	201	M09	105
26	B10	26	90	F10	26	122	H10	26	202	M10	106
27	B11	27	91	F11	27	123	H11	27	203	M11	107
28	B12	28	92	F12	28	124	H12	28	204	M12	108
29	B13	29	93	F13	29	125	H13	29	205	M13	109
30	B14	30	94	F14	30	126	H14	30	206	M14	110
31	B15	31	95	F15	31	127	H15	31	207	M15	111
32	B16	32	96	F16	32	128	H16	32	208	N16	112
33	C01	33				129	I01	33	209	N01	113
34	C02	34				130	I02	34	210	N02	114
35	C03	35				131	I03	35	211	N03	115
36	C04	36				132	I04	36	212	N04	116
37	C05	37				133	I05	37	213	N05	117
38	C06	38				134	I06	38	214	N06	118
39	C07	39				135	I07	39	215	N07	119
40	C08	40				136	I08	40	216	N08	120
41	C09	41				137	I09	41	217	N09	121
42	C10	42				138	I10	42	218	N10	122
43	C11	43				139	I11	43	219	N11	123
44	C12	44				140	I12	44	220	N12	124
45	C13	45				141	I13	45	221	N13	125
46	C14	46				142	I14	46	222	N14	126
47	C15	47				143	I15	47	223	N15	127
48	C16	48				144	I16	48	224	N16	128
49	D01	49				145	J01	49	225	O01	129
50	D02	50				146	J02	50	226	O02	130
51	D03	51				147	J03	51	227	O03	131
52	D04	52				148	J04	52	228	O04	132
53	D05	53				149	J05	53	229	O05	133
54	D06	54				150	J06	54	230	O06	134
55	D07	55				151	J07	55	231	O07	135
56	D08	56				152	J08	56	232	O08	136
57	D09	57				153	J09	57	233	O09	137
58	D10	58				154	J10	58	234	O10	138
59	D11	59				155	J11	59	235	O11	139
60	D12	60				156	J12	60	236	O12	140
61	D13	61				157	J13	61	237	O13	141
62	D14	62				158	J14	62	238	O14	142
63	D15	63				159	J15	63	239	O15	143
64	D16	64				160	J16	64	240	O16	144
						161	K01	65	241	P01	145
						162	K02	66	242	P02	146
						163	K03	67	243	P03	147
						164	K04	68	244	P04	148
						165	K05	69	245	P05	149
						166	K06	70	246	P06	150
						167	K07	71	247	P07	151
						168	K08	72	248	P08	152
						169	K09	73	249	P09	153
						170	K10	74	250	P10	154
						171	K11	75	251	P11	155
						172	K12	76	252	P12	156
						173	K13	77	253	P13	157
						174	K14	78	254	P14	158
						175	K15	79	255	P15	159
						176	K16	80	256	P16	160

NOTES:

1. Refer to page 4 "Overview - Important Things to Know".

2. This chart identifies the M1 Lighting Device numbers as they relate to Z-Wave Group, Scene, or Node commands.

2. The PLC (X10) column is for reference only.

Glossary of Terms

Association - The linking together of two nodes (units) so that one node will send information to the other node. The node doing the sending is the source and the node receiving the information is the destination.

Group - A set of one or more modules that are to be operated together as if they were one device. More specifically, every module that is included in a group will switch on or off together as that group is turned on and off. When a group is activated, each Light or Lamp module in that group turns on, returning to its last dim level - a level that in general, will differ from module to module. Appliance Modules may also be included in groups. There are 64 Z-Wave lighting Groups in the Z-Wave protocol.

Node (Unit) - A single Module entity within the Z-Wave network. It could be a Plug-in Dimmer Module, Appliance Module, Wall Switch, Wall Dimmer, etc. There are 160 addressable Z-Wave unit nodes as described in the Z-Wave protocol.

Scene - To link or 'associate' one or more modules, except that the controller stores not only the association, but also the dim level for each Module. The dim level is stored at the time that a Module is added to a scene. Consequently, when a scene is activated, the Modules will all go to their previously defined dim levels regardless of what their most recent dim level may have been. Some Modules may get brighter while others may be pre-programmed by the user to become dimmer. Because Appliance and Wall Switch Modules are switching devices without dimming capability, they will either be defined as on or off when added to a scene. There are 32 Z-Wave lighting Scenes in the Z-Wave protocol. Each Scene can have a maximum of 58 Nodes or individual devices assigned it.

Replicate - To transfer or copy the setup and configuration information between a handheld Primary Controller and a Secondary Controller.

Route - If an obstacle or radio dead spot exists between two Z-Wave modules, Z-Wave automatically repeats or passes the signal from one device to the next, effectively going around obstacles and radio dead spots in a building. Like wise, if two devices are not within range of one another, a route can be manually assigned to the source module (the module sending the information). This essentially enables devices to communicate at long ranges since the signal is repeated or "bounced" until it reaches the receiving module.

Status Reply - The process of a device transmitting its current state (on, off, dim, etc.) in response to an individual node or unit change command from a controller.   At the present time, Z-Wave devices ONLY respond with their status to the specific controller that commanded their change. Secondly, Z-Wave devices DO NOT respond with their status when a Group or Scene command is issued. Z-WAVE DOES NOT BROADCAST STATUS CHANGES TO OTHER CONTROLLERS WITHIN THE NETWORK.

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