





**Name:** Data logger  
**Type:** MacREJ 5

## Installation manual

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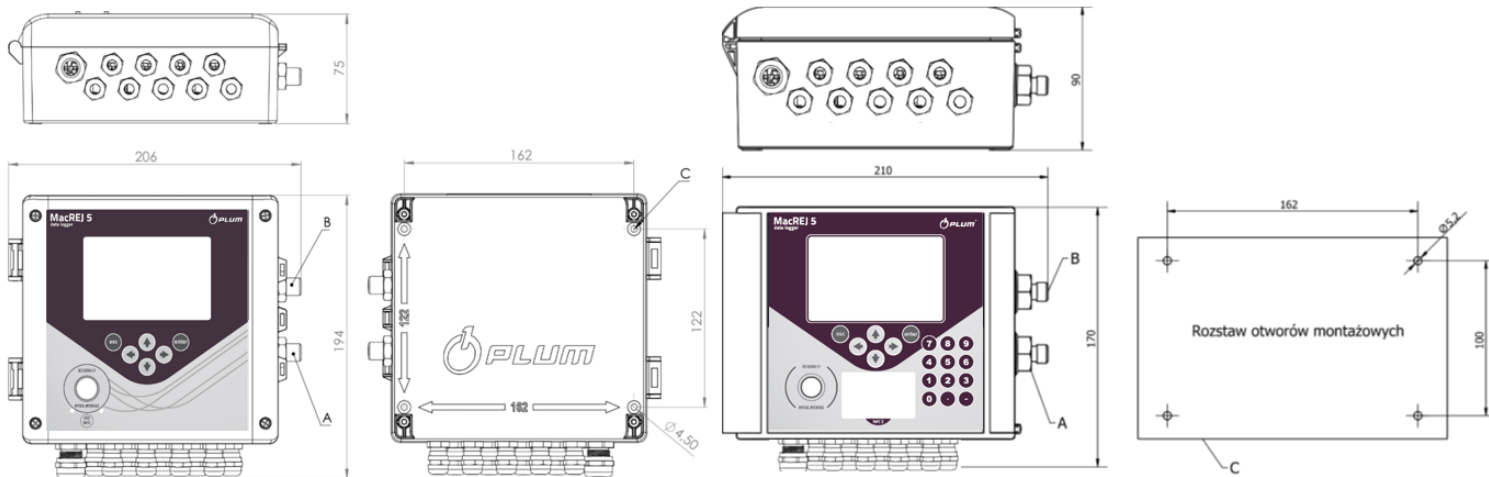


## BASICS

-  **MacREJ 5 data logger is intrinsically safe, explosion proof device. Can be installed in explosive hazardous zones 0, 1 and 2. Ex marking: II 1G Ex ia IIb T4 Ga.**
-  **Minimum requirements for improving the safety and health protection of workers potentially at risk from explosive atmospheres are prescribed in Directive 1999/92/EC of the European Parliament and of the Council of 16 December 1999 (ATEX 137 'Worker Protection Directive').**
-  **To keep declared IP66 rating it is highly recommended to use proper cables' diameters inserted through the cable glands, proper tightening the glands and front cover.**
-  **In some specific conditions polycarbonate housing can keep the electrostatic load ready to ignite. It is not allowed to install the device in environment conducive to gathering electrostatic loads on housing. Clean the product only using wet tissue.**

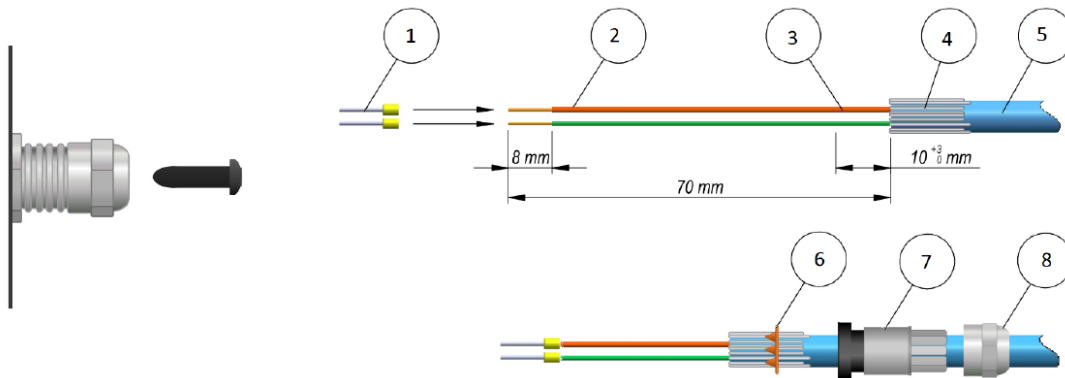
## MECHANICAL ASSEMBLY

Firstly place the data logger stably on surface considering given dimensions. **MacBAT IV** installation kit can be used as well for MacREJ 5. When data logger is equipped with internal pressure sensors, lead the probe pipes to pressure gathering point. When it is equipped with external pressure sensors, place them directly in pressure gathering point. It is recommended to install the three-way valves between pressure sensor and pipeline. Place the temperature sensor in dedicated socket.




## WIRES PREPARATION

It is highly advised to use wire cables of 0,25-0,75mm<sup>2</sup> intersection according to cable glands diameters. Wires preparation is presented in the pictures below.



1 - insulated sleeves, 2 - wires, 3 - foil, 4 - shield, 5 - cable, 6 - gland ring, 7 - gland seal, 8 - gland nut

Remove the plug from the cable gland. Prepare the wire according to the picture above. Roll over the cable shield outside on the insulation. Slide the ring (6) on the shield. Insert prepared cables through proper cable glands. Cable glands are prepared for grounding pulse cables' shields.

 **It is highly recommended to use blue-insulated cables. Used cables must fulfil the requirements of B-type cables according to EN 60079-14 standard. Especially: wires insulation must handle the 500V AC testing voltage.**

Intrinsically safe circuits must be lead separately to the non-intrinsically. Cables must be attached rigidly to avoid risk of mechanical damage.

### Digital inputs - LF, binary, NAMUR:

- LIYCY 2x0,25mm<sup>2</sup> - maximum length 10m
- LIYCY 4x0,50mm<sup>2</sup> - maximum length 10m

### External power supply, modem supply, serial transmission ports, digital outputs:

- LIYCY 2-10x0,5mm<sup>2</sup> - maximum length 150m.
- LIYCY 6-10x0,5mm<sup>2</sup> - maximum length 200m

### Paired cables:

- LIYCY-P 2..5x2x0,34mm<sup>2</sup> - maximum length 100m
- LIYCY-P 2..5x2x0,50mm<sup>2</sup> - maximum length 150m
- LIYCY-P 2..5x2x0,75mm<sup>2</sup> - maximum length 200m

### Required wires amount:

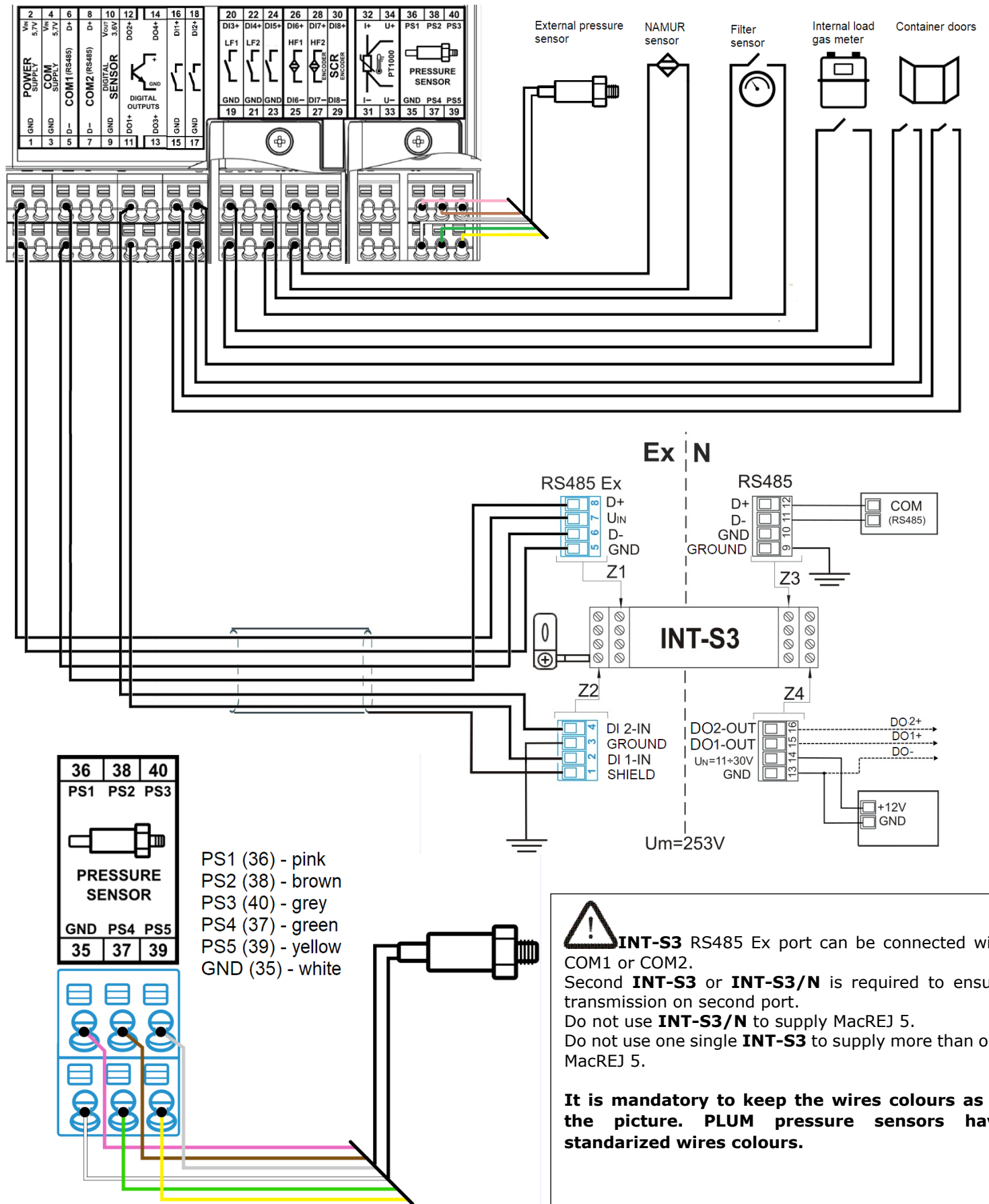
- 2 wires - only data logger and modem power supply - on-line work
- 4 wires - data logger and modem power supply, transmission on one serial port
- 6 wires - data logger and modem power supply, transmission on both serial ports
- 7-10 wires - power supply, serial transmission and digital outputs

## EXTERNAL CIRCUITS CONNECTION

Previously prepared wires ended with insulated sleeves must be connected to the terminals. When inserted, cable should clip automatically. Pull the cable gently to check if it is connected well.

Next page presents diagram of MacREJ 5 development: INT-S3 transmission interface, signalling circuits, external pressure sensors.


# MACREJ 5 CIRCUITS DEVELOPMENT



## CONFIGURATION USING KEYBOARD

Keyboard includes 6 pushbuttons, ENTER to confirm, EXIT to decline and back, 4 navigation arrows.

Main screen consists of basic registered data and customized bargraph.

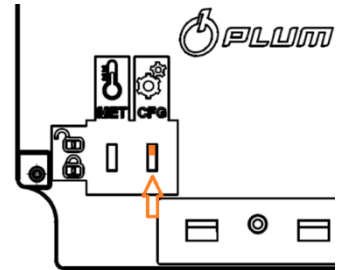
By pressing  on main screen you will be redirected to CONFIGURATION AFTER INSTALLATION menu, where most important parameters are gathered in one list.

Name	Description	Name	Description
DT	Current date and time	P1/P2LAMin	P1/P2 min limit alarm treshold
Dtau	Parameters registration period [min]	P1/P2LTm	Alarm sending delay [s]
EPwRSMODE	Power supply mode [BATT – only batteries, ECO – solar source, FULL – mains]	dP1/P2/T	Trigger of sharp change momentary registration parameters
P1/P2LWMin	P1/P2 min limit warning treshold	COM1/COM2 Bps/Adr	Serial transmission ports address and speed
P1/P2LWMax	P1/P2 max limit warning treshold	Adm401Pwd	Password for 401 account (Administrator)
P1/P2LAMin	P1/P2 min limit alarm treshold	Cust301Pwd	Password for 301 account (Customer)

Signalling inputs	Signalling inputs names and polarization definition – normally opened or normally closed
Outputs	Digital outputs definition - binary or frequency work mode, pulse replication
Pulse inputs	Digital pulse LF inputs definition - binary or counter work mode, counters value and pulse factor setting

Change of various parameters requires user' authorization, which can be done two ways:

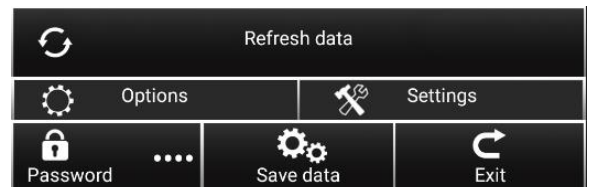
- Authorization using password protected account - 401/Administrator with default 4096 password - changeable.
- Switching the CFG lock to the open position. This turns off authorization demands and enables full device access. This way is recommended during first startup. When configured, and password for 401 account is changed it is recommended to switch the lock to close position and seal it to prevent unauthorized configuration changes.



## CONFIGURATION USING ANDROID APP

Necessary accessories:

- Mobile app NFC MacREJ 5
- Smartphone with Bluetooth functionality
- PLUM OptoBTE interface



Turn on the OptoBTE and place it on OPTICAL INTERFACE window on the front of **MacREJ 5**. Blue LED should be on the right side. Please ensure that optical port is working on 9600b/s speed.

Turn on the **NFC MacREJ 5** app. First readout of available parameters can last longer, that is normal action. When finished, application will pass to main window. Application includes settings as: pressure warning and alarm limits, timeout delay in sending alarm about pressure exceeding, V1 and V2 counters and pulse factors.

Under More parameters button there are hidden options for signalling inputs; names for each input and polarization - normally opened or normally closed.

Saving changes is made by ticking **Save data** button at the bottom of application. Blue icons on the left side of changed parameters will become green, and notification on screen will appear.

## TECHNICAL SUPPORT

Technical Support Department  
Phone: +48 85 749 00 08  
Mail: serwis@plum.pl

Plum Ltd.  
Ul. Wspólna 19, Ignatki  
16-001 Kleosin