EN 50131-1
EN 50131-3
EN 50130-4
EN 50130-5
CEB T031

IB200

I-BUS isolators

Installation and programming manual

inim

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1. Description of IB200

The Isolators are peripherals which can be connected directly to the I-BUS in order to increase both its extension and performance.

Functions

Each isolator has 4 terminals for input connections to the I-BUS and 4 terminals for output connections to the I-BUS. The functions they provide are:

- galvanic isolation, up to 2750V, for the BUS data lines ('D' and 'S') between input and output
- galvanic isolation for the BUS power lines ('+' and '–') between input and output, trough the cutting of the isolation jumpers on the board
- regeneration of communication signals, limiting losses caused by the excessive length of the I-BUS cable
- detection of functional anomalies in direction of the output section and the consequent isolation of the section concerned

Models

3 versions are available:

- **IB200/P**, model with BUS isolation functions, signal regeneration on BUS, uninsulated power supply; comes in a plastic enclosure with protection against forced opening and dislodgement
- **IB200/U**, model with BUS isolation functions, signal regeneration on BUS, uninsulated power supply; comes in a plastic enclosure with on-view terminals, without protection against forced opening and dislodgement
- **IB200/A**, model with BUS isolation functions, signal regeneration on BUS, insulated power supply and DC/DC converter; comes in a plastic enclosure with protection against forced opening and dislodgement

Insolator

The isolator makes it possible to create two groups of peripheral devices by means of the galvanic isolation of the power supply, the ground and the data channels 'D' and 'S' of each group. In this way it is possible to separate one group of peripherals connected and powered directly via the control panel ('group A') from the group connected to the control panel via isolator and not powered via the control panel ('group B').

The protection function is achieved by isolating group B in the event the isolator detects malfunctions in this group:

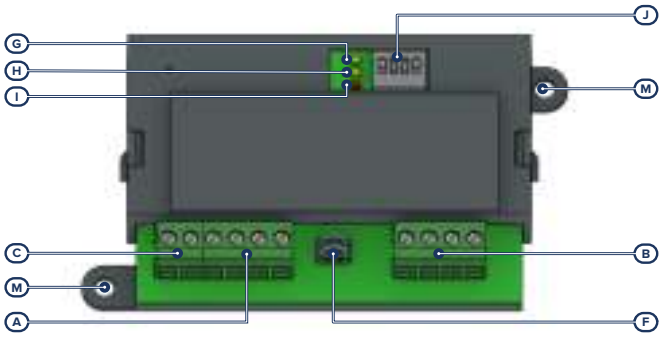
- short-circuit between terminals '+' and '–'
- short-circuit between terminals 'D' and '+' or 'D' and '–'
- short-circuit between terminals 'S' and '+' or 'S' and '–'
- short-circuit between terminals 'D' and 'S'

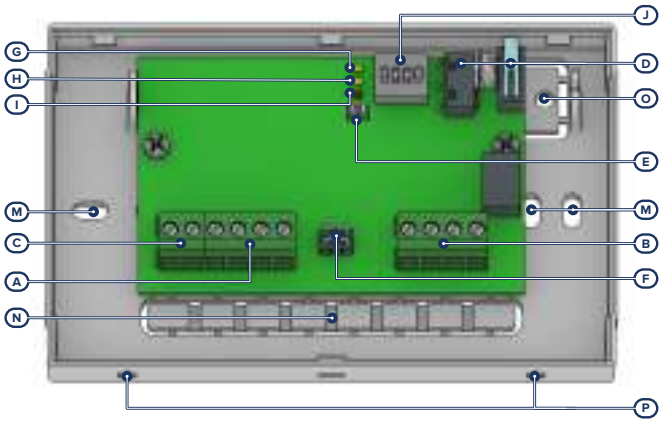
- current absorption higher than 1A between the '+' and '–' terminals (only if the IB200/A model is used)

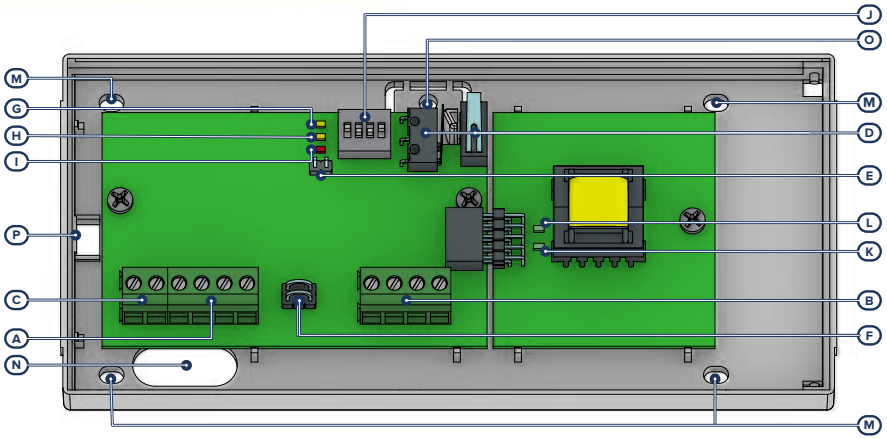
  Once one of these malfunctions has been detected, the isolator will isolate group B thus protecting group A. This status will remain active for 10 seconds or until the next control panel reset operation.

- mains power (230V) on the group B. Devices of the BUS B group and the B section of the isolator will be damaged, while the devices of the BUS A group will be kept safe.

1.1 Description of parts







[A]	I-BUS A terminal board (to control panel)
[B]	Terminal board for I-BUS B
[C]	Anti-tamper terminal board
[D]	Anti-tamper switch
[E]	Connectors for anti-tamper enablement jumper
[F]	Power isolating jumpers
[G]	I-BUS B communication LED (yellow)
[H]	I-BUS A communication LED (yellow)
[I]	Isolation activated LED (red)
[J]	Dip switch for addressing
[K]	BUS A power supply LED (green)
[L]	BUS B power supply LED (green)
[M]	Mounting screw hole
[N]	Cable entry
[O]	Hole for ant-dislodgement device
[P]	Hole for the cover screw

Terminal board

no.	identifier	description
1-2	**TAMPER**	Terminal for signalling presence of mains network
3-4-5-6	**+ Da Sa -**	BUS terminals side 'A'
7-8-9-10	**+ Db Sb -**	BUS terminals side 'B'

LEDs

The blinking of the I-BUS A and B yellow LEDs (*Description of parts, [G]* and *Description of parts, [H]*) indicate communication on the relative group of the BUS.

The red LED (*Description of parts, [I]*):

- ON solid indicates that the isolation function is active because of malfunctioning on the BUS.
- blinking indicates that the isolation function is active because of current consumption higher than 1A (for IB200/A model only).

1.2 Technical specifications of IB200

Model	IB200/U	IB200/P	IB200/A
Voltage			
minimum input voltage	9.5 V ⎓		
maximum input voltage	15 V ⎓		
output voltage	-	-	13.8 V ⎓
Maximum output current	-	-	1 A
Current draw			
maximum from control panel	-	-	1.8 A @ 9.5 Vin 1.4 A @ 12 Vin 1.2 A @ 13.8 Vin
typical	110 mA	110 mA	130 A
Dimensions (W x H x D)	107 x 59 x 21 mm	126 x 80 x 27 mm	172 x 80 x 27 mm
Weight (without battery)	60 g	100 g	170 g
Operating environmental conditions			
Temperature	from -10°C to +40°C		
Relative humidity	≤75%, without condensation		
Security grade	3		
Environmental class	II		

(EN IEC 62368-1)

Terminal type	**TAMPER**	ES1 PS1
	+ Da Sa - + Db Sb -	ES1 PS2

2. Installation of IB200

2.1 Installation of IB200/A IB200/P

1. Choose a suitable mounting placement.
2. Working from the side of the securing screws, open the front plate by separating the two parts.
3. Hold the base to the chosen mounting placement and mark the screw holes and tamper protection position.
4. Pull the connection wires through the cable entry.
5. Using the screws, secure the base and the tamper protection in position.
6. Complete all the connections.
7. Complete the *configuration*.
8. Enroll the device.
9. Re-attach the cover to the base and replace the enclosure screw.

2.2 Installation of IB200/U

IB200 does not have integrated tamper protection and exposes the cables in use to possible tampering.

It is therefore advisable to protect the connections and also the device by installing it inside an enclosure, which can be:

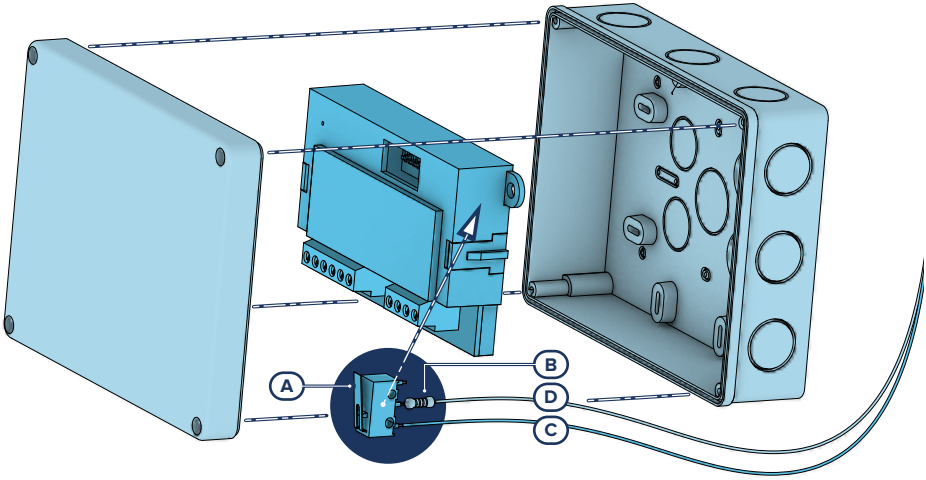
- control panel cabinet, using the appropriate holes on the back plate
- junction box
- electrical cabinet

Note

In order to comply with standard 50131, the enclosure used and the device must be equipped with tamper protection.

1. Choose a suitable mounting placement.
   If the control panel cabinet is used, the control panel must be disconnected completely from both the primary-power source (230V~) and the buffer battery.
2. Secure the device enclosure inside the box.
   If the control panel cabinet is used, secure the plastic enclosure via the threaded holes on the back plate.
3. Pull the wires through the cable entry and wire up the device.
4. Install the device *tamper* protection.
5. Complete the *configuration*.
6. Enroll the device.
7. Close the box.
8. If the control panel cabinet is used, power up the control panel again by connecting the primary-power source (230V~) and the buffer battery.

2.3 Anti-tamper



The peripherals with visible terminals and which do not have an anti-tamper device can still be equipped with protection by intervening on the assembly procedure.

Please note that in order to comply with security standards, all the control panel peripherals must be protected against tamper.

Here we provide information on one of the possible procedures that can be adopted. This involves the assembly of a microswitch on the device, which signals any attempted tamper, and the consequent programming of the terminal used for this contact.

1. Procure a microswitch with at least two normally-open contacts *[A]* (preferably with 3 contacts: COM-NO-NC).
2. Employ a terminal and program it as a '24H' input, whose description type is 'Tamper', balanced with a single 6K8Ω *[B]* resistance, unlimited alarm cycles and belonging to a partition that is viewable on at least one keypad.
3. Using 2 wires, connect the microswitch to the '24H' input terminal.
4. On the microswitch:
   - identify the common contact (COM) and connect it using one of the two wires, to the GND terminal of the '24H' terminal *[C]*.
   - identify the normally open contact (N.O., which is the contact that generates a short-circuit between the contact itself and the COM contact when the switch lever is compressed) and connect one end of the 6k8Ω resistor to it *[D]*.
     Connect the other end of the resistance to the wire which is connected to the '24H' input terminal.
5. Install the microswitch in such a way that under normal conditions the switch lever is compressed.
   If a tamper attempt occurs, the lever will release thus generating the opening of the contact and an immediate alarm on the '24H' terminal.

Note

This wiring method can be applied in most situations, however, it is only a point of reference. In order to ensure proper protection, you must always take into account the specific mechanical and electrical conditions of the device you are working on.

For compliance with grade 3 of the EN 50131-3 safety standard, the device must be fastened inside an enclosure which is in turn must be protected against forced opening and removal from the wall (for example the control panel enclosure).

2.4 Configuration

IB200/U and IB200/P

The IB200/U and IB200/P can be configured in two different ways of use:

- Default configuration.

  Without interrupting the power isolation jumpers, the isolator provides galvanic isolation and regeneration of the 'D' and 'S' signals whereas the electrical power is carried over BUS A and BUS B.

  This configuration must be used in case of low voltage drops and reduced absorption currents of the BUS B group peripherals.

- Interrupting the power isolation jumpers (*Description of parts, [F]*).

  This configuration isolates the electrical power and ground ('+' and '–') of BUS A and BUS B.

  This configuration will allow you to power BUS B from an external power supply via its '+' and '–' terminals.

IB200/A

The IB200/A model operates using the configuration which provides galvanic isolation of the 'D' and 'S' signals and the electrical power.

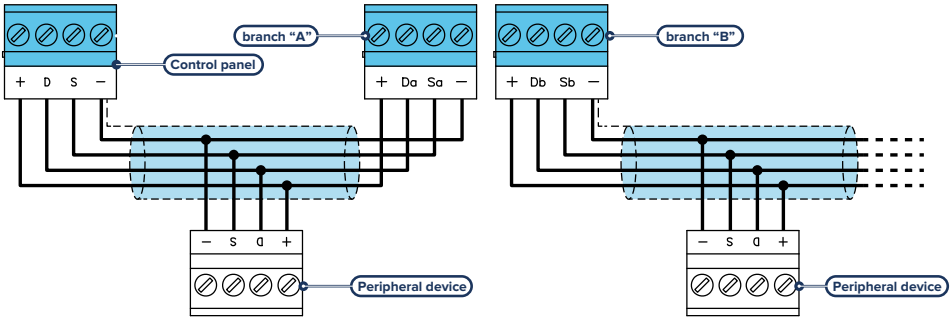
It also has an isolated DC/DC converter which powers the devices connected to BUS B, without the need of an external power supply. The output power voltage supplied by the converter is 13.8V.

Anti-tamper

The IB200/P and IB200/A isolators manage open-enclosure and dislodgement tamper signals via microswitch (*Description of parts, [D]*) which regenerates the signal to the control panel via the "TAMPER" terminal (*Description of parts, [C]*).

This terminal is normally closed. By removing the jumper from the anti-sabotage enablement connectors (*Description of parts, [E]*), the protection function can be disabled.

2.5 Connecting to the I-BUS line



The peripheral devices of Inim Electronics control panels are to be connected to the control panel via the I-BUS.

The connection between the control panel and its peripherals is achieved through a shielded 4 wire (or more) cable.

Attention!

The shield must be connected to one of the ground terminals (or GND) only on the control panel side and must follow the entire BUS without being connected to ground in other points.

The control panel connection is done using terminals '**+ D S -**' on the motherboard.

Sizing

The sizing of the I-BUS line, i.e. the distribution of peripherals and the use of cables to connect them, must be done on the basis of various project factors, in order to ensure the diffusion of the signals of conductors "**D**" and "**S**" and the power supplied by conductors "**+**" and "**-**".

The factors are:

- The current absorption of the connected devices.

  In the case of insufficient power supply from the BUS line to peripherals and detectors (refer to the Technical specifications table), this can also be supplied by external power supplies.

- Cable type

  The cable section used affects the dispersion of the conductor signals.

Recommended cable

Cable AF CEI 20-22 II	number of conductors	section (mm2)	I-BUS terminal
4 wire cable + shield	2	0.5	**+ -**
	2	0.22	**D S**

Cable AF CEI 20-22 II	number of conductors	section (mm2)	I-BUS terminal
6 wire cable + shield	2	0.5	**+ -**
	2	0.22	**D S**
	2	0.22	available
6 wire cable + shield	2	0.75	**+ -**
	2	0.22	**D S**
	2	0.22	available

- Communication speed over the BUS

  This parameter can be changed by means of the programming software (38.4, 125 or 250kbs).

BUS sizing

BUS speed	maximum admissible length (sum of the sections downstream of the control panel or of an isolator)
38.4kbps	500m
125kbps	350m
250kbps	200m

- Number and distribution of isolators.

  To increase the reliability and the extension of the BUS, it is necessary to use isolators.

2.6 IB200 connection

For proper installation of the isolator, and therefore of the BUS, it is necessary to size the BUS branch in which the isolator is located based on the number of peripherals connected to the branch and their total current absorption. This absorption is therefore to be compared with the “Maximum absorption from the control panel” data.

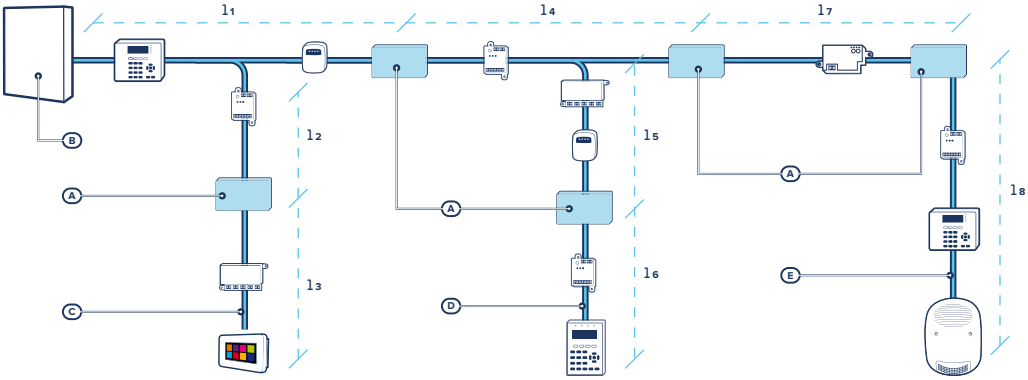
Another feature is the length of the line that is downstream of the isolator up to the successive isolator or EOL. Following is a table with indicative values of the length depending on the BUS speed:

BUS speed	Cable length downstream of the isolator (L)	Maximum number of cascaded isolators
38.4kbps	500m	9
125kbps	350m	6
250kbps	200m	2

The lengths (‘L’) shown here can be identified with:

- the length of the cables between an isolator and the successive peripherals or, in the case of a single line, between two successive isolators.
- the sum of the lengths of all the lines that start from an isolator and arrive at successive isolators or, in the case of branched lines, ending with peripherals.

For this purpose, we provide an example for a system with a BUS speed of 125kbps:



Where:

- l1, l2, l3, l4, l5, l6, l7, l8< L
- l1 + l2 < L
- l4 + l5 < L

[A]	Isolator / power-supply station
[B]	Control panel
[C]	BUS branch: 1 isolator in cascade connection
[D]	BUS branch: 2 isolators in cascade connection
[E]	BUS branch: 3 isolators in cascade connection

It is not recommended to position an isolator immediately after the control panel

Each isolator should be positioned in the points where the quality of the BUS drops drastically.

2.7 Addressing of IB200

If more than one isolator is used on an I-BUS line, it is necessary to allow the control panel to be able to distinguish the various isolators for maintenance or monitoring operations.

Therefore, it is necessary to assign a different address to each isolator.

The address must assigned via the dip-switch (*Description of parts, [J]*), by setting a value between 1 and 16.

0	Switch in 'OFF' position
1	Switch in 'ON' position

Address	**Switch**			
	1	**2**	**3**	**4**
1	**0**	**0**	**0**	**0**
2	**0**	**0**	**0**	**1**
3	**0**	**0**	**1**	**0**
4	**0**	**0**	**1**	**1**

5	**0**	**1**	**0**	**0**
6	**0**	**1**	**0**	**1**
7	**0**	**1**	**1**	**0**
8	**0**	**1**	**1**	**1**
9	**1**	**0**	**0**	**0**
10	**1**	**0**	**0**	**1**
11	**1**	**0**	**1**	**0**
12	**1**	**0**	**1**	**1**
13	**1**	**1**	**0**	**0**
14	**1**	**1**	**0**	**1**
15	**1**	**1**	**1**	**0**
16	**1**	**1**	**1**	**1**

3. General information

3.1 About this manual

Manual code: DCMIINE0IB200

Revision: 130

3.2 Manufacturer's details

Manufacturer: Inim Electronics S.r.l.
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E-mail info@inim.biz
Web: www.inim.biz

The persons authorized by the manufacturer to repair or replace the parts of this system have authorization to work only on devices marketed under the brand Inim Electronics.

3.3 Warranty

Inim Electronics S.r.l.. (Seller, Our, Us) warrants the original purchaser that this product shall be free from defects in materials and workmanship under normal use for a period of 24 months.

As Inim Electronics does not install this product directly, and due to the possibility that it may be used with other equipment not approved by Us;Inim Electronics does not warrant against loss of quality, degradation of performance of this product or actual damage that results from the use of products, parts or other replaceable items (such as consumables) that are neither made nor recommended by Inim Electronics. Seller obligation and liability under this warranty is expressly limited to repairing or replacing, at Seller's option, any product not meeting the specifications. In no event shall Inim Electronics be liable to the purchaser or any other person for any loss or damage whether direct of indirect or consequential or incidental, including without limitation, any damages for lost profits, stolen goods, or claims by any other party caused by defective products or otherwise arising from the incorrect or otherwise improper installation or use of this product.

This warranty applies only to defects in parts and workmanship relating to normal use. It does not cover damage arising from improper maintenance or negligence, damage caused by fire, flood, wind or lightning, vandalism, fair wear and tear.

Inim Electronics S.r.l. shall, at its option, repair or replace any defective products. Improper use, that is, use for purposes other than those mentioned in this manual will void the warranty. Contact Our authorized dealer, or visit our website for further information regarding this warranty.

3.4 Limited warranty

Inim Electronics S.r.l. shall not be liable to the purchaser or any other person for damage arising from improper storage, handling or use of this product.

Installation of this Product must be carried out by qualified persons appointed by Inim Electronics. Installation of this Product must be carried out in accordance with Our instructions in the product manual.

3.5 Documents for the users

Declarations of Performance, Declarations of Conformity and Certificates concerning to Inim Electronics S.r.l. products may be downloaded free of charge from the web address www.inim.biz, getting access to Extended Access and then selecting "Certifications" or requested to the e-mail address info@inim.biz or requested by ordinary mail to the address shown in this document.

Manuals may be downloaded free of charge from the web address www.inim.biz, getting access to the reserved area, after the login, and then to the section of each product.

3.6 Disposal of the product

Informative notice regarding the disposal of electrical and electronic equipment (applicable in countries with differentiated waste collection systems)

The crossed-out bin symbol on the equipment or on its packaging indicates that the product must be disposed of correctly at the end of its working life and should never be disposed of together with general household waste. The user, therefore, must take the equipment that has reached the end of its working life to the appropriate civic amenities site designated to the differentiated collection of electrical and electronic waste. As an alternative to the autonomous-management of electrical and electronic waste, you can hand over the equipment you wish to dispose of to a dealer when purchasing new equipment of the same type. You are also entitled to convey for disposal small electronic-waste products with dimensions of less than 25cm to the premises of electronic retail outlets with sales areas of at least 400m2, free of charge and without any obligation to buy. Appropriate differentiated waste collection for the subsequent recycling of the discarded equipment, its treatment and its environmentally compatible disposal helps to avoid possible negative effects on the environment and on health and favours the re-use and/or recycling of the materials it is made of.

Evolving Security

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