

FLS M9.06

PH/ORP MONITOR AND TRANSMITTER



SAFETY INSTRUCTIONS

General Statements

- Do not install and service the product without following the Instruction Manual.
- This item is designed to be connected to other instruments which can be hazardous if used improperly. Read and follow all associated instrument manuals before using with it.
- Product installation and wiring connections should only be performed by qualified staff.
- Do not modify product construction.

Installation and Commissioning Statements

- Remove power to the instrument before wiring input and output connections.
- Do not exceed maximum specifications using the instrument.
- To clean the unit, use only chemical compatible products.

PACKING LIST

Please verify that the product is complete and without any damage.

The following items must be included:

- M9.06 pH/ORP Monitor & Transmitter
- Instruction Manual for M9.06 pH/ORP Monitor & Transmitter

DESCRIPTION

The new FLS F9.06 is a powerful pH/ORP monitor designed to satisfy a broad range of applications. A 4" wide full graphic display shows measured values clearly together with many other useful information. Moreover, due to the multicolor bright backlight, measurement status can be determined easily also from very long distance. A tutorial software guarantees a mistake-proof and fast set up of every parameter. A calibration based on automatic buffer recognition plus a in line adjustment allow to achieve a precise and a reliable measurement in every conditions.

CONNECTIONS TO INSTRUMENTS

	F3.00	F3.20	F6.30	F3.10	F3.05	F6.60	F6.61	F11
M9.06	-	-	-	-	-	-	-	-

	ULF	F3.80	pH/ ORP200	pH/ ORP400	pH/ ORP600	pH/ ORP800	C150/ 200	C100/ C300	C6.30
M9.06	-	-	X	X	X	X	-	-	-

TECHNICAL DATA

General

- Associated sensors: FLS pH/ORP electrodes and FLS temperature sensors
- Materials:
 - Case: ABS
 - Display window: PC
 - Panel & Wall gasket: silicone rubber
 - Keypad: 5-button silicone rubber
- Display:
 - LC full graphic
 - Backlight version: 3-colors
 - Backlight activation: User adjustable with 5 levels of timing
 - Update rate: 1 second
 - Enclosure: IP65 front
- pH input range: $-2 \div 16$ pH
- pH measurement resolution: ± 0.01 pH
- ORP input range: $-2000 \div +2000$ mV
- ORP measurement resolution: ± 1 mV
- Temperature input range: $-50 \div 150$ °C ($-58 \div 302$ °F) (with Pt100-Pt1000)
- Temperature measurement resolution: 0,5°C/°F (Pt100-Pt1000)

Electrical

- Supply Voltage: 12 to 24 VDC \pm 10% regulated
- Maximum current consumption: 300 mA
- 2 x Current output:
 - 4-20 mA, isolated, fully adjustable and reversible
 - Max loop impedance: 800 Ω @ 24 VDC - 250 Ω @ 12 VDC
- 2 x Solid State Relay output:
 - User selectable as ON-OFF, proportional frequency, proportional pulse, Timed Pulse, Min alarm, Max alarm, Off
 - Optically isolated, 50 mA MAX sink, 24 VDC MAX pull-up voltage
 - Max pulse/min: 300
 - Hysteresis: User selectable
- 2 x Relay output:
 - User selectable as ON-OFF, proportional frequency, proportional pulse, Timed Pulse, Min alarm, Max alarm, Off
 - Mechanical SPDT contact
 - Expected mechanical life (min. operations): 10^7
 - Expected electrical life (min. operations): 10^5 N.O./N.C. switching capacity 5A/240VAC
 - Max pulse/min: 60
 - Hysteresis: User selectable

Environmental

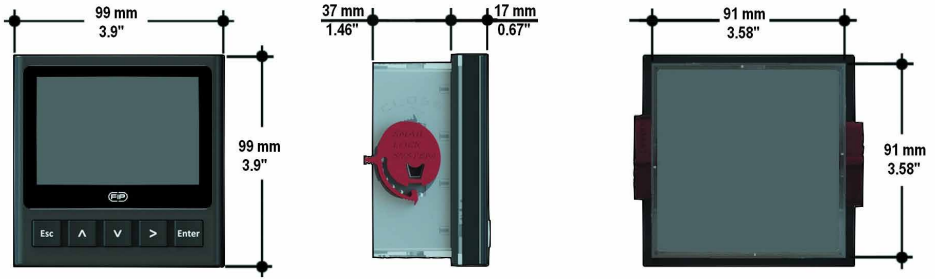
- Operating temperature: -20 to +70°C (-4 to 158°F)
- Storage temperature: -30 to +80°C (-22 to 176°F)
- Relative humidity: 0 to 95% not condensing

Standards & Approvals

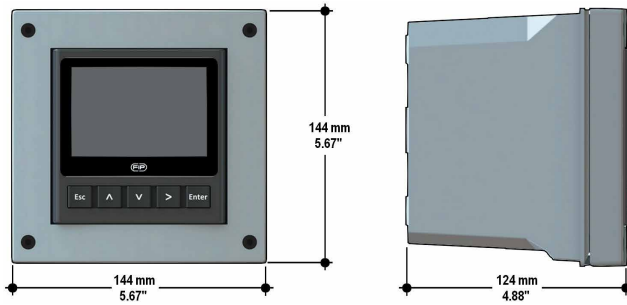
- Manufactured under ISO 9001
- Manufactured under ISO 14001
- CE
- RoHS Compliant
- EAC

DIMENSIONS

PANEL MOUNTING



WALL MOUNTING

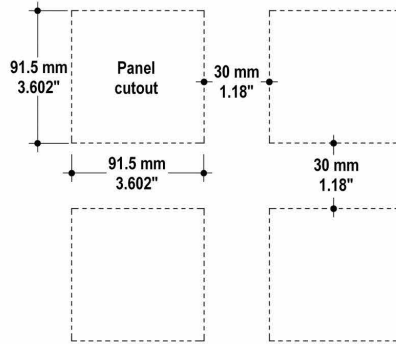
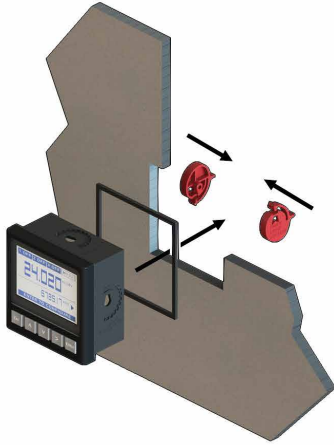


INSTALLATION

Mechanical installation

The pH/ORP monitor & transmitter is available just in one packaging for panel or wall installation. The panel version is installed using the panel mounting kit (M9.SN1), while the wall mounting version is got fixing the panel mounting version on the wall mounting kit (M9.KWX). The mounting kits can be ordered directly connected to the monitor or separately and then simply installed on it.

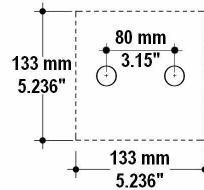
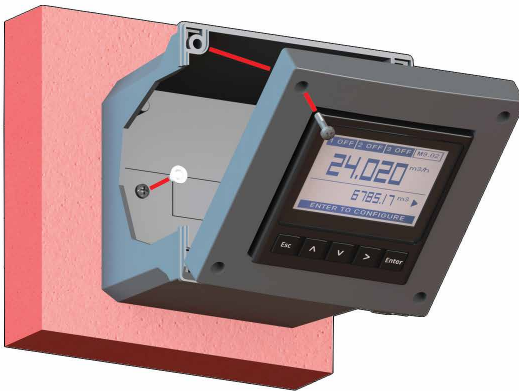
Panel installation



Fix instrument on the panel rotating by hand the fixing snails (M9.SN1).

Wall installation

Use the panel mounting kit (M9.SN1) to fix the M9.06 on the dedicated frontal cutout of the wall mounting kit (M9.KWX).



Tighten front screws of box and waterproof connectors of cables, internally mount caps on screw sites to get a IP65 watertight installation.

WIRING



General recommendation

Always ensure the power supply is switched off before working on the device. Make wiring connections according to wiring diagrams.

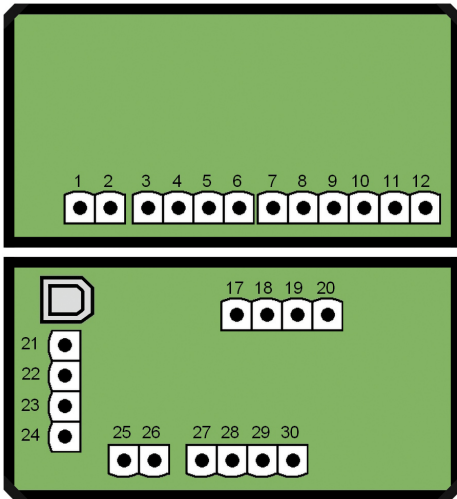
- Terminals accept 26 to 12 AWG (0.08 to 2.5 mm²)
- Strip around 10 mm (0.4") of insulation from the wire tips and tin bare ends to avoid fraying.
- Ferrules are suggested when connecting more than one wire to a single terminal.
- Remove the upper part of the terminals for an easy cabling.
- Insert wire tip or ferrule completely into the terminal and fix with the screw until finger tight.
- Do not route the sensor, DC power, or 4-20mA cables in conduit containing AC power wiring. Electrical noise may interfere with sensor signal.
- Routing the sensor cable in grounded metal conduit can help prevent electrical noise and mechanical damage.
- Seal the cable entry points to prevent moisture damage.

Wall Installation

Pull the electrical cables through liquid tight connectors. Use electrical cables with the proper external diameter for the liquid tight connector.

PG11/PG9: external diameter between 2-7 mm (0.079-0.276")

REAR TERMINAL VIEW

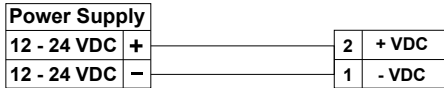


1	-VDC	Power Supply
2	+VDC	
3	NO	SSR1
4	COM	
5	NO	SSR2
6	COM	
7	NO	RELAY1
8	COM	
9	NC	RELAY2
10	NO	
11	COM	
12	NC	
17	+HOLD	Digital Input
18	-HOLD	
19	+REED	
20	-REED	
21	-LOOP2	Analog Output
22	+LOOP2	
23	-LOOP1	
24	+LOOP1	
25	+IN	} pH/ORP Input
26		
27	REF pH	} PT100 - PT1000
28		
29		
30		

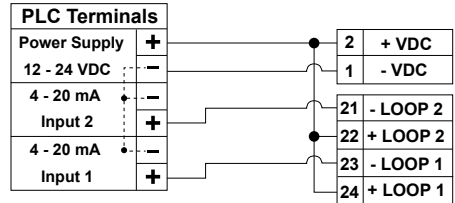
Refer to dedicated sensor manual for its wiring.
 In case a temperature sensor (Pt100-Pt1000) is not available, place a bridge connection between 28 - 29 and between 29 - 30.

POWER/LOOP WIRING DIAGRAM

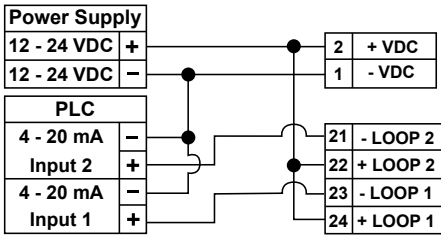
Stand-alone application,
no current loop used



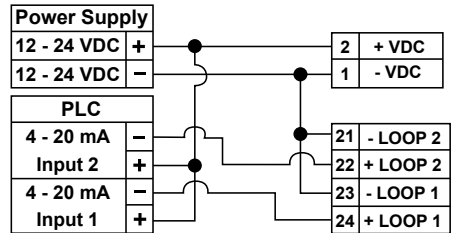
Connection to a PLC with built-in
power supply



Connection to a PLC/Instrument with a separate power supply

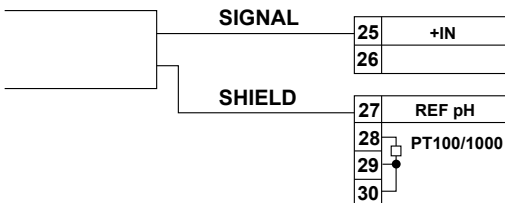


or

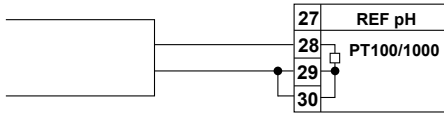


PROBE WIRING DIAGRAM

pH/ORP probe connection



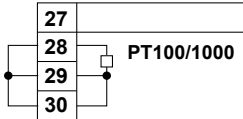
PT100 - PT1000
two wires connection



PT100 - PT1000
three wires connection



Pt100 - Pt1000
no connection



USB PORT

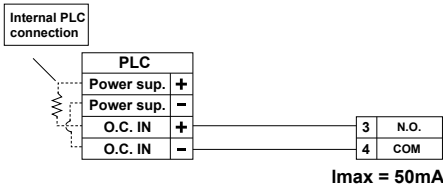
A USB port (type B) is available on the M9.06 PCB.

The USB connection allows the updating of device software.

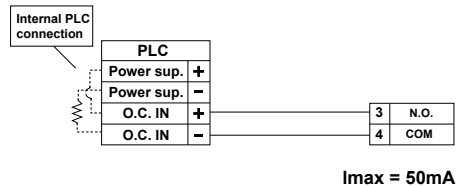
To update the software you need: USB cable (M9.KUSB), the interface software "FLS Calibration System" and the new updating software for M9.06 which are both downloadable from www.flsnet.it freely on product page.

SOLID-STATE RELAY WIRING DIAGRAM (FOR SSR1 AND SSR2)

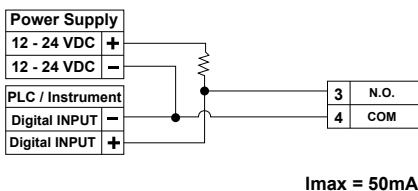
Connection to a PLC with NPN input



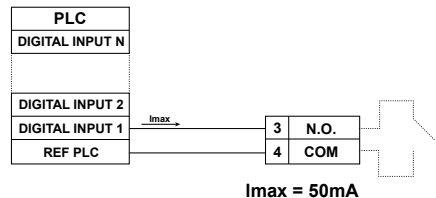
Connection to a PLC with PNP input



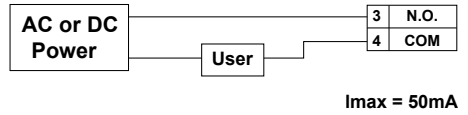
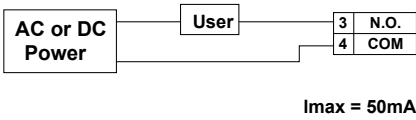
Connection to a PLC / Instrument
digital input with separate Power
Supply



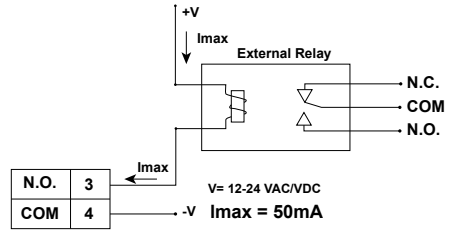
Connection to a PLC / Instrument
digital input for Voltage Free Contacts
(REED)



Connection to an User

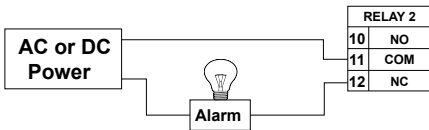


The alarm is off during normal operation and goes ON according to Relay setting.
If $I_{max} > 50\text{ mA}$ use external Relay

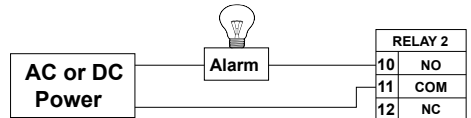


RELAY WIRING DIAGRAM (FOR RELAY 1 & RELAY 2)

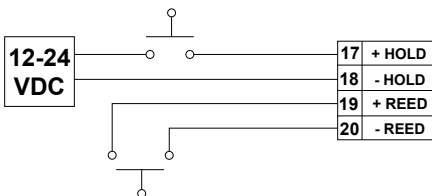
The alarm is OFF during normal operation and goes ON according to Relay settings



The alarm is ON during normal operation and goes OFF according to Relay settings

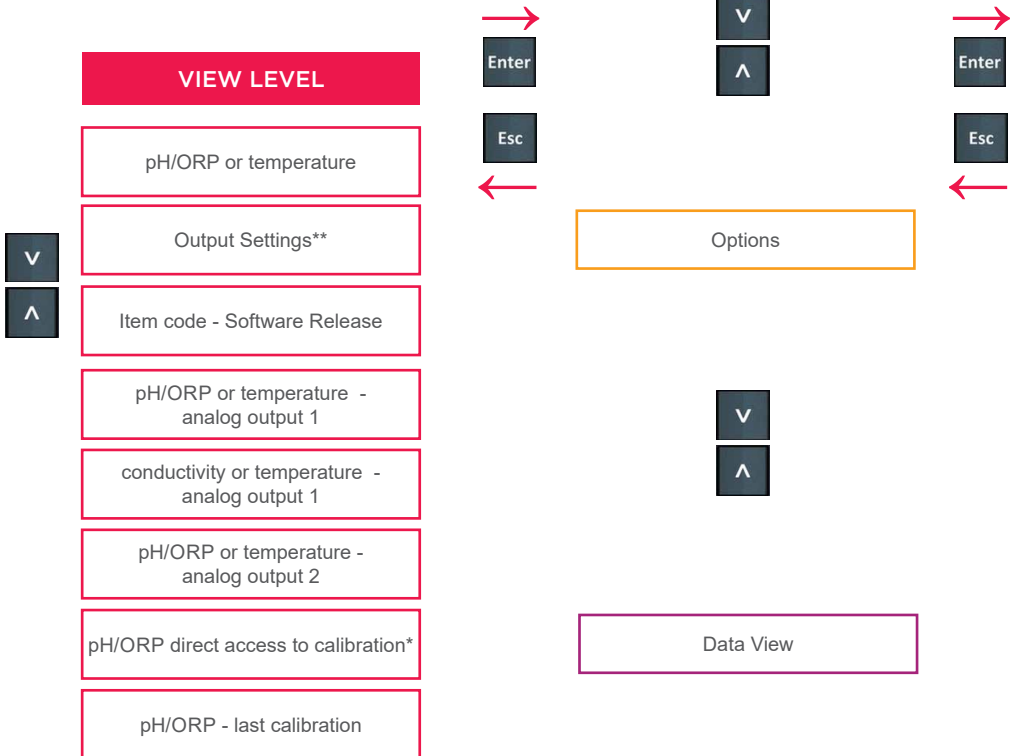


HOLD AND REED CONNECTION



OPERATIONAL OVERVIEW

The M9.06 pH/ORP monitor and transmitter features a full graphic display and a five-button keypad for system set-up, calibration and operation. Full graphic display has a white backlight during standard conditions, a green backlight in case a external device control is activated (ON/OFF, PROPORTIONAL FREQUENCY, PROPORTIONAL PULSE and TIMED PULSE), a red backlight in case a set alarm is activated (MAX Alarm, MIN Alarm, O.V.A., O.T.A., always with priority). The five push buttons of the keypad are used to navigate display levels and modify settings. The function of each button may change according to display level; please refer to following table:



MENU LEVEL

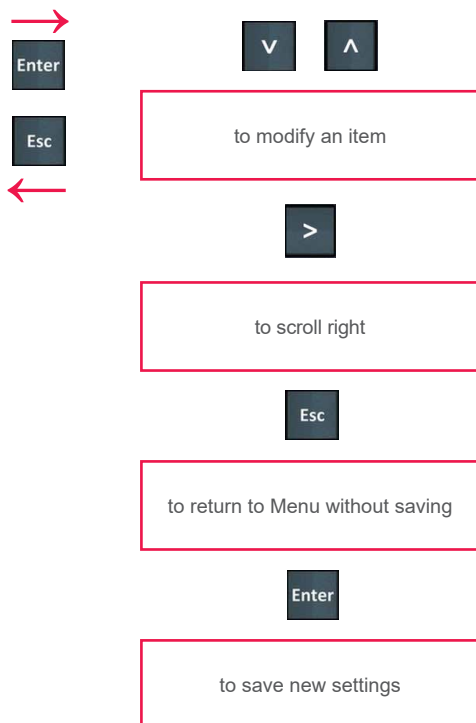
▼	Probe Unit
▲	Temperature Unit
	Manual Temperature
▼	pH/ORP Probe Calibration
▲	Temperature Probe Calibration
	1 SSR
	2 SSR
▼	3 RELAY
▲	4 RELAY
	Output Test
	4-20mA1
	4-20mA2
	Language
	Filter
	Backlight
	Password
▼	Default Data
▲	Output Assigment
	Hold
	Reed
	Contrast
	Upgrade Firmware
	Probe Signal
▼	Hold-Reed Statistic
▲	Output Statistic
	Calibration Data
	Statistic Reset

* "pH/ORP direct access to calibration" includes the "in-line adjustment" option to align on site the measurement with a instant reference value.

** Use  for more info about Outputs

EDIT LEVEL

PUSH BUTTON



OUTPUT MODE





The M9.06 pH/ORP monitor and transmitter features 2 solid state relays and 2 mechanical relays in addition to 2 analog output 4-20mA.

Only the second mechanical relay can be set as an alarm (icon is 4ALR) related to the feedback of external device managing. Icon will turn to 4OTA (Over Time Alarm) in case the setpoint has not been reached within set maximum timing.

Icon will turn to 4OVA (Over Values Alarm) in case measured values overstep the set value band. In addition to the type of failure, a reference number correlated to the involved digital output is reported by the out put number.

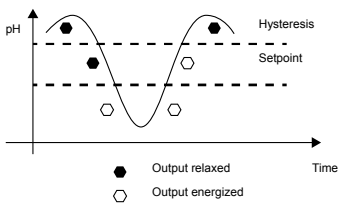
PROCEDURE FOR OUTPUTS SETTING

- go to the “Options” menu
- enter into the “Outputs activation” sub menu
- enable output(s)
- go to the “Outputs” menu
- set the operating mode for each enabled output

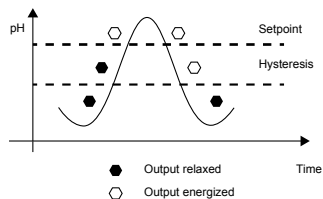
			
<p>Monitor without digital output activated</p>	<p>In case a digital output is enabled, a icon will appear</p>	<p>In case a digital output is set, icon reports the operating mode</p>	<p>In case set digital output is activated, the icon will turn to black</p>

Digital outputs can be set in the following way:

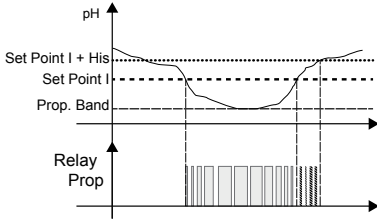
ON-OFF MODE (icon reports O-F) alkaline dosing



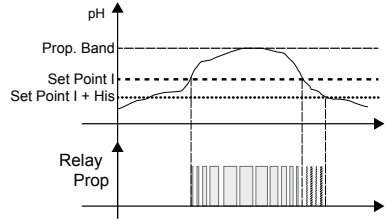
ON-OFF MODE (icon reports O-F) acid dosing



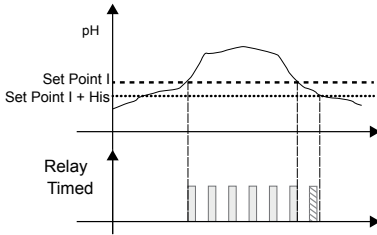
PROPORTIONAL MODE (icon reports PRP) alkaline dosing



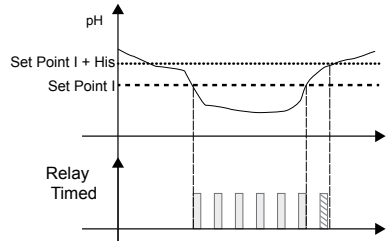
PROPORTIONAL MODE (icon reports PRP) acid dosing



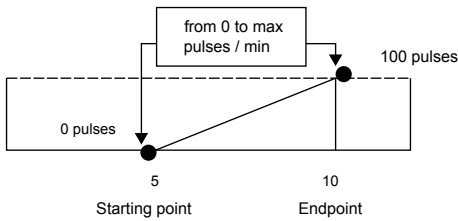
TIMED MODE (icon reports TMD) acid dosing



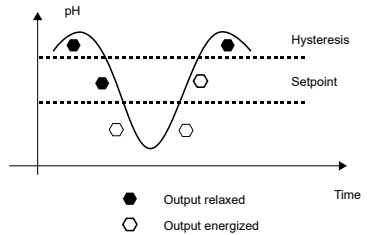
TIMED MODE (icon reports TMD) alkaline dosing



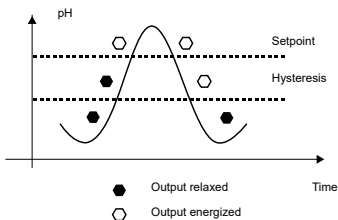
FREQUENCY MODE (icon reports FRQ)



MIN MODE (icon reports MIN)



MAX MODE (icon reports MAX)



SOFTWARE UPDATING

In order to update the Instrument Software with a New Firmware Release follow the suggested procedures:

TO UPDATE INSTALLED UNITS

- Download the interface software "FLS Calibration System" and the Updated Software on www.flsnet.it
- Launch the software "FLS Calibration System" on the laptop
- Select OPTION and then UPGRADE FIRMWARE
- Confirm the "Firmware Upgrade" procedure by ENTER
- Connect M9.06 to the laptop by the USB cable
- Select the item (M9.06) which appears on the surfing area on the "FLS Calibration System" software
- Confirm FW UPGRADE and select the Updated Software

NOTE: At the end of the procedure restart the instruments in order to refresh M9.06 software (It takes 90 seconds to refresh the SW. Please do not interrupt the restarting process).

TO UPDATE NEW UNITS

- Download the interface software "FLS Calibration System" and the updated software on www.flsnet.it.
- Launch the software "FLS Calibration System" on the laptop
- Push together ENTER and ESC powering the monitor
- Connect M9.06 to the laptop by the USB cable
- Select the item (M9.06) which appears on the surfing area on the software "FLS Calibration System"
- Confirm FW UPGRADE and select the Updated Software

NOTE: At the end of the procedure restart the instruments in order to refresh M9.06 software (It takes 90 seconds to refresh the SW. Please do not interrupt the restarting process).

ORDERING DATA

Part No.	Description /Name	Power supply	Wire power Technology	Sensor Input	Output
M9.06.P1	Panel mount pH/ORP monitor	12 - 24 VDC	3/4 wire	pH/ORP	2*(4-20mA), 2*(S.S.R.), 2*(mech. relay)
M9.06.W1	Wall mount pH/ORP monitor	12 - 24 VDC	3/4 wire	pH/ORP	2*(4-20mA), 2*(S.S.R.), 2*(mech. relay)
M9.06.W2	Wall mount pH/ORP monitor	110 - 230 VAC	3/4 wire	pH/ORP	2*(4-20mA), 2*(S.S.R.), 2*(mech. relay)

ACCESSORIES

Part No.	Name	Description
M9.KW1	Wall mounting kit	144x144mm plastic box for wall installation of all panel mount monitors
M9.KW2	Wall mounting kit with power supply	144x144mm plastic box and 110/230VAC to 24 VDC power supply for wall installation of all panel mount monitors
M9.KUSB	USB cable for device interfacing	USB cable dedicated to FLS products, 1,5 meter long

SPARE PARTS

Part No.	Name	Description
M9.SN1	Fixing snails	2 fixing snails for panel installation of FLS monitors



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