

**FLOOD ALARM SYSTEM
with PUMP RELAY**



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DESCRIPTION

The anti flood system for pump activation can avoid expensive damages caused by water flooding of rooms.

The system is formed by a control unit (C.U.), and one or more water detecting 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 a plastic 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 is connected to the internal SPDT relays contacts.

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

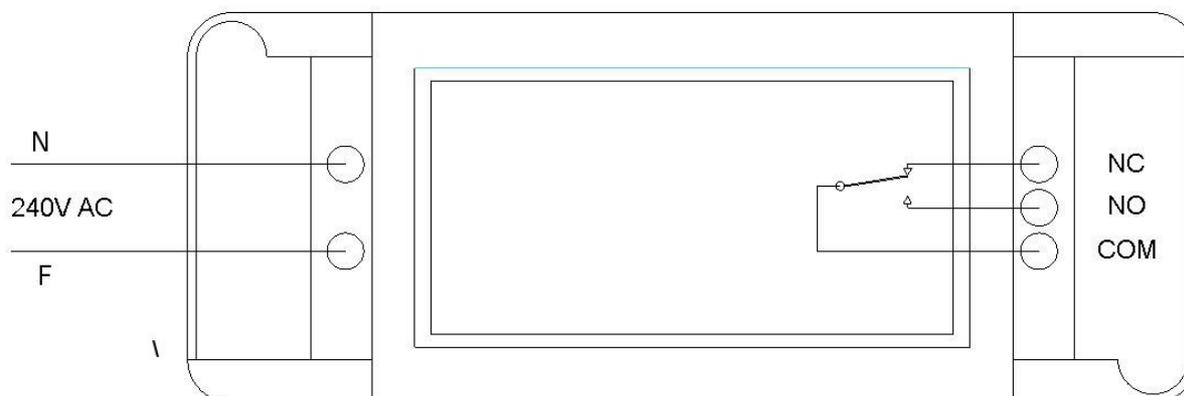


fig. 1

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.

To prevent pump rotor sticking, when the pump is OFF, the control unit periodically activate the pump for a short time. The period of this procedure is set with the **UNLOCK INTERVAL TIME** parameter. The **UNLOCK CLOSE TIME** parameter define the ON time of pump at the end of each interval time.

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

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 activate the internal pump relay. 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*”. When the flood alarm quit the pump relay is deactivated.

With sensor/s alarm, pump can be deactivated by pushing the sensors button for among 2 second. It generate 3 red flash and 3 buzzer burst followed by the led signaling the the relay state. The remote command in this case is not permitted. The state of the relay 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 = relay OFF,
- red = relay ON,
- red blinking = rely OFF during “*pause time*”

It is possible to manually operate the relay from each sensor registerd with th CU. A single push of the button allow to verify the pump relay state by flashing the sensor led according to the above coloring.

An extended (about 2 seconds) push of the button activate or deactivate the pump relay.
Care must be taken to deactivate the relay when there is a flood alarm signaling.

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 alarm get detected after a maximum time equal to **CONNECTION INTERVAL** 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

- Relay OFF: green led
- Relay ON valve: red led
- Control unit in registration mode: yellow flashing led

SENSOR SIGNALING

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

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

- Relay ON: red light
- Relay OFF: green light
- If alarms present: 1, 3 buzzer burst for connection alarms, flood alarm respectively, followed by control unit 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**”);

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 SENSOR ON DELAY	1 - 250	10	[Seconds] flood alarm activation delay time after flood detection.
2 SENSOR OFF DELAY	1 - 250	10	[Seconds] flood alarm deactivation delay time after flood end detection.
3 MAX TIME ON PUMP	0 - 250	0	[Hours] max activation pump time time in hours after a pause interval set by parameter 5. The total on time is the sum of parameter 3 and 4 If both are set to 0 the pump doesn't pause.
4	0 - 60	0	[Minutes] max activation pump time in iminutes after a pause interval set by parameter 5. The total on time is the sum of parameter 3 and 4 If both are set to 0 the pump doesn't pause.

5	PUMP PAUSE TIME	0 - 250	10	[Seconds] pump pause time after activation time period set by parameters 3 and 4.
6	UNLOCK CYCLE TIME	1 - 30	7	[Days] anti pump rotor-sticking procedure time interval. Every "UNLOCK CYCLE TIME" the pump is activated for a short period (parameter 7) to prevent sticking. If set to 0 the function disabled.
7	UNLOCK PUMP TIME	0 - 250	5	[Seconds] pump anti sticking activation time. Every "UNLOCK CYCLE TIME" the pump is activated for a short period to prevent sticking.
8	CONNECTION INTERVAL	1 - 24	4	[Hours] connection test time interval.
9	ALARM CONN. INTERVAL	1 - 60	20	[Minutes] connection test time interval, when alarm is active.
10	BUZZ PULSE TIME	0 - 10	5	[ds] duration of sound impulse emitted in case of alarm; 0= buzzer disabled.
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	22	Programmed channel selection. Used only if parameter CHAN SEL MODE =1 (Frequency= 433,1MHz + PROG CHANNEL * 20KHz)
15	ADDRESS BYTES	3 - 8	3	Address byte number
16	SECURITY BYTES	4 - 16	4	Security byte number

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 message to PC or smartphones connected to internet using the well-known "**bot**" service of "**Telegram**".

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
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	~ 80 gr.
Enclosure protection	IP54
Operating temperature	-10 — +50°C
Operating relative humidity	10 — 80 % not condensing
Sensor unit	
Dimensions	80x80x25 mm
Weight	~ 50gr
Cable length	1 m
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
Pump relay	
Type	SPDT
Contact capacity (resistive load / inductive load)	4 /2 A @ 220V ~
Max allowable voltage	250V ~

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

** with default parameter selection (ref. 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,

- force majeure (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

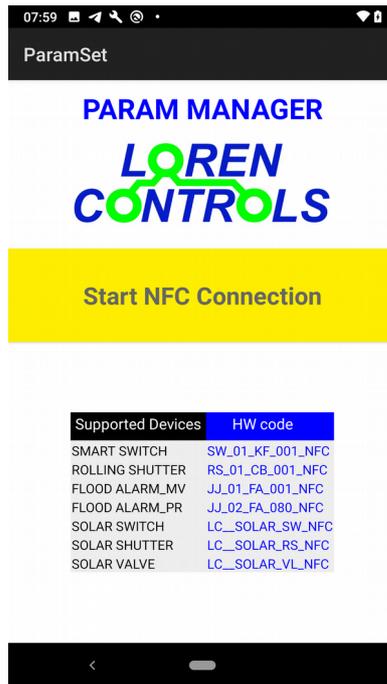
Shown below are some screenshots of the app dedicated to the management of parameters.

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.

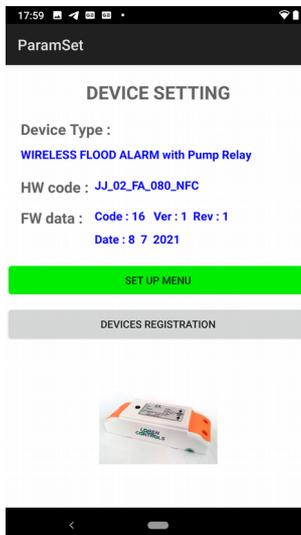
Under every screenshot, its “button press path” is specified. When not used, the App closes itself after a preset time.



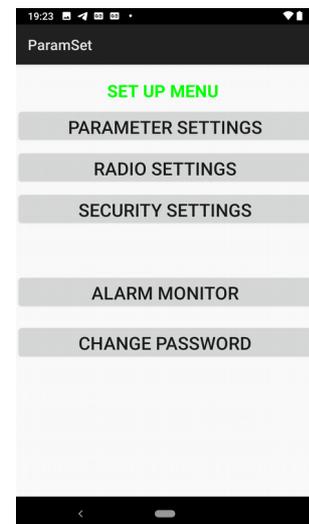
App start_up image



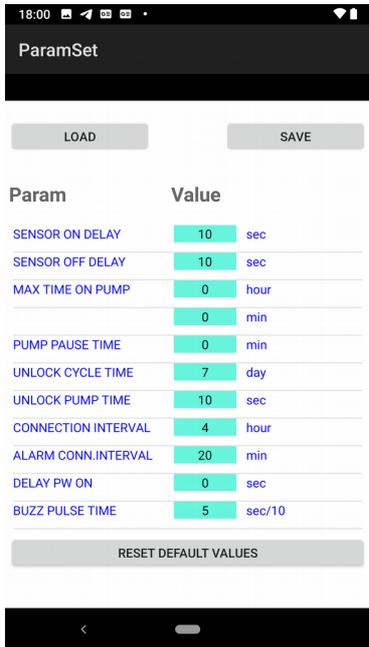
Start NFC Connection



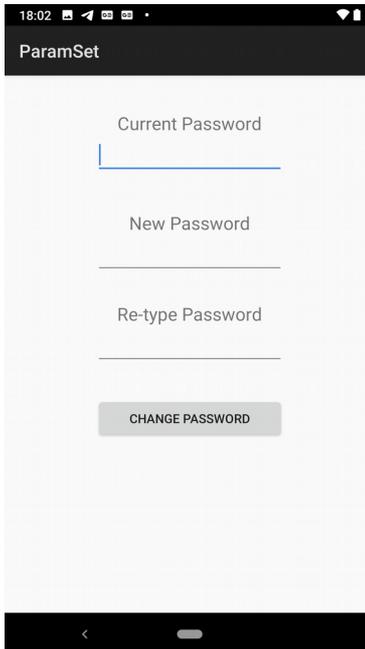
Start NFC Connection > setup/registration selection



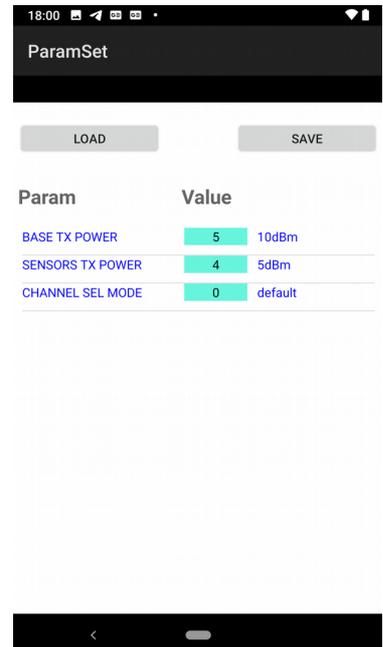
Start NFC Connection > setup/registration selection > set_up menu



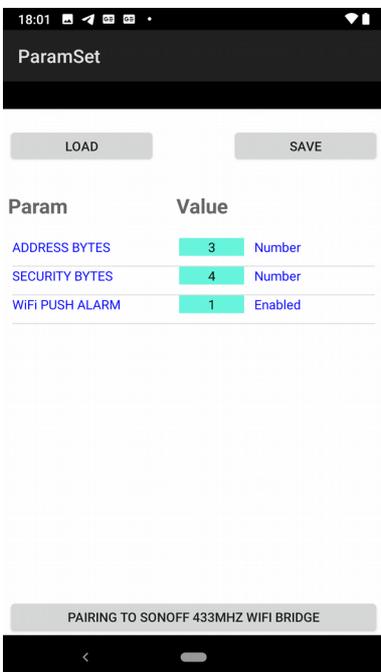
Start NFC Connection >
>setup/registration selection >
SET UP MENU > Parameter settings



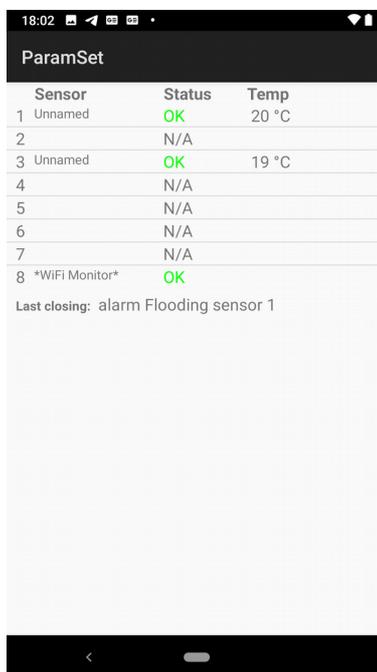
Start NFC Connection >
>setup/registration selection >
SET UP MENU > Change password



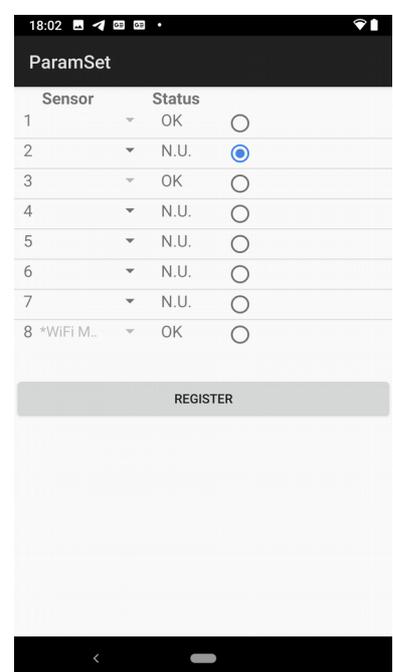
Start NFC Connection >
>setup/registration selection >
SET UP MENU > Radio



Start NFC Connection >
>setup/registration selection >
SET UP MENU > Security settings



Start NFC Connection >
>setup/registration >
selectionSET UP MENU >
Alarm monitor



Start NFC Connection >
>setup/registration >
REGISTRATION