

SWING

INSTRUCTION MANUAL

SWINGgb
lev5 rev. b



SWING Controller Unit

Health and Safety

To ensure that our products are safe and without risk to health, the following points must be noted:

1. The relevant sections of these instructions must be read carefully before proceeding.
2. Warning labels on containers and packages must be observed.
3. Installation, operation, maintenance and servicing must only be carried out by suitably trained personnel and in accordance with the information given.
4. Normal safety precautions must be taken to avoid the possibility of an accident occurring when operating in conditions of high pressure and/or temperature.
5. It must be understood that operation of damaged equipment could, under certain operational conditions, result in degraded process system performance leading to personal injury or death.

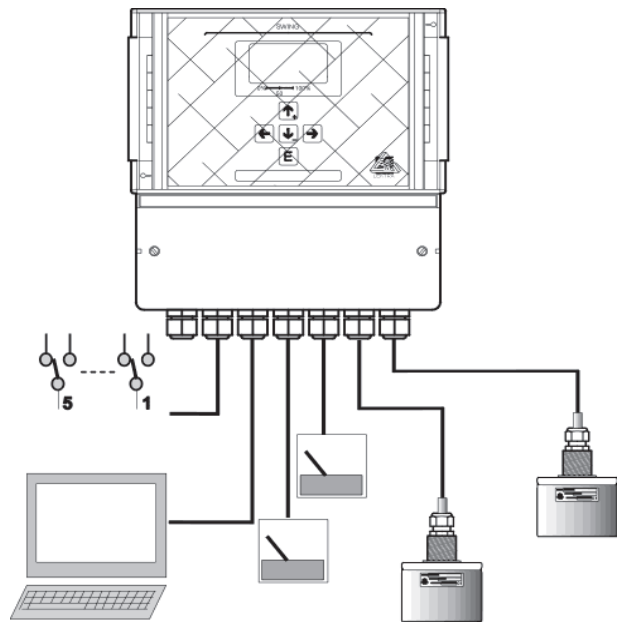
Information in this manual is intended only to assist our customers in the efficient operation of our equipment.

Use of this manual for any other purpose is specifically prohibited and its contents are not to be reproduced in full or part without prior approval.

Because of the technical evolution of the products, the SGM Lektra reserves the possibility of modify the present technical manual without warning.

SWING Controller Unit

- Unit designed to be connected to one or two ultrasonic level sensors (PTU family) & transmitters (Smart family)
- Switched to single or double measurement
Applications: level measurements, Open channel flow measurements, Up to 5 pumps controller
- Analog input 4-20mA allows to connect a general purpose level transmitter instead of the ultrasonic PTU / Smart family unit
- Two insulated 4-20mA outputs and up to 5 relays are available and totally addressed and configured by programming parameters



CODE

SWING	□	□	□	□	
	2	9	A	0	Version
			B	1	Smart/PTU sensors
			C	2	Special
				A	Output relays
				B	None
				C	3 Relays SPDT
					5 Relays SPDT
				0	Power supply
				1	115V ac
				2	230V ac
					24V ac
				A	Analog current Output
				B	None
				C	n.1 4-20mA
					n.2 4-20mA
				0	Serial interface
				1	None
				2	RS485 std.
					Special

TECHNICAL DATA

Enclosure:	IP65, for external installation, wall mounted
Enclosure material:	ABS color RAL 7035
Keyboard:	5 keys
Display:	back lighted graphic LCD 128x64
Electrical connections:	screw-connectors, separate access
Power supply:	24 115 230Vca; ±10% based on ordered supply
Power consumption:	max 15W
Ultrasonic sensor:	IP68 PTU family, IP65 Smart family
Tecnology:	digital, using Flash microprocessor
Custom parameters memory:	EEPROM
Internal supply for transmitter:	24Vdc-200mA max
Relays output:	3 or 5 relays based on model
Contact rating:	5A 250V (resistive)
Analogue output:	n.2 4mA to 20mA galvanic separation
Working temperature:	-20°C ÷ +60°C
CE conformity:	93/68 CEE

SWING Controller Unit - Description

The Swing unit is a general purpose controller for ultrasonic sensors. Swing is a very versatile unit able to perform four different functions:

LEVEL measurement

OPEN CHANNEL FLOW measurement

PUMPS CONTROLLER

DIFFERENTIAL LEVEL measurement

The selection of the function and the calibration of the inherent parameters are made directly on the frontal keys.

Swing unit must be considered a single or a double channel unit. Consequently one or two sensors can be connected.

In the double channel configuration the following function can be performed:

CH1 = LEVEL	CH2 = LEVEL
CH1 = LEVEL	CH2 = FLOW
CH1 = FLOW	CH2 = FLOW
CH1 = FLOW	CH2 = LEVEL
CH1 = PUMPS	CH2 = LEVEL
CH1 = PUMPS	CH2 = FLOW
CH1 = DIFF.LEVEL	CH2 = LEVEL

The relays output can be addressed to the relevant functions and can be 3 or 5 depending from the version.

1 or 2 galvanically isolated analog output are available.

SWING Sensors

The Swing unit can be connected to the Smart family or PTU family sensors and Swing communicates with a RS485 ports.

An extra analog input allows the connection with a 4-20mA level transmitter.


Smart sensors family, are complete units because a 4-20mA current output and two programmable relays are available for local indication and alarms.

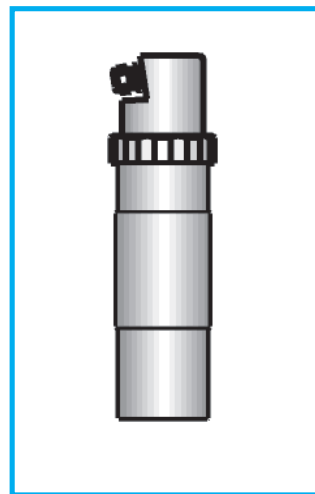
PTU sensor family, is a compact IP68 sensors with RS485 communication port only. The electrical connection between PTU and Swing unit is possible up to 1km and no coax cables are requested:


PTU05: liquids up to 5m (IP68)

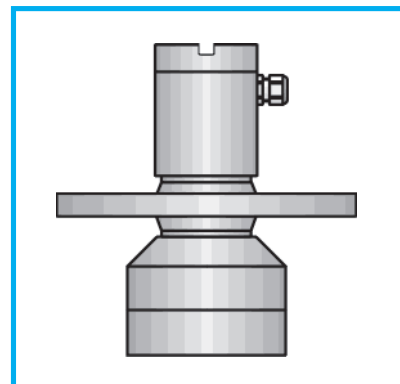
PTU10: liquids up to 10m (IP68)

PTU15: liquids up to 10m (IP68)

 **SmartCost:** for liquids up to 5m IP65



 **521/522Smart:** for liquids 10m/15m & granulates 5m/8m (IP65)



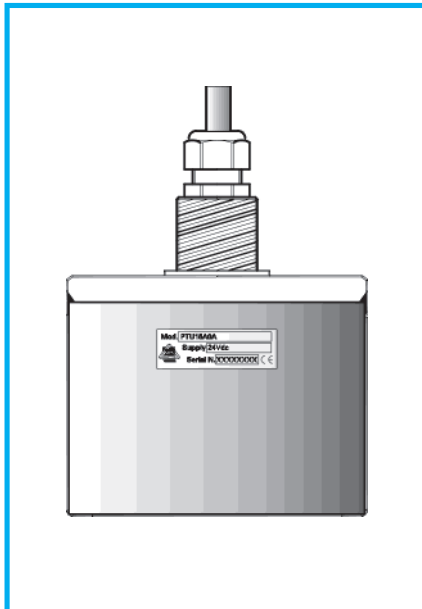
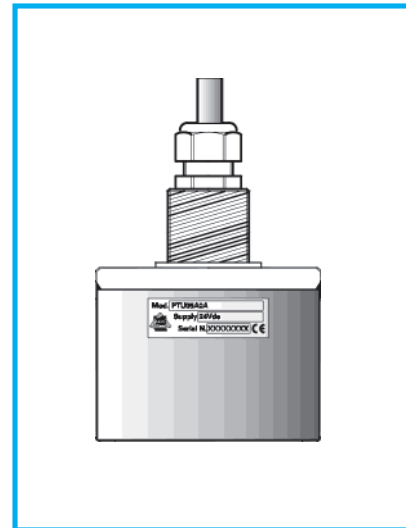
SWING Controller Unit - Description

- PTU05 up to 5m, PTU10 up to 8m, PTU15 up to 12m
- Sensors designed to be connected to Swing unit
- 1" threaded mechanical fitting, IP68 proof, 3m length electrical connection cable
- Sensors designed for level measurement in liquids/water applications, waste water plant applications, environment protection applications

The PTU's sensors are designed for application in tanks, vessels and channels. The sensors communicate to the controller unit (Swing), with RS485 field communication (up to 1km distance from the PTU to Swing unit), to perform four different applications:

LEVEL and **DIFFERENTIAL LEVEL** measurement
OPEN CHANNEL FLOW measurement
PUMPS CONTROLLER

The PTU's calibration are made directly from the associated unit consequently no calibration push buttons are available on the sensor.



LEVEL

Swing unit can be connected to an ultrasonic sensor for liquid application or for application in granulates and powders. The range is from 5m to 25m. The Swing unit can work with 2 different sensors connected. The differential level function allows to drive automatically grill-cleaner.

Open Channel FLOW

The most diffuse standard weirs and flumes are just in a scroll selection of the Swing unit. A special customer situation can be solved with the calibration of a general discharge formula.

Up to 32 level/flow points can be memorized for a special customer table.

Internal volume-totalizer and two counters are available for batch control, additivation, sampler drive.

PUMPS Controller

The Swing unit can drive through relays output up to 5 pumps.

The pumps can be set on-off individually and can be configured for the pumps rotation in order to reach the same average working

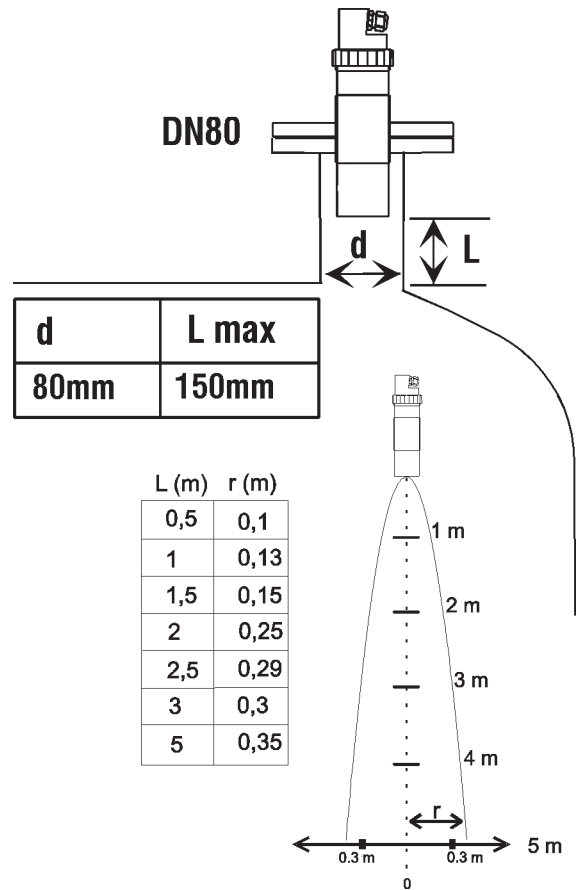
SWING Controller Unit - Description

Important close to the sensor there is a “blind zone” (see tab.1) where the equipment can't measure.
 To reach a good and safe measurement, avoiding spurious echo (not reflected from the surface to measure) need to take care about the sensor sensibility volume in the sound path, no obstacles or objects must be present into the sensibility volume (lobe).

Model	Measuring range	Blocking distance
Smartcost (extendrange)	0.25÷5 m. 0.4÷7 m.	0.25 m. 0.4 m.
521SMART	0.6÷10 m.	0.6 m.
522SMART	0.7÷15 m.	0.7 m.
PTU 05	0.3÷5 m.	0.3 m.
PTU 10	0.4÷8 m.	0.4 m.
PTU 15	0.7÷12m.	0.7 m.

Table 1

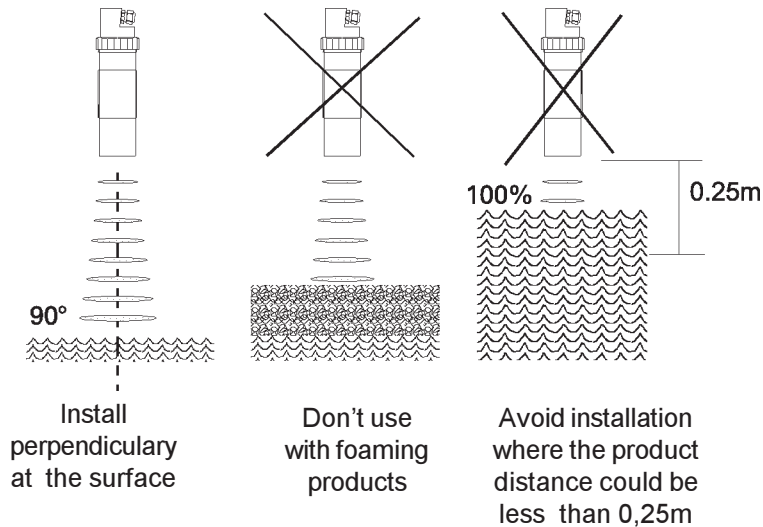
Mechanical sensor mounting



Emission lobe example, indicative only

Fig.4

fig.3



SWING Controller Unit - Description

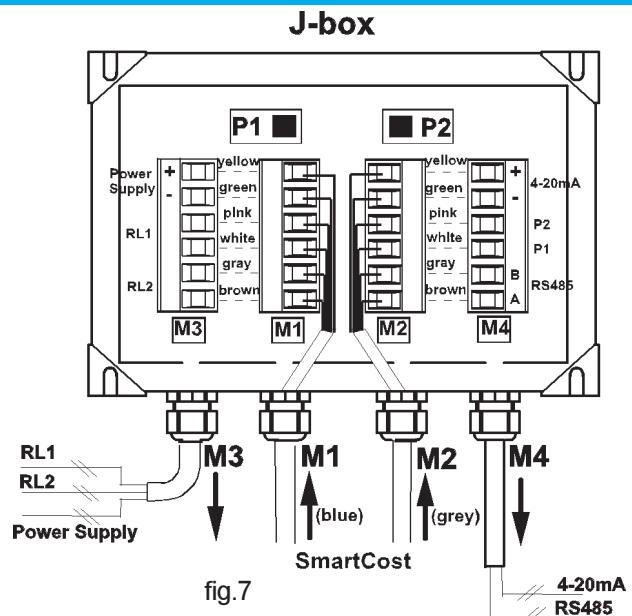
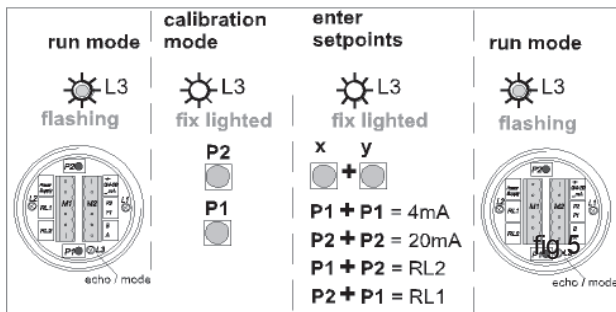


fig.7

SMART family Transmitter Calibration

The SMART family units (SmartCost, 521Smart, 522Smart, 524Smart), connected to the SWING unit, can be locally programmed by means of their P1 and P2 pushbuttons. In this way it is possible to calibrate the SMART family units 4-20mA output range and the RL1, RL2 relay actions. Independent to the SWING function the SMART family transmitter output 4-20mA can be used to drive local indicators, recorders, etc. The 4-20mA SMART family output can also be connected to the SWING unit associated (for instance when long distance, over 1km, there are from SWING to SMART family unit). The normal electrical-connection from SWING to SMART family units is made using the serial digital RS485 port. The SmartCost units can be delivered in the IP68 version. In the above version no access to the internal P1, P2 keys is possible (totally welded unit with output cables). It is in any case possible to program the IP68 unit by means of a special "Junction - box" where are lodged in a printed board the relevant P1 and P2 keys, see fig.7

The SmartCost calibration can be done in two different ways:

- By means of the P1 and P2 push-buttons.
- With PC LC software communication with RS485 port.

To calibrate by means of 2 push-buttons P1 and P2 (see figure), needs to put the "SmartCost" respectively at the distance referred to 0% and 100% level, in order to store the relevant distance electronically.

In the condition of normal working the SMARTCOST shows green L3 (echo led) flashing (when echo is received).

To calibrate 4mA needs to put the SmartCost at the distance requested for 4mA output current. Wait till the L3 is flashing then push simultaneously P1 and P2, release them and verify that L3 will stay fix lighted.

Push twice P1, release it and wait until L3 is flashing again before to move the sensor. The distance has been stored and associated to 4mA output.

To calibrate 20mA needs to put the SmartCost at the distance requested for 20mA output. Wait till the L3 is flashing then push simultaneously P1 and P2, release them and verify that L3 will be fix lighted.

Press twice P2, release it and wait until L3 is flashing again before to move the sensor. The distance has been stored and associated to 20mA output.

The SmartCost relays configuration;
 RL1, min distance alarm (max level alarm)
 RL2, max distance alarm (min level alarm)

To calibrate the threshold of minimum distance (maximum level) needs to put the SmartCost at the distance at which you want minimum distance set-point, waiting till the L3 is flashing then: push simultaneously P1 and P2, release them and verify that L3 will stay fix on. Push P2 and release it, push P1 and release it. Wait until L3 is flashing again 10s before to change the distance. The threshold of RL1 has been stored.

To calibrate the set point (threshold) of max distance (minimum level) needs to put the SmartCost at the distance at which you want max distance set-point, waiting till the L3 is flashing then push simultaneously P1 and P2, release them and verify that L3 will stay fix on. Push P1 and release it, push P2 and release it. Wait until L3 is flashing again for 10s before to change the distance. Threshold of RL2 has been stored

SWING Controller Unit - Description

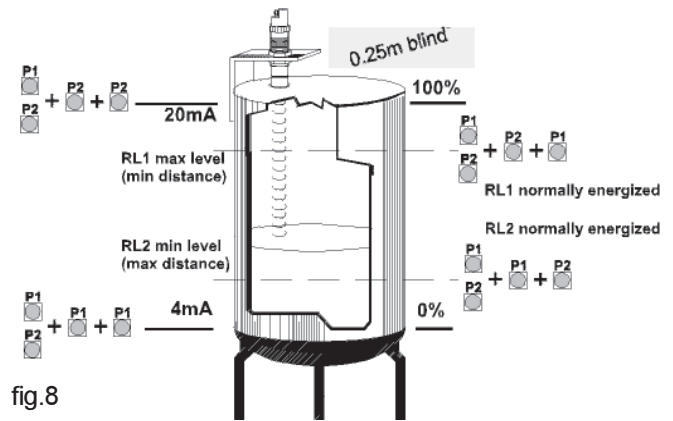
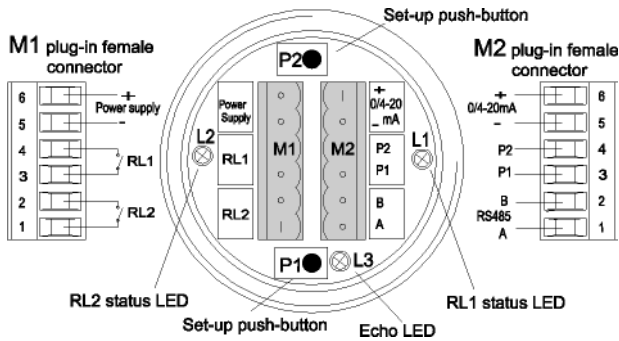
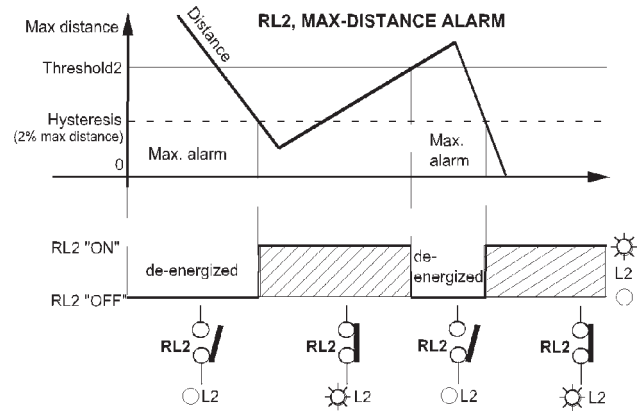
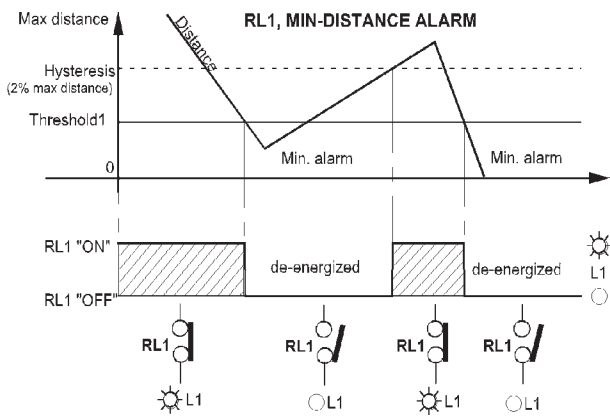
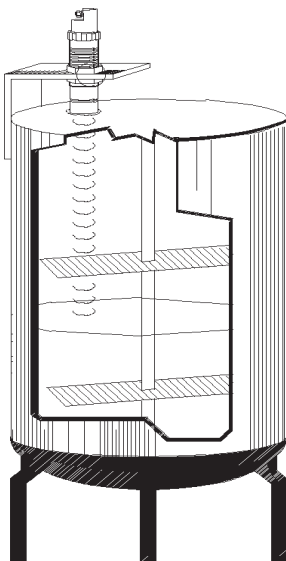


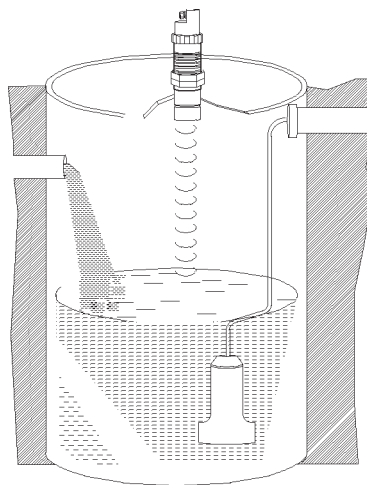
fig.8



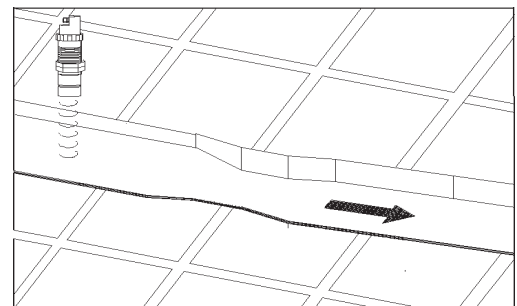
SWING Application examples



Non contact continuous level measurement into tanks with agitator

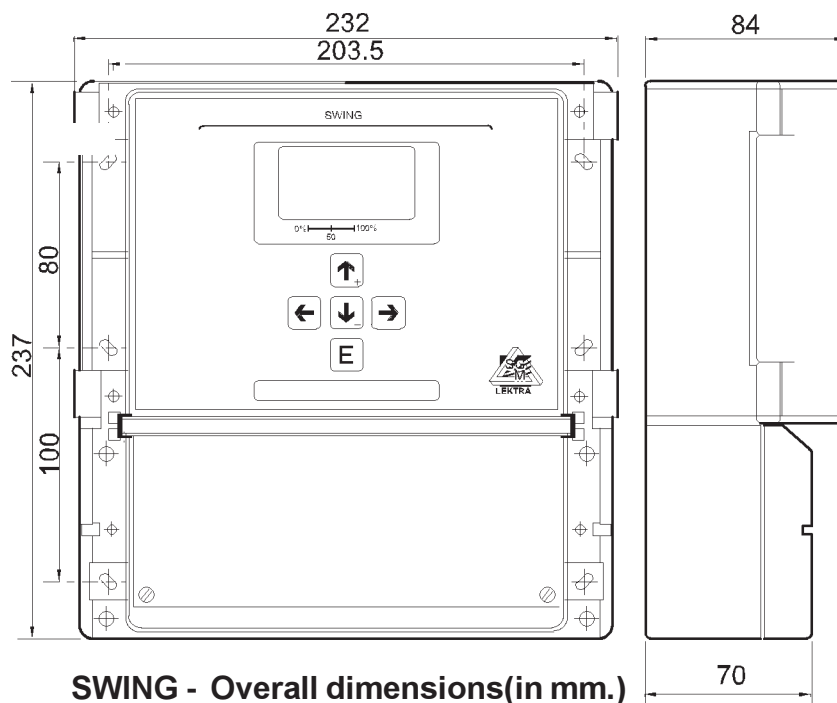


Pump control, compact stand alone unit. The Pump control configuration can be made from PC using the communication "LC" S/W.



Measurement in vessels and flow in open channels

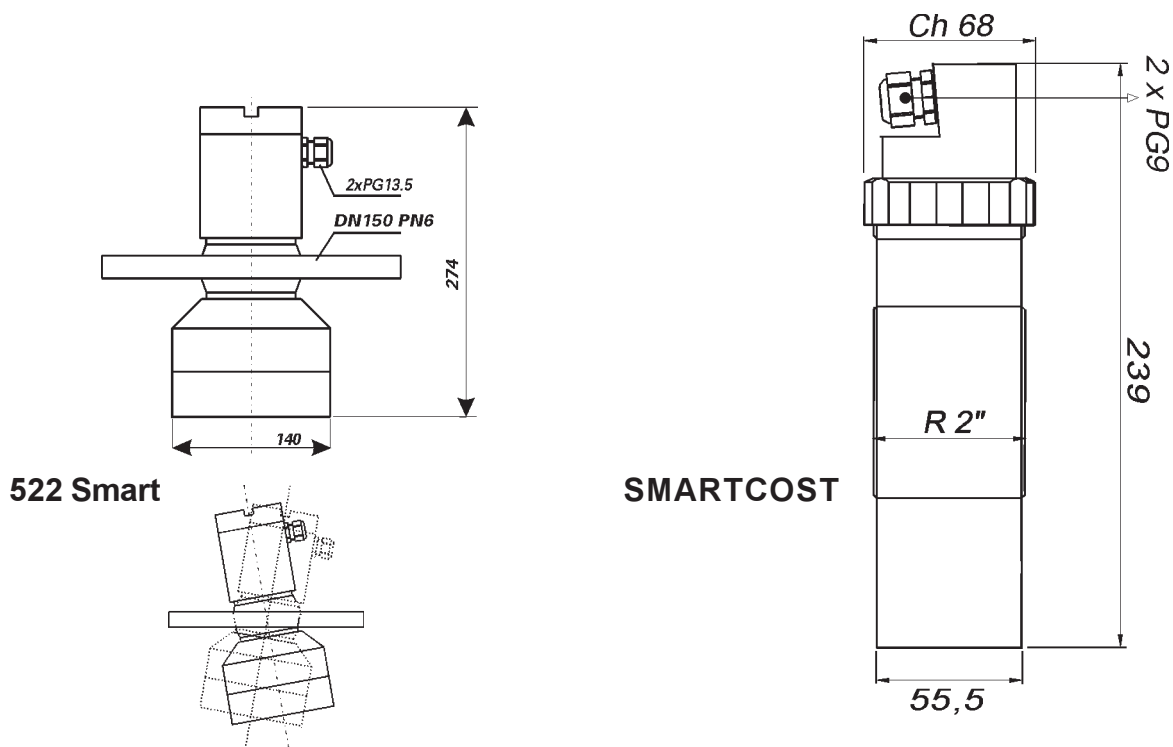
SWING Controller Unit - Description



SWING - Overall dimensions(in mm.)

Sensors - Overall dimensions(in mm.)

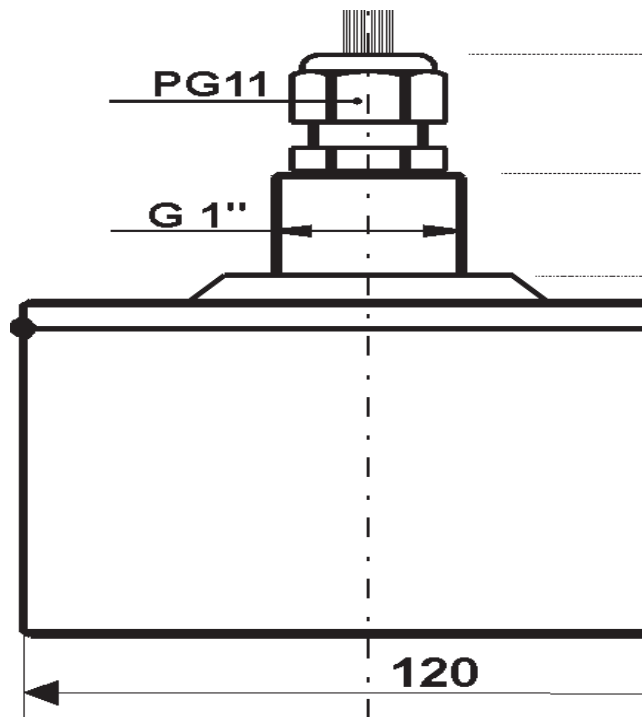
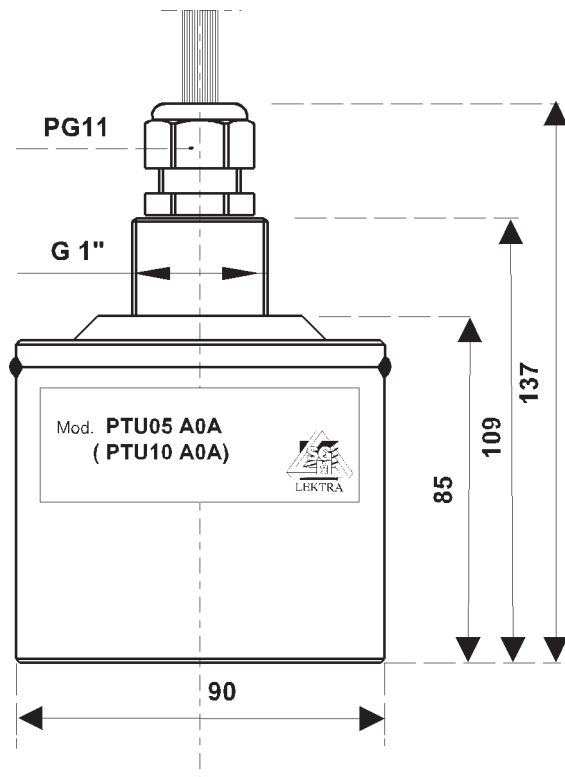
During the installation it is important to leave a "blind zone" in proximity of the sensor where no measurement is possible (see tab.1, pag.7)



SWING Controller Unit - Description

PTU family Sensor Calibration

The PTU family sensors (PTU05.., PTU10.., PTU15..) are IP68 sensors designed to be connected to the SWING unit. PTU family sensors can be programmed by SWING unit or PC s/w communication only. No local calibration is possible.



SWING Controller Unit - Description

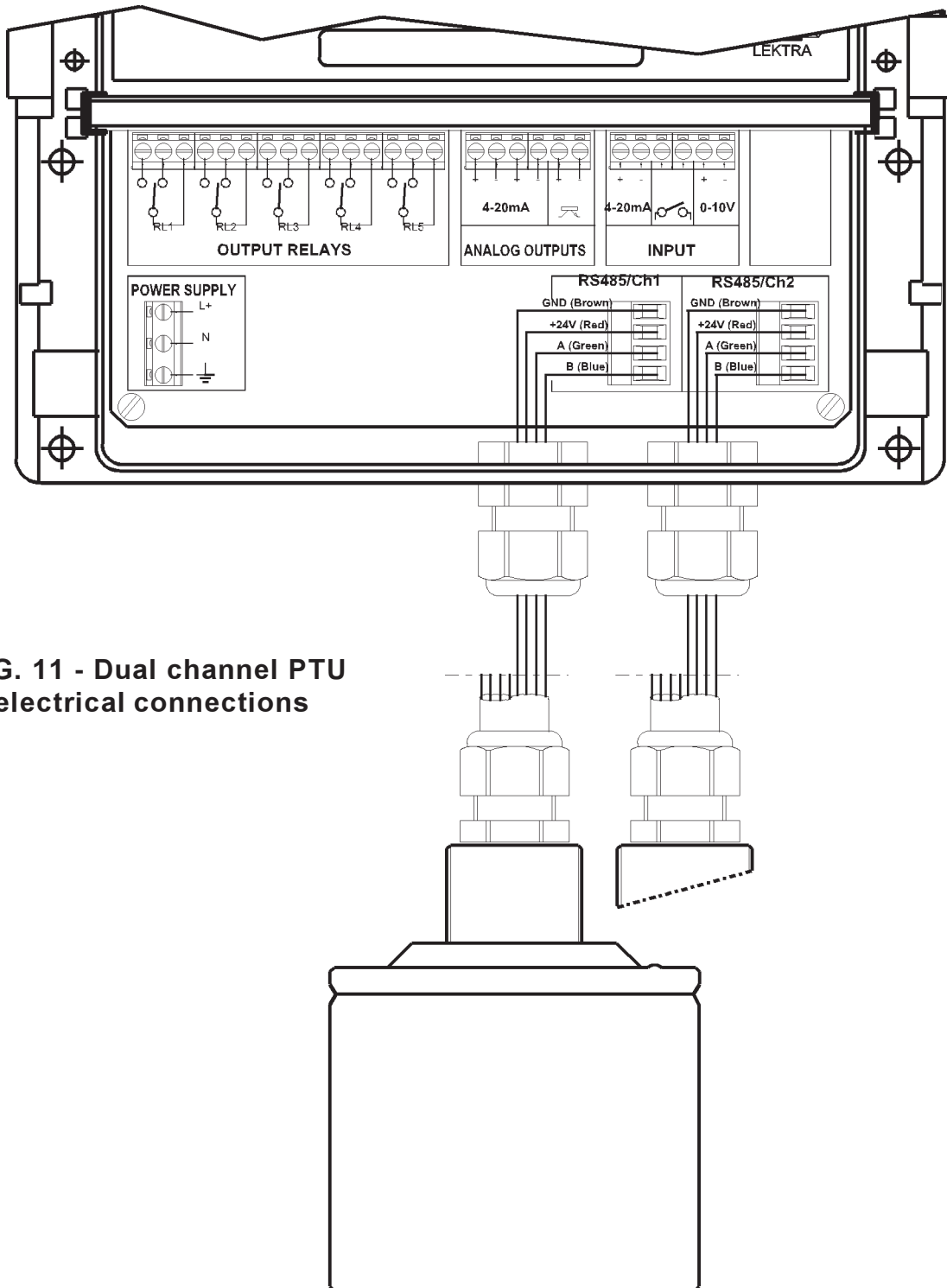


FIG. 11 - Dual channel PTU electrical connections

Warning. For dual channel configuration, it is necessary set the internal Unit Identification Device (UID) by the RS485 ports. To program different UID codes for each PTU sensor needs to connect the CH1 PTU sensor disconnecting the CH2 PTU sensor extracting connector then refer to the procedure in “Configuration/ProbeCH1-Selection”. Successively connect CH2 PTU sensor, disconnecting the CH1 PTU sensor and refer to “Configuration/ProbeCH2-Selection”, then connect both PTU sensors.

SWING Controller Unit - Description

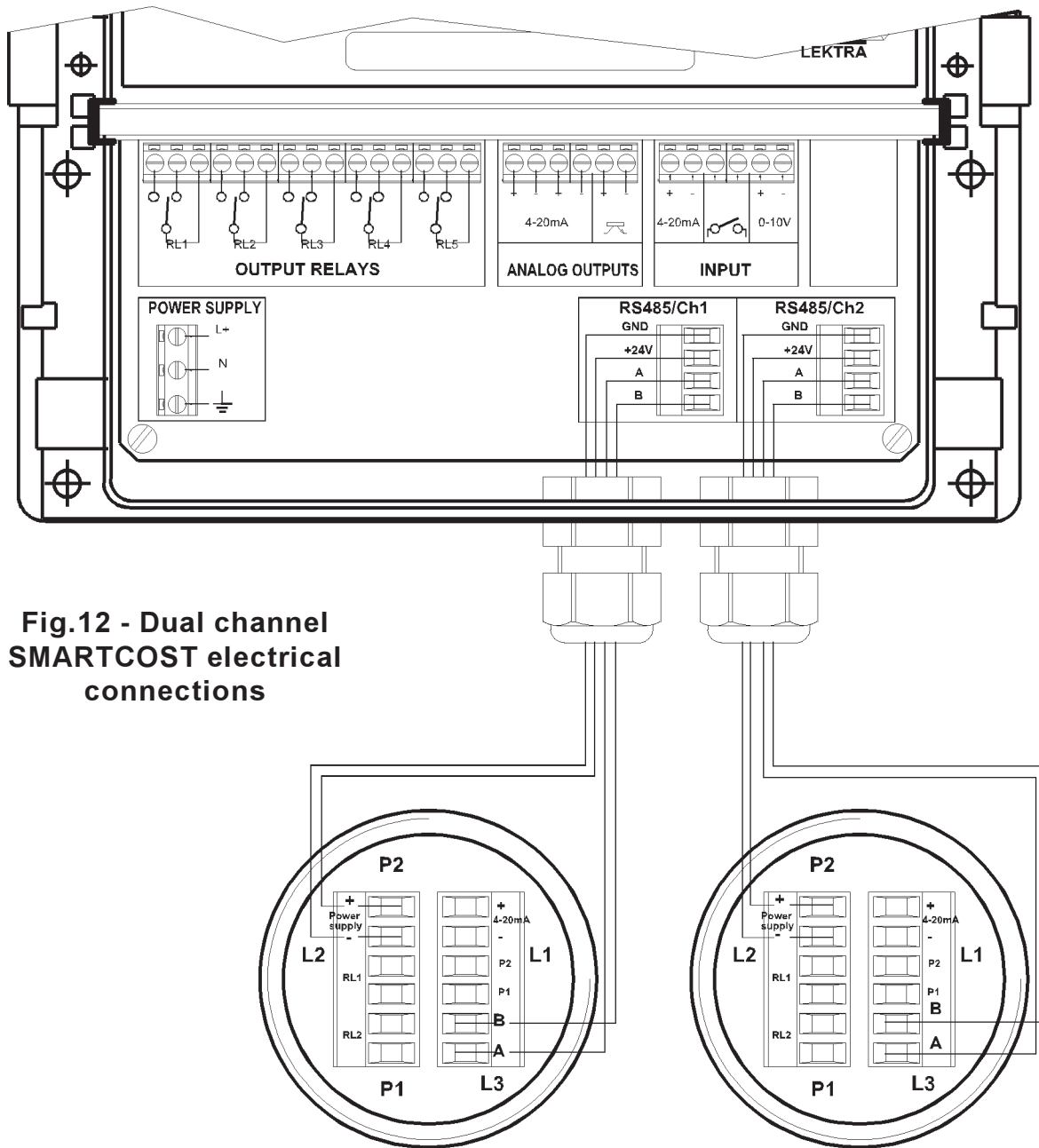


Fig.12 - Dual channel SMARTCOST electrical connections

Warning. For dual channel configuration, it is necessary set the internal Unit Identification Device (UID) by the RS485 ports. To program different UID codes for each SmartCost transmitter needs to connect the CH1 SmartCost disconnecting the CH2 SmartCost extracting connector then refer to the procedure in “Configuration/ProbeCH1-Selection”. Successively connect CH2 SmartCost, disconnecting the CH1 SmartCost and refer to “Configuration/ ProbeCH2-Selection”, then connect both SmartCost transmitters.

SWING Configuring/Programming the unit

1. Programming structure:

Swing has three different access levels:

- **MENU**
- **GROUPS**
- **PARAMETERS**

Each **MENU** include different **GROUPS**, each **GROUP** has a few **PARAMETERS**.

Each **PARAMETER** can be of three different types:

FLOAT

Are numeric(integer positive and negative) values that can be setted digit per digit using (+) and (-) keys.

STRING

Are selection messages scrolling by (+) and (-) keys.

STRUCT

Are selection mixed with STRING and FLOAT values. Normally must be selected the message by scrolling then the numeric value pressing i (+), (-) and (E) keys.

2. MENUs & GROUPs:

CONFIGURATION

SINGLE/DOUBLE
 INSTALLED RELAYS @
 PROBE CH1
 PROBE CH2
 ANALOG INPUT @
 DIGITAL INPUT @
 TASK
 EMERGENCY STATUS (EXALARM
 CONDITION) @
 ALARM OUTS STATUS (EXALARM
 CONDITION) @
 PROGRAM LEVEL
 TAG NAME @
 BACK LIGHT @
 CLOCK @
 SERVICE @

LEVEL

DISPLAY
 LEVEL ADJ
 ANALOG INPUT ADJ @
 APPLICATION @
 SET-POINT

FLOW

DISPLAY
 FLOW ADJ
 ANALOG INPUT ADJ @
 APPLICATION
 SET-POINT

PUMPS

DISPLAY
 LEVEL ADJ

APPLICATION

PUMPS ADJ
 SET-POINT

DIFFERENTIAL

DIFFERENCE LEVEL
 DIFFERENCE OFFSET

3. Keyboard (fig.13 e 14)

5 keys allow the control and the configuration/ programming of all the SWING operative functions.

4 keys can move the cursor into the parameters map. Jump from one to another **MENU**, or nested from **MENU** to **GROUP** and to the relevant parameters. [E] key, is used for data confirmation. For instance starting from **EDIT** page display it is possible move the cursor from **CONFIGURATION** to **LEVEL** to **FLOW** using the arrow DOWN key, while, reversely pushing arrow UP key.

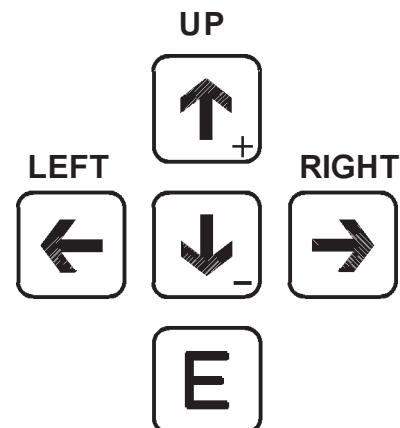
To move from menu **LEVEL** to its **GROUPS** push RIGHT key, to jump back from **GROUP** to the relevant **MENU** push LEFT key. In this situation, [E] key, will stop the configuring/programming (**EDIT**) operation jumping to the (**RUN**) **DISPLAY** mode.

UP and DOWN function keys change when a parameter to be modify is selected; in this situation, UP and DOWN keys are used to set value or to choosed the message.

The number and message are always displayed normally when they are equal to the memorized one ; if some changing are made in the value or in the selection message, the new value/selection, will be displayed in "reverse". Pushing [E] key, the "reverse" displayed value/selection will be memorized into the EEPROM memory and the acknowledge change from "reverse" to normal display.

The RIGHT key is used to move the cursor, while the LEFT key, has the escape function, leaving the same value and returning from parameters to GROUPS or to **MENU** as applicable.

Press at the same time UP and RIGHT to change the dot position



SWING Configuring/Programming the unit

4. DISPLAY

SWING unit has two different operating and display mode: **EDIT** and **RUN**.

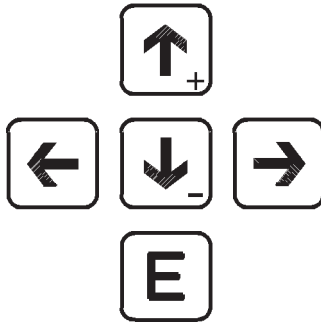
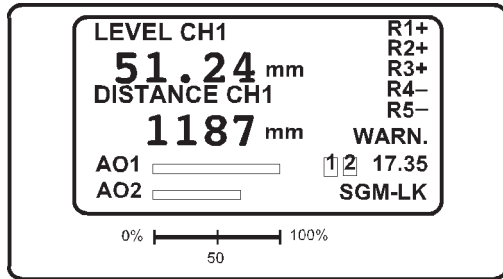


Figure 13 - RUN mode display

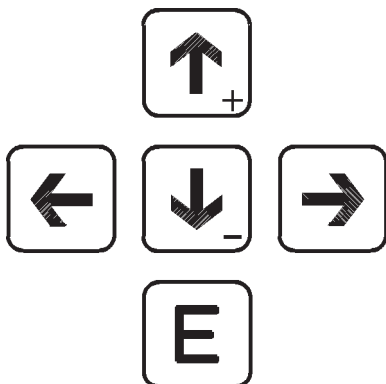
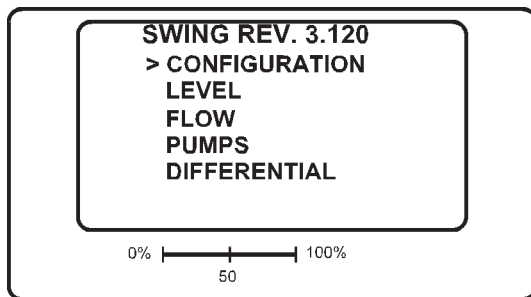


Figure 14 EDIT mode display

SWING unit after turn on power supply if already configured (made in factory), it will go automatically on the run mode display.

The moving from **RUN** mode to **EDIT** mode, to configure and program the relevant parameters, is made by press the LEFT key.



To jump back to the measuring **RUN** mode press enter



Once push LEFT key, is showed the **MENU** list.

With UP e DOWN keys the cursor > is moving up and down in the list then, referring to the selected **MENU**, press RIGHT key to enter in the desired menu. The GROUPS list will be displayed.

If depends to the configuration, some **MENU** are not available, the **MENU** name will be in "reverse" and the cursor will displayed in the opposite direction.

< FLOW

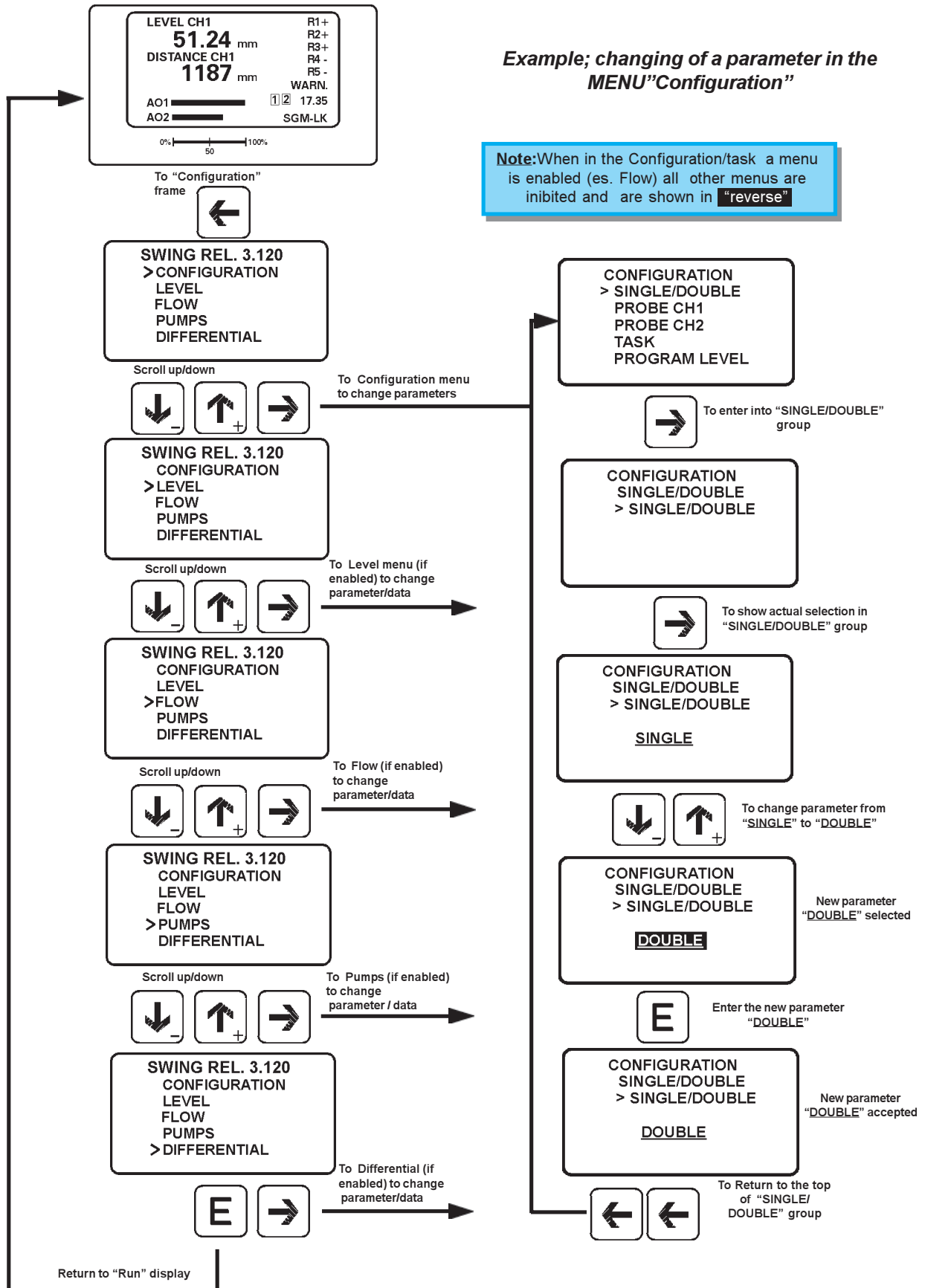
SWING enable **MENU** are selected into **CONFIGURATION TASK** parameters.

5. Contrast

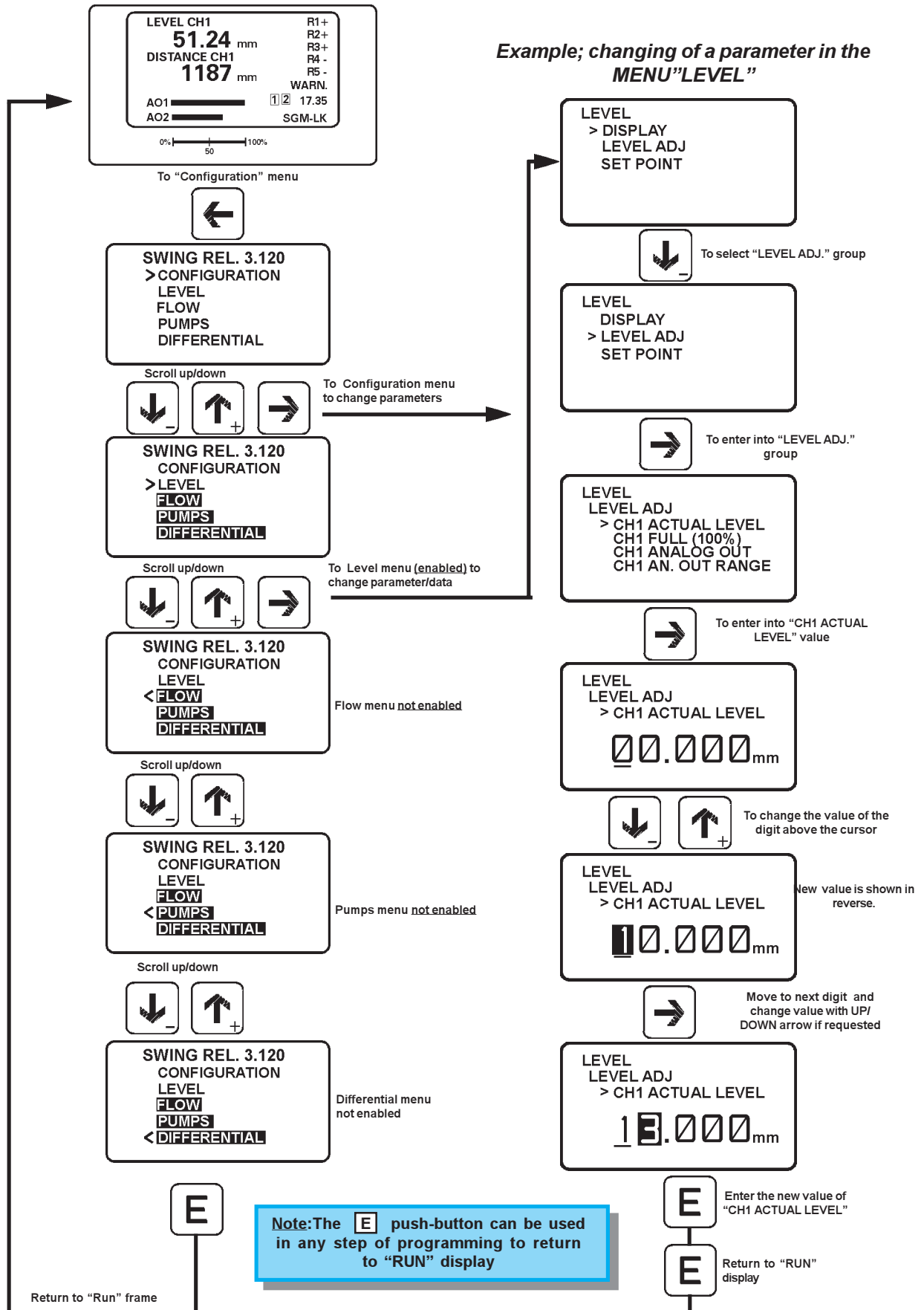
In RUN mode the contrast can be modify pressing UP and DOWN function keys.

Warning: In the next paragraphs, dedicates to the configuration and programming of the SWING unit, the factory setted default parameters value, are underlined

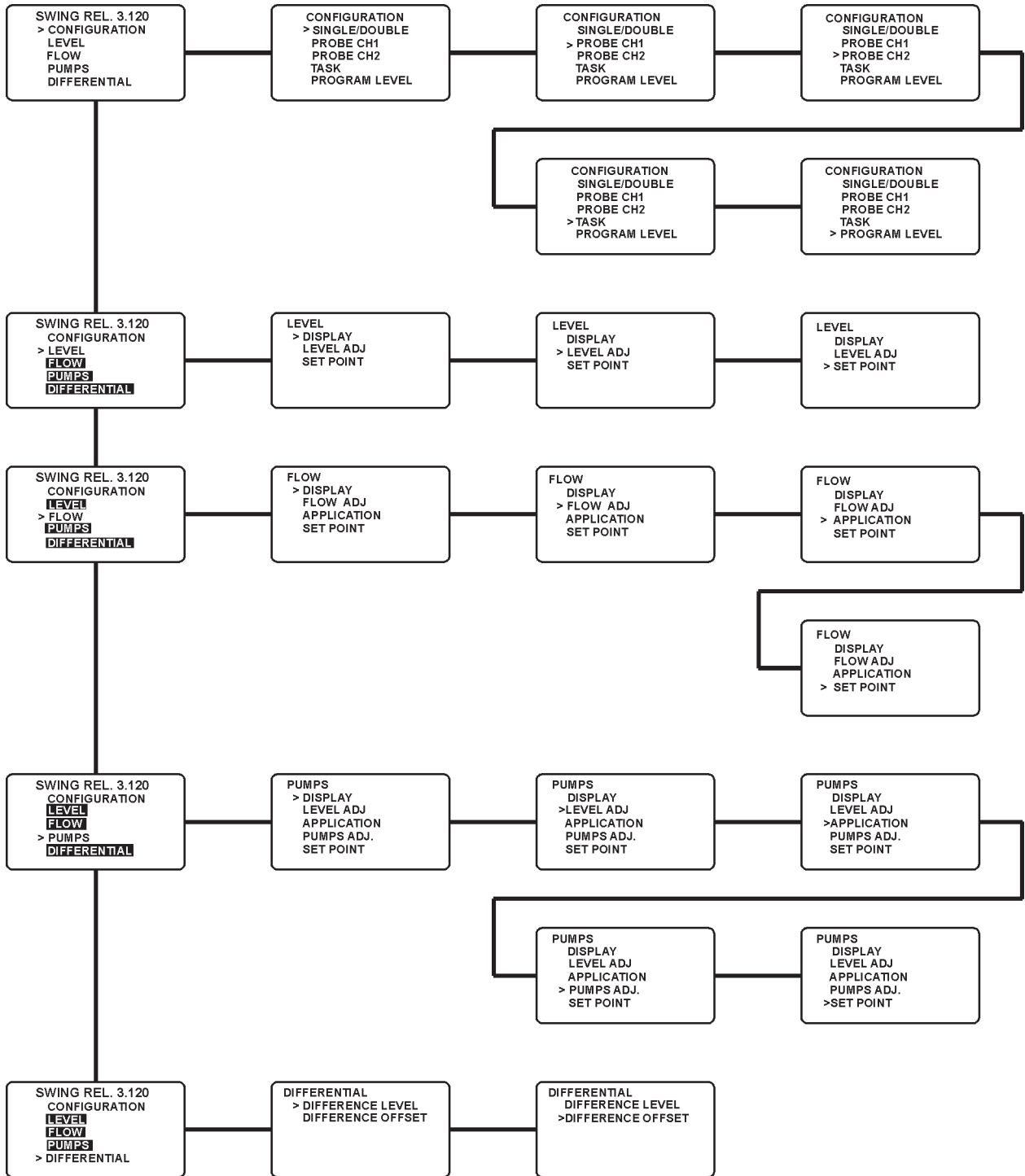
SWING Configuring/Programming the unit



SWING Configuring/Programming the unit



SWING Configuring/Programming the unit



SWING Configuration parameters

1. CONFIGURATION

1.1 SINGLE/DOUBLE

1.1.1 SINGLE/DOUBLE

The unit can operate as single measurement (only one sensor) or double measurement channels. If SINGLE , parameters referred to the CH2 will not be displayed.

Selection messages

SINGLE

DOUBLE

1.2 INSTALLED RELAYS @

1.2.1 N. RELAYS @

This parameter select the SWING unit able relays

Selection messages

5 RELAYS

3 RELAYS

NONE

Description

N.5 able relays

N.3 able relays

None able relays

1.3 PROBE CH1

1.3.1 PROBE TYPE

This parameter select the ultrasonic sensor type to be connected to the SWING at the CH1 measurement channel. The selection will be made scrolling the Smart and PTU family, pressing "E" key to confirm selection. During the ultrasonic sensor selection will be checked the electrical connection and the corrispondence to the wiring sensor .

Setting the parameter means that the SWING unit accept the sensor connected and, write into the ultrasonic sensor the relevant UID code name. **Warning ! ! if two ultrasonic sensor SMART or PTU family are connected , during this setup, only the CH1 ultrasonic sensor must be connected (consequently disconnect please, CH2 sensor taking out the CH2 extractable connector).**

Selection messages

SPECIAL

PTU15

PTU10

PTU05

524SMART

522SMART

521SMART

SMARTCOST

NONE

Description

None standard sensor connected

PTU15 sensor connected

PTU10 sensor connected

PTU05 sensor connected

524SMART sensor connected

522SMART sensor connected

521SMART sensor connected

SMARTCOST sensor connected

None sensor connected

SWING Configuration parameters

1.4 PROBE CH2

1.4.1 PROBE TYPE

Showed if DOUBLE was selected in 1.1.1 parameter

This parameter select the ultrasonic sensor type to be connected to the SWING at the CH2 measurement channel. The selection will be made scrolling the Smart and PTU family, pressing "E" key to confirm selection. During the ultrasonic sensor selection will be checked the electrical connection and the correspondance to the wiring sensor .

Setting the parameter means that the SWING unit accept the sensor connected and, write into the ultrasonic sensor the relevant UID code name. **Warning !! if two ultrasonic sensor SMART or PTU family are connected , during this setup, only the CH2 ultrasonic sensor must be connected (consequently disconnect please, CH1 sensor taking out the CH1 extractable connector).**

Selection messages

SPECIAL

PTU15

PTU10

PTU05

524SMART

522SMART

521SMART

SMARTCOST

NONE

Description

None standard sensor connected

PTU15 sensor connected

PTU10 sensor connected

PTU05 sensor connected

524SMART sensor connected

522SMART sensor connected

521SMART sensor connected

SMARTCOST sensor connected

None sensor connected

1.5 ANALOG INPUT @

1.5.1 FUNCTION @

This parameter select the analog input signal function.

Selection messages

FOUT PROBES

NONE

SF2

SF1

PROBE CH2

PROBE CH1

NONE

Description

Not yet available

Not yet available

Not yet available

Not yet available

Not yet available

CH1 sensor selected (available)

None selection

1.5.2 ANALOG RANGE @

This parameter select the analog input signal kind.

Selection messages

SPECIALCURRENT

0÷10V

4÷20mA

Description

Out standard signal

0÷10V analog input signal

4÷20mA analog input signal

1.6 DIGITAL INPUT @

1.6.1 DIGITAL INPUT @

This parameter select the digital input signal function

Selection messages

PUMPS PROTEC.

FAULT PROBES

NONE

Description

Pumps block-signal

Ultrasonic level sensor generic anomaly alarm signal

Not able function

SWING Configuration parameters

1.7 TASK

1.7.1 CH1 TASK

Measurement channel CH1, selection of the relevant function

Selection messages

LEVEL

FLOW

PUMPS

NONE

Description

CH1 makes LEVEL measurement

CH1 makes Open Channel Flow measurement

CH1 makes the pumps controller

None function at CH1

1.7.2 CH2 TASK [Showned if DOUBLE was selected in 1.1.1 parameter]

Measurement channel CH2, selection of the relevant function

Selection messages

LEVEL

FLOW

NONE

Description

CH2 makes LEVEL measurement

CH2 makes Open Channel Flow measurement

None function at CH2

1.8 EMERGENCY STATUS @

1.8.1 REL 1,2,3,4,5 @

This parameter select, when there is a digital input alarm (see 1.6 paragraph), the relays state

Selection messages

DE-ENERGIZED

ENERGIZED

NONE

Description

All de-energized relays

All energized relays

None change relays state

1.8.2 ANALOG OUT 1 @

This parameter select, when there is a digital input alarm (see 1.6 paragraph), the forced analog out1 state

Selection messages

H

MAX

MIN

Description

None forced

Forced 20mA

Forced 4mA

1.8.3 ANALOG OUT 2 @

This parameter select, when there is a digital input alarm (see 1.6 paragraph), the forced analog out1 state

Selection messages

H

MAX

MIN

Description

None forced

Forced 20mA

Forced 4mA

1.8.4 SLOPE OUT1 @

Not yet available

1.8.5 SLOPE OUT 2 @

Not yet available

SWING Configuration parameters

1.9 ALARM OUTS STATUS @

1.9.1 REL 1 @

This parameter select the relay 1 not alarm state

Selection messages

NORM. ENERGIZED

NORM.DE-ENERGIZED

Description

Normal energized relay

Normal de-energized relay

1.9.2 REL 2 @

This parameter select the relay 2 not alarm state

Selection messages

NORM. ENERGIZED

NORM.DE-ENERGIZED

Description

Normal energized relay

Normal de-energized relay

1.9.3 REL 3 @

This parameter select the relay 3 not alarm state

Selection messages

NORM. ENERGIZED

NORM.DE-ENERGIZED

Description

Normal energized relay

Normal de-energized relay

1.9.4 REL 4 @

This parameter select the relay 4 not alarm state

Selection messages

NORM. ENERGIZED

NORM.DE-ENERGIZED

Description

Normal energized relay

Normal de-energized relay

1.9.5 REL 5 @

This parameter select the relay 5 not alarm state

Selection messages

NORM. ENERGIZED

NORM.DE-ENERGIZED

Description

Normal energized relay

Normal de-energized relay

1.10 PROGRAM LEVEL

Parameter Program selection

Selection messages

normal

@

Description

Makes active the most important calibration parameters (suggested)

normal plus special service parameters (not suggested)

1.11 TAGNAME @

This parameter permises the 8 caracters tagname inserting, that will be showed in RUN mode on the right bottom display side

1.12 BACKLIGHT @

1.12.1 BACKLIGHT @

This parameter permises the display back lighting time value inserting

1.12.2 CONTR. @

This parameter permises the display contrast value inserting

SWING Configuration parameters

1.13 CLOCK @

1.13.1 CLOCK @

This parameter sets the hour and minutes

<i>Selection messages</i>	<i>Description</i>
SET HOUR	Hour setting
SET MINUTE	Minutes setting

1.14 SERVICE @

Different SWING unit functions are tested or seted in this program level

1.14.1 DIAGNOSTIC @

Not yet available

<i>Selection messages</i>	<i>Description</i>
SET POINT LIMIT	x

1.14.2 RESTORE MEMORY @

This parameter tests the system memory

<i>Selection messages</i>	<i>Description</i>
CHK_SUM XXX	Test result

1.14.3 SENSOR COM @

Not yet available

<i>Selection messages</i>	<i>Description</i>
COMM._OK	x

1.14.4 ACCESS CODE @

This parameter permises the access code value inserting

1.14.5 CH1 SENSOR PARAM.

This parameter permises to modify the CH1 ultrasonic level sensor internal parameters running

<i>Selection messages</i>	<i>Description</i>
AVERAGE NUMBER	Not yet available
AVERAGE OFFSET	Not yet available
TB DELAY	Not yet available
4mA CALIB.	Not yet available
20 mA CALIB.	Not yet available
DIVISION STEP	Not yet available
THRS1 CONFIG.	Not yet available
THRS1 VALUE	Not yet available
THRS2 CONFIG.	Not yet available
THRS2 VALUE	Not yet available
AGC PULSE LENGHT	Not yet available
SOUND VEL.	Not yet available

SWING Configuration parameters

1.14.6 CH2 SENSOR PARAM.

This parameter permits to modify the CH2 ultrasonic level sensor internal parameters running

<i>Selection messages</i>	<i>Description</i>
AVERAGE NUMBER	Not yet available
AVERAGE OFFSET	Not yet available
TB DELAY	Not yet available
4mA CALIB.	Not yet available
20 mA CALIB.	Not yet available
DIVISION STEP	Not yet available
THRS1 CONFIG.	Not yet available
THRS1 VALUE	Not yet available
THRS2 CONFIG.	Not yet available
THRS2 VALUE	Not yet available
AGC PULSE LENGHT	Not yet available
SOUND VEL.	Not yet available

1.14.7 B SCALE IN

According to analog input signal kind selected at 1.5.2 paragraph, this parameter sets the analog input begin scale value at 4mA or 0V

<i>Selection messages</i>	<i>Description</i>
CONNECT TO BEGIN SCALE TYPE 'E'	Set at 4mA or 0V the analog input signal
VALORE LETTO	Value seted

1.14.8 E SCALE IN

According to analog input signal kind selected at 1.5.2 paragraph, this parameter sets the analog input end scale value at 20mA or 10V

<i>Selection messages</i>	<i>Description</i>
CONNECT TO END SCALE TYPE 'E'	Set at 20mA or 10V the analog input signal
VALORE LETTO	Value seted

1.14.9 B SCALE OUT CH1

4mA CH1 analog output signal setting

<i>Selection messages</i>	<i>Description</i>
038	4mA PWM value

1.14.10 E SCALE OUT CH1

20mA CH1 analog output signal setting

<i>Selection messages</i>	<i>Description</i>
198	20mA PWM value

1.14.11 B SCALE OUT CH2

4mA CH2 analog output signal setting

<i>Selection messages</i>	<i>Description</i>
038	4mA PWM value

1.14.12 E SCALE OUT CH2

20mA CH2 analog output signal setting

<i>Selection messages</i>	<i>Description</i>
198	20mA PWM value

SWING Configuration parameters

1.14.13 DIG. 0. TST

Relays test

Selection messages

5

Description

Not yet available

1.14.14 CH1 RESET TOT

CH1 totalizer reset

Selection messages

RESETTED

Description

Resetted CH1 totalizer

1.14.15 CH2 RESET TOT

CH2 totalizer reset

Selection messages

RESETTED

Description

Resetted CH2 totalizer

SWING Level parameters

2. LEVEL

2.1 DISPLAY

The SWING's display, can shows up to two variables. This parameter selects the variables to be displayed. The first variable setted will be positioned in the upper part, then if another variable will be selected the last will be positioned in the upper part and the previous variable will be shifted below. (if a third variable is setted the first one will be lost).

Variables	Description
DISTANCE CH1	Distance
LEVEL CH1	Level
LEVEL % CH1	% Level
TEMPERATURE	CH1 Sensor temperature measurement (only for Smart, PTU family)

[CH2 parameters are showed if DOUBLE was selected in 1.1.1 parameter]

Variables	Description
DISTANCE CH2	Distance
LEVEL CH2	Level
LEVEL % CH2	% Level
TEMPERATURE	CH2 Sensor temperature measurement (only for Smart, PTU family)

2.2 LEVEL ADJ

Ultrasonic sensor , level calibration, output transmitter

2.2.1 CH1 MEASURE UNIT

CH1 measure unit parameter selecting

Parameters	Selection messages
CH1 MEASURE UNIT	m
	dm
	cm
	<u>mm</u>

2.2.2 CH1 CALIBRATE MODE @

CH1 calibration mode kind selecting

Parameters	Selection messages	Description
CH1 CALIBRATE MODE	DIMENSION	Empty and full calibration mode
	<u>ACTUAL LEVEL</u>	<u>Actual level calibration mode</u>

2.2.3 CH1 ACTUAL LEVEL

Parameter to calibrate the ultrasonic Smart, PTU sensor level. Must be setted the present level measured from the ultrasonic level sensor in mm. , if the level is different from 0. Swing unit compute automatically the distance at which set the 0 level. Set the present instantaneous level (in mm) and then push "E" key to confirm.

Parameter	Description
CH1 ACTUAL LEVEL	Instantaneous level =0

2.2.4 CH1 EMPTY (0%)

The parameter set the level value, in mm, referred to 0% . Set the value and push "E" key to confirm.

Parameter	Description
CH1 EMPTY (0%)	Level value in mm referred to level =0% =0

SWING Level parameters

2.2.5 CH1 FULL (100%)

The parameter set the CH1 level value, in mm, referred to 100%. Set the value and push "E" key to confirm.

<i>Parameter</i>	<i>Description</i>
CH1 FULL (100%)	Level value in mm referred to level=100% =3000

2.2.6 CH1 BLOCK DIST. @

CH1 ultrasonic level sensor block distance (min. measurable level).

<i>Parameter</i>	<i>Description</i>
CH1 BLOCK DIST. = 250	Level value in mm referred to block distance

2.2.7 CH1 OUT DISTANCE @

CH1 ultrasonic level sensor out distance (max. measurable level).

<i>Parameter</i>	<i>Description</i>
CH1 OUT DISTANCE =50000	Level value in mm referred to out distance

2.2.8 CH1 ANALOG OUT

Selection of the CH1 output variables to be addressed to CH1 4+20mA.

<i>Parameters</i>	<i>Selection messages</i>
CH1 ANALOG OUT	NONE
	DISTANCE
	LEVEL
	LEVEL %
	TEMPERATURE

2.2.9 CH1 ANALOG OUT RANGE

Selection of the CH1 output range of 4+20mA.

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 AN. OUT RANGE	Begin scale	"CH1 Analog Out " begin scale. Set the value, and press E
	End scale	"CH1 Analog Out " end scale. Set the value, and press E

If DOUBLE was selected in 1.1.1 ; the following CH2 parameters will be displayed, please refer to the CH1 correspondance

2.2.10 CH2 ACTUAL LEVEL

2.2.11 CH2 FULL (100%) @

2.2.12 CH2 ANALOG OUT

2.2.13 CH2 ANALOG OUT RANGE

2.2.14 CH2 FULL (100%)

2.2.15 CH2 BLOCK DIST. @

2.2.16 CH2 OUT DISTANCE @

2.2.17 CH2 ANALOG OUT

2.2.18 CH2 ANALOG OUT RANGE

SWING Level parameters

2.3 ANALOG INPUT ADJ @

2.3.1 MEASURE UNIT @

Analog input measure unit

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
MEASURE UNIT	mm cm dm m	

2.3.2 SET RANGE @

Analog input range setting

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
SET RANGE	BEGIN SCALE END SCALE	4mA or 0V begin scale value 20mA or 10V end scale value

2.4 APPLICATION @

2.4.1 CH1 LOST ECHO TIME @

Not yet available

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 LOST ECHO TIME	Not yet available	Not yet available

2.4.2 CH1 AGITATOR @

Not yet available

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 AGITATOR	WITHOUTAGITATOR WITHAGITATOR	Not yet available Not yet available

2.4.3 CH1 FILL TIME m/h @

Not yet available

<i>Parameter</i>	<i>Description</i>
CH1 FILLING TIME m/h =9999.9	Not yet available

2.4.4 CH1 EMPTING T. m/h @

Not yet available

<i>Parameter</i>	<i>Description</i>
CH1 EMPTING TIME m/h =9999.9	Not yet available

If DOUBLE was selected in 1.1.1 ; the following CH2 parameters will be displayed, please refer to the CH1 correspondence

2.4.5 CH2 LOST ECHO TIME @

2.4.6 CH2 AGITATOR @

2.4.7 CH2 FILL TIME m/h @

2.4.8 CH1 EMPTING T. m/h @

SWING Level parameters

2.5 SET-POINT

2.5.1 CH1 SETPOINT1

Setpoint associated to REL1, variable and value selection

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETPOINT1	DISTANCE, =500	Limit point in mm, referred to the distance variable.
	LEVEL, =4500	Limit point in mm, referred to the level variable.
	LEVEL PERC., =90	Limit point in mm, referred to the level % variable.
	TEMPERATURE, =50°	Limit point in mm, referred to the temp. variable.
	NONE	Disabled setpoint

2.5.2 CH1 SETPOINT2

Setpoint associated to REL2, variable and value selection

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETPOINT2	DISTANCE, =1500	Limit point in mm, referred to the distance variable.
	LEVEL, =3500	Limit point in mm, referred to the level variable.
	LEVEL PERC. =70	Limit point in mm, referred to the level % variable.
	TEMPERATURE, =50°	Limit point in mm, referred to the temperature variable.
	NONE	Disabled setpoint

2.5.3. CH1 SETPOINT3

Setpoint associated to REL3, variable and value selection

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETPOINT3	DISTANCE, =2500	Limit point in mm, referred to the distance variable.
	LEVEL, =2500	Limit point in mm, referred to the level variable.
	LEVEL PERC. =50	Limit point in mm, referred to the level % variable.
	TEMPERATURE, =50°	Limit point in mm, referred to the temperature variable.
	NONE	Disabled setpoint

2.5.4. CH1 SETPOINT4

Setpoint associated to REL4, variable and value selection

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETPOINT4	DISTANCE, =3500	Limit point in mm, referred to the distance variable.
	LEVEL, =1500	Limit point in mm, referred to the level variable.
	LEVEL PERC. =30	Limit point in mm, referred to the level % variable.
	TEMPERATURE, =50°	Limit point in mm, referred to the temperature variable.
	NONE	Disabled setpoint

2.5.5 CH1 SETPOINT5

Setpoint associated to REL5, variable and value selection

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETPOINT5	DISTANCE, =4500	Limit point in mm, referred to the distance variable.
	LEVEL, =500	Limit point in mm, referred to the level variable.
	LEVEL PERC. =10	Limit point in mm, referred to the level % variable.
	TEMPERATURE, =50°	Limit point in mm, referred to the temperature variable.
	NONE	Disabled setpoint

SWING Level parameters

The following five parameters select the action type referring the relevant previous setpoint variable. The parameter can be setted as a Minimum, Maximum, Window, and Differential threshold action

2.5.6 CH1 SETP.1 MODE

Parameters

CH1 SETP.1 MODE

Selection messages

MAX =2

MIN =2

WINDOW=2

DIFF. =10

Description

Set hysteresis value in mm below threshold variable setp.

Set hysteresis value in mm above threshold variable setp.

Set hyst. value in mm above and below threshold setp.

The hysteresis will be setted automatically above or below the setp. depending if the across of the setp. is made during increase or decrease of the value.

2.5.7 CH1 SETP.2 MODE

Parameters

CH1 SETP.2 MODE

Selection messages

MAX =2

MIN =2

WINDOW=2

DIFF. =10

Description

Set hysteresis value in mm below threshold variable setp.

Set hysteresis value in mm above threshold variable setp.

Set hyst. value in mm above and below threshold setp.

The hysteresis will be setted automatically above or below the setp. depending if the across of the setp. is made during increase or decrease of the value.

2.5.8 CH1 SETP.3 MODE

Parameters

CH1 SETP.3 MODE

Selection messages

MAX =2

MIN =2

WINDOW=2

DIFF. =10

Description

Set hysteresis value in mm below threshold variable setp.

Set hysteresis value in mm above threshold variable setp.

Set hyst. value in mm above and below threshold setp.

The hysteresis will be setted automatically above or below the setp. depending if the across of the setp. is made during increase or decrease of the value.

2.5.9 CH1 SETP.4 MODE

Parameters

CH1 SETP.4 MODE

Selection messages

MAX =2

MIN =2

WINDOW=2

DIFF. =10

Description

Set hysteresis value in mm below threshold variable setp.

Set hysteresis value in mm above threshold variable setp.

Set hyst. value in mm above and below threshold setp.

The hysteresis will be setted automatically above or below the setp. depending if the across of the setp. is made during increase or decrease of the value.

2.5.10 CH1 SETP.2 MODE

Parameters

CH1 SETP.2 MODE

Selection messages

MAX =2

MIN =2

WINDOW=2

DIFF. =10

Description

Set hysteresis value in mm below threshold variable setp.

Set hysteresis value in mm above threshold variable setp.

Set hyst. value in mm above and below threshold setp.

The hysteresis will be setted automatically above or below the setp. depending if the across of the setp. is made during increase or decrease of the value.

SWING Level parameters

If DOUBLE was selected in 1.1.1 ; the following CH2 parameters will be displayed please, refer to the CH1 correspondence

2.5.11. CH2 SETPOINT1

2.5.12. CH2 SETPOINT2

2.5.13. CH2 SETPOINT3

2.5.14. CH2 SETPOINT4

2.5.15. CH2 SETPOINT5

2.5.16. CH2 SETP.1 MODE

2.5.17. CH2 SETP.2 MODE

2.5.18. CH2 SETP.3 MODE

2.5.19. CH2 SETP.4 MODE

2.5.20. CH2 SETP.5 MODE

SWING Open Channel Flow parameters

3. FLOW

3. DISPLAY

The SWING's display, can shows up to two variables. This parameter selects the variables to be displayed. The first variable setted will be positioned in the upper part, then if another variable will be selected the last will be positioned in the upper part and, the previous variable will be shifted below. (if a third variable is setted the first one will be lost).

<i>Messages</i>	<i>Description</i>
CH1 FLOW	Instantaneus flow
CH1 LEVEL	Instantaneus level (head)
CH1 TOTALIZER	Totalizer max 9999999
CH1 COUNTER	Counter max 9999999
CH1 COUNTER DOWN	Presetable counter

CH2 parameters showed if DOUBLE was selected in 1.1.1 parameter]

<i>Messages</i>	<i>Description</i>
CH2 FLOW	Instantaneus flow
CH2 LEVEL	Instantaneus level (head)
CH2 TOTALIZER	Totalizer max 9999999
CH2 COUNTER	Counter max 9999999
CH2 COUNTER DOWN	Presetable counter

3.2 FLOW ADJ

3.2.1 CH1 LENGTH UNIT

Select the channel length measure unit then press "E" to confirm.

<i>Parameters</i>	<i>Selection messages</i>
CH1 LENGTH UNIT	m
	dm
	cm
	mm

3.2.2 CH1 FLOW UNIT

Select the flow measure unit then press "E" to confirm.

<i>Parameters</i>	<i>Selection messages</i>
CH1 FLOW UNIT	L/Sec
	L/min
	L/hour
	-m3/Sec
	-m3/min
	-m3/hour

3.2.3 CH1 CALIBR. MODE @

Select the level measure calibration mode then press "E" to confirm.

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 CALIBRATE MODE	DIMENSION	Empty and full calibration mode
	ACTUAL LEVEL	Actual level calibration mode

SWING Open Channel Flow parameters

3.2.4 CH1 ACTUAL LEVEL

Parameter to calibrate the ultrasonic Smart and PTU sensor level. Must be set the present level measured from the ultrasonic level sensor in mm. , if the level is different from 0, Swing unit compute automatically the distance at which set the 0 level (0 flow). Set the present instantaneous level (in mm) and then press “E” key to confirm.

<i>Parameter</i>	<i>Description</i>
CH1 ACTUAL LEVEL $\equiv 0$	Instantaneous level

3.2.5 CH1 EMPTY (0%)

The parameter set the level value, in mm, referred to 0% . Set the value and push “E” key to confirm.

<i>Parameter</i>	<i>Description</i>
CH1 EMPTY (0%)	Level value in mm referred to level =0% $\equiv 0$

3.2.6 CH1 FULL (100%)

The parameter set the level value, in mm, referred to 100% . Set the value and press “E” key to confirm.

<i>Parameter</i>	<i>Description</i>
CH1 FULL (100%) $\equiv 3000$	Level value in mm referred to level=100%

3.2.7 CH1 BLOCK DIST. @

CH1 ultrasonic level sensor block distance (min. measurable level).

<i>Parameter</i>	<i>Description</i>
CH1 BLOCK DIST. $\equiv 250$	Level value in mm referred to block distance

3.2.8 CH1 OUT DISTANCE @

CH1 ultrasonic level sensor out distance (max. measurable level).

<i>Parameter</i>	<i>Description</i>
CH1 OUT DISTANCE $\equiv 50000$	Level value in mm referred to out distance

3.2.9 CH1 ZERO OFFSET @

Min. flow level measurement

<i>Parameter</i>	<i>Description</i>
CH1 ZERO OFFSET $\equiv 0000$	Level value in mm referred to min. flow level measurement

3.2.10 CH1 ANALOG OUT

Selection of the CH1 output variables to be addressed to CH1 4-20mA.

<i>Parameters</i>	<i>Selection messages</i>
CH1 ANALOG OUT	NONE
	HEAD
	FLOW

3.2.11 CH1 ANALOG OUT RANGE

Selection of the CH1 output range of 4-20mA.

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 AN.OUT RANGE	Begin scale	“CH1 Analog Out “ begin scale. Set the value, press E
	End scale	“CH1 Analog Out “ end scale. Set the value, press E

SWING Open channel Flow parameters

If DOUBLE was selected in 1.1.1 ; the following CH2 parameters will be displayed please, refer to the CH1 correspondence

3.2.12 CH2 LENGTH UNIT ###

3.2.13 CH2 FLOW UNIT

3.2.14 CH2 CALIBR. MODE @

3.2.15 CH2 ACTUAL LEVEL

3.2.16 CH2 EMPTY (0%)

3.2.17 CH2 FULL (100%)

3.2.18 CH2 BLOCK DIST. @

3.2.19 CH2 OUT DISTANCE @

3.2.20 CH2 ZERO OFFSET @

3.2.21 CH2 ANALOG OUT

3.2.22 CH2 ANALOG OUT RANGE

3.3 ANALOG INPUT ADJ @

3.3.1 MEASURE UNIT @

Analog input measure unit

<i>Parameters</i>	<i>Selection messages</i>
MEASURE UNIT	mm cm dm m

3.3.2 SET RANGE @

Analog input range setting

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
SET RANGE	BEGIN SCALE	Begin scale value (4mA o 0V)
	END SCALE	End scale value (20mA o 10V)

SWING Open Channel Flow parameters

3.4 APPLICATION

3.4.1 CH1 PRIMARY DEVICE

The flow measurement in open channel needs hydraulic restriction and must be measured the level (HEAD) of the liquids before the restriction. Mathematical equations, already implemented into the SWING unit, will convert the Head into the relevant Flow. WEIRS, must be used for clean water, FLUMES are better for water with sedimentation. If not standard restrictions are used and the Head-Flow relation are known (like discharge table), TABLE can be used to fit the relevant correspondence (up to 32 couple of head-flow values). Select and press "E" key to confirm.

Parameters	Selection messages
CH1 PRIMARY DEVICE	WEIRS
	FLUMES
	TABLE

3.4.2 CH1 WEIRS

Displayed only if : Primary Device = Weirs

Parameters	Selection messages
CH1 WEIRS	NOT COSTR.RECT.
	COSTR.RECT.
	V-NOTCH
	TRAPEZIOIDAL

3.4.3 CH1 FLUMES

Displayed only if : Primary Device = Flumes

Parameter	Messages
CH1 FLUMES	VENTURI

3.4.4 CH1 DIMENSION

Referred to the previous selections, (WEIRS or FLUMES;),

Parameters	Selection messages
CH1 DIMENSION	A = 0000 ≈ 1000
	B = 0000 ≈ 100
	C = 0000 ≈ 0
	D = 0000 ≈ 0
	E = 0000 ≈ 90

Description

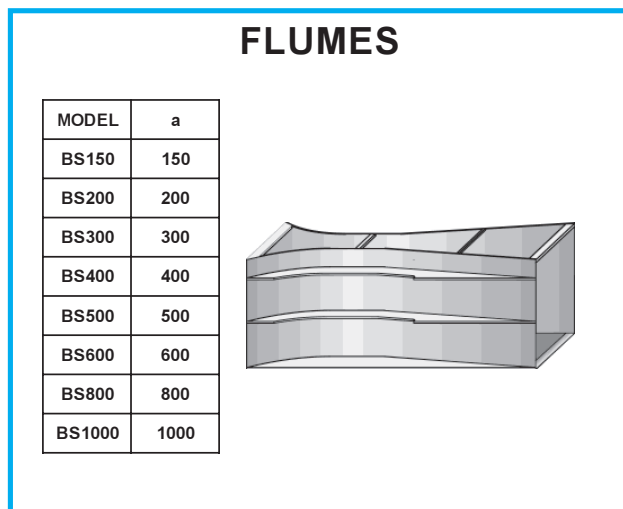
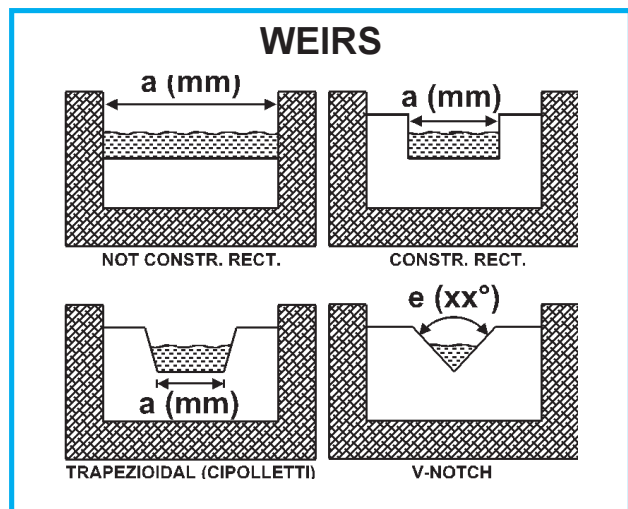
SGM LEKTRA VENTURI flumes model or a weir dimension; see the next figures

Not yet available

Not yet available

Not yet available

V-notched weir opening angle; see the next figures



SWING Open Channel Flow parameters

3.4.5 CH1 HYDRA. PARAM. @

The parameters set the flow measurement open channel hydraulic values

<i>Parameters</i>	<i>Selection messages</i>
CH1 HYDRA. PARAM.	k = 0000, \equiv 1000 a = 0000, \equiv 100 b = 0000, \equiv 0 d = 0000, \equiv 0

3.4.6 CH1 DISCH. FORMULA

Not yet available

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 DISCH. FORMULA	B.S. HYDRAULIC	Not yet available
	GENERAL	Not yet available

3.4.7 CH1 LEV/FLOW TAB

Displayed only if : Primary Device = TABLE

Note: The values couples must be entered in ascending mode

<i>Parameters</i>	<i>Selection messages</i>
CH1 LEVEL/FLOW TAB	LEVEL 01 \equiv 0 FLOW 01 \equiv 0 LEVEL 32 \equiv 0 FLOW 32 \equiv 0

3.4.8 CH1 COUNTER RESET

<i>Parameter</i>	<i>Selection messages</i>	<i>Description</i>
CH1 COUNTER RESET	RESETTED	Resetted CH1 counter

3.4.9 CH1 C.DOWN PRESET

<i>Parameter</i>	<i>Selection messages</i>	<i>Description</i>
CH1 COUNT DOWN PRESET	\equiv 1000	Set the count- down counter start value

3.4.10 CH1 VOLUME PULSE

Based on the flow measure unit selected, (eg.: m3/h), set the value of this parameter that multiply the volume unit (m3). This variable represent the counting unit for all the totalizer, and counters. For instance flow measure unit l/s; set the parameter volume pulse=1000; one count each 1 m3 (1000 liters)

<i>Parameter</i>	<i>Selection messages</i>	<i>Description</i>
CH1 VOLUME PULSE	\equiv 1	Set the desired value and press "E" key,

SWING Open Channel Flow parameters

If DOUBLE was selected in 1.1.1 ; the following CH2 parameters will be displayed please, refers to the CH1 corrispondence

3.4.11 CH2 PRIMARY DEVICE

3.4.12 CH2 WEIRS

3.4.13 CH2 FLUMES

3.4.14 CH2 DIMENSION

3.4.15 CH2 HYDRA. PARAM.

3.4.16 CH2 DISCH. FORMULA

3.4.17 CH2 LEV / FLOW TAB

3.4.18 CH2 COUNTER RESET

3.4.19 CH2 C.DOWN PRESET

3.4.20 CH2 VOLUME PULSE

3.5 SET-POINT

3.5.1 CH1 SETPOINT1

Set point associated to REL1, variable and value selection

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETPOINT1	FLOW \cong 100	Limit point referred to CH1 instantaneous flow variable
	LEVEL \cong 200	Limit point referred to CH1 level variable
	TOTALIZER \cong 1	Repetition of totalizer pulse (Must be set \cong 1)
	COUNTER \cong 1000	Limit point referred to the counter value
	COUNT.DOWN \cong 0	Limit point referred to cont.down counter value

3.5.2 CH1 SETPOINT2

Set point associated to REL2, variable and value selection

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETPOINT2	FLOW \cong 100	Limit point referred to CH1 instantaneous flow variable
	LEVEL \cong 200	Limit point referred to CH1 level variable
	TOTALIZER \cong 1	Repetition of totalizer pulse (Must be set \cong 1)
	COUNTER \cong 1000	Limit point referred to the counter value
	COUNT.DOWN \cong 0	Limit point referred to cont.down counter value

3.5.3 CH1 SETPOINT3

Set point associated to REL3, variable and value selection

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETPOINT3	FLOW \cong 100	Limit point referred to CH1 instantaneous flow variable
	LEVEL \cong 200	Limit point referred to CH1 level variable
	TOTALIZER \cong 1	Repetition of totalizer pulse (Must be set \cong 1)
	COUNTER \cong 1000	Limit point referred to the counter value
	COUNT.DOWN \cong 0	Limit point referred to cont.down counter value

SWING Open Channel Flow parameters

3.5.4 CH1 SETPOINT4

Set point associated to REL4, variable and value selection

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETPOINT4	FLOW \equiv 100	Limit point referred to CH1 instantaneous flow variable
	LEVEL \equiv 200	Limit point referred to CH1 level variable
	TOTALIZER \equiv 1	Repetition of totalizer pulse (<u>Must be set =1</u>)
	COUNTER \equiv 1000	Limit point referred to the counter value
	COUNT.DOWN \equiv 0	Limit point referred to cont.down counter value

3.5.5 CH1 SETPOINTS5

Set point associated to REL5, variable and value selection

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETPOINT4	FLOW \equiv 100	Limit point referred to CH1 instantaneous flow variable
	LEVEL \equiv 200	Limit point referred to CH1 level variable
	TOTALIZER \equiv 1	Repetition of totalizer pulse (<u>Must be set =1</u>)
	COUNTER \equiv 1000	Limit point referred to the counter value
	COUNT.DOWN \equiv 0	Limit point referred to cont.down counter value

The following five parameters select the action type referring the relevant previous setpoint variable. The parameter can be setted as a Minimum, Maximum, Window, and Differential threshold action

3.5.6 CH1 SETP. 1 MODE

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETP. 1 MODE	MIN \equiv 2	Set hysteresis value above threshold variable setpoint
	MAX \equiv 2	Set hysteresis value below threshold variable setpoint
	WINDOW \equiv 2	Set hysteresis value above and below threshold setpoint
	DIFFER. \equiv 10	The hysteresis will be setted automatically above or below the setpoint depending if the across of the set point is made during increase or decrease of the value.

3.5.7 CH1 SETP. 2 MODE

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETP. 2 MODE	MIN \equiv 2	Set hysteresis value above threshold variable setpoint
	MAX \equiv 2	Set hysteresis value below threshold variable setpoint
	WINDOW \equiv 2	Set hysteresis value above and below threshold setpoint
	DIFFER. \equiv 10	The hysteresis will be setted automatically above or below the setpoint depending if the across of the set point is made during increase or decrease of the value.

3.5.8 CH1 SETP. 3 MODE

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETP. 3 MODE	MIN \equiv 2	Set hysteresis value above threshold variable setpoint
	MAX \equiv 2	Set hysteresis value below threshold variable setpoint
	WINDOW \equiv 2	Set hysteresis value above and below threshold setpoint
	DIFFER. \equiv 10	The hysteresis will be setted automatically above or below the setpoint depending if the across of the set point is made during increase or decrease of the value.

SWING Open Channel Flow parameters

3.5.9 CH1 SETP. 4 MODE

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETP. 4 MODE	MIN ≅2	Set hysteresis value above threshold variable setpoint
	MAX ≅2	Set hysteresis value below threshold variable setpoint
	WINDOW ≅2	Set hysteresis value above and below threshold setpoint
	DIFFER.≅10	The hysteresis will be setted automatically above or below the setpoint depending if the across of the set point is made during increase or decrease of the value.

3.5.10 CH1 SETP. 5 MODE

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 SETP. 4 MODE	MIN ≅2	Set hysteresis value above threshold variable setpoint
	MAX ≅2	Set hysteresis value below threshold variable setpoint
	WINDOW ≅2	Set hysteresis value above and below threshold setpoint
	DIFFER. ≅10	The hysteresis will be setted automatically above or below the setpoint depending if the across of the set point is made during increase or decrease of the value.

If DOUBLE was selected in 1.1.1 ; the following CH2 parameters will be displayed please refer to the CH1 corispondence

3.5.11 CH2 SETPOINT1

3.5.12 CH2 SETPOINT2

3.5.13 CH2 SETPOINT3

3.5.14 CH2 SETPOINT4

3.5.15 CH2 SETPOINT5

3.5.16 CH2 SETP. 1 MODE

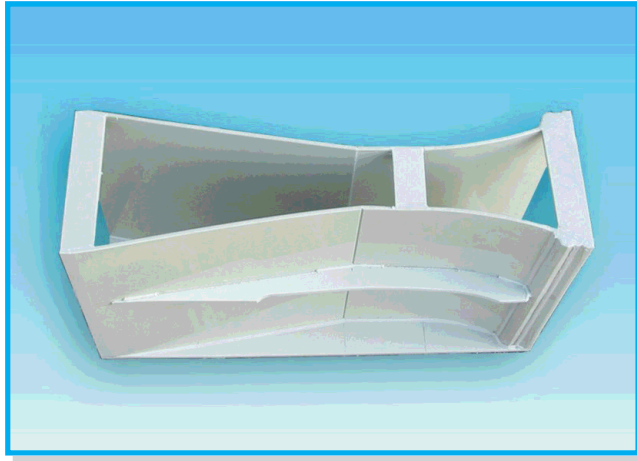
3.5.17 CH2 SETP. 2 MODE

3.5.18 CH2 SETP. 3 MODE

3.5.19 CH2 SETP. 4 MODE

3.5.20 CH2 SETP. 5 MODE

SWING Open Channel Flow parameters



The SGM-LEKTRA wants to improve his presence into the branch of open channel flow measurement. SGM-LEKTRA has developed its own flumes family called BS... in co-operation with the Division of Hydraulic of University of Pavia. The BS... flume is a special Venturi with flat bottom and ready to be lodged in a pre-existing rectangular channel.

BS... flume family are designed for irrigation, sewage, and industrial waste measurement.

The submerged flow (ratio from downstream head and upperstream head) can be well tollerated. The practical limit of submergence for all sizes is about 90%.

A copy of the technical documentation from University is at your disposal on request.

The complete open channel measurement system are composed from: Weir or Flumes like BS... , ultrasonic head measurement (Smartcost), associated display and volume-totalizer unit like Swing or CA301.

SWING Pumps control parameters

4. PUMPS

The Pumps control is active in the CH1 only. Consequently for double channel measurement, will be possible to add to Pumps-control, Level or Open Channel Flow measurement function.

4.1 DISPLAY

The SWING's display, can show up to two variables. This parameter selects the variables to be displayed. The first variable setted will be positioned in the upper part, then if another variable will be selected the last will be positioned in the upper part and the previous variable will be shifted below. (if a third variable is setted the first one will be lost).

<i>Variables</i>	<i>Description</i>
DISTANCE CH1	Display CH1 Distance
<u>LEVEL CH1</u>	Display CH1 Level
LEVEL % CH1	Display CH1 % Level
TEMPERATURE CH1	Display CH1 Temperature

4.2 LEVEL ADJ

4.2.1 CH1 MEASURE UNIT

CH1 measure unit parameter selecting

<i>Parameters</i>	<i>Selection messages</i>
CH1 MEASURE UNIT	m
	dm
	cm
	<u>mm</u>

4.2.2 CH1 CALIBR. MODE @

CH1 calibration mode kind selecting

<i>Parameters</i>	<i>Selection messages</i>	<i>Description</i>
CH1 CALIBRATE MODE	DIMENSION	Empty and full calibration mode
	<u>ACTUAL LEVEL</u>	<u>Actual level calibration mode</u>

4.2.3 CH1 ACTUAL LEVEL

Parameter to calibrate the ultrasonicSmart, PTU sensor level. Must be setted the present level measured from the ultrasonic level sensor in mm. , if the level is different from 0, Swing unit compute automatically the distance at which set the 0 level. Set the present instantaneous level (in mm) and then press "E" key to confirm.

<i>Parameter</i>	<i>Description</i>
CH1 ACTUAL LEVEL =0	Instantaneous level

2.2.4 CH1 EMPTY (0%)

The parameter set the level value, in mm, referred to 0% . Set the value and push "E" key to confirm.

<i>Parameter</i>	<i>Description</i>
CH1 EMPTY (0%)	Level value in mm referred to level =0% =0

4.2.5 CH1 FULL (100%)

The parameter set the level value, in mm, referred to 100% . Set the value and push "E" key to confirm.

<i>Parameter</i>	<i>Description</i>
CH1 FULL (100%) =3000	Level value in mm referred to level=100%

SWING Pumps Control parameters

4.2.6 CH1 BLOCK DIST. @

CH1 ultrasonic level sensor block distance (min. measurable level).

<i>Parameter</i>		<i>Description</i>
CH1 BLOCK DIST.	= 250	Level value in mm referred to block distance

4.2.7 CH1 OUT DISTANCE @

CH1 ultrasonic level sensor out distance (max. measurable level).

<i>Parameter</i>		<i>Description</i>
CH1 OUT DISTANCE	= 50000	Level value in mm referred to out distance

4.2.8 CH1 ANALOG OUT

Selection of the CH1 output variable to be addressed to CH1 4-20mA.

<i>Parameter</i>	<i>Messages</i>
CH1 ANALOG OUT	NONE DISTANCE LEVEL LEVEL % TEMPERATURE

4.2.9 CH1 ANALOG OUT RANGE

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
CH1 AN.OUT RANGE	Begin scale End scale	"CH1 Analog Out " begin scale. Set the value and press E "CH1 Analog Out " end scale. Set the value and press E

4.3 APPLICATION

4.3.1 CH1 LOST ECHO TIME @

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
CH1 LOST ECHO TIME	0000000	Not yet available

4.3.2 CH1 AGITATOR @

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
CH1 AGITATOR	WITHOUT AGITATOR WITHAGITATOR	Not yet available Not yet available

4.3.3 CH1 FILLING TIME m/h

<i>Parameter</i>	
CH1 FILL.TIME	= 9999.9

4.3.4 CH1 EMPTING TIME m/h

<i>Parameter</i>	
CH1 EMPTING TIME	= 9999.9

SWING Pumps Control parameters

4.4 PUMPS ADJ

4.4.1 PUMPS MODE

In the same well, specify the Pumps operating mode: Emptying or Filling

<i>Parameter</i>	<i>Messages</i>
PUMP MODE	<u>EMPTYNG</u> FILLING

4.4.2. PUMP1

Pump1 parameter is referred to the REL1, if chosed "none", REL1 can be used for alarm or other functions. ROTATION enables a special feature to exchange the function from all the pumps (ROTATION) in order to have the average working time. FIXED means normal fix connection of the setpoint to the same pump (no pumps rotation).

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP1	<u>NONE</u> ROTATION FIXED	Disabled Pumps rotation (only between the pumps in ROTATION) Pump with fixed setpoint

4.4.3 PUMP2

Pump2 parameter is referred to the REL2, if chosed "none", REL2 can be used for alarm or other functions. ROTATION enables a special feature to exchange the function from all the pumps (ROTATION) in order to have the average working time. FIXED means normal fix connection of the setpoint to the same pump (no pumps rotation).

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP2	<u>NONE</u> ROTATION FIXED	Disabled Pumps rotation (only between the pumps in ROTATION) Pump with fixed setpoint

4.4.4 PUMP3

Pump3 parameter is referred to the REL3, if chosed "none", REL3 can be used for alarm or other functions. ROTATION enables a special feature to exchange the function from all the pumps (ROTATION) in order to have the average working time. FIXED means normal fix connection of the setpoint to the same pump (no pumps rotation).

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP3	<u>NONE</u> ROTATION FIXED	Disabled Pumps rotation (only between the pumps in ROTATION) Pump with fixed setpoint

4.4.5 PUMP 4

Pump4 parameter is referred to the REL4, if chosed "none", REL4 can be used for alarm or other functions. ROTATION enables a special feature to exchange the function from all the pumps (ROTATION) in order to have the average working time. FIXED means normal fix connection of the setpoint to the same pump (no pumps rotation).

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP4	<u>NONE</u> ROTATION FIXED	Disabled Pumps rotation (only between the pumps in ROTATION) Pump with fixed setpoint

4.4.6 PUMP 5

Pump5 parameter is referred to the REL5, if chosed "none", REL5 can be used for alarm or other functions. ROTATION enables a special feature to exchange the function from all the pumps (ROTATION) in order to have the average working time. FIXED means normal fix connection of the setpoint to the same pump (no pumps rotation).

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP5	<u>NONE</u> ROTATION FIXED	Disabled Pumps rotation (only between the pumps in ROTATION) Pump with fixed setpoint

4.5 SET POINT

4.5.1 PUMP1 REFERENCE

This parameter set the pump referred variable

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP1 REFERENCE	LEVEL	referred to the level variable
	DISTANCE	referred to the distance variable

4.5.2 PUMP1 SET

This parameter set the points to start (on) and to stop (off) the pump1

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP1 SET	ON =9999	Over the set value, the pump becomes active
	OFF =9999	Below the set value, the pump becomes non active
	DELAY =5	Delay time of the start of the pump, in seconds

4.5.3 PUMP2 REFERENCE

This parameter set the pump referred variable

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP2 REFERENCE	LEVEL	referred to the level variable
	DISTANCE	referred to the distance variable

4.5.4 PUMP2 SET

This parameter set the points to start (on) and to stop (off) the pump2

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP2 SET	ON =9999	Over the set value, the pump becomes active
	OFF =9999	Below the set value, the pump becomes non active
	DELAY =5	Delay time of the start of the pump, in seconds

4.5.5 PUMP3 REFERENCE

This parameter set the pump referred variable

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP3 REFERENCE	LEVEL	referred to the level variable
	DISTANCE	referred to the distance variable

4.5.6 PUMP3 SET

This parameter set the points to start (on) and to stop (off) the pump3

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP3 SET	ON =9999	Over the set value, the pump becomes active
	OFF =9999	Below the set value, the pump becomes non active
	DELAY =5	Delay time of the start of the pump, in seconds

4.5.7 PUMP4 REFERENCE

This parameter set the pump referred variable

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP4REFERENCE	<u>LEVEL</u>	referred to the level variable
	DISTANCE	referred to the distance variable

4.5.8 PUMP4 SET

This parameter set the points to start (on) and to stop (off) the pump4

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP1 SET	ON <u>=9999</u>	Over the set value, the pump becomes active
	OFF <u>=9999</u>	Below the set value, the pump becomes non active
	DELAY <u>=5</u>	Delay time of the start of the pump, in seconds

4.5.9 PUMP4 REFERENCE

This parameter set the pump referred variable

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP4REFERENCE	<u>LEVEL</u>	referred to the level variable
	DISTANCE	referred to the distance variable

4.5.10 PUMP5 SET

This parameter set the points to start (on) and to stop (off) the pump5

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
PUMP1 SET	ON <u>=9999</u>	Over the set value, the pump becomes active
	OFF <u>=9999</u>	Below the set value, the pump becomes non active
	DELAY <u>=5</u>	Delay time of the start of the pump, in seconds

SWING Pumps Control parameters

5. DIFFERENTIAL

5.1 DIFFERENCE LEVEL

Difference CH1-CH2, operates with all the parameters and analog output of the CH1, (updating the values)-The priority (Master) channel is CH1.

Difference CH2-CH1, operates with all the parameters and analog output of the CH2, (updating the values)-The priority (Master) channel is CH2.

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
DIFFERENCELEVEL	NONE	Differential function disabled
	CH1-CH2	Difference between CH1 and CH2
	CH2-CH1	Difference between CH2 and CH1

5.2 DIFFERENCE OFFSET

Compensation of any offset of the difference due to misalignment in the installation or other reasons. The offset can have positive or negative value but same unit and limits set for both channels.

<i>Parameter</i>	<i>Messages</i>	<i>Description</i>
DIFFERENCEOFFSET	Diff. Offset level	Set the required difference offset value