

Introduction

This application note describes the Senlab standard frame formats.

As different LoRaWAN FPorts are used for different frame types, FPort information is precised in the frame title.

Senlab M & T & H & A & P / Uplink START MESSAGE - FPort 4 - extended with datalog cfg

This frame is sent automatically after a successful network connexion for informing the application layer of start.

ID (1B)	DEV_EUI (8B)	APP_TYPE (1B)	Version (3B)	Ext ID (1B)	Log Period (2B)	Tx Period (2B)	Max Batt Level (4B)
0x00	LSB first	SenlabM: 0x4D SenlabT: 0x54 SenlabH: 0x48 SenlabA: 0x41 SenlabP: 0x50	Major Minor Revision	0x00	0xLLLL	0xTTTT	0xBBBBBBBB

0xLLLL: the log period expressed in 2 seconds units

0xTTTT: the transmit period expressed in 2 seconds units

0xBBBBBBBB: the maximum battery level used for battery life calculation expressed in mAs

Senlab D / Uplink START MESSAGE - FPort 4 - extended with Event cfg

This frame is sent automatically after a successful network connexion for informing the application layer of start.

ID (1B)	DEV_EUI (8B)	APP_TYPE (1B)	Version (3B)	Ext ID (1B)	Internal (6B)	Open duration (1B)	Close duration (1B)
0x00	LSB first	SenlabD: 0x44	Major Minor Revision	0x03		0xOO	0xCC

0xOO: Open duration for event detection in seconds units

0xCC: Close duration for event detection in seconds units

0xBBBBBBBB: the maximum battery level used for battery life calculation expressed in mAs

Senlab T / Uplink DATALOG - FPort 3. Warning: format valid for one log per transmission only

ID (1B)	BATTERY_LEVEL (1B)	Internal data (n bytes)	Log value (2B)
0x01	0xBB	Confidential (Length is variable)	0xVVVV MSB first

0xBB: the battery level expressed in 1/254 %

0xVVVV: temperature expressed in 1/16 °C as a 2 bytes signed int

ex: 01FE5B8134018F

0xFE: Battery level 99%

0x018F: Temp = 399/16 = 24,9575 °C

Senlab H / Uplink DATALOG - FPort 3. Warning: format valid for one log per transmission only

ID (1B)	BATTERY_LEVEL (1B)	Internal data (n bytes)	Temperature Log value (2B)	Humidity Log value (1B)
0x03	0xBB	Confidential (Length is variable)	0xTTTT MSB first	0xHH

0xBB: the battery level expressed in 1/254 %
0xTTTT: temperature expressed in 1/16 °C as a 2 bytes signed int
0xHH: humidity expressed in % as 8bits signed int [0-100%]

Senlab M / Uplink DATALOG - FPort 3. Warning: format valid for one log per transmission only

ID (1B)	BATTERY_LEVEL (1B)	Internal data (n bytes)	Log value (4B)
0x02	0xBB	Confidential (Length is variable)	0xVVVVVVVV MSB first

0xBB: the battery level expressed in 1/254 %
0xVVVVVVVV: pulse number as a 4 bytes unsigned int

Senlab M / Uplink ENHANCED DATALOG - FPort 3. Warning: format valid for one log per transmission only and wirecut detection activated - since FW V1.3

ID (1B)	BATTERY_LEVEL (1B)	Wire cut status (1 st &3 bits of 1B)	Internal data (n bytes)	Log value (4B)
0x07	0xBB	0xSS	Confidential (Length is variable)	0xVVVVVVVV MSB first

0xBB: the battery level expressed in 1/254 %
0xSS: third bit indicates if the wirecut detection is activated
If YES, the first bit of 0xSS byte indicates the Wire cut status (1 → Wire cut detected)
0xVVVVVVVV: pulse number as a 4 bytes unsigned int

ex: 07FE01508134000000D
0xFE: Battery level 99%
0x04: Enhanced status - Wirecut detection is activated and Wirecut is detected

Senlab A / Uplink DATALOG - FPort 3. Warning: format valid for one log per transmission only

ID (1B)	BATTERY_LEVEL (1B)	Internal data (n bytes)	Current Log value (2B)
0x00	0xBB	Confidential (Length is variable)	0xAAAA MSB first

0xBB: the battery level expressed in 1/254 %
0xAAAA: input current expressed in 1/200 mA as a 2 bytes unsigned int [0-25mA]

Senlab D / Uplink DATALOG - FPort 3. Warning: format valid for immediate event transmission cfg.

ID (1B)	BATTERY_LEVEL (1B)	Current Log value (1B)	Internal data (n bytes)
0x05	0xBB	0xVV with bit mask 0x80	Confidential (Length is variable)

0xBB: the battery level expressed in 1/254 %
0xVV: 1 for open state / 0 for clos state (ex: 0x83 → open / 0x03 → close)

Senlab P / Uplink DATALOG - FPort 3. Warning: format valid for one log per transmission only

ID (1B)	BATTERY_LEVEL (1B)	Internal data (n bytes)	Log value (4B)
0x02	0xBB	Confidential (Length is variable)	0xVVVVVVVV MSB first

0xBB: the battery level expressed in 1/254 %
 0xVVVVVVVV: detection number as a 4 bytes unsigned int

Senlab M & T & H & A & D & P / Downlink STOP DATALOG MESSAGE – FPort 2

This operation (request/response) will stop datalog transmission.
 After response confirmation, new activation of device with magnet will be necessary to restart the datalog.

Request	ID (1B)	STOP PARAM. (2B)	Response	ID (1B)	STATUS (1B)	STOP PARAM. (2B)
	0x01	0x0700		0x81	0x00 OK 0x01 KO	0x0700

Senlab M & T & H & A & P / Downlink DATALOG CONFIGURATION MESSAGE – FPort 2

This operation (request/response) will update datalog configuration (log sample & log transmission periods).
 A new configuration will be applied as it receives the uplink response starting by 0x8100.

It will also force the uplinks to happen half way between two data-log (± 15 sec) for more regular radio communication update.

Request	PAYLOAD	Log timestamp
Log / Tx = 5min	0x0107010100960071020096002609000F	=Msg reception timestamp -2min30
Log / Tx = 10min	0x01070101012C010702012C007109000F	=Msg reception timestamp -5min
Log / Tx = 15min	0x0107010101C2019D0201C200BC09000F	=Msg reception timestamp -7min30
Log / Tx = 30min	0x010701010384035F020384019D09000F	=Msg reception timestamp -15min
Log / Tx = 60min	0x01070101070806E3020708035F09000F	=Msg reception timestamp -30min
Log / Tx = 2h	0x010701010E100dEB020E1006E309000F	=Msg reception timestamp -1h
Log / Tx = 3h	0x01070101151814F30215180A6709000F	=Msg reception timestamp -1h30
Log / Tx = 4h	0x010701011C201BFB021C200DEB09000F	=Msg reception timestamp -2h
Log / Tx = 12h	0x010701015460543B0254602A0B09000F	=Msg reception timestamp -6h
Log / Tx = 24h	0x01070101A8C0A89B02A8C0543B09000F	=Msg reception timestamp -12h

Senlab M / Downlink request WIRECUT CONFIGURATION – FPort 2 (since FW v1.3)

These operations (request/response) will activate/deactivate SenlabM wirecut detection.

- After new configuration confirmation, Senlab UPLINK message will be DATALOG (ID 0x02) or ENHANCED DATALOG (ID 0x07), in dependence with the new configuration
- Wirecut status in ENHANCED DATALOG message will be automatically "RESET" to 0 after a downlink reception (at least after the daily link check)

Activation:

Request	ID (1B)	ACTIVATION (5B)	Response	ID (1B)	ACTIVATED (6B)
	0x01	0x0300000002		0x81	0x000300000002

Deactivation:

Request	ID (1B)	DEACTIVATION (5B)	Response	ID (1B)	DEACTIVATED (6B)
	0x01	0x0300020000		0x81	0x000300020000

Senlab M / Downlink RESET RAW INDEX – FPort 2

This operation (request/response) will reset to 0 the current index of SenlabM.

Request	ID (1B)	RESET RAW INDEX (5B)	Response	ID (1B)	RESET CONFIRMATION (1B)
	0x04	0x0200000000		0x84	0x0200000000

Senlab M / Downlink RESET DETECTON NUMBER – FPort 2

This operation (request/response) will reset to 0 the current detection nb. of SenlabP

Request	ID (1B)	RESET DETECTION INDEX (5B)	Response	ID (1B)	RESET CONFIRMATION (5B)
	0x04	0x0200000000		0x84	0x0200000000

Senlab M & T & H & A & P (version INDOOR) / Downlink RESET BATTERY LEVEL – FPort 2

This operation (request/response) will reset the battery level to 100%.

Warning: It must be used only for Indoor version when new battery have been replaced!

Request	PAYLOAD	Response OK
Reset battery to 100%	0x040100000000	0x8400...