

# EasyBus3® SDATAWAY

## Easy3 System – Technical documentation

### Easy3-H – Easy3-M



#### **230 VAC Power Line Communication system**

- Interactive colour touch screen 4"
- Easy-to-Use graphical interface
- Up to 128 devices on each Sub-Network
- Up to 1000m length by Sub-Network
- Up to 3 Sub-Networks on the same display
  - Up to 384 devices in one installation
  - Up to 3000m total network length installation
- Advanced power line communication
  - 255 communication channels
  - Up to 28800 bps
  - Automatic adaptive modulation
- Configurable inputs and outputs
  - 8 universal digital inputs/outputs
  - 2 output relays
  - Configurable I/O functions
- Integrated 2 ports ethernet switch
- Monitoring function with USB or SD card
- Integrated filter
- Device groups
  - 2 groups on each network
  - Group by priority or function
- Group control/monitoring with digital I/Os
- Modbus RTU/RS-485 and TCP/IP
- BACnet MS/TP or BACnet IP
- DIN rail or screw fixation

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# 1 Safety instructions

Please read the safety precautions carefully before EasyBus3<sup>®</sup> system installation and maintenance.

Please follow the instructions below.

- The installation or maintenance must accord with the instructions.
- Comply with all national electrical codes and local electrical codes.
- Pay attention to the warnings and cautions in this manual.
- All installation and maintenance shall be performed by distributor or qualified person.
- All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.
- Be caution during installation and maintenance. Prohibit incorrect operation to prevent electric shock, casualty and other accidents.

The EasyBus3<sup>®</sup> system (including all EasyBus3<sup>®</sup> modules) must be:

- Installed, commissioned, maintained, repaired and removed by a qualified installer or qualified service person. When any of these jobs is to be done, ensure that only qualified installer or qualified service person is performing it. A qualified installer or qualified service person is an agent who has the mandatory qualifications and appropriate knowledge to perform the task(s) required.

For all the tasks related to the 230VAC power supply:

- Installation and maintenance must be performed by a skilled electrical installer ensuring all legal and official regulations compliance.
- All wiring & connections must be done with the power off and according to the local energy supplier's instructions.

## 2 General Information

### 2.1 Compliance

The EasyBus3<sup>®</sup> system (including all EasyBus3<sup>®</sup> modules) complies with the following standards:



- ✓ EN 60730-1  
[https://ec.europa.eu/eip/ageing/standards/home/sensors-actuators-and-alarms/en-60730\\_en](https://ec.europa.eu/eip/ageing/standards/home/sensors-actuators-and-alarms/en-60730_en)
- ✓ CENELEC EN50065-1  
<https://www.cenelec.eu/standardsdevelopment/ourproducts/europeanstandards.html>




### 2.2 Disposal instructions



#### Unit Disposal Instructions

The EasyBus3<sup>®</sup> modules contain electronics. Please do not discard with regular waste. Return to SDATAWAY or dispose according to local guidelines for disposing of electronics. Dispose according to Waste Electrical and Electronic Equipment (WEEE) directive in European Union.

## 2.3 Symbol instructions

	<p>Electrical Shock or Burn Hazard (230 VAC)</p> <p>All electric work must be performed by a licensed technician according to local regulations and the instructions given in this manual.</p>
	<p>Caution Hot surface</p>
	<p>Warning to catch your attention to important points, the non-respect of these points could:</p> <ul style="list-style-type: none"> <li>- Impact / Reduce the system functionalities.</li> <li>- Damage the modules and / or the entire installation.</li> </ul>

## 2.4 Operating conditions

<p>Minimum / Maximum ambient temperature:</p>	<p>5 – 40 °C</p>
<p>Humidity</p>	<p>0 – 95% RH, non-condensing</p>
<p>Operating</p>	<p>Indoor Use only</p>

## 2.5 Storage and transport conditions

The EasyBus3® modules should be stored and transported in environmental conditions of -10°C to 60 °C, 0 to 95% RH, non-condensing.

## 2.6 Copyright ©

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### 3 Technical characteristics

Description	Name	Min.	Typ.	Max.	Unit
<b>Electrical characteristics</b>					
Easy3-H supply voltage	$V_{EASY3-H}$	21.6	24	26.4	Vdc
Easy3-H power consumption	$P_{EASY3-H}$			10	W
Easy3-M power consumption (Note 1)	$P_{EASY3-M}$			10	W
Easy3-M supply voltage	$V_{EASY3-M}$		230		Vac
Easy3-M high voltage power consumption	$P_{EASY3-M-HV}$			5	VA
Easy3-M maximum load power	$P_{EASY3-M-LOAD}$			2000	VA
<b>Easy3-H digital inputs/outputs</b>					
Input maximum voltage	$V_{IN-MAX}$			30	Vdc
Input low level voltage	$V_{IN-LOW}$		0	4	Vdc
Input high level voltage	$V_{IN-HIGH}$	10	24		
Input pull-up resistor	$R_{IN}$		3.3		kΩ
Output voltage	$V_{OUT}$	21.6	24		Vdc
Maximum output current (each output)	$I_{OUT-MAX}$			100	mA
<b>Easy3-H output relays</b>					
Switching voltage	$V_{REL-MAX}$		230		Vac
Switching current	$I_{REL-MAX}$		10		A
<b>Power-line communication</b>					
Frequencies	$f_{PLC}$	100		240	kHz
Modulations	Mod		PSK/FSK		
Baud rate	-	2400		28800	Bps
Number of slave devices per Easy3-M	$N_{SLAVES-MAX}$			128	
Communication time per slave	$t_{COM-SLAVE}$		40		ms
Cycle time 128 devices	$t_{CYCLE}$		7s		
Maximum cycle time for 8 slave devices in high priority group	$t_{CYCLE-8}$			1	s
<b>Connections distances</b>					
Easy3-H to Easy3-M	$L_{MASTER}$			100	m
Sub-Network total length	$L_{NETWORK}$			1000	m
Network total length	$L_{3NETWORKS}$			3000	m
<b>Certification</b>					
EN 60730-1					
CENELEC EN50065-1					
<b>Protection class</b>					
IP20					

**Note 1:** The Easy3-M(s) is powered by 24V from the Easy3-H. Then the Easy3-M(s) power consumption must be added to the Easy3-H power consumption and taken in consideration to calculate the 24V power supply power.

## 4 System overview

The EasyBus3® system is designed to remotely control slave devices over a proprietary power line communication (PLC). The slave devices are specifically designed to match building automation ventilation system needs such as fire dampers, variable valves, general purpose inputs and outputs, and more...

The system is composed of three types of devices which are described here below.

### Easy3-H

The Easy3-H device is the main controller of the system. It is the communication gateway between the building automation control system and the Easybus3® network. It is capable to manage up to three Easy3-M devices.



### Easy3-M

The role of the Easy3-M device is to communicate with the remote slave devices using powerline communication over the mains network (230 VAC). One Easy3-M is able to control up to 128 slave devices. The Easy3-M device must be connected to an Easy3-H using a dedicated cable.



### Slave devices

Different types of slave devices are available. Each type is designed for a specific function such as fire damper motor control, variable valve control, general purpose inputs and outputs, and more... They are connected to the mains network and communicate with the Master using powerline communication over the mains network.

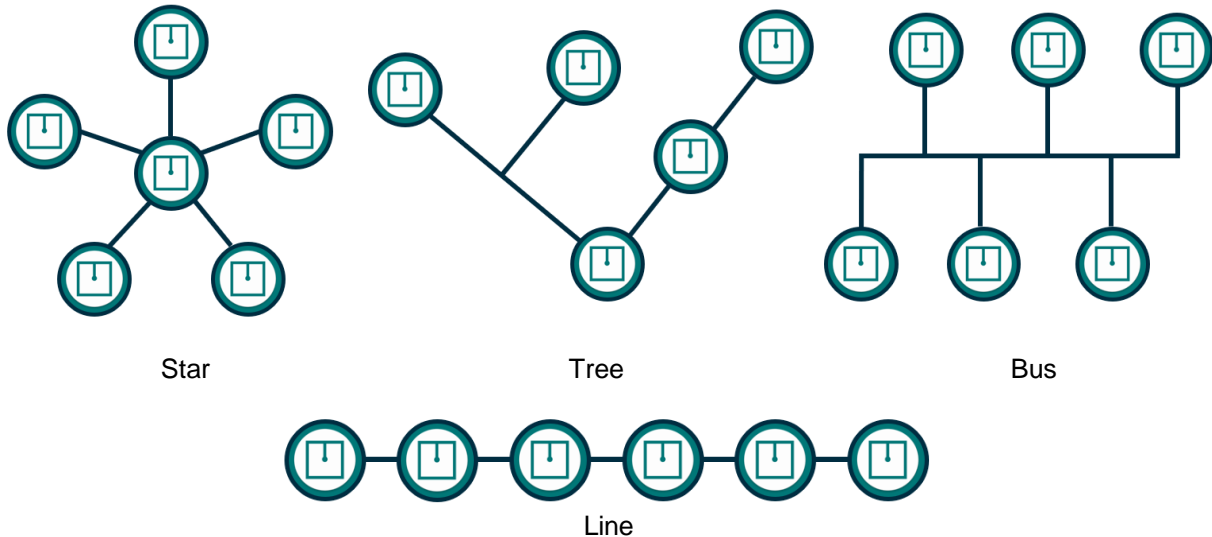
- ➔ Please refer to specific EasyBus3® slave devices product specification for complete description.



## 5 EasyBus3® Network

### 5.1 Topologies

The EasyBus3® Sub-Network supports the following topologies:



### 5.2 Distance between networks cables and other power cables

To avoid any communication interference between the different network, it is required to keep a minimum distance of 5cm between all the EasyBus3® network cables.

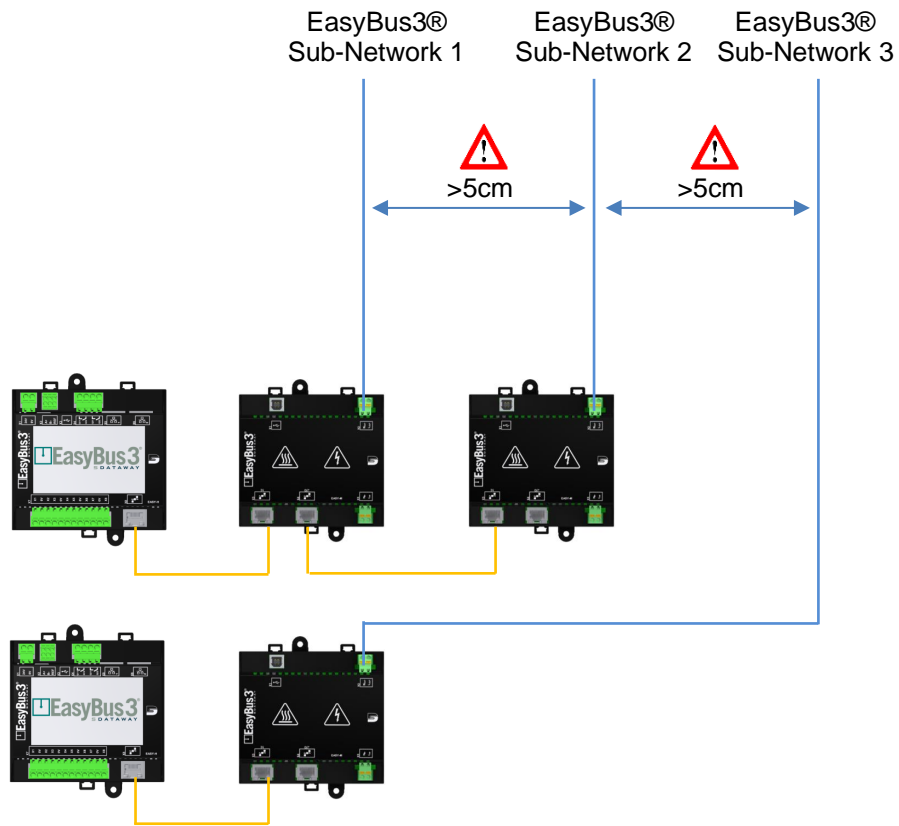
The disturbances linked to an electromagnetic field induced on the cables of Easybus sub-networks can have different effects:

- Brief interruption of data transmission
- Long-term interruption of data transmission
- Data loss
- Damage to devices

In order to minimize disruption, we recommend:

- With round cable:
  - Use a minimum twisted cable 3 x 2.5 mm<sup>2</sup> (even shielded depending on the configuration)
  - The bus cables must not be tied with other bus cables or with power cables
- With flat cable:
  - Use a minimum cable 3 x 2.5 mm<sup>2</sup>
  - The distance from all power cables and other Bus cables must be at least 5 cm.
  - Bus cables must not be tied together with other bus cables nor with power cables

In the electrical panel, the connections to the Masters - terminal block X2 L / N Out - must be made via a cable and not individual electrical wires.



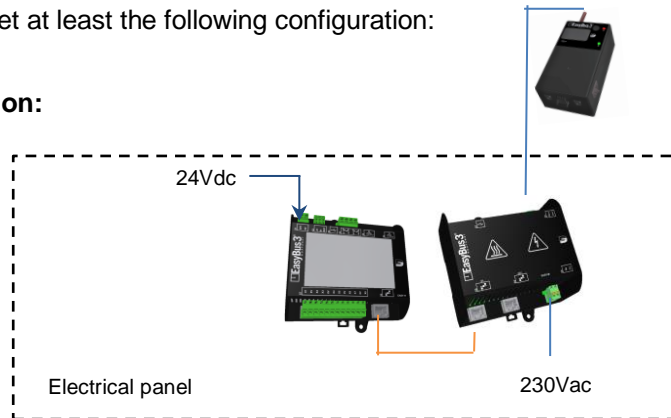


### 5.3 Minimum / Maximum Configuration

To function, an EasyBus3® system must get at least the following configuration:

**Minimum EasyBus3® system configuration:**

- 1 Easy3-H
- 1 Easy3-M
- 1 Easy3-X (module slave)




The diagram below shows the main network topology in its maximum configuration.

It is composed of a Easy3-H device connected to the building automation system and three Easy3-M devices.

Each Easy3-M device is powered from the mains network and can control up to 128 slave devices

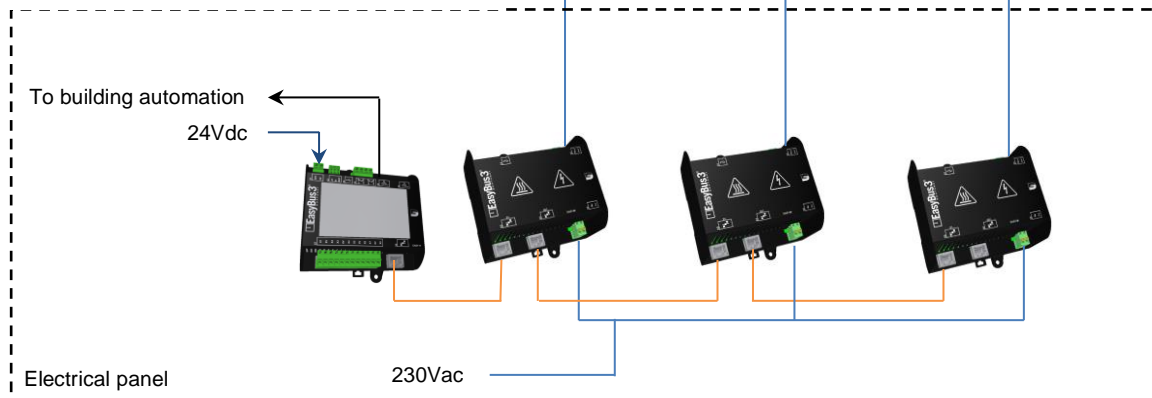
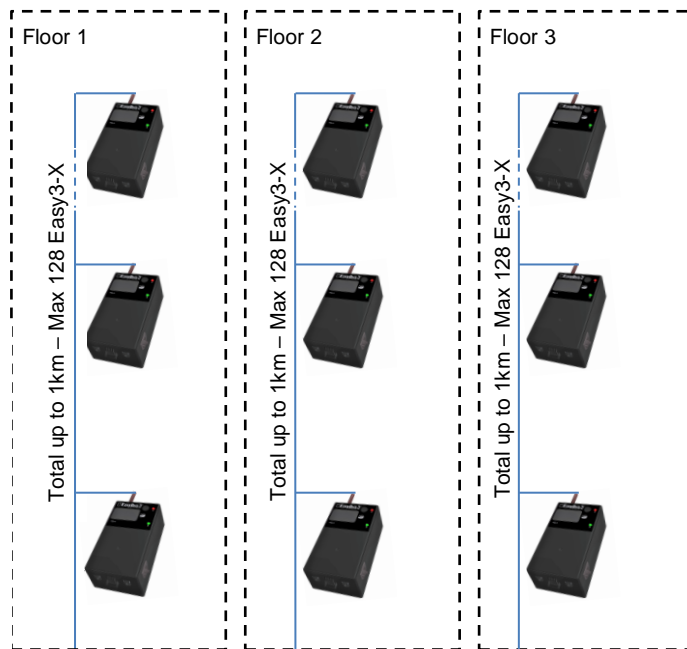
**Maximum EasyBus3® system configuration:**

- 1 Easy3-H
- 3 Easy3-M
- 384 Easy3-X (Slave Modules)

 The maximum distance of a Sub-Network generated by a Master is 1000 m.

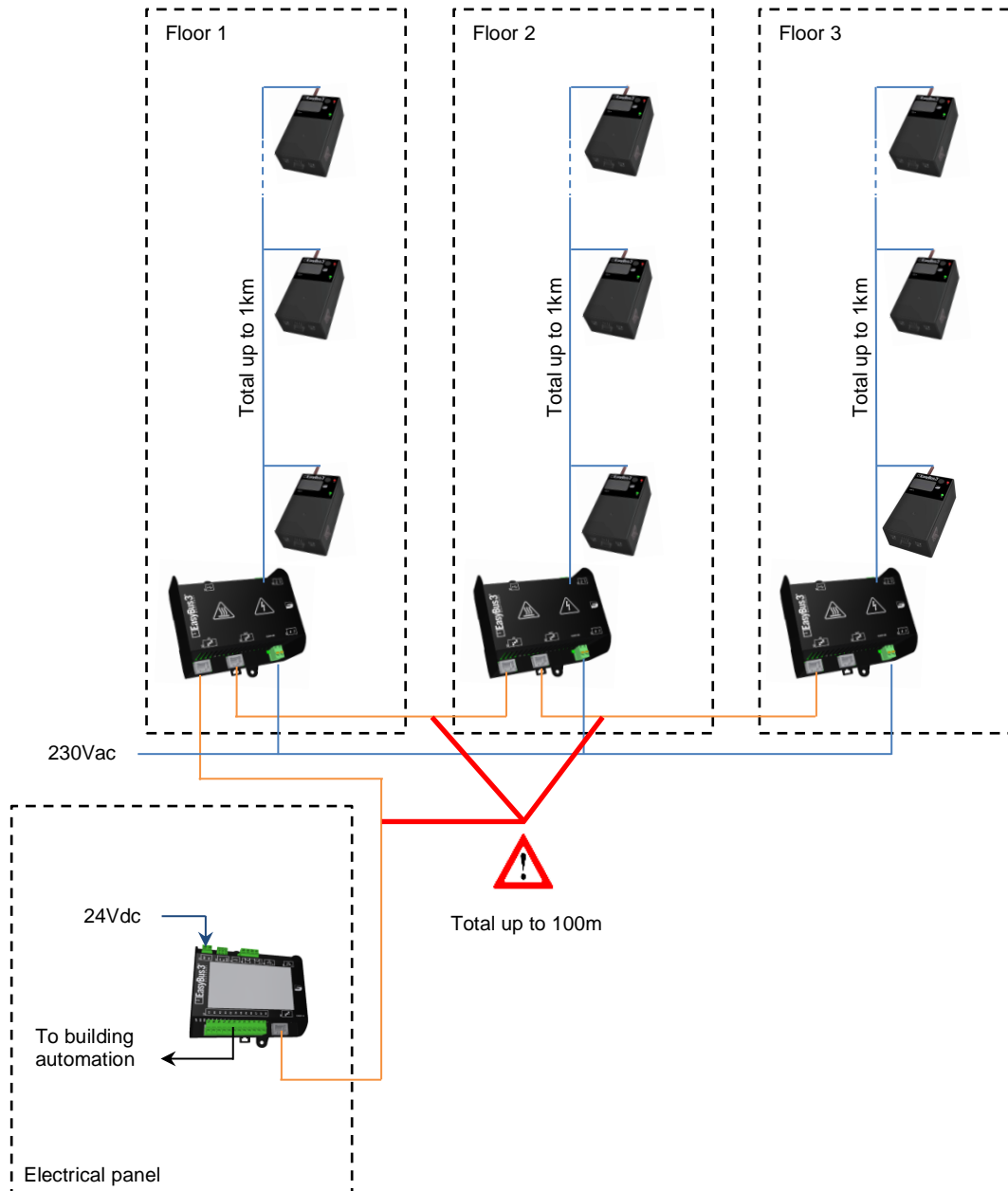
This distance is given for information only. It can vary according to the number of slave modules, the network but also many external parameters such as the architecture of the network, the structure of the building, the cables types, etc...

It is up to the installer to ensure and size the additional electrical elements to the specific constraints of the installation.



## 5.4 Remote Easy3-M devices

In the main topology, the Easy3-M devices are intended to be placed together with the Easy3-H module in the building electrical panel.

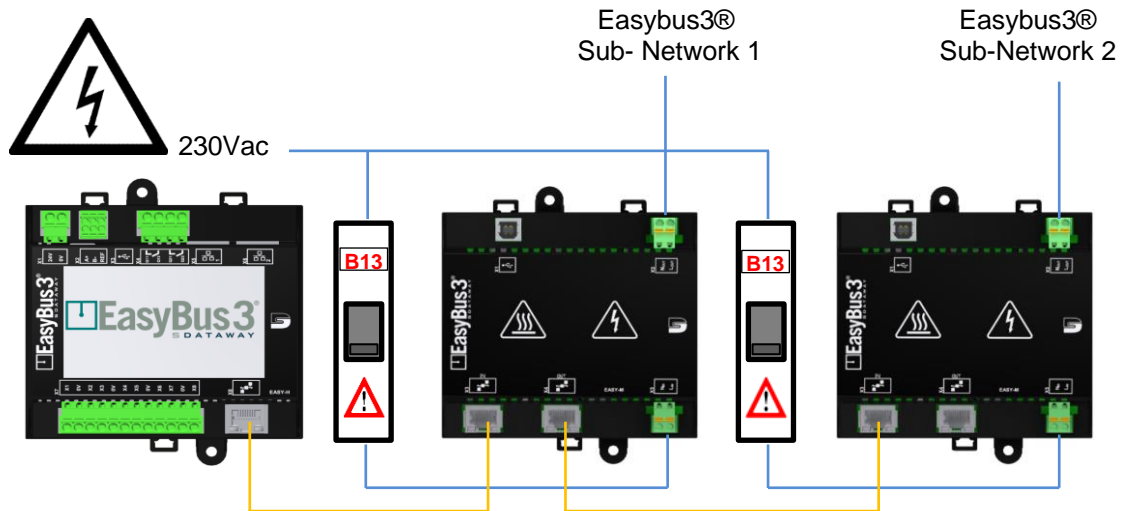



But it is also possible to relocate the Easy3-M modules next to the ventilation systems while respecting a **maximum and total distance of 100 meters** between the Easy3-H and the far-most Easy3-M(s).

In this configuration Easy3-M(s) must be located in a dedicated electrical cabinet.

## 5.5 Electrical connection to mains network

The 230 Vac inputs of the Easy3-M devices must be protected as a minimum with **13A Type B** circuit breaker.

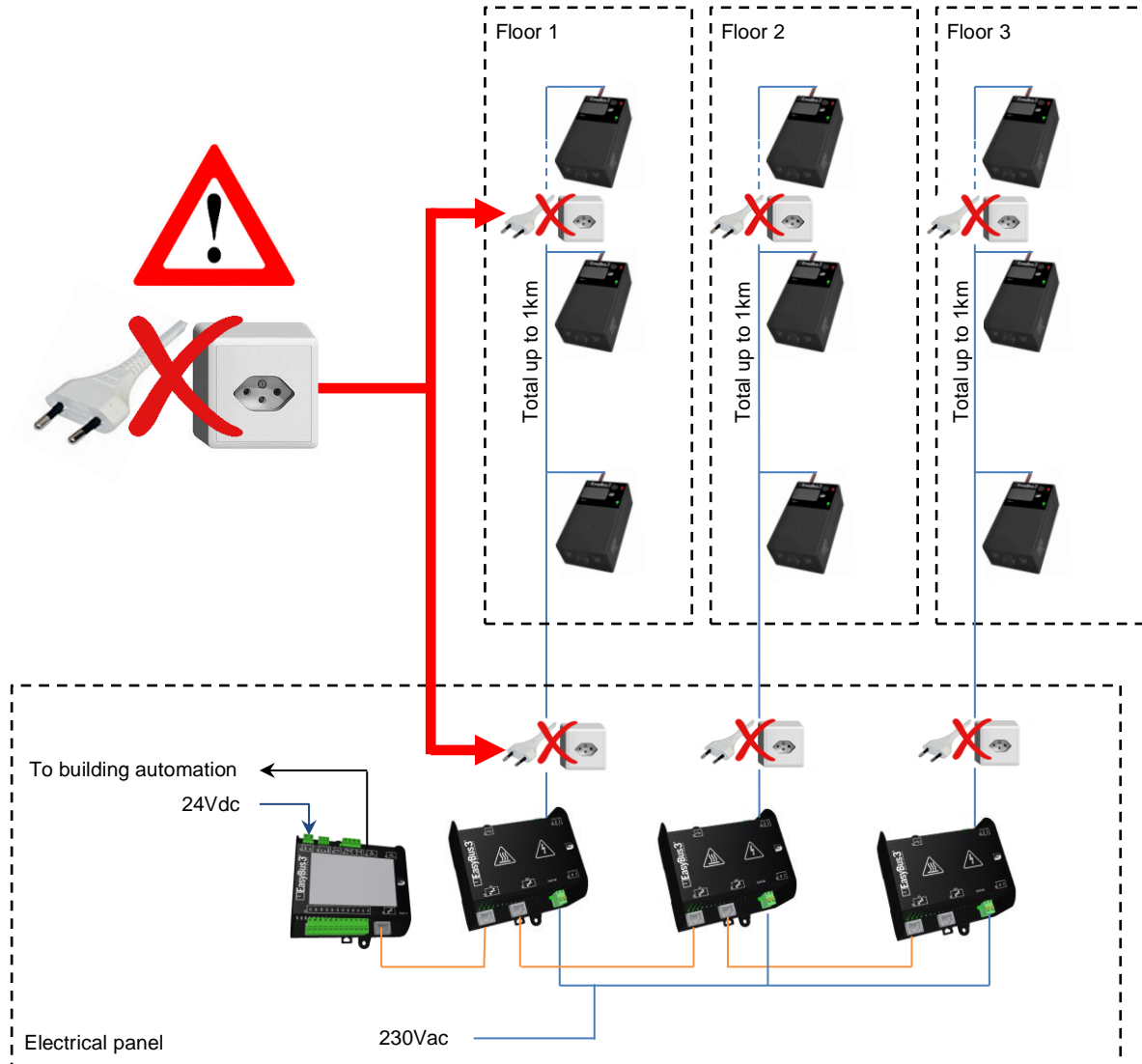


 It is up to the installer to ensure and size the additional electrical elements to the specific constraints of the installation.

## 5.6 Power Line Networks

EasyBus3® Sub-Networks are proprietary powerline networks.

Only EasyBus3® products can be installed on these networks.



**!** EasyBus3® Sub-Network(s) cannot be used as power supply network(s). It is strictly forbidden to install T13 plugs to supply other equipment.

The addition of supplementary non-compatible products may lead to damage to the modules and / or the entire installation.

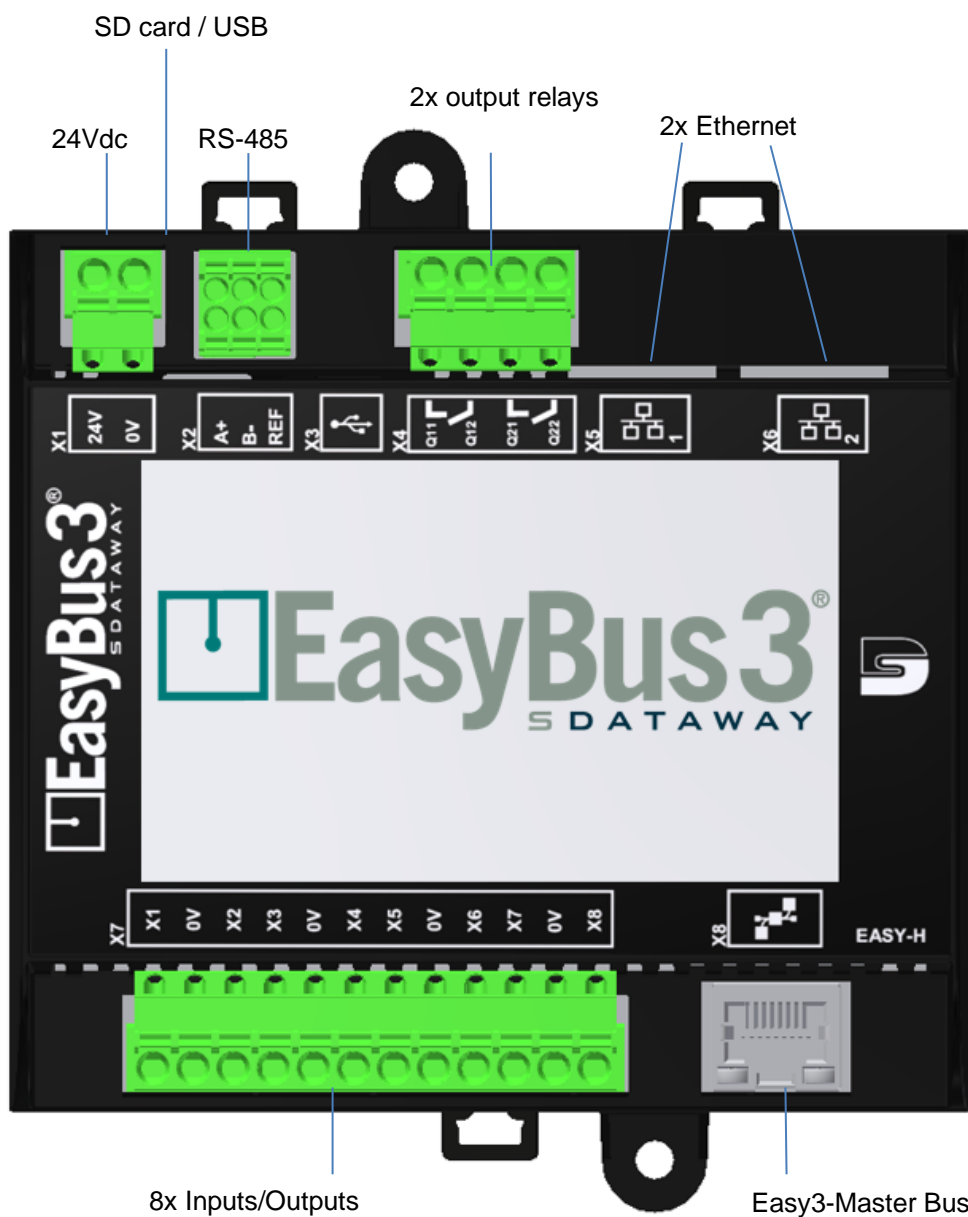
## 6 Easy3-H

The Easy3-H device is the main controller of the system.

It is the communication gateway between the building automation control system and the EasyBus3® network.

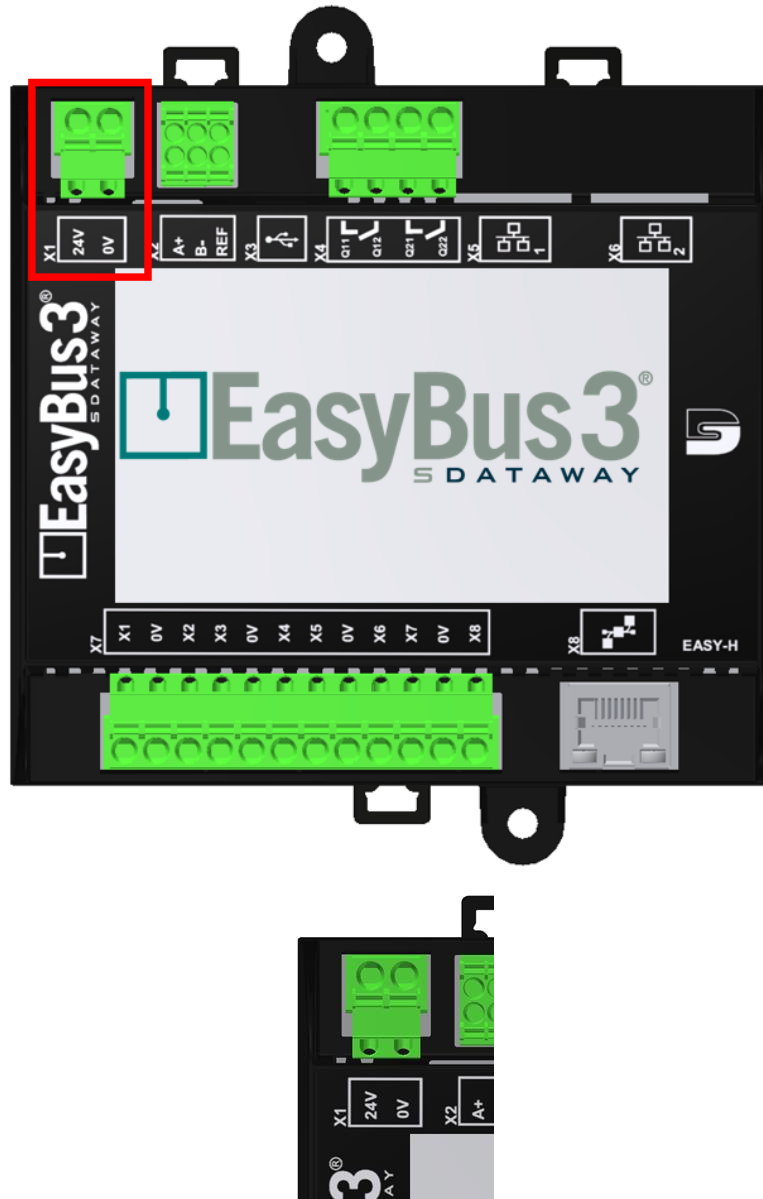
By design, depending of the installation size, configuration & requirements, it can also operate the entire EasyBus3® system in autonomous mode.

It is capable to manage up to 3 EasyBus3® Easy3-M devices.



## 6.1 X1 – Power supply 24Vdc

Easy3-H requires a 24Vdc power supply. The X1 electrical terminal is the 24Vdc power supply input for the EasyBus3® system.



Pin no.	Description
24V	Positive power supply
0V	0V reference voltage

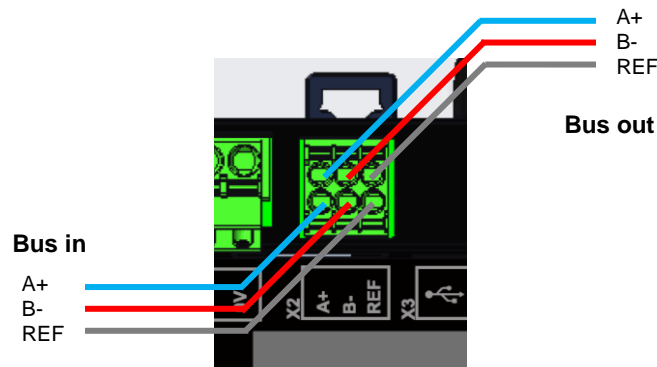
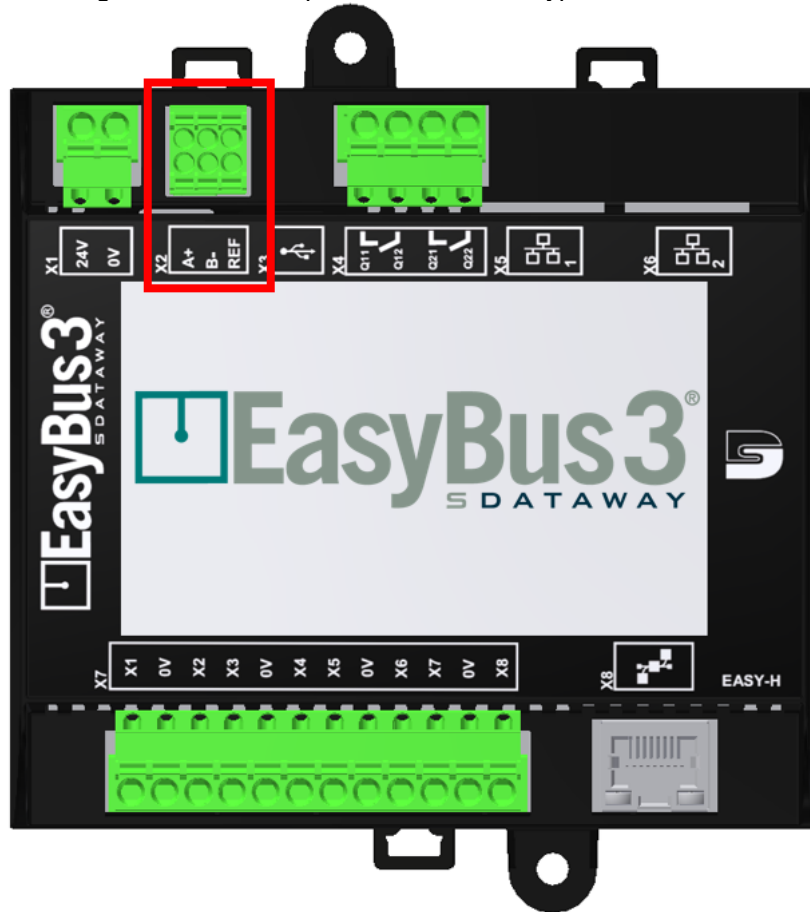
Description	Min.	Nom.	Max.	Unit
Power supply voltage	21.6	24	26.4	Vdc
Power supply current			2	A
Wire size	0.2		2.5	mm <sup>2</sup>



The Easy3-M(s) is powered by 24V from the Easy3-H. Then the Easy3-M(s) power consumption must be added to the Easy3-H power consumption and taken in consideration to calculate the 24V power supply power.

## 6.2 X2 – Modbus or BACnet MSTP, RS-485

The X2 electrical terminal is the interface connection between the automation building system and the EasyBus3® system using a Modbus RTU protocol or BACnet type MSTP.

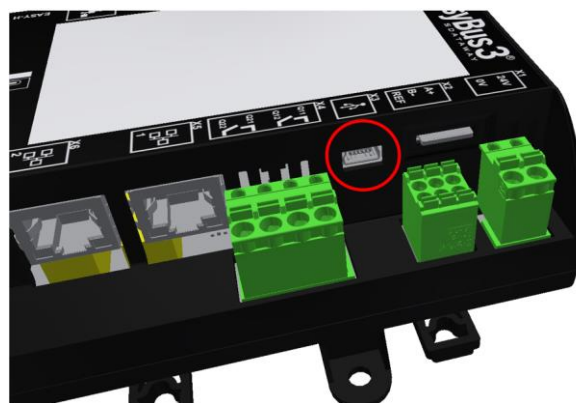
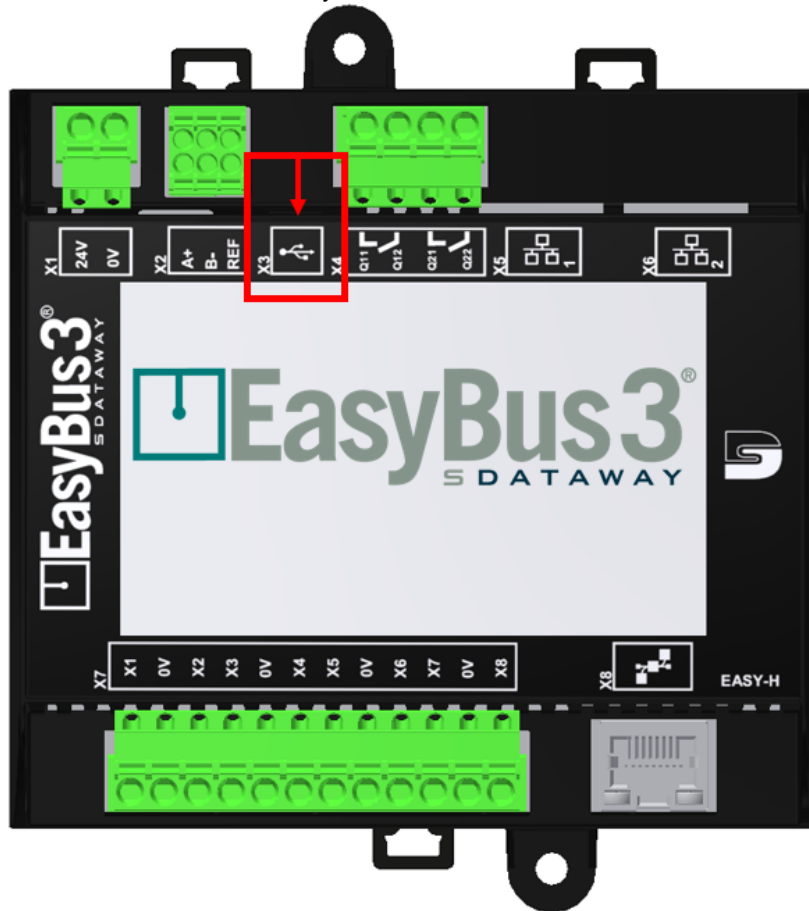


Pin no.	Description
A+	RS-485 A+
B-	RS-485 B-
REF	Reference voltage, 0V

Description	Nom.	Unit
Termination resistor	120 (software switchable)	Ohm
Baud rate	9600, 19200, 36400, 56600, 115200	bps
Parity / Stop bits	8-N-2, 8-E-2, 8-O-2	
Protocol	Modbus RTU, BACnet MSTP	
Wire size	0.75 (max 1.5)	mm <sup>2</sup>

### 6.3 X3 – USB

The X3 USB connector enables access to system data stored on the SD card data from a computer.

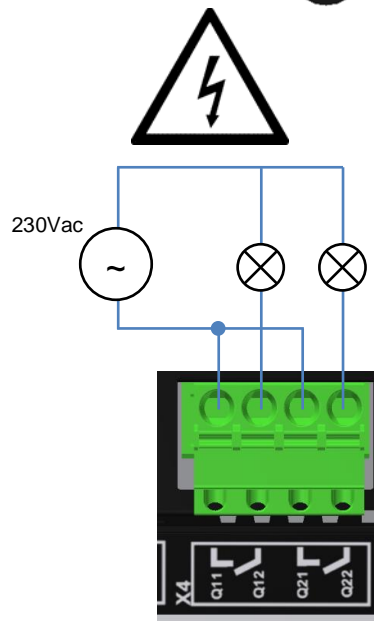
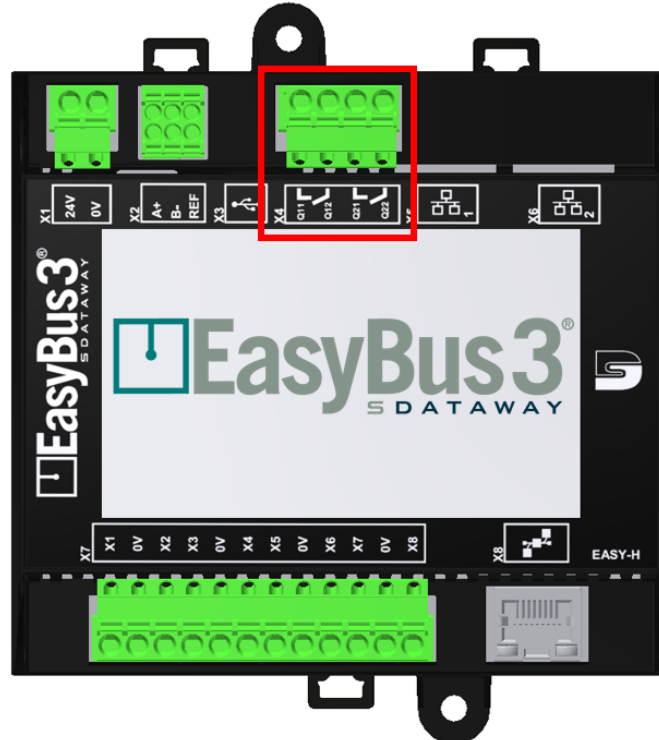


Description	Nom.
Connector type	Mini-USB
Protocol	Proprietary / Maintenance



## 6.4 X4 – Configurable 2x output relays

The X4 electrical terminal is used to expose two outputs poles dry contacts. These contacts can be mapped on several software computed states (damper status, smoke detection, etc.).

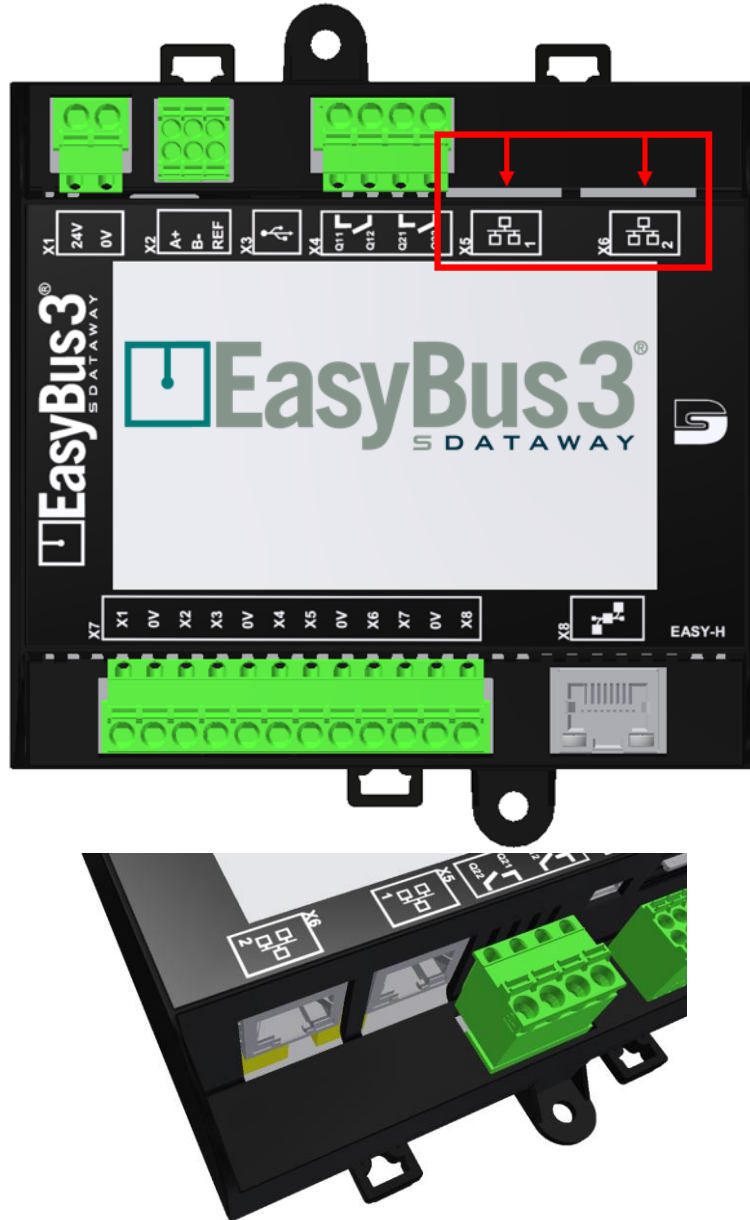



Pin no.	Description
Q11	Relay 1 terminals
Q12	
Q21	Relay 2 terminals
Q22	

Description	Typ.	Unit
Switching voltage	230	Vac
Switching current	10	A
Wire size	0.2 .. 2.5	mm <sup>2</sup>

## 6.5 X5, X6 – TCP/IP or UDP ethernet ports

The X5/X6 RJ45 connectors are the interface connections between the automation building system and the EasyBus3® system using a Modbus TCP protocol or BACnet IP.



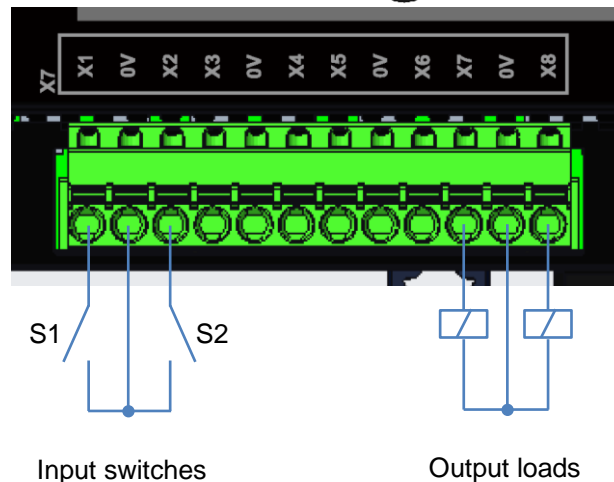
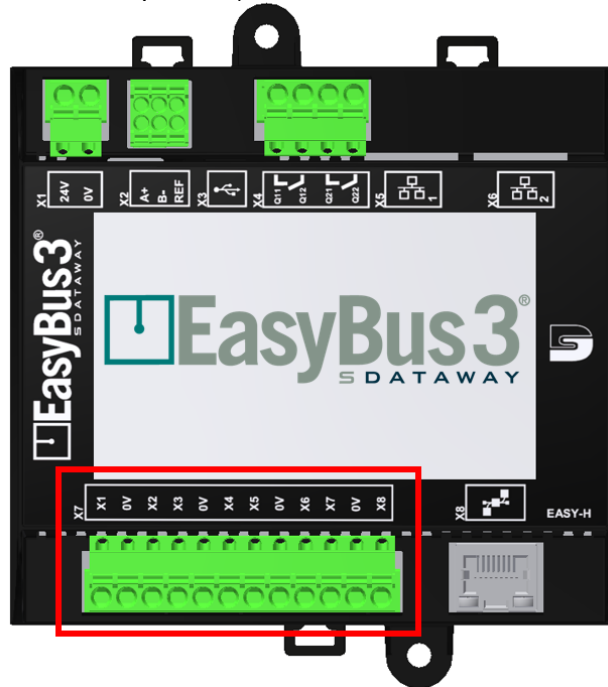
 These ethernet ports are not compatible with PoE

**Note:** Both ports are connected to an ethernet switch and to the internal device. There is no functional difference between them. They can be used to chain several Easy3-H or to connect a maintenance device in parallel.

Description	Nom.	Unit
Connector type	RJ45	
Speed	10 / 100	Mbit
IP	IPV4	
Addressing mode	DHCP, static	
Protocol	Modbus TCP, BACnet IP	

## 6.6 X7 – Configurable 8x Inputs / Outputs

The X7 electrical terminal (I/Os) is used to expose 8 configurable inputs/outputs contacts. These contacts can be mapped on several software computed states (damper status, smoke detection, etc.) or commands (damper control, fire input, etc.).



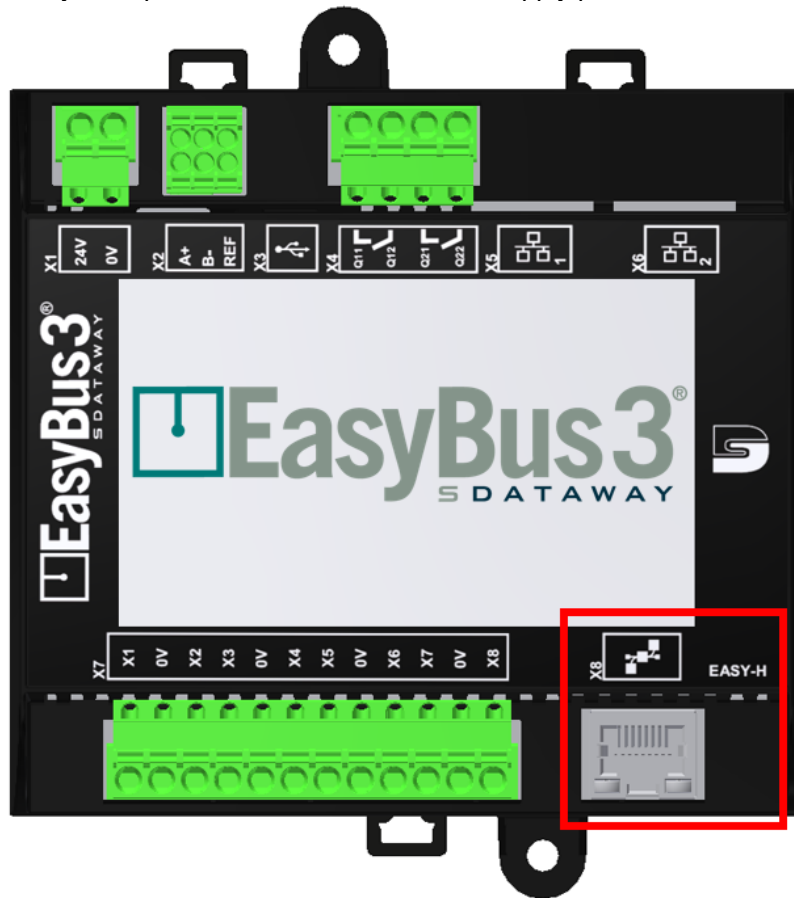
**Note:** The input switches and output loads are shown as an example. Each signal pin can be configured either in input or output mode.

Pin no.	Description
X1 .. X8	Configurable input / output signal
0V	0V reference voltage

Description	Min.	Typ.	Max.	Unit
Input maximum voltage			30	Vdc
Input low level voltage		0	4	Vdc
Input high level voltage	10	24		
Input pull-up resistor		3.3		kΩ
Output voltage		24		Vdc
Maximum output current			100	mA
Wire size	0.2		2.5	mm <sup>2</sup>

## 6.7 X8 – Easy3-Master bus

The X8 RJ45 connector is a 24 Vdc output power line communication. It is using a proprietary BUS protocol to communicate and supply power to one or more Easy3-M(s).



Description	Nom.	Unit
Connector type	RJ45	
Protocol	Proprietary	
Maximum voltage	24	V
Cable type	Min. Cat-5, F/FTP or S/FTP	

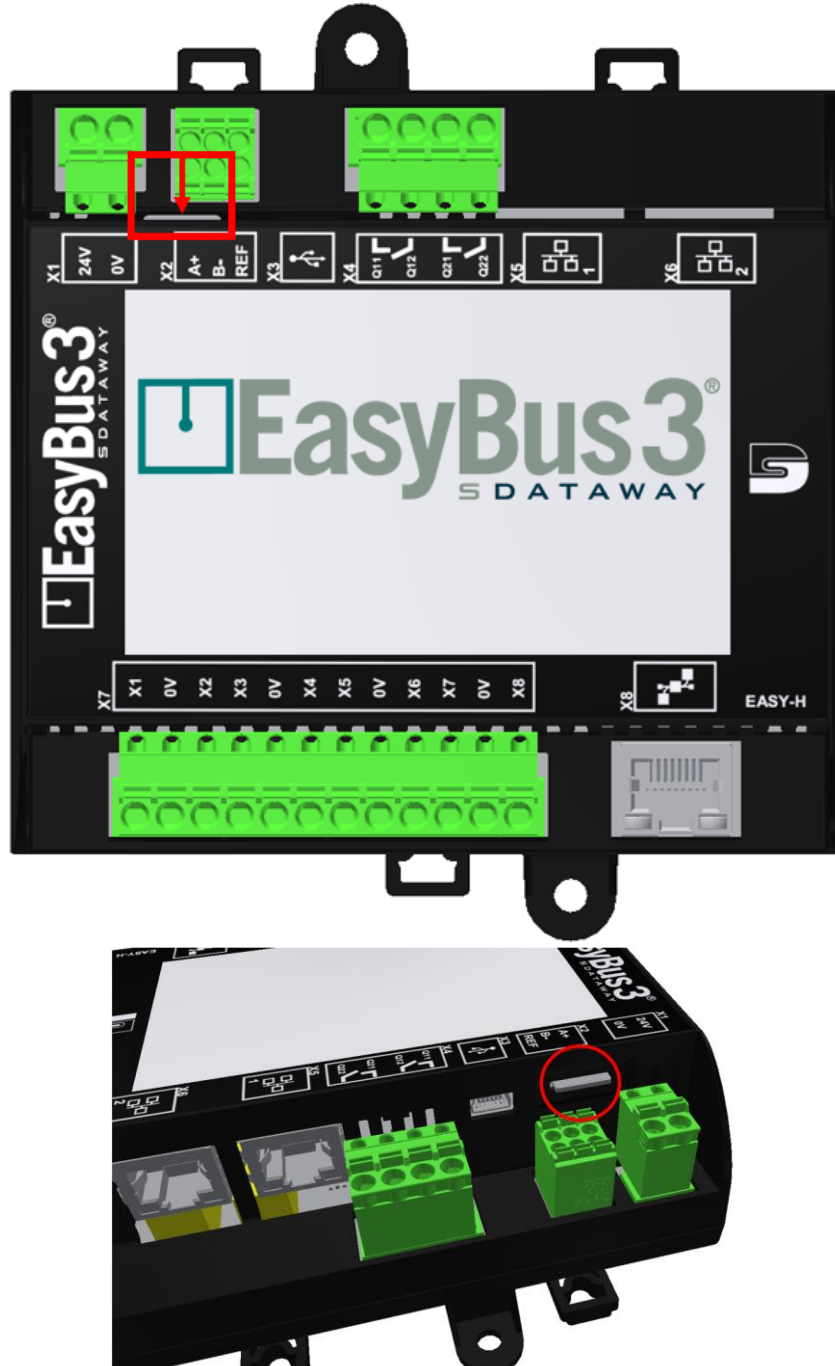


This port is using a RJ45 connector but is not compatible with ethernet. Plugging a RJ45 with PoE can damage the electronics.

## 6.8 Micro SD card

The Micro SD card holder has been designed to host Micro SD card.

The SD card should not be removed while then system is powered on.  
The system data stored on the SD card is accessible from USB connector using a computer.



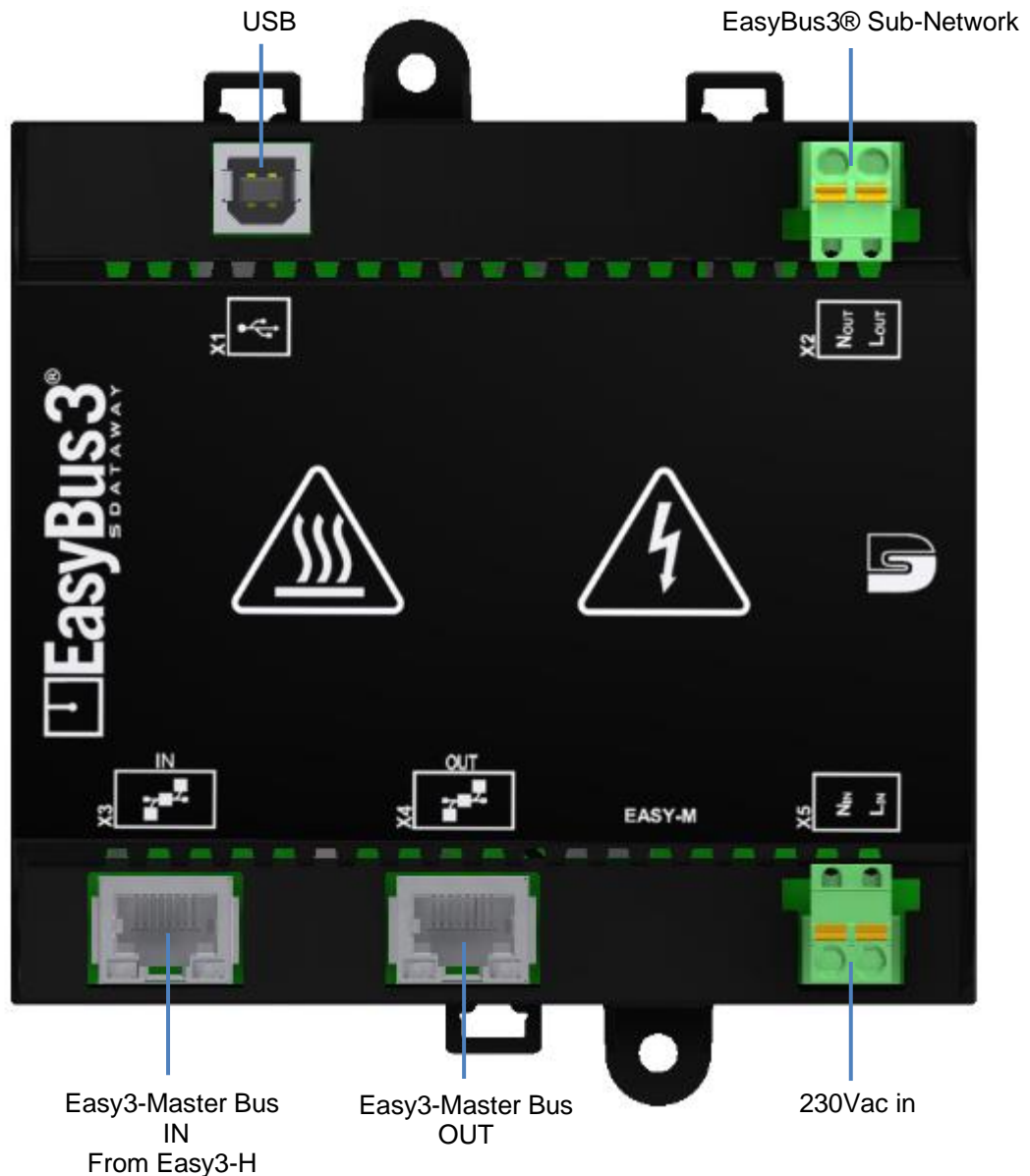
Description	Nom.
Card form factor	Micro-SD
Card type	SDHC
Memory size System capability	2Go to 16Go
Memory Card size	8 Go
File system	FAT32
Each Easy3-H is equipped with an 8 Go Card memory size	

## Easy3-M

The role of the Easy3-M device is to communicate with the remote slave devices using powerline communication over the mains network. The Easy3-M is already equipped with an internal Filter.

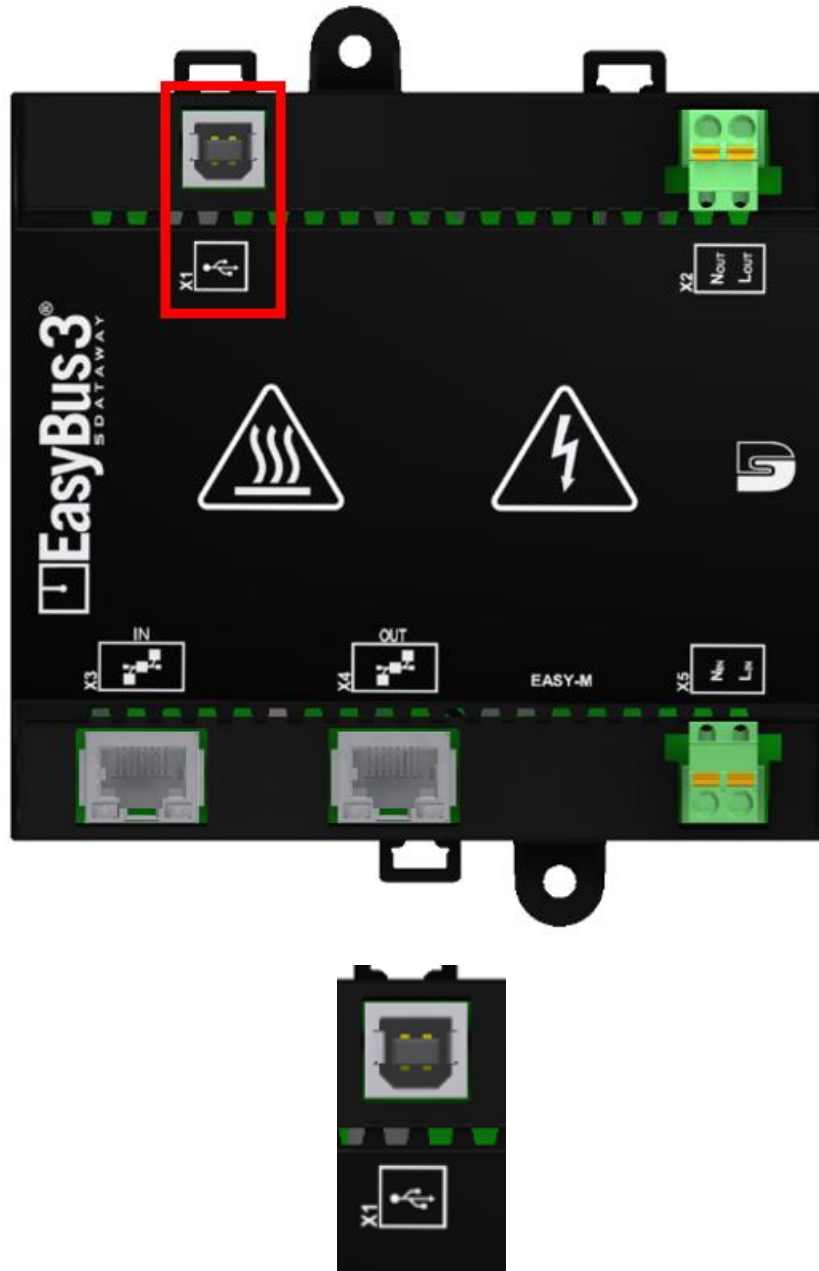
One Easy3-M is able to control up to 128 slave devices.

The Easy3-M device must be connected to an Easy3-H using a dedicated cable.



## 6.9 X1– USB

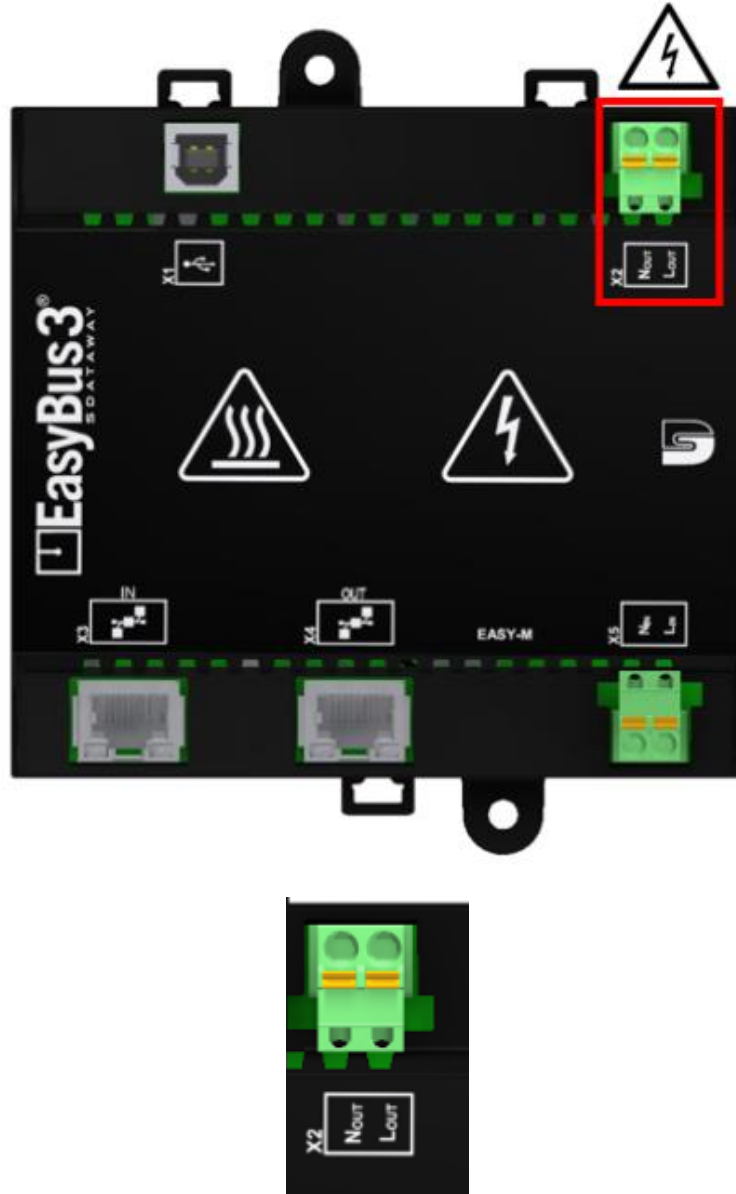
The X1 USB Type B connector is used for manufacturing settings and/or major system modification from a qualified engineer.



Description	Value
Connector type	USB Type B
Protocol	Proprietary

## 6.10X2 – EasyBus3® Sub-Network 230 Vac

The X2 electrical terminal is an output 230 Vac power line communication (EasyBus3® Sub-Network). It is using the BUS protocol to communicate and supply power across an electrical line.



Pin no.	Description
NOUT	Easybus3® network neutral
LOUT	Easybus3® network line

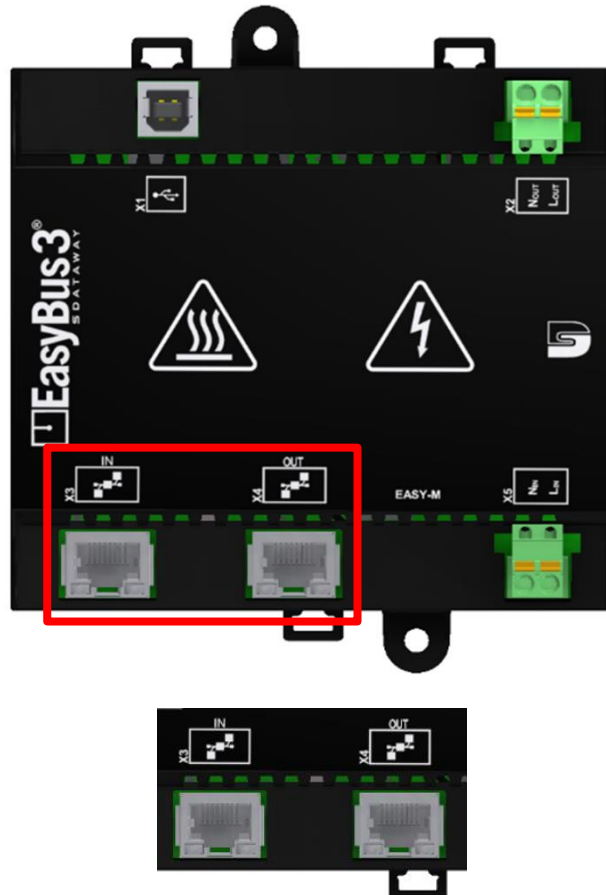
Description	Nom.	Unit
Easybus3® network voltage	230	Vac
Easybus3® network current	3	A
Wire size	2.5	mm <sup>2</sup>



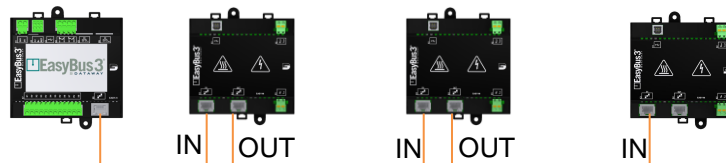
## 6.11X3, X4 – EasyBus3®-Master

The X3 RJ 45 connector is an input 24 Vdc power line communication. It is using a proprietary BUS protocol to communicate and get power from the Easy3-H or from the previous Easy3-M in the configuration.

The X4 RJ45 connector is an output 24 Vdc power line communication. It is using a proprietary BUS protocol to communicate and supply power to the next Easy3-M in the configuration.




The port X3 is the input and X4 the output. It is required to respect the following topology:



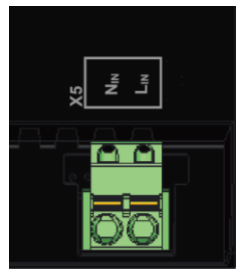
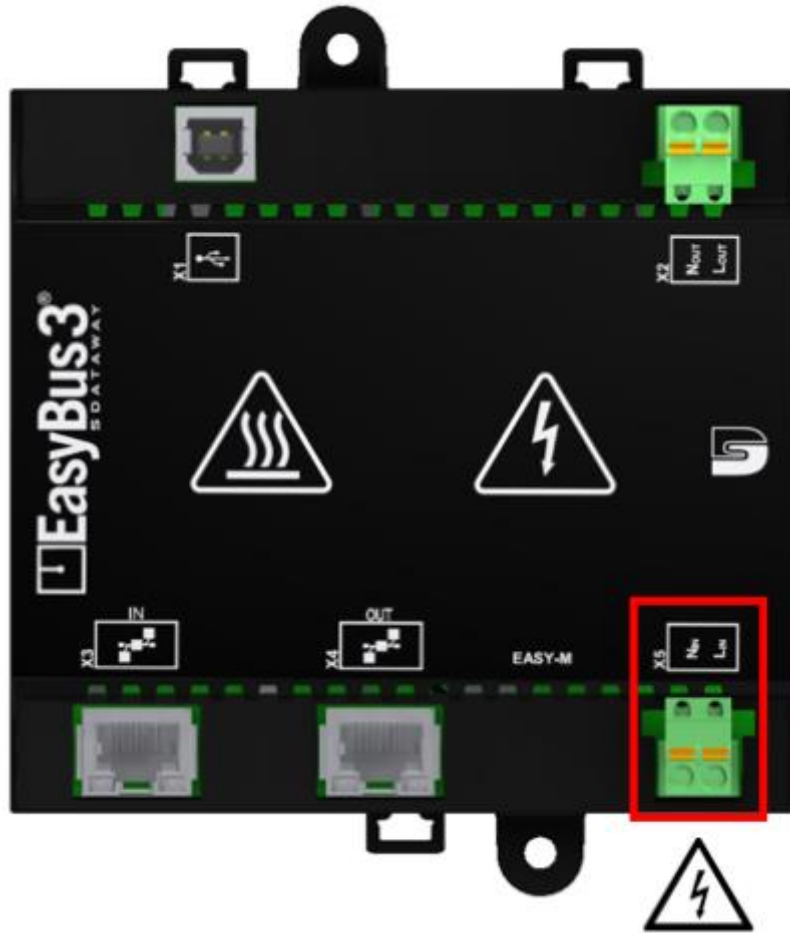
  
Max 3 Easy3-M

Description	Nom.	Unit
Connector type	RJ45	
Protocol	Proprietary	
Maximum voltage	24	V
Cable type	Min. Cat-5, F/FTP or S/FTP	
Termination resistor	Automatic	

 These ports are using a RJ45 connector but is not compatible with ethernet. Plugging a RJ45 with PoE can damage the electronics.

## 6.12X5 –Mains 230Vac input

The X5 electrical terminal is the input for the main power supply 230 Vac.

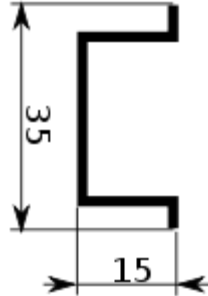


Pin no.	Description
N <sub>IN</sub>	Mains network input N
L <sub>IN</sub>	Mains network input L

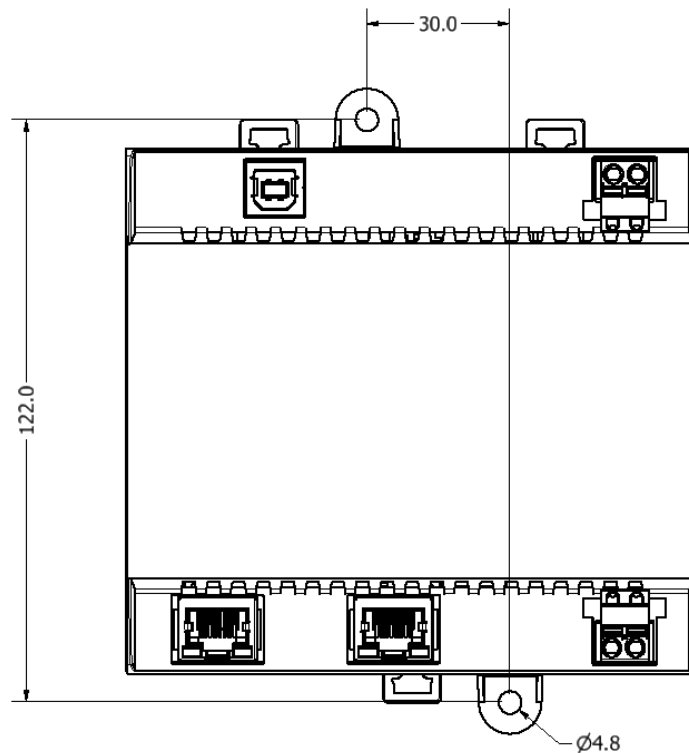
Description	Nom.	Unit
Power supply voltage	230	Vac
Maximum power	2000	VA
Wire size	2.5	mm <sup>2</sup>

## 7 Mechanical fixations

Both Easy3-H and Easy3-M devices are made to be mounted on a 35x15mm DIN rail.



Both devices can also be fixed directly on a wall with two screws as shown in the picture below.

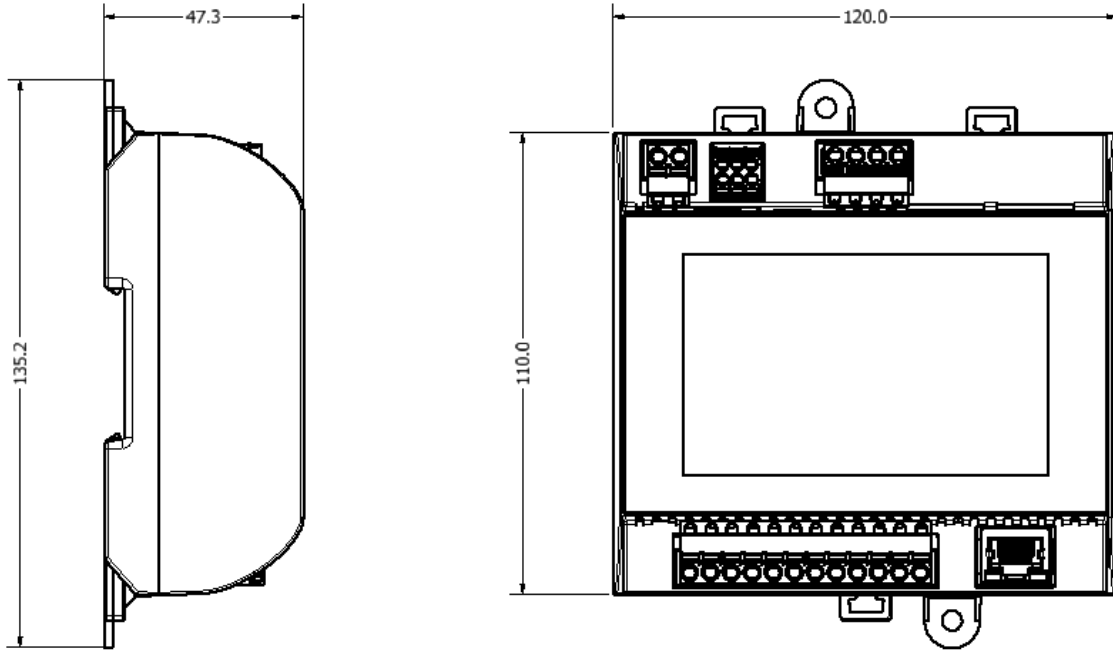


The Easy3-Mcase temperature can raise up to 60°C. To ensure a proper passive air ventilation it is required to follow the both following points:

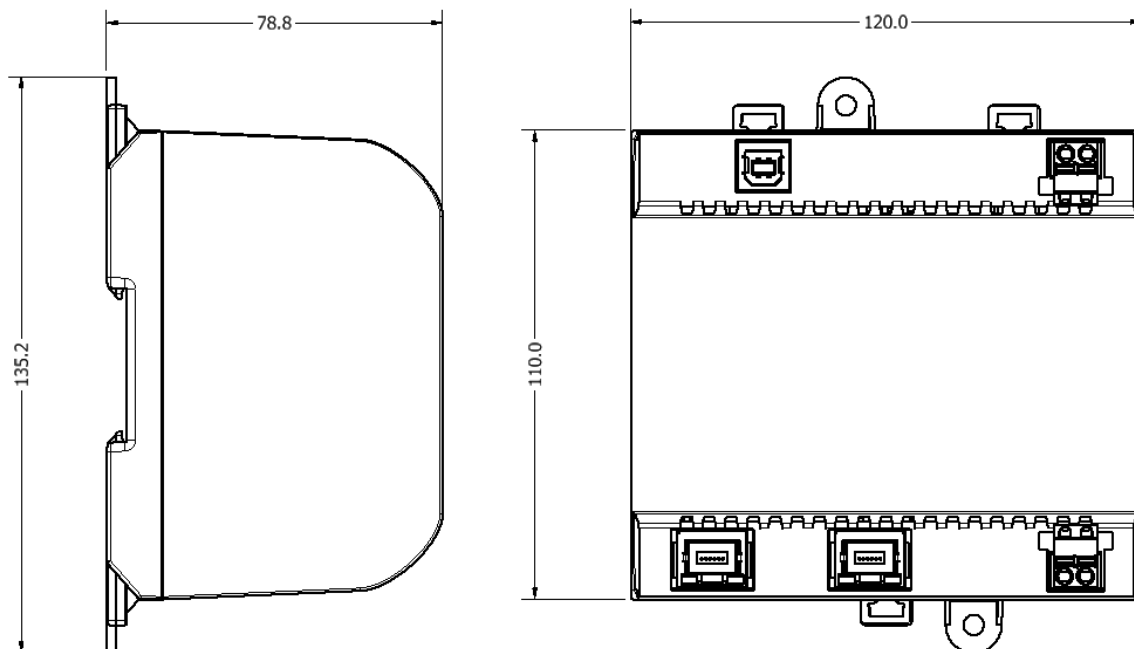
- Fix the device vertically, the picture above shows the correct position.
- Respect a clearance of 30mm below and above the device. Only the connected cables can pass through.

## 8 Dimensions

### EasyBus3® Easy3-H dimensions



### EasyBUS3® Easy3-M dimensions



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## 9 ModBus Register

Modbus default communication parameters:

- 8 data bits, parity even,
- 2 stop bits,
- address 1,
- 19200 bds.

Address and bauds rate can be changed, please refer to EasyBus3<sup>®</sup> Easy3-HMI User Manual

The Modbus registers table is available in the EasyBus3<sup>®</sup> system Technical Documentation tab.  
<https://sd servicedesk.atlassian.net/servicedesk/customer/portal/1/article/17498302>

## 10 BACnet

### Communication

BACnet MS/TP	Medium	RS-485
	Transmission formats	1-8-N-1, 1-8-E-1 and 1-8-O-1 (start bit, data bits, parity, stop bits)
	Baud rates	9600, 19200, 38400, 57600, 115200
	Termination	With/Without
BACnet IP	IP address assignment	Static or DHCP
	Parametrization	Device menu

### Information device

General information	Vendor Name	SDATAWAY
	Vendor Identifier	1201
	BACnet Protocol Revision	16
	BACnet Standard Device Profile	BACnet Application Specific Controller (B-ASC)
	Segmentation Capability	Both
	Data Link Layer Options	MS/TP master Baud Rates: 9600, 19200, 38400, 57600, 115200 BACnet IP master
	Device Address Binding	Static or DHCP
	Character Sets Supported	ISO 10646 (UTF-8)
	Network Security Options	Non-secure device

### BIBBs

BIBBS BACnet Interoperability Building Blocks supported	DS-COV-B	Data Change of Value-B
	DS-RP-B	Data Sharing-Read Property-B
	DS-RPM-B	Data Sharing-Read Property Multiple-B
	DS-WP-B	Data Sharing-Write Property-B
	DS-WPM-B	
	DM-DDB-B	Device Management-Dynamic Device Binding-B
	DM-DOB-B	Device Management-Dynamic Object Binding-B
	DM-DCC-B	Device Management-Device Communication Control-B
	DM-RD-B	Device Management-Reinitialize Device-B

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## 12 Contact

Please visit our website to get all the EasyBus3<sup>®</sup> information and to download the latest version of this manual.

[support.easybus3.com](https://support.easybus3.com)

Scan here to download the latest version of the EasyBus3<sup>®</sup> system technical manuals.

