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SenlabM

PUL-LAB-xxNS©

FIRMWARE VERSIONS 1.2 / 1.3 / 1.4 / 2.0

User guide

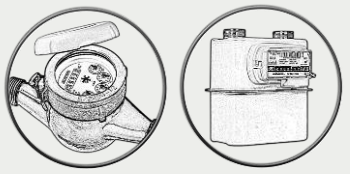
SENSING-LABS

VERSION 02 - REV N MARS 2021

Table of contents

Thank you for your choosing our Senlab product!
We hope you will find the instructions on this user manual clear and easy to follow.

General overview



The Senlab Metering (SenlabM) sensor is a smart LoRaWAN™ radio device with pulse input for monitoring pulse emitter counter: dry contact and/or specific electronic switching.

- Since FW v1.4, two inputs can be monitored, this configuration can be change remotely (see Application features (datalog or stream mode)).
- Since FW v2.0, advanced threshold detections are available (see Flowrate alarm).
- Check "SenlabV2" Application Note for V2.0 full specs: network migration, re-join…

SenlabM logs the number of pulse and allows 3 functional modes (refer Understand the SenlabM (PUL-LAB-xxxx) functional modes for more details):

- **Basic** (also called "Standard"): Periodic "log and transmit"
- **Datalog**: Periodic logs (up to 24 logs) and "all in one" transmission
- **Stream** (only FW V1.3): transmission of current raw_index with each pulse timestamp (for profile consumption analysis)

A pulse is defined as performing a closed contact between two wires for a given duration (see below).

Interface compatibility ? (dry contact)	The default duration for both the open and closed states is 65ms. Since FW V1.4, this duration can be adjusted down to 16ms.
	The maximal closed state load resistor is defined as Rc = 1kΩ (during a pulse)
	The minimal open state load resistor is defined as Ro = 1MΩ

Interface compatibility ? (elect. switching) ***Since FW V1.3***	The default duration for both the open and closed states is 32ms. Since FW V1.4, this duration can be adjusted down to 8ms
	The switching output must be "open collector" type (transistor).
	This use (electronic switching) need a specific configuration.

And Online FAQ can help to check Meter compatibility

Any question about your meter compatibility? Please contact your distributor.

Part number	Casing type	Protection level	Dimension
PUL-LAB-13NS	Outdoor	IP68	102x56x35mm cable : 1m
PUL-LAB-13XS	Outdoor	IP68 / ATEX	102x56x35mm cable : 1m
PUL-LAB-41NS	Indoor v2	IP30	91.5x50x25mm int. connector

Outdoor Indoor

3 steps are required to make your SenlabM fully operational, described below.

Provisioning of the device

You have to be sure that your **Senlab device has been well commissioned** to be able to reach your LoRaWAN network.

- ✓ Contact if needed your distributor to get your Senlab configuration
- ✓ Required information for provisioning the device into your LoRa system are listed in the following table:

> Warning, don't unprovision device from your system before stopping it!
> (refer application features to stop the application via RF))

About network configuration:

- if OTAA (by default): **devEUI**, **appEUI** and **appkey** are required
  if ABP: **devAddress**, **nwkSkey** and **appSkey** are required

➢ Network & Application configuration of Senlab device can be done:
  - o At factory (for minimal batch of 1000 devices)
  - o By your distributor (more often)
  - o By yourself (if you have your own SLsetting tool)

➢ **All application configuration can also be dynamically adjusted Over The Air** (via downlink request)

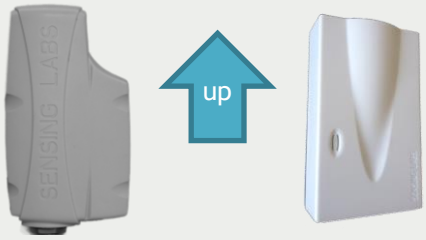
➢ Please refer to parameter list described into the Application features chapter to fit to your use case and get a "Plug&Play" device.

On-site installation

Device positioning

You have first to find the best position to your Senlab:

- ✓ Prefer vertical position (***antenna part upwards*** as on following pictures)
- ✓ Avoid positioning the external cable pulled vertically under the device (prefer coiled positioning or use the rear gutters for outdoor version)
- ✓ Avoid direct sun light exposure or heater system proximity



Device is not designed for an installation above 2 meters.

Device mounting

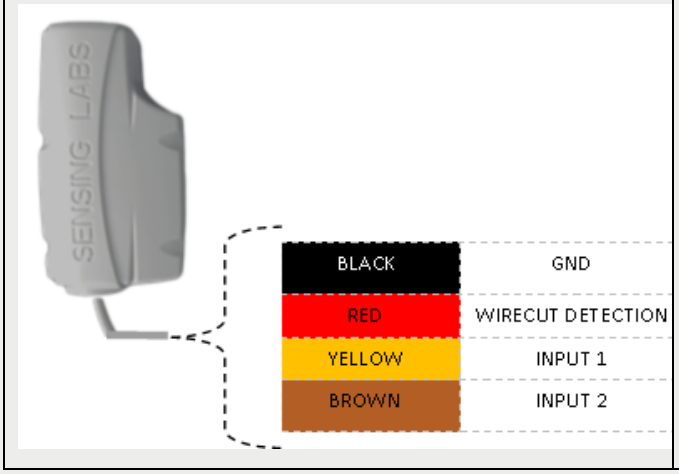
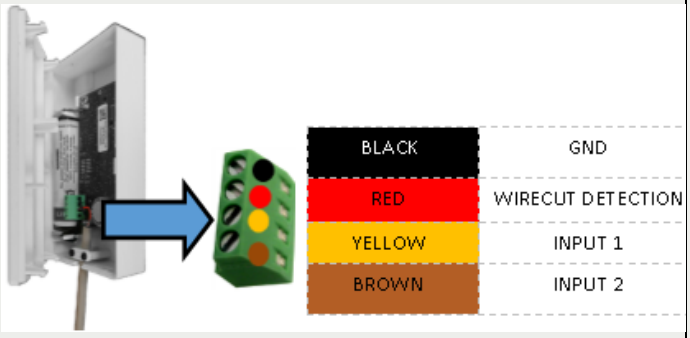
Device type	Device mounting
All versions	Stick the product to the wall or cabinet with a double-sided adhesive tape
Indoor versions	Screw the rear side of the product to the wall with countersunk screws make sure the screw heads don't exceed from the plastic side once installed
Outdoor versions	Use plastic cable ties with screw mount

Refer to « Application Note Senlab installation » for full recommendation.

For best radio performance:

- Positioned the upper part of the device upwardly in a free space area
- avoid positioning the Senlab against a metallic element

Pinout

Outdoor	*Indoor*
	

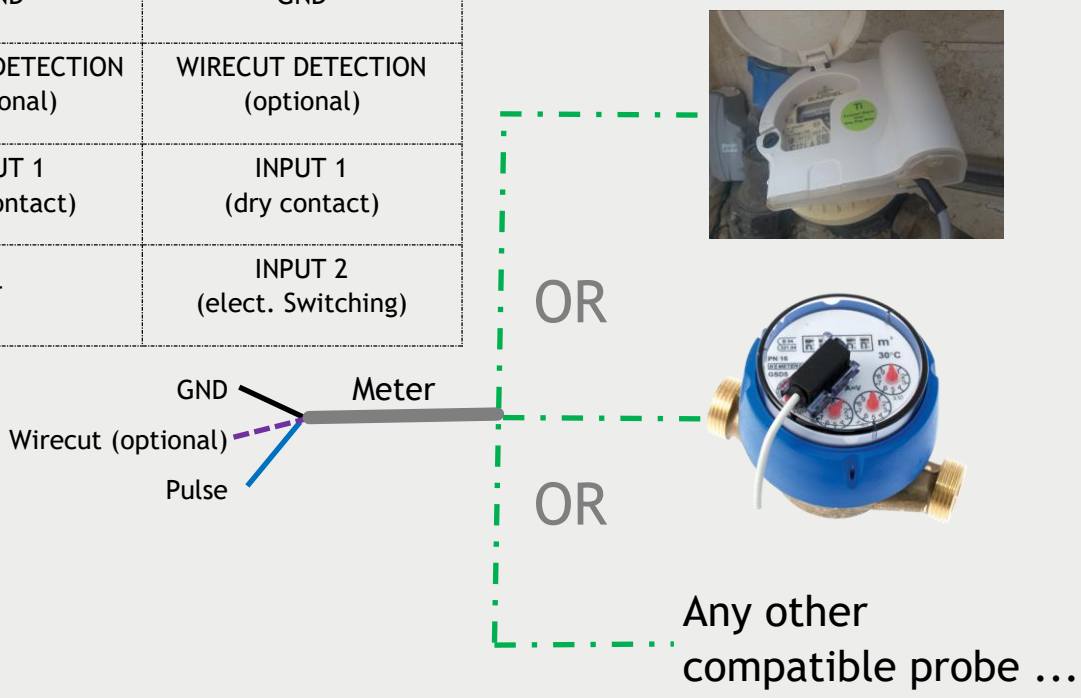
Wiring diagram (until FW V1.3)

FW V1.2: **one meter** can be connected: dry contact on input1 only

FW V1.3: **one meter** can be connected: dry contact (input1) OR elect. Switch. (input2)

Input configuration have to be done during the initial configuration.
(SLsetting is mandatory)

	FW 1.2	FW 1.3
BLACK	GND	GND
RED	WIRECUT DETECTION (optional)	WIRECUT DETECTION (optional)
YELLOW	INPUT 1 (dry contact)	INPUT 1 (dry contact)
BROWN	-	INPUT 2 (elect. Switching)



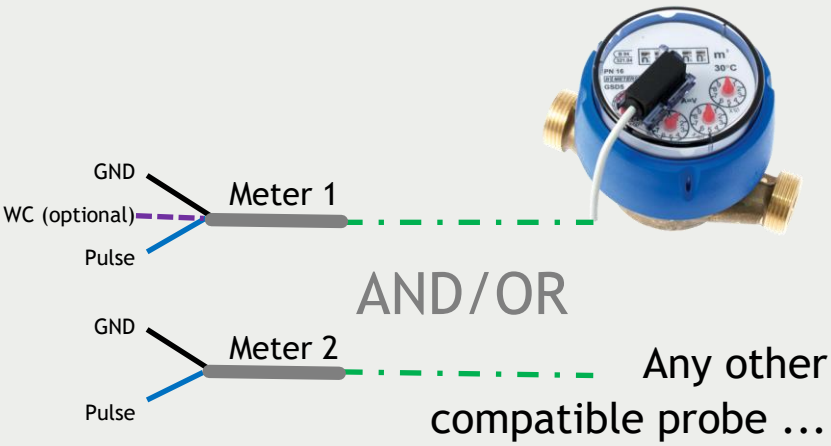
Wiring diagram (FW V1.4 and FW V2.x)

From FW V1.4, **one or two meters** can be connected.

Configuration can be done during initial configuration, or remotely, with downlink.

Input configuration have to be done:
during the initial configuration (SLsetting is mandatory)
OR
over the air with downlink (device already activated on the network)

BLACK	GND (common for IN1&2)
RED	WIRECUT DETECTION (optional)
YELLOW	INPUT 1 (any type)
BROWN	INPUT 2 (same type as input1)



Help for on-site installation

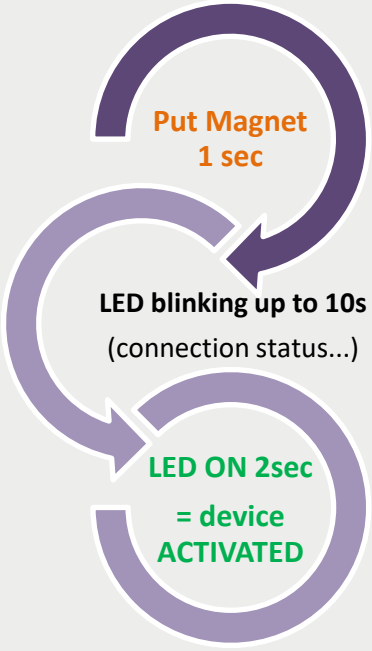
- An application note is available to help to connect SenlabM to meter(s):
  PDF is downloadable here "Connect to a meter"
- FW 1.4:
  After activation, the LED will blink on each detected pulse **during the first hour**
- FW 2.x:
  After activation, the LED will blink on each detected pulse **during the first 5 minutes and after each magnet action**

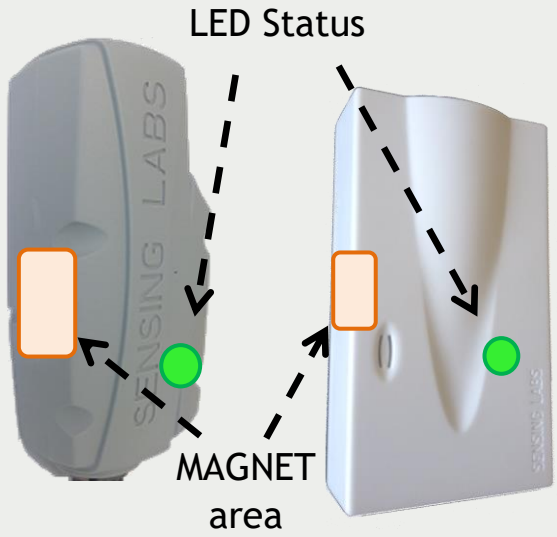
Now the device is well physically installed and plugged, you can start the activation process.

➢ Pairing to meter can be done with a default raw index before the activation step by using SLsetting tool. Please contact your distributor for more information.

Activation of the device

To activate the Senlab device, you have to use a magnet (min pulling force 1Kg).

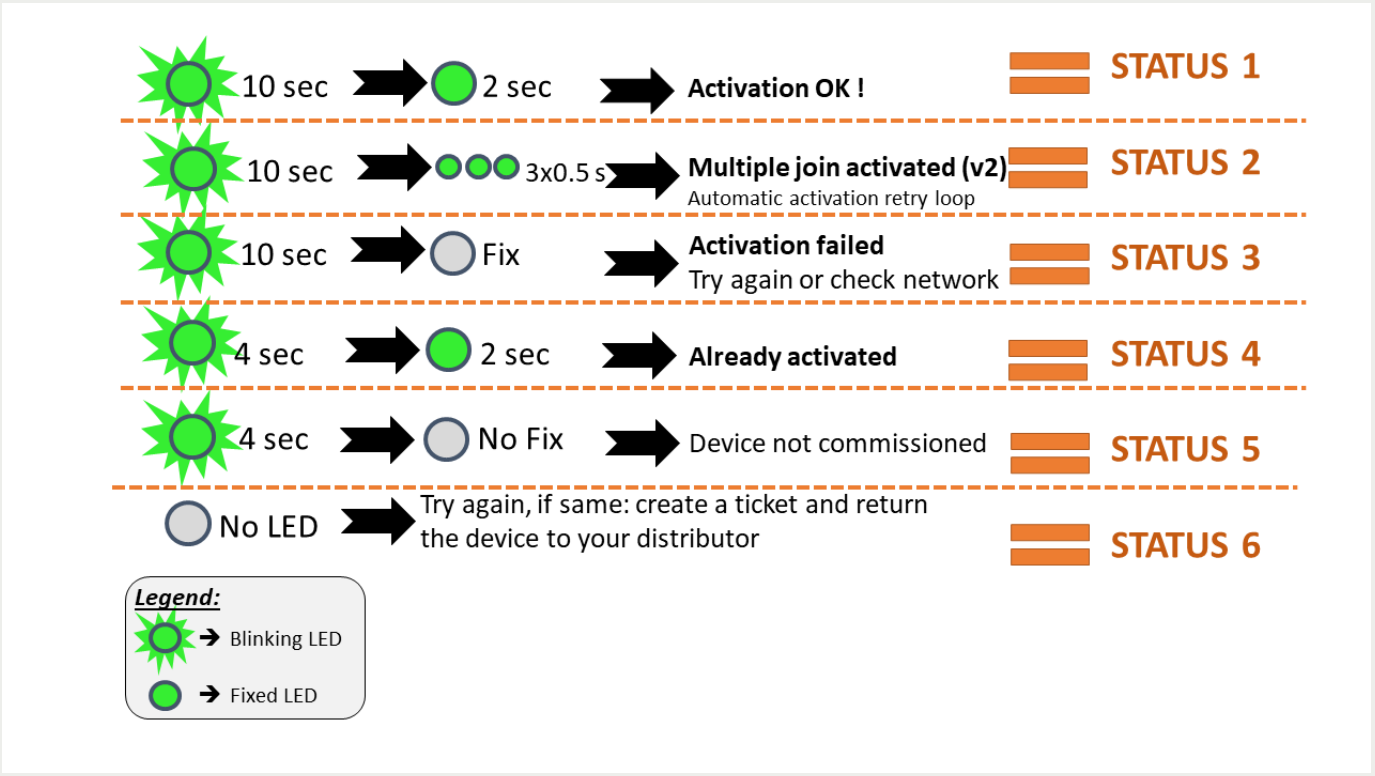




- ✓ Remove the magnet as soon as the LED flashes!
- ✓ If activation fails (No solid LED ON 2sec), Senlab will come back in storage mode
- ✓ After successful activation, device will automatically send its START message

Once activated, if you pass the magnet one more time, the device will indicate its activation status after 3s LED blinking:
--> Solid LED ON 2sec will confirm that device is activated

LED Status meaning



Deactivation of the device

If you decide to deactivate Senlab, no more transmissions will be sent → you will need a physical access to the Senlab to active it again.
Many ways are possible:

- **Over the Air**: by sending the downlink request "STOP application" (via your LoRaWAN system on port **2** with hexadecimal payload x**010700**)
- **With physical access (with SLsetting tool)**: by using SLsetting "disconnect" action
- **With physical access (if "magnet switch off" is activated – recommended for test)**: By holding the magnet during 20 seconds until the LED stay ON for 5 seconds.

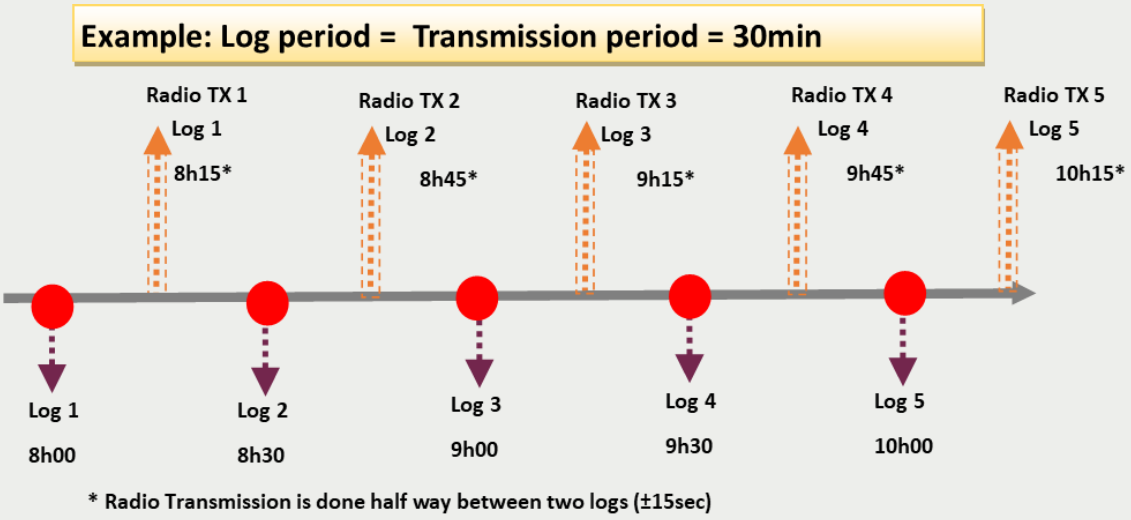
Understand the SenlabM (PUL-LAB-xxxx) functional modes

It is important to understand all modes in order to choose the best one to fit with your use case and environment.
All modes are switchable from one to each other Over The Air or with SLsetting tool.

Basic mode (or standard mode)

This mode allows to transmit periodically 1 measure (raw index):

- ✓ Measure period can be configured from 3min to 24h (Tx < 10min is for test only)

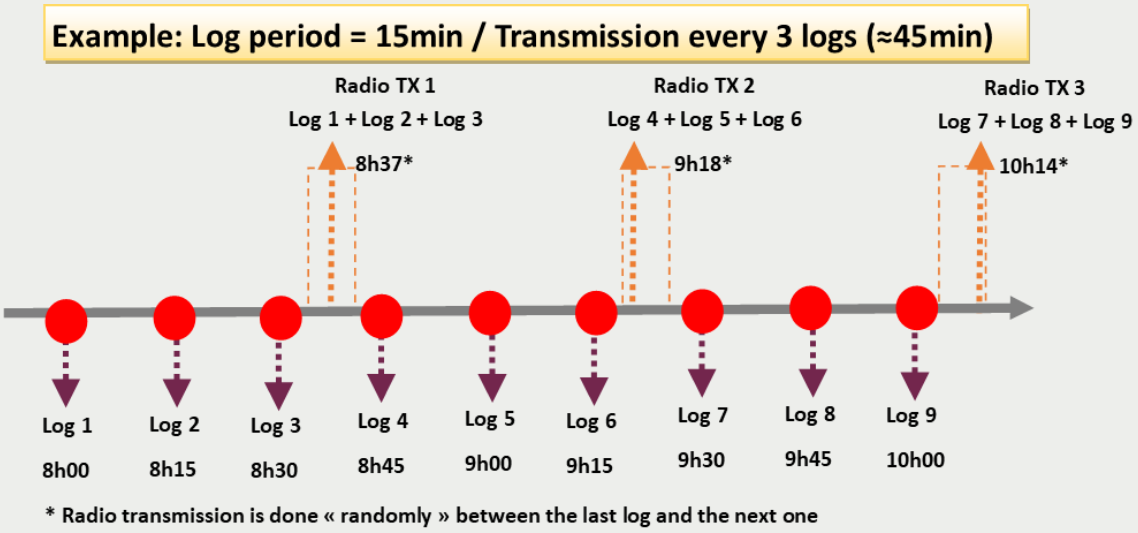


Availability	All firmware versions
Compatibility	✓ Operated network ✓ SLgatewayV1 or V2 ✓ Third part gateway with SLcodec or manual decoding
Advantages	✓ "Manual" decoding possible (without SLcodec) ✓ Over The Air reconfiguration
Typical use cases	✓ Monitoring of physical value(s) with slow variation
What to configure?	✓ Measure period (the transmission period will be the same)
How to get applicative data?	✓ All SLgateway's APIs : refer to SLgateway user guide ✓ SLcodec : refer to SLcodec help ✓ By decoding payload yourself: **Refer to « Application Note SenlabMessageFormat »**

Datalog mode

This mode allows to transmit up to 24 periodic measures (up to 12 if 2 inputs) in each message:

- ✓ Measure period can be configured from 1min to 24h
- ✓ Transmission period can be configured from 3min to 24h (Tx < 10min is for test only)
- ✓ Possibility to activate a "log redundancy" feature to integrate previous logs in current transmission (*ex: TX2 will contains logs n°1 to 6 and TX3 logs n°4 to 9*)
  - ***Maximum number of logs is 24, including redundancy logs***

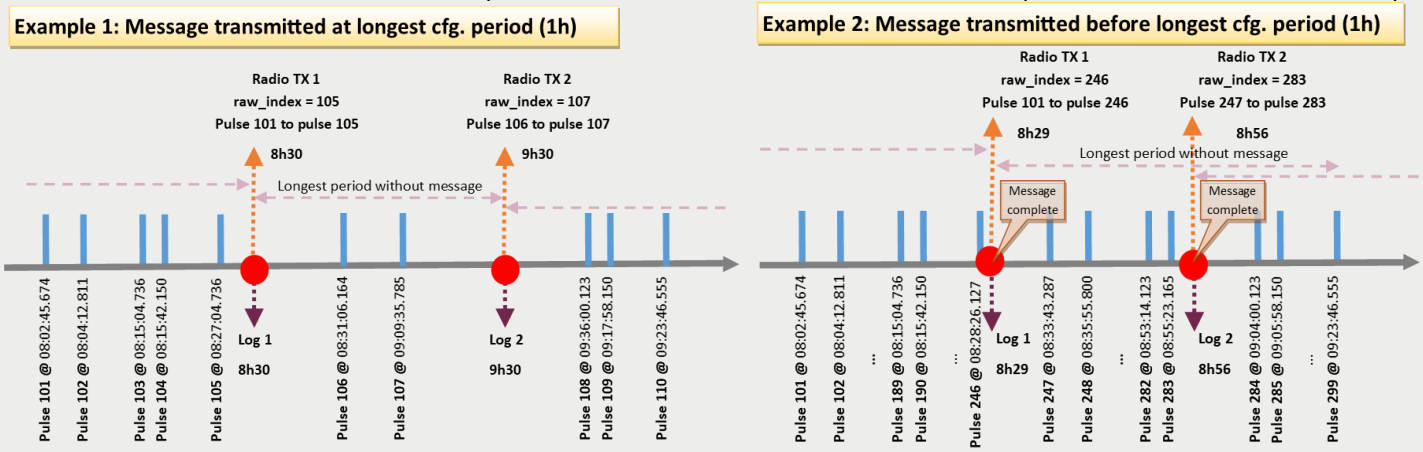


Availability	All firmware versions
Compatibility	✓ Operated network ✓ SLgatewayV1 or V2 ✓ Third part gateway with SLcodec
Advantages	✓ Log precision up to 1 log every minute and transmission by "datalog" to optimized battery life time ✓ Log redundancy feature to recover not received message Over The Air reconfiguration
Typical use cases	✓ Monitoring of physical value(s) with fast variation ✓ Important battery life time
What to configure?	✓ Measure period ✓ Transmission period (multiple of measure period)
How to get applicative data?	✓ All SLgateway's APIs : refer to SLgateway user guide ✓ SLcodec : refer to SLcodec help

Stream mode

This mode allows to monitor each pulse timestamp and is designed for residential monitoring (***typical rate of flow of 1000 pulses per day***)

- ✓ Senlab will store pulse timestamp and will transmit them when message is full compressed or at least every X minutes (settable from 10min to 12h);
- ✓ Transmitted message will also contain the current raw index and battery level;
- ✓ This mode is not adapted if rate of flow is more than 10 pulses / min continuously.



Availability **(important point to check)**	**FW 1.3 : OK (enable with SLSetting only)** **FW 1.4 and FW 2.0 : Contact us** **(enable/disable with a specific software and SLSetting tool)** **incompatible with dual-input** **FW 2.1 : OK (enable with SLsetting or downlink)**
Compatibility	✓ Operated network ✓ SLgatewayV2 (better performance with low SF with 8CH SLgw)
Advantages	✓ Very rich transmitted data (timestamp of each pulse) Over The Air reconfiguration
Typical use cases	✓ Profile consumption analysis process ✓ « Real-time monitoring » of temporal evolution of water consumption
What to configure?	✓ The longest period without message. « long period » will improve battery life time.
How to get applicative data?	✓ SLgateway V2 : CSV to FTP (format 1 for millisecond precision) ✓ SLcodec : refer to SLcodec help

Application features (datalog or stream mode)

This chapter describes the SenlabM application features available in datalog or stream mode (accessible via SLgateway or SLcodec)

Measure data

ID	Description	Type	Unit	Range
raw_index	Number of detected pulses Initialized at 0 when the device is delivered	UINT32	Pulse	0…2^{32}
raw_index2 ***(If input1&2 activated)***	Number of detected pulses on input2 Initialized at 0 when the device is delivered ***(since FW V1.4)***	UINT32	Pulse	0…2^{32}
battery_current_level	Battery level of the device	UINT8	%	1…100
wirecut ***(if option activated)***	Wirecut detection status ***(since FW V1.3)*** (Reset to 0 only after downlink reception – at least after the daily link check)	UINT8	-	0: not detected 1: detected
max_interpulse ***(if option activated)***	Maximum duration between 2 pulses detection since the last transmission ***(since FW V1.3)***	FLOAT	second	0 if no pulse precision 100ms
pulse ***(stream mode only)***	Detected pulse ***(since FW V1.3)*** Timestamp (in ms) is available for each pulse	UINT8	-	1: detected

Event data

ID	Description	Type	Unit	Range
start_event	Happens when device is restarted on the field	BOOL	-	-

Configuration requests

Parameter ID	Description	Type	Unit	Range
Datalog configuration *(ID = request_write_datalog_cfg)*				
log_period	Device will measure every X minutes	UINT16	Minute	1…1440
log_tx_period	Device will send logged measure every X minutes (must be a multiple of log_period)	UINT16	Minute	3…1440 (24h)
log_tx_random_activation	Maximize device datalog reliability (optional)	BOOL	-	-
redundancy_factor	Log-redundancy (since FW V1.3) Send the X n-1 last log(s) with the last log(s)	UINT8	-	1-12
Options configuration *(ID = request_senlabm_options)* **(since FW V1.3)**				
max_interpulse_tx	Leakage activation (if activated, the max_interpulse will be send in all transmission messages)	BOOL	-	-
wirecut_detection	Wirecut detection activation	BOOL	-	-

Pulse input configuration *(ID = request_write_input_cfg)* **(since FW V1.4)** *This request will reset raw_index and raw_index2.* ***(see** Standard pulse input configuration downlink (since FW V1.4) **for standard cfg)***				
input1	enable/disable the input1	BOOL	-	true: enable false: disable
input2	enable/disable the input2	BOOL	-	true: enable false: disable
type	*Input type set for all inputs*		-	0: dry contact 1: elect.switching
pulse_duration (optional)	Minimum width of the pulse to detect *Set for all inputs* **your pulse_duration is used to calculate the applied value type 0 (*15.624ms, 31.25ms or 62.5 ms*)** **type 1 (*7.812ms, 15.624ms or 31.25ms*)**	UINT8	ms	16...255 (type 0) 8...255 (type 1)
Stream configuration *(ID = request_write_pulse_cfg)* **(since FW V2.1)** *This request switch the device to stream mode.* ***Send a Datalog configuration to switch mode and disable stream mode***				
keep_alive	*Longest period without message transmission*			*x10min*
Get FW version *(ID = request_get_version)* **(since FW V1.3)**				
NO PARAMETERS	Ask the device to return it configuration and FW version			
***Reset battery level* (after battery change)** *(ID = request_reset_battery_level)*				
NO PARAMETERS				
***Reset raw_index* (to 0)** *(ID = request_reset_raw_index)*				
NO PARAMETERS				
Reset raw_index2 (to 0) *(ID = request_reset_raw_index2)* **(since FW V1.4)**				
NO PARAMETERS				
Stop application *(ID = request_stop_application)* ➔ Reactivation with magnet will be mandatory!				
NO PARAMETERS				

In order to take advantage of Senlab datalog mode, you need to use SLcodec libraries.

--> Refer to the “SLcodec Application Note” or contact us to get more information about SLcodec integration and usage.

Standard pulse input configuration downlink (since FW V1.4)

Following list of payloads will match with most common use meters.

	INPUTS configuration	payload request (downlink to send)	payload response (uplink start with…)
Case 1	input 1: dry contact (pulse 65ms min) input 2: disabled	014131ff04 (port 2)	**8100 → success** **8101 → failed**
Case 2	input 1: electronic switching contact (pulse 32ms min) input 2: disabled	014101ff10 (port 2)	**8100 if success** **8101 if failed**
Case 3	input 1: disabled input 2: electronic switching contact (pulse 32ms min)	014102ff10 (port 2)	**8100 if success** **8101 if failed**
Case 4	input 1: dry contact (pulse 65ms min) input 2: dry contact (pulse 65ms min)	014133ff04 (port 2)	**8100 if success** **8101 if failed**
Case 5	input 1: electronic switching contact (pulse 32ms min) input 2: electronic switching contact (pulse 32ms min)	014103ff10 (port 2)	**8100 if success** **8101 if failed**
Another case?	Need a specific configuration to fit with your meter?	Online tool Or Ask us on support website	**8100 if success** **8101 if failed**

Dual meter management (input 1&2 enable - since FW V1.4)

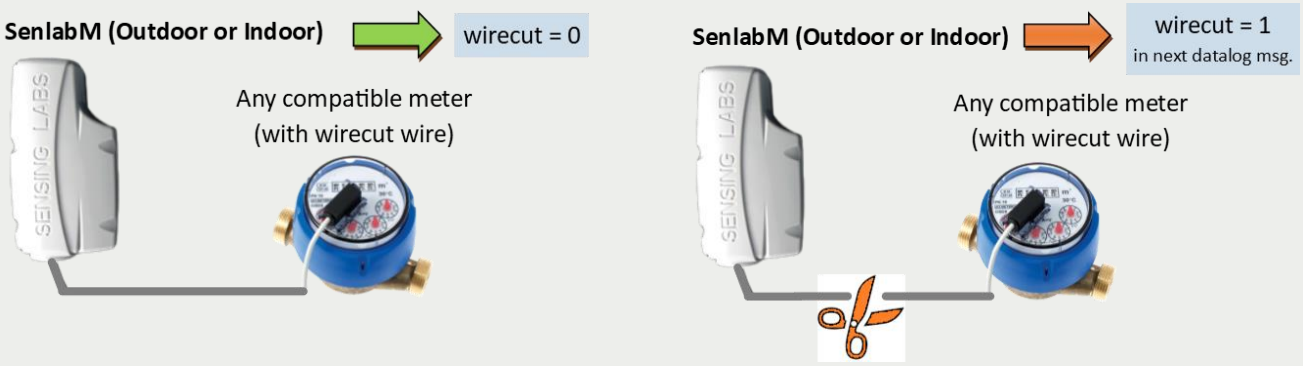
If you connect 2 meters to SenlabM, you will have to configure the device for that, with SLsetting, or remotely (downlink - see **Configuration requests**))

The SenlabM will count, log and send number of detected pulses on each input with same timestamp (***raw_index*** & ***raw_index2***)

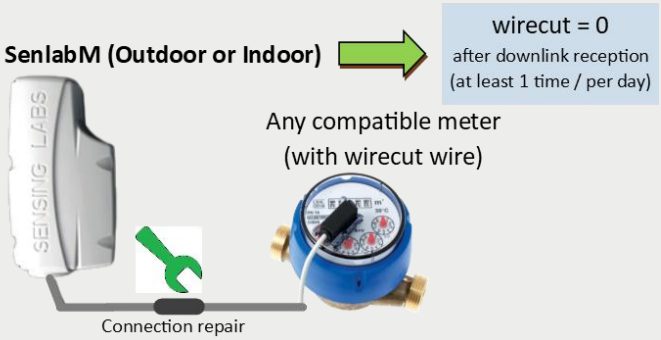
- ✓ Both inputs must have the same type (dry contact OR electronic switching), and the same pulse duration
- ✓ Wirecut option can only be activated for 1 of the 2 meters.
- ✓ Max interpulse option will only works on "raw_index" measure (input 1)

Understand the "wirecut" feature

If configured, SenlabM will transmit the wire cut status into each datalog message.



To come back to "undetected" wire cut status, SenlabM is waiting for a downlink message. This ensure that the wire cut detection has been received by the system.



"wirecut" only work on one connected meter:

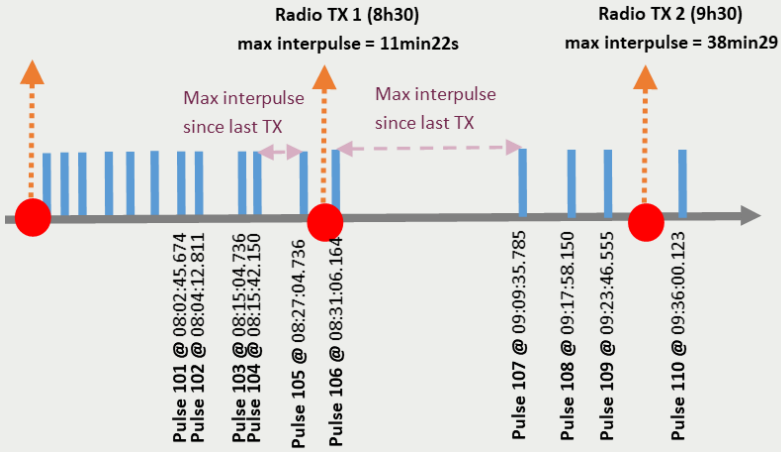
- FW V1.3: only 1 input (dry or elec switch), so only one meter to check
- FW V1.4: if configured with "2 inputs", only one meter can have wirecut check (this meter connected to "wirecut wire"

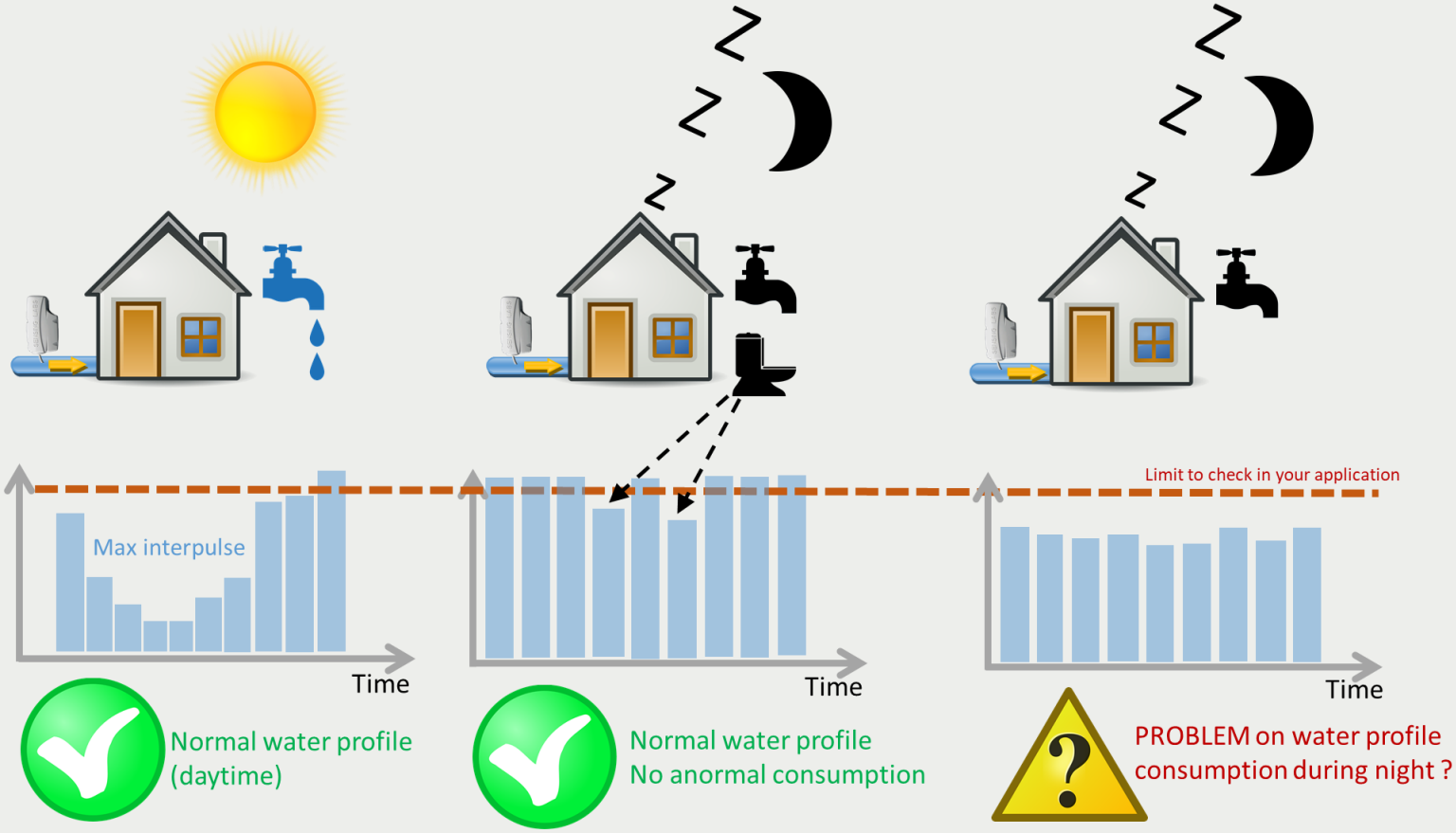
Understand the “max interpulse” feature

If configured, SenlabM will transmit in each datalog message the *max_interpulse* duration measured since the last datalog message transmission.

This information is useful to check if a ***residual leak*** is present on a meter.

- ✓ Leakage is present if max interpulse value never raise the expected duration without consumption for a given meter (ex: Night period for a residential meter)
- ✓ If no pulse is counted between 2 transmissions, value 0 will be send.





Interpulse duration alarm (since FW V2.0)

This alarm monitor thresholds overrun on a given duration between 2 successive pulses (useful for automatic leakage detection).
A strong knowledge of the use case is required to determine the fine-tuning of the threshold.

- It can be configured via SLsetting tool or over-the-air (downlink request).
- If 2 inputs are configured, each input can have its own alarm configuration.

Configuration requests

Online describe on http://codec.slbase.io/senlabM

Parameter ID	**Description**	**Type**	**Unit**	**Range**
	REQUEST ALARMS CONFIGURATION (ID = request_alarms_configuration)			
alarms_retransmissions_number*	Alarms retransmissions number	UINT8	-	0..3
interpulse_highthreshold_activation*	Interpulse high threshold activation	BOOL	-	-
interpulse_highthreshold_trigger	Interpulse high threshold value to trigger the alarm	UINT16	Minute	0..65535
interpulse_highthreshold_release	Interpulse to release high threshold overrun (< to high trigger value)	UINT16	Minute	0..65535
interpulse2_highthreshold_activation*	Interpulse high threshold activation	BOOL	-	-
interpulse2_highthreshold_trigger	Interpulse high threshold value to trigger the alarm	UINT16	Minute	0..65535
interpulse2_highthreshold_release	Interpulse to release high threshold overrun (< to high trigger value)	UINT16	Minute	0..65535

(*) mandatory parameters

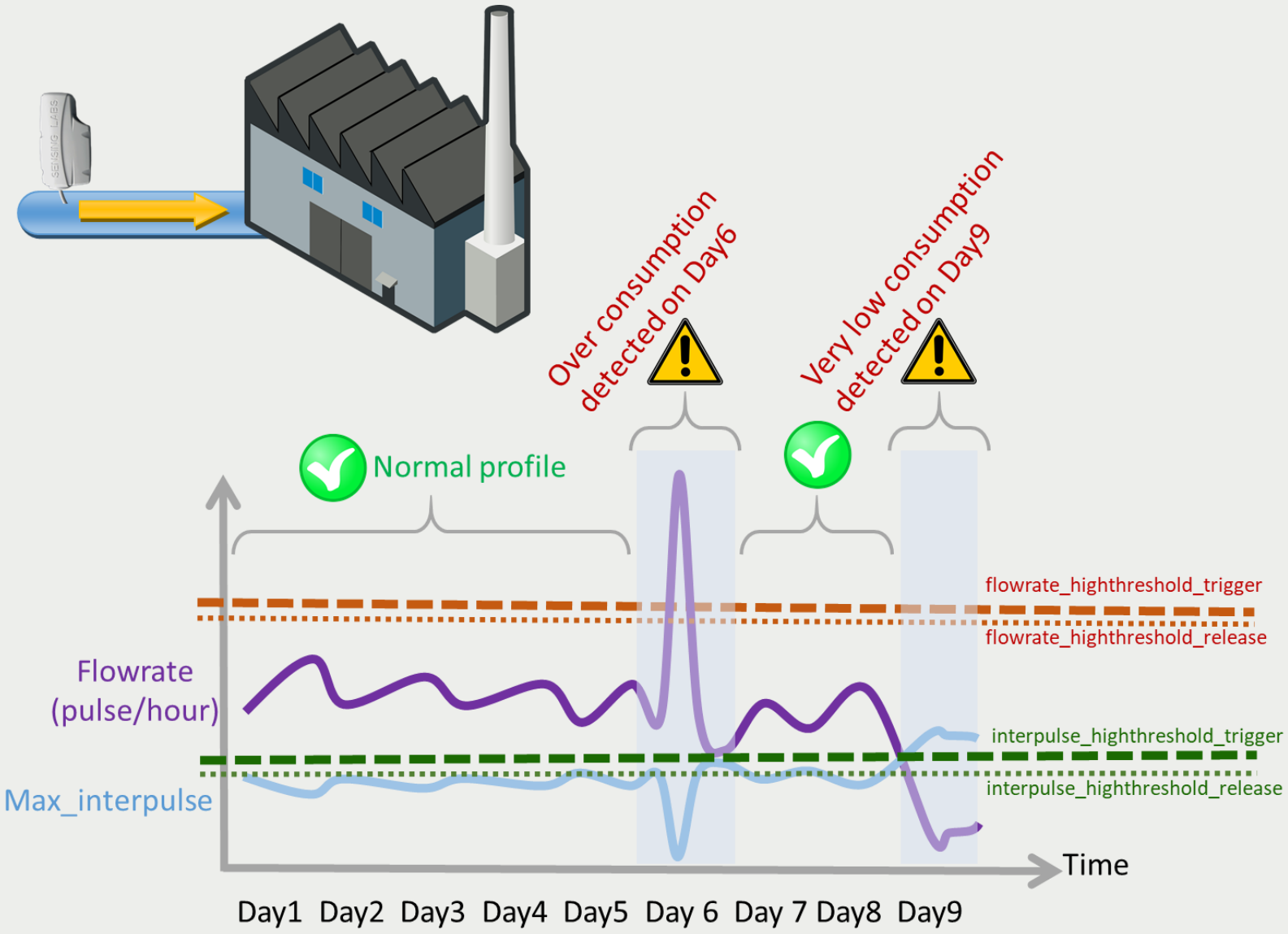
Event data (Alarm)

ID	**Description**	**Type**	**Unit**	**Range**
interpulse_highthreshold_overrun	Notified if high threshold condition is triggered	UINT16	minute	0..65535
interpulse_highthreshold_backtonormal	Notified if high threshold condition is released	UINT16	minute	0..65535
	Next events are available only for dual input			
interpulse2_highthreshold_overrun	Notified if high threshold condition is triggered	UINT16	minute	0..65535
interpulse2_highthreshold_backtonormal	Notified if high threshold condition is released	UINT16	minute	0..65535

Flowrate alarm (since FW V2.0)

This alarm allows to monitor if the flowrate (nb of pulse/hour) doesn't exceed a high threshold.

- It can be configured via SLsetting tool or over-the-air (downlink request).
- If 2 inputs are configured, each input can have its own alarm configuration.



Configuration requests

Online describe on http://codec.slbase.io/senlabM

Parameter ID	**Description**	**Type**	**Unit**	**Range**
	REQUEST ALARMS CONFIGURATION (ID = request_alarms_configuration)			
alarms_retransmissions_number*	Alarms retransmissions number	UINT8	-	0..3
flowrate_highthreshold_activation*	Flowrate high threshold activation	BOOL	-	-
flowrate_highthreshold_validation_duration	Flowrate high threshold validation duration	UINT16	second	0..65535
flowrate_highthreshold_trigger	Flowrate high threshold value that must be maintain the validation duration to trigger the alarm	UINT32	Pulse/hour	$1…2^{32}$
flowrate_highthreshold_release	Flowrate to release high threshold overrun (< to high trigger value)	UINT32	Pulse/hour	$1…2^{32}$
flowrate2_highthreshold_activation*	Flowrate high threshold activation	BOOL	-	-
flowrate2_highthreshold_validation_duration	Flowrate high threshold validation duration	UINT16	second	0..65535
flowrate2_highthreshold_trigger	Flowrate high threshold value that must be maintain the validation duration to trigger the alarm	UINT32	Pulse/hour	$1…2^{32}$
flowrate2_highthreshold_release	Flowrate to release high threshold overrun (< to high trigger value)	UINT32	Pulse/hour	$1…2^{32}$

(*) mandatory parameters

Event data (Alarm)

ID	**Description**	**Type**	**Unit**	**Range**
flowrate_highthreshold_overrun	Notified if high threshold condition is triggered	UINT32	Pulse/hour	$1…2^{32}$
flowrate_highthreshold_backtonormal	Notified if high threshold condition is released	UINT32	Pulse/hour	$1…2^{32}$
	Next events are available only for dual input			
flowrate2_highthreshold_overrun	Notified if high threshold condition is triggered	UINT32	Pulse/hour	$1…2^{32}$
flowrate2_highthreshold_backtonormal	Notified if high threshold condition is released	UINT32	Pulse/hour	$1…2^{32}$

Battery replacement (Indoor version only)

Replacement battery must by a Lithium 3,6V AA type with 50mA min of supported continuous current → Contact your distributor to get original battery reference.

Senlab indoor have the capability to keep activation status during a few minutes, so the process is:

1. Open the casing
2. Remove the old battery and, **during the same minute**, put the new battery
3. Check if the device activation is still OK (see "Activation of the device" chapter)
4. In case activation lost, you need to activate the device again
5. Close the casing
1. Send the configuration request "request_reset_battery_level" to the device, using your application

ATTENTION:

EN: There is a risk of explosion if the battery is replaced by an incorrect type. Dispose of used batteries according to instructions.
FR: Il y a risque d'explosion si la batterie est remplacée par une batterie de type incorrect. Mettre au rebut les batteries usagées conformément aux instructions.

Technical characteristics

ISM Radio bands usage

Senlab globally communicates over frequencies in the 865-870MHz radio band with a maximum transmission power of 25mW e.r.p (+14dBm e.r.p).

More precisely, the following table describes the different sub-bands, as defined per Annex 1 of ERC Recommendation 70-03 (13 October 2017), which can be used by Senlab:

Frequency Band		Power	Spectrum Access
h1.3	865-868MHz	25mW e.r.p	1% duty-cycle
h1.4	868-868.6MHz	25mW e.r.p	1% duty-cycle

Note that 1% duty-cycle for sub-band h1.3 is allowed by ERC/REC 70-03 Annex 1 Note 5 as its usage is limited to 865-868MHz.

V1.0.3 LoRaWan stack compliant

Senlab FW	LoRaWan stack compliant
1.1.X	V1.0.0
1.2.X / 1.3.X / 1.4.X	V1.0.1
2.0.X	V1.0.3

Nothing to configure for the user, no change for the application layer, but this information could be useful if you need to connect Senlab device to LoRaWan network.

More information on LoRa Alliance®

LoRaWan Adaptive Data Rate (ADR)

Senlab devices are compatible with ADR and support from DR0 (SF12) to DR5 (SF7).
For any problem with ADR, check the FAQ Senlab on Help Center.

Electrical safety

All circuits are SELV (Safety extra low voltage), including interface circuits which are only used for measurement (signals without power, these circuits are considered LPS).

Ambient temperature of use

The ambient temperature of use depends of the version:

Indoor version	From 0°C to +55°C
Outdoor version (non-ATEX)	From -20°C to +70°C
Outdoor version (ATEX)	From -20°C to +40°C

ATEX (PUL-LAB-13XS)

Protection

The Ex apparatus, protection mode 'ic', usable in hazardous area for zone 2, is built in accordance to the European standards which are applicable:

- EN 60079-0 : 2012 + A11 : 2013
- EN 60079-11 : 2012

Marking

The marking is composed of two stickers:

The first one, which is generic includes the following information:

- serial number
- CE logo
- Optionally the year of manufacturing

The second one, which is ATEX specific includes the following information:

- Manufacturer:
  Sensing Labs
- Address:
  F-34960 Montpellier
- Type designation:
  Senlab M
- Directive marking code:
   II 3 G
  - Complementary marking code:
    Ex ic IIB T4 Gc

- Reference of certificate
  INERIS 17ATEX3003

Electrical characteristics

Maximum output parameters (ATEX):

- Uo = 3.9V
- Io = 3.04 A
- Po = 0.98 W

Particular conditions for safe use

Electrical circuits that can be connected to the device must be of a certified type for use in explosive atmosphere for IIC or IIB gas groups and their maximum input characteristics must not be greater than the following parameters:

- Ci = 500 µF
- Li = 12.59 µH for the cable version (2 meters maximum length
- Li = 14.59 µH for the connector version

The interconnections of these apparatuses must be compliant from an intrinsic safety point of view.

Complementary documents

Each apparatus will be delivered with an original copy of this user guide. This document will be accompanied by their translation into the language of the country of use.

Legals

SENSING LABS SAS reserves the right to make corrections, modifications, enhancements, improvements and other changes to its products and services at any time and to discontinue any product or service without notice.

SENSING LABS products is not authorized for use in safety-critical applications (such as life support) where a failure of the product would reasonably be expected to cause severe personal injury or death, unless officers of the parties have executed an agreement specifically governing such use.

Buyers confirm that they have all necessary expertise in the safety and regulatory ramifications of their applications, acknowledge and agree that they are solely responsible for all legal, regulatory and safety-related requirements concerning their products and any use of the product in such safety-critical applications, notwithstanding any applications-related information or support that may be provided by SENSING LABS SAS.

This is a non-contractual document and specifications are subject to change at any time without notice.

For more information about this software:
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