TECHNICAL INSTALLATION MANUAL

DEA SECURITY®

FUSION P2P®

FENCE-MOUNTED DUAL-TECH INTRUSION DETECTION SYSTEM

DEA SECURITY®

TECHNICAL INSTALLATION MANUAL FUSION P2P

Contents

1. **INTRODUCTION 5**
   - 1.1 System description 5
   - 1.2 General operation of the system 6
   - 1.3 Typical system 7

2. **SYSTEM COMPONETS 7**
   - 2.1 Sensor-strings 8
   - 2.2 Connectorized junction 9
   - 2.3 Connectorized termination 10
   - 2.4 Control unit 11
   - 2.5 Input Module 12
   - 2.6 Connection cable and initial cable 13
   - 2.7 Unconnectorized junction 14
   - 2.8 Unconnectorized termination 14
   - 2.9 Controller board 15
   - 2.10 Relay expansion (XS 16 RE) 16
   - 2.11 Relay expansion (DN) 17

3. **SYSTEM INSTALLATION 18**
   - 3.1 Installation environments 18
     - 3.1.1 Chain-link mesh fence 18
     - 3.1.2 Welded wire mesh fence 18
     - 3.1.3 Grating fence 18
     - 3.1.4 Rigid fence 19
     - 3.1.5 Wall with concertina topping 19
     - 3.1.6 Grating fence with concertina topping 19
   - 3.2 Sensor installation 20
   - 3.3 Installation junction / termination 20
   - 3.4 Sensor replacement 21

4. **CONNECTIONS 22**
   - 4.1 Controller board 22
   - 4.2 Control unit 24
   - 4.3 Input Module 25
   - 4.4 Unconnectorized junction 26
   - 4.5 Unconnectorized Termination 27

5. **APPLICATIONS 28**
   - 5.1 Chain-ink mesh-fence 28
   - 5.2 Welded wire mesh fence 29
   - 5.3 Grating fence 30
   - 5.4 Rigid fence 31
   - 5.5 Wall with concertina topping 32
   - 5.6 Grating with concertina topping 33
   - 5.7 Bypass / repair 34
   - 5.8 Swing gate 35
   - 5.9 Sliding gate 36

6. **CONFIGURATION AND CALIBRATION 37**
   - 6.1 Sensors and/or relay acquisition 37
   - 6.2 Calibration 37

7. **APPENDIX 39**
   - 7.1 Maintenance 39
   - 7.2 Assistance 39

1. Introduction

This document aims at describing the procedure for a correct installation of FUSION P2P system.

1.1. System description

FUSION P2P is the new generation of DEA fence-mounted intrusion detection systems. It is the first outdoor perimeter system to employ **D**EA **S**ensor **F**usion (**DSF**), **dual tech** detection technology, thanks to which it redefines the current industry standard as far as performance and versatility are concerned.

The system can be mounted both on flexible metal fences (rolled fences or semi-rigid welded panels) and on rigid panels. It is also employed on the most common types of walls.

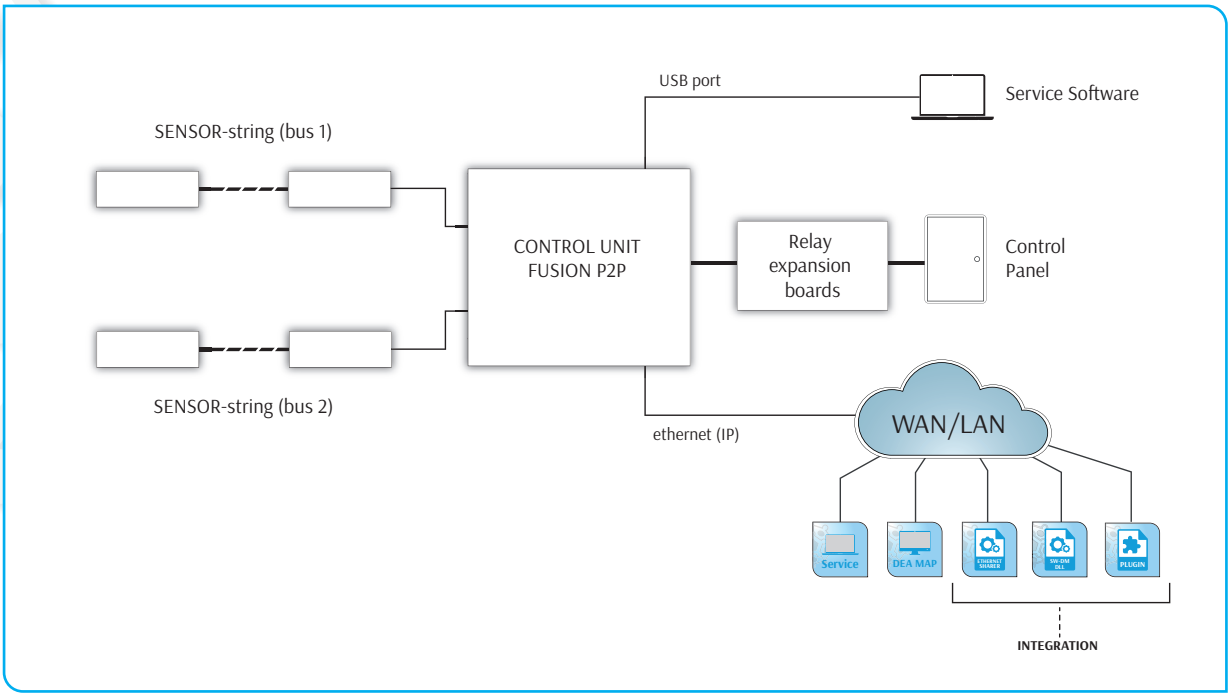
FUSION P2P senses and analyses the vibrations and the movements of a fence while an intrusion attempt for cutting, breaking through or climbing is occurring, discriminating all of those noises which could trigger improper alarms..

The detectors employ two different sensitive elements: a well-proven piezoelectric transducer and a MEMS accelerometer. The data coming from the two sources of signal are processed and analysed using adaptive intelligence algorithms able to recognize the intrusion attempts and discriminate them from the environmental and climatic noises.

The system is composed of prewired sensor-strings, preassempled electronic control units, junctions and terminations. The sensor-strings are available with different spacing between the sensors: 5 metres (strings with 5 or 15 sensors) and 3 metres (strings with 5, 15 or 25 sensors).

The control unit manages up to 300 detectors on two communication buses for 1.500 metres of perimeter if the spacing between the sensors is 5 metres and 900 metres of perimeter if the spacing is 3 metres. Besides enabling the configuration of the detectors by means of a service software, the control unit automatically recognizes and sorts the field detectors and raises the alarm signals.

Junctions (beginning of string and intermediate) and terminations are connectorized, therefore they do not need any on-site sealing or welding.



The main system features are:

- **DEA Sensor Fusion technology.** The new DSF technology developed by DEA Security combines, in a single seismic sensor, all of the benefits of a traditional Piezoelectric transducer with the advantages of a MEMS accelerometer. The outcome is a detector capable of the highest performance.
- **Adaptive intelligence.** Thanks to the complex adaptive intelligence algorithms, the system can work best on almost any metal fence and walls and in environmental conditions which could strain any other traditional detection system.
- **Redundancy support.** FUSION P2P can be installed in loop configuration, which allows the sytem to continue functioning efficientely following a bus cable cut performed anywhere along the sensor-string.
- **Maximum environmental immunity.** The immunity to environmental and climatic nuisances featuring SERIR systems is here at its utmost. As a matter of fact, thanks to its noise limiter function, FUSION P2P is able to recognize and digitally filter the disturbances generated by adverse climatic conditions.
- **Professional easy-plug connectors.** The prewired sensor-strings employ, on both of their ends, professional easy-plug connectors with IP68 rating and military-grade specifications. These connectors make the electrical connection of the strings very fast and error-proof.

- **IP native support.** The controller board is equipped with an Ethernet interface which allows the system to connect to a TCP/IP network and to exchange data with third-party systems and equipment. Thanks to specific plug-in software, the system can also integrate the main PSIM and VMS software.
- **Self-test on each sensor.** FUSION P2P sensors have a self-test function which readily signal potential functioning failures. This makes periodical on-site check unnecessary and service operations quicker.
- **Anti-tamper and anti-removal.** The sensors are equipped with devices which detect the removal and the thermal and magnetic tamper attempts.
- **Smart automatic sorting.** During the first activation of the system, the controller automatically performs the identification and sorting of the sensors.
- **General and individual calibrations.** Each sensor can be calibrated and configured together with the others of the same logical line or individually.
- **Event log per sensor.** The Controller is equipped with an internal memory where all the events detected by the single sensors are stored.

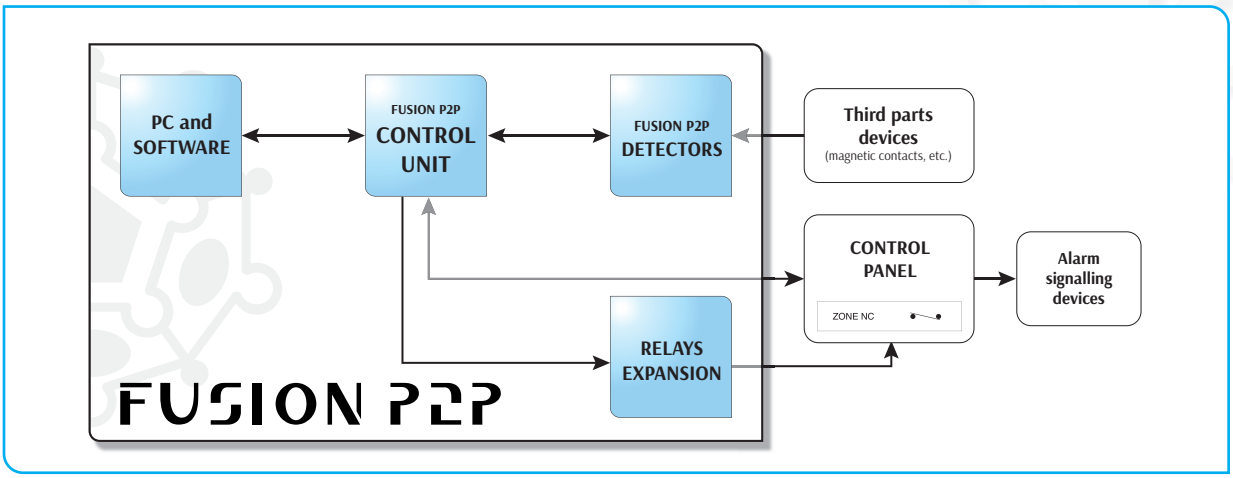
1.2. General operation of the system

The FUSION P2P system is essentially made up of:

- **Sensors** for detecting the intrusion event and input modules to integrate third-party devices;
- String **junctions** and **terminations** (connectorized and unconnectorized);
- The **Control Unit**, a prewired cabinet containing power supply unit and controller board for the management of the sensors/input modules;
- **relay expansion** boards (if needed);
- the **connection cable** between the controller board and the sensors/input modules;
- the **service software** for the management of FUSION P2P system.

FUSION P2P system is able to interface with the rest of the alarm system which is generally composed of:

- **Control panel** which manages the data provided by the Controller board, by the expansion boards (if any) or by other devices present in the system;
- Alarm **signalling devices**.



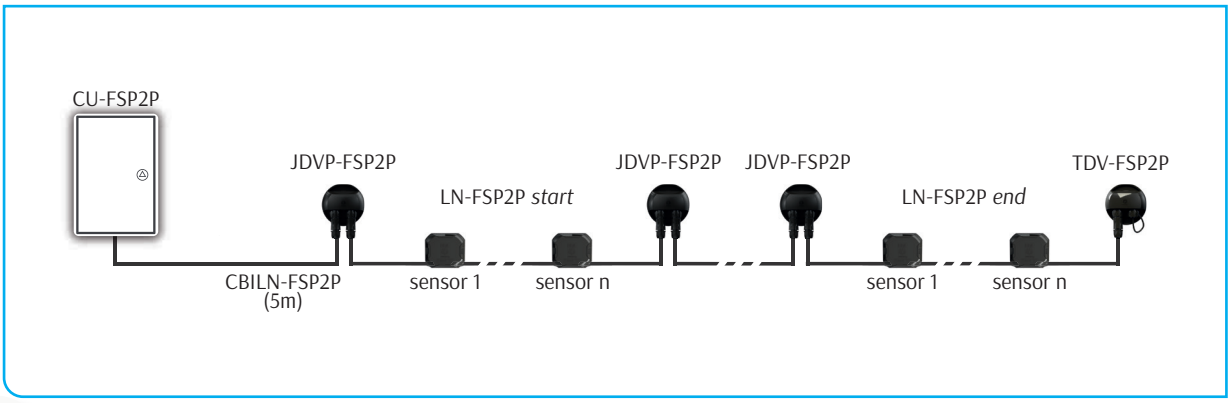
FUSION P2P interfaces with the control panel through relay outputs on the Controller board or on dedicated expansion modules (if any). These outputs, after a resistor balancing, are wired on the zones present on the control panel. If an alarm is triggered, the control panel will activate optical-acoustic indicators and/or automatic phone diallers.

The sensors/peripheral devices of FUSION P2P system are powered by the Controller board and the communication between the sensors/the input modules and the Controller board is a DEA proprietary multi-point communication protocol.

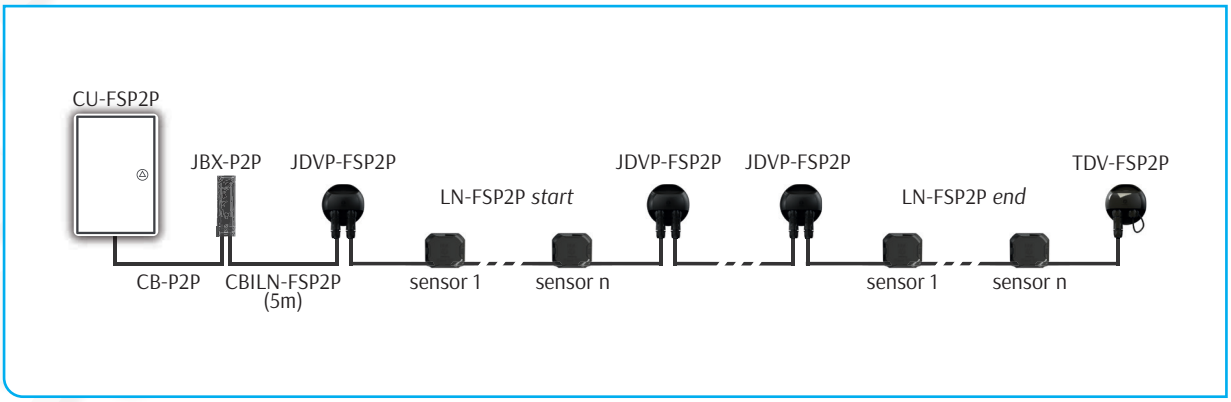
1.3. TYPICAL SYSTEM

FUSION P2P is a quite flexible system, however we suggest choosing between two types of string connections which ensure a reliable and quick installation.

- **Application example 1**: Control Unit placed not more than 5 metres from the first sensor-string of the bus.



- **Application example 2**: Control Unit placed more than 5 metres from the first sensor-string of the bus.



2. SYSTEM COMPONENTS

FUSION P2P is composed of:

- Sensor-strings (P/N LN-FSPP2P)
- Initial string cable (P/N CBINL-FSP2P)
- Initial string and intermediate connectorized junctions (P/N JDVP-FSP2P)
- Connectorized terminations (P/N TDV-FSP2P)
- Control Unit (P/N CU-FSP2P) composed of a polyester cabinet (P/N BOX-P2P) preassempled with:
  - Controller board P2P V3 (P/N BR-FSP2P-CTRL)
  - Stabilized power supply unit AL-P2P-3024;
  - Two backup batteries BT-P2P-12V;
  - Tamper switch;
- Interface peripheral module (P/N SC-IN1-P2P);
- Connection cable (P/N CB-FSP2P);
- Unconnectorized junctions (P/N JBX-P2P)
- Unconnectorized terminations (P/N TBX-P2P)

2.1. FUSION P2P SENSOR-STRINGS

P/N LN-FSP2P

FUSION P2P prewired and connectorized sensor-strings composed of SN-FSP2P sensors with DEA Sensor Fusion (DSF) technology; they protect soft, semirigid and rigid fences from cut, sporadic cut, climb and break through.

The detectors are equipped with integrated electronics, to pin point an intrusion, and a self-diagnosis system which checks the operating status of the sensor, detecting thermal tamper and removal attempts.

DSF technology combines the robustness and reliability of the piezoelectric transducer with MEMS accelerometer, which guarantees timely detection and sensor adjustment. The outer casing, made of glass fiber reinforced polyamide, resists continuous exposure to sunlight, abrasion, oils and hydrocarbons.

The signals generated by the detector are transmitted to the Controller board (BR-FSP2P-CTRL), assembled inside the Control unit (CU-FS-P2P), which processes them and triggers an alarm.

COMPLIANCE

In combination with Control Unit:

- **DIRECTIVE 2014/30/UE (EMC)**
  - EN 50130-4:2011+A1:2014
  - EN 61000-6-3:2007+A1:2011
- **DIRECTIVE 2011/65/UE (ROHS)**
  - EN 50581:2012

TECHNICAL FEATURES

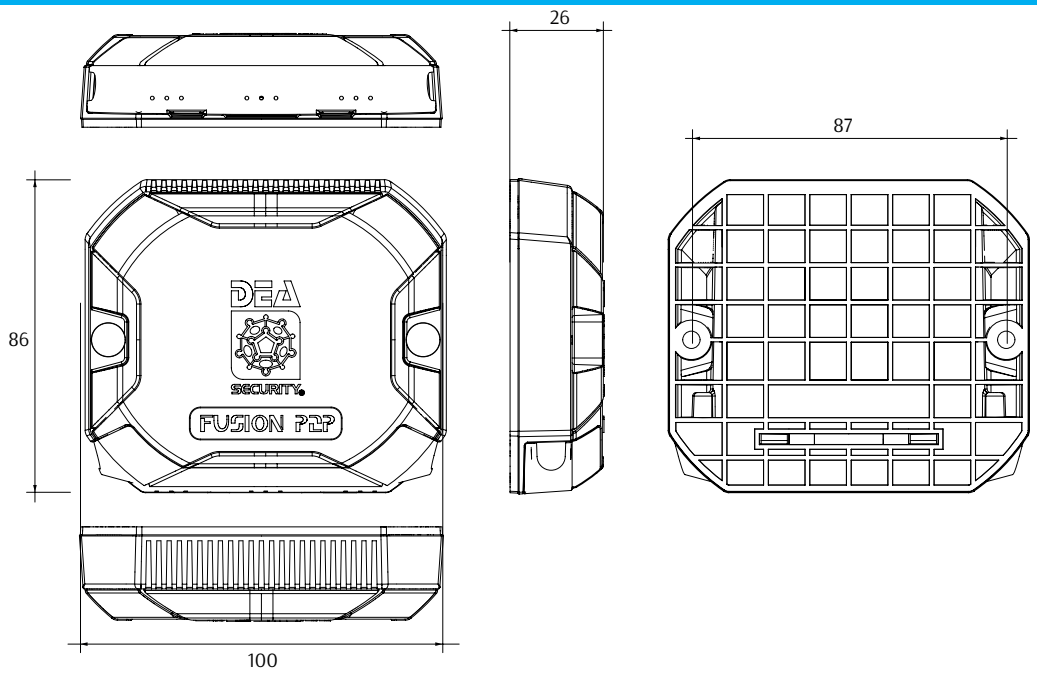
- **ENVIROMENTAL CLASS**: IV (in accordance with EN-50130-5)
- **DIMENSIONS**: 98 x 85 x 26 mm (L x H x W)
- **MATERIAL**: glass fiber reinforced polyamide, sealed with polyurethane resin, U.V., oil and scratch resistant
- **FIXING SYSTEM**: steel plate
- **PROTECTION RATING**: IP67 (vertical position as installation pecifications)
- **COLOUR**: black
- **POWER SUPPLY**: by BUS FSP2P (24 V_{DC})
- **CURRENT**: 0,8 mA (stand by) / 1 mA (max)
- **OPERATING TEMPERATURE**: -40 ÷ +80 °C
- **RELATIVE HUMIDITY**: <95% non condensing
- **COVERAGE AREA**: up to 5 x 5 m each sensor

CABLE

See the CB-FSP2P datasheet.

PART NUMBER	SENSORS SPACING (m)	No SENSORS EACH STRING
LN5-FSP2P-300	3 m	5
LN15-FSP2P-300	3 m	15
LN25-FSP2P-300	3 m	25
LN5-FSP2P-500	5 m	5
LN15-FSP2P-500	5 m	15

DIMENSIONAL SCHEME



2.2. Connectorized Junction

P/N JDVP-FSP2P

Device for the junction of the LN-FSP2Pprewired sensor-strings. It is provided with a UV resistant housing, two easy-plug sockets and a fixing support. UV resistant polyamide case with connectors and disk-shaped fixing support used to make Junction for FUSION P2P connectorized LN-FSP2P string.

Compliance

In combination with sensors-string:

- **Directive 2014/30/UE (EMC)**
  - EN 50130-4:2011+A1:2014
  - EN 61000-6-3:2007+A1:2011
- **Directive 2011/65/UE (ROHS)**
  - EN 50581:2012

Technical features

- **ENVIRONMENTAL CLASS**: IV (in accordance with CEI EN-50130-5)
- **GROSS WEIGHT**: 123 g
- **NET WEIGHT**: n.d.

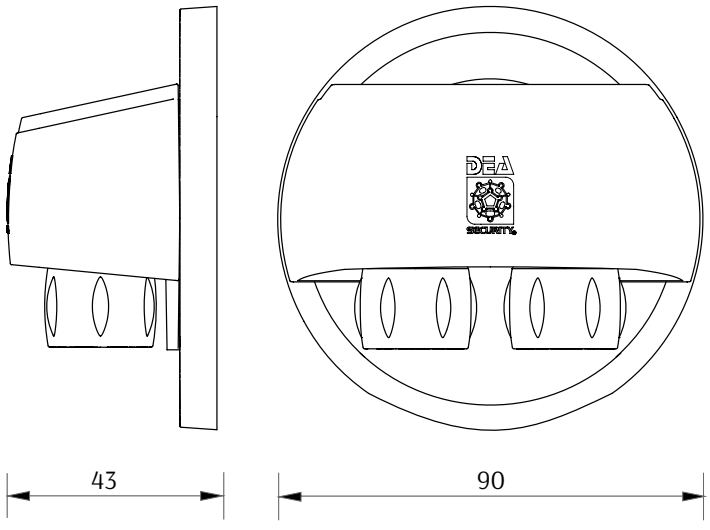
CASE (JUNCTION)

- **HOUSING DIMENSION**: 90 x 56 x 43 mm (L x L x H)
- **FIXING PLATE**: 90 x 8 mm (Ø x L)
- **OPERATING TEMPERATURE**: -40 ÷ +80 °C
- **RELATIVE HUMIDITY**: <95% non-condensing
- **MATERIAL**: glass fiber reinforced polyamide
- **IP RATING**: IP54
- **COLOUR**: black

CONNECTOR (SOCKET)

- **CONNECTOR TYPE**: 6-pole male circular socket
- **DIMENSION**: 27 x 33,9 mm (Ømax x L)
- **OPERATING TEMPERATURE**:-40 ÷ +80 °C
- **RELATIVE HUMIDITY**: <95% non-condensing
- **MATERIAL**: thermoplastic resistant to UV rays, mineral oils, hydrocarbons and acids
- **IP RATING**: IP68 (if correctly fastened with the relevant plug)
- **COLOUR**: black

Dimensional scheme



2.3. CONNECTORIZED TERMINATION

P/N TDV-FSP2P

Device for the termination (EOL) of the LN-FSP2P prewired sensor-strings. It is provided with a UV resistant housing, two easy-plug sockets and a fixing support

.

COMPLIANCE

In combination with sensors-string:

- **DIRECTIVE 2014/30/UE (EMC)**
  - EN 50130-4:2011+A1:2014
  - EN 61000-6-3:2007+A1:2011
- **DIRECTIVE 2011/65/UE (ROHS)**
  - EN 50581:2012

TECHNICAL FEATURES

- **ENVIRONMENTAL CLASS**:: IV (in accordance with CEI EN-50130-5)
- **GROSS WEIGHT**: 132 g
- **NET WEIGHT**: n.d.

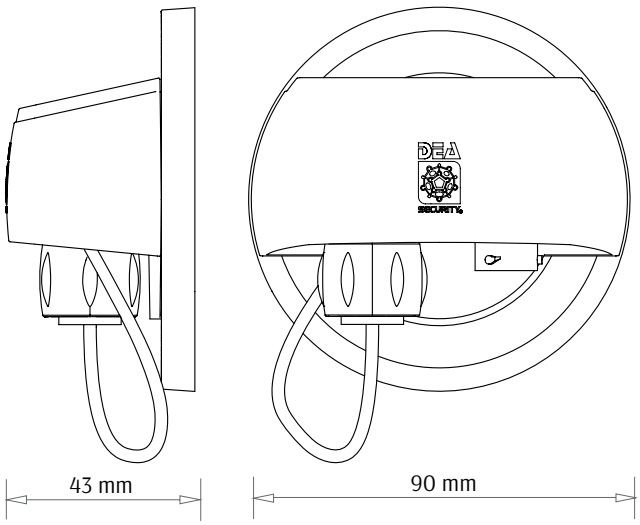
CASE (JUNCTION)

- **HOUSING DIMENSION**: 90 x 56 x 43 mm (L x L x H)
- **FIXING PLATE**: 90 x 8 mm (Ø x L)
- **OPERATING TEMPERATURE**: -40 ÷ +80 °C
- **RELATIVE HUMIDITY**: <95% non-condensing
- **MATERIAL**: glass fiber reinforced polyamide
- **IP RATING**: IP54
- **COLOUR**: black

CONNECTOR (SOCKET)

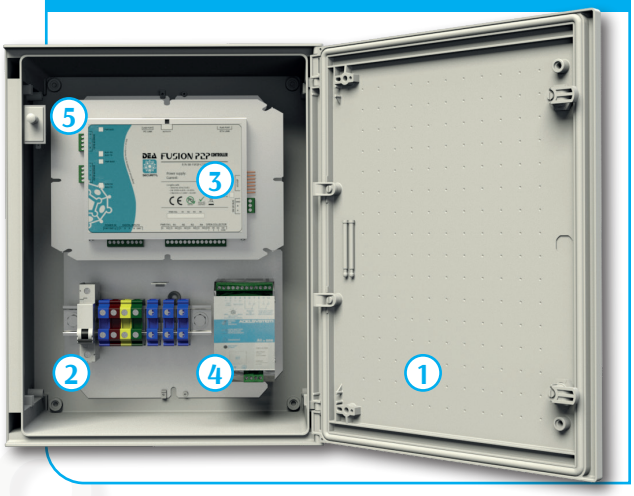
- **CONNECTOR TYPE**: 6-pole male circular socket
- **DIMENSIONS**: 27 x 33,9 mm (Ømax x L)
- **OPERATING TEMPERATURE**:-40 ÷ +80 °C
- **RELATIVE HUMIDITY**: <95% non-condensing
- **MATERIAL**: thermoplastic resistant to UV rays, mineral oils, hydrocarbons and acids
- **IP RATING**: IP68 (if correctly fastened with the relevant plug)
- **COLOUR**: black

DIMENSIONAL SCHEME



2.4. CONTROL UNIT

P/N CU-FSP2P



The Control Unit manages up to 300 detectors on 2 communication buses for a maximum coverage of 1,500 meters of perimeter in the case of lines with a span of 5 meters and 900 meters of perimeter in the case of lines with a span of 3 meters. Besides allowing the configuration of the detectors by means of the related service software, the Control Unit has the task of automatically recognizing and sorting the detectors in the field and collecting alarm signals.

Composition of the Control Unit:

1. Controller board BR-FSP2P-CTRL;
2. Stabilized power supply AL-P2P-3024;
3. Two BT-P2P-12V batteries;
4. Tamper switch;
5. BOX-P2P polyester panel.

COMPLIANCE

In combination with sensors-string:

- **DIRECTIVE 2014/30/UE (EMC)**
  - EN 50130-4:2011+A1:2014
  - EN 61000-6-3:2007+A1:2011
- **DIRECTIVE 2011/65/UE (ROHS)**
  - EN 50581:2012
- **DIRECTIVE 2014/35/UE (LVD)**
  - EN 62368-1:2014+A11:2017
- IEC 60695-2-10, IEC 60695-2-11, IEC 60695-11-5, IEC 62208

TECHNICAL FEATURES

BOX

- **ENVIRONMENTAL CLASS**: IV (in accordance with CEI EN-50130-5)
- **DIMENSIONS**: 300 x 400 x 200 mm (L x H x W)
- **NET WEIGHT**: 7.600 g (excluding batteries)
- **MATERIAL**: polyester self-estinguishing housing, provided with ventilation devices.
- **INSULATION**: double, halogen-free
- **TERMICAL CLASS**: 105
- **PROTECTION RATING**: IP66 (IP54 with ventilation devices), IK10
- **OPERATING TEMPERATURE**: -30 ÷ +70 °C

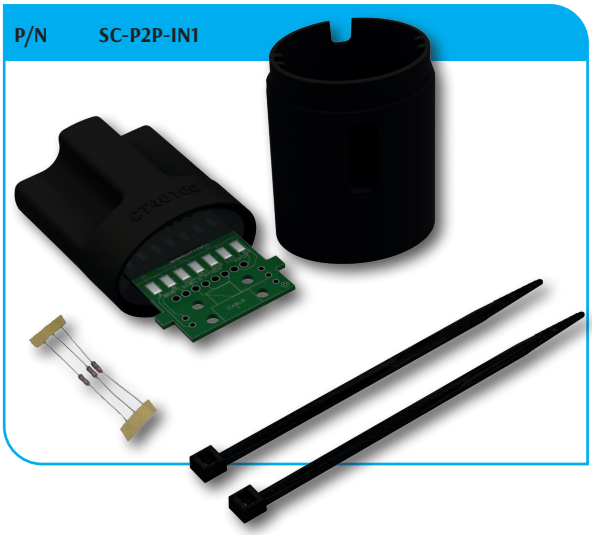
POWER SUPPLY

- **DIMENSIONS**: 65 x 115 x 135 mm (Lx H x W)
- **POWER SUPPLY** (from net): 115/230 Vca ± 10% 50 Hz
- **CURRENT** (from net):
  - max 0,25 A (230 V_{AC})
  - max 0,5 A (115 V_{AC})
- **OPERATING TEMPERATURE**: -25 ÷ +70 °C
- **RELATIVE HUMIDITY**: <95% non condensing
- **SPDT RELAY OUTPUTS**:
  - low or damaged battery
  - mains or battery power supply
- **BACKUP BATTERIES**: 2 lead batteries (12 V / 7,2 Ah)

CONTROLLER BOARD see BR-FSP2P-CTR datasheetL

2.5. Input Module

P/N SC-P2P-IN1



Peripheral module containing an electronic interface board for the management of a resistive balanced input. It can be connected everywhere along the bus and allows you to integrate into the system signals coming from third-party devices. The printed circuit board is protected by a polyamide housing which provides a very high resistance to UV rays and scratch.

Compliance

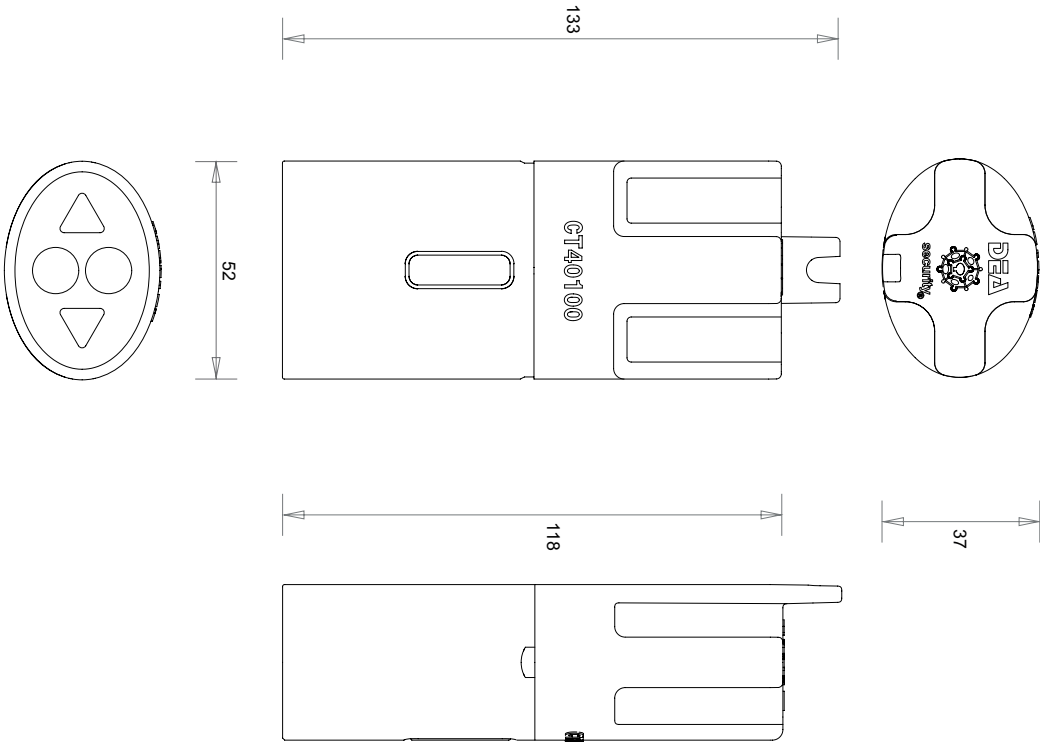
In combination with sensors-string:

- **Directive 2014/30/UE (EMC)**
  - EN 50130-4:2011+A1:2014
  - EN 61000-6-3:2007+A1:2011
- **Directive 2011/65/UE (ROHS)**
  - EN 50581:2012

Technical features

Classe ambientale:	IV (in accordo con norma EN-50130-5)
Dimensioni:	133 x 52 x 37 mm (L x H x P)
Dimensioni confezione:	165 x 90 x 65 mm (L x H x P)
Peso lordo:	184 g
Peso netto:	144 g
Materiale:	poliammide con aggiunta di fibra di vetro
Colore:	nero
Temperatura di esercizio:	-40 ÷ +80 °C
Umidità relativa:	0 – 100% (dopo sigillatura con resina RP-100)
Grado di protezione:	IP54
Ingressi:	1 triple balancing

Dimensional scheme



2.6. CONNECTION CABLE AND INITIAL CABLE

P/N CB-FSP2P

Cable for connecting the sensor-strings of a bus (LN-FSP2P or SN-FSP2P sensors). Consisting of four conductors, in addition to the screen, it allows the connection of the CU-FSP2P Control Unit to an unconnectorized sensor-string or to the CBINL-FSP2P connectorized cable at the beginning of the line. It can also be used to carry out repairs on the line or to overcome any discontinuity in the fence. The FUSION P2P cable is available in the following versions:

- CB-FSP2P-50, length 50 m and black color
- CB-FSP2P-150, length 150 m and black color

Connectorized cable 5 meters long for connecting the CU-FSP2P Control Unit to the first LN-FSP2P sensor-line of a bus.

P/N CBINL-FSP2P

COMPLIANCE

- CEI 20-29 CL.5
- UL 758, CEI 20-11, EN 50363, UL 1581, CEI 20-35/1-2, EN 60332-1-2, IEC 60332-1, VDE 0282-10, 2014/35/EU
- EU DIRECTIVE ROHS 2011/65/EU

TECHNICAL FEATURES

- **GENERAL PROPERTIES**
  - NOMINAL DIAMETER: 7 mm (+/- 0,15)
  - CONDUCTOR: 2 twisted-twin, flexible stranged tinned copper
  - CONDUCTOR SECTION: 0,75 mm² (power supply) - red/black
    0,22 mm² (comunication, RS-485) - white/blue
  - INSULATION: halogen free polyolefin
  - SHIELD: Aluminium-Polyster foil tape with tinned copper drain wire cross sectional area 0,22 mm²
  - LAY UP: Laying up of the two elements in pair with filler and polyster protective tape(0,22 mm²)
  - TOTAL LAY UP: Total laying up of the two elements in pair with filler and polyster protective tape
  - JACKET: Special flame-retardant nd oil resistant PVC
  - COLOR: black
- **ELECTRICAL PROPERTIES**
  - MAX DC CONDUCTOR RESISTANCE (20°C): 26,7 Ω/Km (0, 75 mm²)
    93,25 Ω/Km (0,22 mm²)
  - INSULATION RESISTANCE OF SOLID POLYETHYLENE:
    › 600 MΩxKm
    (20°C @ 500V_{DC})
  - NOMINAL IMPEDANCE: 100 Ω (0, 75 mm²)
  - NOMINAL CAPACITY: 55 pF/m (0, 75 mm²)
  - TENSIONE DI ESERCIZIO: 300 V
  - TEST VOLTAGE (cond./cond.; cond/shield): 1500 V
  - TEST VOLTAGE OUT: 4000 V
  - INSULATION VOLTAGE: 0,6/1 kV
- **PHISYCAL PROPERTIES**
  - RAGGIO DI CURVATURA: 15 volte il diametro esterno
  - OPERATING TEMPERATURE: -40 ÷ +80 °C (posa fissa)
    -15 ÷ +80 °C (posa mobile)
  - NOMINAL WEIGHT: 72,14 Kg/km
- **CONNECTOR (PLUG)**
  - CONNECTOR TYPE: 6-pin female circular plug with bayonet locking
  - DIMENSIONS: 26,2 x 63,2 mm (Ø max X L)
  - OPERATING TEMPERATURE: -40 ÷ 105 °C
  - MATERIALE INVOLUCRO: thermoplastic resistant to UV rays, mineral oils, hydrocarbons and acidsi
  - IP RATING: IP68 (if correctly inserted into the relevant socket)
  - COLOUR: black

2.7. UNCONNECTORIZED JUNCTION

P/N JBX-P2P

COMPLIANCE

In combination with sensors-string:

- **DIRECTIVE 2014/30/UE (EMC)**
  - EN 50130-4:2011+A1:2014
  - EN 61000-6-3:2007+A1:2011
- **DIRECTIVE 2011/65/UE (ROHS)**
  - EN 50581:2012

TECHNICAL FEATURES

- **ENVIRONMENTAL CLASS**: IV (in accordance with EN-50130-5)
- **DIMENSIONS**: 30 x 30 x 114 mm (L x H x W)
- **GROSS WEIGHT**: n.d.
- **NET WEIGHT**: n.d.
- **OPERATING TEMPERATURE**: -40 ÷ +80 °C
- **RELATIVE HUMIDITY**: 0 – 100% (after sealing with RP-100 resin)
- **IP RATING**: IP68
- **MATERIAL**: glass fiber reinforced polyamide
- **COLOUR**: black

UV resistant case for the junction of the unconnectorized FUSION P2P sensor-strings and for the junction of the CB-FSP2P cable with the CBINL-FSP2P initial string cable. (typically, to perform bypasses and repairs on the sensor-string).
JBX-P2P is also used if one or more sensors wired in the SN-FSP2P line without easy-plug connectors must be connected to another sensor-string. It is supplied with a printed circuit board to simplify the wiring procedures.

2.8. UNCONNECTORIZED TERMINATION

P/N JBX-P2P

COMPLIANCE

In combination with sensors-string:

- **DIRETTIVE 2014/30/UE (EMC)**
  - EN 50130-4:2011+A1:2014
  - EN 61000-6-3:2007+A1:2011
- **DIRETTIVE 2011/65/UE (ROHS)**
  - EN 50581:2012

TECHNICAL FEATURES

- **ENVIRONMENTAL CLASS**: IV (in accordance with EN-50130-5)
- **DIMENSIONS**: 30 x 30 x 114 mm (L x H x W)
- **GROSS WEIGHT**: n.d.
- **NET WEIGHT**: n.d.
- **OPERATING TEMPERATURE**: -40 ÷ +80 °C
- **RELATIVE HUMIDITY**: 0 – 100% (after sealing with RP-100 resin)
- **IP RATING**: IP68
- **MATERIAL**: glass fiber reinforced polyamide
- **COLOUR**: black

UV resistant case for the termination of the unconnectorized FUSION P2P sensor-strings. It is supplied with a printed circuit board to simplify the wiring procedures.

2.9. CONTROLLER BOARD

P/N **BR-FSP2P-CTRL**

COMPLIANCE

In combination with sensors-string:

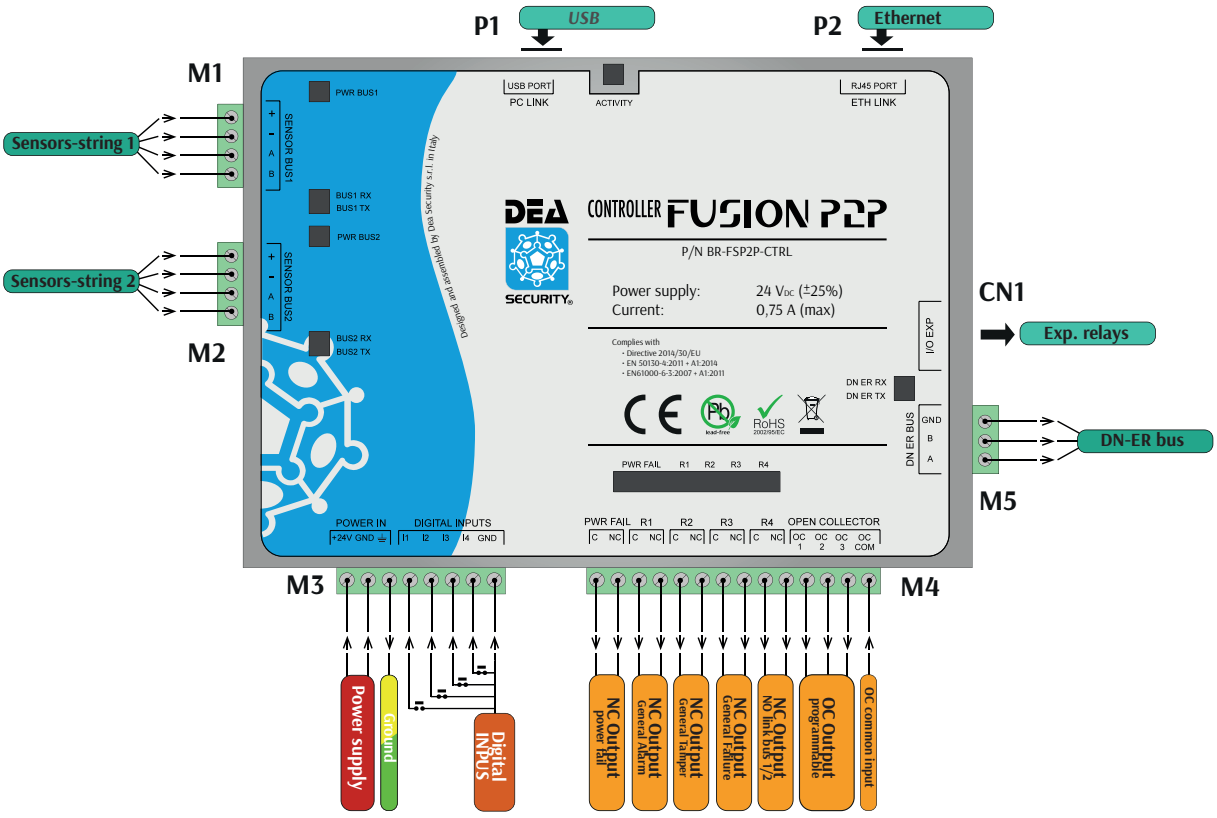
- **DIRECTIVE 2014/30/EU**
  - EN 50130-4:2011
  - EN 61000-6-3:2007+A1:2011
- **DIRECTIVE 2011/65/EU**
  - EN 50581:2012

TECHNICAL FEATURES

- **DIMENSIONS**: 185 x 135 x 41 mm (L x H x D)
- **PACKAGE DIMENSIONS**: 280 x 160 x 70 mm (L x H x D)
- **GROSS WEIGHT**: 705 g
- **NET WEIGHT**: n.d.
- **POWER SUPPLY**: 24 Vcc (+/-25%)
- **CURRENT**: 0,75 A (max)
- **OPERATING TEMPERATURE**: -25 ÷ +70 °C
- **RELATIVE HUMIDITY**: <95% non condensing
- **MANAGEMENT CAPABILITY**: up to 150 FUSION P2P sensors each bus
- **DIGITAL INPUTS**: No 8 optoisolated inputs (software programmable)
- **NC RELAY OUTPUTS (POSITIVE SECURITY)**:
  - low battery
  - general alarm
  - general tamper
  - sensor failure
  - bus link loss
  - up to 128 external on optional boards (8 SC-DN-ER16 or 8 BR-XS-RE16L)
- **OC OUTPUTS**: No 3 programmable
- **CONNECTIONS**:
  - Ethernet (RJ45)
  - USB
- **CALIBRATIONS and CONFIGURATIONS by MEANS of SERVICE SOFTWARE**
- **CPU**: 32 bit, 168 MHz
- **DIGITAL MEMORY:** more than 20.000 events
- **SERVICE SOFTWARE LICENCE INCLUDED**

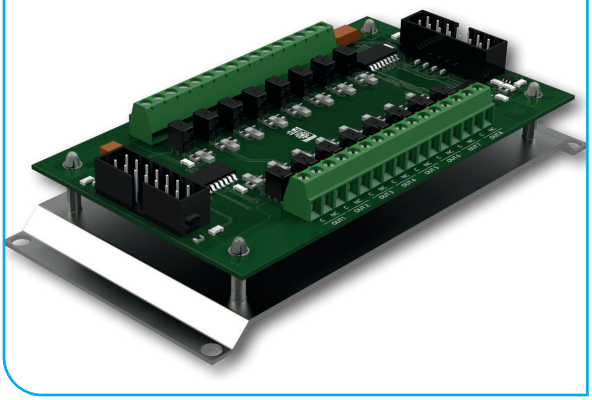
Controller board that manages up to 300 FUSION P2P sensors on two communication buses (150 sensors per bus). Its functions include the acquisition and automatic sorting of sensors, the processing of alarm signals and native support for centralization and remote management of the system on IP networks.

GENERAL SCHEME



2.10. RELAYS EXPANSION XS 16 RE

P/N BR-XS-16L



16-relay expansion board to make the alarm signals available through C/NC contacts. All the relay outputs can be programmed via software from FUSION P2P (BR-FSP2P-CTRL) CONTROLLER boards.

COMPLIANCE

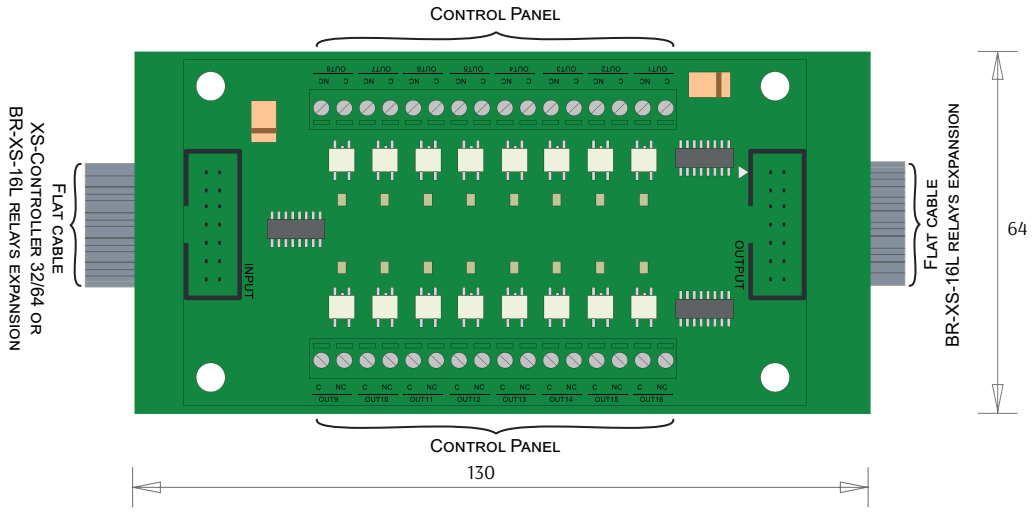
In combination with Controller board

- **DIRECTIVE 2014/30/UE (EMC)**
  - EN 50130-4:2011+A1:2014
  - EN 61000-6-3:2007+A1:2011
- **DIRECTIVE 2011/65/UE (ROHS)**
  - EN 50581:2012

TECHNICAL FEATURES

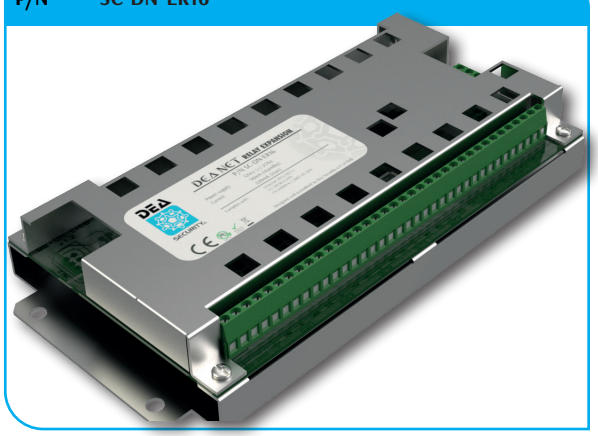
DIMENSIONS:	130 x 64 x 29 mm (L x H x W)
PACKAGING DIMENSIONS:	145 x 70 x 67 mm (L x H x W)
GROSS WEIGHT:	78 g
POWER SUPPLY:	from CONTROLLER FUSION
CURRENT:	30 mA (max)
OPERATING TEMPERATURE:	-25 ÷ +80 °C
RELATIVE HUMIDITY:	<95% non condensing
C/NC RELAY OUTPUTS:	16-relay outputs programmable from Controller board
CONNECTION:	14-way connector for by flat cabl

GENERAL SCHEME



2.11. RELAYS EXPANSION 16 DN

P/N SC-DN-ER16



Expansion board with 16 relays for transferring the signals from the DEA NET network to C / NC / NO exchange contacts. It is equipped with software programmable relay outputs from BR-FSP2P-CTRL

COMPLIANCE

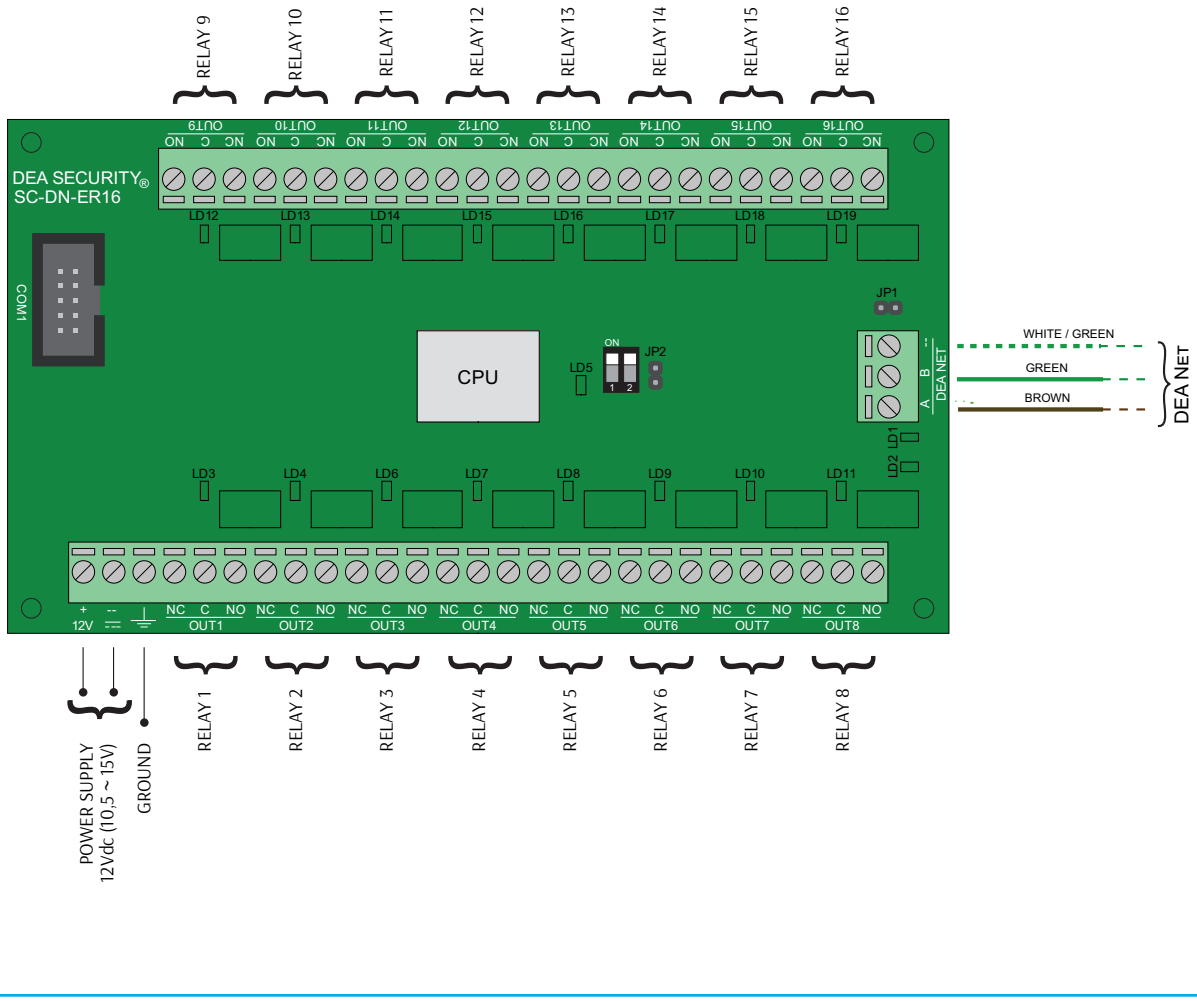
In combination with Controller board

- **DIRECTIVE 2014/30/UE (EMC)**
  - EN 50130-4:2011+A1:2014
  - EN 61000-6-3:2007+A1:2011
- **DIRECTIVE 2011/65/UE (ROHS)**
  - EN 50581:2012

TECHNICAL FEATURES

DIMENSIONS:	175 x 89 x 27 mm (L x H x P)
PACKAGING DIMENSIONS:	180 x 95 x 47 mm (L x H x P)
GROSS WEIGHT:	288 g
NET WEIGHT:	n.a.
POWER SUPPLY:	12 V_{DC} (+/- 25%)
CURRENT:	50 mA (stand-by) 220 mA (max)
OPERATING TEMPERATURE:	-25 ÷ +80 °C
RELATIVE HUMIDITY:	<95% non condensing
NC RELAY OUTPUTS:	16 programmable
CONNECTIONS:	DEA NET bus
CPU:	16 bit, 16 MHz

GENERAL SCHEME



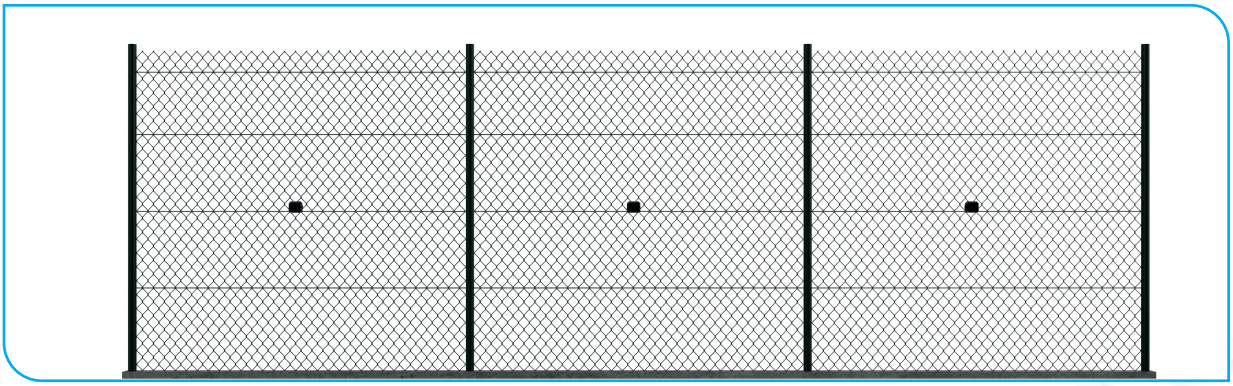
3. System installation

3.1. Installation environments

The versatility of FUSION P2P system enables you to protect different types of perimeter structures.

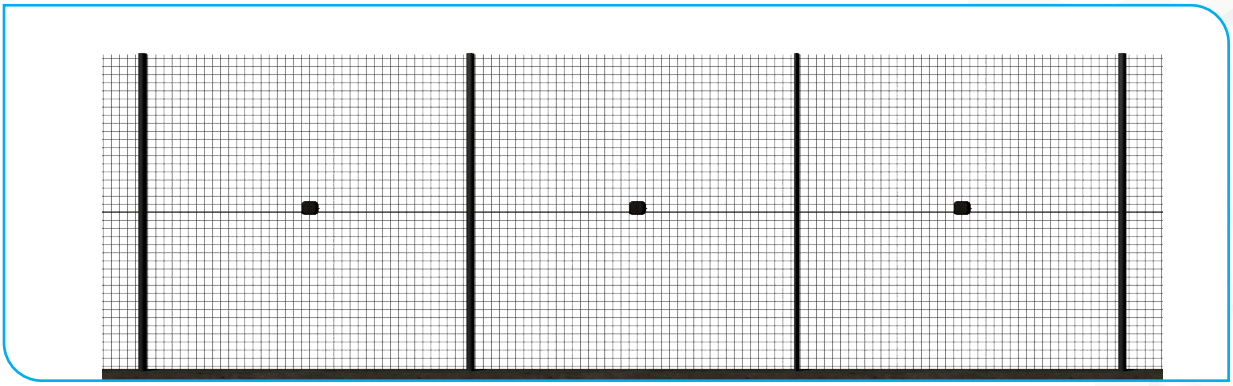
3.1.1 Chain-link mesh fence

A chain-link mesh fence is generally composed of wires which run vertically and are bent into a zig-zag pattern. Each sensor covers up to 3 m x 3 m.



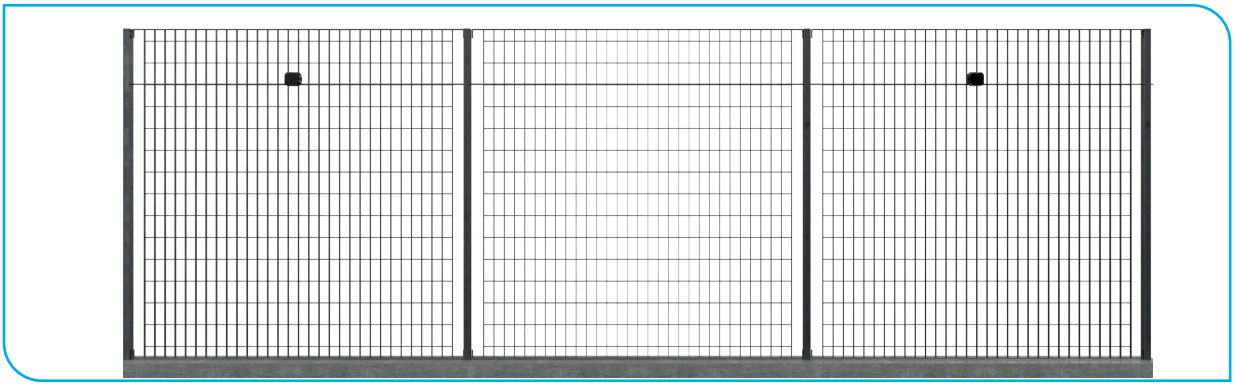
3.1.2 Welded wire mesh fence

A welded wire mesh fence consists of wire strands electrically welded together to form a square or a rectangular weave. Each sensor can cover up to 3 m x 3 m.



3.1.3 Grating fence

Structures composed of self-supporting rigid panels, fixed to posts placed at regular distance. Each sensor can cover up to 5 m x 3 m.

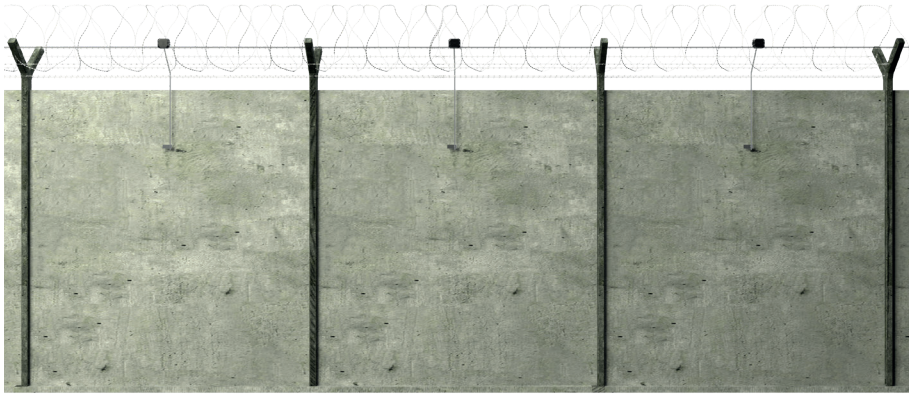


3.1.4 Rigid fence

Rigid structures with posts placed at regular distance and fixed to the curb or to the wall underneath. Each sensor can cover up to 5 m x 3 m.

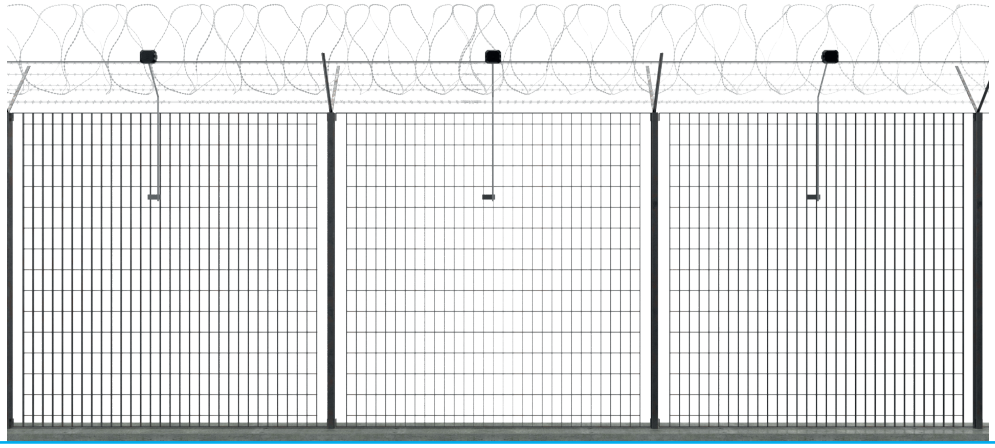
3.1.5 Wall with concertina topping

A wall with concertina razor wire topping can be protected by means of special custom-made metal rods (quotation on demand) which connect the sensor installed on the concertina to the wall underneath. In this way both the wall can be protected against breakthrough events and the concertina against cutting and climbing attempts.



3.1.6 Grating fence with concertina topping

A grating fence with concertina razor wire topping can be protected by means of special custom-made metal linking rods (quotation on demand) which connect the sensor installed on the concertina to the metal fence. In this way both the grating and the concertina are protected against cutting and climbing attempts.

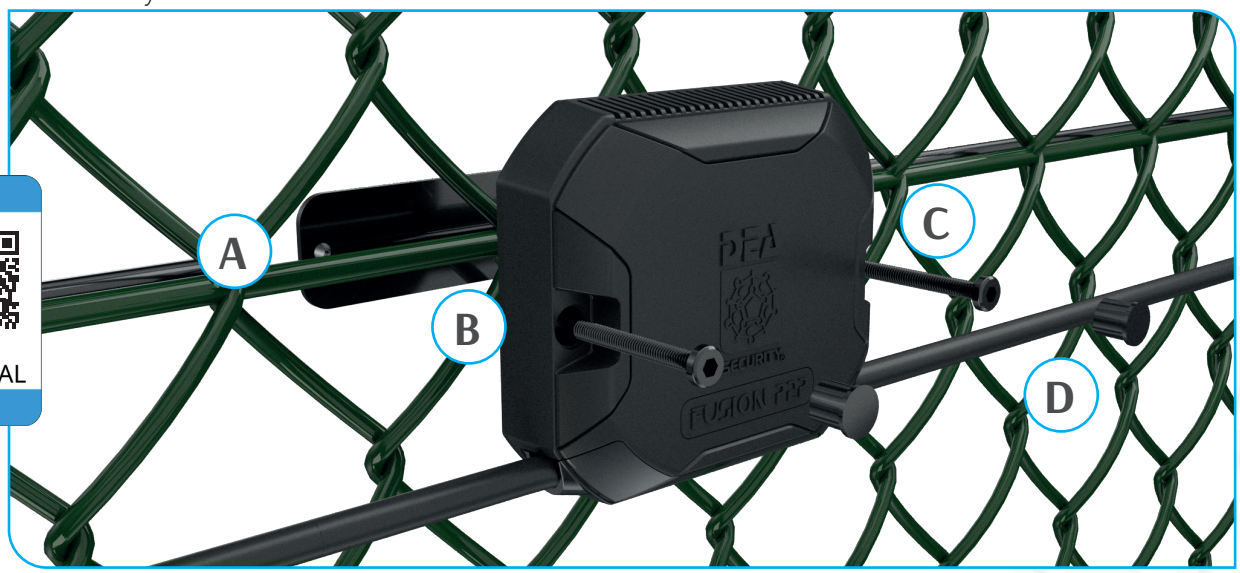


3.2. SENSOR INSTALLATION

The sensor position varies depending on the type of structure. Generally it is better to place it in the middle of each fence panel.

- Place the fixing plate (A) on the external side of the fence;
- Align the holes on the plate (A) with the holes on the sensors (B), then insert the screws (C) into the holes and screw them.
- Clamp the screws and insert the covers (D) on the front.
- Fix the cable with the tie-wraps (suitable for external environment, U.V. resistant and equipped with metal core) to be placed every 30 cm approx. to prevent the cable from hitting the fence. The cable should be shaped nearby the sensor to have a tolerance.

TUTORIAL



3.3. INSTALLATION JUNCTION / TERMINATION

For a correct installation of the connectorized junction some simple operations must be carried out:

1. Install the disk-shaped fixing support to the fence (with the arrow downwards) using the tie- wraps provided and the holes present on the disk (A);
2. Insert and tight the connectors of the two string ends to the junction, ensure an IP68 rating (B);
3. Attach the JDVP-P2P junction case to the fixing disk with the outlet cable downwards and make it slide down on the fixing disk (C);
4. Rotate the junction so that it is oriented horizontally.

TUTORIAL

To execute a termination of FUSION P2P connectorized strings, you need to:

1. Install the disk-shaped fixing support with the arrow downwards on the fence using the tie wraps provided and the holes present on the disk (A).
2. Insert and tight the string end to be terminated to the TDV-FSP2P termination, ensuring IP68 rating (B).
3. Attach the TDV-FSP2P to the fixing disk with the outlet cable downwards and make it slide down on the fixing disk (C).
4. Rotate the termination so that it is oriented horizontally.

TUTORIAL

3.4. SENSOR REPLACEMENT

Should you need to replace a FUSION P2P sensor, please contact the DEA Security technical department (see chapter Technical support).

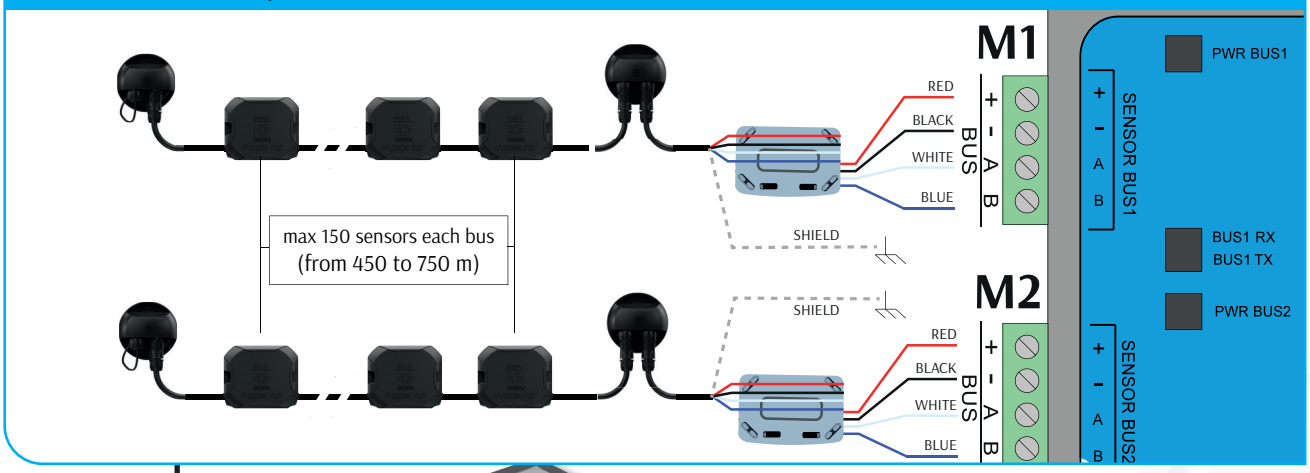
4. CONNECTIONS

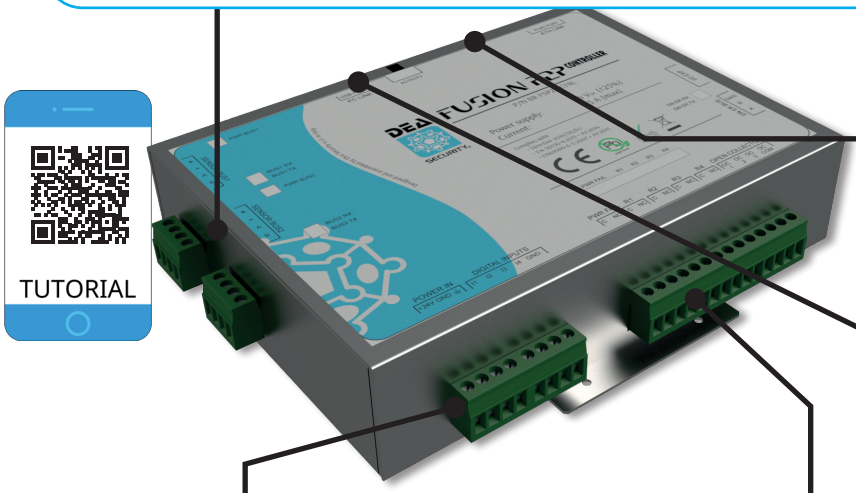
Inside the Control Unit is placed the controller board, through which the connections are created.

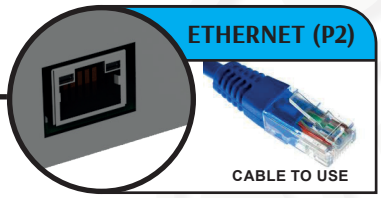
4.1. CONTROLLER BOARD

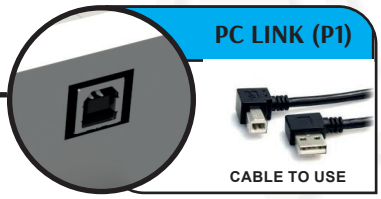
The board is 24 V_{DC} powered (linear stabilized power supplies). The connections are made via Controller terminal blocks: M1 (bus1), M2 (bus2), M3 (inputs) M4 (outputs), M5 and CN1 (relay expansions), USB (PC connection) and ethernet port.

TERMINAL BLOCK M1 / M2

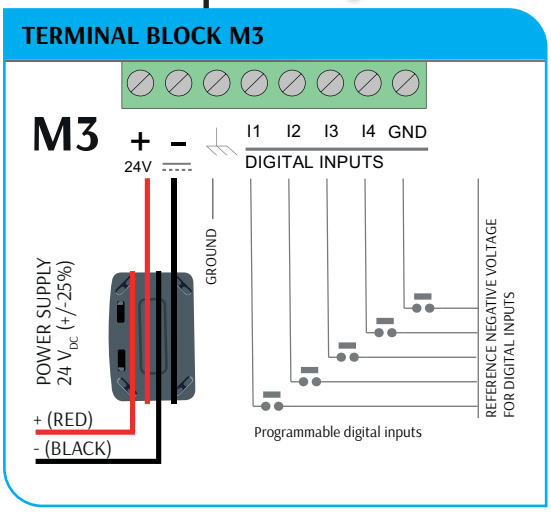




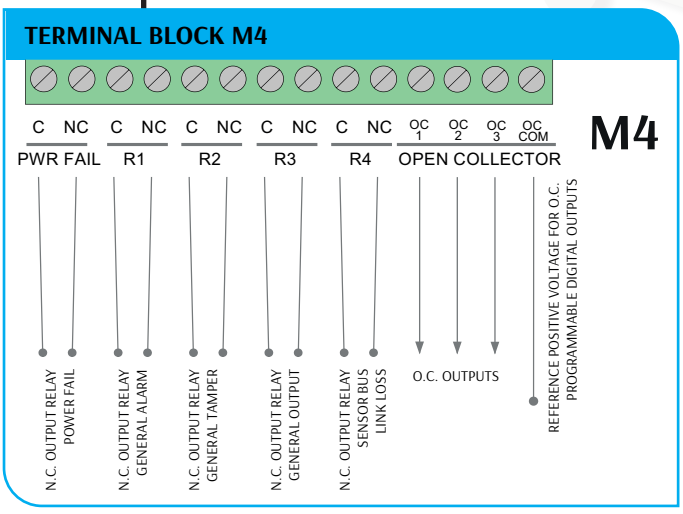




TERMINAL BLOCK M3



TERMINAL BLOCK M4



N.B. ***THE BOARD MUST BE INSTALLED INSIDE A CABINET PROTECTED AGAINST OPENING. THE INSTALLATION OF THE BOARD OUTDOORS IS POSSIBLE ONLY INSIDE WATER-PROOF CABINETS. IF TEMPERATURE AND HUMIDITY ARE OUT OF RANGE, IT IS NECESSARY TO INSTALL AN AIR-CONDITIONING UNIT INSIDE THE CABINET. DEA SECURITY SUGGESTS PERIODICALLY CHECKING ALL THE EQUIPMENT TO ENSURE MAXIMUM EFFICIENCY OVER TIME.***

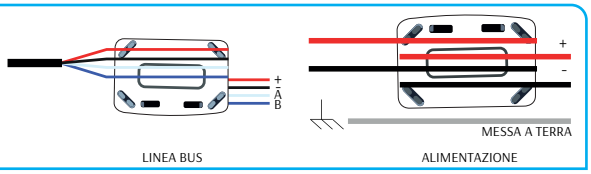
- **SENSOR BUS (M1 / M2)**

  FUSION P2P sensor-strings must be connected to terminal block M1 and M2 as shown on the previous picture. Each bus can manage up to 150 sensors, guaranteeing a maximum perimeter protection of 750 m (5 m span sensors).

  4 ferrites improve the immunity of the card to electromagnetic disturbances of the sensor-strings and power supply, placing them as close as possible to the P2P V3 Controller.

THE CABLES MUST MAKE A TURN AROUND THE FERRITE CORE AS SHOWN IN FIGURE. A FERRITE MUST BE USED ALSO FOR MAINS POWER SUPPLY CABLE.

THE POWER LINE (24 VDC) IS ALREADY SUPPLIED PRE-WIRED WITH INSERTED FERRITE.



IF THE CABLES OF THE DIGITAL INPUTS, OR OF THE OUTPUTS, EXCEED THE LENGTH OF 3 METERS, IT IS NECESSARY TO INSERT A FERRITE (MODEL WE 74271132) MAKING THE CABLES TURN AROUND IT. DEPENDING ON THE NUMBER OF CABLES EXCEEDING 3 METERS, MORE FERRITES MAY BE NEEDED TO CONTAIN THEM ALL.

- **INPUTS (M3) AND OUTPUTS (M4)**
  - **Digital Inputs (M3)**: 4 digital inputs are available to program (and reference negative).
  - **Relay outputs (M4)**: the board provides relay outputs for POWER FAIL (low battery or insufficient power supply and service activity in progress), general alarm, general tampering, general fault, loss of sensor bus link and 4 open collector outputs.

<u>IMPORTANT</u>: ALWAYS CONNECT THE POWER FAIL OUTPUT TO A 24/7 ZONE OF THE ALARM CONTROL PANEL TO REPORT BOARD TROUBLES AND / OR POWER FAILURES.

- **PC (P1 PORT) AND WAN/LAN (P2 PORT)**

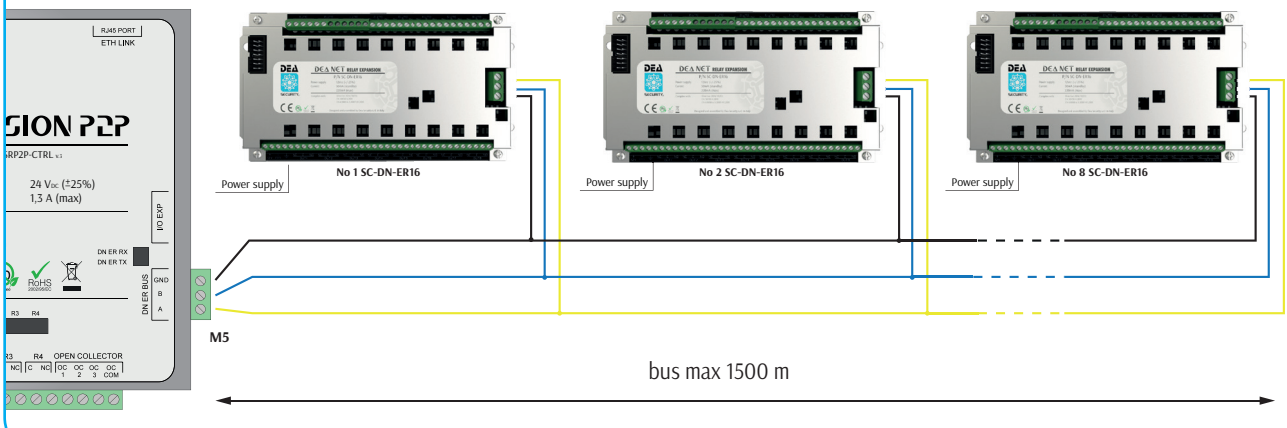
  BR-FSP2P-CTRL controller board has two different connectors available:
  - **P1 port** (type B USB) is for service activity (configuration and setting up of the system) using the provided service software.
  - **P2 port** (Ethernet) allows connection of the FUSION P2P system to a LAN / WAN network, using TCP / IP protocols:
    1. integration with graphic map management systems (DEA MAP supervision software);
    2. communication with integrated and integrable third-party video surveillance systems (plugins);
    3. integration, through the dynamic library SW-DM-DLL, of the signals coming from the P2P V3 Controller in a third-party software;
    4. service activities, by connecting the PC and using the service software..

<u>IMPORTANT</u>: IF THE CARD IS PERMANENTLY CONNECTED TO THE NETWORK OR THE ETHERNET CONNECTION IS GREATER THAN 3 METERS, IT IS MANDATORY TO USE AN STP TYPE NETWORK CABLE, WITH A FERRITE (MODEL WE 74271132)

- **CONONNECTION OF RELAY EXPANSION BOARDS**
  - **CONNECTION WITH SC-DN-ER16 BOARDS**

    SC-DN-ER16 board is used to convert alarm, tamper or failure signals to dry contacts (C/NC/NO). Expansion relay modules must be connected to BR-FSP2P-CTRL controller board using terminal board M5. BR-FSP2P-CTRL controller can manage up to 8 SC-DN-ER16 (128 programmable output relays).

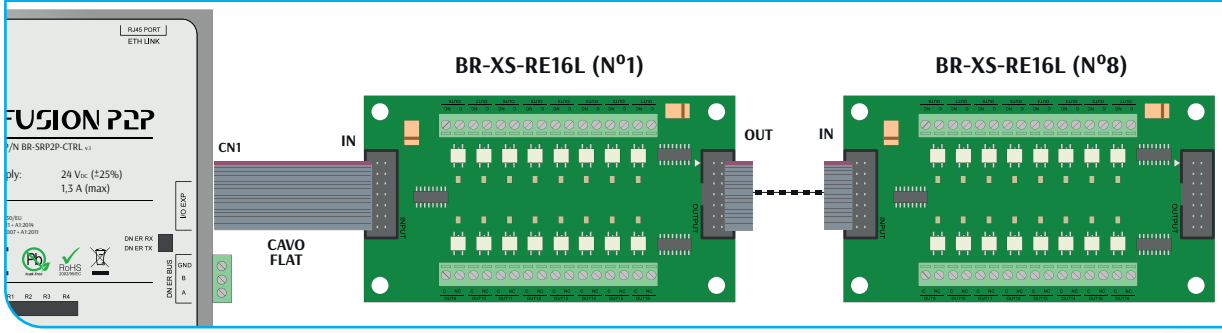
TERMINAL BLOCK M5



CONNECTION WITH BR-XS-RE16L BOARDS

BR-FSP2P-CTRL can be equipped with relay expansions through the connection of the BR-XS-RE16L boards, interfaces for the transfer of the signals to C / NC / NO exchange contacts, equipped with 16 relays each. These cards are connected to the P2P CONTROLLER via a flat cable, thanks to which they are also powered. Each P2P CONTROLLER can manage up to 8 BR-XS-RE16Ls, for a total of 128 configurable relays.

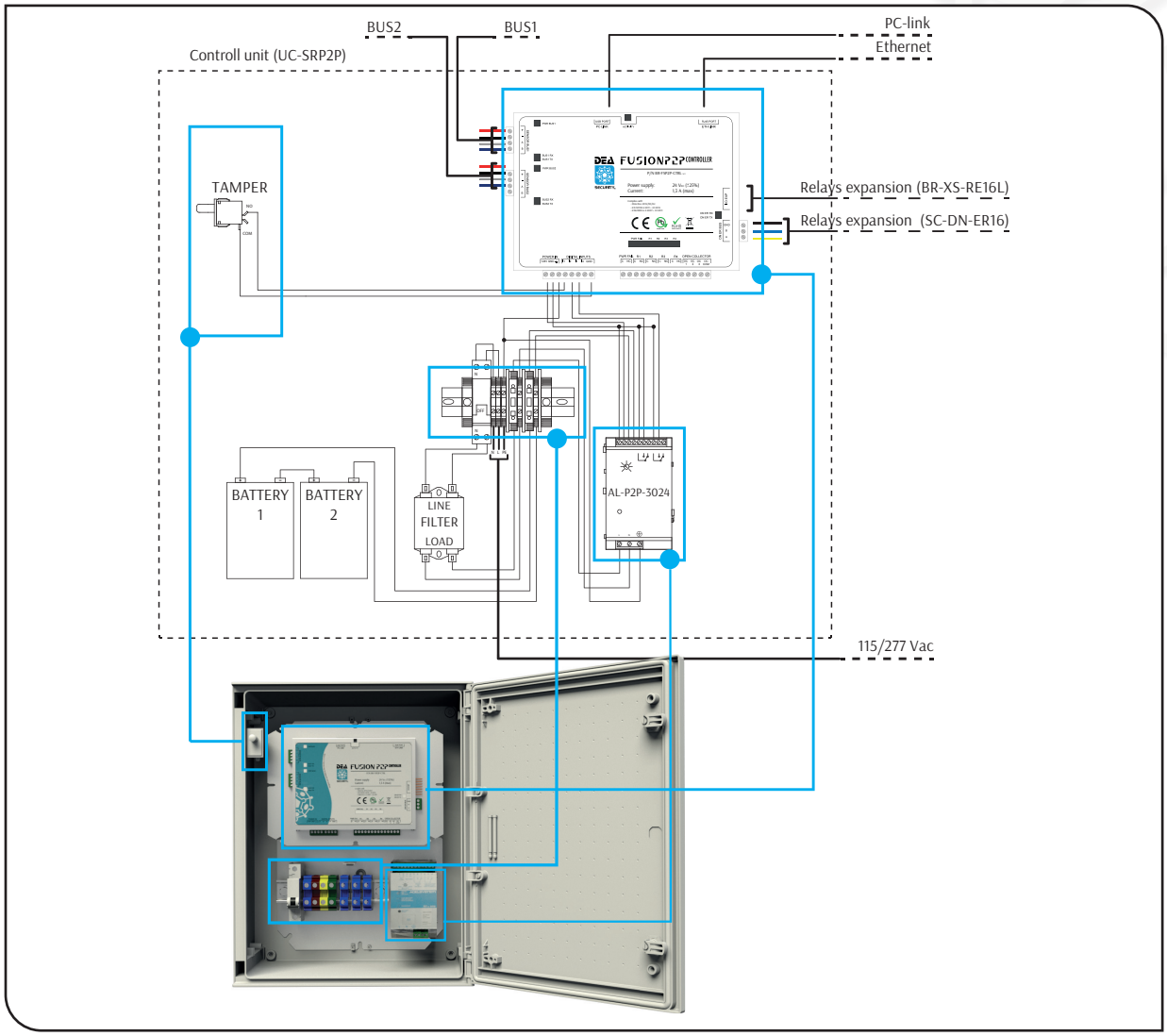
CONNECTOR CN1



THE CONTROLLER CAN BE CONNECTED TO THE RELAY EXPANSION BOARDS THROUGH THE FLAT CABLE (BR-XS-RE16L) OR THROUGH THE BUS DN ER. BOTH CONNECTIONS ARE NOT POSSIBLE.

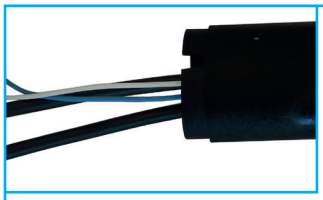
4.2. CONTROL UNIT

The wiring diagram of the Control Unit is as follows:

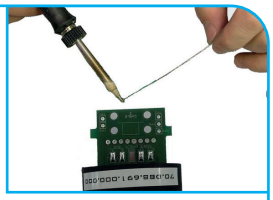


4.3. Input Module

To insert an SC-P2P-IN1 module inside the sensor bus, simply interrupt the section and perform the following procedure:



Insert all the cables to be solded in in the holes of the cover case



Tin the pads on both sides of the printed circuit board

- **Preliminaries**

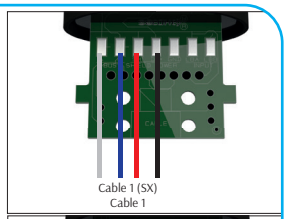
  Cut the CV-P2P cable and insert the two ends of the cable and the third-party device wires, after balancing it, in the holes of the cover case. Solder all the wires to the pcb as shown below.

SOLDER THE SHIELD TO THE SPECIFIC PAD.

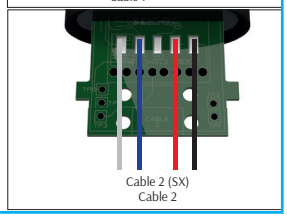
- **Balanced line**

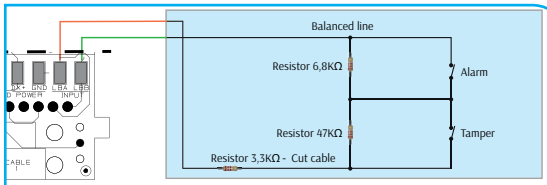
  The connection of the balanced lines and a generic sensor are described below. The connection with the SC-P2P-IN1 input module will be described later.

Cable 1 (SX)	SC-P2P-IN1
WHITE	A (BUS)
BLUE	B (BUS)
RED	DX+ (POWER)
BLACK	GND (POWER)

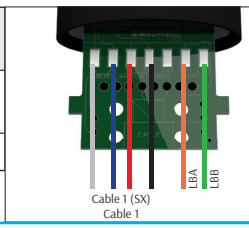


Cable 2 (DX)	SC-P2P-IN1
WHITE	A (BUS)
BLUE	B (BUS)
RED	SX+ (POWER)
BLACK	GND





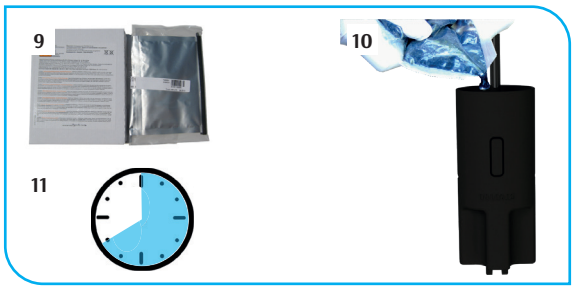
Third-Party Sensor	SC-P2P-IN1
ORANGE (C)	LBA (INPUT)
GREEN (NC)	LBB (INPUT)



- **Sealing**

1. Prepare RP-100 polyurethane resin as shown on its package.
2. Close the case with the cap, turn it upside down and fix it to the structure.
3. Pour the resin into the triangular holes until the container is filled.

Wait for the complete polymerization of the resin, at least 40 minutes at 5 ° C or 25 minutes at 25 °

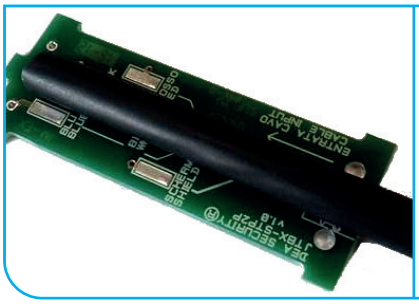


4.4. UNCONNECTORIZED JUNCTION

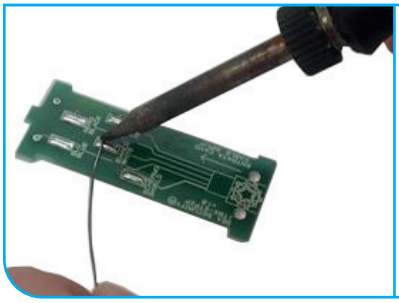
In case of need for unconnectorized junctions, it is necessary to follow the procedure below to connect them.

- **PRELIMINARIES**

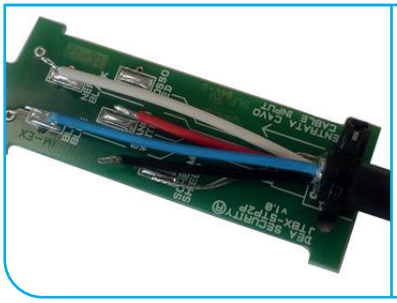
Insert the cable in one of the round holes of the case cover.



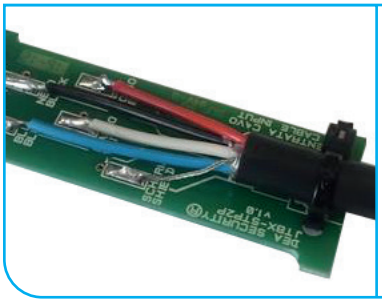
Strip the cable as shown on the printed circuit board.



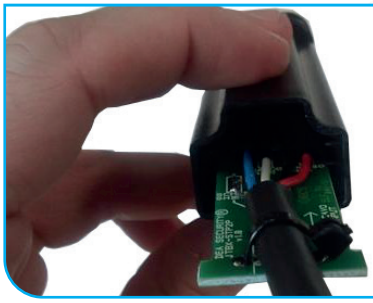
Tin the pads named RED, BLACK, BLUE,WHITE (Cable Input side).



Using the FPM-100 tie wrap, fix the cable to the printed circuit board (Cable Input side).



Solder the wires and the shields to the RED, BLACK, BLUE, WHITE pads on the printed circuit board.



Insert the printed circuit board into the case body using the proper guides.

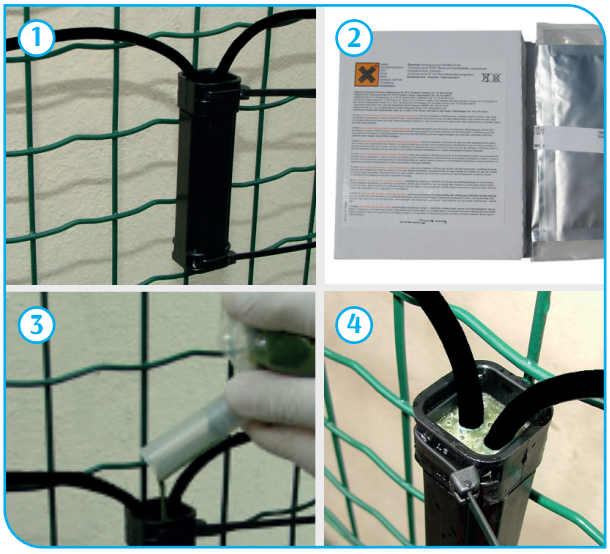
SOLDER THE SHIELD TO THE SPECIFIC PAD.

ONE PACKAGE OF RESIN IS USED TO SEAL TWO JBX-P2P CASES.

Close the case with its cover.

- **SEALING**

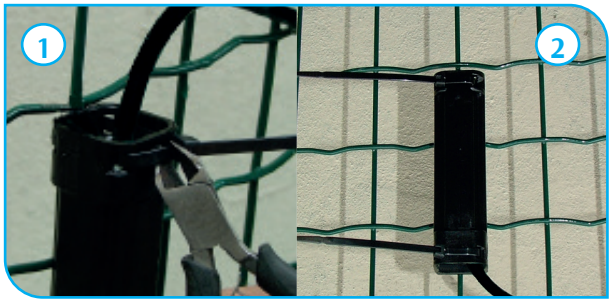
1. Prepare RP-100 PUR cast resin as shown on its package.
2. Close the case with the cap, turn it upside down and fix it to the structure.
3. Pour the resin into the triangular holes until the container is filled.
4. Wait for the complete polymerization of the resin, at least 40 minutes at 5 ° C or 25 minutes at 25 ° C



ONCE THE RESIN HAS DRIED, TURN THE CONTAINER BY POSITIONING IT WITH THE CABLES DOWNWARDS TO AVOID WATER STAGNATION AND ANY INFILTRATION OF MOISTURE INSIDE

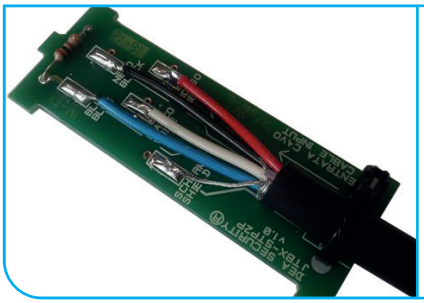
- **PLACEMENT ON THE FENCE**

1. Once the polymerization is complete, remove the tie wraps.
2. Using the last tie-wraps supplied, fix the JBX-P2P case to the fence with cover and cable input downwards.



4.5. UNCONNECTORIZED TERMINATION

It is necessary to carry out the same procedure described for the execution of the unconnectorized junction, with only one preliminary variant.

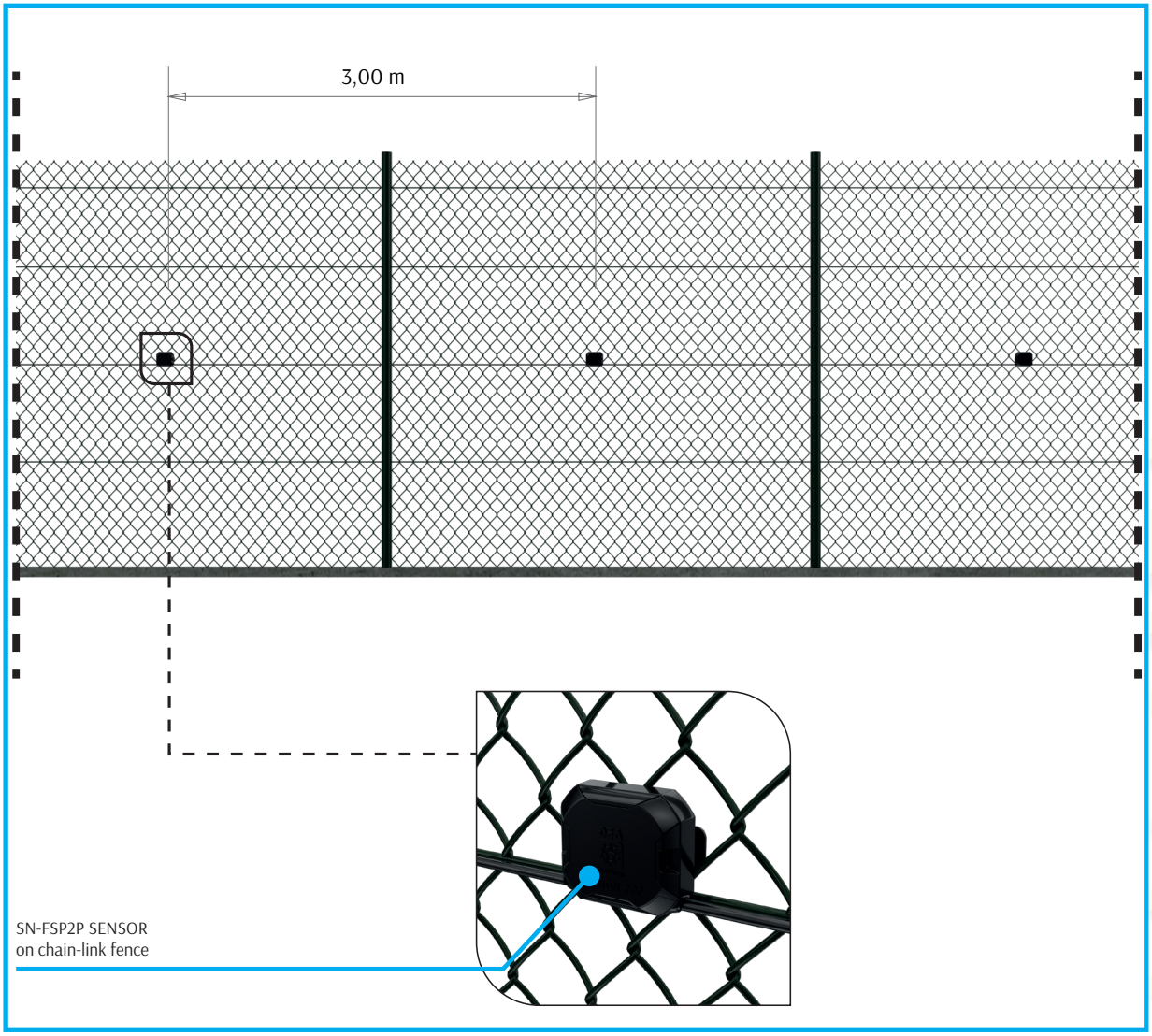


Solder the resistor supplied in pad R1 of the printed circuit.

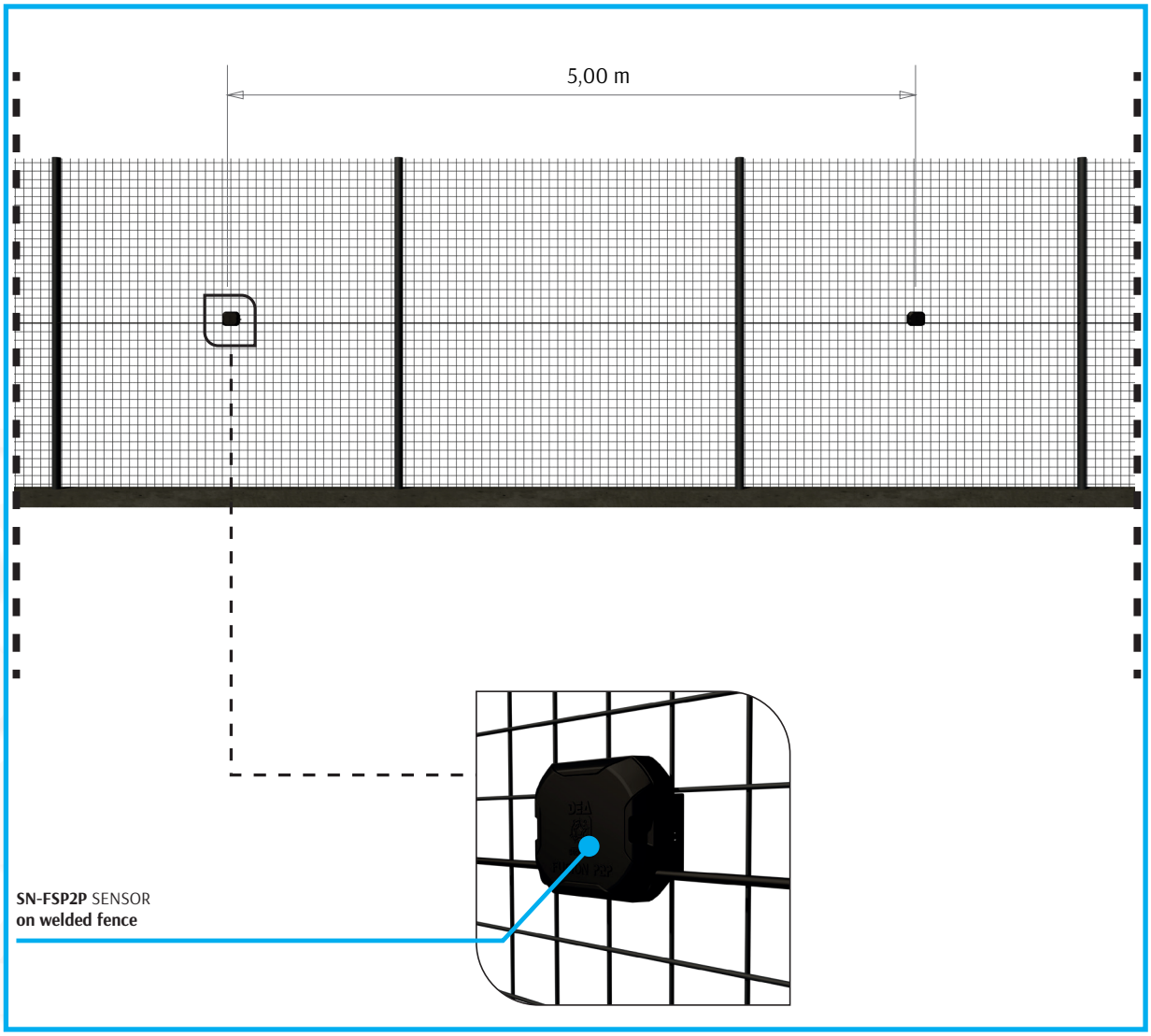
5. APPLICATIONS

Below you can find some typical applications of FUSION P2P sensors:

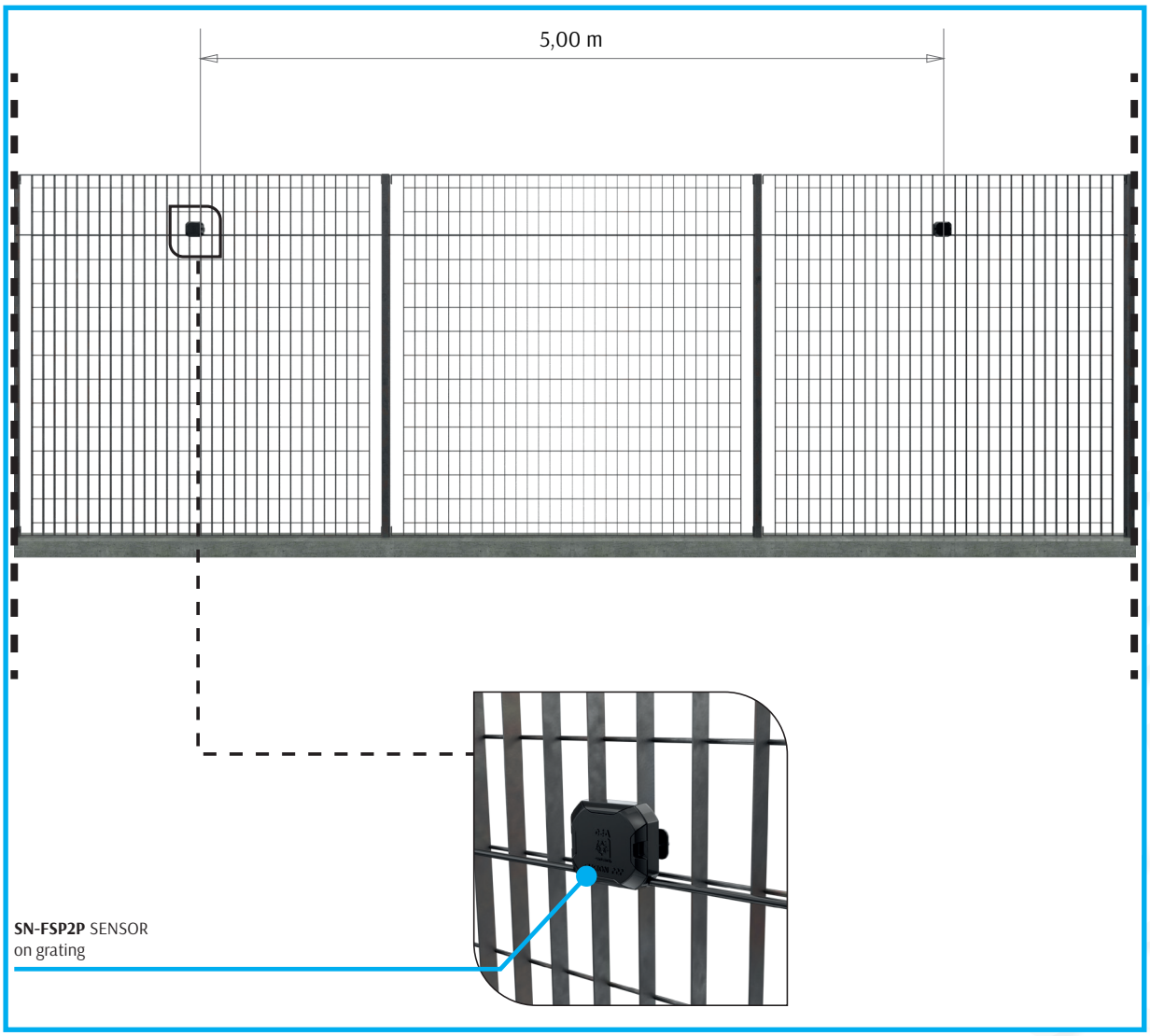
5.1. CHAIN-LINK MESH FENCE



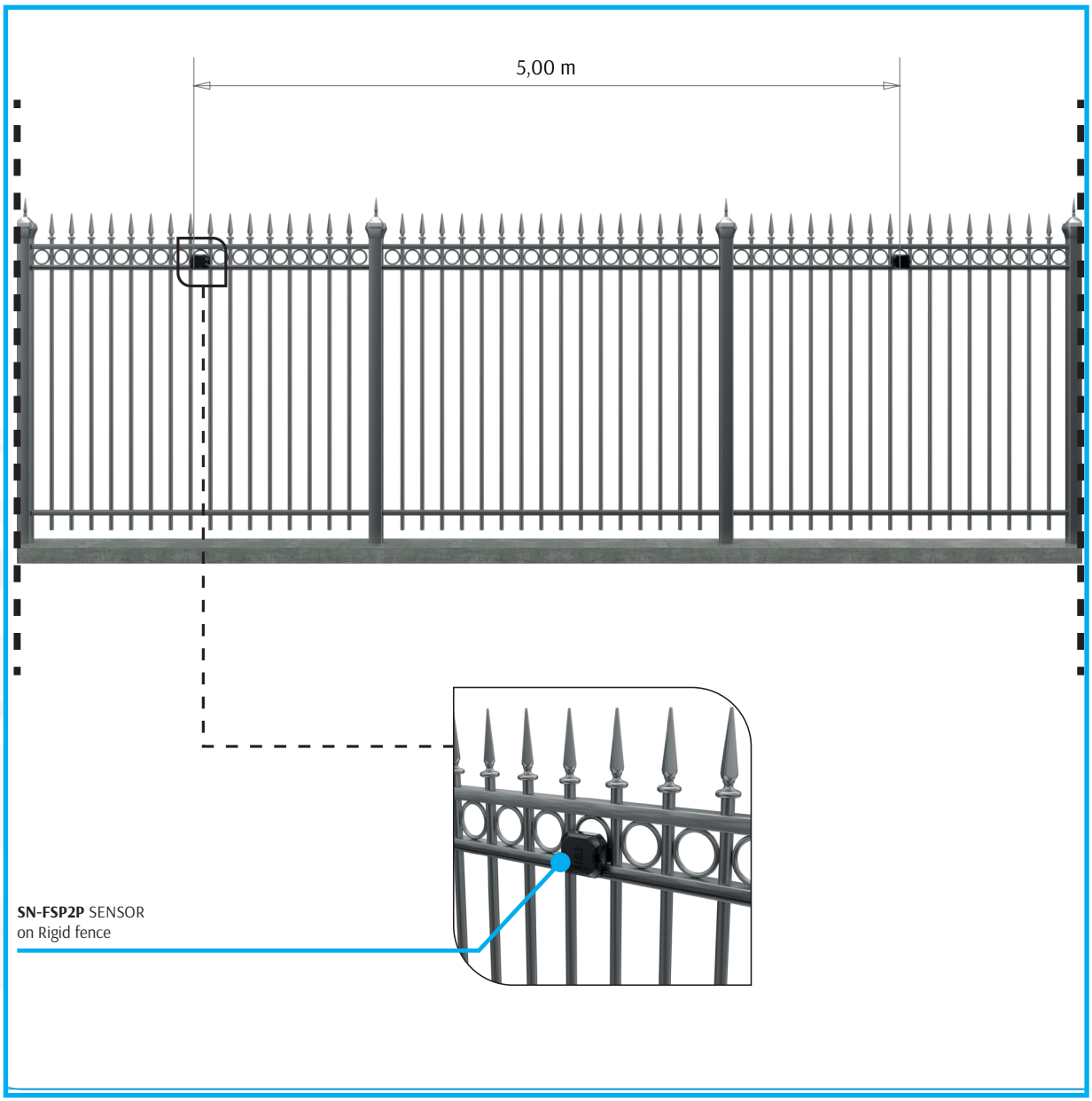
5.2. WELDED WIRE MESH FENCE



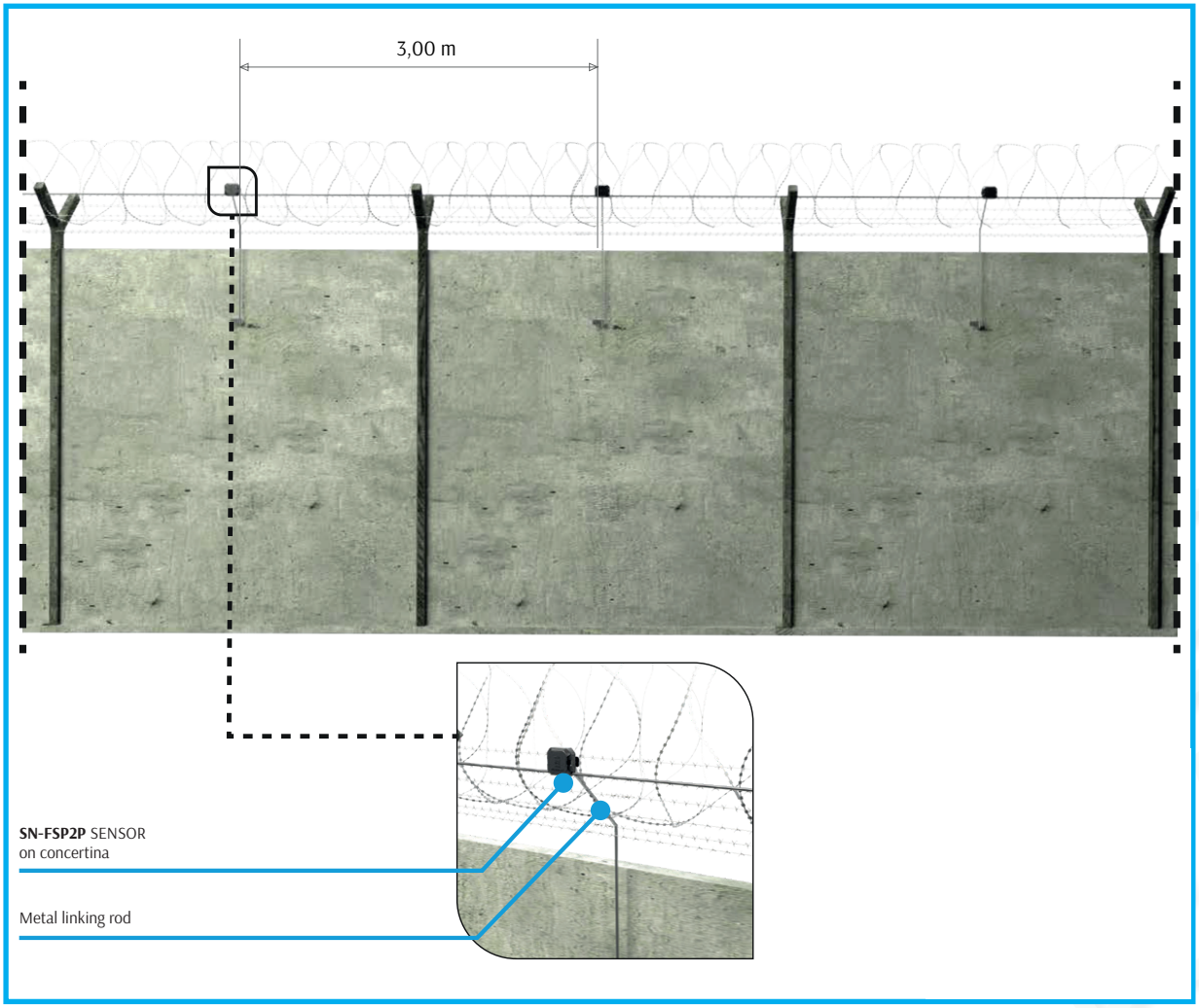
5.3. GRATING FENCE



5.4. RIGID FENCE



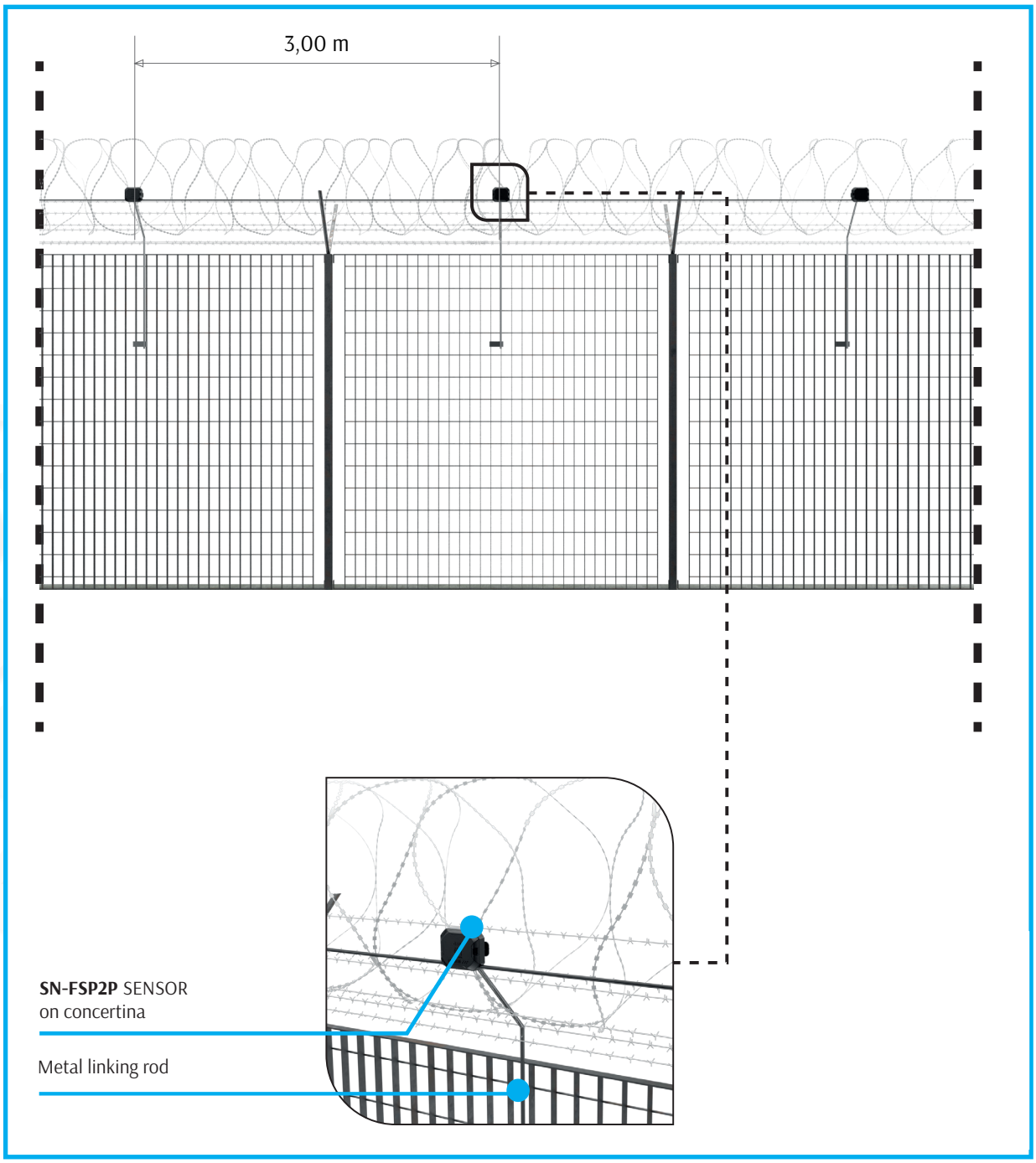
5.5. WALL WITH CONCERTINA TOPPING



GENERALLY, THE SENSOR IS FIXED TO THE CONCERTINA, THE CABLE TO THE SUPPORTING WIRE AND THE LINKING ROD TO THE WALL.

IN ANY CASE, BEFORE PROTECTING A CONCERTINA TOPPING, PLEASE CONSULT DEA SECURITY'S TECHNICAL DEPARTMENT.

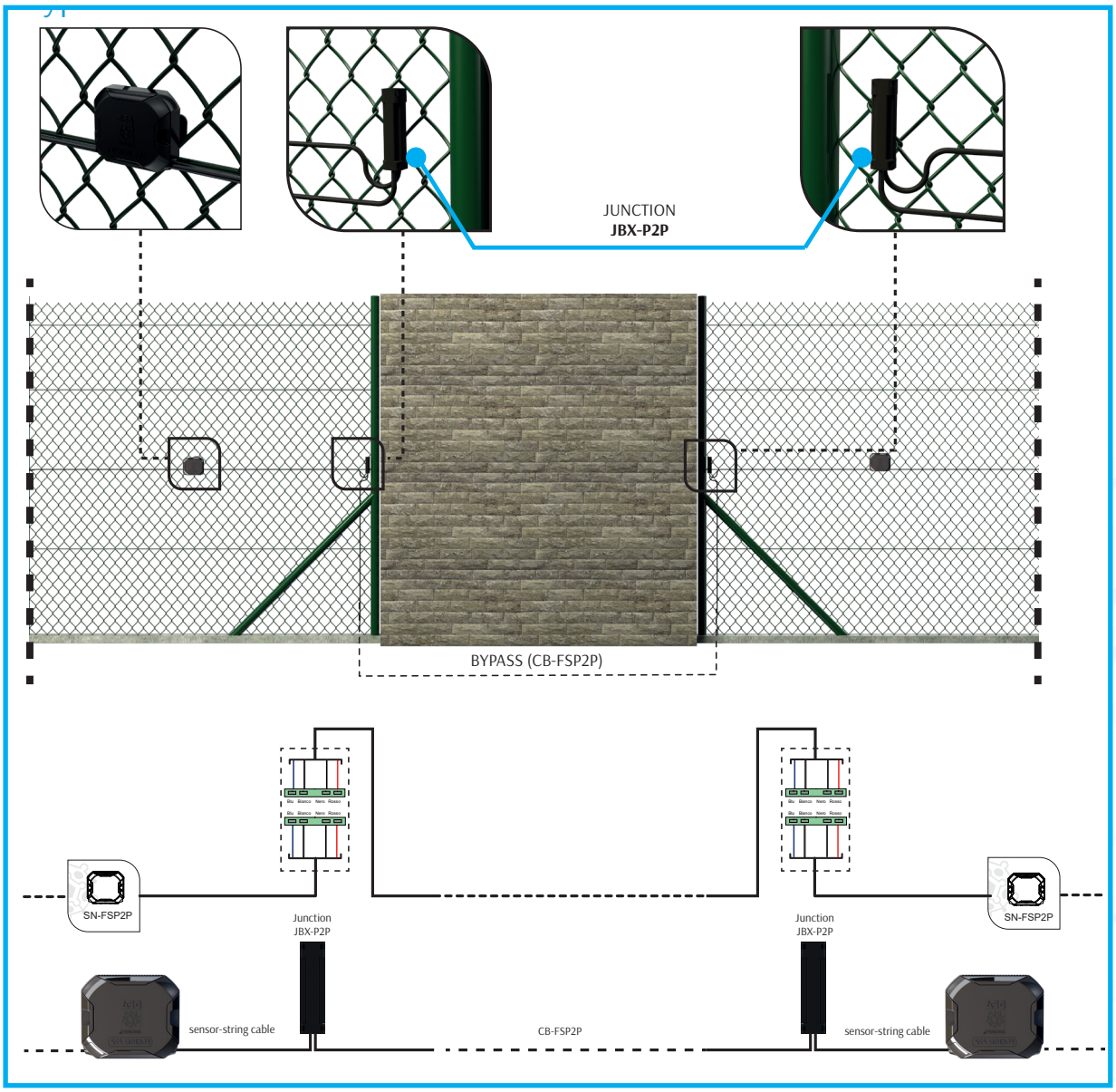
5.6. GRATING WITH CONCERTINA TOPPING



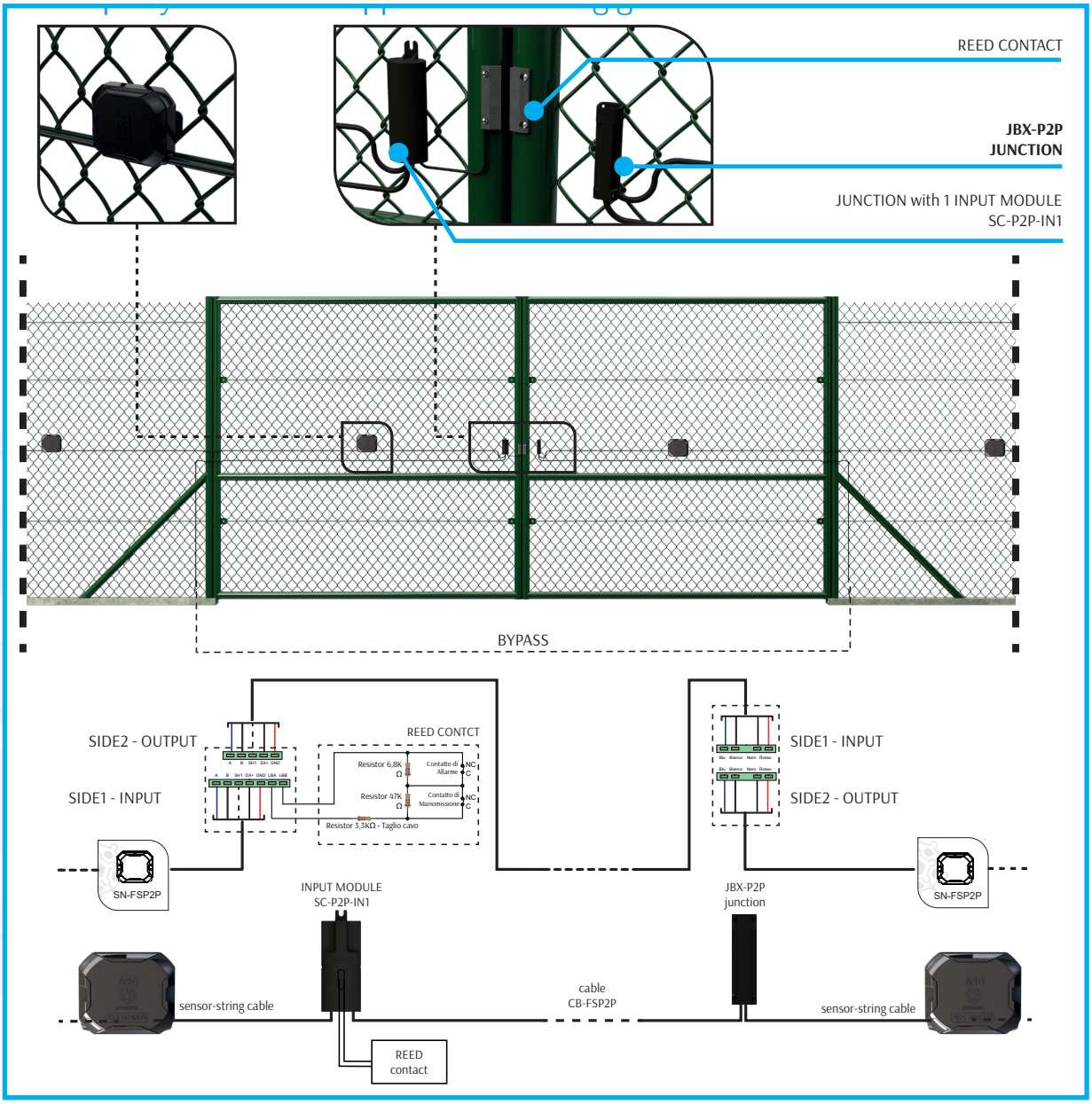
GENERALLY, THE SENSOR IS FIXED TO THE CONCERTINA, THE CABLE TO THE SUPPORTING WIRE AND THE LINKING ROD TO THE GRATING FENCE.

IN ANY CASE, BEFORE PROTECTING A CONCERTINA TOPPING, PLEASE CONSULT DEA SECURITY'S TECHNICAL DEPARTMENT.

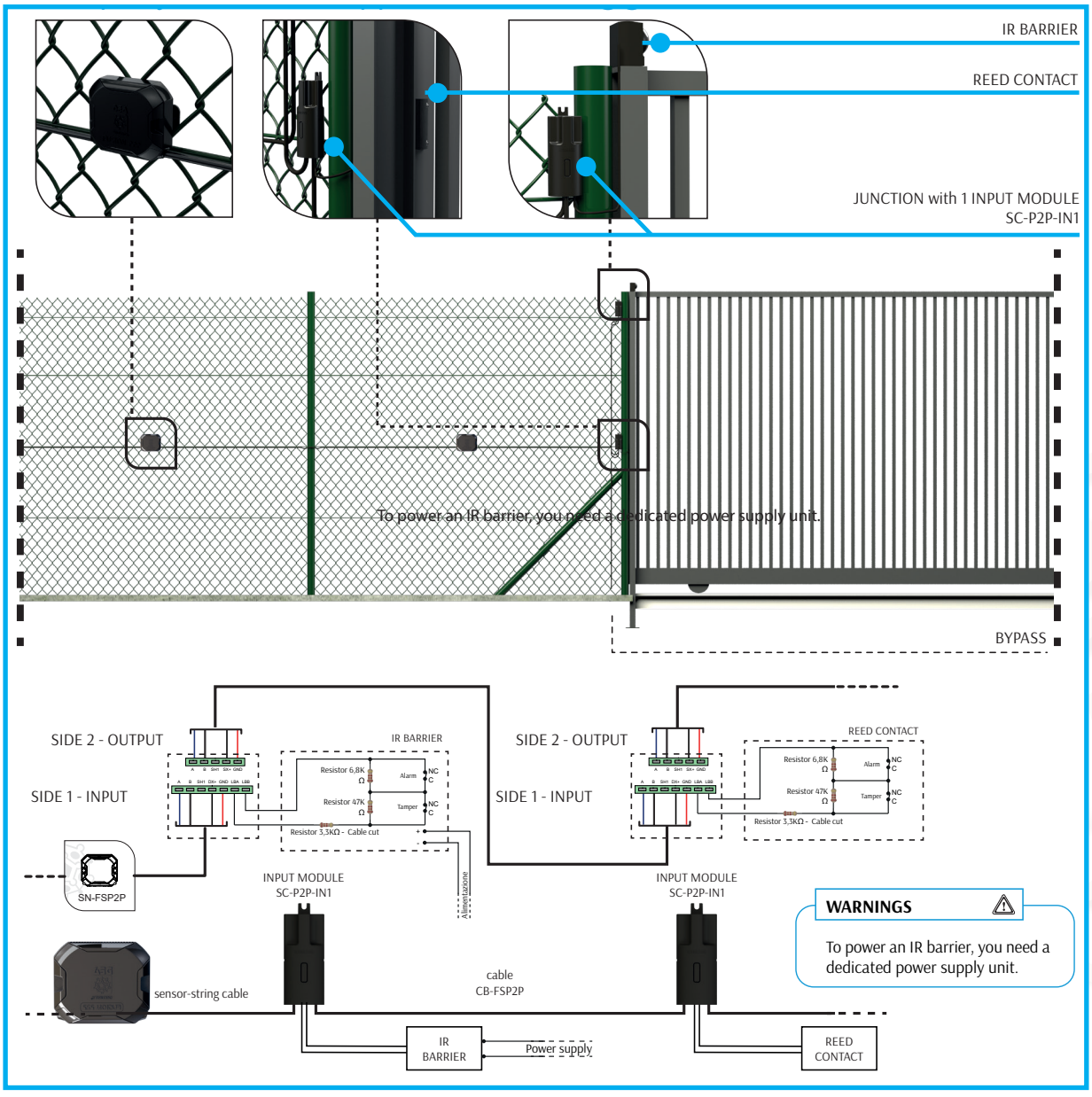
5.7. Bypass / Repair



5.8. SWING GATE



5.9. SLIDING GATE



6. CONFIGURATION AND CALIBRATION

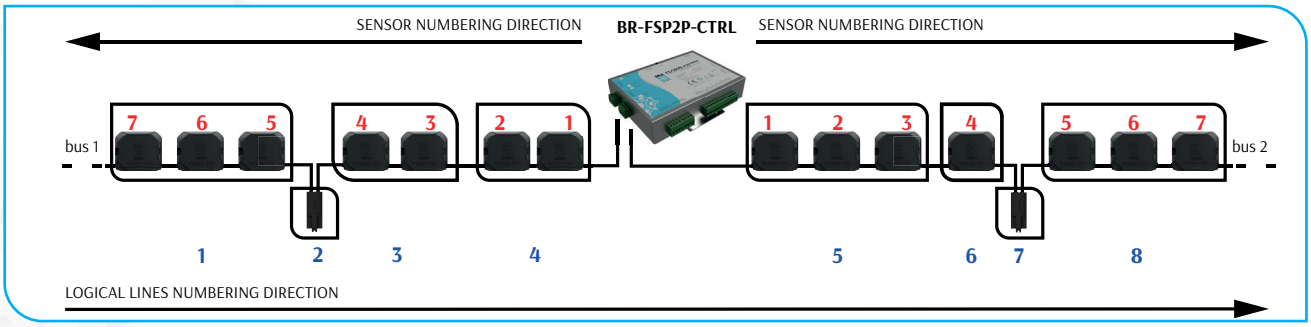
6.1. SENSORS AND/OR RELAY ACQUISITION

N.B. *BELOW YOU CAN FIND SOME BASIC INFORMATION ON HOW TO PERFORM THE CALIBRATION; FOR FURTHER INFORMATION CONCERNING THE SERVICE SOFTWARE USE, PLEASE READ THE "SERVICE SOFTWARE USER MANUAL".*

N.B. *IF USB CONNECTION IS USED, CONNECT THE CABLE ONLY AFTER POWERING UP THE BOARD.*

Once the installation of the sensors and their connection to the controller has been completed, the configuration of the system must be performed.
Service software has a special section for the automatic configuration of the system which allows a quick configuration following a series of guided steps. After the Service software has been started, from the Configuration page select the Auto setting button . The Controller:

- acquires the sensors and the input modules (if any) connected to BUS1 and BUS2 (sensors and input modules are identified by their unique Serial Number);
- sorts sensor and input modules on a physical basis, using a patented sorting algorithm (sensor N.1 is the sensor closest to the Controller);
- places the acquired sensors on logical lines (up to 64) following the selected procedure (see Service Software User Manual);
- detects relay expansion boards (if any) connected to it;
- assignes logical lines to available output relays so to have, at least, an alarm relay and a tamper relay per line (if the relays are sufficient).



Once the Auto setting procedure has been completed, all of the sensors and input modules have been placed on logical lines and all of the output relays have been configured. The configuration can also be completely customized according to particular install needings. Following picture show how sensors and lines are automatically numbered.

6.2. CALIBRATION

THE CALIBRATION MUST BE PERFORMED ON ALL THE CONFIGURED LINES.

- **GLOBAL CALIBRATION**
  Once the lines / relays configuration phase has been completed, the sensor-strings must be calibrated. The quickest way is to click the **Action** command from the drop-down menu, and select **All lines calibration**.
- **STRUCTURE TYPE SELECTION**
  Before calibration it is necessary to select from the drop-down menu the type of structure to be protected, are available 7 presets suitable for any type of structure.

- **Sensitivity and security level**

  The detection capability of the sensor can be calibrated using two parameters: Sensitivity Level and Security Level:
  - **Sensitivity Level** acts on the input signal gain. It is possible to vary the trimmer from 0(min) to 100(max) on 5 levels.
  - **Security Level**, acts on the signal processing parameters of the sensor, affecting readiness and receptivity with which the system reacts to external events (weak impacts, gross impacts, continuous vibrations). Three different settings are available:
    - HIGH → Maximum detection reactivity.
    - MEDIUM (default) → Medium detection Reactivity. This is the default setting and ,under Normal conditions, provides the best compromise between detection reactivity and environmental disturbances immunity.
    - LOW → Minimum detection reactivity, indicated in case of strong environmental disturbances where the maximum immunity is needed keeping at the same time a fair detection capability.

7. Appendix

7.1. Maintenance

FUSION P2P system contains no wearing parts, but the battery should be periodically checked. The check can be performed by removing the mains power (set the magnetothermic circuit breaker to OFF) and measuring the voltage supplied by the battery with a multimeter.

To replace the mains fuse, remove the mains power (set the magnetothermic circuit breaker to OFF), open the box and turn the fuse holder using a screwdriver tip. The fuse must be a 10 A delay type fuse.

To clean the outside of the cabinet, use only a soft and dry cloth. Avoid cleansers and abrasive sponges.

To ensure maximum system efficiency, routine maintenance of the system must be scheduled to prevent potential breakdown and to keep the various equipment working efficiently.

In particular, the following functional tests are suggested:

- on the alarm control panel;
- on the controls;
- on all detectors making sure that they are adjusted according to the system's needs;
- on the acoustic and light alarm signalling devices. The functional test must include recording and remote transmission equipment, if any;
- on power supply units, checking the maintenance status of the batteries.

7.2. Technical support

DEA Security's technical support is available at:

- Via Bolano – 19037 Santo Stefano di Magra (SP) - Tel.: (+39) 0187 699233 / Fax: (+39) 0187 697615
- Email: dea@deasecurity.com or assistenza@deasecurity.com - Sito web: www.deasecurity.com

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