

GWMP Interface

Approvals

Written by	Approved by	Validated by
Jean-Marie LEMETAYER	Mickaël GARIN	Martin CHAPLET
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WRITTEN	APPROVED	VALIDATED

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PUSH_DATA

Header

Bytes	Function
0	Protocol Version (0x02)
1 - 2	Message ID
3	Message Type (0x00)
4 - 11	Gateway ID
from 12	JSON Payload

JSON Payload

Received Packets

Name	Type	Mandatory	Description
rxpk	array of object		
rxpk.jver	number	✓	Version of the JSON rxpk frame format (always 2)
rxpk.time	string		UTC time of pkt RX, us precision, ISO 8601 'compact' format
rxpk.tmms	number		GPS time of pkt RX, number of milliseconds since 06 Jan.1980
rxpk.tmst	number (32 bits unsigned integer)	✓	Internal timestamp of "RX finished" event
rxpk.freq	number (unsigned float)	✓	RX central frequency in MHz (Hz precision)
rxpk.brđ	number (unsigned integer)	✓	Radio ID
rxpk.aesk	number (unsigned integer)	✓	Concentrator board used for RX
rxpk.stat	number	✓	CRC status: 1 = OK, -1 = fail, 0 = no CRC

rxpk.modu	string	✓	Modulation identifier "LORA" or "FSK"
rxpk.datr	string	✓	LoRa datarate identifier (eg. SF12BW500)
rxpk.datr	number (unsigned integer)	✓	FSK datarate (in bits per second)
rxpk.codr	string	✓	LoRa ECC coding rate identifier
rxpk.size	number (unsigned integer)	✓	RF packet payload size in bytes
rxpk.data	string	✓	Base64 encoded RF packet payload, padded
rxpk.delayed	boolean		true if the message has been delayed due to a buffering
rxpk.rsig	array of object		Received signal information, per antenna
rxpk.rsig.ant	number	✓	Antenna number on which signal has been received
rxpk.rsig.chan	number (unsigned integer)	✓	Concentrator "IF" channel used for RX
rxpk.rsig.rssic	number (signed integer)	✓	RSSI in dBm of the channel (1 dB precision)
rxpk.rsig.rssis	number (signed integer)		RSSI in dBm of the signal (1 dB precision)
rxpk.rsig.rssisd	number (unsigned integer)		Standard deviation of RSSI during preamble
rxpk.rsig.lsnr	number (signed float)	✓	Lora SNR ratio in dB (0.1 dB precision)
rxpk.rsig.etime	string		Encrypted 'main' fine timestamp, ns precision [0..999999999]
rxpk.rsig.foff	number		Frequency offset in Hz [-125 kHz..+125 kHz]
rxpk.rsig.ftstat	number (8 bits unsigned integer)		Fine timestamp status
rxpk.rsig.ftver	number		Version of the 'main' fine timestamp
rxpk.rsig.ftdelta	number		Number of nanoseconds between the 'main' fts and the 'alternative' one

Statistics

Name	Type	Mandatory	Description
stat	object		
stat.time	string		UTC 'system' time of the gateway, ISO 8601 'expanded' format
stat.boot	string		UTC boot time of the gateway, ISO 8601 'expanded' format
stat.lati	number (float)		GPS latitude of the gateway in degree (N is +)
stat.long	number (float)		GPS longitude of the gateway in degree (E is +)
stat.alti	number (integer)		GPS altitude of the gateway in meter RX
stat.rxnb	number (unsigned integer)		Number of radio packets received
stat.rxok	number		Number of radio packets received with a valid PHY CRC
stat.rxfw	number (unsigned integer)		Number of radio packets forwarded
stat.ackr	number		Percentage of upstream datagrams that were acknowledged
stat.dwnb	number (unsigned integer)		Number of downlink datagrams received
stat.txnb	number (unsigned integer)		Number of packets emitted
stat.lpps	number (unsigned integer)		Number of lost PPS pulses
stat.temp	number (signed integer)		Temperature of the Gateway
stat.fpga	number (unsigned integer)		Version of Gateway FPGA
stat.dsp	number (unsigned integer)		Version of Gateway DSP software
stat.hal	string		Version of Gateway driver (format X.X.X)
stat.ping	number		Ping in ms for the last PULL_ACKs

PUSH_ACK

Header

Bytes	Function
0	Protocol Version (0x02)
1 - 2	Message ID of the PUSH_DATA
3	Message Type (0x01)

PULL_DATA

Header

Bytes	Function
0	Protocol Version (0x02)
1 - 2	Message ID
3	Message Type (0x02)
4 - 11	Gateway ID

PULL_ACK

Header

Bytes	Function
0	Protocol Version (0x02)
1 - 2	Message ID of the PULL_DATA
3	Message Type (0x04)

PULL_RESP

Header

Bytes	Function
0	Protocol Version (0x02)
1 - 2	Message ID
3	Message Type (0x03)
from 4	JSON Payload

JSON Payload

Transmit Packets

Name	Type	Mandatory	Default	Description
txpk	object	✓		
txpk.imme	bool	✓ <i>At least one</i>		Send packet immediately (will ignore tmst & tmms)
txpk.tmst	number			Send packet on a certain timestamp value (will ignore tmms)
txpk.tmms	number			Send packet at a certain GPS time (GPS synchronization required)
txpk.freq	number (unsigned float)	✓		TX central frequency in MHz (Hz precision)
txpk.brd	number (unsigned integer)		0	Radio ID
txpk.ant	number (unsigned integer)	✓ <i>At least one</i>		Concentrator antenna used for TX
txpk.rfch	number (unsigned integer)			Concentrator antenna used for TX
txpk.powe	number (unsigned integer)		0	TX output power in dBm (dBm precision)
txpk.modu	string	✓		Modulation identifier "LORA" or "FSK"
txpk.datr	string	✓		LoRa datarate identifier (eg. SF12BW500)
txpk.datr	number (unsigned integer)	✓		FSK datarate (in bits per second)
txpk.codr	string	✓		LoRa ECC coding rate identifier
txpk.fdev	number (unsigned integer)	✓		FSK frequency deviation (in Hz)
txpk.ipol	bool		false	Lora modulation polarization inversion
txpk.prea	number (unsigned integer)		8 (LoRa) 5 (FSK)	RF preamble size
txpk.size	number (unsigned integer)	✓		RF packet payload size in bytes
txpk.data	string	✓		Base64 encoded RF packet payload, padding optional
txpk.ncrc	bool		false	If true, disable the CRC of the physical layer

TX_ACK

Header

Bytes	Function
0	Protocol Version (0x02)
1 - 2	Message ID of the PULL_RESP
3	Message Type (0x05)
4 - 11	Gateway ID
from 12	JSON Payload

JSON Payload

Status

Name	Type	Mandatory	Description						
txpk_ack	object	✓							
txpk_ack.error	string	✓	Indication about success or type of failure that occurred for downlink request. Values are the following:						
			<table border="1"> <thead> <tr> <th>Value</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>NONE</td> <td>Packet has been programmed for downlink</td> </tr> <tr> <td>TOO_LATE</td> <td>Rejected because it was already too late to program this packet for downlink</td> </tr> </tbody> </table>	Value	Description	NONE	Packet has been programmed for downlink	TOO_LATE	Rejected because it was already too late to program this packet for downlink
Value	Description								
NONE	Packet has been programmed for downlink								
TOO_LATE	Rejected because it was already too late to program this packet for downlink								

COLLISION_PACKET	Rejected because there was already a packet programmed in requested timeframe
TX_FREQ	Rejected because requested frequency is not supported by TX RF chain
TX_POWER	Rejected because requested power is not supported by gateway
GPS_UNLOCKED	Rejected because GPS is unlocked, so GPS timestamp cannot be used
SEND_LBT	Rejected by LBT
SEND_FAIL	Low level error
UNKNOWN	Unknown error