

# **Instructions for the Use of the Intelligent Node System for Motorhomes**

Rimor - Version 1.2



Warnings

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## Introduction

The wiring system used for the electric system of this motorhome is has a highly advanced design. Its potential is extremely higher than those of conventional systems. If used correctly, this system will allow you to add new functions and accessories to your vehicle, also at later stages, with no further complications of wiring new cables. This system has been designed for second or later generation campers who know their own needs and want to adapt their vehicle to the use they make of it.

You will discover that this system is capable of offering you important data about the conditions of health of the electric system and of the loads connected to it, in such a way as to considerably simplify solving any problems that may arise in the future.

As this system differs a great deal in structure from the conventional one, we have decided to include a short description of the operating principles so that the user will be able to obtain the utmost benefit from the potential offered.

## General description

The wiring system mainly comprises the four components mentioned below:

- Intelligent nodes
- Power node
- Display panel
- Cable

All the loads present on the motorhome take energy from the same cable through their own **intelligent node**. The intelligent node acts as carrier for the supply of energy from the power cable and also controls abnormal absorption of the load itself. The node can also receive signals from temperature, level and voltage sensors or anything else the user wishes to add to his/her motorhome. The node, in turn, still via the shared cable, transmits data to the display panel to show them. The node's own programme possesses the data to guarantee correct operation of the load, and it also contains instructions about the way to communicate new data to other nodes or to the display panel.

The **power node** replaces the battery charger and the separator, integrating all the functions in a single unit.

The power supply section is of the electronic, switching type, which ensures that the voltage delivered is clean, limiting stress for the batteries and lights which are more sensitive to current peaks. Like the nodes, this device, too, can converse with the other nodes and with the display panel. The programme for the power supply unit is extremely sophisticated and makes it possible to considerably lengthen the life of the accumulators.

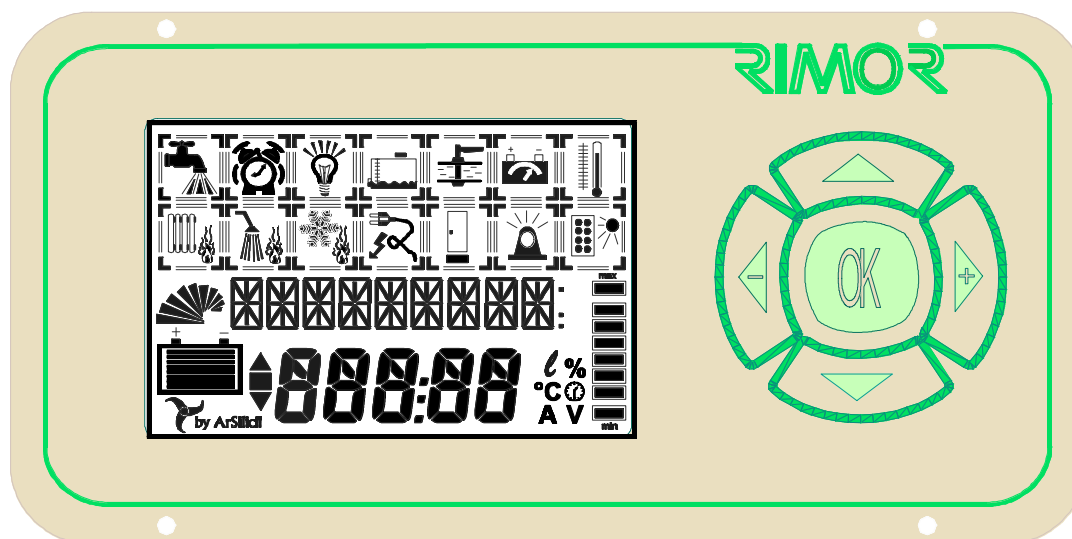
The **display panel** is an intelligent node with a specially-made LCD display. Through this instrument it is possible to know the main data of the vehicle and any faults present, and also to switch certain functions on and off.

The **shared cable** comprises four condensers, two with a higher section, for carrying the energy, two with a very small section, for communication between the nodes, display panel and power node.

Any new function you decide to add to your vehicle, can be added in the conventional manner, using a new supply wire, and losing the possibility of the control of the display panel, or using the shared cable, through a node suitable for the function you want to add. Your dealer or the manufacturer's customer service network will be able to answer all your questions and advise you about the most suitable way for the function you have chosen.

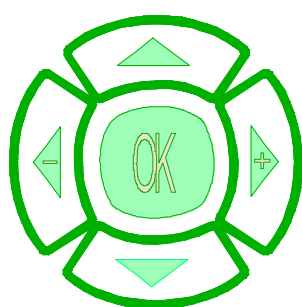
## Control panel structure and how it works


The panel is formed of a keypad with 5 keys, positioned on the right of the panel and an LCD display on the other side. The panel is illustrated below.

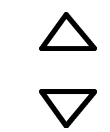



### KEYPAD

The keypad has 4 arrow buttons and a central OK button. Their meaning changes according to the context you are in and is described below.



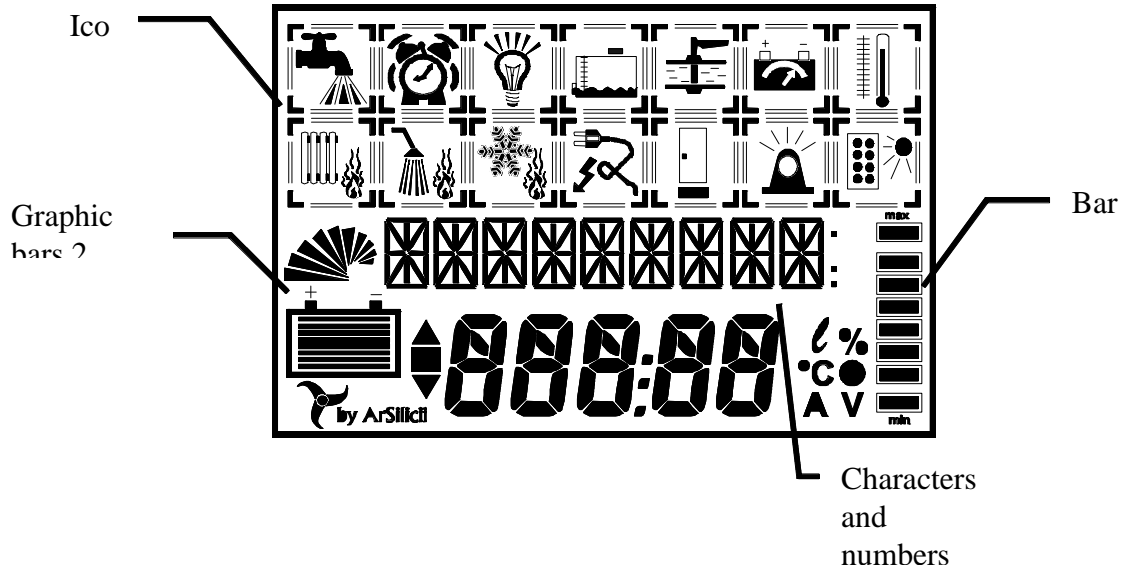
 This pair of keys is for scrolling the various symbols on the display, and, when a symbol has been selected, they are for **choosing among the different alternatives** (e.g. on/off) or setting new values.

 This other pair of keys, is also for scrolling the various symbols on the display, and, when a symbol has been selected, they are for **choosing among the different items of the menu** for each symbol.

 This key is for choosing a symbol and entering the different menus associated with that symbol. When a symbol has been selected it is used for **performing the selected command** and for returning to the symbol navigation mode.

**LCD DISPLAY**

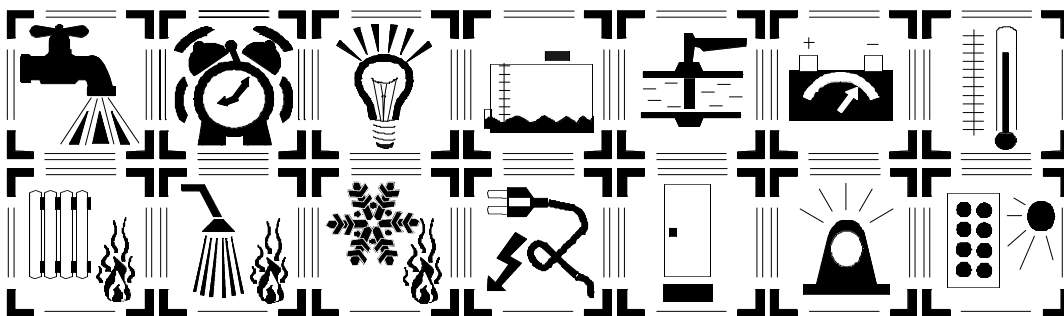
The structure of the LCD display is shown below.



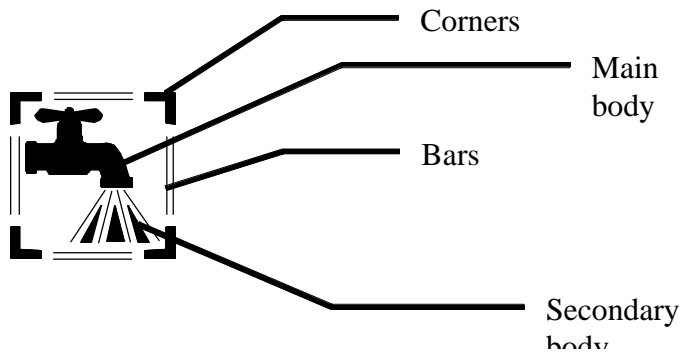
The upper part symbolically shows the functional units through small pictures called icons. Immediately below, there are two lines of characters to represent characters and numbers which describe the functions selected through the icon. At the sides there are bars which give a graphic indication of the essential ratings that the control unit keeps under control. Of course, not all the graphic symbols shown here are displayed at the same time.

**ICONS**

There are 14 icons and they schematically represent all the functions of the control unit.





Each icon is composed of four parts, which are displayed or not according to the case. For instance, the first icon is the one associated with the water pump.





The **main body**, the tap, indicates the function. In this case, the water pump. The **secondary body** summarises whether the function is active or not. In this case the icon shows water running out of the tap only if the water pump is on. The **corners** show whether the icon in question is the I am actually on at the moment, and they move from icon to icon using the arrow keys. Lastly, the **lit bars** indicate an alarm status or fault present. In this case for example, they could mean a short circuit on the pump.

**An example: Turning the water pump On or Off**


 Scrolling the icons with the arrow keys, we position above the icon with the tap, pressing the OK button, the additional information in letters and numbers appears. In this case, the word PUMP appears with the general ON or OFF status underneath.


 Using the up and down arrows scrolls the items of the pump menu: PUMP, PROTECTION and PROBLEMS. We are setting on PUMP.


 The right and left arrows select the new status to be set: ON or OFF


 Pressing the OK button, the chosen command is applied and will be kept in the navigation mode.



## GRAPHIC BARS

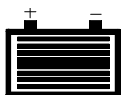
There are three graphic bars which give an evaluation “on sight” of the main ratings of the field. These ratings may be viewed in more detail in special menus, in the versions of the control unit for which these functions have been provided.

- **Bar 1** shows the level of clean water



The Min. and Max. levels shown respectively indicate the Full tank and Empty tank. For more accurate information it is necessary to consult the special menu.

- **Bar 2** shows the residual battery charge



This indicator is present only on the advanced control units.

- **Bar 3** indicates the system absorption



It is filled *counter-clockwise*, the higher the number of segments, the higher the absorption.

## CHARACTERS and NUMBERS

The area devoted to showing the characters and numbers is subdivided on two lines. Once you have entered a menu, the top line shows the name of the function selected. During navigation, the bottom line shows the time. When a menu has been selected it shows the possible values which that given function may have (e.g. the pump can be ON or OFF). Depending on the cases, the appropriate units of measurement may be displayed at the side.

## **POWER NODE**

This device goes well beyond normal battery chargers. The same container houses two circuits, one that supervises transforming the 220 V power supply into 12 V current and the other that decides the charging cycles, the connections between the two batteries, and operating the solar panels according to the settings decided by the user. Everything works like a veritable power unit, which, like the nodes, can send and receive information through the shared wire. All the measurements of the electric parameters, voltage and current are carried out by this unit.

## Detailed description of functions

In this section we are giving a detailed description of the functions on the control unit. Please remember that some of them might not be present in the model in your possession. For convenience, the functions are grouped according to the icons which contain them.

### **Navigation**

As mentioned in the previous section, we can move from one icon to another with the four arrow keys, unless we are already in a menu, in which case, pressing the OK key, we return to the navigation mode. Once we are positioned on the icon we want, the same OK key serves for entering the associated menu. During this phase, the advanced models always show the clock.

### **Functions**

#### **Pump**



This icon gathers the menus concerning the use and diagnostics of the water pump. The bars of the frame are shown only in the event of a Short Circuit on the pump. Water flowing indicates that the pump is on.

#### **PUMP: ON or OFF**

In this menu it is possible to select the general on or off status of the water pump.

#### **PROTECTION: ON or OFF**

In addition to the electrical protection, which is always present, you can choose whether to also introduce a protection when the water is below a certain level. Removing this protection there is the possibility to use all the water in the tank but risk running the pump also without water. In this case, it would stop, failing to pressurise the water circuit, and would inevitably burn out.

#### **PROBLEMS: NO or SC**

This indicates whether there are electrical problems on the pump, NO = No problem, while SC indicates a Short Circuit, i.e. two wires of the pump supply are touching or the motor is seriously damaged. In the case of a short circuit, the icon corner bars are also shown, meaning a dangerous condition.

## Clock



This icon gathers the menus concerning the clock which is shown in the navigation mode.

### HOURS:

The hour digits are selected using the right and left arrows, then press OK.

The menu will then show:

### MINUTES:

The minute digits are selected using the right and left arrows, then press OK and return to the navigation mode.

## Lights



This icon supervises the lighting system. The bulb rays are shown when any light is on; this is a good way to check that hidden lights such as those on the forepeaks are not left on by mistake. The frame bars indicate a short circuit or an open circuit in the lighting system.

### LIGHTS: ON or OFF

In this menu it is possible to simultaneously turn off all the lights. The lights may be turned on again immediately after the OFF command using their switches. N.B.: The ON command is therefore not indispensable.

### PROBLEMS: NO or SC or OC

This indicates whether there are electrical problems on one of the lights, NO = no problem, SC indicates a Short Circuit, i.e. two wires of a light supply are touching, while OC = Open Circuit may occur for the wires of a disconnected bulb or a blown bulb. In the case of SC or OC the icon frame bars are shown to indicate a dangerous situation which may be specified reading the contents of this menu.

## Levels



Under this symbol we find the levels of the different tanks present on the motorhome. The alarm bars indicate either the lack of clean water or that one of the recovery tanks is full.

### CLEAN: X%

This item of the menu gives the level of the clean water tank in percentage.

**DRAIN 1: 0 or 100**

This item indicates whether the kitchen recovery tank has reached the overflow threshold. 0 does not mean that the tank is empty but simply that it does not need emptying yet.

**DRAIN 2: 0 or 100**

This item indicates whether the WC recovery tank has reached the overflow threshold. 0 does not mean that the tank is empty but simply that it does not need emptying yet.

**Gas - Solenoid Valve**



This icon contains the menus concerning the protection against gas leaks or the presence of carbon dioxide and the protection of the solenoid valve on the gas line.

**FUNCTION NOT ACTIVE IN THIS MODEL**

**Batteries**



This includes all the functions concerning the status of the energy available or delivered by the vehicle batteries. The alarm signals through the icon frame are active for low voltage rates of one of the two batteries.

**ENGINE BATTERY: X V**

This gives the voltage in Volts at the engine battery terminals. The alarm situation, signalled by the icon frame, is generated for voltage rates below the minimum that can be withstood by the cells, below which irreversible damage and loss of accumulator capacity results.

**SERVICE BATTERY: X V**

This gives the voltage in Volts at the service battery terminals. The alarm situation, signalled by the icon frame, is generated for voltage rates below the minimum that can be withstood by the cells, below which irreversible damage and loss of accumulator capacity results.

**CURRENT: X A**

This indicates the net current delivered by the service battery. If the motorhome is not connected to external sources of energy, this is the current delivered by the service battery. If the vehicle is connected to the 220 V power supply or is fitted with solar panels, or is simply running,

the engine alternator is charging, therefore this value is given by the difference between the current required by the loads and that supplied by the battery. This way, **positive values indicate when the battery supplies less current to the loads than it receives from the battery charger, i.e. it is “draining”**. Conversely **negative values mean that the battery is being charged**.

AMPERES: X (Ah)

This indicates the charge utilised since the last service battery reset. It tells us how much we are actually consuming.

In practice, this indication is helpful also for checking whether the battery storage capacity has undergone any changes. To do this, proceed as follows:

- ◇ Make sure that the battery is charged completely, maybe connecting to the 220 V power supply for a sufficiently long time.
- ◇ Reset the meter with the command described below.
- ◇ Using the battery purely sectioned, disconnected from the power supply and from the solar panels, check this indication until the flat battery alarm signal appears.
- ◇ The value shown should be near the nominal rating stamped on the battery by the manufacturer. (Ah)

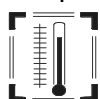
RESETAMPH

Pressing OK resets the ampere/hour meter (Ah)

PROBLEMS: NO or LO

Service battery problems. LO means that the service battery charge is below the safety level. NO means that everything is proceeding normally.

Temperatures



These menus concern indications of the temperature inside and outside the vehicle. The frame bars are shown only if the temperature is too high or too low.

FUNCTION NOT ACTIVE IN THIS MODEL

Heating



This menu controls turning the stove on and off and also through this menu it is possible to obtain timer and thermostat functions to control switching on times and the temperature inside the vehicle.

FUNCTION NOT ACTIVE IN THIS MODEL

## Boiler



This menu controls turning the hot water boiler on and off, and also through this menu it is possible to obtain timer functions to control switching on times.

FUNCTION NOT ACTIVE IN THIS MODEL

## Fridge



This icon supervises operation of the fridge. We can see the gas, 12V or 220 V supply source.

FUNCTION NOT ACTIVE IN THIS MODEL

## 220 V Power supply



Icon concerning the functions of the 220 V power supply and the functions of the power supply unit. The bars of the icon frame light up if the inside temperature of the power supply unit exceeds 70°C. The flash indicates connection to the active power supply.

In this menu it is possible to activate two charging procedures, FAST and MAINTENANCE, as alternatives to those normally used.

### EXT. SUPPLY: ON or OFF

This indicates the presence of the 220V line connected to the power supply unit. This indication is also shown by the flash symbol, which, if shown, means connection to the 220 V power supply.

### PARALLEL: ON or OFF

When connected to the 220 V power supply, it is possible to decide whether to charge the engine battery in parallel with the service battery. In any case, the batteries are separate during discharging, and only the service battery is made available, to prevent the engine battery from being drained.

### MAX V: X V

This shows the maximum voltage given to the battery by the battery charger when charging. It depends on the charging cycle adopted and on the phase of the charging cycle in progress at that moment.

#### SUPPLY TEMP: X °C

This gives the temperature inside the power supply unit. It should be noted that the temperature alarm range is that above 70 °C.

#### FAST: ON or OFF

**Alternative** charging cycle to the one normally set. The fast battery charging cycle is active to speed up charging operations. This cycle requires about 8 hours and overrides the normal, pre-set, charging cycle, which needs about 20 hours to be brought to completion. However, this method has the drawback of subjecting the loads to high voltage rates and the life of the more sensitive elements such as bulbs may be reduced if they are turned on during repeated FAST cycles.

However, once in a while, there is no harm in charging the battery with a fast cycle to regenerate it.

This mode starts immediately when the OK key is pressed or the next time the 220 V power supply is turned on if it is not on at the moment. The FAST mode has priority over the maintenance mode, even if this is set. The battery will receive high voltage until it is charged; it will then be set to the maintenance mode and charged again briefly at high voltage.

**This function is deactivated manually only, setting this item of the menu to OFF.**

**Ideally this cycle should be performed only with the battery drained, to charge it and regenerate it and not when it is already charged.**

#### MAINTENANCE: ON or OFF

**Alternative** charging cycle to the one normally set. The function of this mode is to maintain the vehicle batteries when the vehicle is not being used. It is advisable during long halts, when it is possible to keep the vehicle connected to the 220V power supply. In this case, the energy consumption of the battery charger is minimal but battery life is considerably extended, compensating the normal self-discharging of the accumulators, which occurs also when the terminals are disconnected. In these cases it may be a good idea to put the two batteries in parallel to buffer both the service and the engine battery.

If the fast mode is activated, it overrides this function.

**This function is deactivated only manually, setting this item of the menu to OFF.**

#### Languages



This makes it possible to choose between the different languages possible: ITALIAN, ENGLISH, FRENCH, GERMAN and SPANISH.

## Alarms



This menu contains all the possible sources of alarm, and it also offers the possibility to activate single warning devices.

FUNCTION NOT ACTIVE IN THIS VERSION

## Solar panels



This menu reflects the status of the solar panels. The sun symbol is shown if the panels are charging the batteries.

**SOLAR PANELS: ON or OFF**

It is possible to select whether to enable the solar panels for charging the batteries or not. When OFF has been set, the panels will not charge the batteries even if the sun is shining.

**POWER: X**

This gives a reading of the power that can be delivered by the solar panels to the batteries. This rating depends on the sunlight and the efficiency of the panels and does not depend on whether they are enabled to charge the batteries or not.