

Senstick Soil 3.0 LoRaWAN Protocol FW v1.0

1. LoraWAN DATA Payload (Uplink)

Parameter:	stat	t	rh	ap	bat	soil	SUM
Size:	1B	2B	2B	2B	1B	2B	10B

Parameter	Name	Range	Size	Type	Description
Status	stat	0 - 255	1B	uint8	Status Codes: 0x00 - OK Bit0 - Movement Detected Packet Bit1 - Movement Detected Confirmed Bit2 - Battery Low Power Bit3 - Accelerometer Failure Bit4 - T/RH Sensor Failure Bit 5 - AP Sensor Failure Bit6 - NFC Failure Bit7 - EUI Failure
Temperature	t	-128.00 - 127.00	2B	int16	Temperature (t / 100)
Relative Humidity	rh	0.00 - 100.00%	2B	uint16	Relative Humidity (rh1 / 100)
Air Pressure	ap	300 - 1200 mbar	2B	uint8	Air Pressure (ap / 10)
Battery Level	bat	1 - 3.55V	1B	uint8	Battery Level (bat / 100 + 1) (min. 2.2V)
Soil Moisture	soil	0 - 3000mV	2B	uint16	Soil Moisture (soilmoisture*)

NOTE: When Movement Detected LoRaWAN Port 1 is used, for regular packet LoRaWAN Port 2 is used.

NOTE 2:

- PinoTech Probe:
 - SoilMoisture = (soil - 44) * 100 / 2832;
 - VWC = (2.8432 * soil * soil * soil) - (9.1993 * soil * soil) + (20.2553 * soil) - 4.1882
- *VWC equation is suitable for most mineral soils - most mineral soils will saturate around 35-50% VWC
- Meter Group EC-5 Probe:
 - SoilMoisture = (soil - 298) * 100 / 649;

2. LoraWAN CONFIG Payload (Uplink)

Param:	stat	period	movt	ackco	dr	fid	pid	hw	fw	SUM
Size:	1B	1B	1B	1B	1B	1B	1B	1B	1B	9B

Parameter	Name	R/W	Size	Type	Default Value	Description
Status	stat	R	1B	uint8	0x00	Status Codes: 0x00 - OK Bit0 - Movement Detected Packet Bit1 - Movement Detected Confirmed Bit2 - Battery Low Power Bit3 - Accelerometer Failure Bit4 - T/RH Sensor Failure Bit 5 - AP Sensor Failure Bit6 - NFC Failure Bit7 - EUI Failure
Send Period	period	R/W	1B	uint8	15 min	Data send period in minutes.
Movement Threshold	movt	R/W	1B	uint8	12 (1 - 127)	Movement threshold to send measurement. (16 x movt mg). 0 == OFF.
Packet Confirm	ackco	R/W	1B	uint8	24	Request confirmed packed every N transmissions. 0 == OFF.
Data Rate	dr	R/W	1B	uint8	0 - 7 (255)	DR0 - DR7 (x = DRx), 255 = ADR On.
Family Id	fid	R	1B	uint8	1	Family Id.
Product Id	pid	R	1B	uint8	2	Product Id.
Hardware Version	hw	R	1B	uint8	3.0	Hardware version (hw / 10).
Firmware Version	fw	R	1B	uint8	1.0	Firmware version (fw / 10).

NOTE: For Config packet LoRaWAN Port 3 is used.

3. LoRaWAN RECEIVE Payload Config (Downlink)

Param:	period	movt	ackco	dr	SUM
Size:	1B	1B	1B	1B	4B

Parameter	Name	R/W	Size	Type	Default Value	Description
Period	period	R/W	1B	uint8	15 min	Data send period in minutes.
Movement Threshold	movt	R/W	1B	uint8	12 (1 - 127)	Movement threshold to send measurement. (16 x movt mg). 0 == OFF.
Packet Confirm	ackco	R/W	1B	uint8	24	Request confirmed packed every N transmissions. 0 == OFF.
Data Rate	dr	R/W	1B	uint8	0 - 7 (255)	DR0 - DR7 (x = DRx), 255 = ADR On.

DEFAULT DOWNLINK PACKET: 0F 0C 18 FF

NOTE: For Config packet LoRaWAN Port 3 is used.

4. LoRaWAN CONFIG Payload (Downlink) - Send Period

Param:	sendp	SUM
Size:	1B	1B

Parameter	Name	R/W	Size	Type	Default Value	Description
Send Period	sendp	R/W	1B	uint8	15 min	Send period in minutes.

DEFAULT DOWNLINK PACKET: 0F

5. LoRaWAN CONFIG Payload (Downlink) - Reboot

Param:	reboot	SUM
Size:	2B	2B

Parameter	Name	R/W	Size	Type	Default Value	Description
Reboot	reboot	W	2B	uint16	0xFFFF	Start REBOOT procedure.

DEFAULT DOWNLINK PACKET: FF FF

6. LoRaWAN CONFIG Payload (Downlink) - Factory Defaults

Param:	fdef	SUM
Size:	2B	2B

Parameter	Name	R/W	Size	Type	Default Value	Description
Factory Defaults	fdef	W	2B	uint16	0xEEEE	Erase NFC EEPROM.

DEFAULT DOWNLINK PACKET: EE EE

7. TTN Downlink Guide

Overview Live data **Messaging** Location Payload formatters Claiming General settings

Uplink **Downlink**

Schedule downlink

Insert Mode

- Replace downlink queue
 Push to downlink queue (append)

FPort *

2 ←

Payload type

- Bytes JSON

Payload

0F 0C 18 FF ←

The desired payload bytes of the downlink message

- Confirmed downlink

Schedule downlink ←

Application > End Device > Messaging > Downlink