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# **THE UNILINER GUIDE**

**Versions : 1.05**

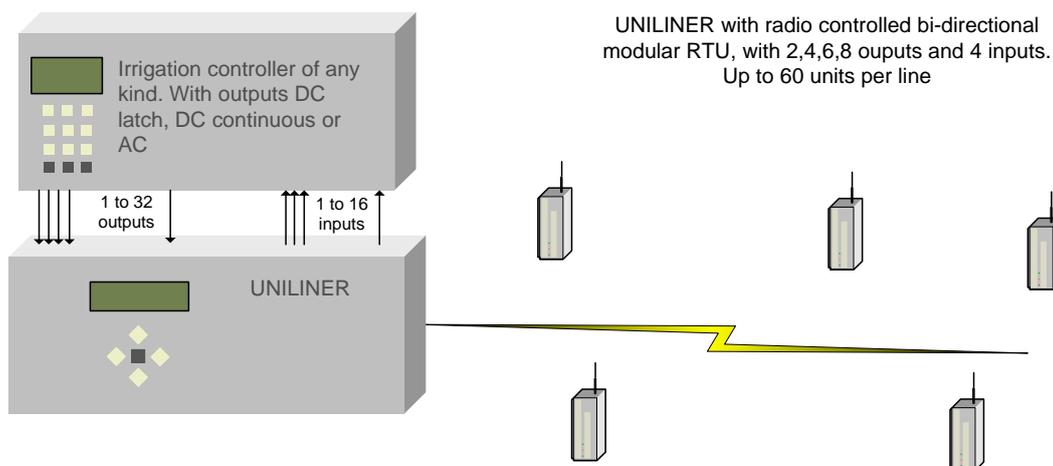
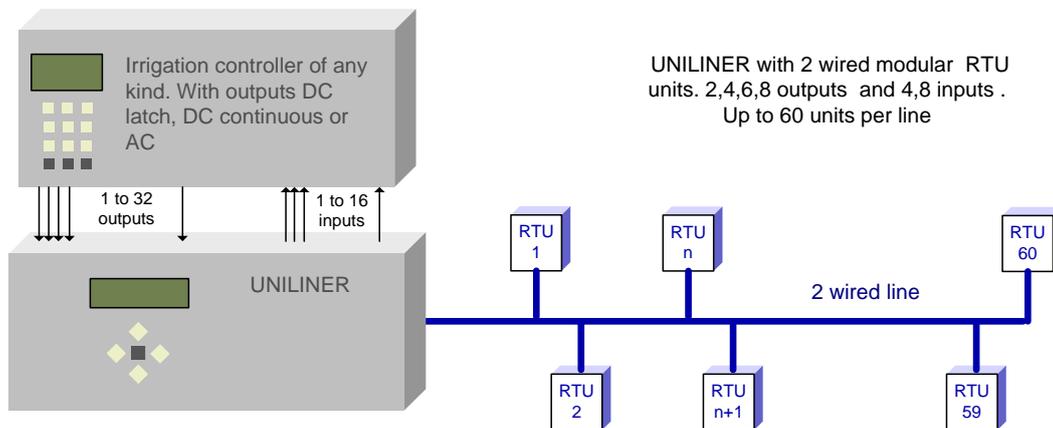
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# UNILINER

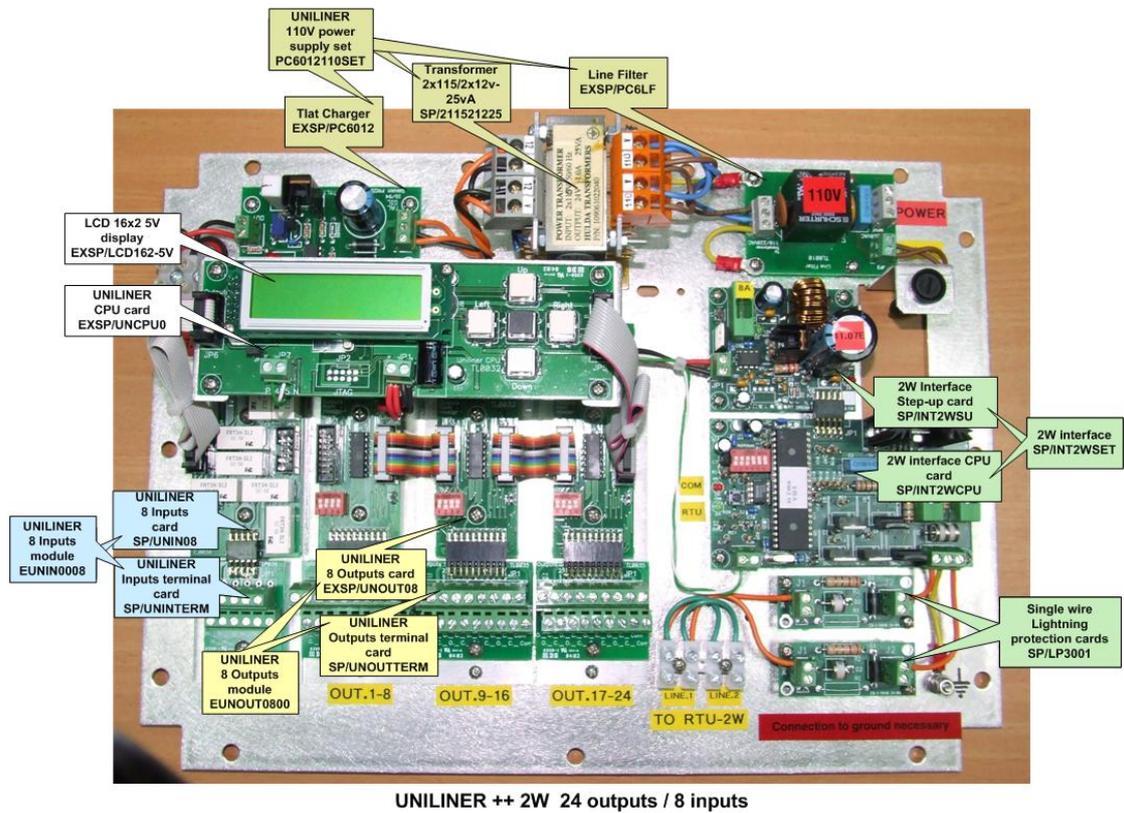
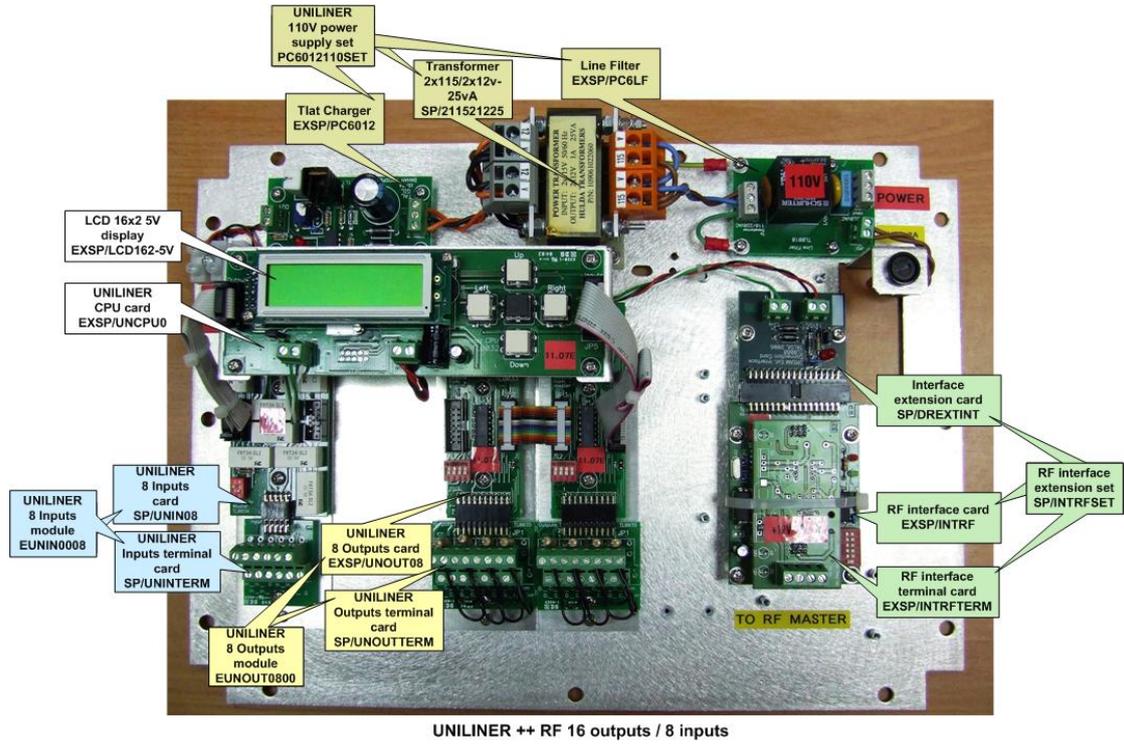
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# 1. Introduction

- The UNILINER has been designed to work in conjunction with irrigation controllers of any type for improving their connectivity with remote accessories. The input/output terminals of the UNILINER are connected back to back with the input/output terminals of the irrigation controller, thus the UNILINER serves as a bridge between the controller and the remote valves and sensors.
- For reaching the remote devices the UNILINER uses Remote Terminal Units (RTU). There are two types of RTUs, the first type uses a 2 wired cable for connection to the UNILINER and the second type uses radio communication instead of cable. When ordering a UNILINER system, the appropriate type of RTUs must be specified in each case.
- The open/ close commands initiated by the controller are transmitted to the remote valves, and signals originated at the remote sensors are brought back to the controller's inputs.
- The RTUs activate 12v DC 2 wired pulse latching solenoids.



## 1.1 The internal structure



## 2. Installation

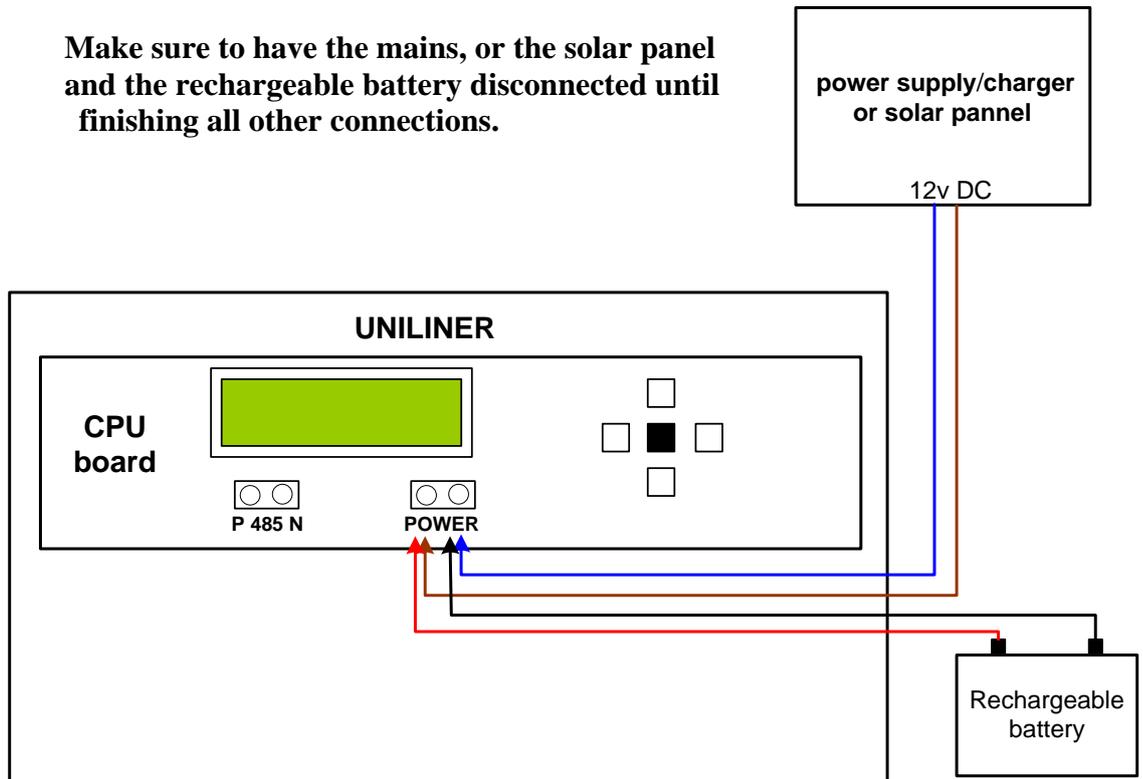
### 2.1 First installation and connections

#### 2.1.1 The UNILINER's energy source

The UNILINER basically uses 12 v DC as its energy source. The energy may be transformed from the mains when electric supply exists or may arrive from a solar panel when electric supply does not exist. In both cases there will be a rechargeable backup battery in parallel with the 12v source keeping the system alive during power outages.



**Make sure to have the mains, or the solar panel and the rechargeable battery disconnected until finishing all other connections.**



#### 2.1.2 Connections between the Controller and the UNILINER

The only connections between the controller and the UNILINER are connections of outputs and inputs. Outputs of the controller that are required to activate remote valves through the UNILINER, will be connected to the UNILINER'S outputs terminal block, and the inputs of the controller which are supposed to read remote meters will be connected to the UNILINER'S inputs terminal block. This type of connection is known as "back to back" connection.

Through the inputs terminal block of the UNILINER dry contact indications will be supplied to the input terminals of the controller.

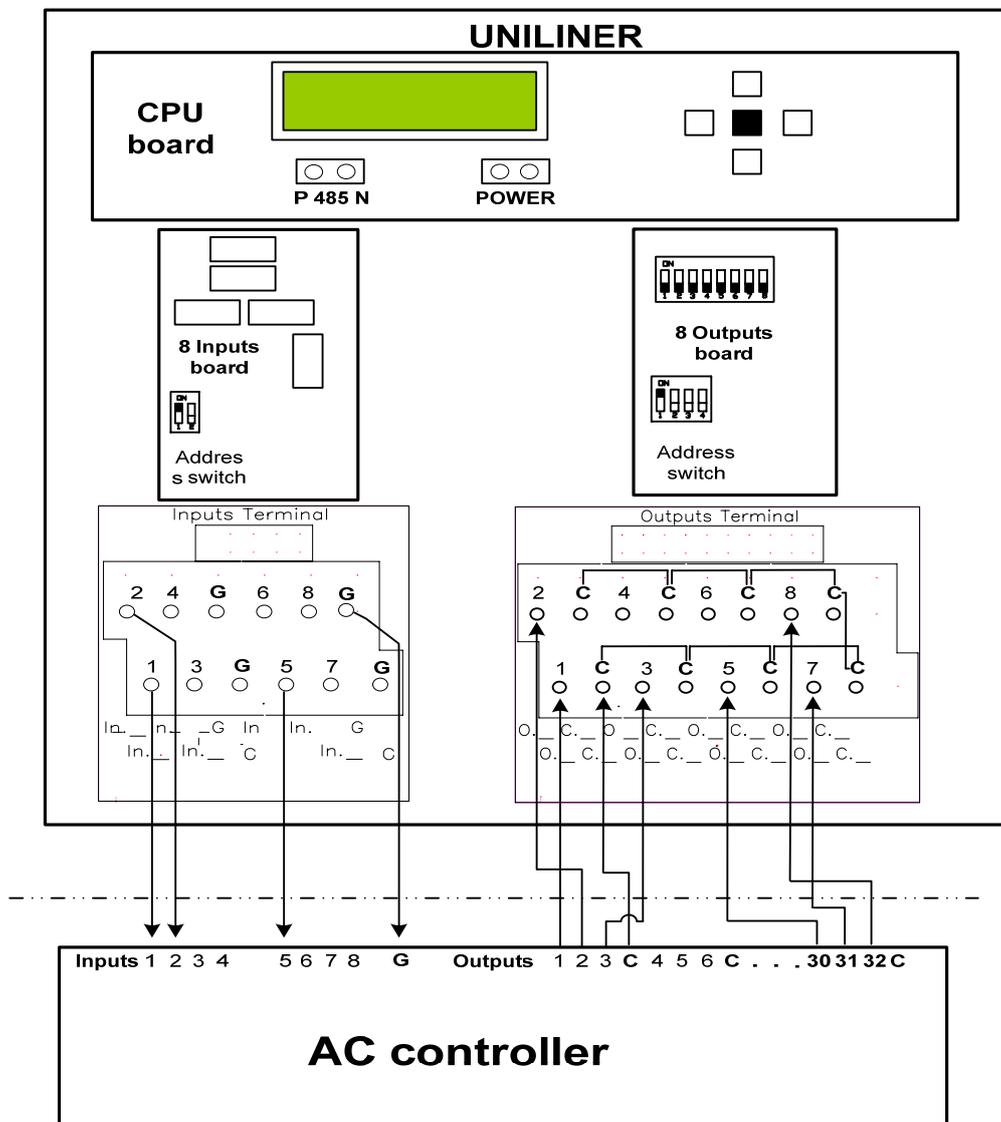
The outputs terminal blocks of the UNILINER receive commands from the controller. There are different types of controllers with different types of output commands. The

UNILINER can be set for receiving the following types of output commands: 24v AC, 12v DC continuous or 12v DC latching.

Appendix A below describes the way of wiring for each type of command.

Each outputs terminal block is plugged into a board of 8 OUTPUTS and each inputs terminal block is plugged into a board of 8 INPUTS. The number of boards of each type in the particular system dictates the number of outputs and inputs that the system can handle. A UNILINER can have 0 to 4 OUTPUT boards and 0-2 INPUT boards. An address switch on each INPUT/OUTPUT board enables differentiating between them. The numeration of the boards of both types starts with address 1 and must continue without gaps.

For demonstrating the “back to back” connections between a controller and a UNILINER we shall use an AC controller and a UNILINER containing only a single OUTPUT board and a single INPUT board as in the drawing below:



**When there is more than one output card, the commons of the cards can be interconnected. The input cards require one common “G” per input card.**

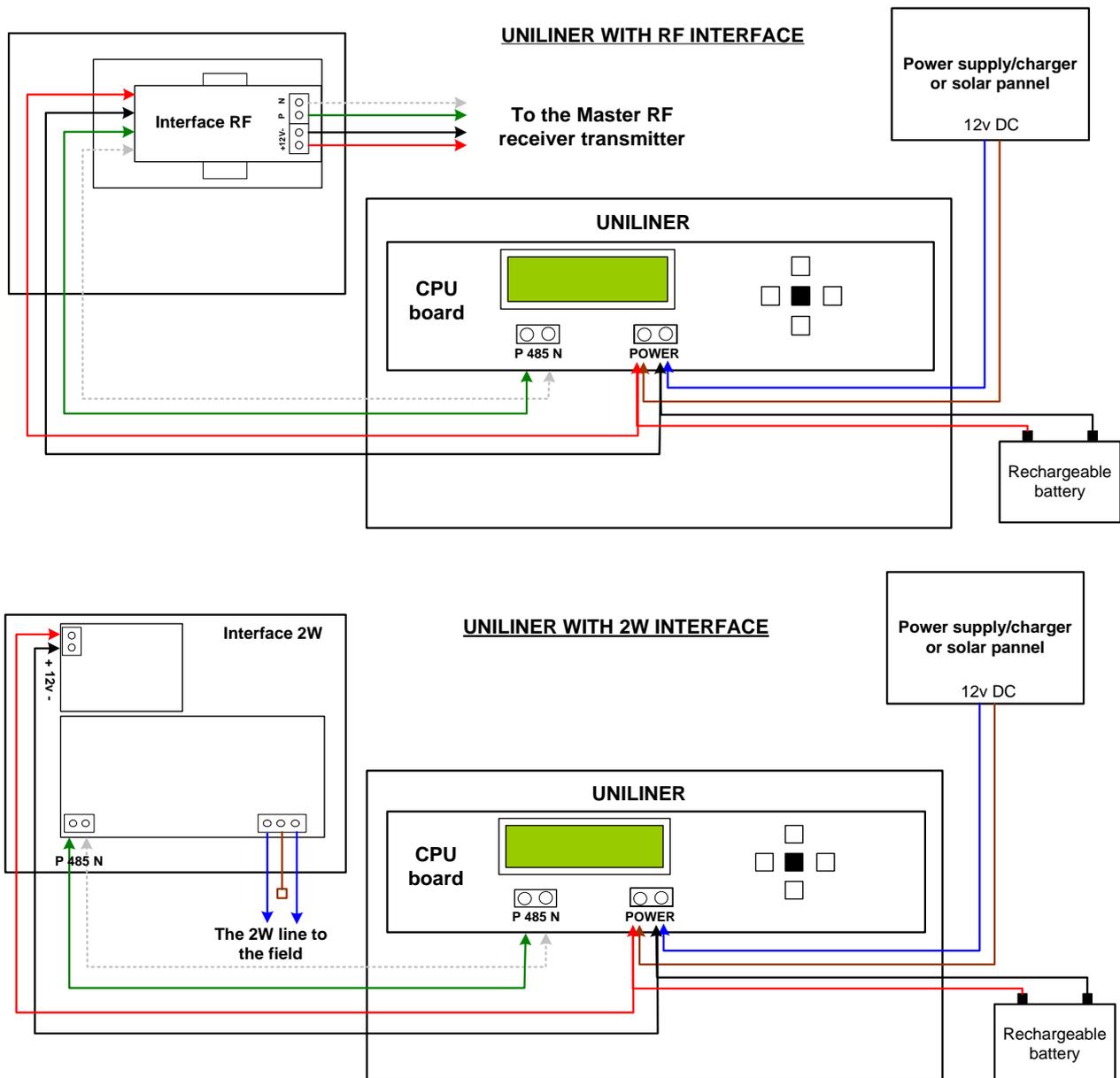
### 2.1.3 Connections between the UNILINER and the Interface (RF or 2W)

The UNILINER and any of the interfaces have two types of connections between them. The first one is for energy supply and the second is for data communication. The interface is energized by 12V DC arriving from the UNILINER. The data communication between the UNILINER and the interfaces uses RS485 standard.

The connection is made by four wires. The red and the black wires bring the energy from the UNILINER to the interface. The green and white wires are used for data communication.

It is important to notice that the interface is connected on one side to the UNILINER and on it's other side to the device that carries out the field communication. In case of RF interface it will be connected to the Master RF receiver-transmitter and in case of 2 Wired interface it will be connected to the two wired line which carries to the field both the energy and the communication.

The following drawings demonstrate the wiring in both cases:





**Complimentary information required for setting up the RF RTU system can be found in the manual UNILINER RF RTU SYSTEM GUIDE 2007 and for the 2W RTU system in the manual UNILINER 2W RTU SYSTEM GUIDE 2007.**

## 3. Setup

In this chapter, we will review the system setup process. The explanation refers to a UNILINER with RF RTU system, but it is applicable to a 2 wired RTU system as well.

### 3.1 The user interface

The UNILINER user interface consists of two parts:

- The 2X16 LCD screen, which allows the user to see the various screens.
- The 5 keys, four arrow keys (white) and the ENTER key in the middle (black). These keys allow the user to move between the screens and edit the data when necessary.

Working with the UNILINER is done in the following manner:

- A. Using the 4 arrow keys, the user may navigate between the different screens.
- B. Upon pressing “ENTER”, the controller will start EDIT MODE, which means the data in the screen can now be changed. The cursor will appear at the field being currently edited. The arrow keys will now be used to set the desired value or select the desired option. If the field being currently edited is a number then the RIGHT and LEFT arrows are used for moving between the digits and the UP and DOWN arrows decide the value. If the field being currently edited offers selection of options, then only the UP and DOWN arrow keys are used for choosing. After reaching the desired value /option pressing enter will confirm the change.
- C. If there is more then one editable field on the screen, after pressing “ENTER” the cursor will cycle automatically to the next editable field on the screen.

### 3.2 The opening screen and access levels selection

Assuming everything is connected correctly, The unit can now be connected to the energy source.

The first screen that will appear will be:

```
UNILINER V1.05
WIRE LESS I/O
```

This screen shows the UNILINER’s version and the type of interface connected to it.

If there is a problem with one of the connections in the system or with the communication, the letter “E” will appear in the right bottom corner and the buzzer will start beeping. Pressing “ENTER” / “DOWN” arrow key will cause the UNILINER to move to the error display screen in which the details of the existing problems appear.

For example, if the UNILINER is connected to an RF interface and the master isn't connected or not functioning properly the following screen will appear:

```
UNILINER V1.05
MASTER COM ERR
```

If everything is connected correctly and no errors appear in the system, the user should press the right arrow key in order to reach the access-level selection screen:

In this screen, the user decides what kind of access he wants to have:

```
ENTER PASSWORD:
* * * or -->
```

1. For viewing only – press the right arrow, you will be able to go into the UNILINER menu but without any editing allowed.
2. For full access – Enter the code 139, and you will be permitted editing any of the items.

### **3.3 Constants**

The first item in the UNILINER menu screens is the CONSTANS. We shall review the screens included in this item in the order in which they appear.

In the following discussion the controller using the services of the UNILINER will be referred to as the “MASTER”.

#### **3.3.1 Outputs from master:**

Here the user defines how many outputs from the controller (master) are going to be operated via the UNILINER. The options are 0, 1-8, 1-16, 1-24, 1-32.

The screen appears like this:

```
OUTPUTS FROM
MASTER:*(1-16)
```

#### **3.3.2 Inputs from master:**

Here the user defines how many inputs of the controller (master) are going to be received via the UNILINER. The options are 0, 1-8, 1-16

The screen appears like this:

INPUTS TO  
MASTER:\*(1-8)

### **3.3.3. Attached outputs limit:**

The UNILINER permits attaching (associating) additional outputs to any of the OUTPUTS commanded by the controller. The additional outputs can be located at various RTUs. If the controller opens that output the additional outputs will open as well. In this screen, the user defines the limit of how many outputs can be associated with any output. The values can be from 0-7. The screen appears like this:

ATTACHED OUPUTS  
LIMIT: 2 (0-7)

### **3.3.4 Master output type:**

As mentioned above, the UNILINER can work either with Continuous or with latching commands.

Here the user may choose the type of command the UNILINER will receive from the controller.

The screen appears like this:

MASTER OUTPUT  
TYPE \* LATCHING

### **3.3.5 Polling period (Only for interface RF)**

Here the user chooses the interval of the communication cycles between the interface and the RTUS. The value in this screen depends on the number of RTUS in the system. Please see the UNILINER RF RTU SYSTEM GUIDE 2007 for details.

The screen appears like this:

POLLING PERIOD:  
\* 10 SEC

### **3.3.6 Enabling RF Test (Only for interface RF)**

This screen allows the user to enable / disable the RF "TEST MODE". For details please see the UNILINER RF RTU SYSTEM GUIDE 2007.

RF TEST ENABLE  
\* YES

### 3.3.7 Output config. Clear

This screen appears only if the user has already defined at least one output connection. Here the user can clear all the output configuration previously made.

```
OUTPUTS CONFIG
CLEAR ? *NO
```

### 3.3.8 Input config. Clear

This screen appears only if the user has already defined at least one input connection. Here the user can clear all the input configuration previously made.

```
INPUTS CONFIG
CLEAR ? *NO
```

## **3.4 Out connections (If defined)**

The second item in the UNILINER menu screens is the “Out – connections”. In each screen, the user can define to which output in which RTU the particular output command will be transmitted.

For example in this screen, Output number 5 in the UNILINER is associated with Output 3 in RTU 2.

```
MASTER OUT: 05
RTU: 02    OUT:3
```

The screens of this item are arranged in a matrix form. Moving up and down will cycle between the outputs of the UNILINER connected with the outputs of the MASTER, moving to the right will bring us to the screens where the additional outputs are defined to be attached to the current output.

```
ATCH 1 OUT: 05
RTU: 10    OUT:3
```

## **3.5 Input connections (If defined)**

The third item in the UNILINER menu screens is the input connections. The screens in this item are in a form of a column. Moving up and down will cycle between the inputs of the UNILINER.

In each screen, the user can define from which input in which RTU the UNILINER input will receive its signal.

For example in this screen, input number 2 in the UNILINER is associated with input 2 in RTU 1.

```
MASTER INP: 02
RTU: 01     IN:2
```

### 3.6 Test

The fourth item in the UNILINER menu screens is the Test. We will review the screens in this item in the order in which they appear.

#### 3.6.1 Opening screens:

These two screens supply additional data about the system. The first screen shows the I/O version and the second screen (reachable by pressing ENTER / DOWN arrow ) shows whether there is a problem. These are non-editable screens.

```
WIRE LESS I/O
VER:01.00
```

```
WIRE LESS I/O
WORKING O.K.
```

#### 3.6.2 Status of output commands arriving from the Master

The purpose is to show the user what is the status of the various output commands arriving from the Master. Each screen exhibits 8 outputs, if there are more than 8 outputs then the other screens are reachable by using the UP / DOWN arrows. These are non-editable screens.

The following example shows that output1 and output 3 are activated by the Master, all the outputs attached to Outputs 1 and 3 at the UNILINER should currently be open:

```
M. OUTS 12345678
(1-8)    +-+-----
```

#### 3.6.3 Status of input signals reported to the Master

The purpose is to show the status of the input signals being sent to the Master, resulting from information received from the RTUs. Each screen exhibits 8 inputs, when there are more than 8 inputs then another screen becomes reachable by using the UP / DOWN arrows. These are non-editable screens.

The following example shows that Input 1 in the UNILINER reports a closed contact to the Master.

```
M. INPT 12345678
(1-8)    +-----
```

#### 3.6.4 Status of the outputs per RTU

The purpose is to show the status and allow manually changing (if necessary) the state of the outputs residing in each of the RTUs. The number of screens depends on the

number of RTUs defined in the UNILINER (in the Out connections screens) and they are reachable by using the UP / DOWN arrows. If the user wants to change the state of a particular output, the steps are as follows:

- A. Use the UP/DOWN arrows until you reach the desired RTU.
- B. Press “ENTER”, the cursor will blink on the first output available.
- C. Use the LEFT/RIGHT keys to reach the desired output.
- D. Use the UP arrow to open/close the valve.
- E. Press “ENTER” to confirm.

```
RTU: 01 OUTPUTS
---+--+xx
```

- : closed output
- + : opened output
- x : non defined output

### 3.6.5 State of inputs per RTU

This purpose of this screen (screens) is to show the state of the inputs in the RTU. The number of screens depends on the number of RTU defined in the UNILINER (by the Input connections screens) and they are reachable by using the UP / DOWN arrows.

```
RTU: 01 INPUTS
-+xxxxxx
```

### 3.6.6 Battery voltage

The user can see the current voltage feeding the UNILINER. This screen is informative only.

```
BATTERY VOLTAGE
13.94 V
```

### 3.7 RTU'S logger

The fifth and last item in the UNILINER menu screens is the RTU'S logger. The screens of this item are arranged in a column. Moving up and down between the screens will cycle between the RTUS defined in the UNILINER showing the number of communication errors accumulated for each RTU. The user can clear the number in the following manner:

- A. Use the UP/DOWN arrows to reach the desired RTU.
- B. Press “ENTER”, and you will be asked whether to “CLEAR ERR CNT” ?
- C. Use the UP/DOWN keys to choose. Y – reset to zero, N – keep the number
- D. Press “ENTER” to confirm.

```
RTU: 01
Errors: 002
```

## 4. Technical information

### **Power Supply**

Main power supply –220v 50 ( 110v 60 Hz )

Max Power - 25 Watt

### **Outputs commands received from external controller**

Output voltage – 24v AC or DC continuous, 12v DC latching

Maximum number of outputs from the MASTER – 4\*8=32

### **Outputs activated by the RTUs**

12v DC latching

Maximum number of outputs to be activated through the RTUs – 32\*8=256

### **Inputs reported to the external controller**

Inputs type – dry contact

Maximum number of inputs – 2\*8=16

### **Temperature and Humidity**

**Ambient:** temperature ( -0) to 60 C° ; (-4) to 140 F°

Relative Humidity – 0-90%

**Storage:** temperature – ( -30) to 70 C° ; (-22) to 158 F°

Relative Humidity – 0-90%

### **Housing**

Material - ABS UV resistant

Protection class – IP65

### **Dimensions**

40 x 30 x 18 cm ; 15.75'' x 11.8'' x 7.1''

### **Weight**

5.5 kg ; 12 pound

## Appendix A –

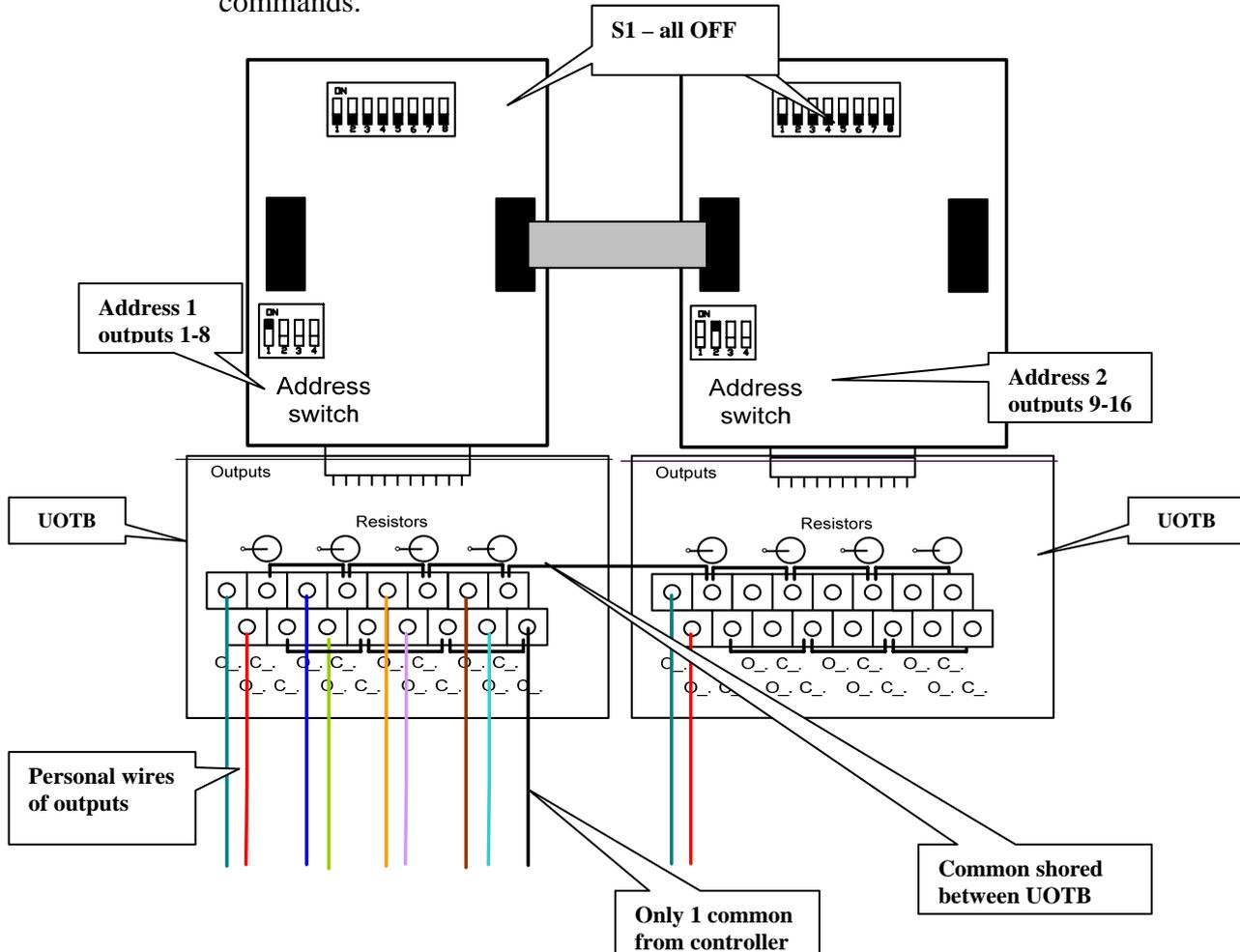
### connections for various command types.

As said before the UNILIENR can work with several types of commands, we shall review the differences required when adjusting the UNILINER for each type.

#### AC continuous

Controllers using AC continuous output commands will usually have per each output a personal wire and a common wire shared by several outputs. The UNILINER supports this way of wiring:

1. For each output of the Master controller, to be connected to the UNILINER connect only the personal wire to the desired location in the UNILINER outputs terminal block (UOTB)
2. Connect one common wire only from the controller to any of the common terminals marked by “C” at the UOTB.
3. Make sure that all the commons “C” of the UOTB are short – circuited (they should arrive like that). If not, do the connection yourself. If there are several UOTBs each of them should have its own common wire connected to the Master controller’s common output terminal.
4. The S1 DIP SWITCH (see diagram) should be all OFF (down) for this type of commands.

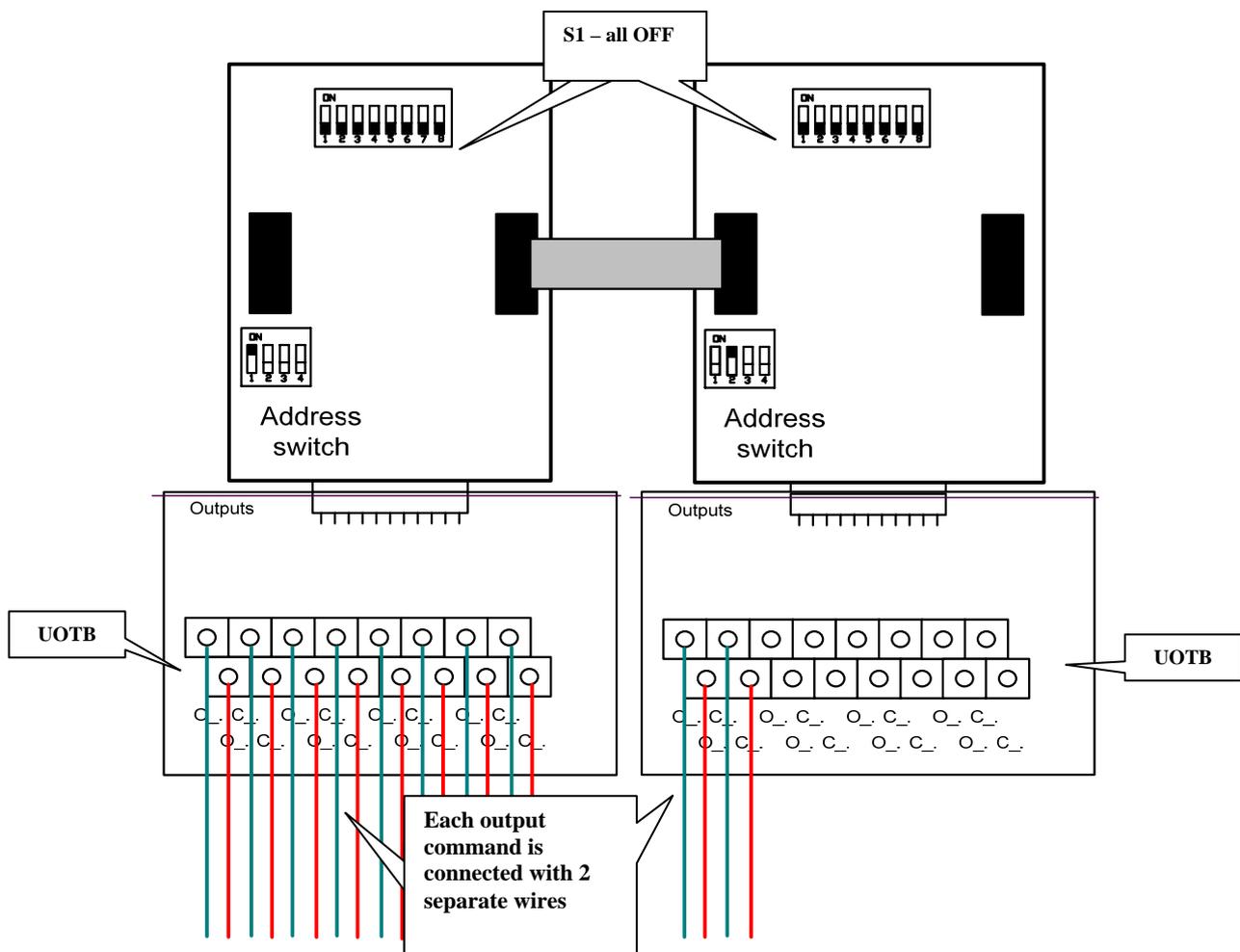


## DC continuous

The connections are the same as for the AC continuous. The only difference is that the UOTB card will arrive without the resistors.

## DC Latch 2 wires

The connections for 2 wire DC latch commands will usually be different from the AC continuous due to the fact that in this type of controllers there may be two independent personal wires per each output without any interconnection. The connection will be done in the following manner:



**Note – If some of the outputs in the controller share the same common, then the user can short-circuit the commons in the UOTB (for the outputs that share the commons) and only one common will be needed for these outputs.**

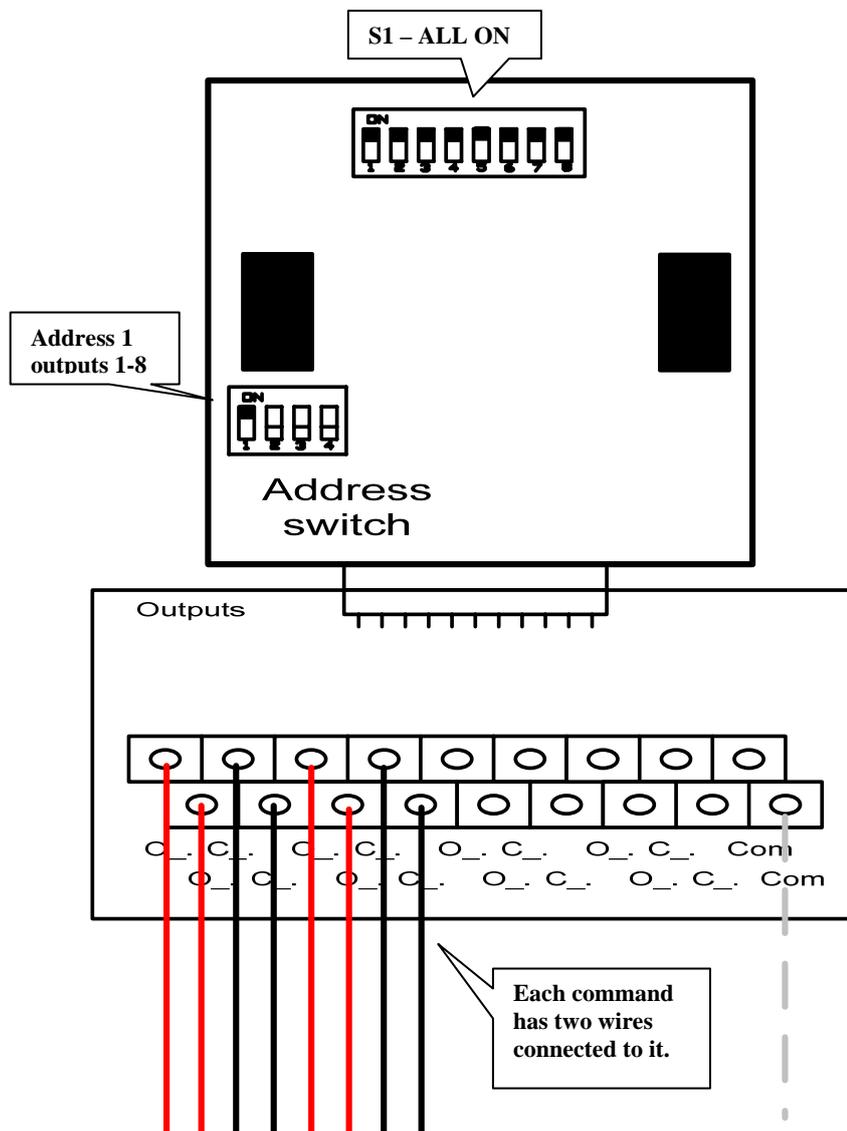


**Note – If the controller is going to use latch commands, this should be defined in the constants menu.**

### DC Latch 3 wires

The connections for 3 wired DC latch commands differs from all the other types of connections. The UOTB will also be different, there will be one more terminal in use in each row, this terminal will be marked as COM. In addition, a change in the setting of the DIP SWITCH S1 will be needed. The connection will be done in the following manner:

1. For each command, there will be 2 wires: The red wire to the O position, the black wire to the C position.
2. Only one white wire is necessary from the common in the controller to the COM in the UOTB (If there is more then one UOTB card, make a short-circuit between the COM of the various UOTBs)
3. The S1 switch (see diagram) should be all **ON (UP)** for this type of commands.



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