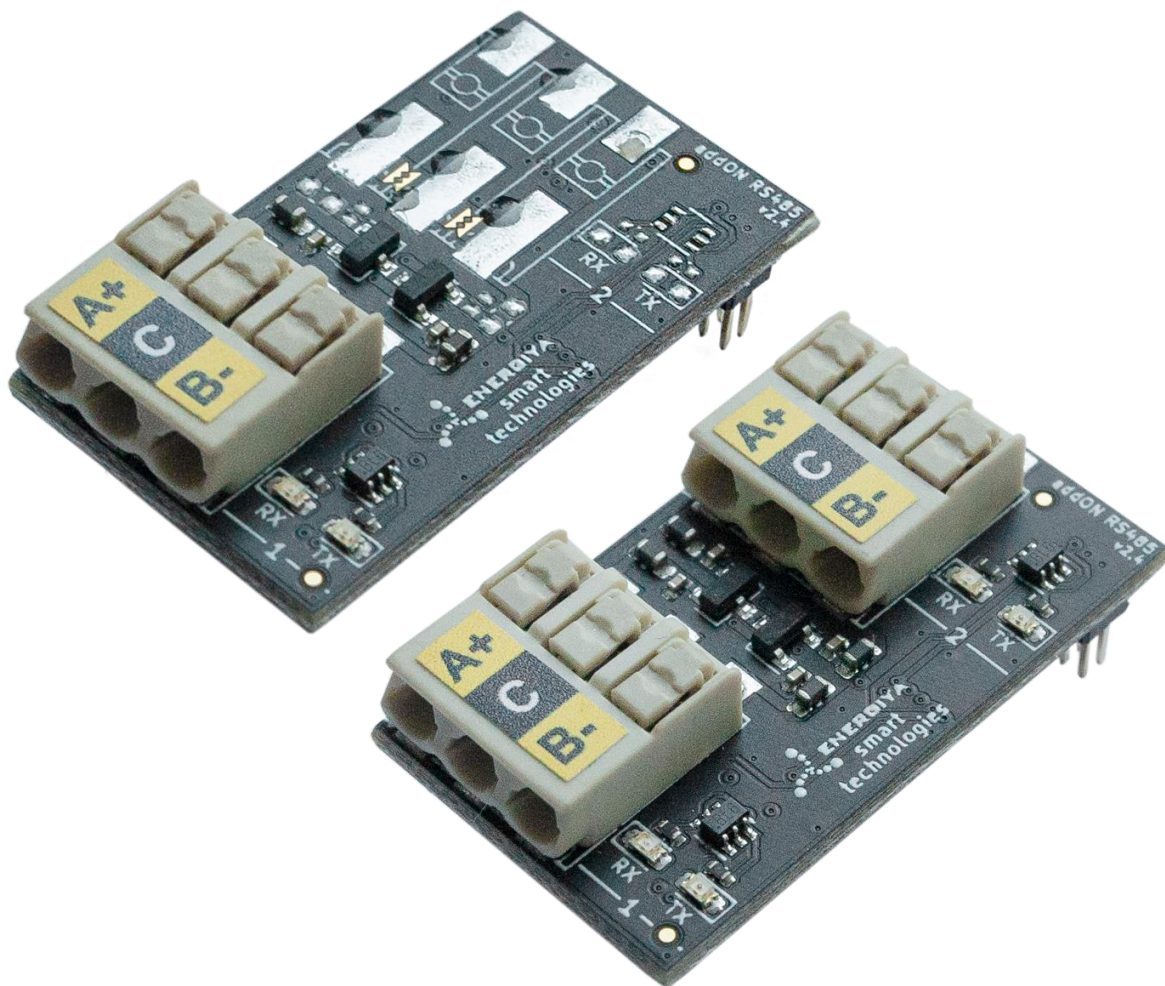


**addON**

# **RS485S / RS485D**

Single / Dual RS485 extension card

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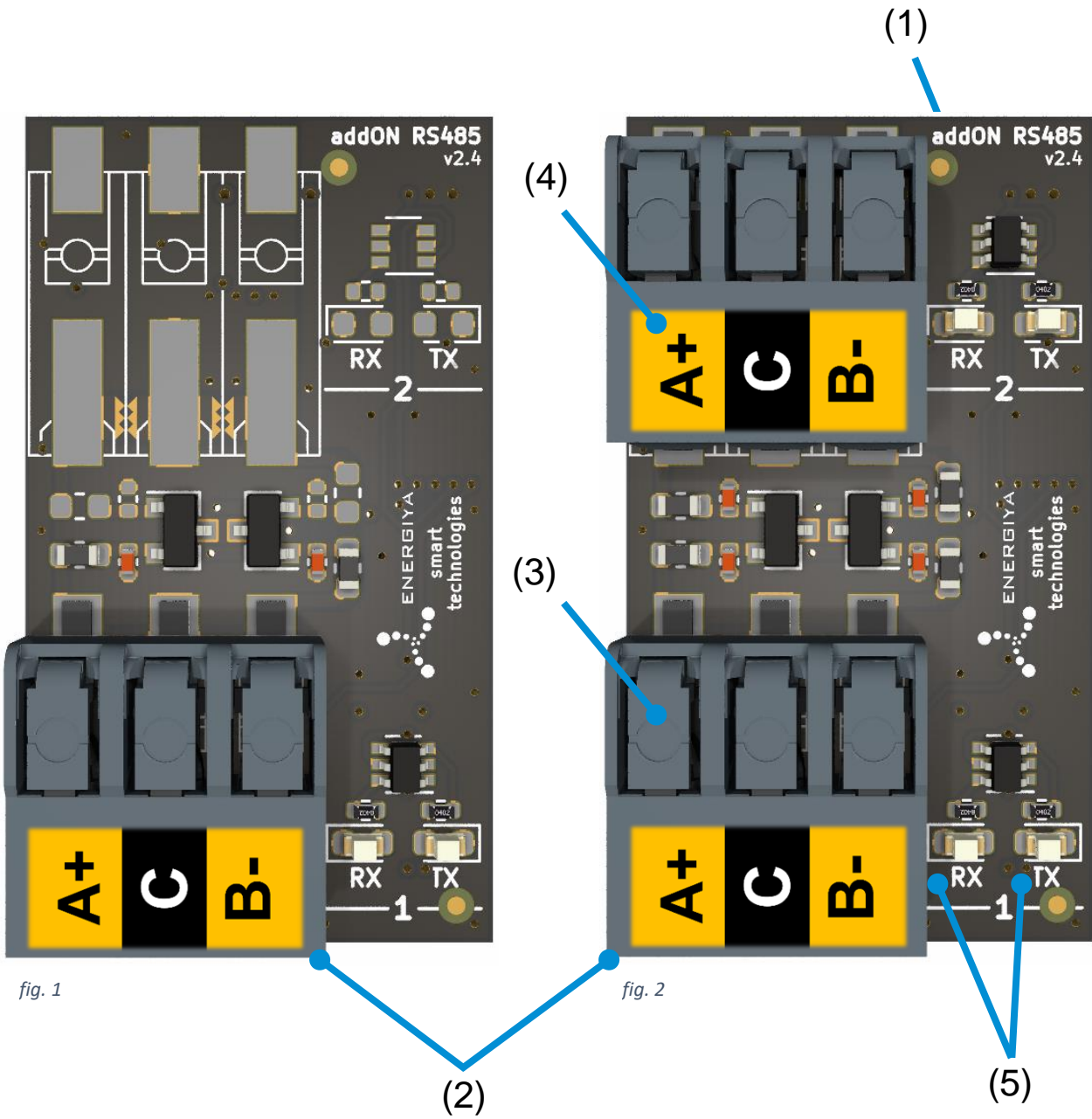


fig. 1

fig. 2

- 
- (1) addON connector (on bottom side)

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  - (2) clamp connectors

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  - (3) wire release

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  - (4) connector description label

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  - (5) RXD (receive data) and TXD (transmit data) LEDs

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## Description

The addON expansion cards allow you to extend the functionality of IoT cards with additional inputs, outputs and interfaces.

With the addON RS485S (S = single) card we can expand each IoT card with one RS485 interface (fig. 1). With the addON RS485D (D = dual) card we expand each IoT card with two additional RS485 interfaces (fig. 2).

The addON card is compatible with all of Energiya IoT cards.

## Mounting the addON card

The addON card is mounted on top of the IoT card in a dedicated connector.

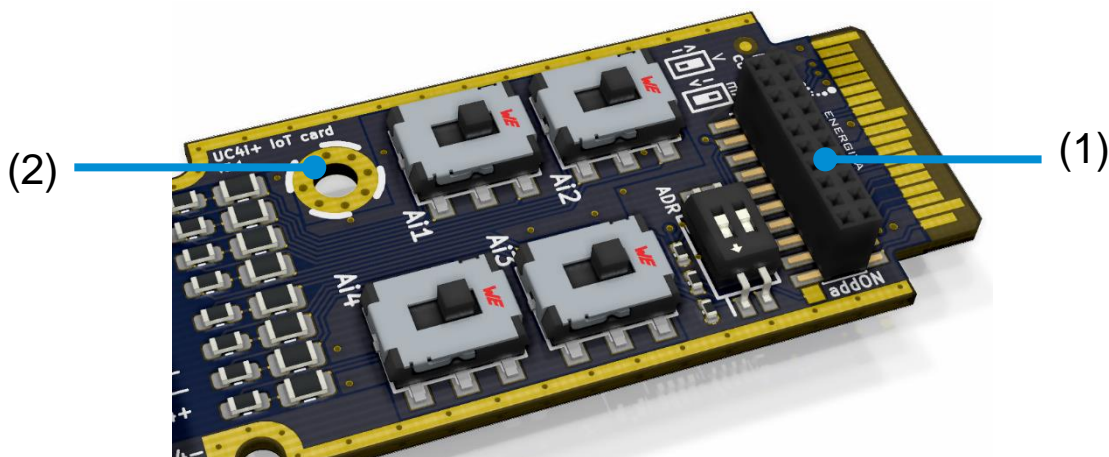


fig. 2

First place the addON card into the slot on the top of the IoT card (1). Then use the polyamide screw (supplied with the addON) to screw the expansion card to the IoT board (2).

There are two types of addON slots. Please find below the picture of correct assembly:

- 18 pin addON slot (fig. 3):

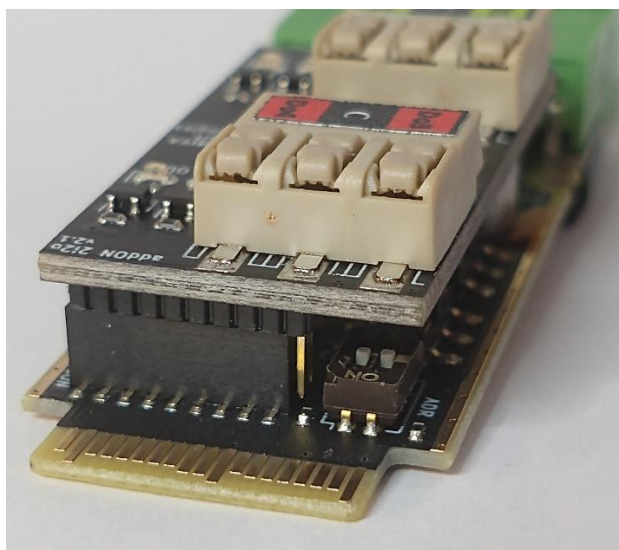


fig. 4

- 20 pin addON slot (fig. 4):

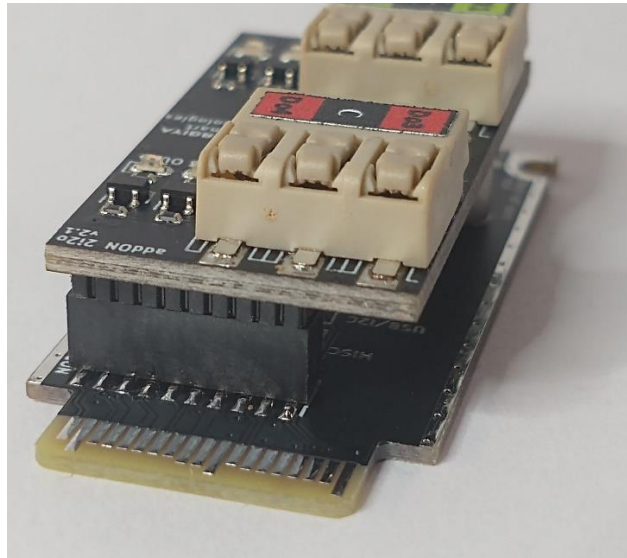


fig. 5

- ⚠ **Important!** Never mount or remove the addON card with power on! This way you can easily cause a short circuit and damage the card.
- ⚠ **Important!** Always remember to secure the card with a polyamide screw! Vibration can make slide out the card out of the connector and cause short circuit.

### RS485 bus wiring

The following figure shows a description of the connector terminals.

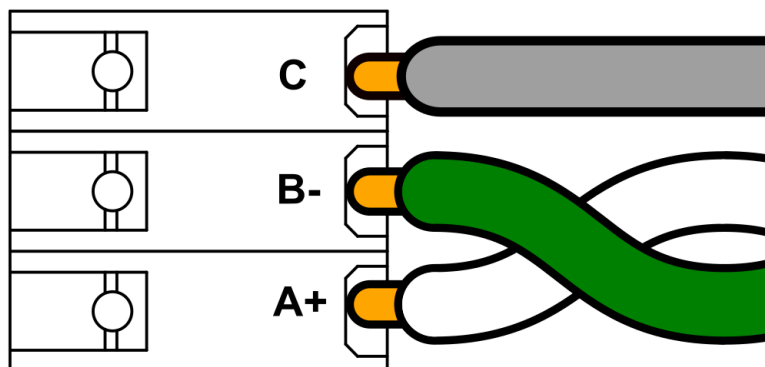


fig. 6

A+, B-	RS485 bus terminals
C	common

## RS485 topology and termination

Twisted pair cable is used as a wire in the RS485 bus (A and B). The RS485 bus has a straight line topology with a maximum length of 1200 m. Straight line topology is recommended, and when we can't avoid a branch, let's try not to exceed 10 m. Star and ring topology should be avoided. Terminating resistors (T) must be activated at the extreme ends of the bus (fig. 7).

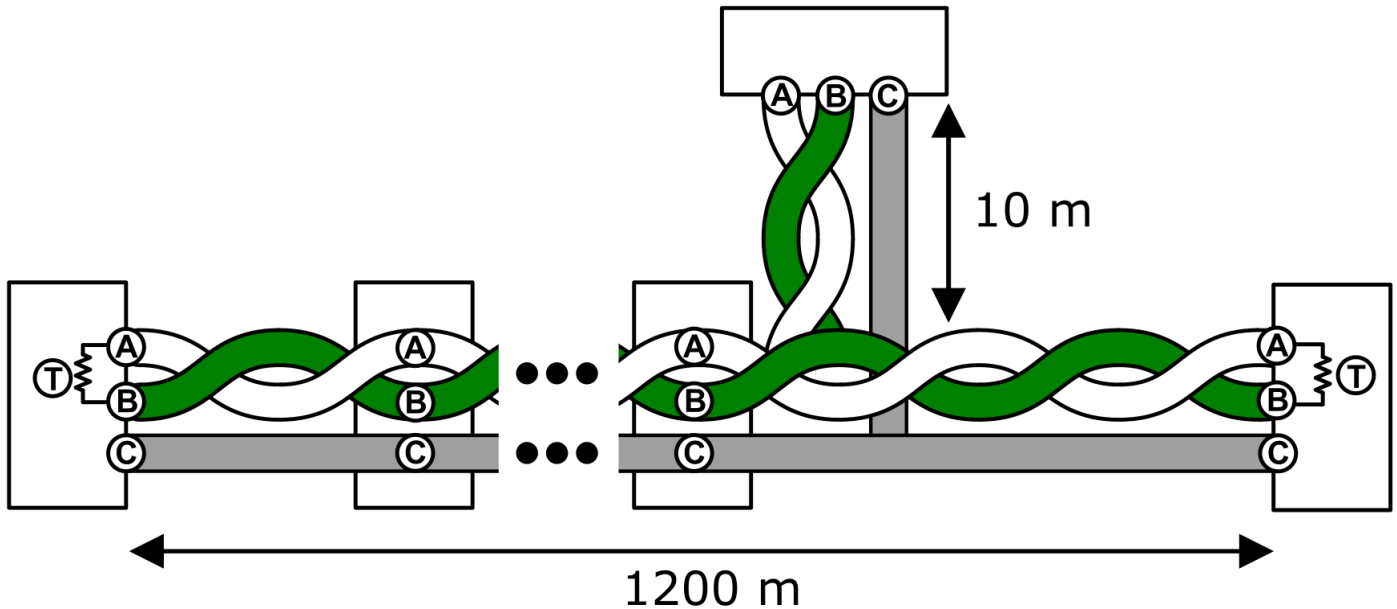


fig. 7

**Important!** Connections via terminals A and B are sufficient for RS485 communication. We recommend potential equalization and connection of the common terminals of all units. This avoids potential differences that can lead to communication errors or make communication completely impossible.

**Important!** Terminating resistors are used to avoid signal reflections. They are connected in parallel between terminals A and B of the RS485 bus at its extreme points. To connect the terminating resistor in the RS485+ IoT card, the jumper must be shorted on the TERM pins (see figure 1, element 3).

**Important!** The quality of the cables used and their diameter also affects the quality of data transmission. It is recommended to increase the wire diameter as the bit rate increases, because as the wire diameter increases, its resistance decreases.

**Important!** Try to don't unwinding your twisted pair more than one or two inches. This may be difficult with shielded cables, but it is worth taking care of the cabling quality.



**RS485 grounding**

RS485 addON cards do not have a grounding terminal. It is allowed and even recommended to connect the device common point to the earth lug. It is important that in the whole device ground is connected to common only in one point. This increases the safety and resistance of the system to electrostatic discharge.

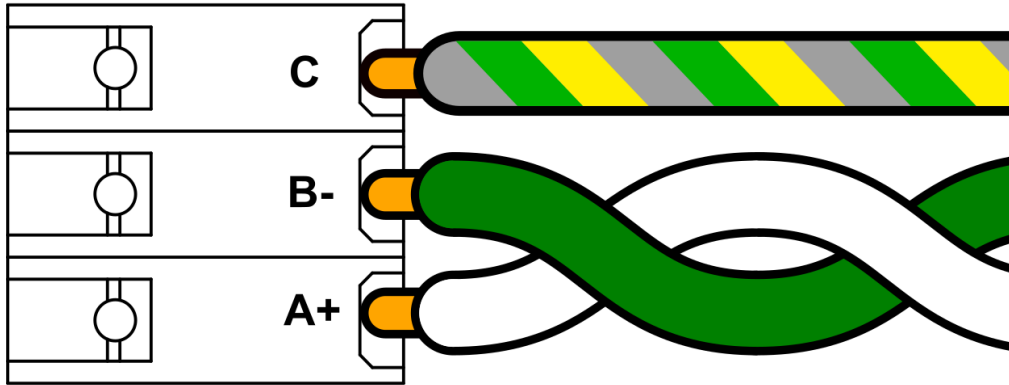


fig. 8

The use of shielded cables also improves safety and transmission quality. However, badly connected or not connected shields of cables can only worsen the situation. Connect the shields of bus cables to the ground only at one point.

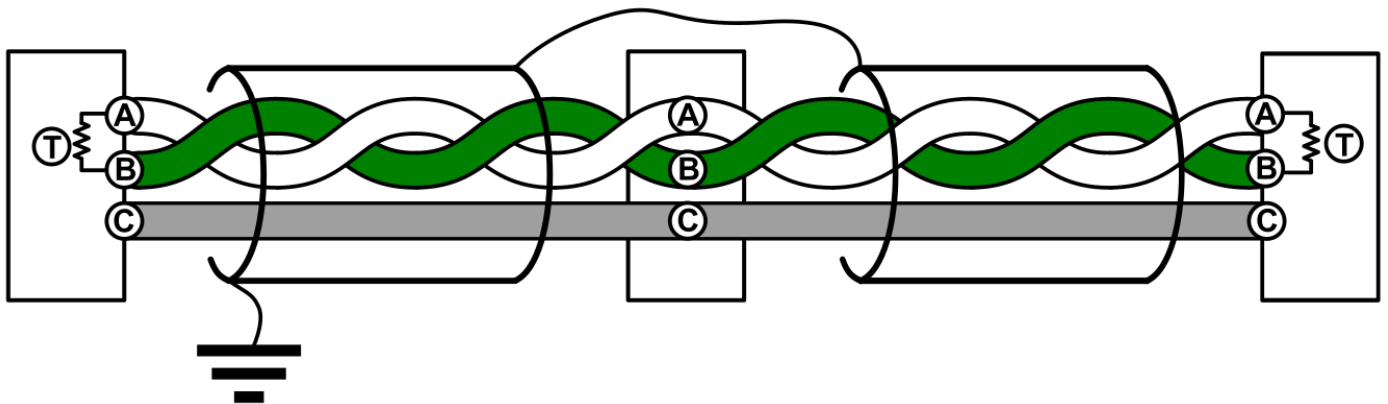


fig. 9

**⚠ Important!** Using high quality materials and taking care of the quality of the installation from the very beginning, we can be sure that the system will function without the slightest malfunction or interference for a long time, which is of great importance in bus systems and data transmission.

## Specifications

Dimensions (W x H x D)	19.3 x 33.6 x 12.8 mm
Operating temp	-40 to +85°C
Weight	5 g
Current consumption	10 mA
Number of RS485 interfaces	1 (RS485S) 2 (RS485D)
Max recommended cable length	1200 m
Terminating resistor	yes (120 Ω)
Fail-safe biasing	yes
Reverse polarity protection	yes
Connector type	screwless connector
Wire range	0.2 to 1.0 mm <sup>2</sup> (24 to 17 AWG)
ESD protection	yes
Latching cover for FX30	yes

## Troubleshooting

Lack of communication	check the bus according to the instructions in the manual, check for a short circuit
Communication errors	check baud rate, check topology and termination, check common points and grounding

Send us your feedback and suggestion to help us improve our products! 😊 [info@energija.pl](mailto:info@energija.pl)



Please consider the environment before printing this manual.