

# ELK-M1XRFTW

Two-Way Wireless Receiver/Transceiver  
& Input Expander for Elk Two-Way Wireless Sensors.

Refer to page 8 for a listing of sensor part numbers.

# INSTALLATION MANUAL

## IMPORTANT NOTE:

ELK-M1G and M1EZ8 Controls require application firmware ver. 5.2.8 or higher to be compatible with the M1XRFTW Receiver. Refer to Elk's website for "flash" file updates.

For the very latest downloadable version of this manual please go to our website:  
<http://www.elkproducts.com>

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## FEATURES:

- Adds up to 144 individual wireless zones (sensors/points)
- Operates from the 4 wire RS485 Data Bus
- Multiple Receivers (up to 11) may be connected to a single M1 or M1EZ8 Control for redundancy and greater coverage
- Flash Memory allows field updating of operating Firmware
- Compatible with Elk complete line of Two-Way Wireless Sensors.

## SPECIFICATIONS:

- Operating Frequency: 902 Mhz to 928 Mhz
- Transmission Duration (active on-time): 50 ms
- Sensitivity: >105 dbm
- Operating Temperature: 0 to +120 degrees F
- Operating Voltage: 12 Volts D.C.
- Current Draw: 25mA Receiving, 85mA Transmitting
- Indoor Range: 300 to 500 ft. \*\* line of sight

\*\* Laboratory tests have achieved greater distances, however walls and metal objects generally reduce actual operating range.

## FCC COMPLIANCE STATEMENT:

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.

NOTE: ELK PRODUCTS IS NOT RESPONSIBLE FOR ANY CHANGES OR MODIFICATIONS NOT EXPRESSLY APPROVED BY THE PARTY RESPONSIBLE FOR COMPLIANCE. SUCH MODIFICATIONS COULD VOID THE USER'S AUTHORITY TO OPERATE THE EQUIPMENT.

<u>Part Number</u>	<u>Description</u>	<u>FCC ID Number</u>
ELK-M1XRFTW	M1 Two-Way Receiver	FCC ID: TMA ELK-M1XRFTW
ELK-6010	KeyChain Remote "FOB"	FCC ID: TMA ELK-6010
ELK-6021	Mini Door & Window Sensor	FCC ID: TMA ELK-6021

## OVERVIEW

The **"TW"** model of the ELK-M1XRF Wireless RF Receiver (part # ELKM1XRFTW) allows an ELK-M1 and ELK-M1EZ8 Controls to accept Elk's complete line of Two-Way Wireless Sensors. Refer to the list of available transmitters in this manual.

Including this new Elk Two-Way Receiver, Elk now produces three (3) different models of wireless receivers for the M1 Control. One is for Elk sensors (M1XRFTW), one is for GE sensors (M1XRF2G), and one is for Honeywell sensors (M1XRF2H). Regardless of the receiver model, they each attach directly to the M1 via the four (4) wire Keypad Data Bus. And they enroll and integrate in much the same way as a hardwired zone expander, with the exception that a single M1XRF can handle up to 144 wireless Sensors/Zones. The benefits of operating from the data bus are: 1) Receiver(s) do not have to be installed adjacent to the control, rather they can be installed virtually anywhere in a building up to the maximum distance of the data bus. This provides optimum convenience and coverage. 2) Multiple receivers (up to 11 total) can be connected to a single control, providing greater coverage as well as redundancy. Utilizing multiple receivers it is possible to cover hundreds if not thousands of square feet with a receiver placed in strategic locations.

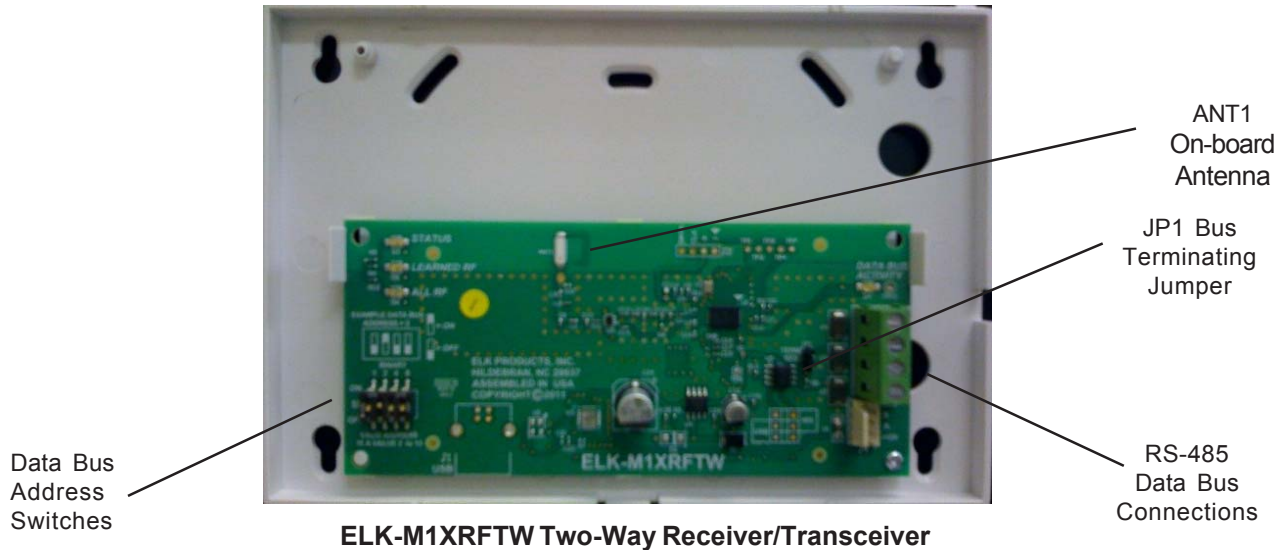
A strong point of the Elk Receivers is that all transmitter serial numbers and setup information is stored in the control panel rather than in the receiver(s). There are two advantages of this: 1) Sensors need only be enrolled one time, yet they can be received by any compatible format "redundant" receiver in the building. This is especially great for coverage of portable Keychain (FOB) Remotes. 2) Should a receiver ever become damaged or need replacement it will not be necessary to re-enroll the transmitters. Simply replace the receiver and perform a data bus enrollment of the receiver to the control panel.

### **IMPORTANT NOTE - THE BRAND OF TRANSMITTERS INSTALLED MUST BE MATCHED TO THE CORRECT RECEIVER.**

**Receiver brands can be mixed on a single M1 Control, allowing a mixture of transmitter brands. While this is great for takeover situations, extreme care must be taken to assure that each transmitter is within range of it's respective receiver model. In other words, the receiver/transmitters are physically and electronically different and are only compatible within their own brands.**

# General Installation and Setup

## INSTALL UNIT \* SET ADDRESS AND OPTION JUMPERS \* ACTIVATE M1 BUS ENROLLMENT PROCESS



NOTE: Jumper JP1 makes it convenient to terminate the RS-485 Data Bus if this is the last installed device.

- 1. Mounting** - Two (2) #6 x 1/2" screws (not provided), one on each side of the housing should be used for mounting. The receiver connects to the M1's Keypad data bus and may be remotely located up to several thousand feet away from the control. Mounting inside a metal enclosure or on metalized wallpaper is NOT RECOMMENDED! Mount at least 10 feet away from any electrical device that generates noise including the M1 Control. Electrical noise can and may reduce the receiver sensitivity. For increased signal coverage or redundancy additional M1XRF Receivers (up to 11 max.) may be connected to the same M1 Controller. See Appendix C.
  - 2. Wiring Connections** - Before making any wiring connections, turn the power Off on the Control Panel. Connect terminals +12V, A, B, and Neg from the receiver to the M1's Keypad Data Bus (terminals +VKP, Data A, Data B, & Neg).
- NOTE: Refer to the M1 Installation Manual and the M1DBH information in this manual about proper connections of data bus devices with multiple homerun cables.**
- 3. Antenna** - The M1XRFTW uses a single on-board ceramic antenna. There is no external antenna required.

### DIAGNOSTIC LED INDICATORS:

There are four (4) LEDs on the board that provide valuable information as to the operation of the M1XRF:

**STATUS** (Data Bus Status) - Multiple conditions exist for this LED:

OFF = No Power to the M1XRF

ON Solid = Power is good but it is not yet enrolled with the M1 or the Microprocessor is not functioning.

BLINKING = 2 different blink rates:

- Slow "one blink per second" indicates Normal Operating mode.
- Rapid "two quick blinks with a brief off time" indicated the Receiver is in Bootloader mode, indicating it has not yet been flashed with application firmware. This should only occur if you are field updating the unit. It will not be operational until application firmware has been flashed into the unit using ElkRP.

**LEARNED RF** - This LED will momentarily turn on when the M1XRF receives a valid transmitter and is in the process of sending the signal packet back to the M1 Controller. As soon as the packet is acknowledged by the M1 Controller the LED will turn Off.

**ALL RF** - This LED blinks whenever ANY Elk RF transmitter is heard or detected.

**DATA BUS ACTIVE** - This LED blinks near continuously and indicated activity on the M1 Data Bus.

## Setting the M1XRF Data Bus Address and the Starting Wireless Zone ID

Every device on the M1 RS-485 4-wire data bus must have a valid address setting (from 1 to 15) within its device type. TYPE 1 is for Keypads, TYPE 2 is for Hardwire and Wireless Input expanders, TYPE 3 is for Output expanders, TYPE 4 is for Serial expanders. The device types allow address numbers to be re-used in each different device type. There are 4 address switches, each with an OFF or ON position (binary value 0 or 1) and decimal equiv. value of (1, 2, 4, or 8). The total decimal value of the "ON" switches determines the data bus address. Set the switches to the desired data bus address by referring to Tables 1-1 and 1-2. A small screwdriver may be helpful. See important information before proceeding to "Data Bus Enrollment".

### **VERY IMPORTANT! PLEASE READ!**

Since Hardwire and Wireless expanders share the same device type and same bus address range, unintentional data bus "Conflicts" are possible with M1XRF Wireless Receiver(s) and M1XIN Hardwired Expander(s) installed on the same control. These conflicts can be avoided with proper understanding of the issues and careful planning and execution during installation. The important point to remember is that M1XRF Wireless Receivers and M1XIN Zone Expanders share the same data bus addresses. Below are some issues and recommendations to avoid addressing conflicts:

**M1XIN Expanders:** A single ELK-M1XIN Hardwired Zone Expander (M1XIN) provides 16 hardwired zones. The data bus address SETS THE ID OF THE STARTING ZONE of each 16 zone group. See Table 1-1. If additional M1XINs are installed, each must have a different address (usually the next available) to set the starting zone of the next 16 zone group. I.E., Each data bus address equates to a specific group of 16 zone IDs. Everything works fine as long as there are NO DUPLICATE addresses.

**M1XRF Receivers:** The differences between a ELK-M1XRF Wireless Receiver and a ELK-M1XIN Zone Expander are:

- 1) A single M1XRF Receiver can add up to 144 wireless zones to the control. These are assigned in groups of 16 at a time. One stipulation is that to have 144 total wireless zones the first group of 16 must begin at zone 17 and the balance of the wireless zones must be sequential through zone 160. If any hardwired zone expanders are enrolled in the range of zones 17 through 160 you lose one entire group of 16 wireless zones for every hardwired (16 zone) expander installed.
- 2) For added range and coverage redundancy multiple "like branded" M1XRF Wireless Receivers can be installed on the bus. Redundant receivers can be assigned to any unused data bus address as long as it doesn't conflict with another Type 2 device.

**NOTE:** The data bus address of an M1XRF Receiver does not inherently set starting wireless zone number. Even so, Elk strongly encourages Installers to set the data bus address of the first M1XRF Receiver to the starting zone ID as depicted in Tables 1-1 and 1-2. While the actual data bus address of the M1XRF could be address 10 and the first group of 16 wireless zones could be programmed as 17-32, the disadvantages of doing this are potential zone numbering conflicts when M1XIN Hardwired Zones Expanders exist.

### **Other important considerations when installing an M1XRF:**

- a) Although wireless zones are allocated in Groups with a minimum number of 16 zones each, you are not required to utilize all 16 of the zones in each group.
- b) Care must be taken to ensure that wireless zones NEVER spill over into data bus addresses already assigned to a M1XIN Hardwired Zone Expander, or vs. versa.
- c) Regardless of where the wireless zones start we strongly suggest that all additional wireless zones be contiguous and that no M1XIN Hardwired Zone Expanders be installed at data bus addresses associated with those wireless zone numbers. Data Bus Addresses whose zone IDs are effectively "overlapped" by wireless zones are considered "reserved" for wireless use and should not be used by a hardwired zone expander. See Appendix C.
- d) The last wireless zone number can NEVER be assigned higher than zone 160. Put another way, zones 161 through 208 cannot be wireless zones.
- e) The maximum number of wireless zones is 144, therefore the last wireless zone number cannot be greater than 160.

**Example:** You decide to create 64 contiguous wireless zones. And the starting wireless zone ID is set to "17" (associated with data bus address 2). That would mean that zones 17 to 31, 32 to 48, 49 to 64, and 65 to 80 are going to be wireless zones. Based on Tables 1-1 and 1-2 it can be seen that zones 17 to 31 are associated with data bus address 2. Zones 32 to 48, 49 to 64, and 65 to 80 are associated with data bus addresses 3, 4, and 5 respectively. As a result, addresses 3,4, and 5 ARE NOT AVAILABLE for use by M1XIN Expanders because the wireless zones are overlapping these addresses.

**NOTE:** Consider whether the system may ever required more wireless or hardwired zones. If the answer is yes it would be good to plan the data bus address assignments in such a way that future growth is possible without having to default the control or totally re-arrange the addresses at a future date.

### M1XIN Zone Expanders

Data Bus Address	Starting and Ending Zone Numbers	Switch Settings			
		S1	S2	S3	S4
2	Zones 17 - 32	Off	On	Off	Off
3	Zones 33 - 48	On	On	Off	Off
4	Zones 49 - 64	Off	Off	On	Off
5	Zones 65 - 80	On	Off	On	Off
6	Zones 81 - 96	Off	On	On	Off
7	Zones 97 - 112	On	On	On	Off
8	Zones 113 - 128	Off	Off	Off	On
9	Zones 129 - 144	On	Off	Off	On
10	Zones 145 - 160	Off	On	Off	On
11	Zones 161 - 176	On	On	Off	On
12	Zones 177 - 192	Off	Off	On	On
13	Zones 193 - 208	On	Off	On	On
14	not valid	-	-	-	-
15	not valid	-	-	-	-

Table 1-1

### M1XRF Wireless Receivers

Data Bus Address	Suggested Wireless "Starting Point"	Switch Settings			
		S1	S2	S3	S4
2	Zone 17	Off	On	Off	Off
3	Zone 33	On	On	Off	Off
4	Zone 49	Off	Off	On	Off
5	Zone 65	On	Off	On	Off
6	Zone 81	Off	On	On	Off
7	Zone 97	On	On	On	Off
8	Zone 113	Off	Off	Off	On
9	Zone 129	On	Off	Off	On
10	Zone 145	Off	On	Off	On
11	not valid	-	-	-	-
12	not valid	-	-	-	-
13	not valid	-	-	-	-
14	not valid	-	-	-	-
15	not valid	-	-	-	-

Table 1-2

Other Jumper Settings:

JP1 - Used to engage a 120 Ohm resistor for terminating the RS-485 Data Bus. See Data bus wiring instructions before use.

### Data Bus Address Switches

#### Data Bus Enrollment:

Once the address is set and the M1XRF is powered up it will be necessary to manually ENROLL the device so that the M1 Control knows it is present. This is accomplished either from keypad programming "Menu 1 - Bus Module Enrollment" or from the ElkRP Remote Programming Software.

(The steps below require an M1 LCD Keypad)

1. Press the ELK key, then press 9 (or scroll up) to display 9 - Installation Programming. Press the RIGHT arrow key to select this menu. The Installer Program Code (PIN) must be entered to access this menu.
2. Enter the Installer Program Code. (The default code is 172839)
3. The first Installer Programming menu displayed will be "Bus Module Enrollment"
4. Press the RIGHT arrow key to select this menu. "Enrolling Bus Modules" will display
5. The control will transmit an enrollment message to all data bus devices, followed by a display showing the total Bus Modules that are enrolled. To view the enrolled devices and/or remove a device press the RIGHT arrow key next to the word Edit.
6. Press the \* or Exit keys to exit Installer Programming.

Auth. Required  
Enter Valid Pin

01-Bus Module  
Enrollment

XX Bus Modules  
Enrolled, Edit▶

# Operation

## **What makes the Elk Two-Way technology different from existing "older" wireless technology?**

Elk's Two-Way technology is vastly superior to traditional one-way wireless. Each transmission from an Elk sensor is looking for an acknowledgement from the receiver. Positive acknowledgement of a transmission results in the sensor generally only needing to send a single transmission. In a rare case where the transmission is not acknowledged by the receiver, the sensor intelligently resends the transmission. Each sensor also monitors and adjusts its ideal RF power, using only enough power to get a signal through, thereby maximizing the battery life of the sensor.

Confidence of signal strength at the time of installation another unique feature of the Elk Two-Way technology. As long as the Installer mounts the sensor in it's final intended location prior to enrolling and activates the enrollment process after mounting, a positive acknowledgement from the Receiver automatically indicates there is sufficient signal strength for continued reliable operation.

## **Requirements for Programming the Receiver and Enrolling Transmitters:**



The Receiver and wireless transmitters may be programmed using either the M1 Keypad Installer Programming or the ElkRP Remote Programming software. The following pages document the options and steps for programming from the keypad.

# Elk Wireless Sensors and their enrollment procedures

## Wireless Devices may be enrolled into M1 from the Keypad Installer Level Programming or from ElkRP

M1 Keypad Installer Level Programming utilizes Menu 14 and the "Lrn" mode process. Enrollment steps often vary between device types, so please follow the specific enroll method mentioned beside each device.

ElkRP Remote Programming primarily involves typing in the TxID or serial number of the sensor, along with selecting the particular attributes.

Image	Part Number(s)	M1 Keypad Installer Level Programming: Use Menu 14 > sub-menu 3. Enter 3 digit Zone number or use Up/Down arrows to scroll and locate a particular zone. Follow the specific Xmtr instructions outlined.
	Elk6010 5-Button Two-Way Keychain Remote	<b>Use Enroll Method 3</b> Special notes: In Menu 05 – Zone Definitions, program the zone def. as KEYFOB. In Menu 14 – Wireless Definitions, sub-menu 2, program Supervision Type (option 2) as "0" for un-supervised. Keychain "FOB" do not send supervisory check-in signals. Also, under sub-menu 4 each button may be assigned a specific functionality.
	Elk6021 Mini Two-Way Door/Window Sensor	<b>Use Enroll Method 1</b>



## Enrolling Wireless Devices into M1 from the Keypad Installer Level Programming

**Enroll Method 1 - Sensors with no tamper switch.** \* REMOVE BATTERY from sensor or verify it is not NOT installed before proceeding \*

Step 1 – Enter Keypad Installer Level Programming and navigate to Menu 14 – Wireless Definitions

Step 2 – Press the right arrow key and scroll or navigate to Option 3 – Learn Wireless Transmitter.

Step 3 – Press the right arrow key and scroll or navigate to the desired wireless zone number.

Step 4 – Press the right arrow key labeled “Lrn” to activate the enroll mode.

Step 5 – Immediately insert the transmitter battery. If battery is already installed, remove it and wait 5 seconds, then re-install.

Note: A special enrollment command is sent to the receiver and the battery must be removed long enough for the circuit to recognize a power on startup.

Sensor is enrolled when keypad chimes & briefly displays the Xmtr 7 digit Hex ID. Keypad will step to next available (blank) zone allowing rapid enrollment of sensors by tripping the next one to enroll.

Step 6 – To end Rapid Enrollment press ELK.

Step 7 – Press the ELK key twice when done.

**Enroll Method 3 - Keychain “FOB” Remotes** \* BATTERY MUST ALREADY BE INSTALLED in this type sensor before proceeding \*

Step 1 – Enter Keypad Installer Level Programming and navigate to Menu 14 – Wireless Definitions

Step 2 – Press the right arrow key and scroll or navigate to Option 3 – Learn Wireless Transmitter.

Step 3 – Press the right arrow key and scroll or navigate to the desired wireless zone number.

Step 4 – Press the right arrow key labeled “Lrn” to activate the enroll mode.

Step 5 – Press & Hold any one of the buttons on the Keychain Remote. Sensor is enrolled when keypad chimes & briefly displays the Xmtr 7 digit Hex ID.

Keypad will step to next available (blank) zone allowing rapid enrollment of sensors by tripping the next one to enroll

Step 6 – To end Rapid Enrollment press ELK.

Step 7 – Press the ELK key twice when done.

Step 8 – Perform a Test of every sensor using the Keypad Walk Test (User Menu 3).

## Enrolling Wireless Devices into M1 from ElkRP Software

Step 1 – Install the battery in the Sensor. It doesn't matter at this point if the sensor is mounted or not-mounted.

Step 2 – On the ElkRP Account Details screen open the Wireless Setup.

Step 3 – Navigate to the Transmitters tab and double click the desired Zone number.

Step 4 – Place a check mark in the Enabled box.

Step 5 – Select the desired Supervision type as either: 0=Not Supervised (Keychain Fobs), 1=Normal Supervision (Most Burglary Sensors), 2=Fire Supervision

Step 6 – Consult the Instructions which come with each Sensor to determine if either Option 1 or Option 2 is supported. Follow recommendations of the sensor.

Step 7 – The box for PIR should NOT be checked UNLESS specifically mentioned in the Instructions accompanying the wireless PIR sensor.

Step 8 – The Keyfob User ID is for use with Keychain remotes to force their actions to be logged as a specific User ID. Ignore if the sensor is not a Keychain remote.

Step 9 – Type in the TxID number of the wireless sensor (printed on the sensor and packaging) and click Save. Do not use the DL or H ID blocks.

Step 10 – Program the Loop # according to the sensor input(s). By default most will be Loop “0”. If adding a sensor which has a secondary input like for an external pushbutton or reed switch, follow the Instructions which came with that sensor for information on which Loop# to use..

Step 11 – Click Save and then Navigate to Zone (Inputs) > Wireless Group x. Program the Zone definition for each wireless sensor added.

Step 12 – Following programming, always perform a Test of every sensor using the Keypad Walk Test (User Menu 3).

# Programming via Keypad

From the keypad enter the Installer Level Programming mode. Press ELK, 9 > (enter installer code).  
Navigate to the Wireless Setup - Menu 14 and press the RIGHT arrow key to select.

## 14 - Wireless Setup ▶

There are four (4) wireless setup submenus: 1-Receiver Options, 2-Xmitter Options, 3-Xmitter Enroll, and 4-Keyfob Event Definitions. Use the UP or DOWN arrow keys to locate the desired submenu, then press the right arrow key to select.

### Wireless Submenu

### Description

#### 1:Rec Sel ◀ Prg▶ Receiver Options

This submenu is for Receiver options. To select this menu press the RIGHT arrow key, or press the Up or Down arrow keys to scroll the submenus.

#### R03:=024 Hours ▶ Reg. Supervision

Rec. Option R03 is the time value for zones programmed as Supervisory Type 1 or "Non-Fire" transmitters (see Xmit Transmitter Opt 02 below). The range is 001 to 255 hours. If a Type 1 sensor fails to check-in prior to the expiration of this time it is considered "missing". Factory default setting is 024 hours. NOTE: A value less than 4 hours is NOT RECOMMENDED!

#### R04:=004 Hours ▶ Fire Supervision

Rec. Option R04 is the time value for zones programmed as Supervisory Type 2 or "Fire" transmitters (see Xmit Transmitter Opt 02 below). The range is 001 to 255 hours. If a Type 2 sensor fails to check-in prior to the expiration of this time it is considered "missing". Factory default setting is 004 hours. NOTE: A value less than 4 hours is NOT RECOMMENDED!

#### 2:Xmit Sel ◀ Prg▶ Transmitter Opt ▶

This submenu is for specific transmitter options. Some options are not applicable to this model of the M1XRf. To select this menu press the RIGHT arrow key, or press the Up or Down arrow keys to scroll the submenus.

#### WZn017:Sel ◀ Prg▶ Wireless Zone

Use the UP and DOWN arrow keys to locate a particular wireless transmitter. Press the RIGHT arrow key to select and program the displayed transmitter.

#### WZn017 01: = No ▶ Enable Transmitt

Displays whether a transmitter is enabled or disabled. This option CANNOT be used to add a new device, but it can be used to temporarily suspend an already enrolled device. The enroll process must be used to add a new transmitter, after which this location will be set to Yes.

#### WZn017 02: = 0 ▶ Supervision Type

Supervision type sets the expected check-in interval of a sensor. KeyChain Remotes (Fobs) or devices which may leave the building program set this "0" = non supervised. Burglar Sensors should have this option set as "1"=Normal Supervision. Fire Sensors should have this option set as "3" = HI Supervision. See receiver selections R02 and R03 for supervision time values. Valid values are: 0, 1, or 3 Factory default setting is 1 (Normal Supervision).

#### WZn017 03: = No ▶ Enable Option 1

Pertains only to certain types of Transmitters. For KeyChain Remotes setting this option to Yes converts buttons 1,2,3,4 to be instead buttons 5,6,7,8. Default is No. **See list of compatible Transmitters to determine which (if any) transmitters use this option.**

#### WZn017 04: = No ▶ Enable Option 2

Pertains to transmitters with Ext. contact terminals. Setting this to Yes permits Open Circuit [N/O] switches. If set to No then only Closed Circuit [N/C] switches may be connected. Default is No. **See list of compatible Transmitters to determine which (if any) transmitters use this option.**

#### WZn017 05: = 001 ▶ Keyfob User ID

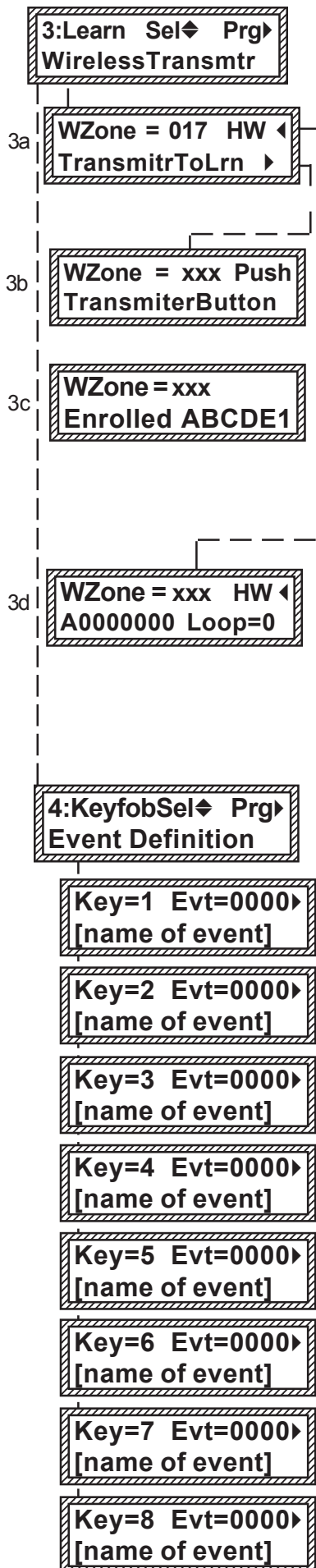
Used to program the User ID which will be logged when a Keychain Remote assigned to this zone is used to arm or disarm. Valid range is 001 to 255. Numbers 001 to 199 mirror keypad user codes. Note: Open/Close reports may be programmed for every User code.

#### WZn017 06: = No ▶ PIR Auto Restore

Not used. If set to Yes the zone is auto-restored to normal in 8 seconds with no restoral signal from the transmitter.

WZn017 shown as an example only!

< continued on next page >



This submenu is used for manually enrolling transmitters. To select this menu press the RIGHT arrow key, or press the Up or Down arrow keys to scroll submenus.

Select the zone to enroll a new transmitter by entering the three (3) digit zone number OR by scrolling to the zone number using the UP and DOWN arrow keys. NOTE: If a transmitter is already enrolled for this zone the display will resemble 3c below. Otherwise, it will display "TransmtrToLrn".

**WZone = 17 shown as example only!**

Press the RIGHT arrow key to select and program that zone.

This message will display and the M1 will speak: "Press Transmitter Button for Zone XXX", UNLESS a transmitter is already enrolled (see below). Proceed to the transmitter and execute the enroll process. I.E. Insert the battery or press the tamper button, etc. If successful the keypad will chime and M1 will speak: "[Zone Name] Enrollment."

Displays the zone number and ID of the enrolled transmitter. NOTE: After a new transmitter is enrolled this display advances to the next zone number and the M1 speaks "Press Transmitter Button for Zone xxx." This permits rapid enrollment of additional transmitters in sequential order. When enrollment is complete press the ELK key twice to exit the enrollment.

IMPORTANT! To delete or replace an existing transmitter navigate to transmitter option "WZnxxx 01" and select "No". This will disable the existing transmitter.

Pressing the LEFT arrow marked "HW" at step 3a will produce display 3d. The left number represents the transmitter ID in decimal notation. Press the RIGHT arrow key to move cursor over to Loop. For most Elk transmitters the Loop should automatically be set to "0". However, for a sensor that offers both an internal reed switch PLUS external inputs for an external contact the Loop would need to be changed to "1" in order for the external contact to be functional.

This menu is used to program the operation or "action" for Keychain Remote (FOB) buttons. Each button can be assigned one of six (6) separate operations as explained below. To select this menu press the RIGHT arrow key.

Press the UP or DOWN arrow keys to select a key (button) 1 to 8. Some keys (buttons) may not be usable depending on the model. The definition or operation is programmed using a four (4) digit event code derived from the Zone Definitions table located in the M1 Installation Manual. The range is 0000 to 0030 See M1 Installer Manual, Appendix A, Event Codes.

By factory default the M1 programming is assigned to the following keyfob buttons with printed symbols.

Key # / (ICON)	M1 Default Value	Operation
Key 1 / Lock	Event=0027	KeyMomAway (Arm the Control)
Key 2 / Unlock	Event=0029	KeyMomDisarm (Disarm the Control)
Key 3 / Light	Event=0000	"No default function"
Key 4 / Asterisk	Event=0000	"No default function"

Center Key on Elk6010 KeyChain Remote is not programmable. It is permanently set to function as a Information "I" key which can query the Elk Receiver for Status

#### DOUBLE KEY PRESSES

Pressing the Lock and Unlock buttons together momentarily will trigger the event assigned to Key 7. The M1 Default Event Value is "0000" or "No default function".

Pressing the Light and Asterisk buttons together momentarily will trigger the event assigned to Key 8. The M1 Default Event Value is "0000" or "No default function".

# Appendix A - Data Bus Selection Tables

These tables are intended to help visualize how the Wireless Zones and Hardwired Zones share the data bus address assignments. They should help with the setting of a starting zone ID and data bus address(s) to obtain the total and best mix of wireless and hardwired zones. At a minimum, the left column shows the total "max." wireless zones that may be obtained based on the starting zone ID and data bus addresses chosen.

- Each table has a bolded column showing the 1st wireless zone ID at a particular value (associated with a data bus address).

**NOTE: The total (max.) number of wireless zones is decreased by 16 zones for any hardwired expanders installed or enrolled in the range of zones 17 through 160. This is because only zones 17 through 160 can be used for wireless.**

- Decide how many "total" wireless zones might be required for the job. This narrow down which table to concentrate on.
- Consider existing or future M1XIN hardwired zone expanders. The wireless starting zone ID is critical if you want all wireless zones to be sequential with no hardwired zones interspersed between them. The following are some suggested guidelines:
  - If the job needs 16 hardwired zones or less with no plans for expansion then start the first wireless at zone 17 (associated with data bus address 2). This leaves the most room for future wireless expansion all the way up to zone 160.
  - If the job needs lots of hardwired zones and only a handful of wireless zones consider starting the M1XRF at a higher address, leaving room for future hardwired expansion at the lower addresses.
- Select any table below and start from the left column by choosing the total number of wireless zones required. Follow the row of cells across to the bold column displaying the starting zone ID and associated data bus address where you wish to begin.
  - Cells marked with " \* " indicate bus addresses "reserved" exclusively for wireless zones. However, any of these addresses may also be used for a redundant M1XRF Receiver. Redundant Receivers provide additional range and coverage for extremely large or difficult buildings. See Appendix C regarding Redundant Receivers.
  - Cells marked "RRF" indicate bus addresses where ONLY a redundant M1XRF Receiver can be installed.
  - Cells marked "H or RRF" indicate bus addresses where either a M1XIN Hardwired Expander OR a redundant M1XRF Receiver can be installed.

**NOTE: An M1XRF installed for redundancy does not increase the number of wireless zones, it only increases range and/or coverage.**

Total Wireless Zones (max.)	Starting Zn ID #17 Data bus Addr 2 Zn 17-32	Data Bus Addr 3 Zn 33 - 48	Data Bus Addr 4 Zn 49 - 64	Data Bus Addr 5 Zn 65 - 80	Data Bus Addr 6 Zn 81 - 96	Data Bus Addr 7 Zn 97 - 112	Data Bus Addr 8 Zn 113-128	Data Bus Addr 9 Zn 129-144	Data Bus Addr 10 Zn 145-160	No RF Zones Here		
										Data Bus Addr 11 Zn 161-176	Data Bus Addr 12 Zn 177-192	Data Bus Addr 13 Zn 193-208
16		H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
32		**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
48		**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
64		**	**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
80		**	**	**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
96		**	**	**	**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
112		**	**	**	**	**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
128		**	**	**	**	**	**	**	H or RRF	H or RRF	H or RRF	H or RRF
144		**	**	**	**	**	**	**	**	H or RRF	H or RRF	H or RRF

Total Wireless Zones (max.)	Data Bus Addr 2 Zn 17 - 32	Starting Zn ID #33 Data bus Addr 3 Zn 33-48	Data Bus Addr 4 Zn 49 - 64	Data Bus Addr 5 Zn 65 - 80	Data Bus Addr 6 Zn 81 - 96	Data Bus Addr 7 Zn 97 - 112	Data Bus Addr 8 Zn 113-128	Data Bus Addr 9 Zn 129-144	Data Bus Addr 10 Zn 145-160	No RF Zones Here		
										Data Bus Addr 11 Zn 161-176	Data Bus Addr 12 Zn 177-192	Data Bus Addr 13 Zn 193-208
16	H or RRF		H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
32	H or RRF		**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
48	H or RRF		**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
64	H or RRF		**	**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
80	H or RRF		**	**	**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
96	H or RRF		**	**	**	**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
112	H or RRF		**	**	**	**	**	**	H or RRF	H or RRF	H or RRF	H or RRF
128	H or RRF		**	**	**	**	**	**	**	H or RRF	H or RRF	H or RRF

Total Wireless Zones (max.)	Data Bus Addr 2 Zn 17 - 32	Data Bus Addr 3 Zn 33 - 48	Starting Zn ID #49 Data Bus Addr 4 Zn 49 - 64	Data Bus Addr 5 Zn 65 - 80	Data Bus Addr 6 Zn 81 - 96	Data Bus Addr 7 Zn 97 - 112	Data Bus Addr 8 Zn 113-128	Data Bus Addr 9 Zn 129-144	Data Bus Addr 10 Zn 145-160	No RF Zones Here		
										Data Bus Addr 11 Zn 161-176	Data Bus Addr 12 Zn 177-192	Data Bus Addr 13 Zn 193-208
16	H or RRF	H or RRF		H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
32	H or RRF	H or RRF		**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
48	H or RRF	H or RRF		**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
64	H or RRF	H or RRF		**	**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
80	H or RRF	H or RRF		**	**	**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
96	H or RRF	H or RRF		**	**	**	**	**	H or RRF	H or RRF	H or RRF	H or RRF
112	H or RRF	H or RRF		**	**	**	**	**	**	H or RRF	H or RRF	H or RRF

Cells marked " \* " indicate a **Reserved Address** which can only be used for wireless zones.

Cells marked " RRF " indicate bus addresses where ONLY a redundant M1XRF Receiver can be installed.

Cells marked " H or RRF " indicate bus addresses where either a M1XIN Hardwired Expander OR a redundant M1XRF Receiver can be installed.

## Appendix A - Data Bus Selection Tables (cont'd)

Total Wireless Zones (max.)	Data Bus Addr 2 Zn 17 -32	Data Bus Addr 3 Zn 33 - 48	Data Bus Addr 4 Zn 49 - 64	Starting Zn ID #65 Data Bus Addr 5 Zn 65 - 80	Data Bus Addr 6 Zn 81 - 96	Data Bus Addr 7 Zn 97 - 112	Data Bus Addr 8 Zn 113-128	Data Bus Addr 9 Zn 129-144	Data Bus Addr 10 Zn 145-160	No RF Zones Here		
										Data Bus Addr 11 Zn 161-176	Data Bus Addr 12 Zn 177-192	Data Bus Addr 13 Zn 193-208
16	H or RRF	H or RRF	H or RRF	<b>M1XRF</b>	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
32	H or RRF	H or RRF	H or RRF		**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
48	H or RRF	H or RRF	H or RRF		**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
64	H or RRF	H or RRF	H or RRF		**	**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
80	H or RRF	H or RRF	H or RRF		**	**	**	**	H or RRF	H or RRF	H or RRF	H or RRF
96	H or RRF	H or RRF	H or RRF		**	**	**	**	**	H or RRF	H or RRF	H or RRF

Total Wireless Zones (max.)	Data Bus Addr 2 Zn 17 -32	Data Bus Addr 3 Zn 33 - 48	Data Bus Addr 4 Zn 49 - 64	Data Bus Addr 5 Zn 65 - 80	Starting Zn ID #81 Data Bus Addr 6 Zn 81 - 96	Data Bus Addr 7 Zn 97 - 112	Data Bus Addr 8 Zn 113-128	Data Bus Addr 9 Zn 129-144	Data Bus Addr 10 Zn 145-160	No RF Zones Here		
										Data Bus Addr 11 Zn 161-176	Data Bus Addr 12 Zn 177-192	Data Bus Addr 13 Zn 193-208
16	H or RRF	H or RRF	H or RRF	H or RRF	<b>M1XRF</b>	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
32	H or RRF	H or RRF	H or RRF	H or RRF		**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
48	H or RRF	H or RRF	H or RRF	H or RRF		**	**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
64	H or RRF	H or RRF	H or RRF	H or RRF		**	**	**	H or RRF	H or RRF	H or RRF	H or RRF
80	H or RRF	H or RRF	H or RRF	H or RRF		**	**	**	**	H or RRF	H or RRF	H or RRF

Total Wireless Zones (max.)	Data Bus Addr 2 Zn 17 -32	Data Bus Addr 3 Zn 33 - 48	Data Bus Addr 4 Zn 49 - 64	Data Bus Addr 5 Zn 65 - 80	Data Bus Addr 6 Zn 81 - 96	Starting Zn ID #97 Data Bus Addr 7 Zn 97 - 112	Data Bus Addr 8 Zn 113-128	Data Bus Addr 9 Zn 129-144	Data Bus Addr 10 Zn 145-160	No RF Zones Here		
										Data Bus Addr 11 Zn 161-176	Data Bus Addr 12 Zn 177-192	Data Bus Addr 13 Zn 193-208
16	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	<b>M1XRF</b>	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
32	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF		**	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
48	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF		**	**	H or RRF	H or RRF	H or RRF	H or RRF
64	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF		**	**	**	H or RRF	H or RRF	H or RRF

Total Wireless Zones (max.)	Data Bus Addr 2 Zn 17 -32	Data Bus Addr 3 Zn 33 - 48	Data Bus Addr 4 Zn 49 - 64	Data Bus Addr 5 Zn 65 - 80	Data Bus Addr 6 Zn 81 - 96	Data Bus Addr 7 Zn 97 - 112	Starting Zn ID #113 Data Bus Addr 8 Zn 113-128	Data Bus Addr 9 Zn 129-144	Data Bus Addr 10 Zn 145-160	No RF Zones Here		
										Data Bus Addr 11 Zn 161-176	Data Bus Addr 12 Zn 177-192	Data Bus Addr 13 Zn 193-208
16	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	<b>M1XRF</b>	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF
32	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF		**	H or RRF	H or RRF	H or RRF	H or RRF
48	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF		**	**	H or RRF	H or RRF	H or RRF

Total Wireless Zones (max.)	Data Bus Addr 2 Zn 17 -32	Data Bus Addr 3 Zn 33 - 48	Data Bus Addr 4 Zn 49 - 64	Data Bus Addr 5 Zn 65 - 80	Data Bus Addr 6 Zn 81 - 96	Data Bus Addr 7 Zn 97 - 112	Data Bus Addr 8 Zn 113-128	Starting Zn ID #129 Data Bus Addr 9 Zn 129-144	Data Bus Addr 10 Zn 145-160	No RF Zones Here		
										Data Bus Addr 11 Zn 161-176	Data Bus Addr 12 Zn 177-192	Data Bus Addr 13 Zn 193-208
16	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	<b>M1XRF</b>	H or RRF	H or RRF	H or RRF	H or RRF
32	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF		**	H or RRF	H or RRF	H or RRF

Total Wireless Zones (max.)	Data Bus Addr 2 Zn 17 -32	Data Bus Addr 3 Zn 33 - 48	Data Bus Addr 4 Zn 49 - 64	Data Bus Addr 5 Zn 65 - 80	Data Bus Addr 6 Zn 81 - 96	Data Bus Addr 7 Zn 97 - 112	Data Bus Addr 8 Zn 113-128	Data Bus Addr 9 Zn 129-144	Starting Zn ID #145 Data Bus Addr 10 Zn 145-160	No RF Zones Here		
										Data Bus Addr 11 Zn 161-176	Data Bus Addr 12 Zn 177-192	Data Bus Addr 13 Zn 193-208
16	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	H or RRF	<b>M1XRF</b>	H or RRF	H or RRF	H or RRF

Cells marked " \*\*\* " indicate a **Reserved Address** which can only be used for wireless zones.

Cells marked " **RRF** " indicate bus addresses where ONLY a redundant M1XRF Receiver can be installed.

Cells marked " **H or RRF** " indicate bus addresses where either a M1XIN Hardwired Expander OR a redundant M1XRF Receiver can be installed.

## Appendix B - Examples of Zone Configurations

Example A All 208 Zones as Hardwired			Example B 16 Hardwired Zones 144 Wireless Zones			Example C 48 Hardwired Zones 112 Wireless Zones PLUS 2 Redundant Receivers		
Zones 1-16	Bus Addr x	Inputs on Main Panel	Zones 1-16	Bus Addr x	Inputs on Main Panel	Zones 1-16	Bus Addr x	Inputs on Main Panel
Zones 17-32	Bus Addr 2	M1XIN	Zones 17-32	Bus Addr 2	M1XRF	Zones 17-32	Bus Addr 2	M1XIN
Zones 33-48	Bus Addr 3	M1XIN	Zones 33-48	Bus Addr 3	NO M1XIN Expanders on these addresses	Zones 33-48	Bus Addr 3	M1XIN
Zones 49-64	Bus Addr 4	M1XIN	Zones 49-64	Bus Addr 4		Zones 49-64	Bus Addr 4	M1XRF
Zones 65-80	Bus Addr 5	M1XIN	Zones 65-80	Bus Addr 5		Zones 65-80	Bus Addr 5	<----- Redundant M1XRF *
Zones 81-96	Bus Addr 6	M1XIN	Zones 81-96	Bus Addr 6		Zones 81-96	Bus Addr 6	<----- Redundant M1XRF *
Zones 97-112	Bus Addr 7	M1XIN	Zones 97-112	Bus Addr 7		Zones 97-112	Bus Addr 7	NO M1XIN Expanders on these addresses
Zones 113-128	Bus Addr 8	M1XIN	Zones 113-128	Bus Addr 8		Zones 113-128	Bus Addr 8	
Zones 129-144	Bus Addr 9	M1XIN	Zones 129-144	Bus Addr 9		Zones 129-144	Bus Addr 9	
Zones 145-160	Bus Addr 10	M1XIN	Zones 145-160	Bus Addr 10		Zones 145-160	Bus Addr 10	
Zones 161-176	Bus Addr 11	M1XIN	Zones 161-176	Bus Addr 11		Zones 161-176	Bus Addr 11	M1XIN or Redundant M1XRF *
Zones 177-192	Bus Addr 12	M1XIN	Zones 177-192	Bus Addr 12		Zones 177-192	Bus Addr 12	
Zones 193-208	Bus Addr 13	M1XIN or Keypad Zones	Zones 193-208	Bus Addr 13	M1XIN or Keypad Zones	Zones 193-208	Bus Addr 13	M1XIN or Keypad Zones
N/A	Bus Addr 14	N/A	N/A	Bus Addr 14	N/A	N/A	Bus Addr 14	N/A
N/A	Bus Addr 15	N/A	N/A	Bus Addr 15	N/A	N/A	Bus Addr 15	N/A

Maximum of 144 Wireless Zones

Maximum of 112 Wireless Zones

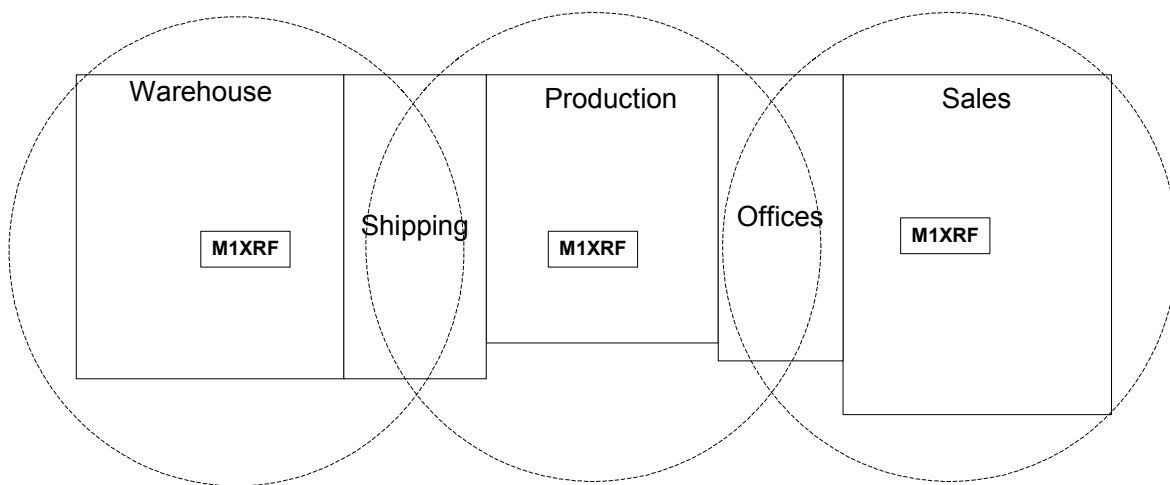


## Appendix C - Installing Multiple Redundant Receivers

After the first M1XRF Receiver has been installed, additional receivers can be installed for redundancy or improved coverage and range. Each additional M1XRF will require its own data bus address and must be enrolled into the control. The data bus address setting of any additional "redundant" M1XRF Receivers can be any unused data bus address except for addresses 13, 14, 15, 16.

**NOTE:** While M1XIN Expanders cannot be assigned to addresses overlapped by wireless zones this is not true for M1XRF Receivers. From the example above, addresses 3, 4, and 5 could be used by additional "redundant" M1XRF Receivers. In theory it is possible to install up to 11 total M1XRF Receivers onto a single M1 or M1EZ8 control, but only if there were NO M1XIN Expanders installed.

\* For large installations or added coverage in areas with poor wireless conditions, additional M1XRF "Redundant" Receivers can be connected to the data bus. Redundant receivers must be addressed and enrolled for proper supervision. Loss of any enrolled bus device causes a Missing Bus Device Trouble. **NOTE:** Redundant M1XRFs can be set to any of the unused addresses that fall in the total wireless zone number assignments.



EXAMPLE OF LARGE COMMERCIAL BUILDING with 3 M1XRF Receivers

## Appendix D - Updating Firmware in the ELK-M1XRF

Operating firmware is stored in "Flash" memory. This state-of-the-art memory allows electronic field updates and eliminates the old fashion method of changing IC chips or shipping boards back to the factory. As new firmware updates become available, they will be posted on ELK's Dealer ONLY restricted website found at [www.elkproducts.com](http://www.elkproducts.com). **NOTE: Firmware updating can only be done through the M1 Control using a Direct to PC Com port connection or an optional Ethernet Network connection. Dial-up connections cannot be used to perform firmware updates.**

### How to Update Firmware:

1. Physically connect the Computer and Control using either the RS-232 Serial Ports or the M1XEP Ethernet Interface.
3. Start ElkRP and open the account belonging to the control. Click on the Connection menu icon and establish a connection. Again, use the appropriate **Direct using Com\_ OR Network** options.
4. Click on Update/Verify Firmware from the Send/Rcv menu icon.
5. On the Update/Verify screen, select the device to be updated. In this case it is a Input Expander. Then also select the "Update to new firmware" option. Then click Continue.
6. The Update Firmware screen displays the device name, the current Firmware, Hardware, and Bootware version, and a pull down window for selecting the firmware version to use on the update. Select the appropriate firmware that you wish to use. **NOTE:** All update (.bin) files that are downloaded or received should be stored in your ~Program Files\ElkRP\Updates directory. This is where RP looks for all update files.
7. Click on the check box for "Update". If "Reprogram" or "Rollback" is displayed the firmware file is the same as OR older that what is in the control. Reprogramming with the same firmware is a waste of time but was included for factory testing purposes. Rollback is not recommended except under the guidance of Elk Technical Support.

