

FLOOD ALARM MV SYSTEM



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DESCRIPTION

The anti flood system is able to avoid expensive damages caused by water leaking.

The system is formed by a control unit (C.U.), a motorized valve and one or more water detecting\temperature sensors. Sensors and control unit communicate by using radio waves, so the installation of data wires is not needed.

It is possible to adapt the system to specific application by setting operational parameters via a NFC communication interface. For this purpose the smart phone App “**LC Param Manager**” has been developed to be used with an Android phone equipped with a NFC antenna.

The App is downloadable from **Google Play Store**.

CONTROL UNIT INSTALLATION

Warning! Work on electrical connection only after the supply voltage has been switched off.

The (IP 54) control unit enclosure is suitable to be inserted inside junction boxes or fixed to a wall with screws or glue. To reach the terminal blocks, remove the 4 screws which hold the orange protection covers. The 2 pole terminal block has to be connected to the power supply (80 - 240V AC) following line and neutral symbols, The 3 pole terminal block has to be connected to the motorized valve (240V, max 200mA).

Fig.1 depict the connection scheme printed also on the sticker on top of the control unit, where:

Supply: F= Line wire, N= Neutral wire,

Motorized valve: Fc= Closing valve wire, Fo= Opening valve wire, N= Neutral wire

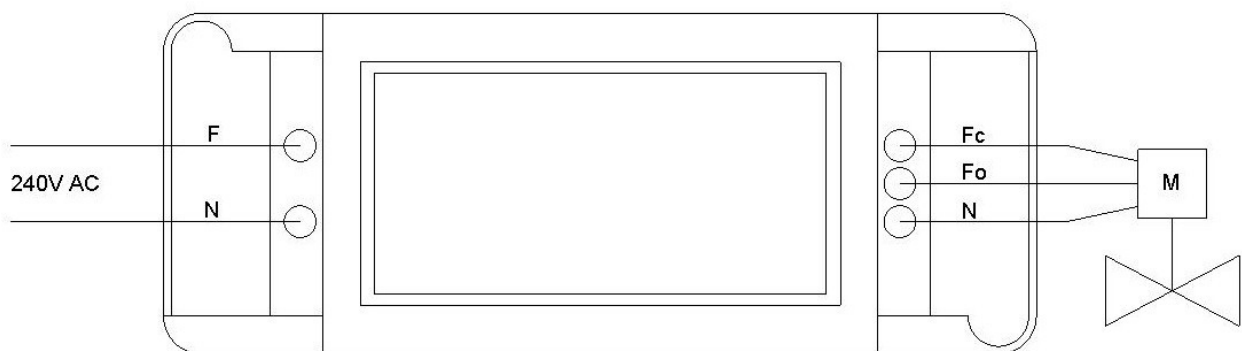


Fig. 1

Once the control unit is connected to the power supply it's possible to register a sensor. The control unit can manage up to 8 sensor. It's possible to check the correct operation of the motorized valve entering the manual mode: “*Start NFC Connection*” → “*SETUP MENU*” → “*Manual override*”, in this mode it is possible to execute **open/close/stop** command so that it's possible to verify that the movements correspond to the commands.

N.B. In manual mode, alarm signals from sensors are not acknowledged; it is necessary to reset the control unit to auto mode pressing the “*Return to Auto Mode*” to resume the normal operation.

To prevent ball valve sticking, when the valve is in open position, the control unit periodically close partially and reopen the valve. The frequency (actually period) and activation of this procedure is set with the **UNLOCK INTERVAL TIME** parameter. **UNLOCK CLOSE TIME** parameter is the closing time of the valve during the procedure and has to be set to obtain a partial closure of the valve, so avoiding water flow temporary interruption.

Sensor registration

Sensors supplied with the control unit are registered at the factory so registration is not needed unless they have to be connected to another control unit.

To register a new sensor start the app and push the “*Start NFC Connection*”, then put in contact your phone antenna with the top surface of the control unit where the NFC symbol is. After a few moments, the device records will appear on the screen together with buttons to access the general settings menu. To proceed, push the “*Device Registration*” button and again put in contact your phone with the NFC symbol on the sticker to get access to the sensor registration menu where it's possible to register up to 8 sensors. It's possible to register a new sensor on any free available position

(marked in the column “Status” by “N.U.”) and name a sensor with the corresponding room selectable from the “spinner” in the Sensor column.

At the end of room name list appears “**WiFi Server Bridge**” that if selected permit the registration of “WiFi server bridge 433” for remote control of the system via internet.

To proceed with the registration, select the desired position pushing the “radio button” in the last column and then the “Register” button. Now the control unit LED begin to blink yellow for a few seconds allowing registration of a new sensor which is achieved by pushing the sensor button for about 3 seconds.

Registration is confirmed by the sensor with a series of 4 green blinks. If the sensor was previously registered to another control unit, it's necessary to erase the previous registration, before attempting a new registration.

N.B. If when pushing the sensor button it immediately emits a single yellow blink, it means that the sensor was already registered and to be registered again, the previous registration need to be erased.

To do that you need to push the button for about 10 seconds, until the green LED start to blink, release the button and push it again for about 10 seconds, until the red LED blinks briefly.

Sensor is erased if when pushing the button a yellow blink appears after about 3 seconds.

SENSOR INSTALLATION

The flood sensor is composed of a plastic enclosure which contains the electronic circuit powered by 2 AAA batteries and a “probe” connected with a small cable. Before the sensor installation it's appropriate to test the radio connection of the sensor to the CU pushing the button with the sensor on the installation position. The connection can be retained good if pressing the button several times at a distance of a few seconds the led doesn't blink yellow and the buzzer doesn't beep. The probe has to be installed directly against the floor surface in the area to be checked and the enclosure on the wall over the probe, see *fig. 2*. Probe and enclosure can be fixed with screws or glue.



fig. 2

VALVE INSTALLATION

The valve is to be installed on the main water supply pipe inside the house so it can stop water flow entirely in case of leaks. The motorized valve must not be considered as a replacement for the manual valve and is to be installed down-line of the manual valve so the water flow can be stopped manually in any case.

SYSTEM OPERATION

When water reach the probe electrodes, after the time “*FLOOD SENSOR DELAY*”, a flood alarm signal is sent to the control unit, which immediately close the valve. Insurgency of the flood alarm is signaled by the sensor with 3 red LED blinks and 3 buzz impulses of duration specified by the “*TIME BUZZ PULSE*” parameter.

The flood alarm subside when water presence is no longer detected for a time longer than “*FLOOD SENSOR DELAY*”. With sensor/s in alarm mode valve opening can be done by pushing the sensors button for among 2 second . In case of an active flood alarm, if the button is pushed, it generate 3 red flash and 3 buzzer burst followed by the led signaling the the valve state.

The state of the valve is signaled both by the LED of the control unit and by the sensor (following a single push of the button) with the following coloring:

- green = valve open,
- flashing green= opening valve,
- red= valve closed,
- flashing red = closing valve,
- flashing red/green alternately= valve in a halfay/undetermined position.

It is possible to manually operate the valve from both the App and sensor, a single push of the button allow to verify the valve position by flashing the sensor led according to the above coloring.
An extended (about 2 seconds) push of the button opens or closes the valve.
Care must be taken to open the valve when there is a flood alarm signaling.
To move the vale from the App read the "CONTOL UNIT INSTALLATION" paragraph.

Low temperature alarm

With the "*ENABLE TEMP ALARM*" parameter it's possible to enable temperature monitoring of the ambient temperature and close the valve to avoid damages caused by pipe bursting.

Permitted values for the parameter are the following:

0= alarm disabled, valve is not closed for low temperature nor the alarm get signaled.

1= alarm enabled, valve get closed automatically when temperature detected by the sensor < **LOW TEMP SET** and can only be re-opened manually.

2= alarm enabled , valve get closed automatically when temperature detected by the sensor < **LOW TEMP SET** and reopen automatically when temperature detected by the sensor >= **LOW TEMP SET + 1°C** , anyway it can be reopened with a manual command.

Connection alarm

In case the communication between control unit and sensors is lost (e.g. sensor with flat batteries), the connection alarm arise after a maximum delay time **CONNECTION INTERVAL**.

With the **EN. CONNECTION ALARM** parameter it's possible to select different behaviours for this kind of alarm:

0= alarm disabled, no action taken;

1= If alarm active, valve get closed and can be reopened only manually.

2= If alarm active, valve get closed and re-opened automatically when communication is re-established.

Connection alarm get detected after a maximum time equal to **SLEEP TIME** and signaled with a periodic buzzer impulse and red light impulse.

The automatic reopening of the valve is not permitted if the valve has previously been closed with a manual command or by a flood alarm.

CONTROL UNIT LED SIGNALING

-Open valve: green led

-Opening valve without alarms: green flashing led

-Closed valve: red led

-Closing valve: red flashing led

-Valve in a halfway/undetermined position: flashing red/green alternately

-Control unit in registration mode: yellow flashing led

SENSOR SIGNALING

-Flood alarm: triple buzz burst and triple red light flashing

-Temperature alarm: double buzz burst

-Connection alarm: single buzz

Following a single button push, sensor signal for about 1 second the state of the valve in the following way:

-Closed valve: steady red light

-Closing valve: flashing red light

-Open valve: steady green light

-Opening valve: flashing green light

-Valve in a halfway/undetermined position: flashing red/green alternately

-If alarms present: 1,2, 3 buzzer burst for connection alarms, temperature alarms and flood alarm respectively, followed by valve state signaling, like specified above.

-Connection attempt failed: one quick yellow light flash.

ANDROID App

Possible setting of the control unit, take place via wireless by means of a smartphone and Near Field Communication (NFC) technology.

To access the App menus, push "Start NFC Connection" button, place the phone on top of the C.U. enclosure where the

NFC symbol is and then push the “SETUP MENU” button.

Other buttons will appear, some to access parameters setting menus (“**Parameter setting**” **Radio setting**” “**Security setting**”); one to access commands to move the valve directly with the phone “**Manual override**”

(**Warning:** When in “Manual mode” the control unit ignores commands from sensors); and one to check state and temperature of the sensors (“**Alarm monitor**”).

N.B. Each time is required by the app, the phone NFC antenna need to be put in contact with the top of the C.U. enclosure overlapping the NFC symbol. Correct data saving get confirmed each time by the app.

PARAMETERS MANAGEABLE BY THE APP

	PARAMETERS	Min-Max	Default values	DESCRIPTION
1	FLOOD SENSOR DELAY	1 - 250	10	[Seconds] flood alarm activation/deactivation delay time, from flood detection.
2	MAX MOTOR ON TIME	1 - 250	30	[Seconds] maximum permitted activation time of valve motor
3	CONNECTION INTERVAL	1 - 24	4	[Hours] connection test & temperature measurement time interval.
4	ALARM CONN. INTERVAL	1 - 60	20	[Minutes] connection test & temperature measurement time interval, when an alarm is active.
5	UNLOCK CYCLE TIME	1 - 30	7	[Days] anti valve-sticking procedure time interval. Every “UNLOCK CYCLE TIME” the valve get partially closed an reopened to prevent sticking, 0= function disabled.
6	UNLOCK CLOSE TIME	0 - 250	5	[Seconds] valve activation time to perform a partial closure.
7	LOW TEMP SET	0-10 °C/ 32-50 °F	5°C/40°F	[C°]/[°F] temperature under which the low temperature alarm get activated.
8	BUZZ PULSE TIME	0 - 10	5	[ds] duration of sound impulse emitted in case of alarm; 0= buzzer disabled.
9	ENABLE TEMP ALARM	0 - 2	0	Low temperature alarm enable for ambient temperature lower than “ LOW TEMP SET ” 0= disabled; 1= enabled, valve automatic closing; manual opening 2= enabled valve automatic closing and reopening when ambient temperature reach “ LOW TEMP SET ” + 1°C or 1°F.
10	ENABLE CONN. ALARM	0 - 2	0	Connection error alarm enable. Valve get closed in case of a connection error on a sensor: 0= disabled, 1= enabled, valve automatic closing; manual opening 2= enabled valve automatic closing and reopening when connection is re-established
11	BASE TX POWER	4 - 5	5	Control unit transmission power (1=+2 dB, 2=+5 dB, 3=+8 dB, 4=+13 dB, 5=+20 dB).
12	SENSOR TX POWER	4 - 5	4	Sensor transmission power (1=+2 dB, 2=+5 dB, 3=+8 dB, 4=+13 dB).
13	CHANNEL SEL MODE	0 - 2	0	Radio channel selection: 0= default, 1= programmed, 2= random automatic selection.
14	PROG. CHANNEL	10 - 36	30	Programmed channel selection. Used only if parameter CHAN SEL MODE =1 (Frequency= 433,1MHz + PROG CHANNEL * 20KHz)
15	ADDRESS BYTES	2 - 8	2	Address byte number
16	SECURITY BYTES	4 - 16	4	Security byte number
17	°C/°F SELECTION	0 - 1	0	Temperature unit of measurement: 0 = C°, 1 = °F.

PASSWORD

It's possible to set a password from the App to block parameter modification and new sensors registration.

PW setting can be done from **MENU->SET UP MENU->Change password.**

N.B. If a new password needs to be activated leave empty the textfield "Current Password", if instead the password has to be deactivated leave empty textfields "New Password" and "Re-type Password". If the password needs to be changed fill all the textfields.

In case of lost password it is possible to reset it by pushing the button that appears on the App screen under the "DEVICES REGISTRATION" button. This reset button is normally hidden, to un-hide it, repeat 3 consecutive cycles of power OFF and power ON of the control unit, within a 30 second time window.

A password reset imply also the cancellation of the address & cipher key of the device, therefore a new registration of the associated sensors is required.

DIGITAL SECURITY OF THE CHANNEL

The parameters "ADDRESS BYTES" & "SECURITY BYTES" are dedicated to adapt the digital security level.

The default values ensure an adequate security for most applications, so their modification is not necessary.

CONTROL UNIT INTERNET MONITORING

The control unit can be monitored with a smartphone or a PC using the "WiFi Server bridge 433" device.

There is no need to install specific app or program, a common internet browsers (Firefox, Chrome, Opera) is simply necessary for the purpose.

The "WiFi Server bridge 433" can also send an alarm onset message to a PC or smartphone connected to internet using the well-known "bot" service of "Telegrame".

The detailed description can be downloaded from the downloads folder of the site "www.lorencontrols.eu".

BATTERIES REPLACEMENT

The sensor is powered by two AAA batteries. To replace batteries, open the enclosure with a flat blade screwdriver by inserting the screwdriver head in the 2 holes corresponding to the elastic clips and force the clips out (see *fig.3*).

Remove then the bottom cover and pull the red ribbon to extract the batteries, insert new batteries and re install the cover by inserting the two protrusions of the bottom cover inside the two holes of the top cover first and then pushing the two elastic clips into their holes.

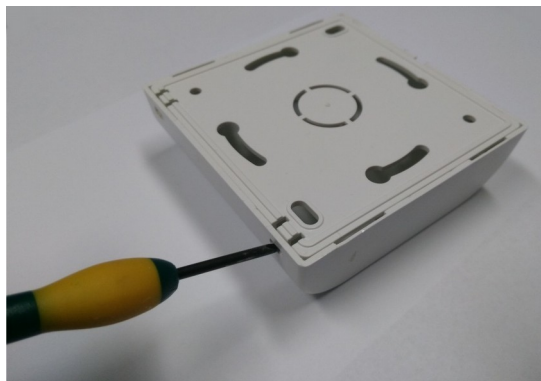


fig. 3

TECHNICAL DATA

Control unit	
Supply	80 — 240 VAC 50/60Hz
Short circuit protection	Fuse 5x20 0,5 A F
Overload protection	PTC fuse 200mA
Standby power consumption	~ 0,15 W
Parameters Read / Write	NFC port prot. IEC 14443 Type B
RF frequency band	ISM 433 MHz
RF power signal	< 10dB mW
Supported sensors number	Max 8
RF connection protocol	Proprietary
Enclosure measures	29x45x115 mm
Weight	~ 90 gr.
Enclosure protection	IP54
Operating temperature	-10 — +50°C
Operating relative humidity	10 — 80 % not condensing
Sensor unit	
Dimensions	80x80x25 mm
Weight	~ 50gr
Enclosure protection	IP54
RF frequency band	ISM 433 MHz
RF power signal	< 10dB mW
Radio range*	10 / 50 m
Battery type	2xAAA
Battery life * *	> 5 anni
Operating temperature	-10 — +50°C
Operating relative humidity	5 — 80 % not condensing
2 way motorized valve	
Hydraulic connections (internal thread)	1" (DN25) , ¾" (DN20)
Motor enclosure protection	IP65

Supply voltage	230V(+/- 10%) 50/60Hz
Power adsorbed (during Opening /Closing)	6W
Closing /Opening time	~ 15 s
Max momentum	4 Nm
Operating temperature	+2 — +90°C
Max operating pressure	16 bar
Weight	~ 0,6 Kg

* the range depend on the number and type of obstacles between sensors and control unit.

** with default parameter selection (initial values as in parameter table)

WARRANTY

The warranty period of 2 years start on day of purchase.

Warranty doesn't cover damages caused by:

- wrong installation,
- failure to observe these instructions,
- tampering, modifications o reparation attempt,
- wrong use,

- failure to observe safety regulation in force,
- majeure force (e.g. over voltages, fire etc.)

Warranty does not include direct or indirect damages due to device defects, or costs derived from installation or removal labor.

In case of malfunction will be our liberty to choose if to replace, fix or refund the cost of the device.

CONTROL PARAMETERS READ WRITE WITH SMARTPHONE

To obtain a connection between smartphone and control unit, take the following steps:

- 1- Make sure the control unit is connected to AC power source (led on).
- 2- Start the dedicated Android application downloadable at <http://www.lorencontrols.eu>
- 3- Push the "Start NFC Connection" button, under the "Loren Controls" logo.
- 4- Like asked by the message on the screen, place the phone on top of the C.U. enclosure where the NFC symbol is.
- 5- If the connection is activated, another screen will appear, showing Software/Hardware data and 2 buttons.
The first button "SET UP MENU" access the parameter setting menu and the second button "DEVICE REGISTRATION" access the sensor registration screen (check next paragraph to see phone screenshots).
If connection fail an error message appears.
- 6- To proceed with the parameter read/write or a new sensor registration push the dedicated buttons and place the phone on the C.U. enclosure like described above.

ANDROID SMARTPHONE APP SCREEN SEQUENCES

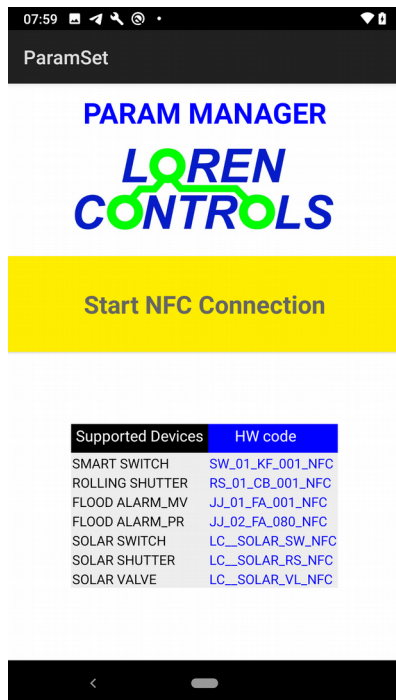
Shown below are some screenshots of the app dedicated to the management of parameters.

The device is supplied with a set of default values.

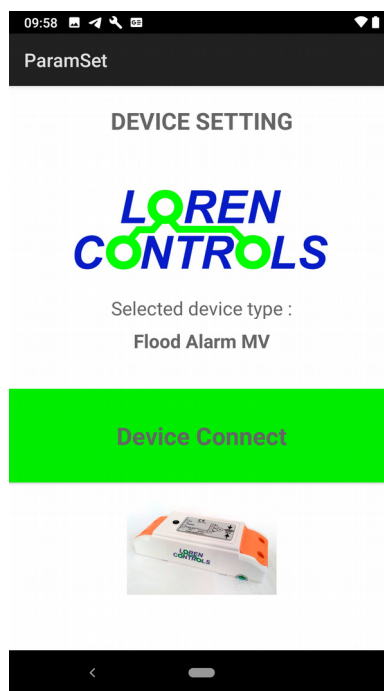
It is possible after parameters have been changed, to restore their default value by pushing the “reset default values” button and then saving those values.

The table of the start up screenshot list the Loren Controls devices managed by the android application.

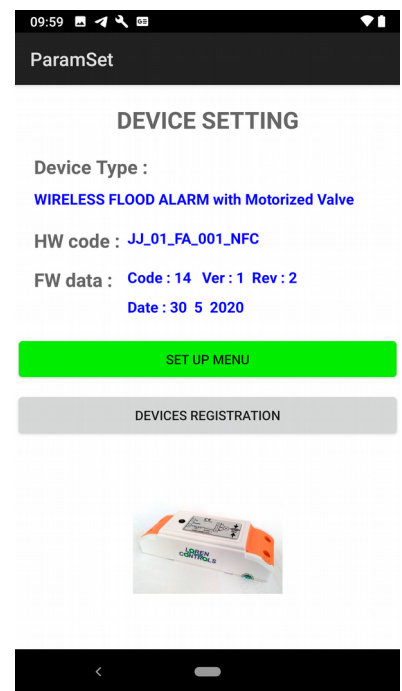
Under every screenshot, its “button press path” is specified. When not used, the App closes itself after a preset time.



First App image



Start NFC connection



Start NFC connection >SET UP MENU

10:50

ParamSet

LOAD SAVE

Param	Value
FLOOD SENSOR DELAY	5 sec
MAX MOTOR ON TIME	30 sec
CONNECTION INTERVAL	4 hour
ALARM CONN.INTERVAL	20 min
UNLOCK CYCLE TIME	7 day
UNLOCK CLOSE TIME	5 sec
LOW TEMP SET	5 °C
BUZZ PULSE TIME	5 sec/10
ENABLE TEMP ALARM	0 No
ENABLE CONN. ALARM	0 No
°C/°F SELECTION	0 °C

RESET DEFAULT VALUES

Start NFC Connection >SET UP MENU>
Parameter settings

10:51

ParamSet

Current Password

New Password

Re-type Password

CHANGE PASSWORD

Start NFC Connection >SET UP MENU>
Change password

10:50

ParamSet

LOAD SAVE

Param	Value
BASE TX POWER	5 10dBm
SENSORS TX POWER	4 5dBm
CHANNEL SEL MODE	0 default

Start NFC Connection >SET UP MENU>
Radio

10:46

ParamSet

LOAD SAVE

Param	Value
ADDRESS BYTES	3 Number
SECURITY BYTES	4 Number
WIFI PUSH ALARM	0 Disabled

Start NFC Connection >SET UP MENU>
Security settings

10:51

ParamSet

CLOSE VALVE

STOP VALVE

OPEN VALVE

RETURN TO 'AUTO MODE'

Start NFC Connection >SET UP MENU>
Manual override

10:51

ParamSet

Sensor	Status	Temp
1	N/A	
2	N/A	
3	N/A	
4	N/A	
5	N/A	
6	N/A	
7	N/A	
8 *WiFi Monitor*	OK	

Last closing: Manual

Start NFC Connection >SET UP
MENU>Alarm monitor