NVX80

High End Motion Detector with Anti-Mask for Indoor/Outdoor Use V1.02

Reference and Installation Manual

PARADOX™

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NVX80-EI00

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Introduction

The NVX80 motion detector is suitable for harsh indoor and inclement outdoor environments. The detector boasts a blend of active IR and microwave anti-masking technologies.

Features

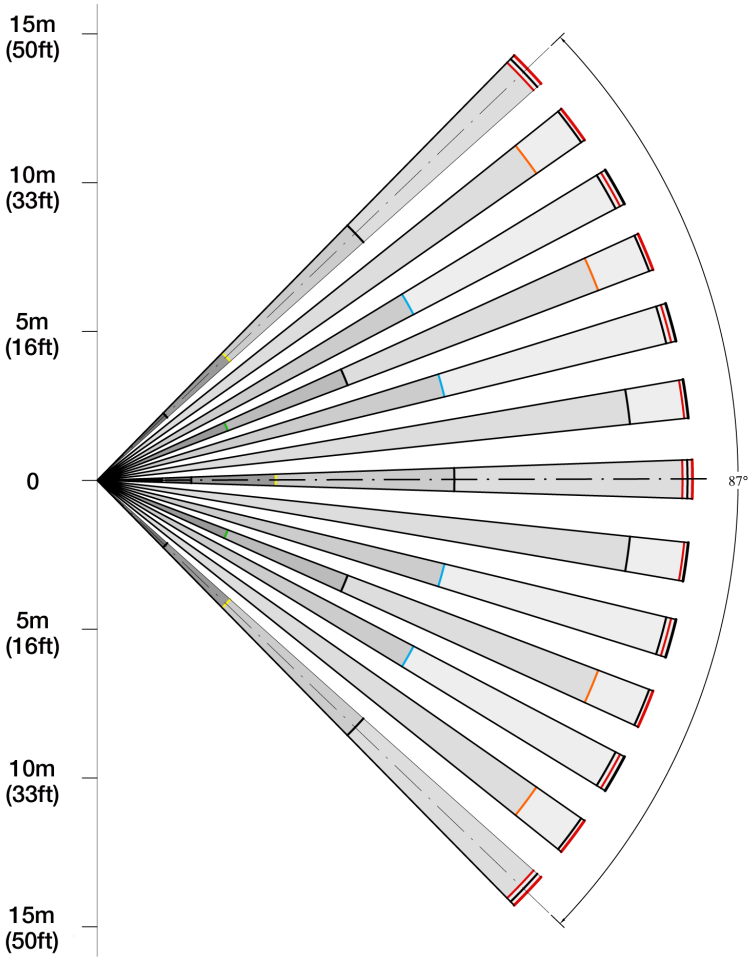
- Paradox Active IR anti-mask recognizes the degradation of lens clarity and objects blocking the main lens within 30 cm of the detector
- 8 detection channels
  - 2x Quad PIR for short to long range detection (4 channels)
  - 1x Independent Quad PIR for Creep Zone Detection (2 channels)
  - 1x 2- Active MW antenna (2 channels)
- MW Anti-mask allows for detection of close proximity movements (0.75 m - 2 m / 2.4 ft - 6.5 ft) – this close proximity range is adjustable
- Paradox's proven Pet Immunity active for false alarm rejection in the short and medium detection ranges
  (note: Creep Zone detection neutralized)
- 3rd generation Paradox digital detection technology delivering improved detection and false alarm rejection
- 15 m x 15 m / 50 ft x 50 ft coverage – refer to beam pattern for details (see page 4)
- 3 m x 3 m / 10 ft x 10 ft Creep Zone protection - refer to beam pattern for details (see page 4)
- Easy Slide installation
- Color OLED display featuring menu-driven, intuitive screens
- Comprehensive diagnostics: individual testing for PIR, MW and anti-mask technologies
- SoloTest™ for easy walk test execution
- 3 configurable relay outputs – these outputs are also reported by the Digiplex EVO bus
- Sleek, vandal-resistant design and tough construction

Coming Soon

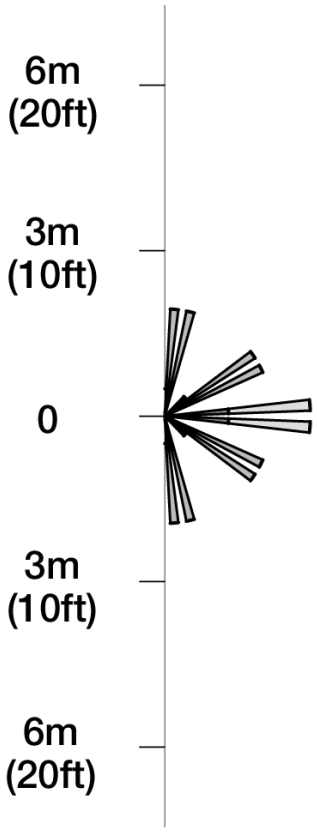
- SeeTru Technology that neutralizes cloaking efforts
- Sway Detection
- Range Filtering

Beam Patterns

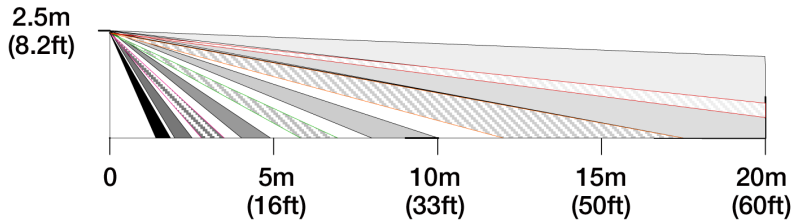
TOP VIEW (short to long range)



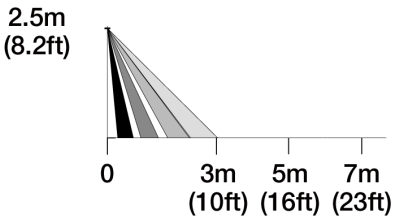
TOP VIEW (Creep Zone)



SIDE VIEW (short to long range)



SIDE VIEW (Creep Zone)

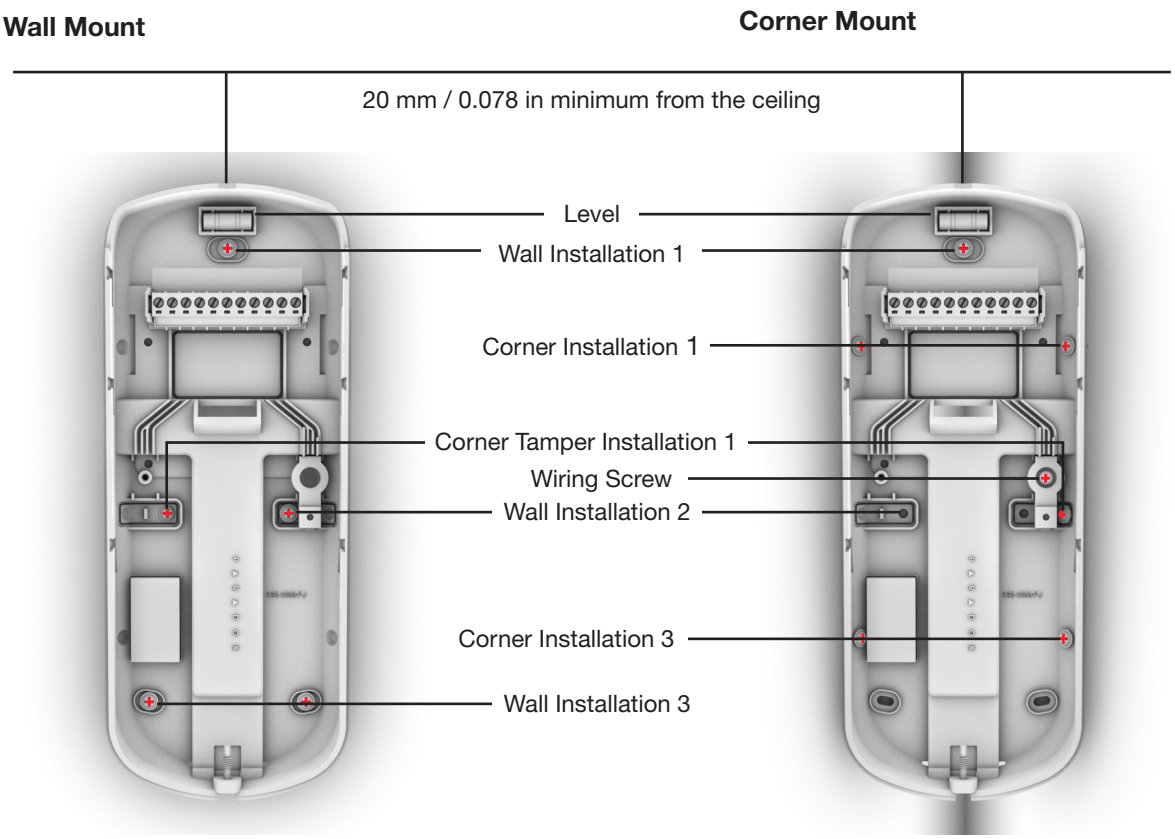


Technical Specifications

Coverage Pattern	90°
Installation Height	Minimum 2.5 m / 8 ft - Maximum 3.0 m / 10 ft
Operating Voltage	9-16 VDC
Electrical Current Consumption (at 12v)	Max = 100 mA Idle = 75 mA
Relay 1 Contact	1A 24 VDC
Relay 2 and 3 Contact	150 mA / 24 VDC
Alarm Time	3 sec minimum
Power Up Time	Approximately 30 seconds
Display	OLED, full color, 96 x 64 pixels
Dimensions	9.8 cm x 22.9 cm x 9.2 cm (3.8 in x 9.0 in x 3.6 in)
Weight	520 gr / 1.1 lbs
Construction Materials	ASA UV Resistant
Tamper Positioning	Cover and Wall
RF Immunity	20 V/m up to 2.7 GHz
Operating Temperature	-35° to 60° C / -31° to 140° F
Bus Connection	EVO192 panel
Certification	EN 50131/Grade 3 (pending), IP55 (pending)
Anti-Mask	IR anti-mask: detects lens obstruction and movement detected within range of 0 - 1 m IR anti-mask: detects an object 0 - 30 cm
Pet Immunity	Increases false alarm rejection, settings for small and large pets
Language	English
Accessories	All Weather Cover Swivel Bracket
Coverage	15 m x 15 m (50 ft x 50 ft) with 3 m x 3 m (10 ft x 10 ft) down-looking creep zone

Installation

Legend



Installation Steps

1. Loosen the tamper screw found at the bottom of the unit
2. Separate the back cover from the unit by sliding the back of the unit down and off
3. Drill or punch out the appropriate knock-out holes for either a wall or corner installation, refer to the installation legend above
4. Make sure to allow for 20 mm / 0.78 in of space between the top of the unit and a ceiling or object found above it
5. Mark your selected location using the back cover of the unit as a template
6. Drill holes into the wall surface
7. Thread the wires through the wire entry hole. To connect the Digiplex bus, attach the red, black, green and yellows to their respective locations
8. Secure the back cover of the unit to the wall surface using mounting screws appropriate for the specific installation
9. Slide the front section of the unit into place on the back cover of the unit. If the wires are connected to electricity, then the power up sequence will automatically start
10. Ensure that the outer rim of the unit is tightly joined, so that waterproof casing is not compromised
11. While the tamper screw at the bottom of the unit is open, begin the power up process and access the menus to change any sensitivity or other settings, then save the altered settings
12. Tightly close the tamper screw found at the bottom of unit and put the detector into operation mode

Installation Do's & Don'ts

Do

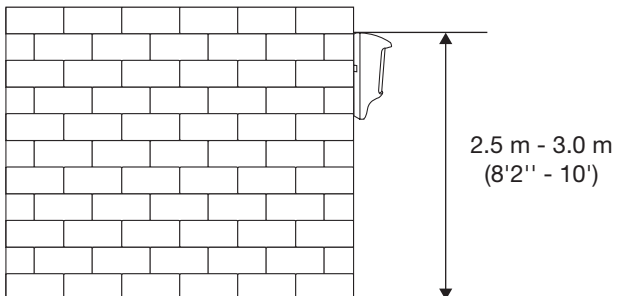
- Do ensure that the unit's detection beams are perpendicular to the anticipated movement
- Keep a minimum distance between adjoining NVX80 detectors to prevent MW cross interference, see the beam pattern diagram (see page 4)
- Do place the unit under a roof, or awning or use our all-weather cover, during an outdoor installation
- Do install the detector within the suggested range: installing the unit lower than 2.5 m / 8 ft 2 in may compromise the Pet Immunity capability, installing over 3.0 m / 9 ft 8 in may require use of our swivel bracket adjusted downward shifting the Pet Immunity beam and neutralizing the creep zone. Installing the unit over 3.0 m / 10 ft does not affect the creep zone.

Don't

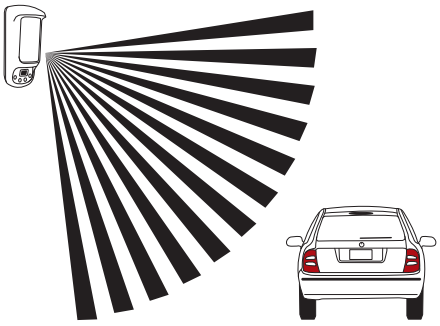
- Don't direct the unit's beams into swaying trees or bushes
- Don't place the detector facing direct sunlight or near a heat source, as it might interfere with the Active IR anti-mask feature
- Don't place any objects, such as shelves, ledges or plants, below the unit
- Don't place any reflective objects within 2 m / 6 ft 6 in of the unit, as this may interfere with the MW anti-mask capabilities

Mounting Considerations

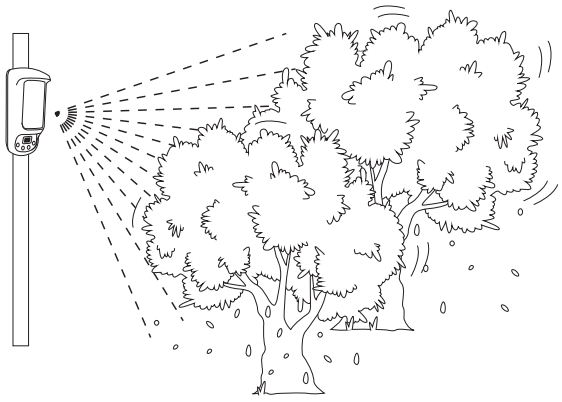
The optimal installation height for the NVX80 is 2.5 m to 3.0 m (8 ft 2 in to 10 ft).



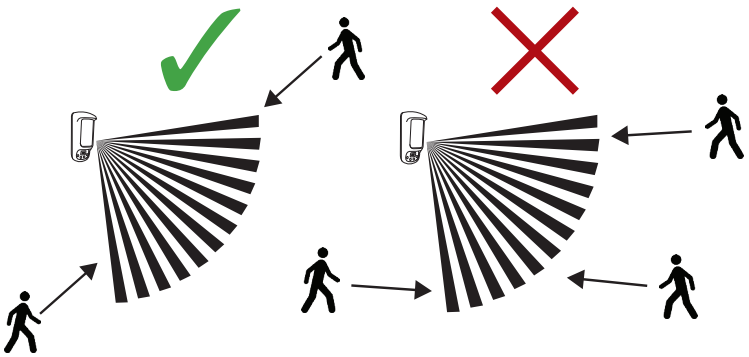
If the installation site is near heavy traffic or objects beyond the required detection range, adjust the MW sensitivity and/or tilt the detector down.



Avoid installing the detector near moving objects (e.g., swaying trees, bushes, etc.).

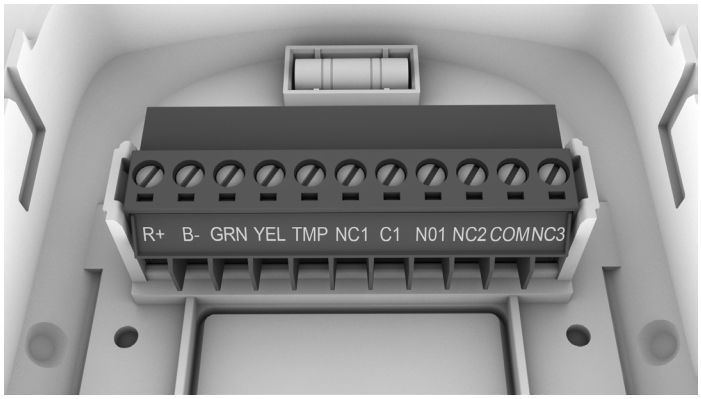


In order to maximize detection efficiency, choose a location that is most likely to intercept intruders moving across the coverage area at a 45 degree angle.



Connecting to the Bus

Connecting to the Digiplex bus is quite straight forward. The red, black, green and yellow wires must be placed into the red, black, green and yellow slots, respectively.



Menus

Menu-Driven Settings and Configuration

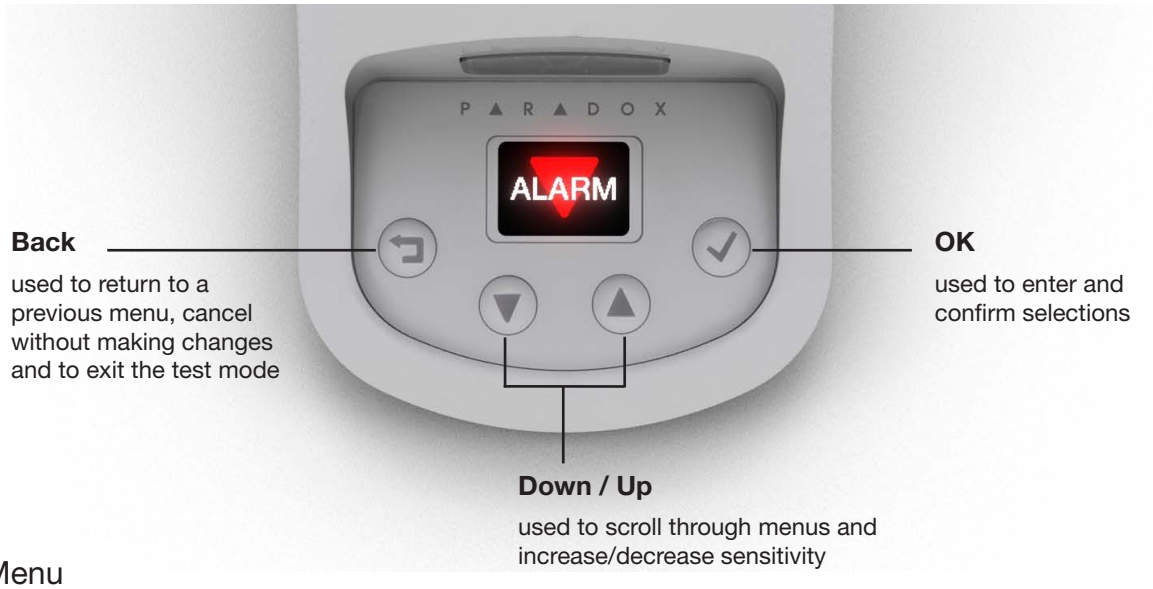
The NVX80 introduces a unique 4-button interface and full-color OLED display screen. The NVX80 is completely menu-driven, making programming and configuration simple. There are no jumpers, trimmers or complex wiring to contend with.

The OLED screen displays a variety of icons which indicate the current state of the detector. Alarm, pre-alarm, and anti-mask events as well as notifications are displayed on the OLED. The menus provide direct control of the detector's operation, the sensitivity level settings, display characteristics and more.

To protect against malicious activity, the NVX80's menus and button interface are active only when the tamper screw at the bottom of the unit is open. The menus and button interface become functional only after a tamper event is issued.

Installation specific settings can be saved and restored if altered. Settings can also be reset to factory defaults, all with the push of a button.

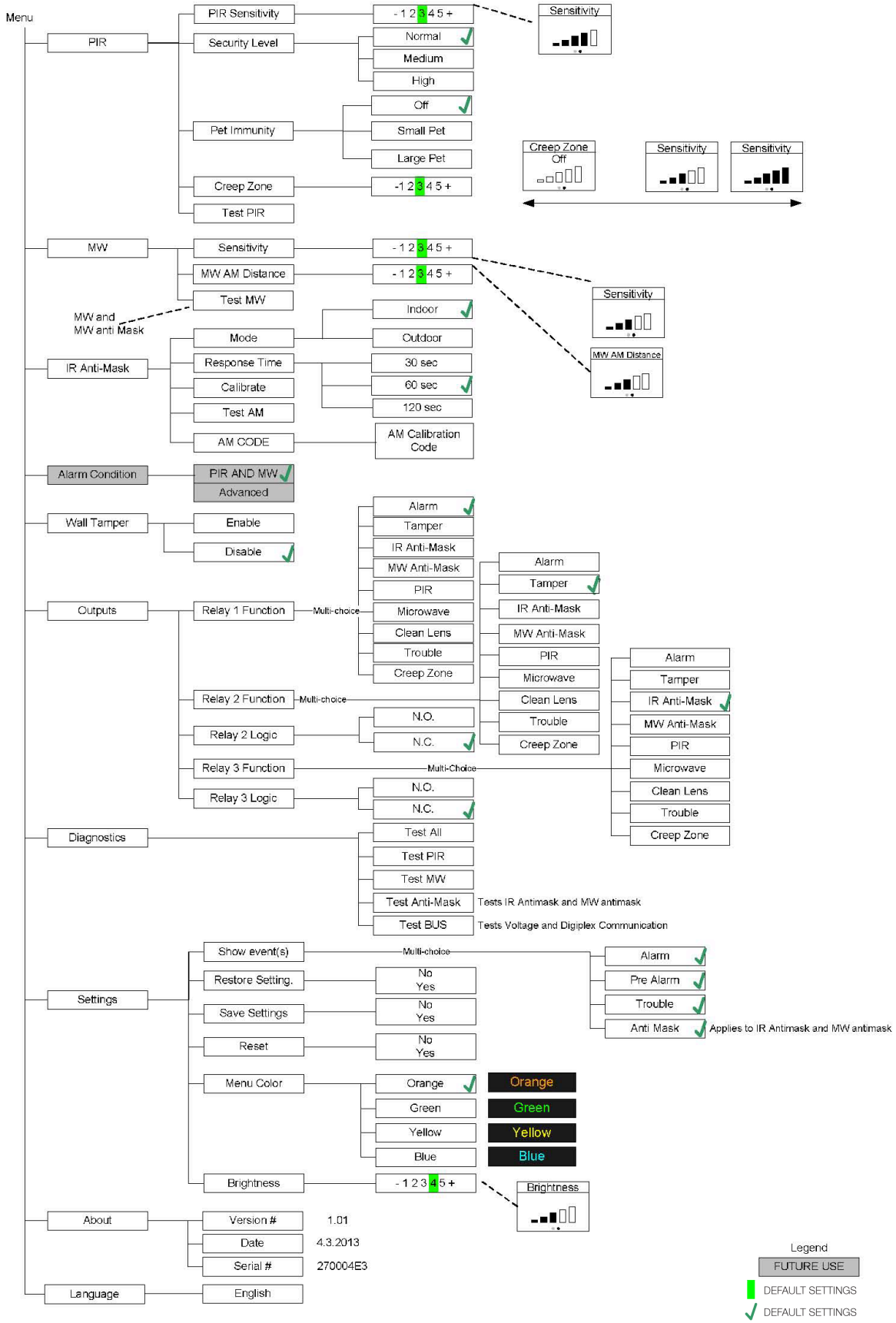
The following items are included in the NVX80 main menu: PIR, Microwave, Anti-Mask, Alarm Condition, Input, Output, Diagnostics, Settings, About and Language. Via the menu these features can be activated, sensitivities set and tested, input and outputs can be defined and product information can be viewed.



Main Menu

PIR	Set and test PIR modes and sensitivity
Microwave (MW)	Set and test MW sensitivity and MW anti-mask
IR Anti-Mask	Set, calibrate and test anti-mask function
Alarm Condition	Set the combination logic of PIR and MW Currently supports only PIR and MW
Wall Tamper	Control tamper input settings
Outputs	Define functionality of the relays
Diagnostics	Test the detectors settings and bus operation
Settings	Control display options, enable/disable notifications, save, restore or reset settings to factory defaults
About	Shows the detectors firmware version, serial number and BUS zone number
Language	Currently English only

Menu Tree


Menu
PIR
PIR Sensitivity
- 1 2 3 4 5 +
Sensitivity
Security Level
Normal
Medium
High
Pet Immunity
Off
Small Pet
Large Pet
Creep Zone
Off
Sensitivity
Sensitivity
-1 2 3 4 5 +
Test PIR
MW
Sensitivity
- 1 2 3 4 5 +
MW AM Distance
- 1 2 3 4 5 +
Test MW
MW and MW anti Mask
Indoor
Outdoor
Mode
IR Anti-Mask
Response Time
30 sec
60 sec
120 sec
Calibrate
Test AM
AM CODE
AM Calibration Code
Alarm Condition
PIR AND MW
Advanced
Wall Tamper
Enable
Disable
Outputs
Relay 1 Function
Multi-choice
Alarm
Tamper
IR Anti-Mask
MW Anti-Mask
PIR
Microwave
Clean Lens
Trouble
Creep Zone
Relay 2 Function
Multi-choice
Relay 2 Logic
N.O.
N.C.
Relay 3 Function
Multi-Choice
Relay 3 Logic
N.O.
N.C.
Diagnostics
Test All
Test PIR
Test MW
Test Anti-Mask
Tests IR Antimask and MW antimask
Test BUS
Tests Voltage and Digiplex Communication
Settings
Show event(s)
Multi-choice
Alarm
Pre Alarm
Trouble
Anti Mask
Applies to IR Antimask and MW antimask
Restore Setting.
No
Yes
Save Settings
No
Yes
Reset
No
Yes
Menu Color
Orange
Green
Yellow
Blue
Brightness
- 1 2 3 4 5 +
About
Version #
1.01
Date
4.3.2013
Serial #
270004E3
Language
English
Legend
FUTURE USE
DEFAULT SETTINGS
DEFAULT SETTINGS

Outputs and Wall Tamper In (Input)

The NVX80 has 3 outputs and 1 input, called Wall Tamper In. The outputs menu also controls zones to 4 in the Digiplex communication. The outputs can be used to define the relay functionality, and the input is used to control the tamper input settings.

Wall Tamper In

Tamper Input	Choose this option to receive TAMPER events from the wall tamper switch. Install the wall tamper switch and wire it to between the BLK and TMP inputs on the terminal connector.
Disable	Disable events from the tamper terminal input.

Outputs Menu

Relay 1 Function	Form C relay / N.C. and N.O. terminal outputs Select events from a list to activate this relay
Relay 2 Function	Relay 2 is a solid state relay Select events from a list to activate this relay
Relay 2 Logic	Select N.C. or N.O. (Remember: Relay 2 will open when power is lost)
Relay 3 Function	Relay 3 is a solid state relay Select events from a list to activate this relay
Relay 3 Logic	Select N.C. or N.O. (Remember: Relay 3 will open when power is lost)

Relay Defaults

	Relay 1	Relay 2	Relay 3
Alarm	✓		
Tamper			✓
Anti-Mask		✓	
MW Anti-Mask			
PIR			
Microwave			
Clean Lens		✓	
Trouble			
Creep Zone			

Power Up

When the detector is first powered, it will display the power up sequence which indicates the various self-diagnostics it completes including; hardware, PIR, MW, Anti-mask, panel connection, bus voltage and tamper. The power up sequence should take approximately 30 seconds. If the unit does not successfully complete the power up sequence it displays a trouble icon signifying a potential problem with the installation.

Settings

Show Event(s)	Select the events to be displayed on the OLED Note: Selection do not affect the operation, only the display Alarm - Alarms are shown Pre Alarms - Pre Alarms (MW, PIR, Creep) are shown Trouble - Trouble events are shown Anti-Mask - Anti-mask events
Restore Settings	Restore detector settings that were previously stored by “Save Settings” option
Save Settings	Save detector settings
Reset	Reset all detector settings to factory defaults
Menu Color	Select menu color for better visibility and fun!
Brightness	Select the general brightness of indications Note: The menu is always shown on maximal brightness except for the brightness screen which demonstrates the chosen brightness

Installation specific settings can be ***saved*** and ***restored*** if altered. Settings can also be reset to factory defaults, all with the push of a button. Setting changes occur once the “OK” button is pushed. Changes will not be saved if the “back” button is pushed.

Diagnostics

Diagnostics Menu	Action
Test All	Tests all detection functions Shows PIR, MW and Anti-Mask notifications The blue frame does not appear in this mode
Test PIR	Tests PIR detection Shows PIR detection and Creep Alarm
Test MW	Tests and shows MW and MW anti-mask detection
Test Anti-Mask	Tests Active IR and MW The blue frame does not appear in this mode
Test Bus	Tests voltage and Digiplex communications Shows the measured bus voltage Shows the status of data and clk lines Ok for valid connection N/A for no connection or invalid operation

Use the built-in diagnostics to pinpoint troublesome installations. Test the NVX80 detector settings and bus operation.

The Test Bus option will test the bus voltage and Digiplex connection, by checking the status of data and clk lines reporting no connection or invalid operation.

You can test the PIR, MW and Anti-Mask functionality separately or as a group.

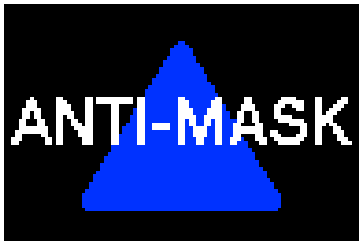
Anti-Masking

IR Anti-Masking Menu	Action
Mode	Select sensitivity to environmental conditions: indoor for high sensitivity or outdoor for reduced sensitivity
Response Time	Choose from 30, 60, 120 seconds to define as the detection time required until an anti-mask event is triggered A blue frame appears 3-5 seconds after masking starts and an anti-mask event is triggered after the selected time frame has passed
Calibrate	Initiate an anti-mask calibration process
Test AM	Test the anti-mask functionality
AM Code	This code is generated after the last anti-mask calibration process and may be required when communicating with distributor support

Paradox developed the NVX80 to provide superior anti-masking capabilities. The combined Active IR and MW anti-mask technologies detect an extensive range of materials placed or sprayed on the lens, and object placed in close proximity of the lens, movement within close range of the unit and the degradation of the lens by dirt or dust by 50% from factory-set levels. The NVX80 anti-mask technology protects the detector from a wide range of materials; including but not limited to clear lacquer, aluminum foil, cling wrap, clear adhesive tape, and spray paint.

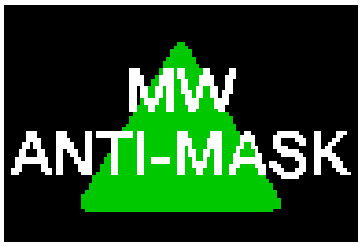
If an obstruction is detected and remains for a predetermined time, an anti-mask event will be noted. If the object causing the obstruction, masking or blocking, is removed before the predetermined time has been reached an alarm will not be triggered or cause an effect on the relays.

Active IR detects any objects blocking the lens in close proximity of the unit; 0 – 30 mm / 0 - 11.8 in. The anti-mask response time can be set at :30, :60, and :120 seconds. The response time will correspond to the time needed for the masking to persist until an alarm is triggered. During the response relay time, 3-5 seconds after detection of an obstruction, a blue frame will be displayed. This will allow for an object accidentally blocking the lens to be removed.



Active IR Anti-Mask appears 3-5 seconds after detection of an obstruction in Test Mode (Test All or Test Anti-Mask) and in rotation with the blue frame icon after the predetermined response time is reached in Operation Mode.

Anti-Mask Notification appears, only in the Operation Mode, 3-5 seconds after an obstruction is detected or in rotation with the Active IR Anti-Mask indicator after the response time is reached.



MW Anti-Mask Pre-Alarm in Test and Operation Mode

The NVX80 is built for harsh conditions, indoor or outdoor. Its anti-mask settings can be set to reduce sensitivity to rain, wind and other inclement conditions.

The MW anti-mask feature detects motion within 0.5 m - 2 m / 1 ft 64 in - 6 ft 5 in from the unit.

The MW anti-mask is activated if a validated detection of movement has occurred during the 10 minutes prior to the anti-mask detection. As the moving object nears the detector, the blue frame will appear on the OLED screen for 90 seconds. The MW anti-mask relay has not yet been activated. If an alarm is triggered as the result of the main lens' detection of an object, during that same period, the blue frame will disappear and a MW anti-mask event will not occur. If no alarm is triggered by detection of the main lens in the 90 second period, a MW anti-mask relay will be activated and the MW anti-mask logo will be displayed. The MW anti-mask relay and logo will be cleared by an Alarm event triggered by the main lens.

An Active IR anti-mask has a higher display priority. If Active IR and MW anti-mask events occur simultaneously, then the blue frame will appear instead of a green frame and the Active IR anti-mask logo will appear instead of the MW anti-mask logo. The resulting relays are not affected by the display priority.

Display Icons

The NVX80 features an OLED screen on which colorful icons are used to display alarm status, alarm type, and notifications.

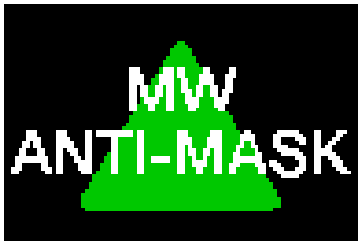
Pre-Alarms

When a movement signal is detected by within a PIR or MW range, the corresponding pre-alarm is shown. The detector waits for 16 seconds for the complementary technology's detection. If no additional movement is detected during that time, the detector will return to its standby state.

PIR Pre-Alarm in Test Mode

PIR Pre-Alarm in Operation

MW Pre-Alarm in Test and Operation Mode



MW Anti-Mask Pre-Alarm in Test and Operation Mode

Alarms

When an obstruction or movement has been detected and confirmed, the following alarm icons will be displayed.

Alarms as shown in Test and Operation Mode after PIR and MW Pre-Alarm

Creep alarm as shown in Test and Operation Mode

Passive Infrared Detection with Independent Creep Zone

PIR Sensitivity	Select sensitivity from 1 (lowest) to 5 (highest) The solid bars represent the current settings The frame represents your selection Use the Up/Down buttons to toggle through the settings Push OK to confirm the change Push Back to cancel any changes
Noise Rejection	Control the level of rejection interference Normal - Indoor, regular and normal Moderate - Industrial conditions Harsh - Extreme conditions (bad weather, machinery, etc.)
Pet Immunity	Off Up to 10 kg (22 lbs) - Small Pet Up to 15 kg (33 lbs) - Medium Pet Up to 20 kg (44 lbs) - Large Pet
Creep Zone	Select Creep Zone sensitivity 1 (lowest) to 5 (highest) 1 for 2.5 m installations 5 for 3.5 m installations
Test PIR	Test the PIR functionality Show only PIR and Creep Zone indications

At an installation height within the suggested range of 2.5 m – 3.5 m / 8 ft 2 in – 11 ft 6 in, infrared detection is possible up to 17 m / 5 ft 6 in. Detection is at 90 degrees.

The creep zone is exceptionally large. The NVX80 delivers approximately a 180 degree angle covering almost 2 m / 6 ft 7 in in all directions in front of the detector. When the Pet Immunity is activated, the creep zone is neutralized.

Creep alarm as shown in Test and Operation Mode

Microwave (MW)

MW Sensitivity	Select sensitivity from 1 (lowest) to 5 (highest) Push OK to confirm the change Push Back to cancel any changes
MW AM Distance	Control MW anti-mask sensitivity, range of 0.5 m to 2 m
Test MW	Test the MW functionality Shows only MW and MW “anti-mask” indications

The microwave coverage varies depending upon the chosen sensitivity setting. The coverage range is approximately effective within 10 m – 19 m / 33 ft 3 in – 62 ft 3 in and up to 110 degrees. The greater the sensitivity setting results in a larger range of coverage.

Sensitivity Setting	Range
3	12 m / 39 ft 4 in
4	15 m / 49 ft 2 in
5	17 m / 55 ft 8 in

Alarm Condition

MW and PIR	Both MW and PIR are required for ALARM Creep Zone detection creates an ALARM, without waiting for MW
Reserved	Coming soon

The PIR detection and the microwave detection can be activated alone or in conjunction with the other capabilities. When setting an output to microwave or PIR only, the relay delays may be as quick as 10 seconds. This should be noted when performing walk tests, as the relay delay may extend to as long as you keep walking or a maximum of 30 seconds.

Pet Immunity

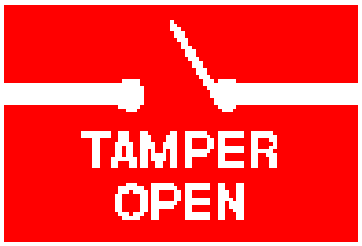
Pet Immunity	Set for small or large pets

The NVX80’s Pet Immunity can filter out the movement small and large animals, up to 20 kg / 44 lbs in both indoor and outdoor environments. By ignoring the movement of the pets the detector’s reliability increases.

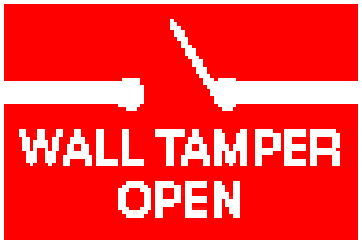
Tamper

Tamper messages are triggered by when the tamper screw at the bottom of the unit is opened or the wall tamper screws have been disengaged.

Appears when the tamper screw at the bottom of the unit is tightly closed. It signifies that the unit has entered operation



Appears when the tamper screw at the bottom of the unit is open and that the menus are not accessible. This message will also appear at the end of the power up sequence.



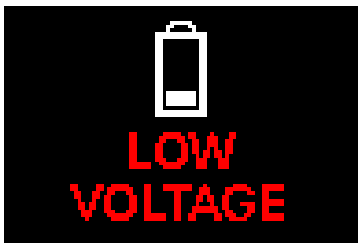
Appears when the Wall Tamper screw has been disengaged. This message will also appear after the Power Up sequence is finished, should the Wall Tamper screw be open during power up. The detector will enter menu mode after the power up sequence is over.

After closing the Wall Tamper, this message will appear.

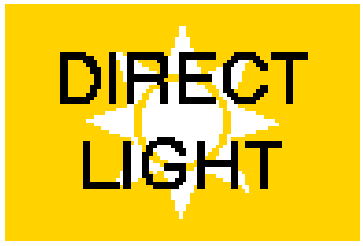
When any of the tampers are detected as open, a relay configured as a Tamper will trigger. The wall tamper switch can be excluded from this relay sequence by disabling it in the Input menu.

Notifications

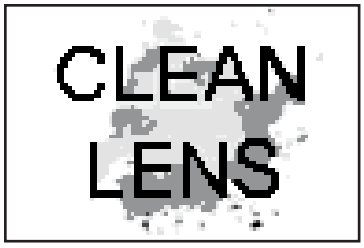
The following notifications appear when the functionality of the NVX80 unit is compromised. These indicators can help troubleshoot during installation or during operation.



Appears in Operation Mode when the unit's voltage is below 10v. It may also appear after an alarm or at the end of the power up sequence if the voltage was low.
The Test Bus tool, reached in the Diagnostics Menu, can be used to discern the unit's current voltage.



Appears in Operation Mode when a strong light source is in front of the unit.



Appears in Operation Mode when the unit detects a reduction in lens transparency, i.e., below 50% of factory-set levels. If this condition exists, this message will appear at the end of the power up sequence.

Appears in Operation Mode if any of the Digiplex wires are disconnected or invalid. This message will appear only once at the end of the power up sequence. Once the Digiplex bus is connected properly, this message will only appear if it is once again disconnected or invalid.

Soon to be activated

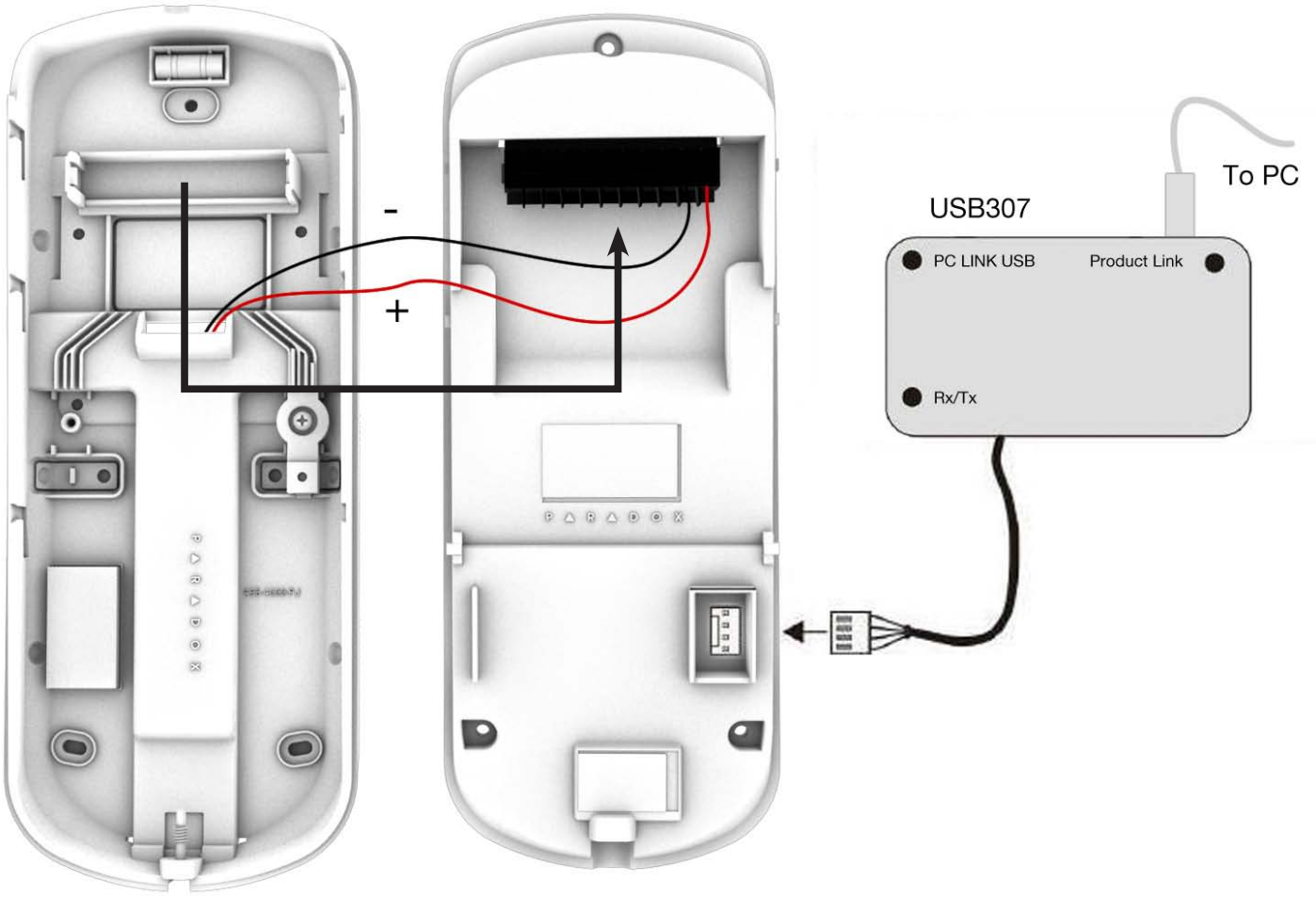
About Us

Version #	Firmware version number
Serial #	Serial Number of the unit - Identification on the digiplex bus
BUS zone #	Shows the zone number set for each of the three relays (future)

Information specific to your individual NVX80 detector can be found in the About Us section.

Firmware Upgrades

Use the diagram below to upload firmware upgrades.



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