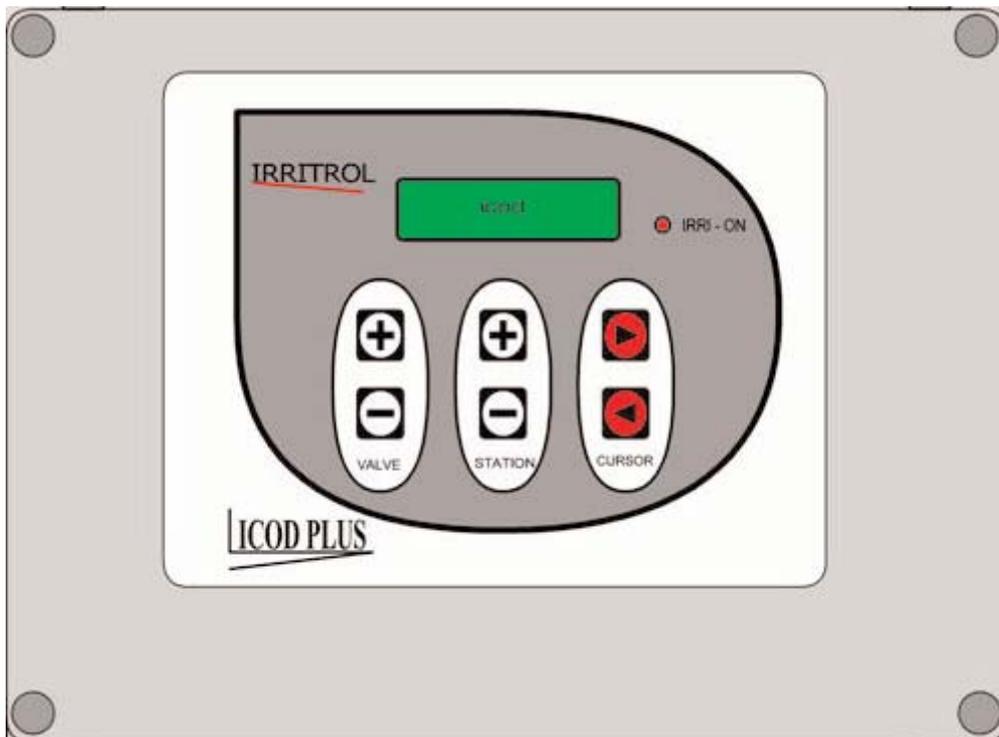


Irritrol®



ICOD PLUS instruction manual

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Preamble

Automation of irrigation systems, be they residential or agricultural, is increasingly becoming not a "luxury accessory" but an essential component in a modern irrigation system.

The reasons for this road to automation are essentially the same as those that ruled diffusion of automatic systems in other fields, and even if labour cost reduction is the mainspring that pushed towards technological innovation, the other automation-related advantages should not be underestimated.

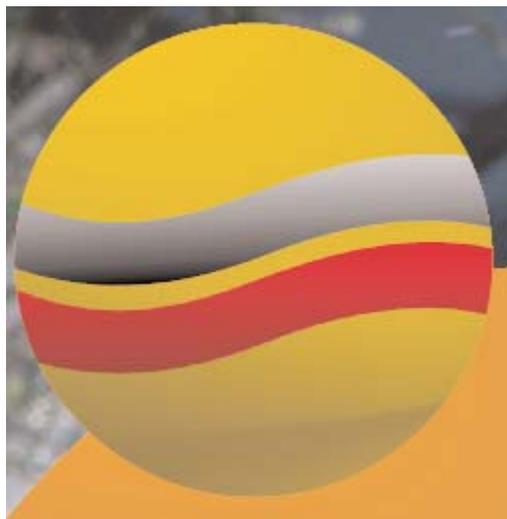
In fact, it is very short-sighted to think of an automated irrigation system as just a timer that opens and closes a tap at a set time.

With a central control it is possible to quickly modify the irrigation parameters, change the duration, the shift and the daily starting time, both on the basis of culture considerations and through the aid of environmental reading systems (rain sensor, temperature sensor, humidity sensor, etc.) which in their turn can be automated.

It must also not be underestimated that an automatic irrigation system, apart from being cost effective and technically beneficial, responds to an ever growing need that is emerging on medium to large farms, where the often expert and skilled workers are starting to retire without equally skilled substitutes being available, and this leaving the economic aspect aside.

The farming industry is rapidly changing and more and more needs new tools, new technologies and new professionalism in order to face the challenges of the future.

The ICOD PLUS management system fully meets the requirements in this context.



2 wires

What is a COD-DECOD system?

The COD-DECOD (ICOD PLUS) system is an intelligent system that transmits information as well as electrical pulses. This is made possible by the particular structure of the system composed of a data "transmission" station (coder) and of many (as many valves as there are to control) small "reception" stations (decoders). The coder sends a coded message to the entire connection network and only the decoder able to decode this message is activated.

Therefore, it is no longer necessary to dedicate 1 wire to each valve/station plus the common wire: one cable made up of 2 wires + GND (yellow/green) will be sufficient for the entire system for signal transmission and earthing. Application of the COD-DECOD system brings a considerable advantage for irrigation of vast green areas, such as parks, golf courses, municipal areas, farms, etc. saving on installation time and cost of the electrical cables and labour. A conventional irrigation control system consisting of a control unit and valves is composed of as many wires as there are valves plus, in the best hypothesis, one common wire: for example, if the system is composed of 15 valves, there will be 16 wires leading into the control unit. With the ICODE PLUS system, there will only be 2 wires + GND (yellow/green) irrespective of the number of stations/valves in the system (max. 48 decoders). As well as not having wiring restrictions, ICODE PLUS allows reaching considerable distances (see the table below).

ICOD PLUS SYSTEM DISTANCES WITH 1.0 mm² CABLE				
No. of decoders installed	1 decoder w/ 1 solenoid	2 decoders w/ 1 solenoid	3 decoders w/ 1 solenoid	4 decoders w/ 1 solenoid
16	3700	2300	1700	1300
24	3100	2000	1500	1200
32	2700	1700	1300	1100
40	2400	1600	1200	900
48	2200	1400	1100	900
No. of decoders installed	1 decoder w/ 2 solenoids	2 decoders w/ 2 solenoids		
16	1500	1700		
24	1400	1600		
32	1200	1400		
40	1100	1300		
48	1100	1200		
No. of decoders installed	1 decoder w/ 3 solenoids			
16	800			
24	800			
32	700			
40	600			
48	600			

These distances may vary depending on the type of system installed.

The resin-bonded decoders can activate up to a maximum of 3 solenoids simultaneously.

ICOD PLUS SYSTEM DISTANCES WITH 1.5 mm² CABLE

No. of decoders installed	1 decoder w/ 1 solenoid	2 decoders w/ 1 solenoid	3 decoders w/ 1 solenoid	4 decoders w/ 1 solenoid
16	5500	3500	2600	2000
24	4700	3000	2300	1800
32	4100	2600	2000	1600
40	3600	2400	1800	1400
48	3300	2100	1600	1300
No. of decoders installed	1 decoder w/ 2 solenoids	2 decoders w/ 2 solenoids		
16	2300	2600		
24	2100	2400		
32	1900	2200		
40	1700	2000		
48	1600	1900		
No. of decoders installed	1 decoder w/ 3 solenoids			
16	1300			
24	1200			
32	1100			
40	1000			
48	900			

These distances may vary depending on the type of system installed.
 The resin-bonded decoders can activate up to a maximum of 3 solenoids simultaneously.

ICOD PLUS SYSTEM DISTANCES WITH 2.5 mm² CABLE

No. of decoders installed	1 decoder w/ 1 solenoid	2 decoders w/ 1 solenoid	3 decoders w/ 1 solenoid	4 decoders w/ 1 solenoid
16	9300	5800	4400	3400
24	7900	5000	3800	3000
32	6900	4400	3400	2700
40	6100	4000	3000	2400
48	5500	3600	2800	2200
No. of decoders installed	1 decoder w/ 2 solenoids	2 decoders w/ 2 solenoids		
16	3800	4300		
24	3500	4000		
32	3200	3700		
40	2900	3400		
48	2700	3300		
No. of decoders installed	1 decoder w/ 3 solenoids			
16	2100			
24	2000			
32	1800			
40	1700			
48	1600			

These distances may vary depending on the type of system installed.
 The resin-bonded decoders can activate up to a maximum of 3 solenoids simultaneously.

ICOD PLUS SYSTEM DISTANCES WITH 4.0 mm² CABLE

No. of decoders installed	1 decoder w/ 1 solenoid	2 decoders w/ 1 solenoid	3 decoders w/ 1 solenoid	4 decoders w/ 1 solenoid
16	14900	9400	7000	5500
24	12700	8100	6100	4900
32	11000	7100	5400	4400
40	9800	6400	4900	3900
48	8800	5700	4400	3600
No. of decoders installed	1 decoder w/ 2 solenoids	2 decoders w/ 2 solenoids		
16	6200	7000		
24	5600	6400		
32	5100	5900		
40	4700	5400		
48	4400	5100		
No. of decoders installed	1 decoder w/ 3 solenoids			
16	3400			
24	3200			
32	2900			
40	2700			
48	2600			

These distances may vary depending on the type of system installed.
 The resin-bonded decoders can activate up to a maximum of 3 solenoids simultaneously.

ICOD PLUS SYSTEM DISTANCES WITH 6.0 mm² CABLE

No. of decoders installed	1 decoder w/ 1 solenoid	2 decoders w/ 1 solenoid	3 decoders w/ 1 solenoid	4 decoders w/ 1 solenoid
16	22300	14100	10500	8300
24	19000	12200	9200	7300
32	16600	10700	8200	6600
40	14700	9600	7400	5900
48	13200	8600	6700	5400
No. of decoders installed	1 decoder w/ 2 solenoids	2 decoders w/ 2 solenoids		
16	9300	10500		
24	8400	9600		
32	7700	8800		
40	7100	8200		
48	6600	7600		
No. of decoders installed	1 decoder w/ 3 solenoids			
16	5200			
24	4800			
32	4400			
40	4100			
48	3900			

These distances may vary depending on the type of system installed.

The resin-bonded decoders can activate up to a maximum of 3 solenoids simultaneously.

Solenoids far from the decoder can also be connected. The following table shows the maximum possible distances between the decoder and the solenoid/s.

Cable cross-section mm ²	1 decoder w/ 1 solenoid	1 decoder w/ 2 solenoids	1 decoder w/ 3 solenoids
1.0	130	65	40
1.5	195	95	65
2.5	325	160	105
4.0	525	260	175
6.0	785	390	260

Three software packages are available:

1. Program for dimensioning the electrical system for the ICOD PLUS automation system
2. Program for calculation of the maximum resistance of the electric cable in relation to the cross-section and the distance.
3. Program for calculation of the residual voltage in relation to the distance, the number of decoders and the cross-section of the electric cable.

Please contact our Engineering Department to receive a free copy of this software.

Versatility and completeness of the ICOD PLUS system

The number of stations is no longer a determining variable: you can go from 16 to 48 zones simply by adding the expansion modules (8 zones each). This possibility of modular expansion solves any future system enlargement problems.

In addition to the 48 zones, it is also possible to control a master valve and/or a pump control; the latter can be replaced with the alarm relay on ICOD PLUS.

It suffices to install a special decoder (IT-DECODP for the pump control or IT-DECODMV for the master valve) on the system, which will automatically recognise and control it according to instructions without the need to connect the ICOD to the MV terminal of the chosen control unit.

The MV and C/P parameter is already set and enabled on ICOD PLUS; never disable it even if MV and C/P are not used.

Another advantage of this system is that it allows wiring without restrictions: no particular configuration is required (e.g. in a loop* as required for the earlier systems); a branch can be added starting from any point in the system.

This feature is very important for possible future expansion of the system.

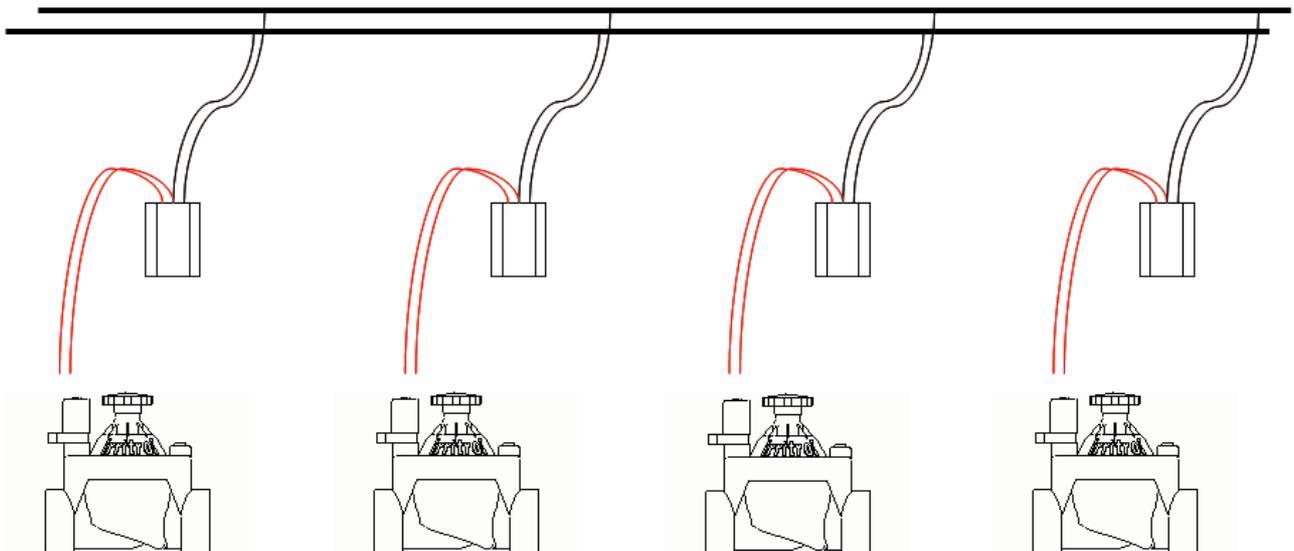
It should however be underlined that where systems with many branches have been installed, it might be necessary to terminate the line.

In this case, please contact our Technical Service Department.

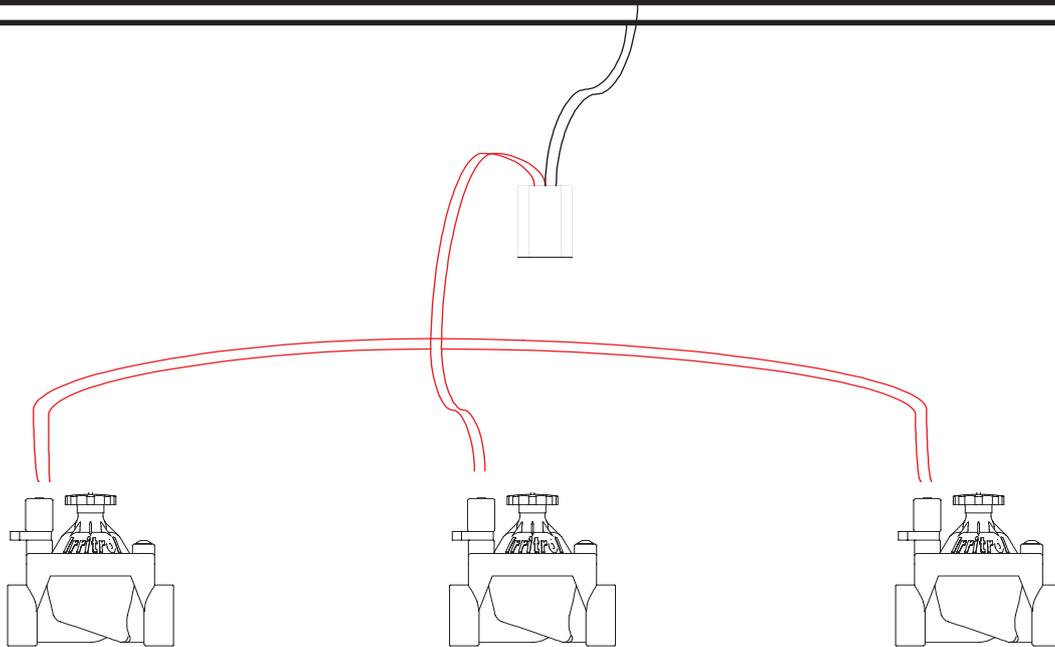
ICOD PLUS can be set to medium or low impedance by means of the switch on the board (see the instructions below for use of this device).

It is possible to have:

- 4 decoders per zone



- 3 valves per decoder



There is also a sensor input (N.C.), an alarm output (N.C.-C-N.O.) and an RS232 port for connection to a PC (see the image on the side).

Thanks to dedicated software ICOD PLUS can be controlled directly from the PC.

With the software version 2.20, you can modify some operating parameters, also directly from the ICOD keypad:

the time between two activations, the holding current, the pulse width, the pulse voltage, the maximum current, the delay between the master valve and the other valves, the delay between the valves, and set the irrigation time in minutes from a minimum of 1 minute to a maximum of 240 minutes for each station.

The decoders, irrespective of how many are installed, are automatically recognised by ICOD PLUS through a simple search operation. This allows considerable time saving and reduces the possibility of typing errors.

If all the decoders are not automatically recognised, it is always possible to activate the manual mode (see "manual entry of decoder serial numbers").

If adding a decoder at a later stage, manual entry of the identification code (6-digit alphanumeric number) is the fastest way. Programming is done via the 6 keys on ICOD, which refer to only 3 parameters (Station, Valve, Cursor) and is displayed on a 16 x 2 alphanumeric display.

For more intuitive display, you can select the desired language from Italian, English (default), French, Spanish, German.

Thanks to the alarms (short-circuit, open-circuit, overload, generic), you can not only diagnose the fault but also identify the zone in which it occurred.

To facilitate locating a short-circuit, a small self-resetting electronic fuse has been incorporated in each decoder.

Should an alarm occur, these fuses (also in the event of a short-circuit) lock the station involved for the entire irrigation time set and programming will continue as set.

ICOD keeps in memory any alarms recorded during the irrigation phase, and they can be viewed by pressing the "Cursor" key.

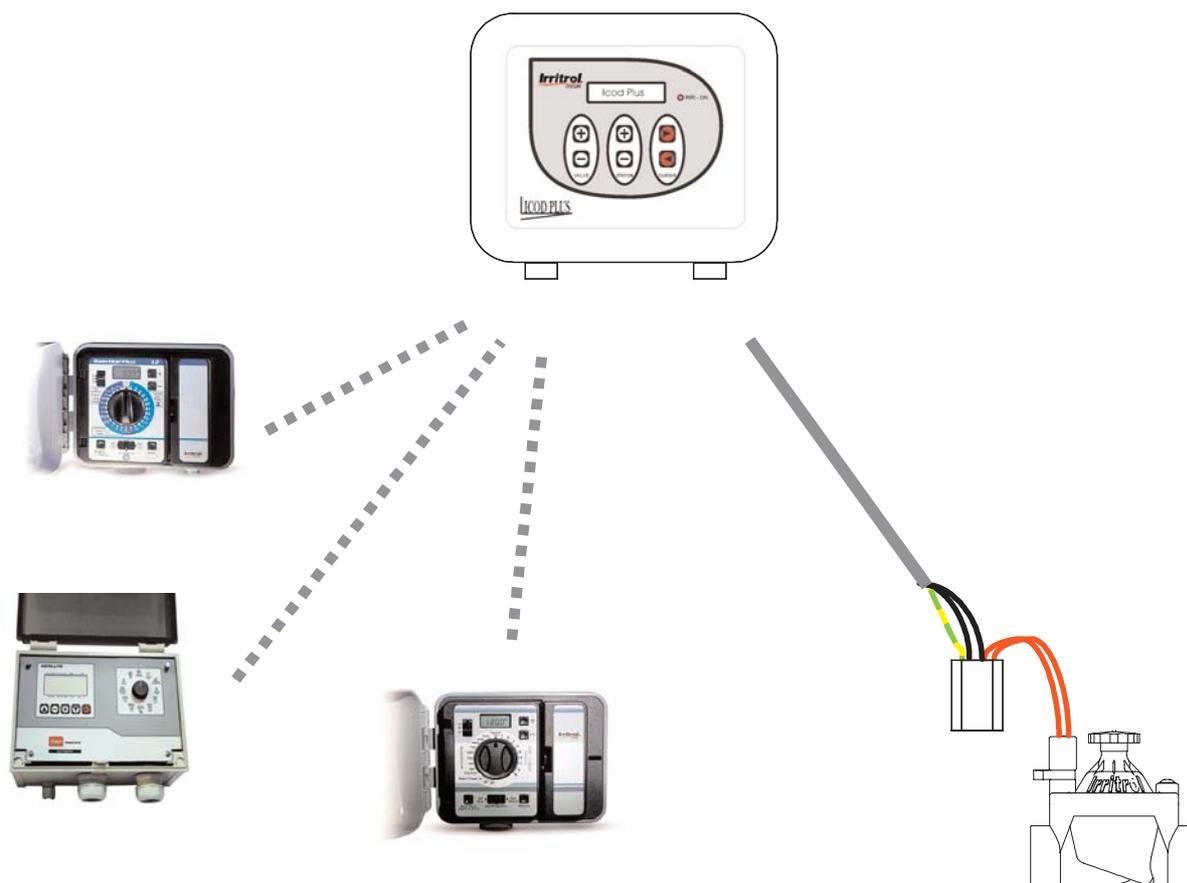


Compatibility of the ICOD PLUS system

ICODE PLUS is compatible with all the Irritrol control units and with any other irrigation control unit, provided that they do not have the open-circuit control function (e.g. Rain Dial Plus) and have a maximum output voltage of 24VAC and a minimum of 15VAC or a maximum of 24VDC and a minimum of 18 VDC. You can thus choose the one most suited to your needs, ignoring what is "downstream": irrespective of the control unit used, the system will always have 2 wires + GND unpolarised.

With a small modification, also the programmers with open-circuit control can be connected to ICOD PLUS (for instructions in this regard, please call the Irritrol Engineering Department).

The system can function with a minimum of one module (8 inputs) up to a maximum of six modules (48 inputs) that can be replaced in the event of a fault or added if you wish to expand the system.



Language

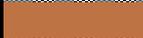
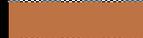
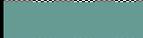
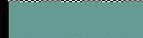
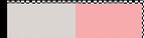
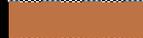
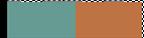
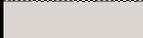
The default language is English, however, you can select a different language from those available (Italian, French, Spanish or German) by simultaneously holding down the three lower keys of the keypad ("-" "-" "t"), thus scrolling from one language to the next; when the desired language appears, release the three keys.



Note: The variable parameters menu is available only in Italian and English.

ICOD PLUS-Control unit connections

Connect the cable/s provided with ICODE PLUS to the terminal board of the irrigation control unit following the order of the colours as shown in the table below. Connect a two/three-pole cable from the OUT/GND terminal of ICODE PLUS to the decoders, taking care to make a workmanlike connection. Connect the sensor and/or any preset alarm and finally insert the plugs in the power socket (230 VAC) .

	St. Colour		St. Colour		St. Colour
Cable 1		Cable 2		Cable 3	
	1 yellow		17 yellow		33 yellow
	2 pink		18 pink		34 pink
	3 red		19 red		35 red
	4 blue		20 blue		36 blue
	5 purple		21 brown		37 brown
	6 brown		22 green		38 green
	7 green		23 grey		39 grey
	8 grey		24 white		40 white
	9 white	Cable 3		Cable 5	
	10 black		25 yellow		41 yellow
	11 grey/pink		26 pink		42 pink
	12 red/blue		27 red		43 red
	13 white/green		28 blue		44 blue
	14 white/yellow		29 brown		45 brown
	15 yellow/brown		30 green		46 green
	16 green/brown		31 grey		47 grey
			32 white		48 white

When switching on, the words ICODE PLUS - FW REV. x.x will appear on the ICODE PLUS display for about one second where x.x indicates the unit revision number. This number will be used to recognise any modifications made to the software over the course of the years.

Immediately afterwards, the number of configured inputs will appear for two seconds. For example, for a system with 16 inputs (2 modules), the message ICODE PLUS - INPUTS FOUND:16 will appear.

When the 2 seconds have elapsed, the first time ICODE PLUS is used, the message NO DECODERS!

- CONFIGURE SYSTEM will appear on the display.

Should the message SENSOR ON appear instead of the above message, check that there is a jumper on the corresponding terminal (sensor) or that the "NC" sensor (e.g. rain sensor) is properly connected.



When the fault has been corrected, go to automatic search for the decoders already installed in the field.

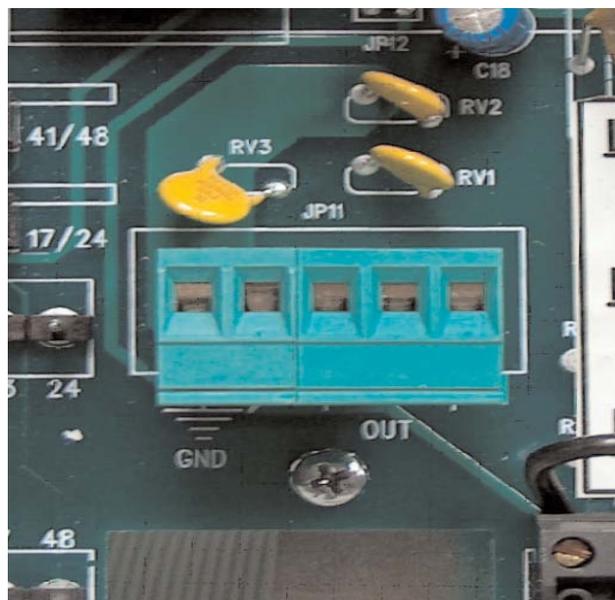
Setting the line impedance

ICOD PLUS is positioned standard on HIGH. The settings can be changed as follows:

- For systems with few decoders and short distances, set the lever to "LOW"
- For systems with many decoders and long distances, set the lever to "MED"

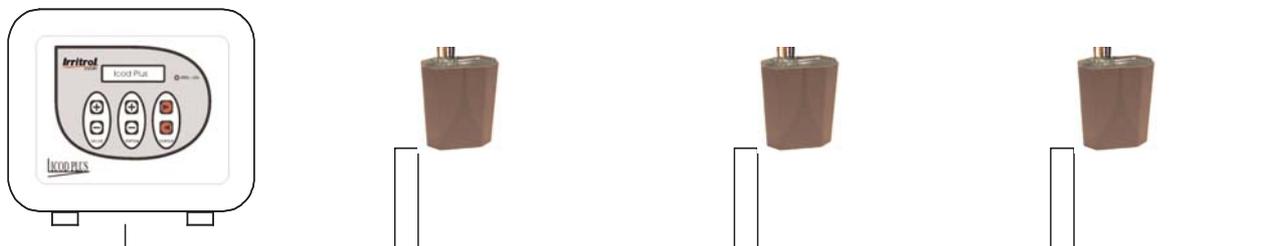


ICOD PLUS-decoder connections



The green terminal board can be extracted so that the ICOD PLUS-decoder connections can easily and quickly be made as shown in the photo above. Various connection configurations are possible of which a few examples are shown below:

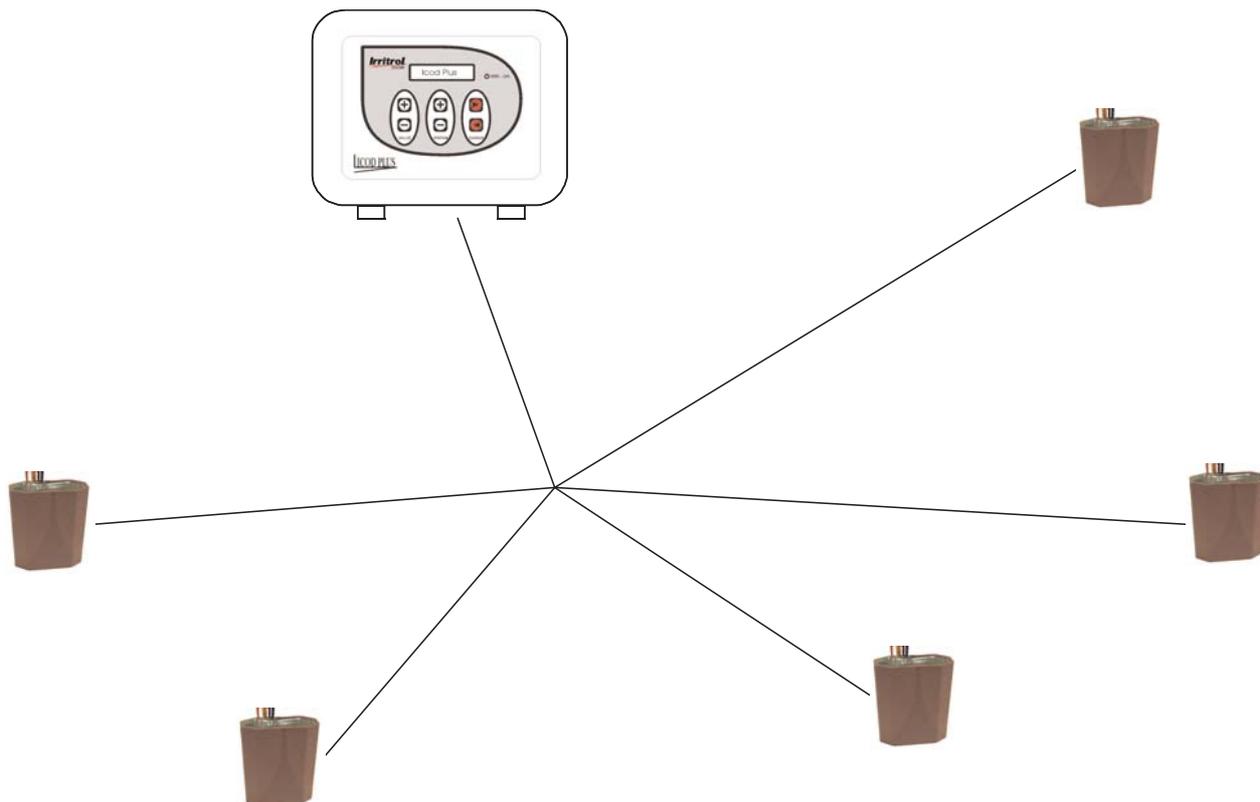
- in series



- comb



- star



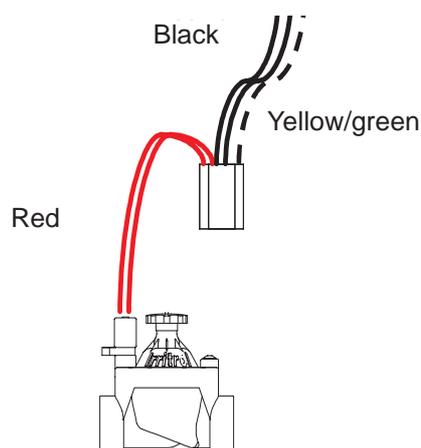
A loop connection is also possible, but in this case the polarity needs to be respected, whereas for all the above configurations the polarity is not determining.

Instructions for decoder installation

Each decoder has 5 wires: 2 black, 2 red and 1 yellow/green. The two black wires must be connected to the main line (leading from the OUT terminals of ICOD PLUS); the two red ones must be connected to the solenoid; the yellow/green wire is the ground and must be connected to the "ground system" (be it general deriving from the main line or individual and discharged to ground)

It is recommended to install the electrical system in a workmanlike manner and to strictly follow the instructions below on pain of forfeiting the guarantee.

1. Always use IP68 waterproof connectors (see the Irritrol catalogue page 39) wherever a decoder is installed.
2. The decoder must be installed immediately following the waterproof connection of all five cables including the yellow/green ground cable.
3. Do not leave or abandon the decoder in the open field if it is not connected as described above. This is to prevent that in case of rain, snow, etc. water penetrates through the cables.
4. The use of waterproof connectors is also essential in order to prevent the formation of oxide on the cables.
Cable oxidation may compromise proper functioning of the entire system.
5. The waterproof connector may not be reused for a second connection, since the grease that has leaked out during previous use will not guarantee the degree of protection. Use a new connector.
6. Exclusively use the yellow or red terminal provided with the waterproof connector; do not use insulating tape of any kind.
7. Any tampering or repair work on the decoder will void the guarantee.



All the decoders are tested in the laboratory. The immersion test is carried out in sweet water at a depth of 1 metre for 72 hours after which the electrical functional test is carried out. The decoders are guaranteed at a depth of maximum 50 cm.

Starting an automatic search

WARNING! During the decoder search procedure, do not work on the system as there is a risk of irreparably damaging ICOD PLUS.

To start the automatic search, simultaneously hold down the Valve "+" and "-" keys for 3 seconds.

At this point, ICOD PLUS will run the search, the message DECODER SEARCH will appear on the display and the red "IRRI-ON" LED will come on.

You will have to wait for more or less time depending on the number of decoders installed.

If quite a few decoders are installed in the system, the first search attempt will probably fail (the capacitors of all the decoders must complete charging); repeat the operation, even two or three times.

In the event that the automatic search fails, manually enter the codes and check system functioning.

If, for example, 16 decoders have been installed, at the end of the search the words FOUND 16 should be shown below the words DECODER SEARCH; at this point, the search has been completed.

If, on the other hand, the message DECODER SEARCH - NOT FOUND! appears after a few seconds, check that the two cables have been properly connected to the OUT terminal or that the system is properly connected.

When the fault has been corrected, repeat the operation.

Assigning the zone

Repeatedly press the Valve "+" or "-" key, to scroll through all the decoders ICOD PLUS has found; the words DECODER xxxxxx (e.g. 00038F) - ASSIGNED TO --- will appear on the display; press the Station "+" or "-" key of ICOD PLUS to assign the zone you have chosen to each decoder.

Check step by step that the serial numbers of the decoders found correspond to the decoders installed and which you entered in the project or in the table.

Once you have assigned the station number to all the decoders, you can proceed with the test phase. The unit is now ready for operation.

N.B. A maximum of 4 decoders can be assigned to each station; for more demanding cases, some parameters can be changed. To make these modifications, please ask for information from our Engineering Department.

Manually entering the decoder serial numbers

Should you wish to add a decoder to a system running under the COD-DECOD system, this can quickly be done by manually entering the corresponding serial number without having to repeat the automatic search. To enter the serial number and subsequently associate it with the zone number, proceed as follows:

Simultaneously press the Station "+" and "-" keys for 3 seconds. The words DECODER xxxxxx - INDEX x/80 will appear on the display, where xxxxxx represents the code of a decoder already installed and x/80 indicates the lowest order number among all the serial numbers of the corresponding decoders found by ICOD PLUS.

Press the Valve "+" key to scroll until DECODER FFFFFFF - INDEX x/80 appears; at this point, you need to enter the six-digit serial number of the decoder just installed.

Use the Cursor "+" or "-" key to position the blinking cursor on the letter F to be modified. Then enter the number or letter by pressing the Station "+" or "-" key. Repeat the operation for all the remaining codes to be modified.

When you have entered the correct serial number, simultaneously press the two Station keys for 3 sec. to exit the serial number setting phase.

The words DECODER xxxxxx - ASSIGNED TO --- will appear on the display, where xxxxxx represents the serial number of the decoder just entered (e.g. 00038F); press one of the Station keys to associate the desired zone number with the decoder. Once you have selected the number, do not carry out any other operations: the unit will already have saved the settings.

Should you enter an already existing code, at the time you assign the station the message THIS SERIAL NUM. - ALREADY EXISTS! will appear on the display

Connections in the field

To make the connections it is essential, as already pointed out, to use the connectors indicated below and the joints must all be inspectable (place the connections in wells or junction boxes).

The electrical wires must be stripped for about 3 cm, and the carefully braided cables must be inserted in the terminal (yellow or red, depending on the cable cross-section).

Do not use any type of insulating or vulcanising tape as these do not guarantee perfect seal against water.

Finally, place the terminal in the waterproof connector and close the connector cover (snap-faster).

It is advisable to keep a modest length of wire in the well in order to prevent damaging voltages on the wire and the decoder (draft) and to facilitate maintenance work.

N.B.: Do not insert two terminals in the same connector.



Testing

You can do a test by manually positioning the cursor of the irrigation control unit; by doing this, you can activate any one zone, provided that it has been entered during ICOD PLUS programming.

For example, manually activate Station 1: you will see that after 2 seconds, the MV/CP decoder activates (if connected) and after a further 5 seconds (parameter variable via software) the corresponding decoder.

Remember that a maximum of 4 decoders can be activated with the same station number. In this case, each decoder will be activated in sequence with a delay of one second between one and the next (parameter variable up to n seconds).

Alarms

The ICOD system has four types of alarms:

- Open-circuit (low absorption) associated with the alarm message: LINE OPEN - ZONE: x; (this alarm will not be signalled if several decoders are active at the same time or if you use a MV or CP decoder)
- Overload (abnormal absorption) associated with the alarm message: OVERLOAD - ZONE: x;
- Short-circuit (high absorption) associated with the alarm message: LINE SHORT - ZONE: x;
- Generic associated with the alarm message: LINE SHORT - ZONE: ??? in the unlikely event that a fault occurs not attributable to the other cases.

For all four the above mentioned conditions, an alarm relay (to which a telephone dial, flashlight, siren, etc. can be connected) will be activated together with the appearance of the message on the display. If an alarm is activated, to deactivate the buzzer possibly connected, press any key on the ICOD PLUS. When repeatedly pressing, even later, the Cursor "u" key, you will find if and which other alarms have occurred during the irrigation phase; at the end of this list of alarms, the messa-

ge NO MORE ALARMS - CLEAR ALARMS? will appear.

At this point, delete the alarms stored, press the Cursor "+" key and the words ICOD PLUS will reappear on the display.

The following alarm signalling devices may be used:

Flashlight



Siren



Telephone dial.



MV/CP installation, activation and deactivation

All the decoders have five wires of which: two black for connection to the ICOD PLUS line (OUT terminal), one yellow/green for earthing (GND terminal) and two red for connection to the solenoid for the models EV and MV or grey for the model CP.

The latter has a clean N.O. contact to which a load (pump) can be applied with the following characteristics: 230VAC 10A max.

As mentioned above, ICOD PLUS does not need to be connected to the MV control on the terminal board of the irrigation control unit (if present) since it is already in the ICOD PLUS memory.

The MV control is enabled and hence ON by default; this can be checked by simultaneously pressing the two Cursor keys; the message MASTER VALVE ENABLED (ON) will appear.

To change this condition, simultaneously hold the Cursor keys down for 3 seconds; the message MASTER VALVE DISABLED (OFF) will appear and so forth. In this way, the mode can be deactivated and reactivated.

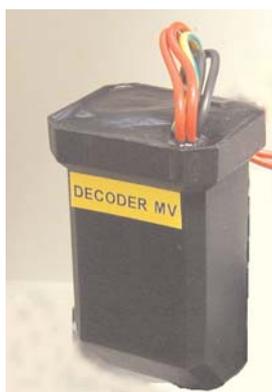
Remember that a maximum of 4 decoders can be activated with the same station number. In this case, each decoder will be activated in sequence with a delay of one second between one and the next (parameter variable up to n seconds).

If a maximum of 3 valves are connected to each decoder, these will all be activated together.

N.B.: Never disable the MV control



Solenoid valve decoder



Master valve decoder



Pump control decoder

System expansion

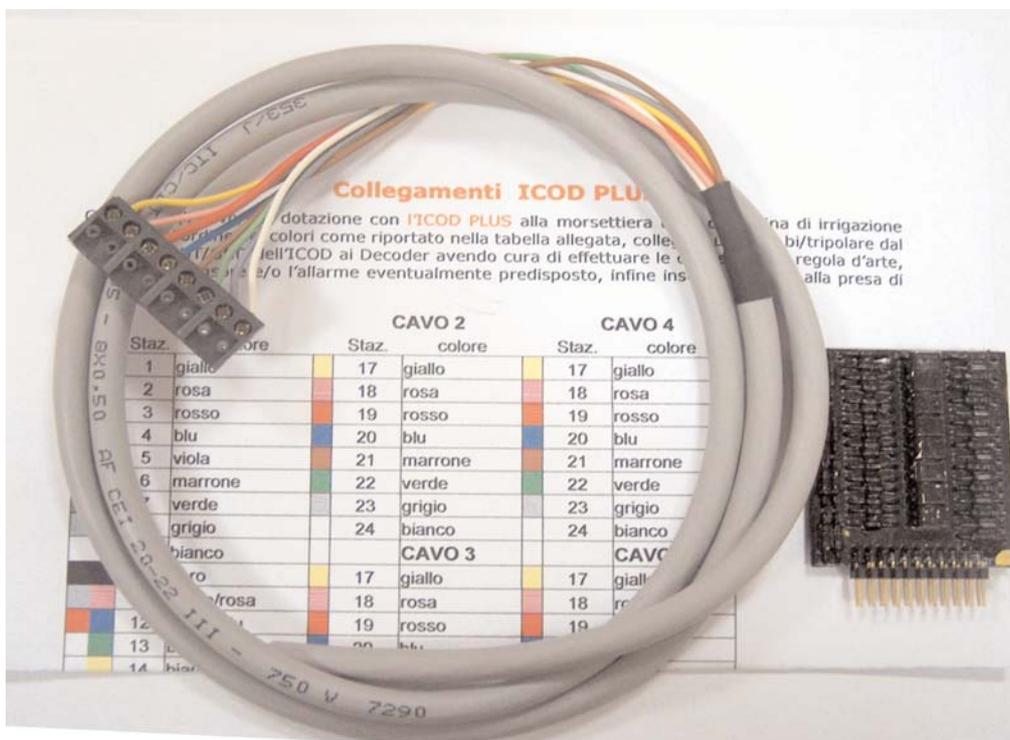
You can increase the number of ICOD inputs up to a maximum of 48 by purchasing one or more modules and simply adding them to the ICOD PLUS circuit.

Do not power ICOD PLUS each time you carry out this operation to prevent possible damage to or malfunctioning of the unit, apart from the fact that the module will not be recognised. The modules must be incorporated in serial order following the screen-printing on the board.

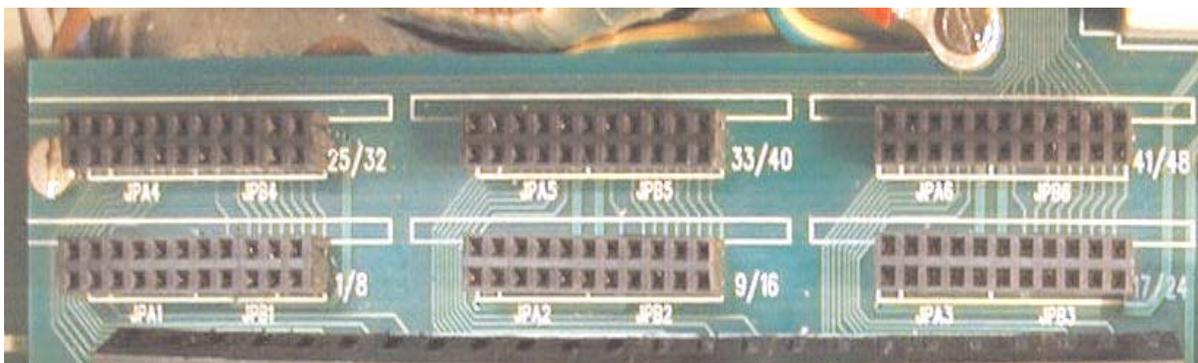
If this condition is not respected, the system will recognise only the number of inputs entered correctly.

Open the screen-printed cover of ICOD PLUS, insert the prewired terminal including the cable and insert the 8-zone expansion module (the prewired terminal, the cable and the expansion modules are included in the IT-ICODEXP8PLUS kit).

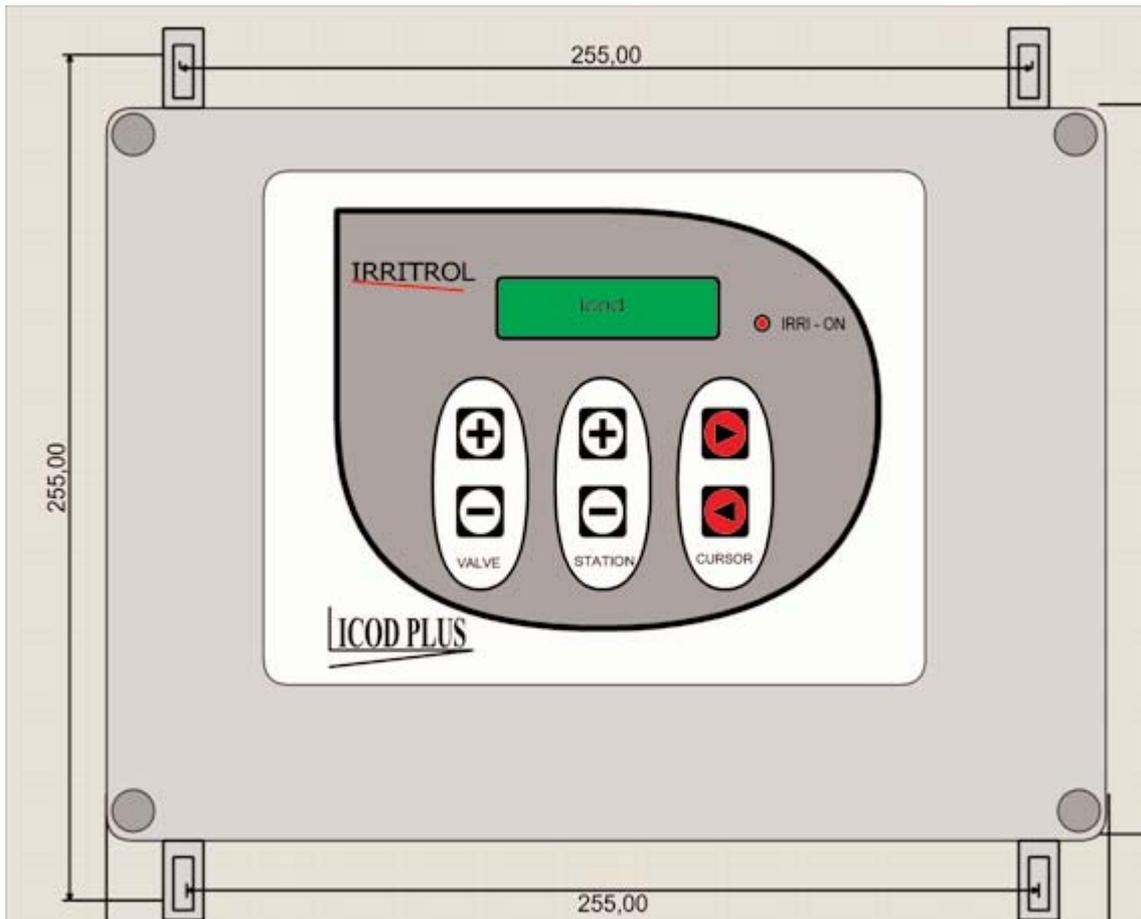
Expansion module kit code IT-IDECODEX8PLUS



Connection point on ICOD for expansion modules



Wall mounting



Technical data

Box: PVC for indoor/outdoor use, removable cover with 4 screws, IP56, brackets for wall-mounting

Dimensions and weight: 220 x 300 x 120 mm (D x L x W) - approx. 4.3 kg

Inputs: 8, 16, 24, 32, 40, 48 depending on the modules installed

Connections:

Power Cable: 3 x 1 mm²

Input connection cable: 1 (3 max) x 16 x 0.5 mm²

1 mm² black common unipolar cable (COM)

Decoder connection cable, max 1-6 mm²

Power supply:

Input: primary 230 VAC 50/60 Hz

Secondary A: (from internal toroidal transformer) 7 VAC, 400 mA

Secondary B (from internal toroidal transformer) 33.5 VAC, 2.2 A

Output: 2-wire, 46 VDC, max 2 A

Sensor input: N.C. switch

Alarm output: N.C. or N.O. relay max. 230 VAC, max. 10 A

Terminal boards:

Inputs (1,2,3, 48) x 1 mm²

Output (OUT), max 6 mm²

RS232 port for connection to a PC

Temperature: -5° C to +50° C

Voltages:

Output voltage (OUT): 46 VDC

Holding current EV = 5.8 VDC *

Holding current CP/MV = 11 VDC *

Absorption:EV decoder activated (without solenoid) = 11 mA \pm 10% *EV decoder in standby = 5 mA \pm 10% *EV decoder with solenoid** activated = 53 mA \pm 10% *MV decoder = 170 mA \pm 10% *CP decoder = 12 mA \pm 10% *

* Setting parameters variable via software-**solenoid: IRRITROL - 24VAC, rush current 340 mA, holding current 200 mA, resistance 32 Ohm.

Specifications

ICOD PLUS

Supply and workmanlike installation in accordance with EC regulations of an electronic coding unit for the opening/closing signal coming from an irrigation programmer for the realisation a "single-cable" automated irrigation system. The coding unit must allow opening, by means of dedicated decoders in the field, solenoid valves equipped with 24V solenoid, using a three-pole electric cable with one pole for the ground connection at the minimum distance, with electric cable cross-section of 1.5 mm² and ____ metres long and a cross-section of 6.0 mm² and ____ metres long.

DECODER

Supply and workmanlike installation of a decoder for an electronic coding unit for the opening/closing signal coming from an irrigation programmer for the realisation of a "single-cable" automated irrigation system.

How to access the modifiable parameters

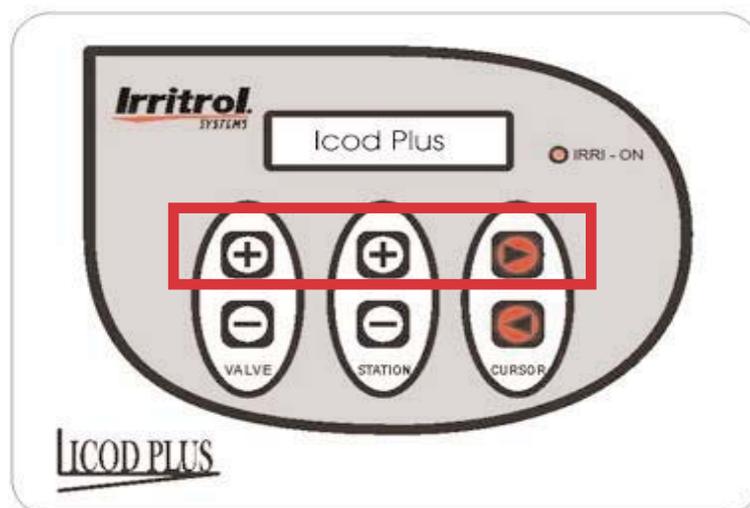
The ICODE PLUS parameters can be modified directly from ICODE PLUS or by connecting it to a PC on which the management software is installed.

Modifying the parameters directly from ICODE

To access the modifiable parameter menu, simultaneously press the three top keys (+)(+)(>).

Enter the password using the key (u) until the last digit and press the Station (+) key to enter the number 1 (provided the PW has not been changed).

Then press the Valve (+) key to access the modifiable parameter menu.



Modifying the parameters

All the modifications to the ICOD PLUS parameters can be made as described in the previous chapter (the fastest and most effective method) or via a PC connected to the coder via the RS232 port. Connection to the RS232 port allows you to change some operating parameters of ICOD PLUS, for example, the delay time between two decoders, EV, MV/CP holding current.

From the PC you can also activate the zones, store the ICOD settings on HD, list and/or deactivate alarms, etc. In this way, ICOD PLUS becomes more responsive to your needs and any particular features of your system.

Below is the complete list of modifiable parameters.

Modifiable ICOD PLUS parameters						
ICOD Manager				Values		
DATI ICOD	Icod Plus	SW		min.	std.	max
HW Release			r.	-	1,0	-
SW Release			r.	2,06	2,10	2,12
Number of Inputs			n.	8	-	48
ACK pulse width			ms	2	150	249
Time between 2 activations			ms	100	280	500
EV holding current			VDC	4	5,8	7,9
EV pulse width			ms	2	20	100
MV holding current			V	8,0	11,0	12,9
ACK pulse voltage			V	2,0	15,0	15,9
Minimum search current			mA	0,0	70,0	100,0
Maximum current			A	0,50	1,50	2,45
MV - EV delay			sec.	1	5	10
EV - EV delay			sec.	1	1	5
Open-circuit current			mA	0	10	100
Master valve			ON/OFF	-	ON	-
Change Password			-	-	0001	-
EV active time			Minutes	1	-	240

Description of the parameters

ACK pulse width

Parameter description

The ACK pulse width value is a functional parameter that affects the result of the automatic search.

Method for checking the parameter

This parameter can be checked only at our laboratory.

Guide to parameter modification

The standard value is 150 ms. If the automatic search is unsuccessful, increase the ACK pulse width value. If the automatic search finds more decoders than are actually present, reduce the ACK value. Before changing this parameter, it is advisable to consult with the Irritrol Engineering Department.

Operating problems due to incorrect parameter setting

Automatic search errors

Tips

Do not modify this parameter if not necessary.

Time between 2 activations

Parameter description

This parameter ensures that the MV and/or the CP are always active when ICOD PLUS goes from one station to the next.

Method for checking the parameter

This parameter can be checked only at our laboratory.

Guide to parameter modification

This parameter may only be modified by the Irritrol Engineering Department.

Operating problems due to incorrect parameter setting

The C/P and/or the MV are deactivated each time the station is changed if the standard value is increased. If the standard value is reduced, the change between one station and the next does not take place.

Tips

Never modify this parameter.

Holding current

Parameter description

The holding current value indicates the voltage on the electric cables leading to the solenoid and represents the energy necessary to excite the solenoid and consequent opening of the solenoid valve.

Method for checking the parameter

To check the holding current value in the field, use a common electrician's tester set to VDC with a full scale of 20 Volt. Connect the red/black test prods to the wires leading from the decoder while the corresponding station is active. The measurement can be considered correct if there is a variation of +/- 10% between the value set on ICOD and the value measured in the field,.

Guide to parameter modification

The standard value of 5.8 VDC is suitable for activation of the standard Irritrol solenoids (24 VDC-50 Hz absorption at a rush current of 0.34 Ampere- holding current absorption 0.20 Ampere).

Holding current modifications are hence necessary if solenoids with different technical features are used.

If the solenoid absorption is higher, reduce the holding current value, while if the absorption is lower, increase it. If you do not know the solenoid specifications, use a common electrician's tester set to Ohm with a full scale <200 Ohm, connecting the red/black prods to the wires that lead from the solenoid. Values of 35 Ohm (+/- 10%) refer to a standard solenoid. Higher values indicate a low-absorption solenoid, while lower values are typical of high-absorption solenoids. Progressively make all the modifications until identifying the value suitable for proper functioning.

Operating problems due to incorrect parameter setting

If the holding current values are lower than those required by the solenoid, ICOD may signal an "OPEN CIRCUIT". If the values are higher, "OVERLOAD" may be signalled.

Tips

Do not modify this parameter if not necessary.

EV pulse width

Parameter description

The EV pulse width value is a technical parameter related to the automatic decoder search function.

Method for checking the parameter

This parameter cannot be checked in the field.

Guide to parameter modification

Modify the standard value of 20 ms when the automatic search is not successful. If the system is equipped with more than 32 decoders and the ICOD automatic search is unable to identify them, the search sensitivity can be increased by increasing the value of the EV pulse width. In the case of a system with few decoders, especially if very close to ICOD, it may find more decoders than actually installed.

Therefore, reduce the search sensitivity by reducing the EV pulse width value.

Operating problems due to incorrect parameter setting

If the pulse width values are higher than those required by the system, ICOD may signal decoders not actually present. If the values are lower than those required by the system, ICOD may only partly or not at all identify the decoders installed.

Tips

Do not modify this parameter if not necessary.

MV - CP holding current

Parameter description

The holding current value indicates the voltage on the electric cables leading to the solenoid and represents the energy necessary to excite the solenoid and consequent opening of the solenoid valve.

Method for checking the parameter

To check the holding current value in the field, use a common electrician's tester set to VDC with a full scale of 20 Volt. Connect the red/black test prods to the wires leading from the decoder while the corresponding station is active. The measurement can be considered correct if there is a variation of +/- 10% between the value set on ICOD PLUS and the value measured in the field.

Guide to parameter modification

The standard value of 5.8 VDC is suitable for activation of the standard Irritrol solenoids (24 VDC-50 Hz. absorption at rush current 0.34 Ampere- holding current absorption 0.20 Ampere).

Holding current modifications are hence necessary if solenoids with different technical features are used.

If the solenoid absorption is higher, reduce the holding current value, while if the absorption is lower, increase it. If you do not know the solenoid specifications use a common electrician's tester set to Ohm with a full scale <200 Ohm, connecting the red/black prods to the wires that lead from the solenoid. Values of 35 Ohm (+/- 10%) refer to a standard solenoid. Higher values indicate a low-absorption solenoid, while lower values are typical of high-absorption solenoids. Progressively make all the modifications until identifying the value suitable for proper functioning.

Operating problems due to incorrect parameter setting

If the holding current values are lower than those required by the solenoid, ICOD PLUS may signal and "OPEN CIRCUIT". If the values are higher, "OVERLOAD" may be signalled.

Tips

Do not modify this parameter if not necessary.

ACK pulse voltage

Parameter description

The ACK pulse voltage value is a technical parameter related to the automatic decoder search function.

Method for checking the parameter

This parameter cannot be checked in the field.

Guide to parameter modification

Modify the standard value of 15 V if the automatic search is unsuccessful. If the system is equipped with more than 32 decoders and the ICOD PLUS automatic search is unable to identify them, the search sensitivity can be increased by increasing the value of the ACK pulse voltage. In the case of a system with few decoders,

especially if very close to ICOD PLUS, it may find more decoders than actually installed. Therefore, reduce the search sensitivity by reducing the ACK pulse voltage.

Operating problems due to incorrect parameter setting

If the ACK pulse voltage values are higher than those required by the system, ICOD PLUS may signal decoders not actually present. If the values are lower than those required by the system, ICOD PLUS may only partly or not at all identify the decoders installed.

Tips

Do not modify this parameter if not necessary.

Minimum search current

Parameter description

The minimum search current value is a technical parameter related to the automatic decoder search function.

Method for checking the parameter

This parameter cannot be checked in the field.

Guide to parameter modification

Modify the standard value of 70 mA if the automatic search is unsuccessful. If the system is equipped with more than 32 decoders and the ICOD PLUS automatic search is unable to identify them, the search sensitivity can be increased by decreasing the value of the minimum search current. In the case of a system with few decoders, especially if very close to ICOD, it may find more decoders than actually installed. Therefore, reduce the search sensitivity by increasing the minimum search current value.

Operating problems due to incorrect parameter setting

If the ACK pulse voltage values are higher than those required by the system, ICOD PLUS may signal decoders not actually present. If the values are lower than those required by the system, ICOD PLUS may only partly or not at all identify the decoders installed.

Tips

Do not modify this parameter if not necessary.

Maximum current

Parameter description

The maximum current value is a technical parameter related to the absorption ICOD PLUS can support.

Method for checking the parameter

To check the maximum current value in the field, use a common electrician's tester set to Ampere with a full scale of 10 Ampere. Connect the red/black test prods in series, one to one of the output terminals of ICOD PLUS and the other to the wire leading into the field. Caution: it might be necessary to move the red cable contact on the tester. The measurement can be considered correct if there is a variation of +/- 10% between the value set on ICOD PLUS and the value measured in the field.

Guide to parameter modification

Modify this parameter when you suspect that a decoder or a section of the line is in short-circuit. Proceed as follows. Increase the value up to 2 Ampere and check if the system functions in these conditions (do not run this test for more than 5 minutes). Start an irrigation section which you know works and visually check if another section is activated. If yes, the short-circuit involves that section (decoder or solenoid); replace the defective part. If no section activates unexpectedly, the short-circuit is in the line. In this case, progressively deactivate the electrical system until identifying by trial and error the point where the short-circuit is. After solving the short-circuit fault, reset the standard values.

Operating problems due to incorrect parameter setting

If the maximum current values are lower than those required by the system, ICOD may signal an "OVERLOAD" or "SHORT-CIRCUIT". If the values are higher than those required by the system, ICOD PLUS may be seriously damaged.

Tips

Do not modify this parameter if not necessary.

Delay between MV and EV

Parameter description

The delay value between MV and EV represents the time that elapses between opening of the master valve and opening of the solenoid valve.

Method for checking the parameter

Use a timer to measure the time that elapses between MV On and EV On.

Guide to parameter modification

Modify this parameter if you do not wish to force the pressurisation system (pump). When the pump starts - if the ducts are completely empty and the solenoid valve is open - a hydraulic moment is determined characterised by a very high flow rate and a low head and high energy absorption.

Operating problems due to incorrect parameter setting

Excessive delay values may generate high pressure in the system while short delay values may determine an increase in energy absorption of the electric pump.

Tips

Do not modify this parameter if not necessary.

Delay between EV and EV

Parameter description

The delay value between EV and EV represents the time that elapses between opening of one solenoid valve and the next.

Method for checking the parameter

Use a timer to measure the time that elapses between EV1 On and EV2 On.

Guide to parameter modification

Modify this parameter for systems with a low operating pressure. In these conditions, there is a risk that during closure the solenoid valve does not close completely when the pulse to another solenoid valve arrives. The first solenoid valve, as a result of partial opening of the second one, would no longer be able to close because of lack of minimum pressure. The second solenoid valve would however be able to open. The solution is to increase the delay time between one valve and the next.

Operating problems due to incorrect parameter setting

Excessive delay values may generate high pressure in the system, while short delay values may not allow hydraulic closure of the solenoid valves set to off.

Tips

Do not modify this parameter if not necessary.

Open-circuit current

Parameter description

This parameter acts on the open-circuit alarm.

Method for checking the parameter

This parameter can be checked only at our laboratory.

Guide to parameter modification

Decrease the value of this parameter to zero to deactivate the open-circuit alarm. Increase the value to increase the open-circuit sensitivity.

Operating problems due to incorrect parameter setting

If the values are higher than 10, unjustified alarms may occur, while when the value is zero, the alarm detec-

tion function is disabled.

Tips

Never modify this parameter if not necessary.

Master valve enabled

Parameter description

Indicates opening of the MV each time an EV opens.

Method for checking the parameter

This parameter can be checked only at our laboratory.

Guide to parameter modification

Never disable the MV, even if not used.

Operating problems due to incorrect parameter setting

If the MV was erroneously disabled, there might be operating problems with the ICOD PLUS system.

Tips

Never modify this parameter.

Change Password

Parameter description

Enter the password to access the modifiable parameter menu.

Method for checking the parameter

Note: Make a note of the password entered and give it only to the persons authorised to modify the operating parameters of ICOD PLUS!

If you forget the password, you can delete the PW entered by contacting the Irritrol Engineering Department.

Guide to parameter modification

To enter the PW and thus access the modifiable parameter menu, simultaneously press the three top keys (+)(+)(>). Enter the PW using the key (u) until the last digit, press the Station (+) key and enter the number (1). Then press the Valve (+) key to access the modifiable parameter menu.

The last parameter in the menu is "CHANGE PASSWORD", which can be modified by pressing the Cursor (u) key until arriving at the number to be modified. At this point, press the Station (+) key to enter the new number. Repeat the procedure for the remaining digits. When done, simultaneously press the three top keys (+)(+)(>).

In this way, the new password will be stored.

Tips

Do not modify this parameter if not necessary.

Entering and activating a cycle or a single zone in manual mode

Parameter description

Entering the minutes of activation associated with the station allows programming a manual irrigation cycle if necessary. This option allows you to in any case water the garden or cultures in the event of failure of the programmer.

Guide to parameter modification

To enter the irrigation time in minutes and associate it with the station number, access the modifiable parameter menu and follow the instructions below.

1. Simultaneously press the three top keys (+)(+)(>). Enter the PW using the key (>) until the last digit, press the Station (+) key and enter the number (1). Then press the Valve (-) key to access the modifiable parameter menu. A screen will appear showing the station number (1) and the minutes "000".

2. To modify the minutes press the Station (+) key. Each time the key is pressed, the minutes increase by 1. Enter the time in minutes (max 240 min.) corresponding to the desired duration of irrigation on station (1).
3. To go to the next station, press the Cursor (>) key until arriving at the station number to be modified. Enter the activation time following the instructions given under point "2".
4. Repeat the procedure described in points "2" and "3" to set the time in minutes for the remaining stations.
5. When done, simultaneously press the three top keys (+)(+)(>)
6. To activate an irrigation cycle, simultaneously hold down the two Cursor keys until the words "program active" appear on the display. The red LED "IRRI-ON" will come on at the same time. The cycle terminates at the end of irrigation of the last station.
7. To interrupt the irrigation cycle set on ICOD PLUS, simultaneously hold down the two Cursor keys until the words "program inactive" appear on the display. The red LED "IRRI-ON" will go off at the same time.

N.B. It will not be possible to use the Cursor keys to activate or deactivate an irrigation program set on the programmer connected to ICOD PLUS.

Open-circuit alarm: What to do?

A) If the open-circuit alarm is signalled by ICOD PLUS on all the zones, the problem lies between ICOD PLUS and the first decoder.

Therefore, check that the connection between ICOD PLUS and the line has been made according to the instructions in the installation manual. If the line has not been connected to the OUT terminal of ICOD or the connection is broken, restoring the connection will solve the open-circuit problem. If the problem persists after checking and correction, go to point 2.

Check that the connection between the line and the first decoder has been made according to the instructions in the installation manual. If the connection has not been made or the connection is broken, restoring the connection will solve the open-circuit problem. If the problem persists after checking and correction, go to point 3.

Using a common electrician's tester (multimeter) set to VDC with a minimum full scale of 50 VDC, check that the voltage on the black wires of the first decoder is 46 VDC (+/- 10%) while ICOD PLUS is active. If this value is lower than 41 VDC or there is no voltage, check the integrity of the electric cable in the section between ICOD and the first decoder as follows: disconnect the cables from the terminal board of ICOD PLUS and join them together (short-circuit them). Then, using a common electrician's tester (multimeter) set to Ohm with a minimum full scale of 200 Ohm and connected to the electric cable at the connection point to the first decoder, check that the resistance is between the interval indicated by the "Electric cable resistance" application contained in the 3 1/2" floppy provided. If the value is higher or infinite, check the integrity of the cable or replace the entire section. If the resistance value is correct, consult with the Irritrol Engineering Department.

B) If the open-circuit occurs in a certain zone (e.g. zone 12) and in all those following it (in terms of connection to the transmission cable), the problem lies in the section of line from zone 12 to the last.

Therefore, check that the connection between the 11th and the 12th zone is intact by using a common electrician's tester (multimeter) set to VDC with a minimum full scale of 50 VDC. The voltage on the black wires of the 12th decoder must be in the min/max interval while ICOD PLUS is active, calculated with the "ICODE Voltage Drop Calculation Program" application. If the value is incorrect, check the integrity of the cable in the section between the 11th and the 12th decoder. If the cable is intact, go to the next point.

If the value previously measured is correct, check the connection between the line and the decoders from the 12th to the last, also checking the connection between the decoders and the solenoids. If the problem persists, go to the next point.

Check the output voltage from the 12th decoder onwards (by disconnecting the solenoid connected to it) using the usual tester set to VDC with a full scale of 20 VDC. The correct value must not be different from that set on ICOD PLUS (5.8 VDC +/-10%). If it is higher or lower, replace the decoder (the new code must be entered in ICOD PLUS and associated with the respective zone). If the value is correct, replace the solenoid. If the problem persists, consult with the Irritrol Engineering Department.

C) If the open-circuit occurs only in a specific zone, for example zone 12 (it is advisable to always try to activate the following zones to check that it is not the case as described in B).

Check the connections between the main line and the decoder (black wires); if a wire is broken, restore the

connection; if everything is in order, but the problem persists, go to the next point.

Check the connections between the decoder and the solenoid; if you find a broken wire or a short-circuit, restore the connection; if everything is in order, go to the next point.

Check that the connection between the 11th and the 12th zone is intact by using a common electrician's tester (multimeter) set to VDC with a minimum full scale of 50 VDC. The voltage on the black wires of the 12th decoder must be in the min/max interval while ICOD PLUS is active, calculated with the "ICOD Voltage Drop Calculation Program" application. If the value is incorrect, check the integrity of the cable in the section between the 11th and the 12th decoder. If the cable is intact, go to the next point.

If the value previously measured is correct, check the connection between the line and the 12th decoder, also checking the connection between the decoder and the solenoids. If the problem persists, go to the next point. Check the output voltage of the 12th decoder (disconnecting the solenoid connected to it), using the usual tester set to VDC with a full scale of 20 VDC. The correct value must not be different from that set on ICOD PLUS (5.8 VDC +/-10%). If the value is higher or lower, replace the decoder (the new code must be entered in ICOD PLUS and associated with the respective zone). If the value is correct, replace the solenoid.

If the problem persists, consult with the Irritrol Engineering Department.

Short-circuit alarm: What to do?

The short-circuit alarm may occur if the line is in short-circuit at a point in the system very close to ICOD PLUS (max. 30 m).

Disconnect the line from ICOD PLUS (OUT terminals) and using a common electrician's tester (multimeter) set to Ohm with a minimum full scale of 20 Ohm, measure the line resistance starting from ICOD PLUS. If the value is that calculated with the "Electric Cable Resistance Calculation Program" application, consult with the Irritrol Engineering Department, otherwise go to point 2.

If the value measured is about 0 Ohm, the line is in short-circuit, therefore, check that the connections are correct in the first section, and if they are, disconnect the first section of the line from the rest of the system and check with the tester if the short-circuit persists. If the short-circuit reoccurs, replace the section of line in short-circuit, otherwise go to the next point.

Repeat the procedure described in point 2 for the following sections until identifying the section in short-circuit, then replace the cable. Caution: a decoder may also be in short-circuit, therefore, it is advisable to disconnect them from the line and check their functioning using the usual tester. If the value measured on the decoder is 0 Ohm, replace the decoder.

Overload alarm: What to do?

Generic alarm not related to a specific zone like for the open-circuit.

If the overload alarm is signalled during the first automatic decoder search, repeat the operation a few times without intervening in any way: the alarm will disappear as soon as the internal decoder capacitors have been charged.

If the overload alarm is signalled at a time other than during the automatic search, it indicates a problem with a decoder, the number (code) of which is indicated by ICOD PLUS. In this case, go to the faulty decoder and check that the connections leading from the decoder (red wires) are not in short-circuit, and if they are, restore the connections, otherwise go to point 3.

Disconnect the decoder from the solenoid and using a common electrician's tester (multimeter) set to VDC with a minimum full scale of 20 VDC, check the output voltage on the zone associated with the decoder in question with ICOD PLUS active.

The correct value must not be different from that set on ICOD PLUS (5.8 VDC +/-10%). If it is much higher, replace the decoder (the new code must be entered in ICOD PLUS and associated with the respective zone). If the value is correct, replace the solenoid. If the problem persists, consult with the Irritrol Engineering Department.

Problems during automatic search of the decoders: What to do?

If the overload alarm appears during this phase, see point 1 of the paragraph "Overload alarm".

If the message "NO DECODER FOUND" appears, retry three or four times and if the problem persists, carry out the following checks.

Check the connection of ICOD PLUS to the transmission line as described in point 1 of the paragraph "Open-circuit alarm", and if everything is in order, go to the next point.

Manually enter the decoder code and then try and activate the zone. If ICOD PLUS activates it, change the "pulse width", "minimum search current" and "ACK pulse voltage" parameters according to the instructions of the service technician of Irritrol Systems Europe. If ICOD PLUS does not activate it, check if there is voltage on the OUT terminals of ICOD while it is inactive. If there is voltage, contact the Technical Service Centre.

If the problem could not be solved by changing the above mentioned parameters, a short-circuit may have occurred during the automatic search. In this case, ICOD PLUS is damaged and not repairable if not by the Technical Service Centre of Irritrol Systems Europe.

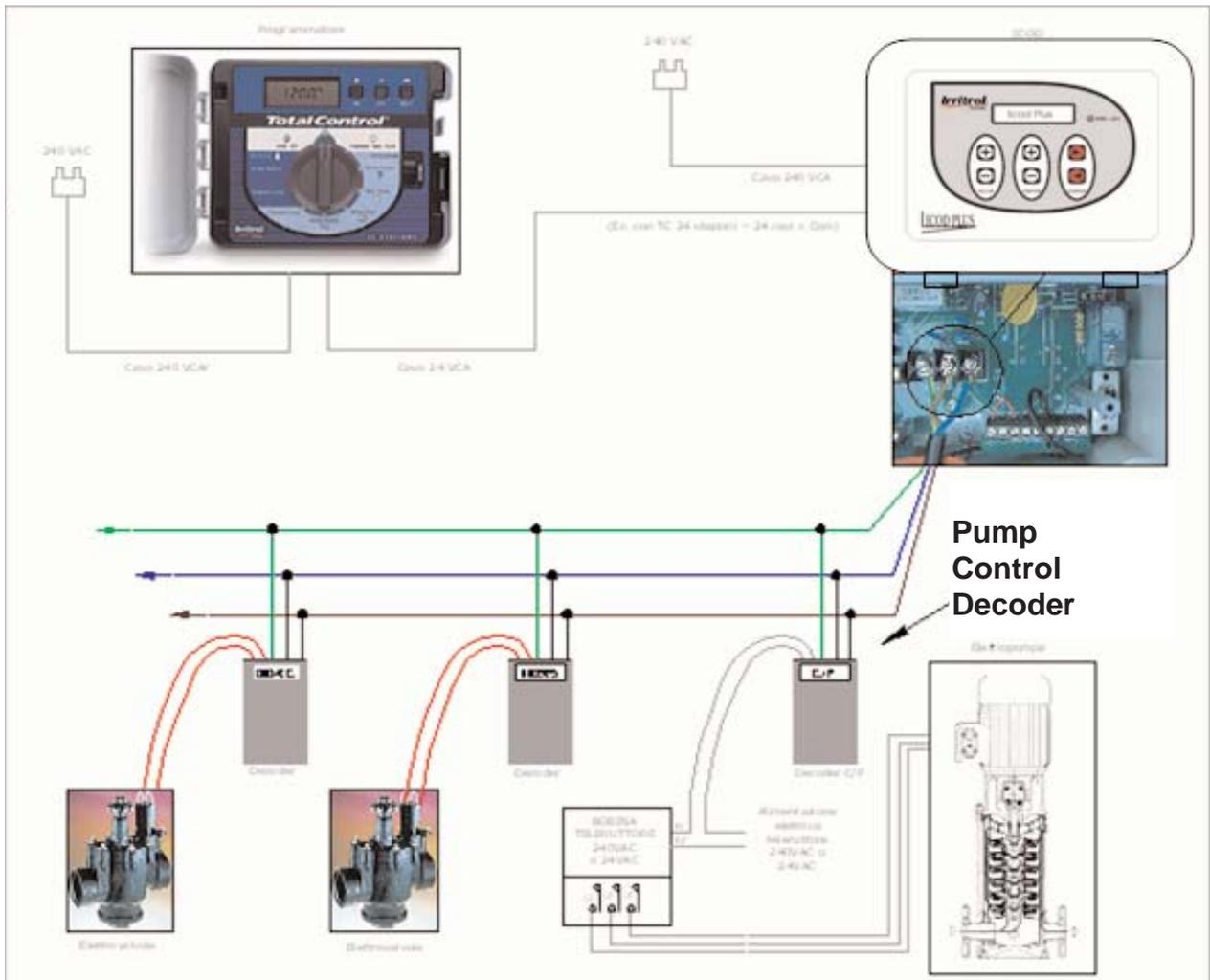
To prevent this damage, it is prohibited to work on the terminal board while the automatic search is running, and pay the utmost attention when connecting the transmission line.

Warnings

In order to ensure the safety of the people working with the ICOD PLUS control unit, we advise you scrupulously follow the warnings listed below.

Our company declines all responsibility for damage to persons or things caused by inobservance of the following warnings:

- The device must be stored and installed in a place not accessible to inexperienced users or children.
- The control unit must be assembled and set up for operation by skilled personnel who are aware of the risks that may arise during installation.
- Disconnect the power cables from the mains before making the connections in the control unit.
- Make sure that your hands and feet are not wet before carrying out any type of operation on the ICOD PLUS control unit and the external electrical system.
- Having made the connections, use a screwdriver to close the front panel of the control unit and only then reconnect the power cable to the mains.
- Where possible, install the control unit in a place protected against direct exposure to the sun.
- Do not install the control unit near sources of heat.
- Do not install the control unit near antennas or radio-frequency transmission systems.
- Before starting the control unit, make sure that the systems connected to it have been set up in "WORKMANLIKE" manner in conformity with the mandatory technical standards and legislation of the country where the installation is made.
- In the event that the protection fuses blow, disconnect the power cable from the mains before replacing the fuses.
- Disconnect the power cable from the mains before carrying out any repair work inside the device.
- Disconnect the power cable from the mains before making any modifications to the connections inside the device.
- It is prohibited to make modifications of any kind to the ICOD PLUS control units



Pump control connection diagram

Form for recording the decoder units (1 - 48 sections).

Icod Plus Module 1					
Station	Brief description for identification of the irrigation area	Decoder 1	Decoder 2	Decoder 3	Decoder 4
1					
2					
3					
4					
5					
6					
7					
8					

Icod Plus Module 2					
Station	Brief description for identification of the irrigation area	Decoder 1	Decoder 2	Decoder 3	Decoder 4
9					
10					
11					
12					
13					
14					
15					
16					

Icod Plus Module 3

Station	Brief description for identification of the irrigation area	Decoder 1	Decoder 2	Decoder 3	Decoder 4
17					
18					
19					
20					
21					
22					
23					
24					

Icod Plus Module 4

Station	Brief description for identification of the irrigation area	Decoder 1	Decoder 2	Decoder 3	Decoder 4
25					
26					
27					
28					
29					
30					
31					
32					

Indicate for each irrigation station the identification code of the decoder installed (note: if several decoders have been attributed to a single irrigation station, make a note of their code in the boxes Decoder 2,3,4).

Icod Plus Module 5

Station	Brief description for identification of the irrigation area	Decoder 1	Decoder 2	Decoder 3	Decoder 4
33					
34					
35					
36					
37					
38					
39					
40					

Icod Plus Module 6

Station	Brief description for identification of the irrigation area	Decoder 1	Decoder 2	Decoder 3	Decoder 4
41					
42					
43					
44					
45					
46					
47					
48					

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