TECHNICAL MANUAL

BLADERF

Advanced wireless IR detector
for door and windows protection

090020839

CE

EL.MO. SPA

WARNING

FOR THE INSTALLER:
Please follow carefully the specifications relative to electric and security systems realization further to the manufacturer's prescriptions indicated in the manual provided.
Provide the user the necessary indication for use and system's limitations, specifying that there exist precise specifications and different safety performances levels that should be proportioned to the user needs. Have the user view the directions indicated in this document.

FOR THE USER:
Periodically check carefully the system functionality making sure all enabling and disabling operations were made correctly.
Have skilled personnel make the periodic system's maintenance. Contact the installer to verify correct system operation in case its conditions have changed (e.g.: variations in the areas to protect due to extension, change of the access modes, etc…)

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This device has been projected, assembled and tested with the maximum care, adopting control procedures in accordance with the laws in force. The full correspondence to the functional characteristics is given exclusively when it is used for the purpose it was projected for, which is as follows:

Advanced wireless IR detector for doors and windows protection

Any use outside of this area is not provided and it is not possible to guarantee its proper operation, and therefore it is expressly forbidden to the holder of this manual to use it for other reasons than those indicated.
The manufacturing process is carefully controlled to prevent defects and malfunctions; nevertheless the components used is subjected to faults extremely low percentage, as indeed it does for every other electronic or mechanical.
Given the target of this article (property and persons protection) invite the user to proportion the protection level offered by the system to the actual risk (considering the possibility that the system it is operating in degraded mode due to faults or other), reminding that there are clear rules for the design and construction of equipment to this type of application.

The system's operator is hereby advised to see regularly to the periodic maintenance of the system, at least in accordance with the provisions of current legislation, as well as to carry out checks on the correct running of said system on as regular a basis as the risk involved requires, with particular reference to the control unit, sensors, sounders, dialler(s) and any other device connected. The user must let the installer know how well the system seems to be operating, based on the results of periodic checks, without delay.

Design, installation and servicing of systems which include this product, should be made by skilled staff with the necessary knowledge to operate in safe conditions in order to prevent accidents. These systems' installation must be made in accordance with the laws in force. Some equipment's inner parts are connected to electric main and therefore electrocution may occur if servicing was made before switching off the main and emergency power. Some products incorporate rechargeable or non rechargeable batteries as emergency power supply. Their wrong connection may damage the product, properties and the operator's safety (burst and fire).

Your dealer:

1. GENERALS

The BladeRF detector is a advanced wireless IR detector with reduced-dimension and high-performance, designed to protect windows, French-windows or doors thanks to their precise curtain coverage. It can be installed in vertical position, at the side of the window or door, or in horizontal above the window, fixed under the roller platform. The detector BladeRf allows to realize an efficient perimeter protection via radio at three levels, in fact is possible to connect a magnetic contact and a detector for shutter to the corresponding terminals.
For installation between shutters/roll-up shutters and windows/doors, the detector is equipped by special paths in the case base and seals to prevent the water ingress when the cables enter laterally.
The detector functionality is selectable through dipswitches, the encoding used by the radio section can be selected to be compatible with the protocol used by Helios system or by the Villeggio system with fw. 5.x or higher.
Note: for Villeggio control unit series with previous firmware at the version 5.0.0, select the HELIOS protocol, the Villeggio protocol is supported only by Villeggio control unit series with firmware 5.0.0 or higher and other compatible devices.
One key point of detector is the use of a digital PIR to obtain a very high immunity to noise and accuracy of detection.
The detector is equipped with blue LEDs to display the periodic transmission and the alarm.
At the time of first power supply, the detector automatically goes into Walk Test for faster functionality test.
The nice aesthetic appearance facilitates installation in any kind of environment.

2. FEATURES

2.0.1 GENERAL FEATURES

- **Wireless IR detector with reduced-dimension and high-performance.**
- **Transmission protocol selectable via Helios radio system or Villeggio.**
- **Designed to realize via radio an effective perimeter protection at three levels, IR – Magnetic contact – Shutter detector.**
- **Horizontal/vertical installation.**
- **It can be placed to protect a roll-up/windows-door, shutter/door-windows, roll-up/windows, shutter/window etc.**
- **DIGITAL PIR sensor high immunity with temperature compensation.**
- **Silicon filter against dazzle.**
- **Sensitivity adjustable in two step.**
- **IR lens with vertical curtain protection with 15° horizontal coverage angle and with 90° vertical coverage angle, range 4m for maximum protection of the window or door area.**
- **Blue LED indicator for operation signaling through the lens.**
- **Terminal inputs for the magnetic contact connection with tamper protection and a roll-up shutter.**
- **Internal dip-switch for remote test control.**
- **Power supplied by 1/AA 3,6V Lithium battery (supplied).**
- **Low supply voltage detection with code transmission of the corresponding event.**
- **Transmissions of alarms, tamper events, magnetic contact alarms, roll-up shutters alarms and supervision events.**
- **Timing for the supervision transmission towards the receiving device with cadence fixed every 26 minutest.**
- **The detector is provided with an identification code programmed at the factory to further speed the installation, the stored code is randomly chosen from a base more than 2 billion combinations (231).**
- **Extremely compact dimensions.**
- **Plastic detector housing with a pleasant design, input arrangements for the connecting cables and gaskets for side access.**

2.1 Features

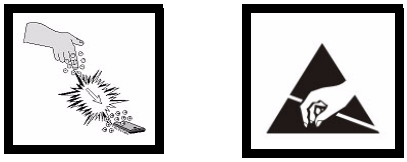
Model:	**BLADERF**
Performance level:	**I level CEI 79-2, level B CEI 79-16, EN50131-5-3 grade 1, EN50131-2-2 grade 1.**
Power supply:	3,6V from battery ½ AA 3,6V to Lithium (supplied).
Discharge battery detection:	if less than 2.8V (3.2V idle state)
Minimum operating voltage:	2.7V for LEDs, 2.4V RF section
Power consumption detector @3.6V	
Stabilization power:	120 µA
At rest:	28 µA
IR alarm, open magnetic contact and roll-up shutter sensor:	16 mA
Functions selection:	dipswitch on board, see wiring diagram.
TX frequence:	digital broadcasts on frequencies for LPD devices (Low Power Devices).
TX protocol:	Selectable with selector for compatibility with Helios or Villeggio system.
Connection range:	120 meters in open space subject to limitations dependent on environmental conditions.
Average life:	2 years with HELIOS Protocol, 2.5 years with Villeggio Protocol.
	Note: the calculation considers 20 total transmissions per day and a supervision transmission every 26 min.
Operations timings	
First power on:	10s disabling the IR section, the other input are active.
Walk-test time:	Activated at the first power on with a duration of 5 min or reset from the first movement of the magnetic contact or the roll-shutter.
Wait time between first IR pulse and second IR pulse:	10s only with minimum sensitivity.
IR inhibition time in Walk-Test after alarm transmission:	3 s.
Alarm from roll-up shutter input:	5 impulses in 15 s.
Supervision time:	Transmission every 26 min.
IR	
Lens type:	Vertical curtain lens.
Sensitive zones:	2 beams.
Coverage area:	see installation diagrams.
Range:	Max. 4 mt, see installation diagrams.
PIR sensor:	Digital immune to RF interference. Silica filter against gazzle (provided).
IR gain stage:	Optimized with the temperature.
Views:	blue LED visible through the lens.
Operating states displayed:	fixed lighting for state as before power; triple flashes for transmission during the Walk-Test, single flash for IR pulse during the Walk-Test, single flash for RF transmission in operation.
Connections:	terminal for connection of the magnetic contact, shutter sensor, tamper input.
Protection:	protection against the opening of the case.
Operating temperature:	-10 / +55 °C.
Humidity:	93% U.r.
Dimensions:	H 96 - W 35 - D 33,5 mm (vertical position).
Wheelbase drilling:	65 mm.
Weight:	65 g.
Parts supply:	screws, dowels, technical manual, battery 3.6 V, with bag labels for capacity reduction.

The BladeRf detector complies with EN50131-5-3 + A1 at level 1and level 2 for the environmental class.
The Blade detector has passed tests conducted in accordance with the directive EMC 2004-108-EC with tests carried out in accordance with EN 50131-2-2 level 1 for IR section, EN 50130-4 + A1+ A2 regarding immunity

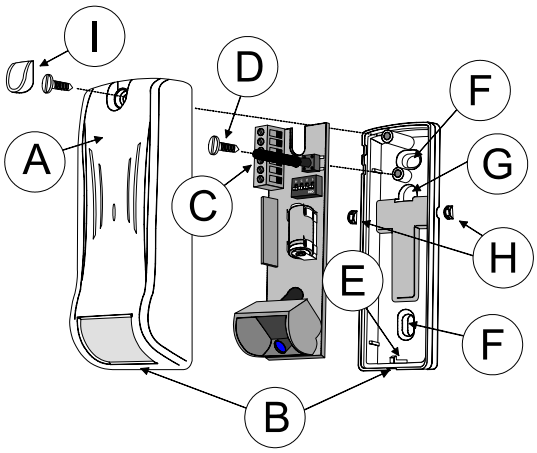
and EN 61000-6-3 concerning electromagnetic emissions. For the radio section has been carried out according to ETSI EN 300220-3, ETSI EN 301489-3.1, EN50131-5-3 + A1 for grade 1. The detector BladeRf complies with the R & TTE 199/5/CE. For the aspects of electrical safety have been complied with requirements of Directive LVD 2006-95-EC with tests carried out in accordance with EN 60950-1.

3. INSTALLATION

3.1 Open, fixed and close operation of the case



The installer must operate in total absence of electrostatic charges already opening the case, make sure that the electronic card of the detector can be damaged by electrostatic discharge. The precautions should be observed during the installation phase and during maintenance.



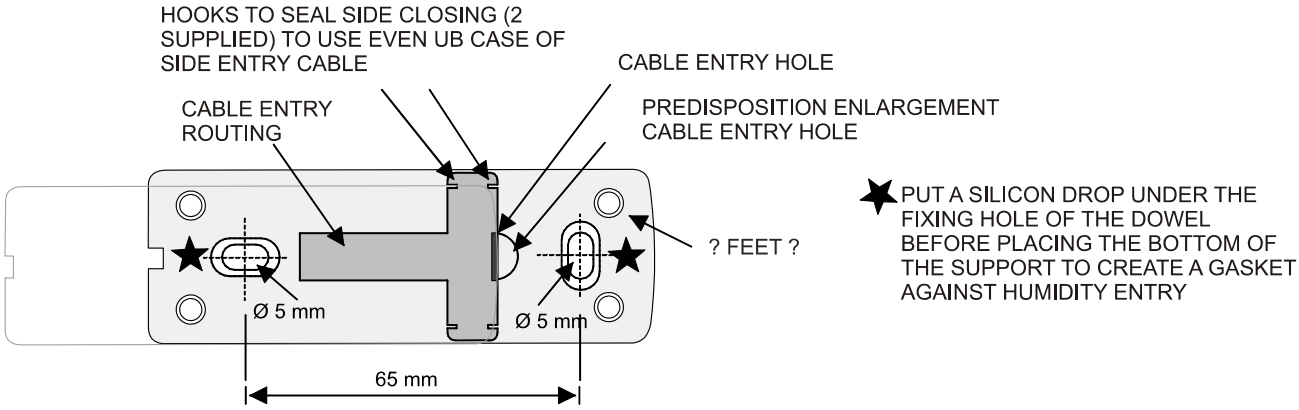
1) Unscrew the fixing screw of the cover on the upper part of the case, indicated with **A**.
2) Separate the front cover by releasing the latches marked with **B** by turning fulcrum in **B**.
3) The closing operation of the cover requires the invert execution of the operations previously exposed, taking the utmost care to ensure that the closing spring of the Tamper protection microswitch indicated with **C** is seated correctly, conclude the fixing operation by screwing the self-tapping screw of the cover. Finally you will have to insert the cap **I** for masking the front screw.

Posting operations and hang-up the board:
1) Remove the fixing screw of the printed circuit indicated by D.
2) Pull out the circuit board by gently twisting it and moving it forward upwards to release it from the lower hook indicated by **E**.
3) The operation of the hang-up board to bottom of the case requires invert execution of the operations previously exposed.

Drilling and wall installation:
1) Proceed to the positioning and fixing of the bottom using as template the detector holes indicated with **F** (distance 65 mm) after analyzing the possibilities of installation and understand the instructions and restrictions highlighted in this manual.

Cable routing:
1) In case of magnetic contact and/or sensor connectior for shutter, the cables must be inserted into the hole **G** at the center of the cable cover channel. The introduction path of the cable is facilitated by the plastic bottom suitably shaped, to the side entrance there are two entrances, when not in use they must be sealed with supplied plastic plugs.

Posterior view:



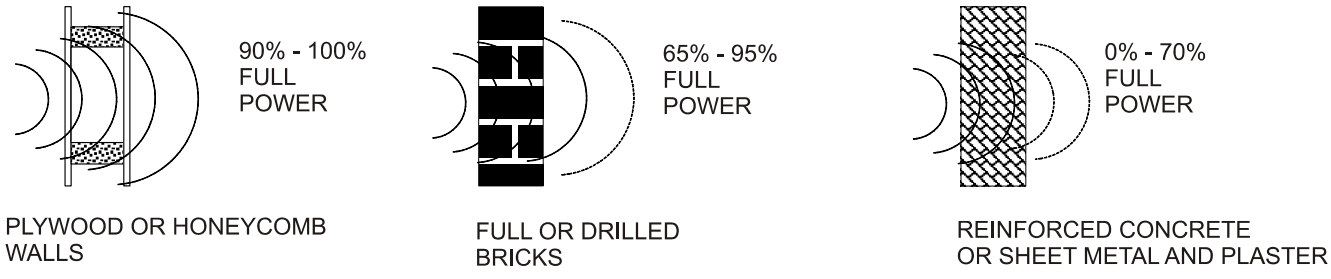
3.2 General warnings

- The curtain detector must be entered in interstice between window \ French-windows and its shutter \ roll-up, the opening of the protection area is approximately 80° longitudinally and 15° transversely.
- Can be installed horizontal or vertical: horizontal is recommended in case of doors, about windows can be install horizontally or vertically. Check position of Dip1 according to the position of fastening defined.
- The installation should be performed:
  A)If vertical with the lens downward and ceiling detector.
  B)If horizontal with the lens towards the center of the window\door and the detector approached the edge wall.
  In both cases, for clarity it is recommended to refer to the installation examples.
- Connect any sensor for shutter and the magnetic contact respecting the instructions in the chapter of the electrical connections.

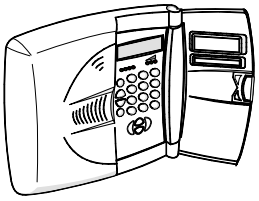
3.3 Effects of building materials and furnishings

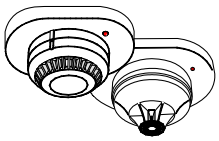
The BladeRf installation must respect certain rules to avoid a drop in performance due to positioning errors. In fact, it is vitally important to define with the greatest care the operating area of the receiving system in which the transmitter is installed, the actual sensors coverage and the correct installation especially in relation to the nature of the materials used in the building construction.
The drawings below show the correct and wrong installation positions, objects that can attenuate the RF signal and the attenuation of some building materials.

Attenuation of the radio signal by some typical materials of construction.

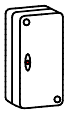


Items that can modify and/or reduce the capacity with HELIOS control unit.

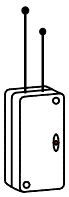




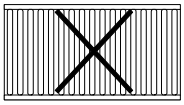
SMOKE AND TEMPERATURE SENSORS



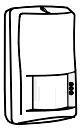
TRANSMITTER WITH INPUT TERMINAL



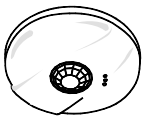
RX/TX RADIO HEAD



METAL GRIDS (E.G. BASEMENT WINDOW WELLS) AND REINFORCED CONCRETE WALLS

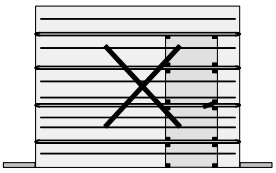


IR DETECTOR



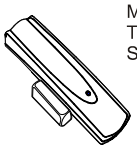
IR CEILING DETECTOR WITH 360° PROTECTION

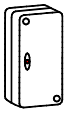
WIRELESS IR DETECTOR WITH MAGNETIC CONTACT INPUT AND SHUTTER



METAL DOORS

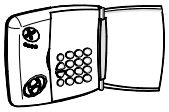
MAGNETIC CONTACT TRANSMITTER, FOR SHUTTER SENSORS AND INERTIAL IMPACT





ACTUATOR

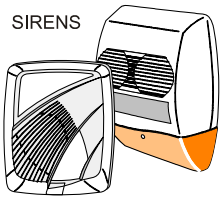
TRANSMITTER WITH BUILT-IN MAGNETIC CONTACT

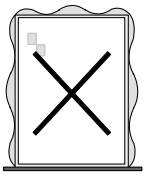


CONTROL KEYBOARD

WIRELESS GAS DETETORS

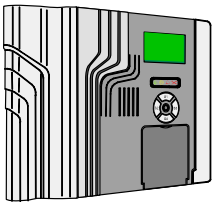
SIRENS



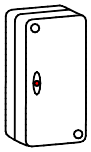


MIRRORS

Items that can modify and / or reduce the capacity with Villeggio series control unit.

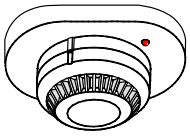


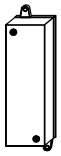
WIRELESS CONTROL UNIT



ACTUATOR

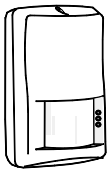
SMOKE SENSORS



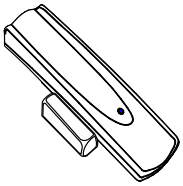


RIVER RF CONCENTRATORS

METAL GRIDS (E.G. BASEMENT WINDOWS WELLS) AND REINFORCED CONCRETE WALLS

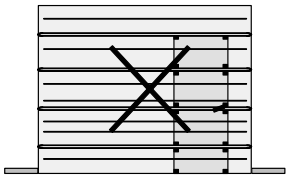


IR DETECTOR

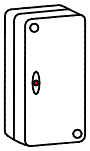


MAGNETIC CONTACT TRANSMITTER, SHUTTER SENSORS AND INERTIAL IMPACT

WIRELESS IR DETECTOR WITH MAGNETIC CONTACT AND SHUTTER INPUT



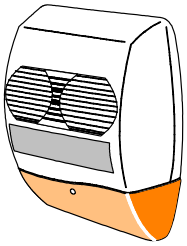
METAL DOORS

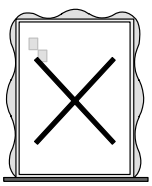


TRASMITTER WITH TERMINAL IMPUT

TRASMITTER WITH BUILT-IN MAGNETIC CONTACT

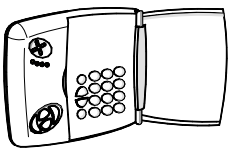
SIREN





MIRRORS

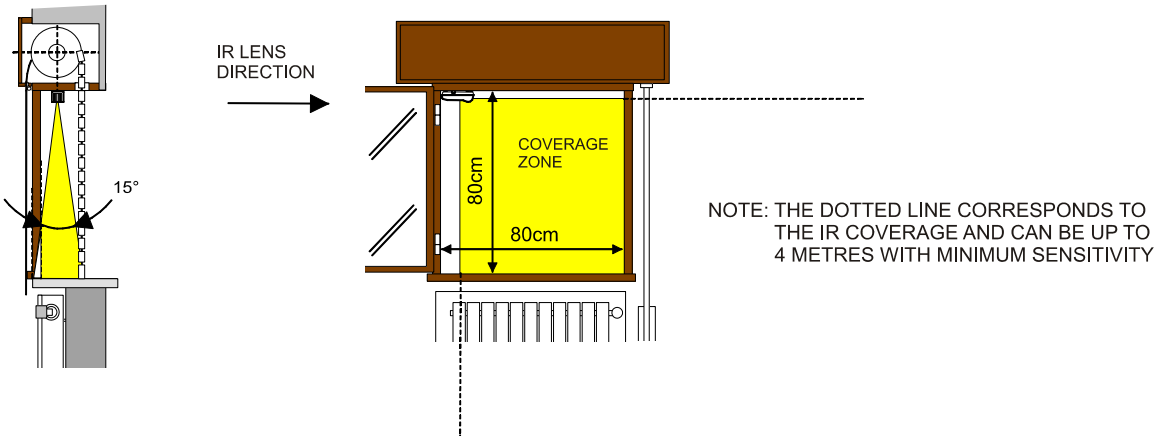
TRANSMITTER WITH TEMPERATURE SENSOR



CONTROL KEYBOARD

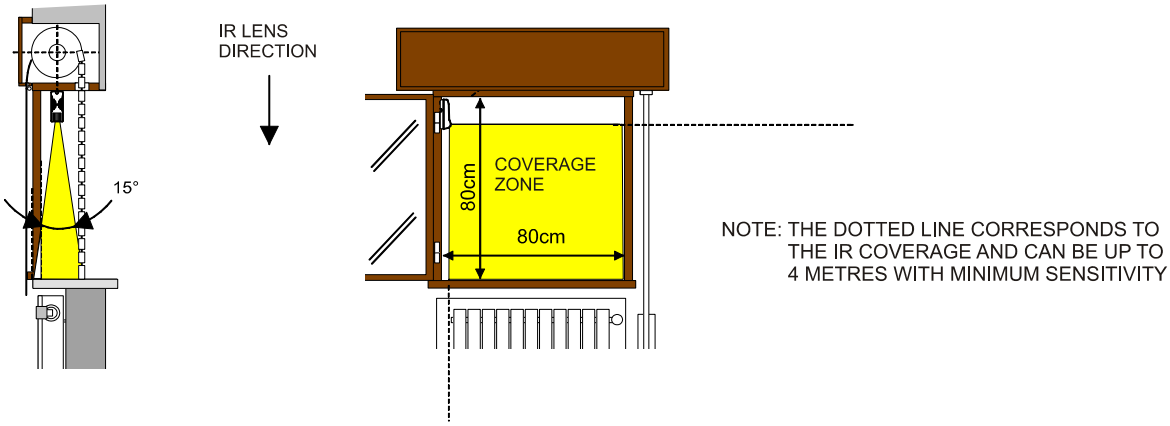
3.4 Installation for window protection and coverage diagram

HORIZONTAL MOUNTING RECCIMENDED FOR WINDOWS PROTECTION



NOTE: THE DOTTED LINE CORRESPONDS TO THE IR COVERAGE AND CAN BE UP TO 4 METRES WITH MINIMUM SENSITIVITY

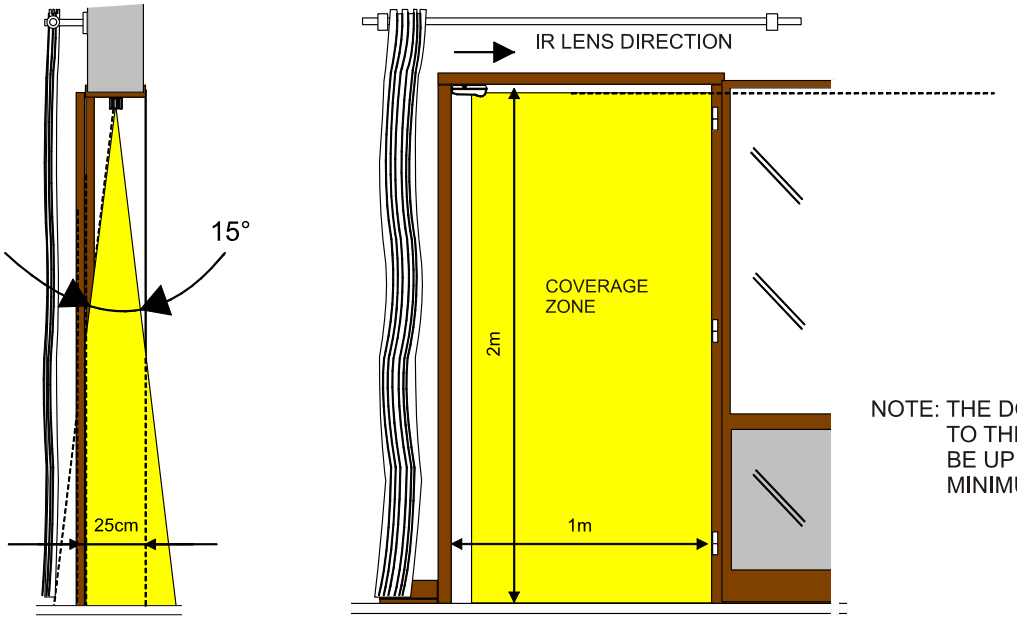
VERTICAL ALTERNATIVE MOUNTING TO PROTECT WINDOWS



NOTE: THE DOTTED LINE CORRESPONDS TO THE IR COVERAGE AND CAN BE UP TO 4 METRES WITH MINIMUM SENSITIVITY

3.5 Installation for door protection and coverage diagram

HORIZONTAL MOUNTING RECOMMENDED FOR DOORS PROTECTION

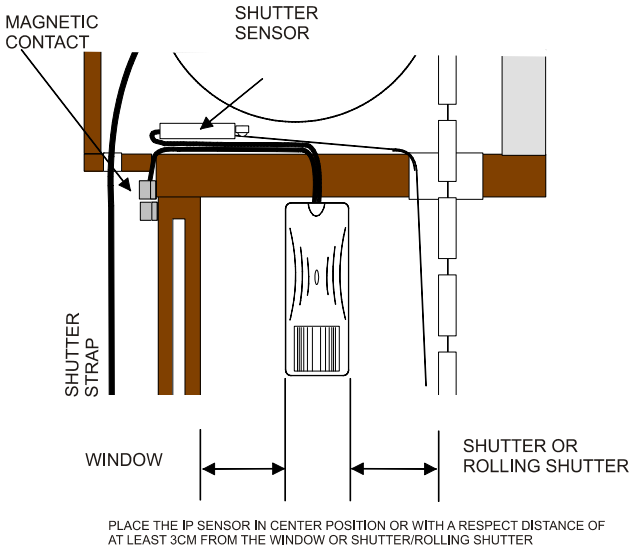


NOTE: THE DOTTED LINE CORRESPONDS TO THE IR COVERAGE AND CAN BE UP TO 4 METRES WITH MINIMUM SENSITIVITY

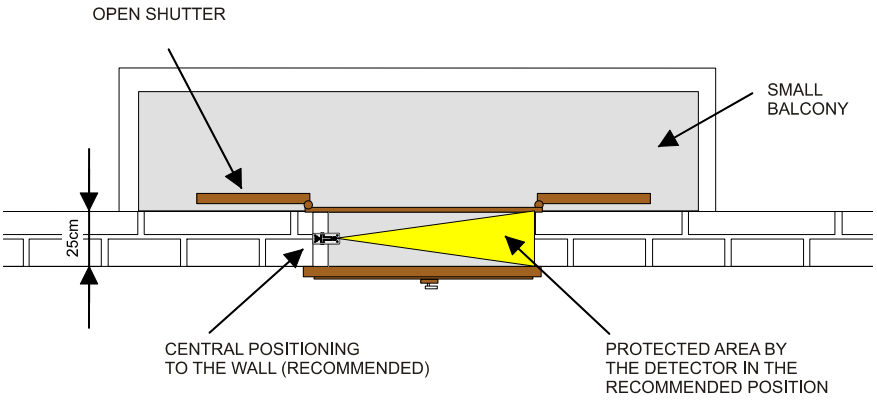
3.6 Detector installation - suggestions

In horizontal installation is imperative to mount the detector with the lens facing the center of the door or window and the body of the detector approached the corner.

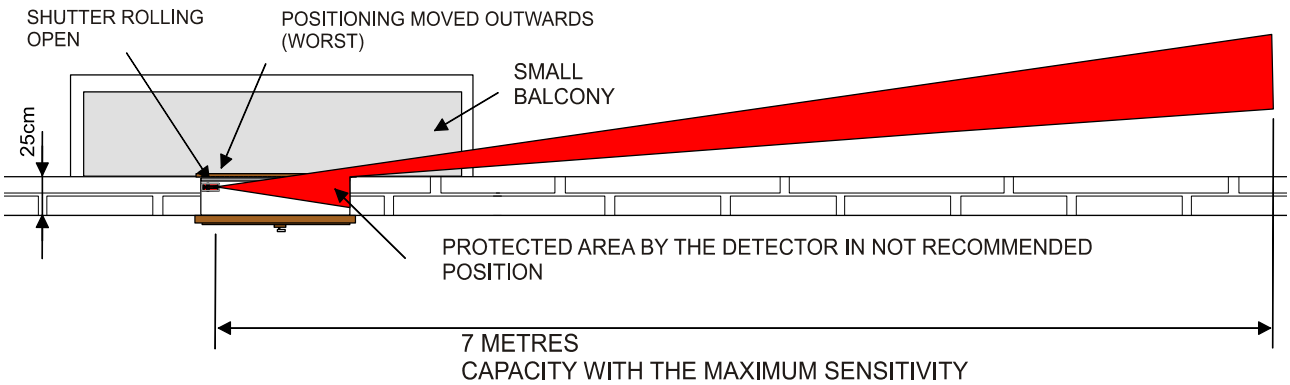
In vertical mounting is imperative to put the detector with the lens facedown and the body of the detector approached the corner at the top.



Top view of the BladeRf range for windows protection:



Resulting capacity with BladeRf installed to the outside of the wall:

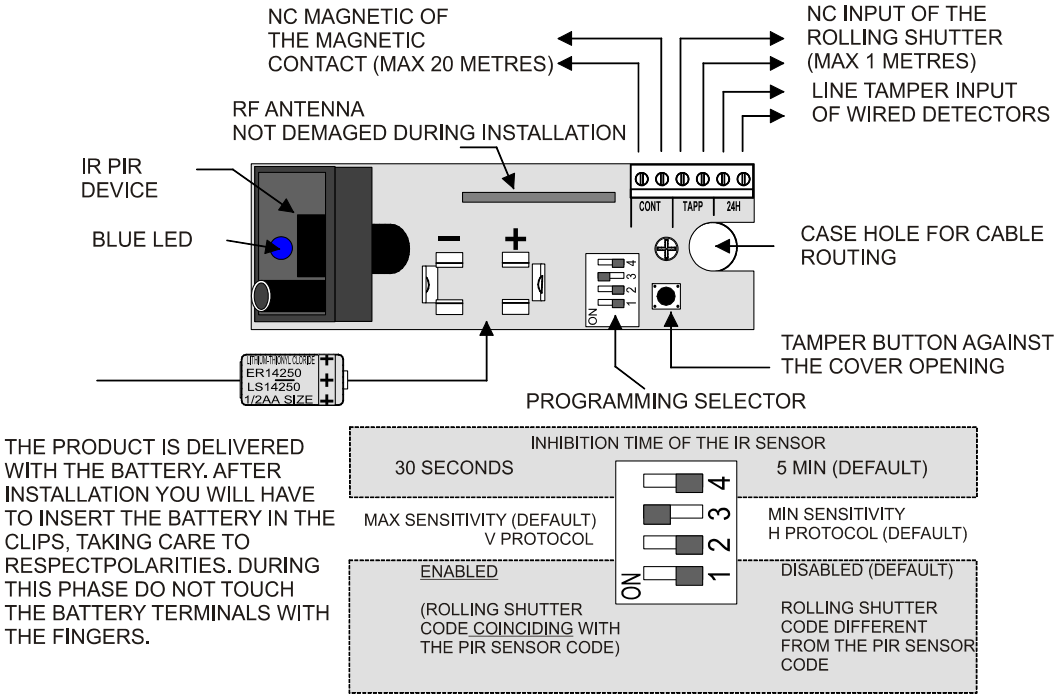


TO REDUCE THE RANGE ABOUT TO 4 METRES OR LESS, MAINTEINING THE MAXIMUM SENSITIVITY, UDE THE SUPPLIED ADHESIVE LABELS

FOR INSTALLATION IN NOT FAVORABLE ENVIRONMENTS IS POSSIBLE TO PUT THE SENSITIVITY TO A MINIMUM, IN THIS CASE THE RANGE WILL DECREASE BY APPROXIMATELY 4 METRES

4. ELECTRICAL CONNECTIONS

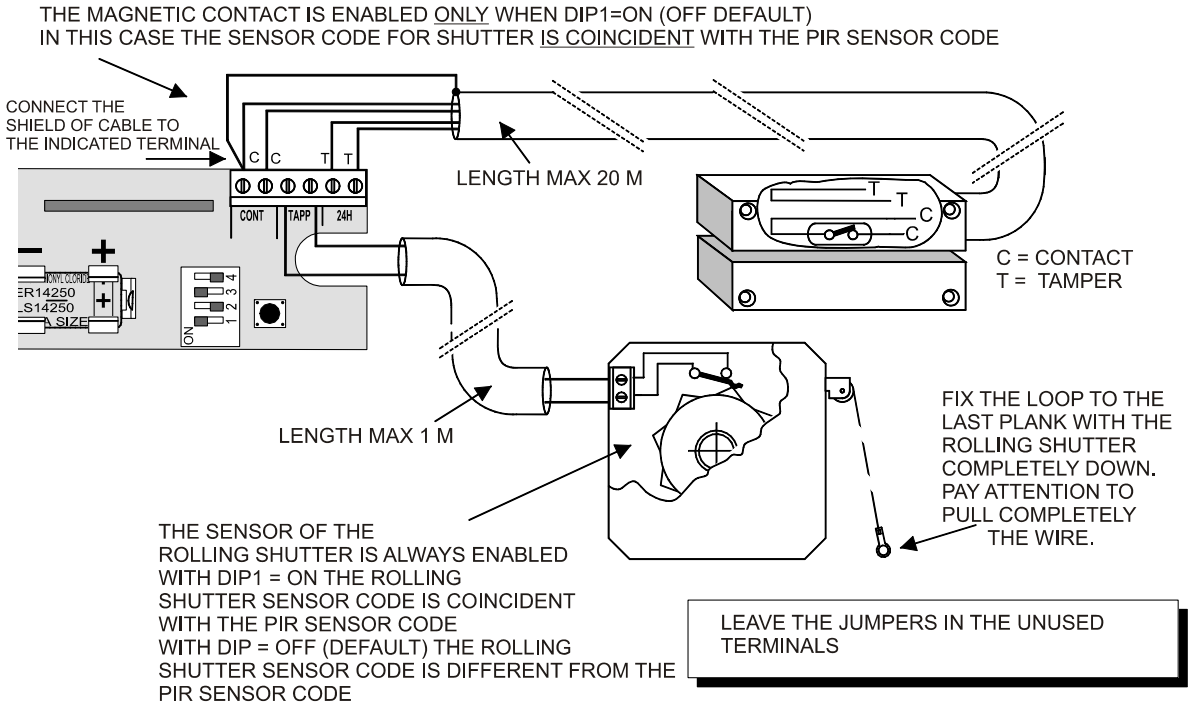
Internal board view:



Information provided by the blue LED:

Stable turned on=	stabilization at first powered.	Single flashing=	Sensor in Walk-test, IR single pulse
Triple flashing=	RF transmission during the walk-test.	Single flashing in operation=	RF transmission

Terminal connections:



5. FIRST POWERED PROCEDURE

The BladeRf transmitter requires special care during the first power supply, the procedures can be summarized as follows:

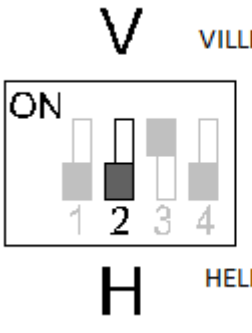
1. Insert the battery (supplied) 3.6 observing the polarity, as indicated in the previous chapter.
2. Press and release 3-4 times the Tamper button.
3. Clear any download battery memories in control unit or in the compatible receiving device.

WARNING: If the battery is new or unused for a long period, there can sometimes be an erroneous low battery signal to the first activations.
This is due to the chemical characteristics of Lithium Thionyl Chloride batteries and can be resolved by performing the above operations.
In case of the battery is at low temperatures, it is advisable to keep the battery at room temperature before inserting it.

6. SETUP PROCEDURE

6.1 Set the communication protocol

BladeRf is an accessory component for wireless systems with HELIOS or VILLEGGIO control unit or other compatible models.
In order to successfully send generated event codes is necessary to correctly set the communication protocol.
For this purpose there is an internal switch that with Dip n.2 allows this approach:



Note: use Villeggio control unit equipped with firmware 5.0.0 version or higher and compatible with other devices.

Note: to use also for Villeggio control unit with firmware version lower than 5.0.0

WARNING: The wrong position of the selector will not allow a transmission intelligible with the compatible control unit.

Note: the Villeggio protocol use (only with compatible devices) improves the communication reliability and battery life.

6.2 Transmitter storage procedure with a compatible control unit

A. Open the plastic case of the transmitter.

B. Set Dip n.4 = OFF (PIR inhibition time = 5min).

C. If you want the PIR sensor and the roll-up shutters management, check the position of the DIP n. 1 = OFF.

D. Powered the sensor and wait the Walk-test end (5min) or generate an alarm on the contact or roll-up shutter to enter immediately into operation.

E. Once in operation be detected by the PIR.

F. Enter in the compatible control unit program, in the capture menu of the wireless device, to begin the learning codes process.
Note: With Dip n.4 = OFF you have 5min to run the learning otherwise you risk PIR unwanted code transmissions by moving in front of the PIR sensor.

G. Cause a transmission by pressing and holding the Tamper button, so you send the code for the PIR sensor recognition.
Note: If only need the PIR sensor control and not the roll-up shutter sensor, out now from programming and ONLY then release the TAMPER button.

WARNING: wrong the pressure sequence of the TAMPER button with an operation of pressure and release is stored incorrectly the transmitter code and therefore it is absolutely necessary to delete the last transmitters stored and repeat the operation correctly.

H. Continuing to hold the TAMPER button, carry on in the control unit menu to add a new transmitter.

I. Activate the recognition of the new transmitter.

J. Release the TAMPER button. The control unit recognizes the received code as from the sensor for roll-up shutter.

K. Exit programming in the usual way.
Note: If you use a programmed BladeRf for the magnetic contact (Dip n.1 = ON), the release of TAMPER will transmit the code of the magnetic contact to the control unit, also in this case the detector for roll-up shutter will assume the same code of the PIR sensor.

L. Once stored the transmitter code, is possible to go to the specialization phase of the attributes referring to the device in question.

M. Install the transmitter in allowed places, for this purpose it is useful to refer to the drawings in the "INSTALLATION" section, checking with the proper functioning of the test transmissions.

N. Close the transmitter case controlling carefully the perfect pression of the Tamper button.

WARNING: the failure care in case reclosing with the consequent anomaly of the Tamper circuit, involves an alarm generation for tampering at each supervision transmission and at each alarm transmission.

7. OPERABILITY

7.1 Precautions before system installation

- Is recommended that the roll-up shutter or the shutter are closed before system installation.
- In case of insertion with open shutter/roll-up shutter to pay attention to the transition to sliding windows and protected doors because the coverage to the outside is extremely limited, people or animals that will pass less than 20 cm distance could be detected.
- **The interior window/doors must be closed** before the implant installation (there must be not vibration with wind and no air exchange inside outside).
- In case of detector installation with a mosquito net that already exists is recommended to rewind the mosquito net before implant installation.
- To further limit the range, use the supplied labels applying them according to specific instructions

7.2 Walk-test

At powered after the initial stabilization of 10s (LED fixed ON) the sensor start in Walk-test.
During the walk, the LED displays every single IR pulse for faster functionality test, the RF transmission is displayed with 3 flashing LED, after each RF transmission the IR reception is blocked for 3s and also the RF transmission is inhibited for 10s.
Passed 5min from powered, the Walk-test automatically shuts down and the sensor goes into operation.
Wishing the Walk-test can be block forced through the first movement contact or shutter.

7.3 Operative functionality

- In operation the single flashing LED indicates a RF transmission.
- After each alarm transmission from the IR section this will be inhibited for the time set on Dip n.4 (default = 5min).
- The other inputs (CONT, TAPP and 24H) are always active even during the inhibition time.

8. DISPOSAL INSTRUCTIONS

Dispose of BLADE RF in compliance with current city regulations and by leaving the device in a dumping ground which is authorized for the disposal of electronic products; if required, please contact the appropriate city office for additional information.
The material used for this product is very harmful and polluting if dispersed in the environment.

9. INDEX

Advanced wireless IR detector for door and windows protection mod. BLADERF - TECHNICAL MANUAL
November 2013 Edition - 090020839

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Global Security Solutions

DICHIARAZIONE DI CONFORMITA' CE DECLARATION OF CONFORMITY

EL.MO. spa
dichiara sotto la propria responsabilità che il prodotto / *declares that the product:*

BLADERF

Sensore IR via radio / *IR wireless detector*
al quale questa dichiarazione si riferisce, è conforme alle seguenti norme:
to which this declaration is referred to is in conformity with the following:

EN 50130-4 2011-06	Sistemi d'allarme Parte 4: Compatibilità elettromagnetica Norma per famiglia di prodotto: Requisiti di immunità per componenti di sistemi antincendio, antintrusione e di allarme personale. *Alarm systems* *Part 4: Electromagnetic compatibility* *Product family standard: Immunity requirements for components of fire, Intruder and social alarm system*
EN61000-6-3 2007-01 +A1 2011-03	Compatibilità elettromagnetica(EMC). Parte 6-3: Norme generiche – Emissione per gli ambienti residenziali, commerciali e dell'industria leggera. *Electromagnetic compatibility (EMC). Part 6-3:Generic standards – Emission standard for residential, commercial and light-industrial environments*.
CEI EN60950-1 2006-04 +A11 2009-03 +A1 2010-03 +A12 2011-02	Apparecchiature per la tecnologia dell'informazione - Sicurezza. Parte 1:Requisiti generali *Information technology equipment – Safety. Part 1: General requirements*
ETSI EN 300220-2 2007-06	Apparati radio e sistemi. Dispositivi a corto raggio. Caratteristiche tecniche e metodi di prova per apparati radio da utilizzarsi da 25 a 1000 MHz con livelli di potenza fino a 500 mW. *Radio equipment and systems. Short range devices. Technical characteristics and test methods for radio equipment to be used in the 25 to 1000 MHz frequency range with power levels ranging up to 500 mW.*
ETSI EN 301 489-3 2002 ETSI EN 301-489-1 2008	Apparati radio e sistemi a corto raggio operanti nella gamma di frequenza tra 9KHz e 25GHz. *Radio equipment and systems. Short range devices.*
EN50131-5-3 2005 +A1 2008	Sistemi antintrusione:parte 5-3, requisiti per interconnessioni di apparati in radiofrequenza Alarm systems. Intrusion systems. Requirements for interconnections equipment using radio frequency techniques
EN 50131-2-2 Grado Sic.I,Sec,Grade I Cl.ambient.II,Environ.class II	Sistemi di allarme – Sistemi di allarme antintrusione e rapina Parte 2-2: Rivelatori infrarosso passivo Alarm systems-Intrusion and hold-up systems Part 2-2: Passive infrared detectors
EN50131-5-3 2005 +A1 2008 Grado Sicurezza 1 Security grade 1 Classe Ambientale II Environmental class II	Sistemi antintrusione:parte 5-3, requisiti per interconnessioni di apparati in radiofrequenza *Alarm systems. Intrusion systems. Requirements for interconnections equipment using radio frequency techniques*

e quindi rispondente ai requisiti essenziali delle direttive:
and then in accordance with the following directives:

☒ 2004/108/CE Compatibilità elettromagnetica *Electromagnetic compatibility*	☒ 2006/95/CE Sicurezza di bassa tensione *Low voltage security*
☒ 1999/5/CE (R&TTE)	Direttiva Europea apparati radio e apparecchiature terminali di telecomunicazione. *European Directive wireless equipment and telecommunication apparatus.*
☒ 2002/95/CE (RoHS)	Direttiva Europea sulla restrizione dell'uso di determinate sostanze pericolose nelle apparecchiature elettriche ed elettroniche *European Directive Reduction of Hazardous Substances*

Campodarsego 10/12/2012

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