

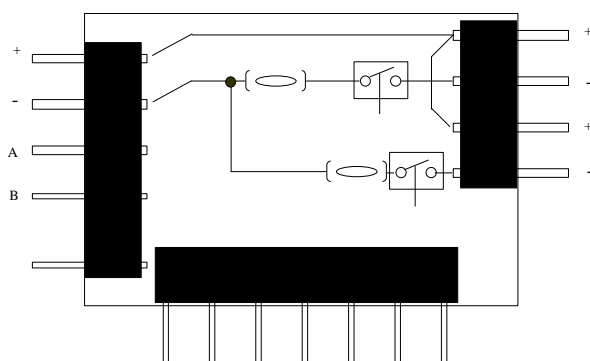
Application Notes for the use and connection of nodes.

NODES

The node is an electronic device with its own independent functions suitable for controlling two power loads and receiving and managing a certain number of input signals at very low power. The node communicates with other devices, i.e. it transmits and receives its information through a bus

Electrical characteristics of the node.

The node can be schematised in a simple manner, as an electric system with a relay and a fuse in series with the supply.



The first thing to be noted is that the node sections the load from the negative part, this in most cases has no adverse effect, however it should be remembered for any load that needs sectioning of the positive to be able to work, the node cannot be used in the standard configuration.

At all events, there are two power outputs, each of which can withstand loads of up to 40W.

The fuse sections the load every time a short circuit occurs and it remains open until the moment in which one tries to trigger the load again, therefore, if the short circuit has been eliminated the system resumes normal operation, otherwise the protection cuts in again.

This way the node makes it possible to keep the lines downstream under control. If a failure occurs, the node immediately cuts off the line and takes a signal to the control unit.

Functions

The functions currently implemented in a node are:

- Turning on and off the downstream loads
- Local control of the loads through switch or button.

Remote control of loads through switch or button.

- Protection of the line in the event of short circuit by immediately opening the load.
- Diagnosis of the main problems on the load.
- Controlling the power on the load (dimmer) when control takes place through a button.

Types of nodes.

The node is a device which has functions according to which it is possible to distinguish the following classes of nodes.

LIGHT nodes the general feature of which is that of having two power outputs controlled by local switches or buttons or by a remote control. The light nodes include a version in which it is possible to control one or more loads managed by other nodes with a switch or button.

SENSOR nodes in which at the most one power output and the reading of external signals is available (e.g. level sensors).

AUX nodes of the ON/OFF type with local switch, controlled by the control unit

Nodes of the usual class have the same electrical characteristics. Most of the nodes installed in a motorhome belong to the LIGHT node category: for example we have the node for cabinet 1, cabinet 2, bathroom, forepeak, etc.; these nodes are classified with a symbolic name and a code: in order to make the system work correctly, nodes which have the same code should not be installed.

The nodes developed for RIMOR motorhomes and installed in chain are the following:

Type of NODE	Code
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LIGHT NODES

- Rooflight1 1.03
- Rooflight1_Dimmer 1.0
- Rooflight2 1.04
- Cabinet1 1.06
- Cabinet2 1.07
- Cabinet3 1.08
- Cabinet4 1.0F
- Bathroom 1.11
- Top bunk 1.0C
- Forepeak 1.0A
- Bunk bed 1.12
- Kitchen 1.01
- Kitchen_Dimmer 1.0

SENSOR nodes

- Sewage_ON 1.10

The LIGHT nodes called Kitchen and Kitchen_Dimmer in RIMOR motorhomes have the possibility of having an extra switch or button for controlling output 1 of the Rooflight1 node.

To the Sewage_ON node two sensors with two levels can be connected (overflow) and a sensor with four levels (clean water).

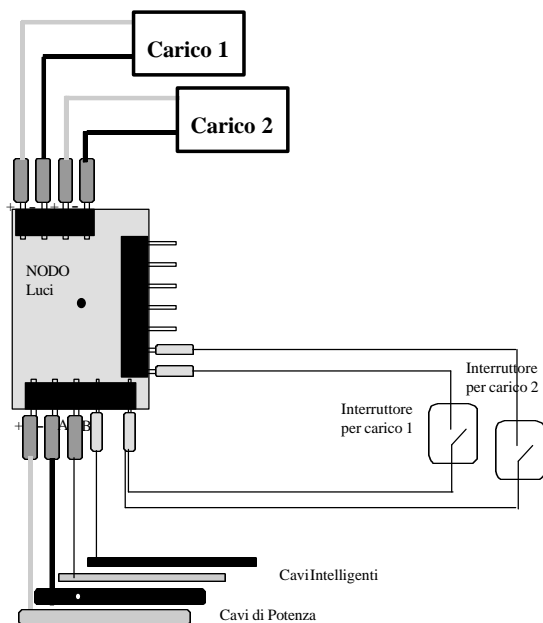
The AUX nodes will be analysed later.

Node connection layout.

Each class of nodes has its own specific connection, let us now see this in detail:

LIGHT NODES

Carico = Load

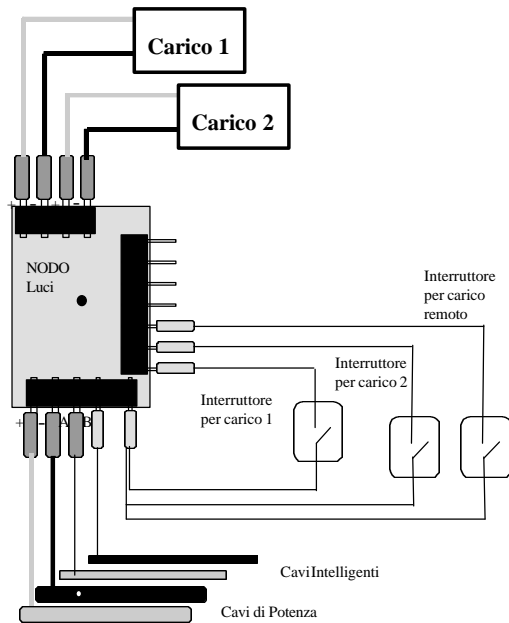


Lights NODE
Switch for load 1

Switch for load 2

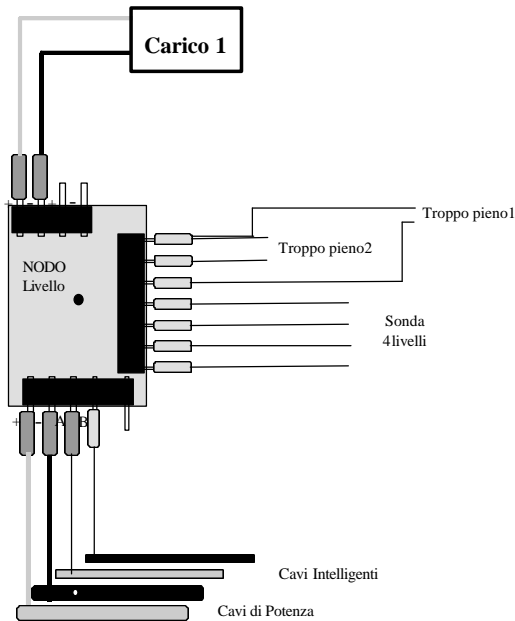
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the Kitchen nodes have an extra switch for controlling output 1 of the Rooflight1 node



SENSOR NODES

Overflow 1
Overflow 2



Level node
4 level sensor

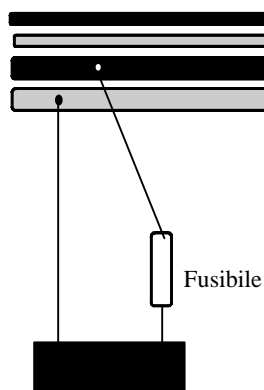
HOW TO ADD NEW LOADS

In general, two ways may be followed to add new functions.

The first is the traditional one and does not need the use of any new node. However this solution does not guarantee protection of the load, which will therefore always have to be accompanied by a suitably-sized fuse.

The other solution, which we recommend, involves an additional node and offers safe, non destructive protection. It also makes it possible to fully exploit the possibility of remote controlling the nodes.

Traditional solution



In this case the voltage is picked up from the pair of wires with larger diameter, paying attention to the bias. An instrument is used to check that the voltage on these wires is correct. The new load is branched from the main wires. The fuse of the necessary size for the new load is installed (normally about twice the operating current stated by the manufacturer, in order to take account of any over-current at pick-up).

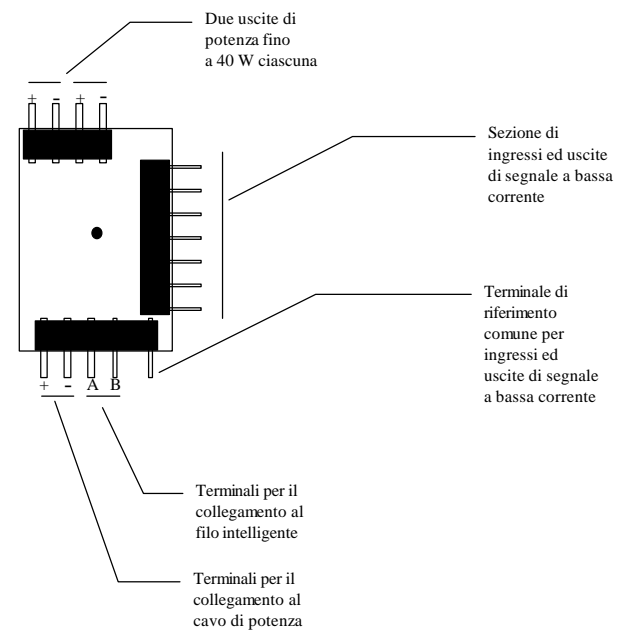
Solution with node

The node structure is shown below. The power connectors are all of the faston type of average size, i.e. blue, while those with the low current signal are all small faston connectors, i.e. red. Below we are giving the assembly instructions for assembling nodes for the more frequent applications.

Two power outputs of up to 40 W each

Low current signal input and output section

Shared reference terminal for low current input & output signals



Terminals for connection to intelligent wire

Terminals for connection to power cable

AUX nodes

Firstly it is necessary to speak of nodes that can be added to the factory-assembled system. Two or more nodes with the same code cannot be installed on a motorhome. E.g. if I need to add other lights in the cabinet of a motorhome in which Cabinet1 node is already present, it is necessary to connect the lights with Cabinet2 node. For this purpose, to avoid inconvenience there are LIGHT nodes with a different

code, which are those that will be installed in the motorhome afterwards. These nodes will have the same connection layout seen previously for the LIGHT nodes.

There are also AUX1 and AUX2 nodes. These have a switch and a fuse in series controlled by a main switch.

They are ON/OFF nodes, in which the main switch is controlled by the control unit but the output status is determined by the local switch if present, otherwise it is considered closed. But the important thing is that more than one AUX1 or AUX2 nodes can be installed: i.e. if I need to install two loads e.g. a light, another 12V socket, TV aerial power supplies, I can use more AUX1 nodes. Each node will protect the load connected to it, in the event of a failure the faulty line will be cut off from the node and the control unit will display the information that one of the AUX1 nodes has had problems. In addition, in AUX nodes it is possible to install a switch that controls the main switch of all the related AUX nodes. For example, if I have connected three AUX1 nodes I can deactivate or activate them all together from the control unit or from a switch located on one of them.

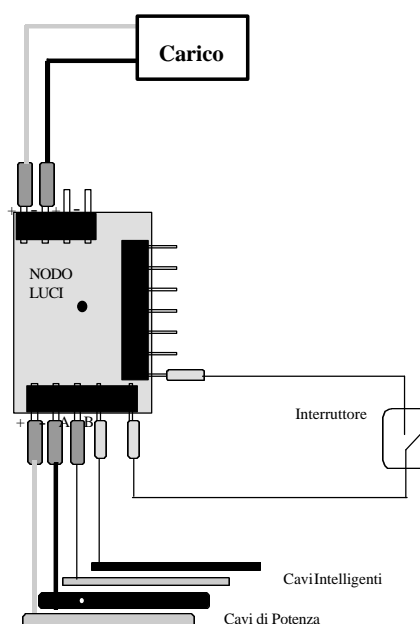
Case 1: Connection of light nodes.

This is the typical case of a bulb, fan, porch or any other load (up to 40 W) that needs a switch positioned next to the actual load.

In this case it is preferable to use a LIGHT node with a different code than the others and suitable faston connectors.

As shown previously, the node is connected as follows:

- Load
- LIGHT node
- Switch



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The following diagram shows the same type of connection for two loads, each with its own switch. In this case, too, I use a LIGHT node.

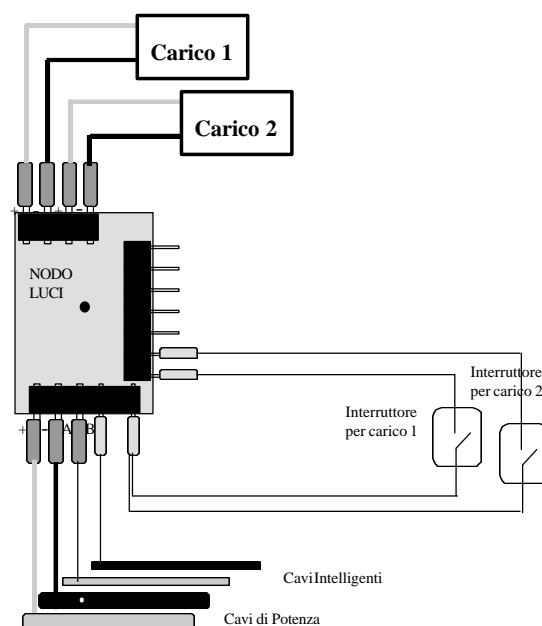
Load 1

Load 2

LIGHT node

Switch for load 1

Switch for load 2



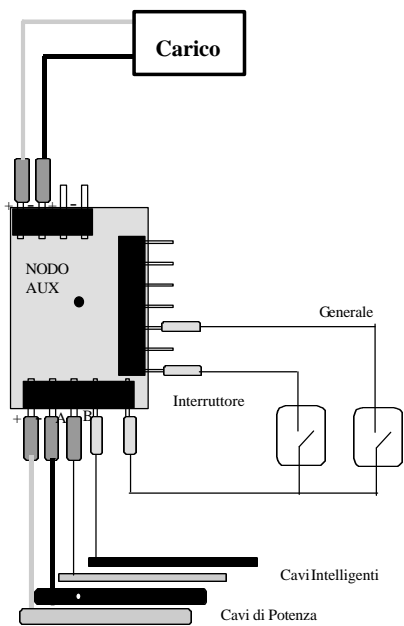
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Case 2: connection of AUX nodes

If, for example, I need to add a load such as a TV aerial power supply and I want to be able to control this load from the control unit, I need to make the following connection:

- Load
- AUX node
- Main switch
- Switch

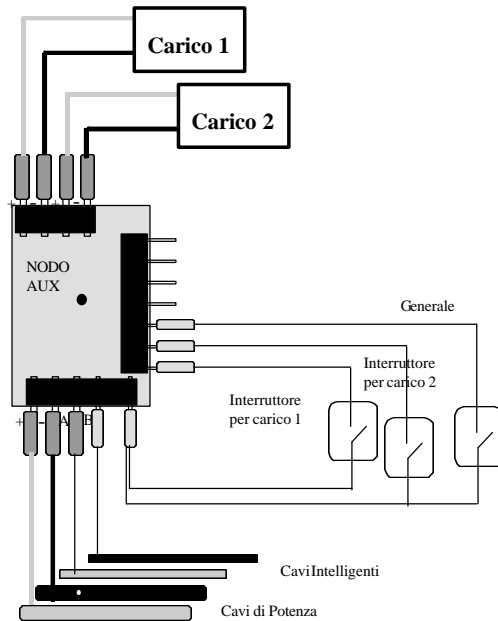


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It should be borne in mind that I control the AUX node from the control unit but the load open or closed condition depends on the position of the local switch. In fact, it is important to underline that the local switch works like a traditional switch in which a position corresponds to a status of the output. While this, for example, does not occur in LIGHT nodes, where the output is sensitive to the change of status of the switch.

To connect two loads the installation layout is the following:

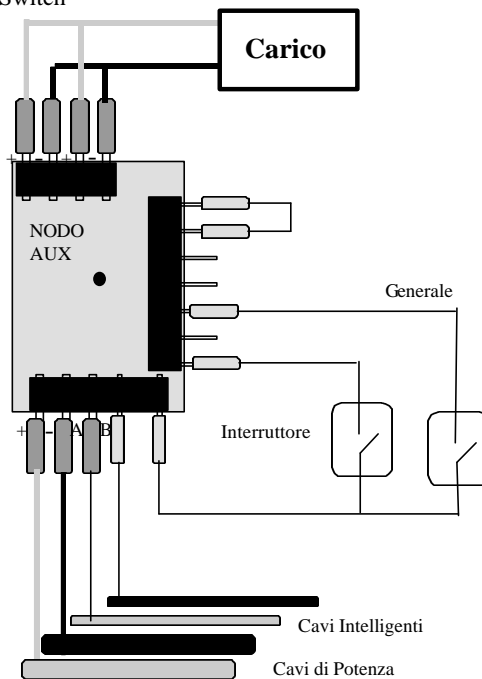
- Load 1
- Load 2
- AUX node
- Main switch
- Switch for load 1
- Switch for load 2



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To connect loads with a power rating of above 40 W but no more than 80 W it is possible to use an AUX Node with the outputs connected in parallel as shown in the following diagram:

- Load
- AUX node
- Main switch
- Switch



Intelligent cables

Power cables