APOLLON Q PAYLOAD DESCRIPTION

This chapter describes the structure of the telemetry data. The number of bytes in the payload depends on the configuration of the sensor. The structure of the data depends on which sensors are present in your product. In principle, each version has a header. This has information about the version and status of the sensor and also contains a master measured value. This measured value can simply be assumed to be the current measured value. The header is followed by an additional payload part that contains further information, such as special parameters for the measuring principle or settings for position and opening detection. Not every sensor has an additional payload part.

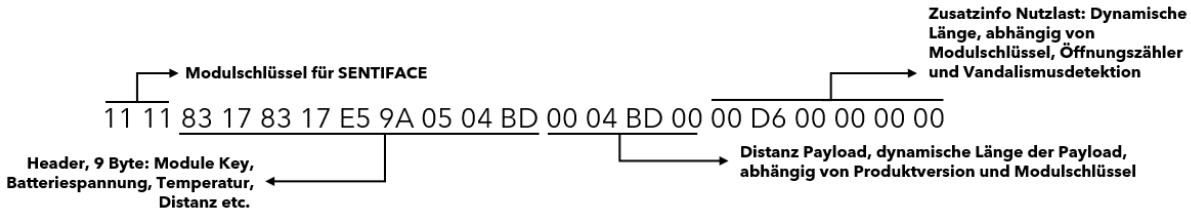
Terms	Description Byte No.
Byte No.	Byte number starting at 1
Alias	Comprehensible name of the variable
Description of the variable	Description of the variable
Designation	Designation in the Dataconverter
Unit	Unit of the variable
Datahub .json key	Key in the .json when using the data hub

STRUCTURE OF THE MODULE KEY

Byte 1		Byte 2	
Bit 7 - 4	Bit 3 - 0	Bit 7 - 4	Bit 3 - 0
Basic ID module e.g. Sentiface, Senticom, Sentivisor	Major version (SW/HW version)	Minor version (SW/HW version)	Product version (sensors, e.g. TH, THL, ACC, ...)

The module key of the SENTIFACE module can be taken from the first 2 bytes of each uplink. The module key is required for the downlink.

UPLINK EXAMPLE (NOT APPLICABLE FOR APOLLON Q)



The following payload example is given for the Helios pressure sensor:

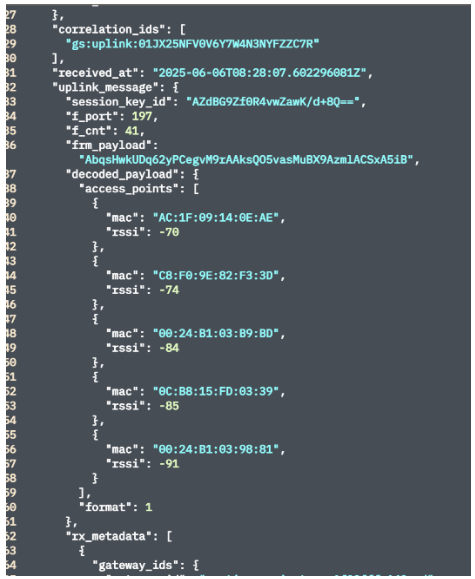
```
11 11 FE 1A D5 95 06 03 00 23 BE
```

bytes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
HEX	11	11	FE	1A	D5	95	06	03	00	23	BE
Module description	Module key	Module key	Uplink Counter	Battery Voltage	Battery Voltage	Temperature	Alarm Flag	Alarm Flag	Measurement Status	Pressure mbar	Pressure mbar

PORT ASSIGNMENT FOR WIFI SSID SCAN PAYLOAD, GNSS SCAN PAYLOAD AND REGULAR PAYLOAD

Feature	LoRaWAN Port	Port description
GNSS scan payload	192	Raw data (satellite ID, time, etc.) is sent to the geolocation backend.
WIFI SSID Scan Payload	197	Scanned MAC addresses + RSSI data are transmitted for localization.
Regular telemetry data	1	Regular payload data from the sensor, such as temperature, relative humidity, angle, battery voltage, etc.

Example for the WIFI SSID scan payload:



```
    },
    "correlation_ids": [
      "gs:uplink:01JX25NFV0V6Y7W4N3NYFZZC7R"
    ],
    "received_at": "2025-06-06T08:28:07.602296081Z",
    "uplink_message": {
      "session_key_id": "AZdBG9Zf0R4vwZawK/d+8Q==",
      "f_port": 197,
      "f_cnt": 41,
      "frm_payload":
        "AbqsHwkUDq62yPCegvM9rAAksQO5vasMuBX9AzmlACSxA5iB",
      "decoded_payload": {
        "access_points": [
          {
            "mac": "AC:1F:09:14:0E:AE",
            "rssi": -70
          },
          {
            "mac": "C8:F0:9E:82:F3:3D",
            "rssi": -74
          },
          {
            "mac": "00:24:B1:03:B9:BD",
            "rssi": -84
          },
          {
            "mac": "0C:B8:15:FD:03:39",
            "rssi": -85
          },
          {
            "mac": "00:24:B1:03:98:81",
            "rssi": -91
          }
        ],
        "format": 1
      },
      "rx_metadata": [
        {
          "gateway_ids": {
```

(i)APOLLON Q T/R/TR/SW PAYLOAD DESCRIPTION

Byte number	Alias Name	Alias Name Description	Unit	Designation in the payload decoder	Module key	Datahub .json Key
1 - 2	Module key	Byte 1 • 4-bit MSB: Module code. For mioty exclusively "Sentiface" telemetry module, i.e. always 0x1. • 4 bit LSB: Major version. FW of the same major version but larger minor version remain compatible with older decoders. However, the number of bytes may change! Byte 2 • 4 bit MSB: Minor version. New SW versions may incrementally add new telemetry to the data packet. • 4 Bit LSB: Sub / Product Version. With Helios, these bits encode the specific configuration of connected sensors.		module_key	XXX1	module_key
3	Uplink counter	Protocol-independent uplink counter that reaches a maximum of 255. After that, the counter starts again at 0.		uplink_counter	XXX1	uplink_counter
4 - 5	Battery voltage	Current voltage of the battery in millivolts //Voltage in volts battery_voltage: (dataBytes[3] << 8 | dataBytes[4]) / 1000.0	mV	battery_voltage	XXX1	battery_voltage
6	Internal temperature	Internal temperature of the sensor + 128 //Temp. in °C internal_temperature: dataBytes[5] - 128.	°C	internal_ temperature	XXX1	internal_ temperature

Byte number	Alias Name	Description	Unit	Designation in the payload decoder	Module key	Datahub .json Key
7	Alarm variable	Uplink was caused by an alarm. • 0: Alarm not triggered • 1: Alarm triggered For new sensors: • 1: Delta Alarm triggered • 2: Temperature Alarm triggered • 4: Opening Alarm triggered • 8: Vandalism Alarm triggered		alarm	XXX1	alarm
8-9	Master measured value, general measured value	• corresponds to the current measured value of the ToF sensor in mm for APOQ-XXXX-T versions • corresponds to the measured value for the maximum peak of the radar for APOQ-XXXX-R versions in mm • corresponds for APOQ-XXXX-TR to a calculated measured value from the current distances of the two measuring principles in mm	mm	master_value	XXX1	master_value

For the other bytes, please note the differentiation according to the hardware version of the sensor!

Byte number	Alias Name	Byte Description	Unit	Designation in the payload decoder	Module key	Datahub .json key
For versions S-(i)APOQ-XXXX-T-(ACC)-(HALL) [versions WITHOUT radar, not PP]						
10	Status ToF Sensor	Status of the sensor in relation to the last measured value • 0: Valid range • 2/4: Out of bounds • 5: Hardware fail • 7: Wrapped target • 8: Algorithm fail • 14: Invalid range • 99: More than one valid target detected		tof_status	XXX1	tof_status
11 - 12	Distance (see master value if source of the sensor is the same)	Current measured distance of the ToF sensor in mm.	mm	tof_distance	XXX1	tof_distance
13	Mode ToF (Index)	Mode in which the sensor recorded the last value recorded. • 0: Short Up to 1.3 meters • 1: Medium Up to 3 meters • 2: Long Up to 4 meters		tof_index	XXX1	tof_index

Byte number	Alias Name	Byte Description	Unit	Designation in the payload decoder	Module key	Datahub .json key
For versions S-(i)APOQ-XXXX-R-(ACC)-(HALL) [versions WITHOUT ToF, not PP]						
10	Status Radar	• 0: Error • 1: Success		radar_status	XXX1	radar_status
11	Number of peaks	Number of peaks detected.		radar_no_peaks	XXX1	radar_no_peaks
12 - 13	Distance 1	Distance with maximum peak in mm.	mm	radar_distance_1	XXX1	radar_distance_1
14 - 15	Peak 1	Distance with maximum peak in dBsm .	dBsm	radar_ra_1	XXX1	radar_ra_1
16 - 17	Distance 2	Distance with second highest peak in mm .	mm	radar_distance_2	XXX1	radar_distance_2
18 - 19	Peak 2	Distance with second highest peak in dBsm .	dBsm	radar_ra_2	XXX1	radar_ra_2
20 - 21	Distance 3	Distance with third highest peak in mm.	mm	radar_distance_3	XXX1	radar_distance_3
22 - 23	Peak 3	Distance with third highest peak in dBsm .	dBsm	radar_ra_3	XXX1	radar_ra_3

Byte number	Alias Name	Byte Description	Unit	Designation in the payload decoder	Module key	Datahub .json key
For versions S-(i)APOQ-XXXX-TR-(ACC)-(HALL), S-(i)APOQ-XXXX-SW-(ACC)-(HALL) [versions with radar AND ToF, not PP]						
10	Status ToF sensor	Status of the sensor in relation to the last measured value • 0: Valid range • 2/4: Out of bounds • 5: Hardware fail • 7: Wrapped target • 8: Algorithm fail • 14: Invalid range • 99: More than one valid target detected		tof_status	XXX1	tof_status
11 - 12	Distance (see master value if source of the sensor is the same)	Current measured distance of the ToF sensor in mm.	mm	tof_distance	XXX1	tof_distance
13	Mode ToF (Index)	Mode in which the sensor recorded the last value recorded. • 0: Short Up to 1.3 meters • 1: Medium Up to 3 meters • 2: Long Up to 4 meters		tof_index	XXX1	tof_index
14	Radar status	• 0: Error • 1: Success		radar_status	XXX1	radar_status
15	Number of peaks	Number of peaks detected.		radar_no_peaks	XXX1	radar_no_peaks
16 - 17	Distance 1	Distance with maximum peak in mm.	mm	radar_distance_1	XXX1	radar_distance_1
18 - 19	Peak 1	Distance with maximum peak in dBsm.	dBsm	radar_ra_1	XXX1	radar_ra_1
20 - 21	Distance 2	Distance with second highest peak in mm.	mm	radar_distance_2	XXX1	radar_distance_2
22 - 23	Peak 2	Distance with second highest peak in dBsm.	dBsm	radar_ra_2	XXX1	radar_ra_2
24 - 25	Distance 3	Distance with third highest peak in mm.	mm	radar_distance_3	XXX1	radar_distance_3
26 - 27	Peak 3	Distance with third highest peak in dBsm.	dBsm	radar_ra_3	XXX1	radar_ra_3

Attached bytes	Alias Name	Alias Description	Unit	Name in the payload decoder	Module key	Datahub .json key
For versions S-(i)APOQ-XXXX-XX-ACC-HALL, S-(i)APOQ-XXXX-XX-ACC - appended bytes [Radar and ToF any, not PP]						
1	Sensor status of the acceleration sensor **(ACC)**	Returns the status of the sensor • 0: OK • other: Error		acc_status	XXX1	acc_status
1	Displays the orientation of the sensor **(ACC)**	Shows the orientation of the sensor: • 0: Vertical: Lying on its side • 1: Face Up: Lens points to the ceiling • 2: Face Down: Lens points to the floor • 3: Error		acc_orientation	XXX1	acc_orientation
1	Flap opening acceleration sensor **(ACC)**	Indicates whether the cover is still open after a certain time interval.		acc_open	XXX1	acc_open
1	Openings Lifetime counter acceleration sensor **(ACC)**	Shows how many openings have been performed (over the entire life cycle).		acc_open_cnt	XXX1	acc_open_cnt
1	Vandalism alarm **(ACC)**	Indicates whether a vandalism event is acute or not • 0: No vandalism event displayed • 1: Vandalism event displayed		acc_impact	XXX1	acc_impact
1	Flap opening Hall sensor **(HALL)**	Indicates whether the sensor is vertical (whether a flap to which the sensor is attached is open): • 1: Open • 0: Closed		hall_open	XXX1	hall_open
1	Openings Lifetime Hall **(HALL)**	Shows how many openings were carried out (over the entire life cycle).		hall_open_cnt	XXX1	hall_open_cnt

Attached bytes	Alias name	description	Unit	Designation in the payload decoder	Module key	Datahub .json key
For versions S-(i)APOQ-XXXX-T-(ACC)-(HALL), S-(i)APOQ-XXXX-TR-(ACC)-(HALL) - appended bytes histogram debug data valid for ToF versions = 2! The histogram data can be used with the usual distance parameters tof_distance (bytes 11-12) to compensate for heavy soiling on the sensor. In normal operation, these should only deviate slightly from the measured distances. These functions should only be used after consultation and by experienced users!						
1 byte attached	Histogram type/version	Specifies whether only values with the histogram function are transferred or also values with the usual average algorithm • 0: Only values with the histogram function are appended and can be found in the master_value or in the tof_distance parameter • 1: In addition to the new values that are determined using the histogram function, the values are also transferred using the usual average algorithm		histo_type	XXX1	histo_type
The following description applies to all variants with histogram type/version = 0 (to be identified by the payload length (+ 5 bytes).						
1 byte appended	Histogram status	For more detailed information, contact the manufacturer.		tof_hist_stat	XXX1	tof_hist_stat
2 bytes appended	Histogram distance	Distance in mm measured with the histogram feature algorithm.		tof_hist_dist	XXX1	tof_hist_dist

DECODING EXAMPLES (FEBRIS)

Payload: 11 11 CE 14 8E 07 EE 1D 00 02 03 D6 01 D1 00

Bytes	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**
HEX	11	11	CE	14	8E	07	EE	1D	00	02	03
Module description	Module key	Module key	Uplink counter	Battery Voltage	Battery Voltage	Internal temperature	Internal temperature	Rel. humidity	Dew point	Dew point	Air pressure

Bytes	**12**	**13**	**14**	**15**
HEX	D6	01	D1	00
Description	Air pressure	CO2	CO2 ALARM	Alarm

```
"uplink_message": {
  "session_key_id": "AYY660iFsk5LInv+xd6AVg==",
  "f_port": 1,
  "f_cnt": 211294,
  "frm_payload": "ESPOFI4Esx0D1gHRAAABZg==",
  "decoded_payload": {
    "alarm": 0,
    "base_id": 1,
    "battery_voltage": 5.262,
    "co2_ppm": 465,
    "dew_point": 2,
    "humidity": 29,
    "internal_temperature": 20.299999999999997,
    "major_version": 1,
    "minor_version": 2,
    "networkBaseType": "lorawan",
    "networkSubType": "tti",
    "pressure": 982,
    "product_version": 3,
    "up_cnt": 206
  },
```