

# DOWNLINK DOCUMENTATION GENERIC EN

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## 1. VERSION HISTORY

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Version	Date	Revision
<b>1.0.0</b>	06.01.2023	Created
<b>1.0.1</b>	09.04.2026	<ul style="list-style-type: none"><li>• Structure standardized</li><li>• Downlink clarified</li><li>• Content updated</li></ul>

## 2. DOWNLINKS

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This documentation can be used for all sensors in the Sentinum series that have the NFC and downlink functions. It serves as generic documentation. The individual descriptions of the fields can be found in the respective sensor specific documentation.

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Like the payload, the downlink commands are divided into modules. The sensor merely acts as a container that manages and implements the commands. The downlinks can be used to configure the sensor for the specific application. In addition to the configurations, executing downlinks, such as a reset, can also be carried out. All commands are protected by minimum and maximum values so that no incorrect settings can be made. The structure is hierarchical and consists of the following elements:

- Module
- Group
- Property
- Command

A module has several groups, which in turn are made up of several properties. The following table shows how the structure is generally organized:

Module 1		Module 2	
Group 1		Group 2	
Property 1	Property 2	Property 1	Property 1

### 3. MODULES AND GROUPS - OVERVIEW EXAMPLE

Module	Module Key	Group	Group ID	Description
<b>Sentiface</b>	0x1XXX	Alarm Settings & Timing	0x00	Defines parameters for alarm settings and measurements and transmission behavior
<b>Sentiface</b>	0x1XXX	ToF Sensor Settings	0x01	Defines measurement parameters for the ToF sensor
<b>Sentiface</b>	0x1XXX	Radar Sensor settings	0x02	Defines measurement parameters for the Radar sensor
<b>Sentiface</b>	0x1XXX	Opening detection settings	0x03	Defines parameters for the opening counter
<b>Sentiface</b>	0x1XXX	Vandal Detection Settings	0x04	Defines the settings for vandalism detection
<b>Senticom</b>	0x2XX1	Network Settings	0x00	Network management settings
<b>Senticom</b>	0x2XX1	Transmission Settings	0x01	Transmission parameters and protocol settings
<b>Senticom</b>	0x2XX1	Rejoin settings	0x02	Parameters for Link Check

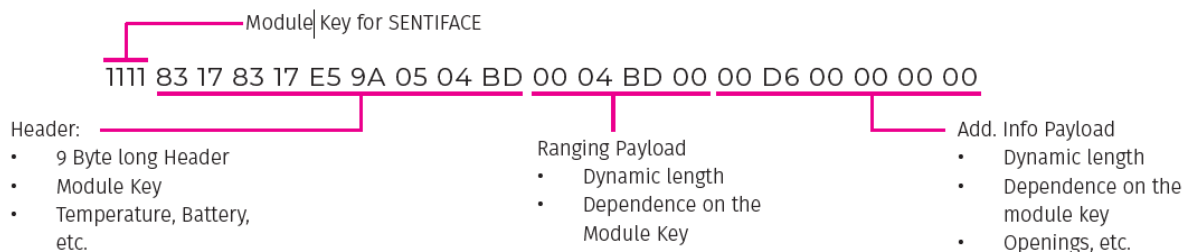
- All configuration commands (Sentiface and Senticom modules) are scheduled on port 4, all execution commands from the SUPERVISOR module on port 5, such as the RESET command.
- Within different subversions Sentinum guarantees backward compatibility. I.e. a Sentiface module with the key 0x1121 also accepts downlink commands with the key 0x1111.

## 4. STRUCTURE OF THE MODULE KEY

Byte 1		Byte 2	
Bit 7 - 4	Bit 3 - 0	Bit 7 - 4	Bit 3 - 0
Base ID Module e.g. Sentiface, Senticom, Senticom	Major Version (SW/HW Version)	Minor Version (SW/HW Version)	Product version (Mounted sensors)

The module key of the SENTIFACE module, can be taken from the first 2 bytes of each uplink.

### Uplink Example



- The module key explained here only refers to the SENTIFACE module. For SENTICOM as module key always 0x2111 shall be used
- In addition to downlinks, we also offer an app with which the sensor can be configured initially. The NFC interface offers further configuration options, e.g. regarding the network configuration (APPEUI, APPKEY, etc.).

	Byte 0	Byte 1 to 2	Byte 3	Byte 4	Byte 5 to 8
	Token	Module Key	Group	Property	Value
<b>Length</b>	1 Byte	Module Key	Group	Property	Value
<b>Description</b>	Serves to assign a command confirmation to a previously sent command. Can be freely selected by the user! (A consecutive number being useful)	Describes the specific version of the sensor and selects the module	Selects the group to which the command is assigned.	Selects an ID (Property ID) in the group. Examples are available within the group.	Contains the new property value.
<b>Example as Downlink</b>	0x01	0x1111	0x03	0x00	0x00 00 10 00

- The reset command is an exception. This is shown on page 9.
- In the first data packet (uplink) an alarm variable is usually set, since the value is compared with an internal reference value.

## 5. EXPLANATION OF TERMS FOR THE DOCUMENTATION

Term	Explanation
<b>Group ID</b>	An ID that allows the user to change various resources within a configuration unit.
<b>Resource</b>	Individual changeable elements that are responsible for the configuration and customization of a system.
<b>Resource ID</b>	An identifier that makes it possible to distinguish between different configuration options of a system.
<b>Key</b>	An NFC/BLE key that is used for authentication and access control to resources within a system.
<b>Min / Max</b>	Minimum / Maximum
<b>Module key</b>	A key that enables access to a specific configuration unit within a system.

### Further explanations of terms

Term	Explanation
<b>green / yellow / red</b>	The focus is not on color fastness, but on the variety of shades of green / orange, yellow and amber / red tones, whereby the colors can vary depending on the product.
<b>default</b>	Used as a synonym for factory setting

## 6. SENTICOM - GROUPS & PROPERTIES (MODULE KEY: 0X2111) - EXAMPLE FOR APOLLON-Q

SENTICOM: Transmission Settings Group 0x01							
Property	Property ID	Description	Min	Max	Default	Unit	Module key
<b>CONFIRMED</b>	0x00	Indicates whether the sensor is operating in confirmed mode: 0: confirmed off = unconfirmed 1: confirmed INFO messages (status uplinks) => currently not available 2: Alarm uplinks confirmed 3: All confirmed	0	3	0		111X
<b>CONFIRMED RETRIES</b>	0x01	Number if maximum retries (send attempts in confirmed mode)	1	5	3		111X
<b>ADR</b>	0x02	ADR on/off: 0: ADR off 1: ADR on	0	5	5	dr	111X
<b>SPREADING FACTOR</b>	0x04	Fixed spreading factor if ADR is switched off	0	5	0	dr	111X
<b>ENABLE DOWNLINK RESPONSE</b>	0x05	Specifies whether a downlink is confirmed outside the confirmation at downlink confirmed. In this case the downlink triggers an uplink: 0: off 1: on	0	1	0		111X

SENTICOM: NETWORK REJOIN GROUP 0x02							
Property	Property ID	Description	Min	Max	Default	Unit	Module key
<b>REJOIN STRATEGY</b>	0x00	Rejoin Strategy 0: Never rejoin 1: All x broadcasts link check 2: All x transmissions confirmed	0	2	0		111X
<b>CONNECTION CHECK EVERY</b>	0x01	Check every determines the number (x for rejstr) after which a check is performed, either by confirmed with ACK or Link Check, depending on how specified in rejstr.	1	48	4		111X
<b>FAILS UNTIL REJOIN</b>	0x02	Rejoin after specifies after how many failed checks the sensor should rejoin	0	5	4	dr	111X

SENTICOM: GNSS GROUP 0x03							
Property	Property ID	Description	Min	Max	Default	Unit	Module key
<b>GNSS MODE</b>	0x00	0: off 1: WIFI SSID scan 2: GNSS SCAN 3: WIFI SSID scan and GNSS scan	0	3	0		111X
<b>GNSS UPDATE PERIOD</b>	0x01	GNSS update period in hours	1	336	336	h	111X

SENTICOM: GNSS EXECUTE GROUP 0x04			
Property	Property ID	Description	Module Key
<b>EXCUTE SCAN</b>	0x00	Start Scan	111X

## 7. SUPERVISOR MODULE

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SUPERVISOR EXECUTABLES			
Property	Property ID	Description	Module key
<b>LOAD RESET</b>	0x00	Load Reset	3111
<b>EXECUTE RESET</b>	0x01	Execute reset: To execute the reset command had to be loaded before	3111
<b>EXECUTE REBOOT</b>	0x02	Execute rebooting of the device	3111

- The reset command must be executed in 2 steps or in 2 downlinks on port 5: First, the reset must be armed (loaded) and can then be triggered.

## 8. SENTIFACE SENSOR SETTINGS

SENTIFACE: TIMINGS AND ALARMS GROUP 0x00							
Property	Property ID	Description	Min	Max	Default	Unit	Module key
<b>MEASUREMENT PERIOD</b>	0x00	Specifies the period in which the measured values are recorded. 10 minutes means that a measurement is always taken by the sensor after 10 minutes.	5	660	60		1111
<b>DELTA VALUE</b>	0x01	Specifies the absolute amount by which the fill level must change compared to the last transmission for an ALARM transmission to be triggered. This transmission is carried out independently of the normal transmission interval. Always refers to the main measured value.	30	2000	200		1111
<b>TRANSMISSION INTERVAL</b>	0x02	Number of measurements after the sensor still schedules an uplink despite the absence of an alarm condition.	1	10	1	dr	1111
<b>MASTER VALUE</b>	0x03	Defines which sensor value is written in the master_value parameter you can find in the payload decoder: 0: ToF 1: Radar	0	1	0		1111

SENTIFACE: TOF SENSOR SETTINGS GROUP 0x01							
Property	Property ID	Description	Min	Max	Default	Unit	Module key
<b>ToF RANGING MODE</b>	0x00	Sets the distance measurement mode for the ToF sensor: 0: auto 1: fixed In auto mode, the sensor selects between the short, medium and long modes. In fixed mode, one mode remains set.	0	1	0		1111
<b>ToF RANGE INDEX</b>	0x01	Indicates which ranging mode the sensor is in: 0: short 1: medium 2: long	0	2	1		1111
<b>ALGORITHM APPLIED</b>	0x02	Measurement Algorithm, that is applied: 0: No histo 1: Histo 2: Hybrid	0	2	2		1111

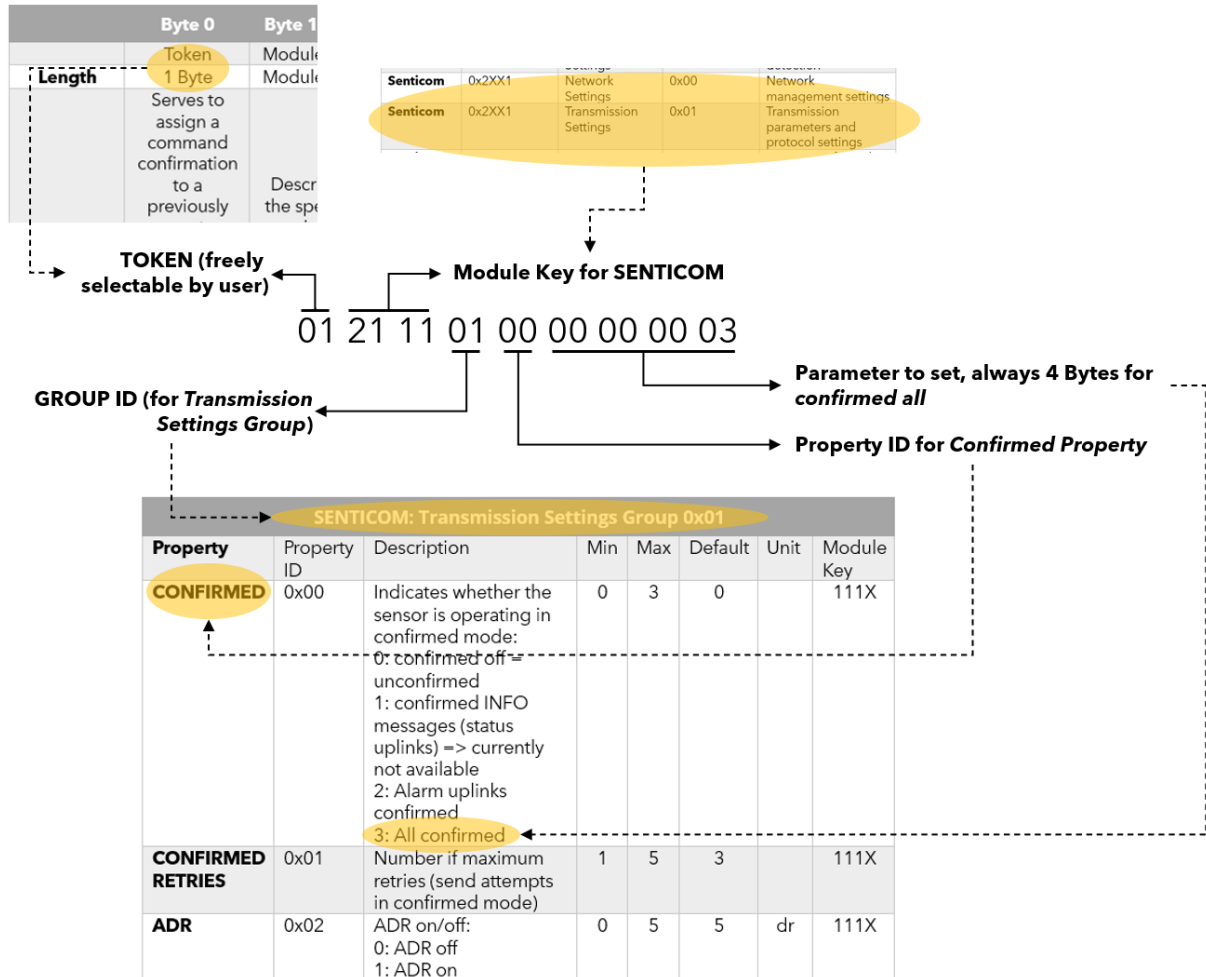
SENTIFACE: OPENING DETECTION GROUP 0x03							
Property	Property ID	Description	Min	Max	Default	Unit	Module key
<b>OPENING DETECTION COOLDOWN</b>	0x00	Specifies a time period in which a further opening cannot be triggered again after an opening has been triggered (debounces the openings). The last counted opening serves as a reference value.	1	600	120		1111
<b>OPENING DETECTION ALARM AFTER</b>	0x01	Specifies how long the cover must be open before an alarm is triggered.	60	3600	900		1111
<b>OPENING DETECTION SOURCE</b>	0x02	Indicates which source was selected for opening detection was selected: 0: None (opening alarm deactivated) 1: Accelerometer 2: Hall	0	2	0		1111
<b>OPENING DETECTION HALL SWITCH</b>	0x03	Indicates the operating mode of the Hall sensor: 0: Container is closed when solenoid is applied 1: Container is open when solenoid is applied 2: Sensor counts an opening when magnet is passed twice	0	2	0		1111
<b>OPENING DETECTION ACTIVE</b>	0x04	Activates or deactivates the open alarm: 0: deactivated 1: activated	0	1	0		1111
<b>OPENED LID OR FLAP</b>	0x05	Specifies whether an alarm is triggered after the Open Alarm After time if the container is open is triggered 0: Alarm not active 1: Alarm active	0	1	0		1111

SENTIFACE: VANDALISM DETECTION GROUP 0x04							
Property	Property ID	Description	Min	Max	Default	Unit	Module key
<b>VANDALISM DETECTION ACTIVATED</b>	0x00	Activates vandalism detection: 0: Vandalism detection off 1: Vandalism detection on	0	1	0		1111
<b>IMPACT DELTA</b>	0x01	The maximum time that may elapse between two impacts for a vandalism alarm to be triggered according to the number of number of impacts is triggered.	5	100	30	sec	1111
<b>IMPACT NUMBER</b>	0x02	Number of impacts, of which a maximum of two may be within the distance of Impact Delta for the vandalism alarm to be triggered.	3	100	5		1111
<b>IMPACT STRENGTH</b>	0x03	As soon as the acceleration is greater than the set impact strength value, an impact is counted.	500	2000	1000	Mg	1111
<b>COOLDOWN</b>	0x04	Specifies a period of time during which another vandalism alarm cannot be triggered after a vandalism alarm has been triggered.	10	1440	30	min	1111

SENTIFACE: PAST READINGS GROUP 0x05							
Property	Property ID	Description	Min	Max	Default	Unit	Module key
<b>TRANSMIT PAST READINGS</b>	0x00	Transmit past readings (more readings from the past will be delivered in one uplink: 0: off 1: on	0	1	1		1111
<b>NUMBER OF PAST READINGS</b>	0x01	Numbers of past readings that are transmitted in one package.	1	15	10		1111

## 9. EXAMPLES

First we want to configure our sensor. We decide to put the sensor into a confirmed mode. For this we look at the following downlink (HEX code):



Next, we want to change the measurement interval to 24 times per day (interval of 60 min). We proceed in this way:

