

User Manual

myRSD III

- 1 **Build** your robot with LEGO® parts, sensors and actuators
- 2 **Connect** your robot to myRSD and NI myRIO platform
- 3 **Have fun** with your robot thanks to NI LabVIEW® software



Create with ease robotics and automation applications thanks to **myRSD** and NI myRIO. Forget connections and protocols headache, measure and control your application using plug and play Lego sensors.

Students and professionals can learn and apply skills in mechanical design, graphical programming and control theory and design, prototype, and automate their own assemblies.

Drivers and Software

myRSD includes a ready to use software library for robotics and automation. The library can be installed using VI Package Manager. VI Package Manager (VIPM) is a package management tool that organizes and maintains packages within your LabVIEW environment. It's the tool for obtaining and configuring libraries and development tools. The library contains specific sub-palette for each one of the supported sensor and actuator.

Thanks to the library you can easily manage sensors and actuators. Init, acquire, actuate and close each device with ease and integrate with robot and automation logic.

 **Information** To download the new version of this manual or for new application software, please visit <http://www.irsdidattica.it/home/myrsd/> or contact didattica@irsweb.it

Disclaimer

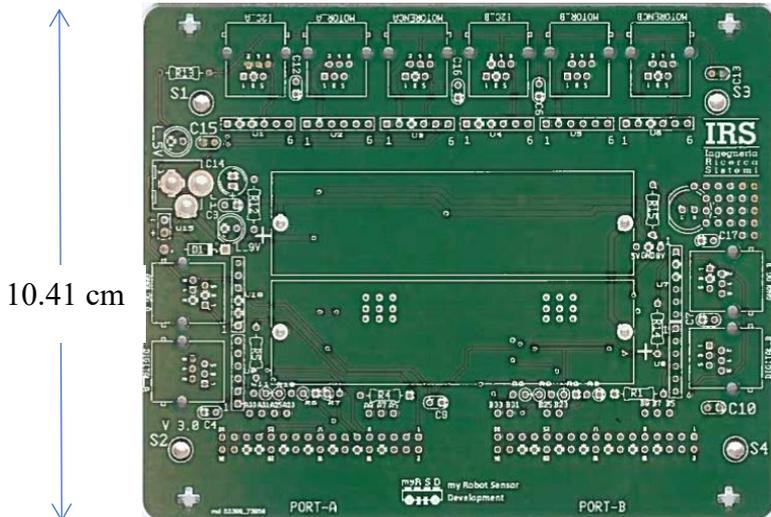
The **myRSD** is a device for educational purposes only and are not suitable for industrial use.

myRSD, NI myRYO, NXT, EV3, LEGO are trademarks of their respective owners and their use is possible only after explicit consent.

Dimensions

The dimensions are given in centimeters.

← 13.06 cm →



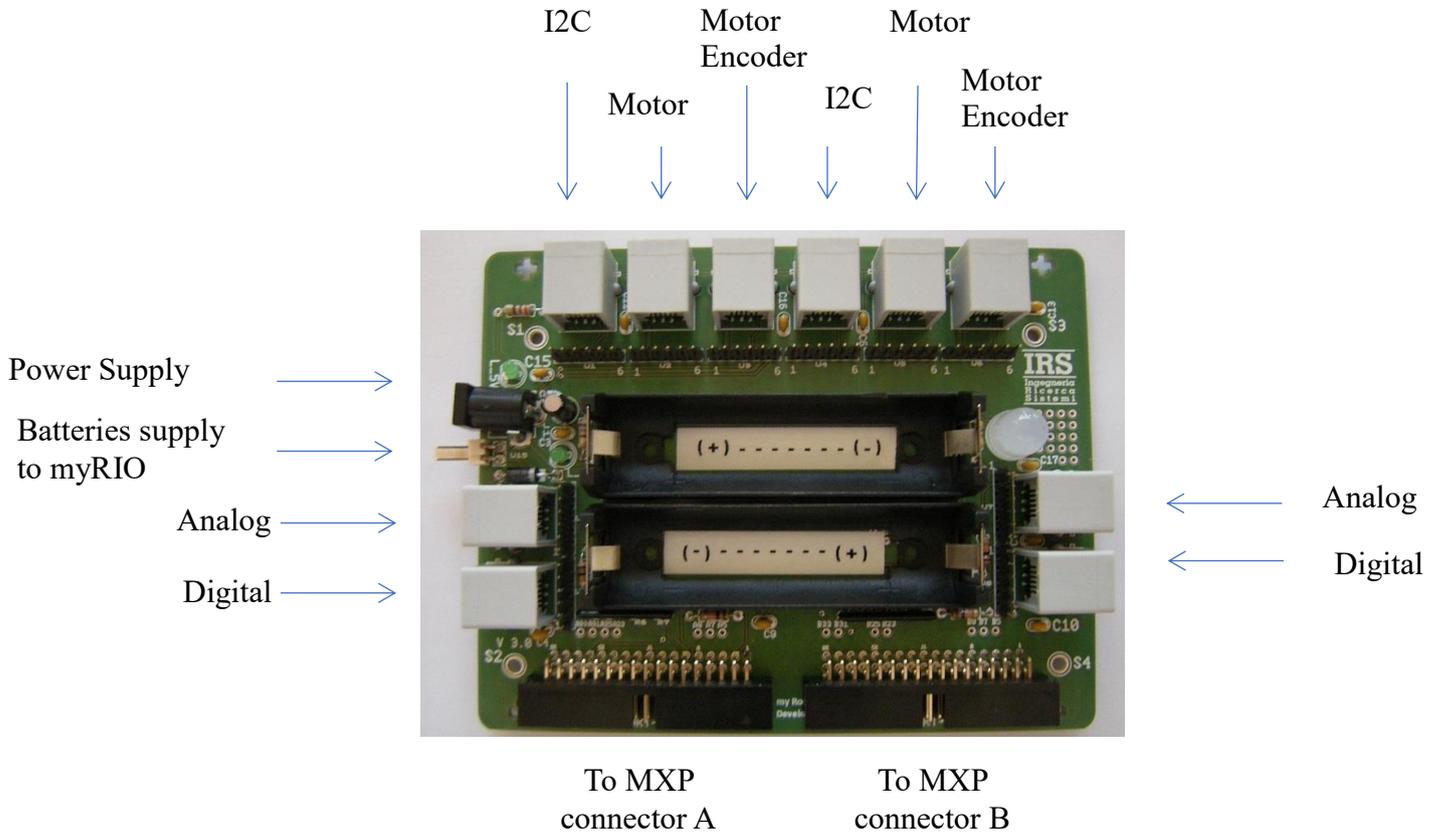
Lego connectors

Sensors and motors are connected to the myRSD using a 6-position modular connector,



General connections

Looking at the **myRSD** card, at the top and on the sides you will find 10 female connectors for the motors and Lego sensors (4 NXT or EV3 motors and 6 NXT or EV3 sensors). At the bottom you will find the two IDC connectors for connection with the NI myRIO. On the left side there are two connectors: a black connector for standard power supply and a white connector for powering myRIO from the batteries.

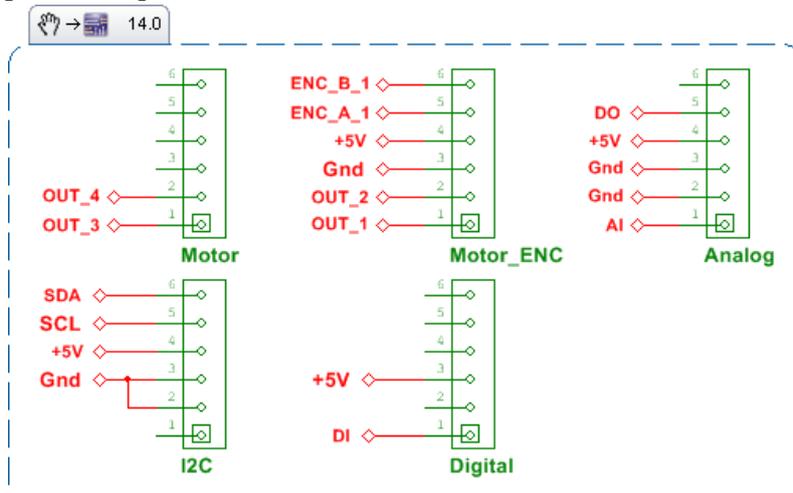


Pins strip connectors description

Each Lego connector is coupled with 6 pin strips. This gives you the ability to use third-party or custom sensors and motors.



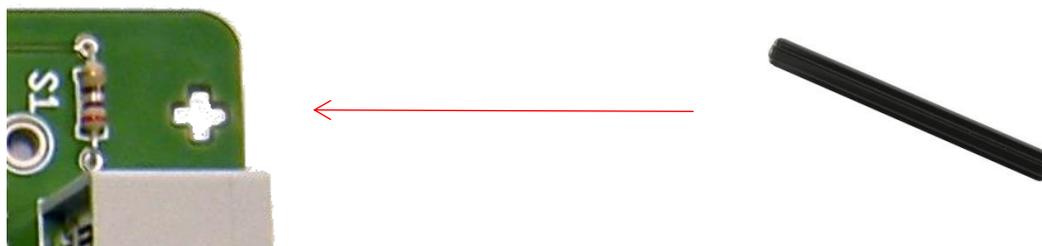
Caution An incorrect connection could damage **myRSD** and myRIO. It is advisable to interface with new sensors only by experienced personnel



Mechanical information

myRSD has got 4 holes, compatible with the axle component. They are spaced horizontally and vertically in order to be easily integrated into a Lego structure.

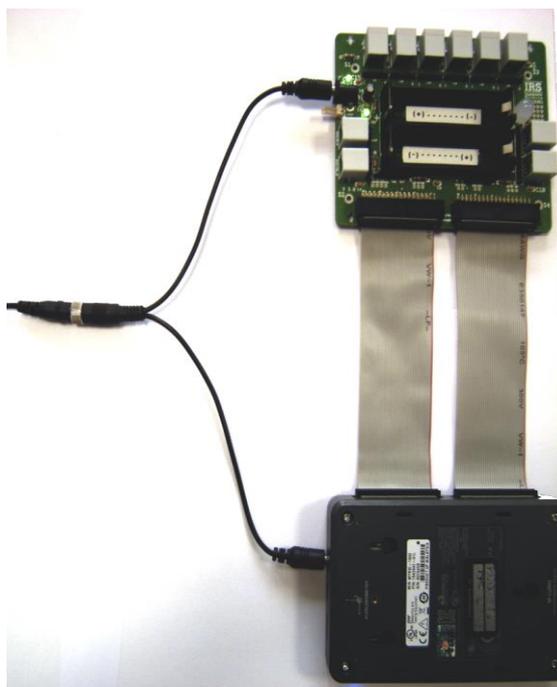
 **Caution** An excessive effort on the axes could damage the pcb



External Power Supply

myRSD kit includes a split cable that allows to power both NI myRIO and to board with power supply.

 **Caution** Using different or longer cables than the supplied ones is strongly discouraged.



Batteries and Power

The batteries provide power for the **myRSD** and NI myRIO. The battery power is provided through a standard 5.5mm barrel jack (The power supply cable is a standard 5.5 female barrel jack with 2.0mm positive hole).

 **Caution** The standard power supply jack is without reverse polarity protection diode. Connect only original NI myRIO power supply.

When connecting power supply to **myRSD**, a switch connect/disconnect the power from the battery barrel jack.

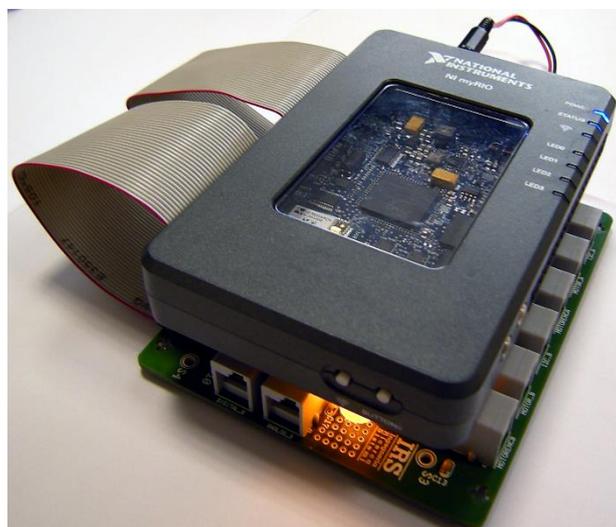
 **Caution** The battery voltage should be 3.7V nominal. The batteries are only 18650 LION type.

myRSD kit comes with a cable that allows to power NI myRIO using **myRSD** batteries. Using different or longer cables than the supplied ones is strongly discouraged.



Flat cables

myRSD kit includes two flat cables for carrying signals and 5 volt power from NI myRIO to **myRSD**. Using different or longer cables than the supplied ones is strongly discouraged.



Operation LED

There are 3 leds on myRSD pcb.

The LED indicates that NI myRIO is supplying the 5V

The LED indicates that power supply is supplying 9V

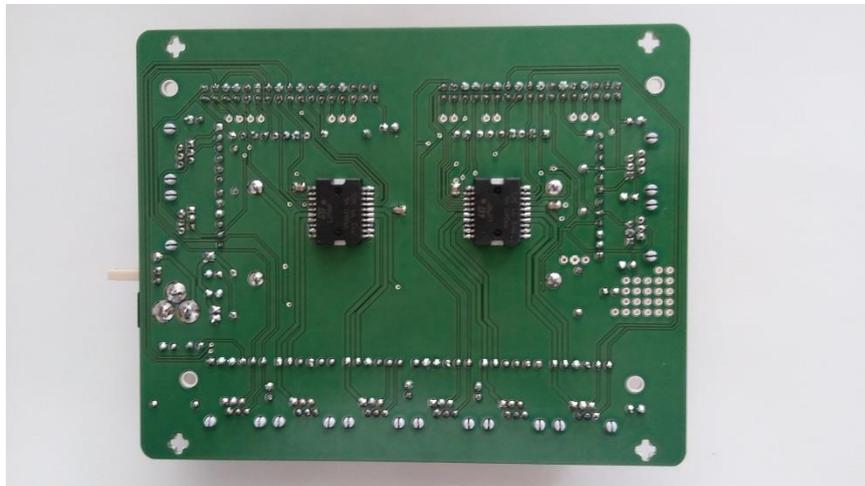


The LED indicates that are powering myRIO batteries

Motor Drivers

The motor drivers are two full bridge L298.

 **Caution** To avoid electronics components overheating don't cover them. Leave enough space for recirculating air.



Safety Information and Troubleshooting

 **Caution** Do not operate the hardware in a manner not specified by this document and by user documentation. Misuse of the hardware can result in a hazard. You can compromise the safety protection if the hardware is damaged in any way. If the hardware is damaged, return it to IRS for repair. Make sure that the hardware is completely dry and free from contaminants before returning it to service.

Electromagnetic Compatibility Guidelines

This product was tested and complies with the regulatory requirements and limits for electromagnetic compatibility (EMC) stated in the product specifications. These requirements and limits provide reasonable protection against harmful interference when the product is operated in the intended operational electromagnetic environment.

This product is intended for use in Educational locations. There is no guarantee that harmful interference will not occur in a particular installation or when the product is connected to a test object. To minimize interference with radio and television reception and prevent unacceptable performance degradation, install and use this product in strict accordance with the instructions in the product documentation.

Furthermore, any modifications to the product not expressly approved by IRS could void your authority to operate it under your local regulatory rules.



Caution This product was tested for EMC compliance using an application software developed using NI LabVIEW. The maximum length for USB cables is 2.0 m (6.6 ft), and the maximum length for signal wires is 30.0 cm (11.8 in.).

Warranty

For customers other than Educational users in the EU: **myRSD** is warranted against defects in materials and workmanship for a period of one year from the date of shipment, as evidenced by receipts or other documentation. IRS will, at its option, repair or replace equipment that proves to be defective during the warranty period.

Hazardous Locations

myRSD is not certified for the following areas and uses:

- Hazardous locations
- Explosive Atmospheres
- Biomedical
- Aerospace
- Military

Any use of this device in a different manner than the type of teaching described in this manual is considered to be unapproved and potentially dangerous.

CE Compliance

This product meets the essential requirements of applicable European Directives as follows:

- Electromagnetic Compatibility (EMC) Directive 2014/30/EU.
- Low-Voltage (Safety) Directive 2014/35/EU.
- Radio Equipment (RED) Directive 2014/53/EU.
- RoHS Directive 2011/65/EU.

Disposal

Disposing of the devices: Never dispose of the devices in normal household waste. The devices should be disposed of via an authorized waste disposal company or your local waste disposal organization. The valid regulations must be complied with. If in doubt, contact your waste disposal organization.

Battery disposal

Dispose of the batteries before disposing of the device. Old batteries should not be disposed of in household waste. Return your used batteries to your dealer or the designated returns point.

Packaging Disposal

Dispose of all packaging material in an environmentally friendly manner.

This information is provided "as is," and we make no express or implied warranties whatsoever with respect to functionality, operability, use, fitness for a particular purpose, or infringement of rights. We expressly disclaim any liability whatsoever for any direct, indirect, consequential, incidental or special damages, including, without limitation, lost revenues, lost profits, losses resulting from business interruption or loss of data, regardless of the form of action or legal theory under which the liability may be asserted, even if advised of the possibility of such damages

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