

Senstick Microclimate 3.3 LoRaWAN Protocol FW v2.1

1. 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	0	Status Codes: 0 - OK Bit0 - Movement Detected Bit1 - Accelerometer Failure Bit2 - T/RH Sensor Failure Bit3 - AP Sensor Failure Bit4 - NFC Failure Bit 5 - EUI IC Failure Bit6 - RTC Failure Bit7 - Log Unavailable
Send Period	period	R/W	1B	uint8	5	Data send period in minutes: 1: 1 min, 2: 2 min, 3: 5 min, 4: 10 min, 5: 15 min, 6: 30 min, 7: 60 min
Movement Threshold	movt	R/W	1B	uint8	0	Movement threshold to send alert. (31.25 x movt mg, 0 = OFF, range: 1 - 63) 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	128	Bit0-6 - DRx Bit7 - ADR status (0 = OFF, 1 = ON)
Family Id	fid	R	1B	uint8	1	Family Id.
Product Id	pid	R	1B	uint8	1	Product Id.
Hardware Version	hw	R	1B	uint8	3.0	Hardware version (hw / 10).
Firmware Version	fw	R	1B	uint8	2.1	Firmware version (fw / 10).

NOTE: For Config packet LoRaWAN Port 3 is used.

2. LoraWAN DATA Payload (Uplink)

Parameter:	stat	t	rh	ap	bat	unix	SUM
Size:	0/1B	2B	2B	2B	2B	0/4B	8/9/12/13B

Parameter	Name	Range	Size	Type	Description
Status	stat	0 - 255	0/1B	uint8	Status Codes: Bit0 - Movement Detected Bit1 - Accelerometer Failure Bit2 - T/RH Sensor Failure Bit3 - AP Sensor Failure Bit4 - NFC Failure Bit 5 - EUI IC Failure Bit6 - RTC Failure Bit7 - Log Unavailable
Temperature	t	-327.68 - 327.67	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	uint16	Air Pressure (ap / 10)
Battery Voltage	bat	0 – vbat mV	2B	uint16	Battery Voltage
Unix time	unix	0 – 4294967295	0/4B	uint32	Unix timestamp (seconds since 1970-01-01 UTC)

NOTES:

- for regular packet, LoRaWAN Port 2 is used.
- the status byte is only sent if any of the status modes is triggered.
- retransmitted packet parameters are only sent if packet retransmission is requested (downlink packet).

Data payload (uplink) if packet retransmitted

Parameter:	Normal data uplink	rfcnt	rstat	rrt	rrh	rap	rbat	runix	SUM
Size:	8/9/12/13B	3B	1B	2B	2B	2B	2B	4B	22/23/26/27 B

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Parameter	Name	Range	Size	Type	Description
Status	stat	0 - 255	0/1B	uint8	Status Codes: Bit0 - Movement Detected Bit1 - Accelerometer Failure Bit2 - T/RH Sensor Failure Bit3 - AP Sensor Failure Bit4 - NFC Failure Bit 5 - EUI IC Failure Bit6 - RTC Failure Bit7 - Log Unavailable
Temperature	t	-327.68 - 327.67	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	uint16	Air Pressure (ap / 10)
Battery Voltage	bat	0 – vbat mV	2B	uint16	Battery Voltage (vbat/1000)
Unix time	unix	0 – 4294967295	4B	uint32	Unix timestamp (seconds since 1970-01-01 UTC)
Retransmitted Packet FCNT	rfcnt	0 - 16,777,215	3B	uint24	Retransmitted Packet Frame Counter
RP Status	rstat	0 - 255	1B	uint8	Status Codes: 0x00 - OK Bit0 - Movement Detected Bit1 - Accelerometer Failure Bit2 - T/RH Sensor Failure Bit3 - AP Sensor Failure Bit4 - NFC Failure Bit 5 - EUI IC Failure Bit6 - RTC Failure Bit7 - Log Unavailable
RP Temperature	rrt	-327.68 - 327.67	2B	int16	Temperature (rrt / 100)
RP Relative Humidity	rrh	0.00 - 100.00%	2B	uint16	Relative Humidity (rrh / 100)
RP Air Pressure	rap	300 - 1200 mbar	2B	uint16	Air Pressure (rap / 10)
RP Battery Volgate	rbat	0 – vbat mV	2B	unit16	Battery Voltage (rbat/1000)
RP Unix time	runix	0 – 4294967295	4B	uint32	Unix timestamp (seconds since 1970-01-01 UTC)

3. LoRaWAN CONFIG Payload (Downlink) – General setup

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

Parameter	Name	R/W	Size	Type	Default Value	Description
Send Period	period	R/W	1B	uint8	5	Data send period in minutes: 1: 1 min, 2: 2 min, 3: 5 min, 4: 10 min, 5: 15 min, 6: 30 min, 7: 60 min
Movement Threshold	movt	R/W	1B	uint8	0	Movement threshold to send alert. (31.25 x movt mg, 0 = OFF, range: 1 - 63) 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	128	Bit0-6 - DRx Bit7 - ADR status (0 = OFF, 1 = ON)

DEFAULT DOWNLINK PACKET: 05 00 18 FF

NOTE: For Config packet LoRaWAN Port 3 is used.

4. LoRaWAN CONFIG Payload (Downlink) - Send Period

Param:	period	SUM
Size:	1B	1B

Parameter	Name	R/W	Size	Type	Default Value	Description
Send Period	period	R/W	1B	uint8	5	Send period, 5: 15 min.

DEFAULT DOWNLINK PACKET: 05

NOTE: For Config packet LoRaWAN Port 3 is used.

5. LoRaWAN CONFIG Payload (Downlink) - Packet Retransmit Parameter

Param:	fcnt	SUM
Size:	3B	3B

Parameter	Name	R/W	Size	Type	Default Value	Description
Packet Retransmit	fcnt	W	3B	uint16	N/A	Packet f_cnt ID retransmit request.

NOTE:

- For the config packet, LoRaWAN Port 3 is used.
- Device logs 40 days of data (at 60 min send period), 14 days (at 20 min send period), 10 days (at 15 min send period), or 7 days (at 10 min send period).

6. 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.

NOTE: For Config packet LoRaWAN Port 3 is used.

7. 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.

NOTE: For Config packet LoRaWAN Port 3 is used.

8. 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 *

3

Payload type

Bytes JSON

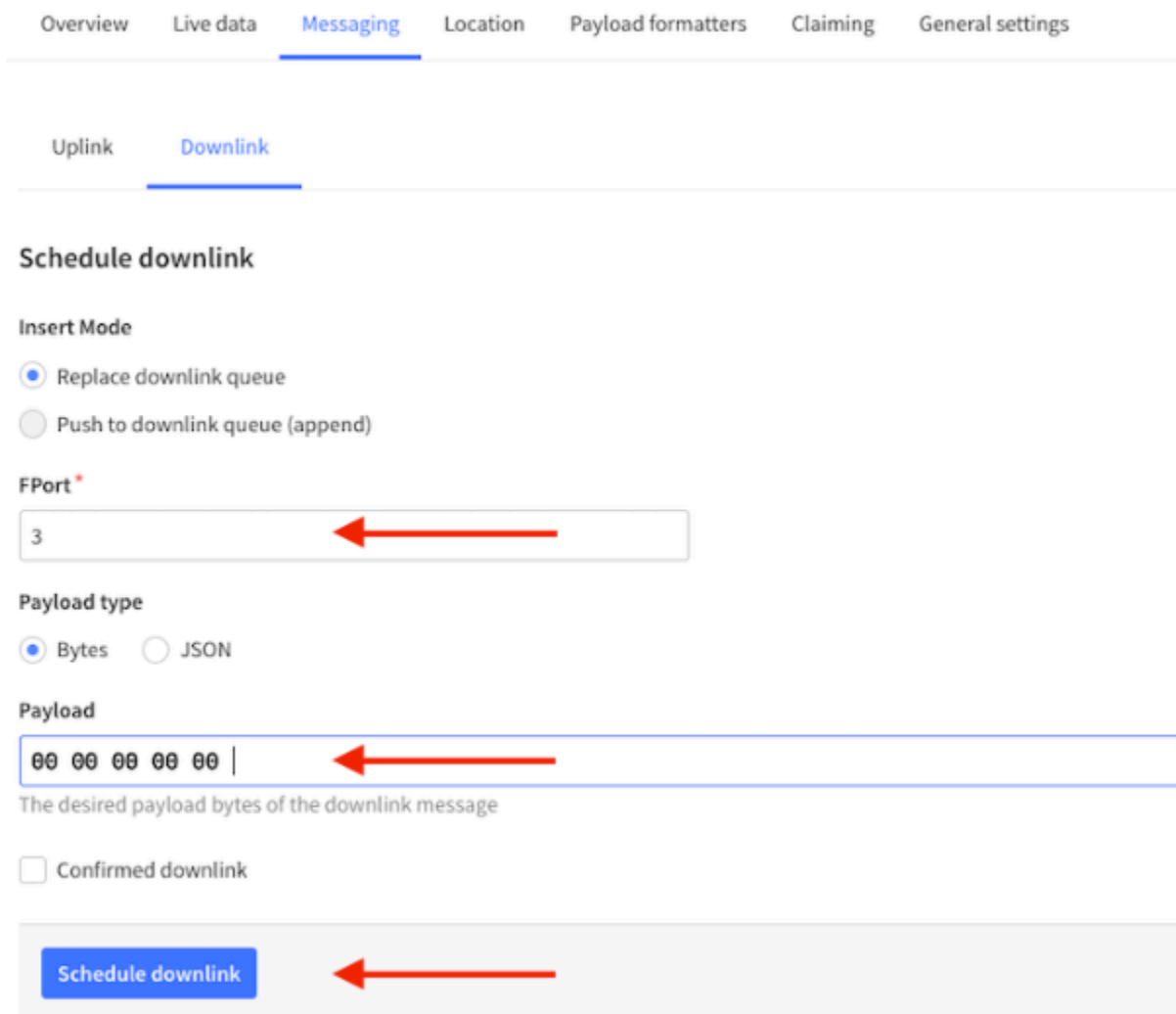
Payload

00 00 00 00 00 |

The desired payload bytes of the downlink message

Confirmed downlink

Schedule downlink



Application > End Device > Messaging > Downlink