AUTOMATED IRRIGATION SYSTEM Model AIS V1 KIOUR

DESCRIPTION

AIS is an electronic device which controls water pumps and solenoids via three relays. It is designed for automated irrigation applications and controls in general a water supply network. **Up to 255 AIS** devices can be used to **manage up to 5 water pumps and control more than 700 irrigation points of a full water supply network**. The maximum distance between two **AIS** devices can be 1 km creating a **water network around 250km.** The network is modbus RS485 and can be independent or operated via a PC. **AIS** device has five irrigation programs and three relays with fully adjustable settings to control water pumps and solenoids.

If a power cut occurs, all device's ongoing timers are reset. When the power recovers, all timers start counting from the beginning. To avoid the aforesaid process, a UPS is mandatory.

FUNCTIONING DESCRIPTION

AIS has five independent irrigation programs. Every program has its own parameter block which can be programmed for a specific irrigation procedure. For example, the program No.1 has the parameters from 3 to 17 as described on the parameter's table. If any of the programs overlap each other, they will successively execute, not simultaneously.

The device is adjusted via the parameter **noS** in three different operation modes: 1) **MASTER,** where the device controls the entire operation of the network, 2) **SLASTER**, where the device operates as MASTER but only in a **PC** network and 3) **SLAVE,** where the device executes orders coming from the MASTER or SLASTER device.

ADJUSTING THE DEVICES TO PERFORM ON A NETWORK

1. Initially we adjust the operation mode of every device on the network via the parameter **noS.** Only one **MASTER** or **SLASTER** can perform on the network, which controls the irrigation programs. All the others must be **SLAVE** devices.
2. In the **MASTER** or **SLASTER** device, the parameter **Add** is set to the **amount** of the **SLAVE** devices on the network. In **SLAVE** devices the same parameter is set to the address of each device on the network, ex. 1, 2, 3, 4, etc.
3. In the **MASTER** or **SLASTER** device, the parameters **n1P** to **n5P** is set**,** for each program, to the **total amount of irrigation points (water solenoids) on the network.** The water pump is not included in this amount.
4. Time between two successive repetitions of a program must be adjusted in hours and minutes via the parameters **H1, nn1 ..., H5, nn5** for each program and only in the **MASTER** device. When timers are adjusted and we exit the parameter's menu, two operations occur: i) irrigation cycle of all programs starts based on the parameter's list and ii) the timer between two successive repetitions of a program starts counting.
5. In each device, through the parameters **i21, i22, i23** of program No.2 for example, we set the **address of each irrigation point on the network**. If we have 7 irrigation points in program No.2, we need 3 AIS devices. Using the parameters **i21, i22, i23** of the 3 devices we set the address of each of the 7 irrigation points, ex. Device 1: i21=**1**, i22=**2**, i23=**3** / Device 2: i21=**4**, i22=**5**, i23=**6** / Device 1: i21=**7**, i22=0, i23=0
6. In any device on the network, we can assign a relay to control a **water pump** through the parameters **P11, P12, P13**. For example, we want to control a pump using the relay 1, so we adjust **P12=1 and I12 = 0**.
7. Finally, every relay corresponding to an irrigation point must have an adjusted timer in hours and minutes. These are programmed through the parameters **t11, S11, … , t13, S13** for the corresponding program.

PC NETWORK - DEVICE PROGRAMMING

In case of wanting to control the irrigation network via a PC network we should convert the MASTER device to SLASTER by programming the parameter **noS = 2.** Every device is connected to the RS485 network via an interface **NET-INS-485.**

ADDITIONAL OPERATIONS

1) Manual start-up of a program: By pressing [**SET**] for 3 seconds, the indication "**P_1**" appears on screen which corresponds to program No. 1. With the [▲], [▼] we choose one of the five programs and press [↵] to **activate** it. By pressing [**SET**] we **cancel** the procedure.

2) Toggle between different irrigation points: During the irrigation process, by pressing [▲] for 3 sec, we close the active irrigation point (relay connected to water solenoid) and open the next one.

3) End of irrigation process: the irrigation process can be terminated by pressing [▼] for 3 sec.

4) When the **water pump** is ON, the indication ⟲ is displayed on all network devices. Additionally, on all network devices the irrigation point which is activated is displayed.

PROGRAMMING THE PARAMETERS

By pressing [↵] we **enter** or **exit** the parameter's menu. The first parameter "**Cod**" is displayed.
By pressing [**SET**] the value of the parameter is displayed and with the [▲], [▼] we adjust the value to "22" to unlock the parameters.
By pressing [↵] we **confirm** the new value and the name of the parameter is displayed.
By pressing [**SET**] we **cancel** the new value and return to the parameter's name.

TECHNICAL SPECIFICATIONS

Power supply: 12VAC/DC ± 10% - Maximum power consumption: 3W
It is recommended using a power supply safety fuse 0.5A (not included)
Serial input – Three relays 250VAC 10 A
Operating temperature: -15÷+55°C – Storage temperature: -20÷+80°C
The device is mounted on Ω rail – Connections with terminal blocks 18A

PARAMETER TABLE

	#		Description	min	max	AIS	UOM
GENERAL	1	**Cod**	code to enter parameter's menu **Cod = 22**	0	255	0	-
	2	**noS**	Operation of device on network, where **noS=0 slave, noS=1 master, noS=2 slaster** (operates only a PC network, where only one SLASTER can exist and all the MASTER functions are applied)	0	2	0	-
PARAMETERS OF PROGRAM No. 1	3	**n1P**	**Number of irrigation points** – how many relays are connected to water solenoids	1	255	0	-
	4	**H1**	**Time between two successive repetitions of program No. 1 in hours**	0	255	0	hours
	5	**nn1**	**Time between two successive repetitions of program No. 1 in minutes**	0	255	0	min
	6	**i11**	**Relay 1** address (irrigation point) on network	0	255	0	-
	7	**i12**	**Relay 2** address (irrigation point) on network	0	255	0	-
	8	**i13**	**Relay 3** address (irrigation point) on network	0	255	0	-
	9	**P11**	Relay 1 works in pump mode, where **P11 = 0 pump control OFF** or **P11 = 1 pump control ON**	0	1	0	-
	10	**P12**	Relay 2 works in pump mode, where **P12 = 0 pump control OFF** or **P12 = 1 pump control ON**	0	1	0	-
	11	**P13**	Relay 3 works in pump mode, where **P13 = 0 pump control OFF** or **P13 = 1 pump control ON**	0	1	0	-
	12	**t11**	Operation time of relay No. 1 in minutes	0	250	0	min
	13	**S11**	Operation time of relay No. 1 in seconds	0	60	5	sec
	14	**t12**	Operation time of relay No. 2 in minutes	0	250	0	min
	15	**S12**	Operation time of relay No. 2 in seconds	0	60	5	sec
	16	**t13**	Operation time of relay No. 3 in minutes	0	250	0	min
	17	**S13**	Operation time of relay No. 3 in seconds	0	60	5	sec
PR. 2	18	**n2P**	Number of irrigation points – how many relays are connected to water solenoids	1	255	0	-
	…	…	…	…	…	…	-
	32	**S23**	Operation time of relay No. 3 in seconds	0	60	0	sec
PR. 3	33	**n3P**	Number of irrigation points – how many relays are connected to water solenoids	1	255	0	-
	…	…	…	…	…	…	-
	47	**S33**	Operation time of relay No. 3 in seconds	0	60	0	sec
PR. 4	48	**n4P**	Number of irrigation points – how many relays are connected to water solenoids	1	255	0	-
	…	…	…	…	…	…	-
	62	**S43**	Operation time of relay No. 3 in seconds	0	60	0	sec
PR. 5	63	**n5P**	Number of irrigation points – how many relays are connected to water solenoids	1	255	0	-
	…	…	…	…	…	…	-
	77	**S53**	Operation time of relay No. 3 in seconds	0	60	0	sec
	78	**trE**	Time response of the device to the **network**	0	100	40	msec
	79	**Add**	**Device's address** on network	0	255	0	-

ALARM TABLE

1	🔧	The **MASTER** device controls which irrigation point (relay) is ON or OFF. When the order is not executed, this symbol turns ON and the number of the irrigation point starts flashing on screen.
2	⚠	When the communication between the **MASTER** device and this **SLAVE** device is lost, this symbol turns ON and the device's address starts flashing on screen.

EXAMPLES OF PROGRAMMING THE PARAMETERS

There are 10 irrigation points (relays), so we need 4 **AIS** devices. One will be the **MASTER** device and the others **SLAVE**.

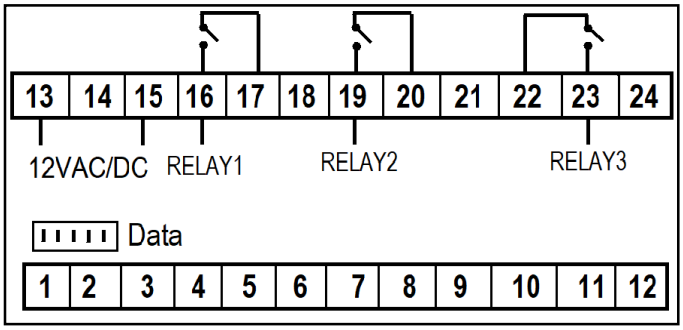
Adjusting the parameters of program 1:
10 irrigation points and 1 water pump.
The pump is connected to relay 1 of the **SLAVE** device with address 1.

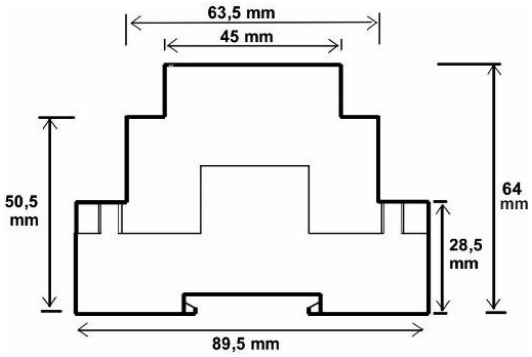
	Parameters	MASTER device	SLAVE 1 device	SLAVE 2 device	SLAVE 3 device
1	noS	1	0	0	0
2	n1P	10	0	0	0
3	H1	12	0	0	0
4	nn1	0	0	0	0
5	i11	1	0	6	9
6	i12	2	4	7	10
7	i13	3	5	8	0
8	P11	0	1	0	0
9	P12	0	0	0	0
10	P13	0	0	0	0
11	t11	15	0	15	15
12	S11	0	0	0	0
13	t12	15	15	15	15
14	S12	0	0	0	0
15	t13	20	15	15	0
16	S13	0	0	0	0
...	....	....	.....	.....	.....
79	Add	3	1	2	3

Adjusting the parameters of program 2.
We can adjust less irrigation points, ex. 5 points and a second water pump on relay 3 of SLAVE device with address 3.

	Parameters	MASTER device	SLAVE 1 device	SLAVE 2 device	SLAVE 3 device
1	noS	1	0	0	0
...	...	...	...	...	...
18	n2P	5	0	0	0
19	H2	12	0	0	0
20	nn2	0	0	0	0
21	I21	0	0	1	4
22	I22	0	0	2	5
23	I23	0	0	3	0
24	P21	0	0	0	0
25	P22	0	0	0	0
26	P23	0	0	0	1
27	T21	15	0	15	15
28	S21	0	0	0	0
29	T22	15	15	15	15
30	S22	0	0	0	0
31	T23	20	15	15	0
32	S23	0	0	0	0
...	....	....	.....	.....	.....
79	Add	3	1	2	3

CONNECTIONS - DIAMENSIONS





INDICATIONS AND BUTTON OPERATIONS

indications	operation
	pump ON
	malfunction ON

button	operation
	Enter parameter's menu
	Down arrow
	Up arrow
SET	Set

Made in Greece.

ATTENTION to prevent electrostatic discharges at the side slots of the device and sharp objects from been inserted.
ATTENTION: separate the signal's cables from the power supply's cables to prevent electromagnetic disorders. Signal cables must never be in the same pipe with the power supply cables.

Read and keep these instructions.

The device is under two year's guarantee of good operation. The guarantee is valid only if the manual instructions have been applied. The control and service of the device must be done by an authorized technician. The guarantee covers only the replacement or the service of the device.

KIOUR preserves the right to adjust its products without further notice.