

Notes about the LCD control unit .

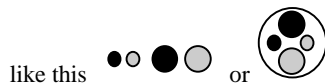
Introduction

These notes concern the maintenance, repair and updating of the LCD control unit for distributed intelligence systems.

General Section

The distributed Intelligence control system developed by ArSilicii, features the presence of a presentation system. This system, often called control unit, is not an actuator like the one for conventional systems. In fact, actuation is carried out in a distributed manner from special elements, i.e. the nodes, near the loads. The control unit can be more or less sophisticated, but its task is that of enabling interaction between the user and the system. In particular, the presentation system is the go-between through which the user sets the commands or checks the system status.

All the components of the distributed intelligence system are connected by 4 leads which, for convenience, are often enclosed in a single sheath or gathered in pairs. In other words :



The pair with the largest diameter is the one that carries the power that the node then distributes or sections, while the thinner pair is exactly the one that allows the nodes to communicate with the control unit and the power node. It is essential that both pairs be connected correctly, i.e. with the correct bias, in every point of the system, so that it can deliver energy, and make the other parts of the system converse correctly.

Incorrect connection can cause damage, therefore read the instructions that follow carefully.

How the control unit is made

The control unit comprises two parts, the front panel, and the electronic board. The two parts are joined together by four studs with self-locking nut.

Front panel

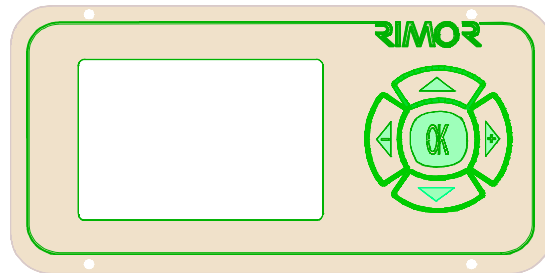
The front panel is formed of a small aluminium panel which is 4 mm. in thickness and it has a Plexiglas square in which it is possible to read the information shown on the led screen located immediately below.

The panel also houses a membrane button which allows the user to interact with the control unit itself.

The panel is covered by a serigraphed membrane. During use, make sure that the panel does not come into contact with solvents or synthetic lubricants which might spoil its appearance irreparably.

Also the Plexiglas should not come into contact with pointed objects as any scratches could compromise its transparency.

Electronic board



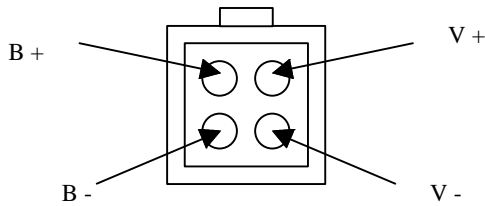
The electronic board houses numerous components on both sides and is connected to the panel by four thru' holes.

The electronic components perform two main functions, i.e. communication and display. In fact the control unit communicates, i.e. it gathers and sends data to the nodes and to the power supply unit and then displays them on the lcd screen for the user.

These operations are directed by a microcontroller, which is the largest-sized component to be found at the centre of the lower page of the board. The behaviour of this component is described by a programme in the memory storage it contains. The memory in question is of a particular type that cannot be erased. This component can easily be updated, replacing it with a similar component with a memory that contains a programme better suited to the customer's needs. This will be discussed in detail in the section below.

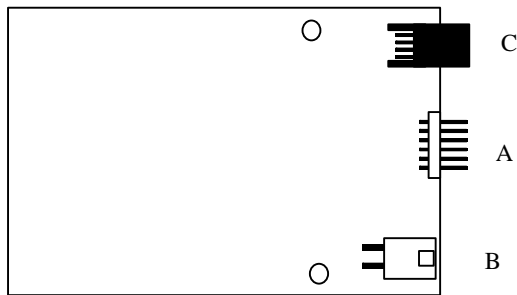
Two connectors come out of the board. The first one (A) is for connecting the keypad through a small flat cable which leads directly from the panel, the second (B) is the connector to the cable with four leads described previously in the general section. Besides these two connectors, there is also an auxiliary connector for connection to external temperature probes, if these are installed.

The layout of the connectors is shown below:



in particular connector B is female and accepts a male connector which seen from the front is headed as follows:

The male connector, to be inserted in the control unit



contains four leads, two thin ones, B+ (orange) and B- (grey), and two supply cables with a larger diameter, V+ (red, +12 v) and V- (black, earth). The connector is shaped in such a way that it can be plugged to the control unit in only one way. It is also fitted with a clamping mechanism which prevents it from being removed by accident.

The wires are fastened in the connector by contacts which are crimped at the end of the lead with special tools. Once the contact has been crimped on the wire, the wire is inserted irreversibly in its housing. For the installer's convenience, connectors are available with lengths of wire already fitted.

Software updating

This operation is necessary each time new functions need to be added to the control unit, or simply to make available the more recent changes on an earlier control unit version.

The procedure is very simple, though some care should be taken to avoid damaging the components or the board.

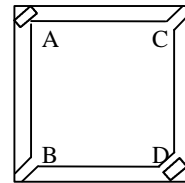
Firstly, the control unit should be removed from its housing, slackening the screws that hold the panel in the housing, then remove connector B and if necessary C, if present.

It is not necessary to separate the board from the panel. Rest the control unit with the components facing upwards on a surface covered with something soft to avoid scratching or damaging the Plexiglas window on the other side.

On the rear of the board, roughly in the centre, we find the microcontroller. This component is square in shape and it is housed in a base which frames it. The contacts are arranged along this frame.

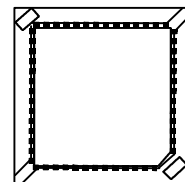
The corners of the base are not all the same, in fact two of them (B and C), have a slot, one (A) is angled and the other (D) is chamfered, as shown in the following drawing:

If you possess the suitable instrument, it should be inserted in the slots on the two corners C and B of the base, and without pushing, simply tighten the instrument to the end of its stroke.



Conversely, if the tool is not available, a small screwdriver can be used, which should be inserted in the slots at corners B and C and be used as a lever for removing the microcontroller. During this operation it is necessary to pay close attention not to damage the contacts of the base, as use of the board would no longer be possible. For this reason it is necessary to lever a little from one side and then a little from the other, removing the microcontroller from its housing very gently, so that it comes out as evenly as possible from both sides.

Re-inserting the new microcontroller should be carried



out just as carefully, because only one of the four possible positions is the correct one. It should be noted that one of the four corners of the microcontroller is chamfered, this is the reference corner. This corner must coincide with the chamfered corner of the base, namely D, which is one of the two without the slot for removal.

Rest the microcontroller on the base, checking the reference corner again to make sure it is correct, check that the contacts along the sides of the microcontroller are correctly aligned with corresponding ones on the base. When alignment is correct, pressing evenly on all sides, the microcontroller is inserted in the base making sure that it is inserted completely.

Once it has been re-connected, the control unit should start up again correctly, giving a brief sound signal at start-up.

Brief analysis of the more frequent faults.

Let us now see the possible faults that may occur to the control unit.

1- The control unit fails to turn on

In this case, if the microcontroller has been replaced, check that that it has been installed correctly.

Use a voltmeter to check, with connector B disconnected, that voltage exists between terminals V+ and V-

2- The control unit turns on but not all the items of the display light up.

If the wordings are incomplete, this may be caused by incorrect positioning of the microcontroller in the base, try removing it and inserting it again.

Check to see whether the control unit has undergone surface damage to the circuit tracks.

3- The control unit turns on but fails to communicate with the rest of the system.

Check connector B of the control unit.

With the control unit disconnected, check for a short circuit between cables B+ and B-. If there is a short circuit, it is necessary to try disconnecting the various nodes to check whether the short circuit ceases, until finding and eliminating the cause.

4- Indications concerning the level of the batteries are not shown.

Check that the intelligent wire is connected to the power supply unit and that this is activated correctly.