Dado Door Motion and Safety Sensor Setup: The IXIO-DT1

Rev 1.00

This guide is prepared for the IXIO-DT1 Motion Detector used in conjunction with the Dado Door Master Controller.

IXIO is a product manufactured by BEA inc. Portions of the IXIO manual have been copied and used in this guide.

MOUNT

1 SLIDE

2 CLIP

UNMOUNT

"A8"

ASSEMBLY

**Mounts with two screws to surface above
IXIO Mounting Bracket**

Cable

**Radar
Motion
Detector**

IXIO Module

**Screwdriver
access
to
remove
cover**

**Infrared
Safety
Sensor
(AIR)**

"A8"

IXIO Front Cover
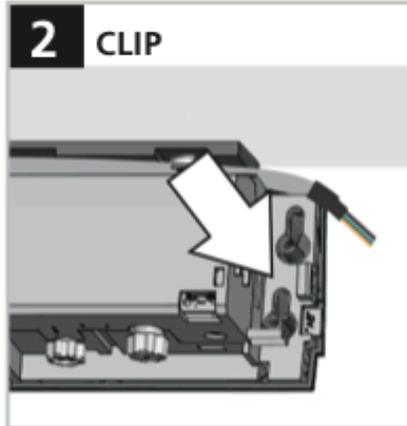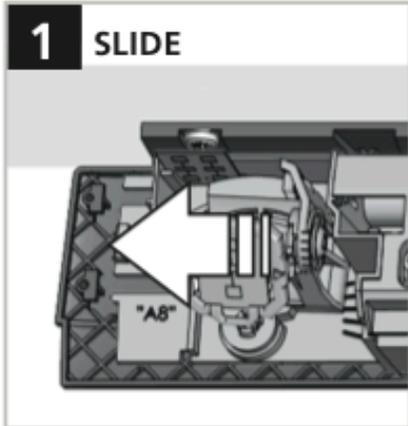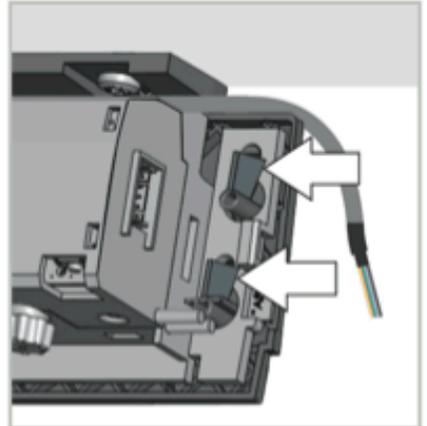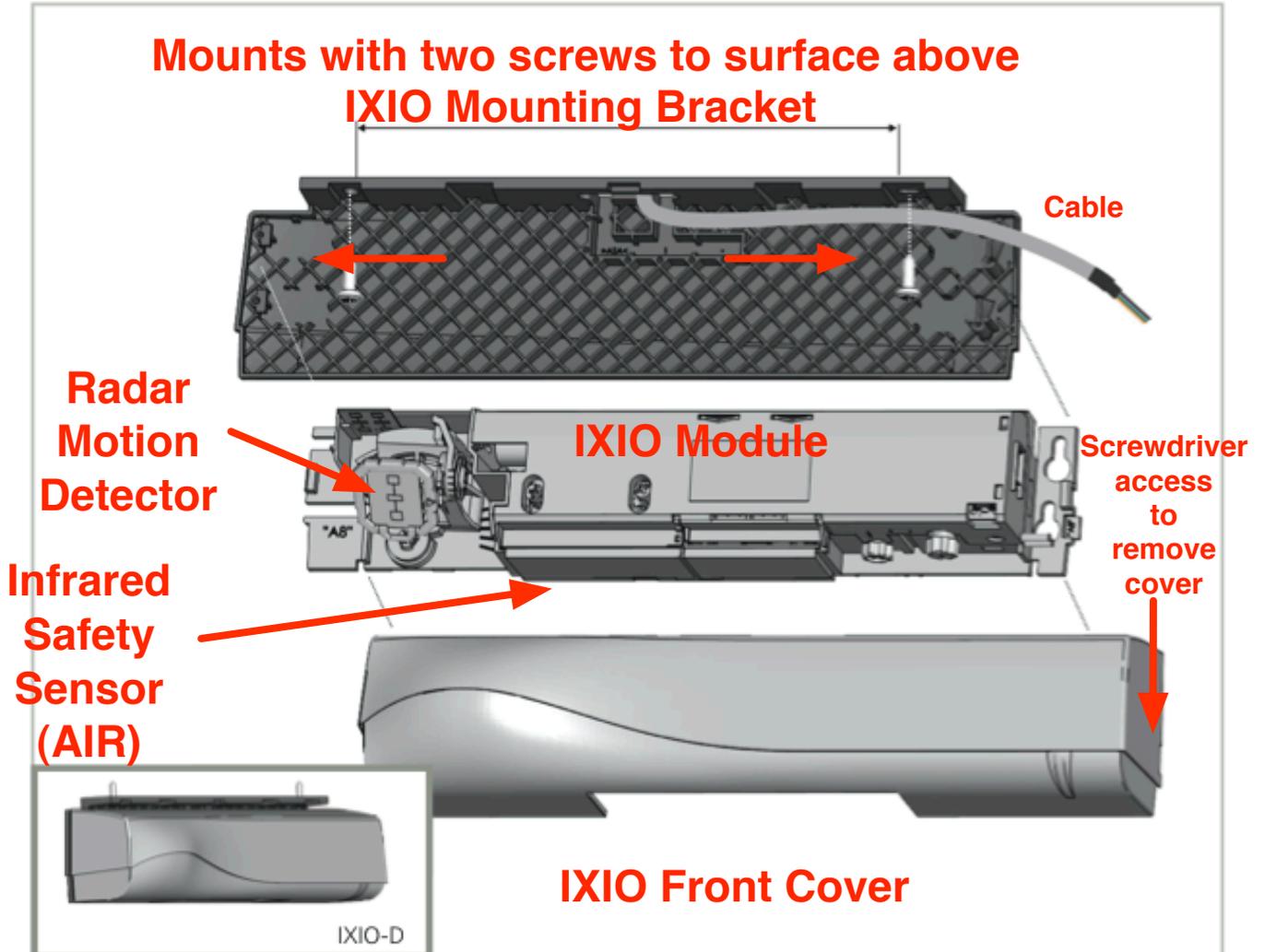
IXIO-D

Getting Started WIth the IXIO

The IXIO sensor device has a plastic cover that snaps off easily with a flat blade screwdriver inserted into a slot on the right hand side of the cover.

On the lower right corner of the IXIO-DT1, there is an LED indicator light. In normal operation, if motion is detected on the Radar, a GREEN LED will turn on solid for several seconds. If the IR Curtain is obstructed, a RED LED will turn on solid for several seconds and remain lit as long as there is an obstruction under the sensor.

Upon powering on the IXIO, the device immediately begins shining an invisible Infrared light across the door opening in two rows of 'spots'. The device then takes a 'snapshot' of the reflections of infrared light coming back to the sensors, and captures the information based on each individual spot intensity. On the IXIO LCD screen, this process is indicated with an image of a camera displayed. This simply means, the device is capturing an image of the reflected infrared information.

After the initial snapshot is taken, any change in the Infrared intensity(something blocking the light) on any of the spots will trigger an output on the device. If an obstruction becomes permanent (for example if a piece of paper falls onto the floor over one of the invisible spots), after an amount of time specified in the PResTime setting the device will recalibrate. On recalibration, the paper that is on the floor is taken into consideration as part of the 'snapshot'.

At any time, the 'snapshot' can be forced manually by pressing and holding the gray thumbwheel button on the lower right of the IXIO 3 seconds. Alternatively, on the IXIO remote control, press UNLOCK, then press the "\" shift key twice to initiate the snapshot.

Installation Overview:

1. Remove the IXIO cover using a flat blade screwdriver.

2. Drill a 3/8" - 1/2" hole in the wall or ceiling for the cable to go through

3. If the IXIO is being attached to a ceiling,drill pilot holes for the two mounting bracket screws used to hold the bracket to the ceiling. Attach the mounting bracket, insure the wire so that it will fit nicely through the hole and into the IXIO module.

4. With the power OFF, attach the wiring from the IXIO to the system. See wiring info.

5. Attach IXIO module onto the mounting bracket.

6. Be sure the floor area under the IXIO is cleared. Power up system.

7. Adjust settings as desired.

The IXIO-DT1 is a Motion Detector/Safety Sensor combo devices. More information is available at www.beainc.com/BEAINC/index.php

Basic Concepts:

A **Motion Detector** is a device that detects a person approaching the door, and automatically opens the door. The Dado Door Master Controller can be configured to automatically close after a number of seconds. The closing delay time is programmed by the user, the range is 0 to 60 seconds. Once the door fully opens, a timer begins to count down the number of seconds programmed in the user settings, and the door will close once the count has been reached. While the door is in motion towards the closed position, if a new motion trigger is detected, the door will come a stop, and retract towards the open position.

A **Safety Sensor** is a device that monitors the path of the door travel for persons or objects blocking the door. If the door is closing, and a person is standing in the path of the door, the safety sensor will detect the person and cause the door to retract. There are several methods of implementing safety sensors. Each method discussed is considered a Light Curtain using Active Infrared Light, and you could think of the array of lights as an invisible Light Curtain.

The light curtain consists of a series of Infrared light beams shine from one side of the door to the other side. The number of light beams varies depending on the device used, but the range may be from 24 to 48 light beams across the door. These infrared light beams are invisible to the eye. If an object or person interrupts one of the light beams, a signal is sent to the Dado Door Master Controller, and the door will retract if the door is closed or is in motion towards the closed position.
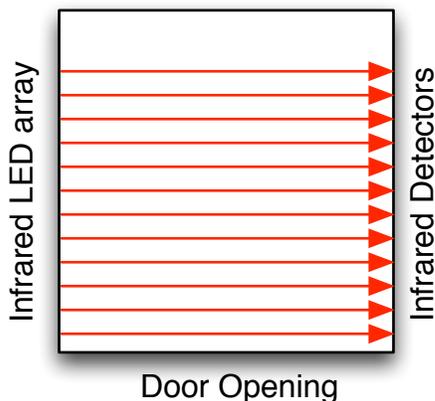
**Side To Side Method of a Light Curtain Array**

Another method of implementing the Light Curtain is to direct the infrared light source from the top of the door to the floor (again in a pattern similar to a curtain). This user guide will focus on the Top Mounted method using the BEAINC IXIO-DT1. In this configuration, since the light source(multiple LED's) are originating from a small region, the pattern looks more like an upside down "V". The light shining onto the floor is really a pattern comprising two rows of 24 'spots'. This method has the light transmitter and receiver elements built into the device, and monitors the IR Light Spots on the floor. The device monitors the spots on the floor, and if any changes occur(one of the light spots is not longer reflecting back to the sender), then the sensor assumes that there is an obstruction and triggers an output back to the Master Controller.

**Motion Detector with Safety Sensor**

Cross Section

Door Opening Front View

Motion Detection

Safety Light Curtain

Floor
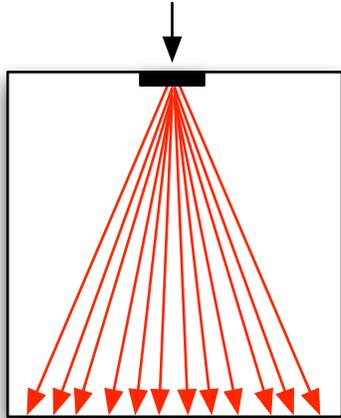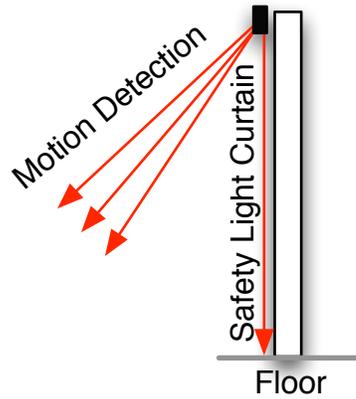
Top Down, Reflective LightCurtain

Optional Sensor 2 Light Pattern hitting the floor, 2 rows of 24 IR "Spots"

Curtain Row 2

Curtain Row 1

Sensor 2

Pocket

Closed Side Jamb

Sliding Door TOP VIEW

Curtain Row 1

Curtain Row 2

Sensor 1

Sensor 1 Light Pattern hitting the floor, 2 rows of 24 IR "Spots"
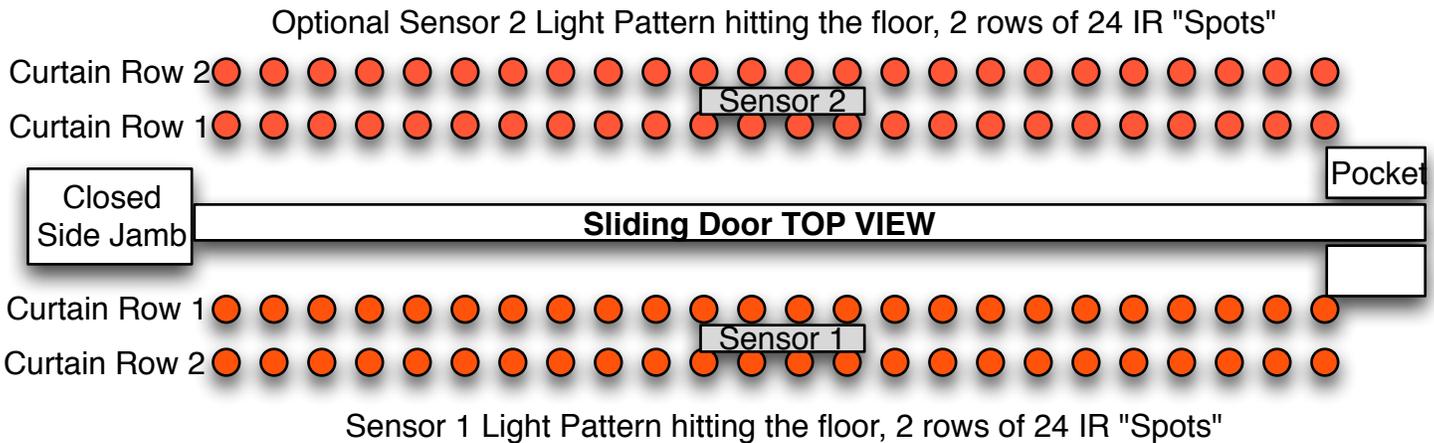
A Motion Detector/Safety Sensor may be used on each side of the door if required. NOTE: The AIR: FREQ setting should be set to 1 on one device, and 2 on the other device when two devices are used on the same door.

To further illustration the concept of spots on the floor, below are images from the IXIO sensor LCD. The IXIO has a built in LCD display for both programming the device as well as monitoring activity. The images below are taken from the IXIO LCD Diagnostics section, AIR SPOTVIEW. This option allows you to view the status of the Light Spots. There are two rows of light curtains. Curtain 1 is the row of spots closest to the automatic sliding door. Curtain 2 is the row next to row 1. An approximate distance between the two rows is 2" to 3".

On this image, the diiagnostics show no obstructions, all fields are clear.
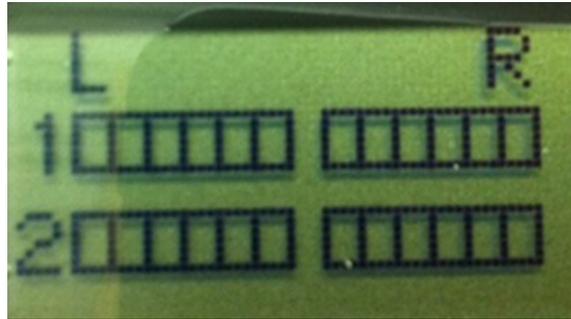
In this image, the diagnostics show an obstruction on several of the center spots.
In this example, a shoe has been placed over one of the regions of row 2,
and the obstruction is observed on the display.
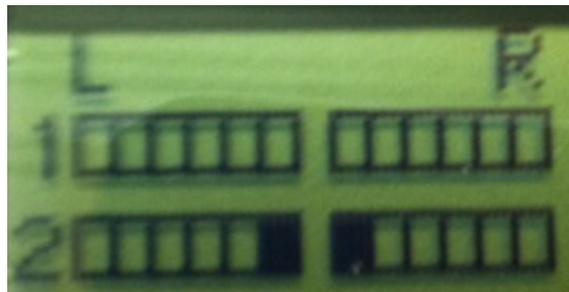
The moment any of the spots are obstructed, the safety sensor sensor sends a signal to the Dado Door Master Controller. The output signal remains active until the obstruction is cleared, or until the AIR: PResTime counter expires.

To enter the IXIO diagnostics, press the gray button the lower right side of the device once, scroll to "More" and press the button, scroll again to "More" and press the button again, then scroll to AIR: SPOTVIEW, then press the button to enter the mode. While in this mode, you can place objects at different points along the floor to see the result on the LCD.

NOTE: If an obstruction is not cleared within the amount of time set in the IXIO AIR: PRESTIME setting, the IXIO device will automatically recalibrate to the compensate for the obstruction. In other words, once the IXIO resets, it will ignore the obstruction and resume normal operation based on the new conditions. The object only has a certain amount of time to be cleared, or the sensor will resume operation. The LCD will display AIR SETUP once the timer is exceeded for PRESTIME, then it will resume operation. Setting the PRESET time longer will provide a better safety margin.

The BEA/IXIO Remote Control

To Change a Setting:

1. Press Unlock
2. Press Icon
3. Press "?"
4. Press the Icon
5. (enter number0-9)
6. Press Lock

Use this sequence
to change settings
from the remote
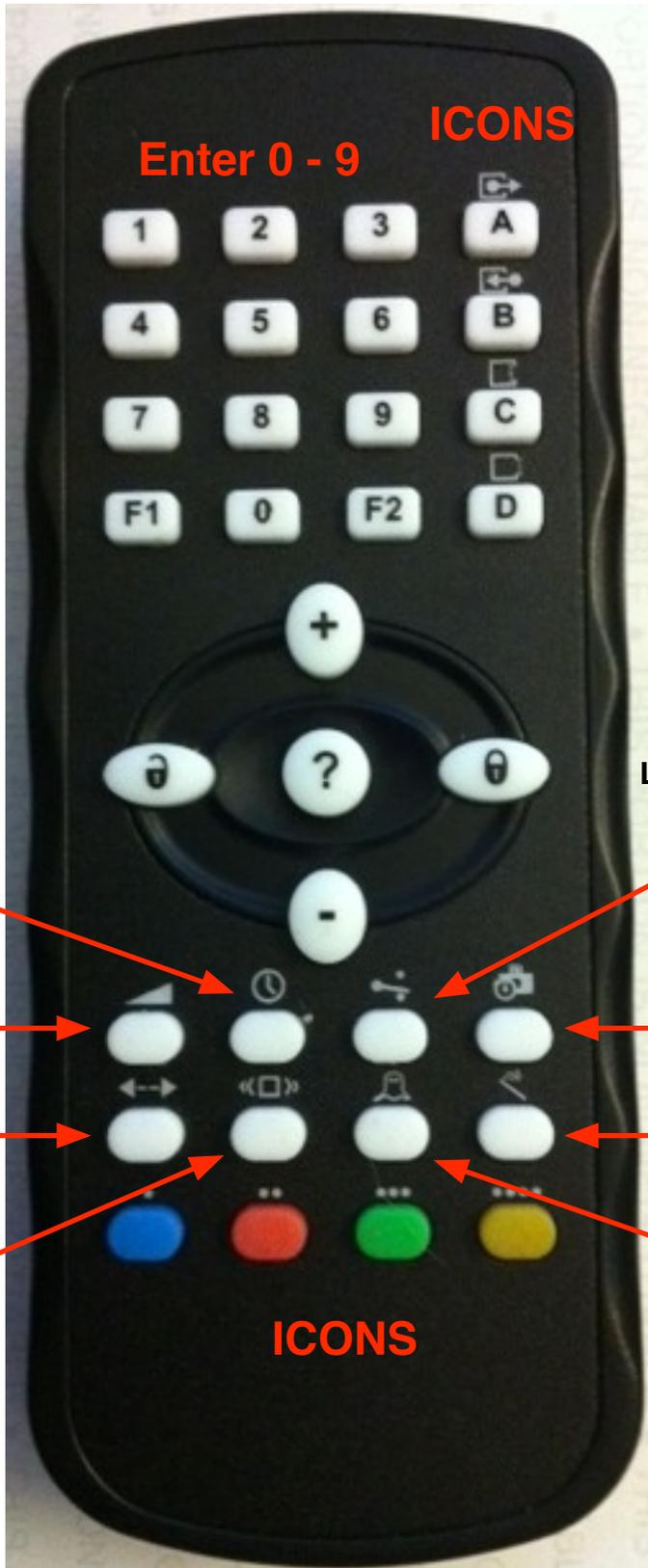
Enter 0 - 9

ICONS

ICON A, B, C, D

A = Test Output
B = AIR: Number
(single spot row
vs. 2 rows)
C = AIR: Width
(Curtain)
D = AIR: Freq(A or
B)

UNLOCK

LOCK

RAD Hold Time

Contact
Output Config

RAD FieldSize

AIR PResTime

RAD Direction

Shift Key

AIR Immunity

RAD FieldSize

ICONS

RAD = Radar Motion
Detection

AIR = Active Infra-Red
Light Curtain

BEA/IXIO-DT1 Remote Control Information
(Optional)

	KEY	USER'S ACTIONS	DEFAULT	LED STATUS
PROGRAMMING GUIDE Cont. UNLOCKING & LOCKING	UNLOCK	Press the UNLOCK key once, then enter your 4-digit code to unlock the Eagle.	0000	The red LED will flash quickly after UNLOCK is pressed once. After entering the valid code, Eagle will flash red LED slowly. If access code is set to the factory default value of 0000, the Eagle will automatically unlock after the UNLOCK key is pressed once. The red LED will immediately begin to slowly flash red.
	LOCK	When all parameters have been set, press the LOCK key once. If you wish to enter a new access code, use the 0-9 number keys and enter the new 4-digit code within 10 seconds. The code must begin with the number 1. If you choose not to enter a new code, press the LOCK key once more, and the existing code will be retained. = Locked with existing code. = Locked with new code that is entered.	0000	After locking, the red LED stops flashing and the sensor will no longer be in a program mode.
	CHECK VALUES	Press the function key that you desire to inquire about, followed by pressing the CHECK VALUES key. After pressing INQUIRY, count the number of LED flashes – this corresponds to the setting. EXAMPLE: 7 = Default sensitivity value		After pressing a function button, the red LED flashes quickly. After pressing the CHECK VALUES key, the LED flashes the number of the current setting. No LED flash will indicate a setting of 0.

The screenshot above is from the BEA Remote Control Users Guide. To view or change settings on the IXIO-DT1 using the remote control, it is advised to keep the passcode at the default value of 0000.

To view a setting or change a setting, aim the remote control at the IXIO device:

1. Press the **UNLOCK** button once. 2. Press the **Icon** associated with the setting you want to change. 3. Press the **"?"** button. The value of that Icon setting will be displayed on the IXIO LCD. The Icon settings are explained on the next page.

To change a value for the setting currently displayed:
1. Press the Icon again for the setting 2. Press one of the numbers on the remote(0-9). The number you pressed will become the new setting. To change to a different value, repeat the two steps again. When done, press the LOCK button to save and exit the IXIO setup menu.

From IXIO-DT1 Users Guide:
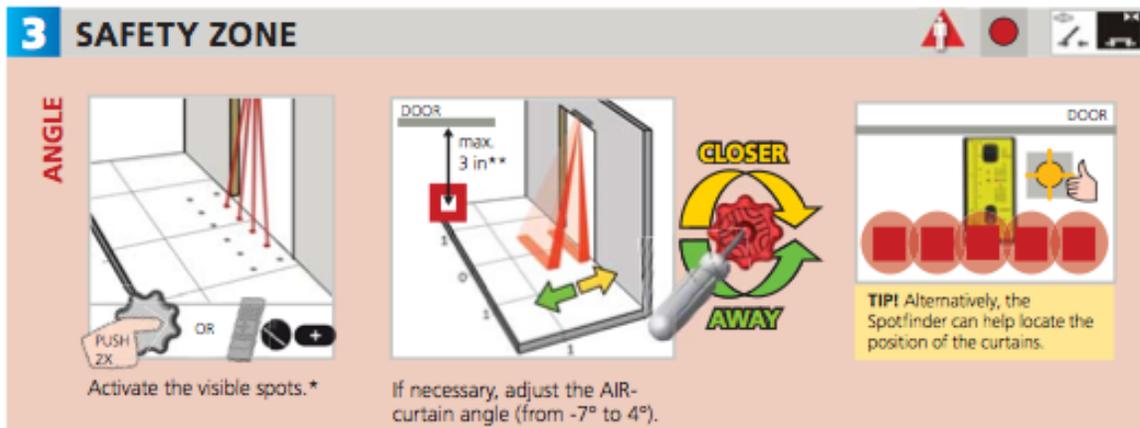
Active Infrared (AIR) Light Curtain

As described above, on the lower right of the IXIO module, there is a red plastic knob that can be turned either by hand or with a screwdriver. This adjustment allows the Light Curtains to be moved closer to the door, or away from the door. There is an option to temporarily produce 4 visible red lights onto the floor for purposes of adjustment. To turn on the flashing red lights, simply double tap the gray button on the lower right side of the device. To turn off the flashing red light, double tap the gray button again. To turn on the visible red lights using the remote, press the Unlock key, then the "\" key followed by the "+" key. When done, press the "\" key followed by the "+" key then press the Lock key.

Adjusting the IXIO Light Curtain Width

WIDTH

The arrow position determines the width of the detection field.

TIP! Always remember to also adjust the width via the LCD or remote control (see p. 5)

Always verify the actual detection field width with this user's guide and not the Spotfinder, which detects the whole emitted field.
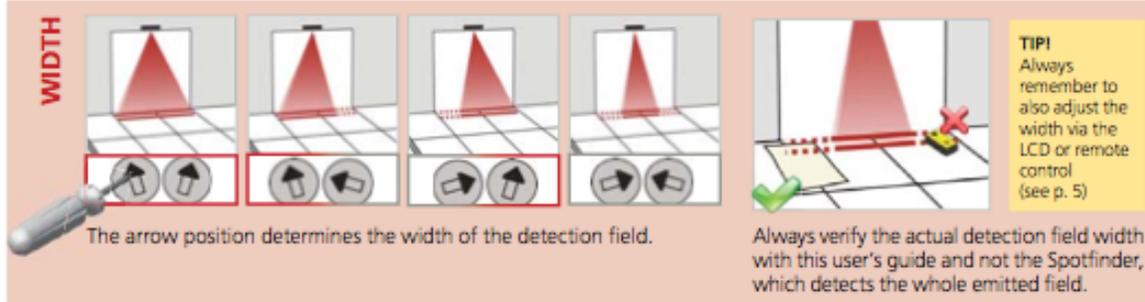
There are two adjustments that allow the safety sensor light array to be 'masked' off as needed for different size doors. The IXIO Users Guide illustration above shows the effect of turning the arrows with a screwdriver
to reduce the visible region on the floor that the sensor will monitor. The screwdriver adjustment is
actually affecting a physical mask on the device. It is important to also change the AIR: WIDTH
setting in the IXIO settings menu to correspond with the physical mask. The default configuration is for WIDE.

L   Sliding Door   R

Left Side Light Curtain Spot Pattern WIDE

Right Side Light Curtain Spot Pattern WIDE

Left Side Light Curtain Spot Pattern NARROW

Right Side Light Curtain Spot Pattern NARROW
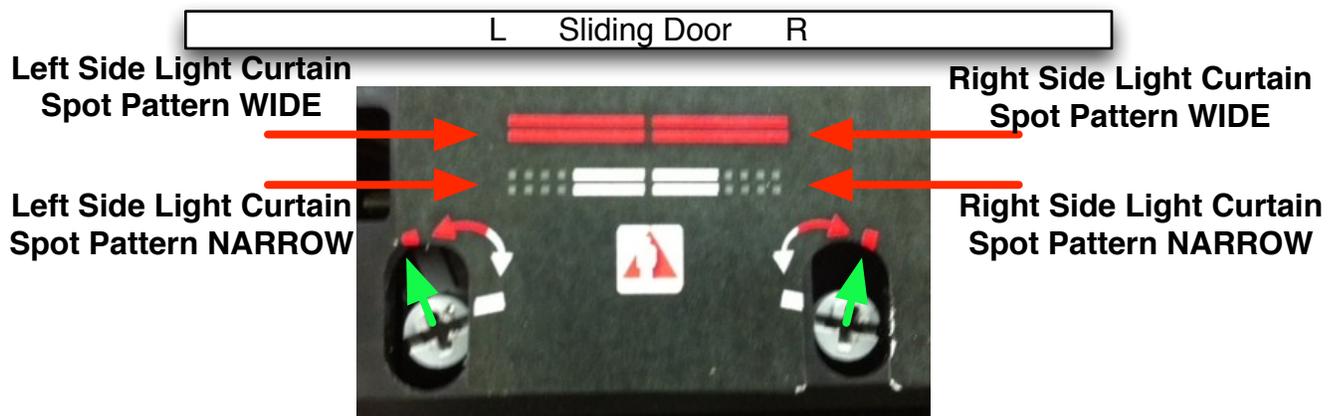

Image of the IXIO physical light curtain 'mask' adjustments shown in gray. Each of the adjustments has a small arrow on it to indicate where the adjustment is pointing. The plastic adjustments will only rotate 90 degrees starting at the white mark moving towards the red mark. Green arrows have been added for illustration showing the mask set to WIDE on both
the left and right curtain.

IXIO DT1 Settings
RAD is Radar Motion Detection
AIR is Active Infra-Red Safety Sensor

Section 1 — BASIC

Setting	0	1	2	3	4	5	6	7	8	9	Notes
RAD: FIELDSIZE	small	>	>	>	>	>	>	**>**	>	large	
AIR: WIDTH	⊞	⊧					⊧	⊧			Always additionally adjust the arrow position on the sensor with a screwdriver.
AIR: OUTPUT *		NO/NC	NC/NO	NC/NC	**NO/NO**						NO: normally open NC: normally closed
TEST *	**off**	on									

Section 2 — ALL

Setting	0	1	2	3	4	5	6	7	8	9	Notes
RAD: FIELDSIZE	small	>	>	>	>	>	>	**>**	>	large	
RAD: IMMUNITY		low	**>**	>	>	>	>	>	high		
RAD: DIRECTION		bi	uni	**MTF**							bi: bi-directional detection (towards & away) uni: unidirectional detection towards sensor MTF: uni with Motion Tracking Feature
RAD: HOLDTIME	0.5 s	1 s	2 s	3 s	4 s	5 s	6 s	7 s	8 s	9 s	
RAD: REENTRY	**small**	>	>	>	>	>	>	>	large		
RAD: OUTPUT *		NO/NC	NC/NO	NC/NC	**NO/NO**						NO: normally open NC: normally closed
AIR: IMMUNITY		**normal**	enhanced								
AIR: WIDTH	⊞	⊧					⊧	⊧			Always remember to also adjust the arrow position on the sensor with a screwdriver.
AIR: NUMBER	service mode	1	**2**								Service Mode = no IR detection during 15 minutes (maintenance).
AIR: PRESTIME			30 s	1 min	2 min	5 min	10 min	20 min	60 min	∞	
AIR: FREQ		**A**	B								Sensors mounted close to each other should have a different frequency.
AIR: OUTPUT *		NO/NC	NC/NO	NC/NC	**NO/NO**						NO: normally open NC: normally closed
TEST *	**off**	on									
REDIRECTION	**motion**	motion or presence									activation output is active in case of: 0 motion detection 1 motion or presence detection
FACTORYRST	restore to factory values										

IXIO-DT1 Diagnostic Settings

NOTE: The COLUMN NUMBER at the top is the number shown on the LCD, and is the number used for viewing and entering the value for each setting.

Section 3

*The SPOTVIEW is useful to test the area of active spots on the floor.

Default Settings for the IXIO-DT1 for use with the Dado Door system are listed below.

RAD settings are for the Radar motion detector sensor.
AIR settings are for the Active Infrared safety sensor.

RAD Field Size (7)   ***set the size of the motion detection field
RAD Immunity (3)   set the amount of the immunity from interference if needed
RAD Direction MTF (3)   detect motion towards the device, away from, etc
RAD Holdtime   .5s (0)   how long the contact is closed on detection
RAD Reentry   (0) Small
RAD Output   (4) Normally Open Contact

AIR Immunity (1) normal
AIR Width   (0) Wide
AIR Number (2)   Number of total active rows of curtains
AIR PResTime   (3)   1 Minute before recalibration
AIR Freq   (1)   * frequency of IR Light pulses. Using two devices, one should be on
            1 and the other on 2 to avoid conflicts**
AIR Output   (4)   Normally Open Contact.

Test   test the device using the remote control to close the contacts
Redirection   Both AIR output AND RADAR output are using the same CONTACT(wires)
Factory Reset   Reset all back to the factory settings

*** These are settings that may be adjusted. Do not adjust other settings without consulting
Dado Door.

**RAD Field Size   This setting adjusts how wide the Radar Motion Detector picks up
motion.**

**AIR Frequency This is used to set two devices to unique frequencies(when two
modules are used on a single door).**

UNI-DIRECTIONAL MODE WITH MTF:

Automatically switches from Uni to Bi directional upon a motion moving towards
the sensor.

WIRING INFO:

The IXIO module has a cable included that has a number of wires. Be sure the power is turned off before making or changing any connections.

RED = 12VDC
BLACK = GROUND

GREEN =   Radar Motion Detection Contact A*
WHITE = Radar Motion Detection Contact B*

BROWN =   AIR Safety Curtain Contact A**
BLUE = AIR Safety Curtain Contact B**

The IXIO has an option in the menu to combine the Radar motion detection contacts with the AIR Safety Curtain contacts.   Consult Dado Door for your specific wiring configuration.

*It should not make any difference if the Green and White wires are connected in reverse.

**It should not make any difference if the Green and White wires are connected in reverse.

***If using one motion sensor module only, typically the device will connect to input 1 on the AUX IO terminal block. If using two modules, the second module will connect to input 2 on the AUX IO terminal block. Be sure to confirm with Dado Door BEFORE making connections to confirm the input configuration.

Connecting to the Dado Door Master Controller:
Typically, when the IXIO Motion Detector is used with the Dado Door Master Controller, an additional part will be supplied with the controller called the AUX IO. This is a small circuit board that will reside outside of the Master Controller. It is connected to the AUXIO port on the Dado Door Master via a short CAT5 cable wired "straight through". Do NOT use internet cables, as these are wired with some connections crossed over in the cable. This may cause damage to the Master Controller or IXIO sensor. Consult Dado Door before making any connections.

On the AUXIO board, there is a 5VDC screw terminal. Route the 5VDC to one of the contacts on the IXIO, then route the other side of the contact to the appropriate AUX INPUT(1-4). Please consult Dado Door before making any connections.