Special documentation

Special documentation for LPWAN communication protocol, model PGW23.100.11

EN

Bourdon tube pressure gauge with wireless output signal, model PGW23.100.11

WIKA

Part of your business

EN

Special documentation
Model PGW23.100.11

Page 3 - 27

© 10/2020 WIKA Alexander Wiegand SE & Co. KG
All rights reserved.
WIKA® is a registered trademark in various countries.

Prior to starting any work, read the operating instructions!
Keep for later use!

14391478.03 03/2022 EN

Contents

EN

14391478.03 03/2022 EN

Contents

EN

Firmware version history

The firmware version of the device can be read out via “myWIKA wireless device” mobile application by selecting “Request device data”.
Alternatively, the firmware version is transferred to the IIoT plattform via LPWAN with the “Sensor identification message”.

Firmware version	Initial release / Modifications
Starting from firmware version 1.2.9	Initial release

14391478.03 03/2022 EN

Supplementary documentation:
- This special documentation for the LPWAN communication protocol applies in conjunction with the operating instructions “Bourdon tube pressure gauge with wireless output signal, model PGW23.100.11” (article number 14391169).

EN

1. General information

1.1 Abbreviations, definitions

OTA	Over-the-air
NS	Network server
AS	Application server
NFC	Near field communication
LPWAN	Low power wide area network

1.2 Description

This technical guide gives a description of the LoRaWAN® specific protocol developed for the PGW23.100.11 gauge. It also describes the procedure of registration and commissioning of the device.
The PGW23.100.11 is a pressure gauge with an integrated sensor, which tranlates the pointer rotation into an electronic signal. It integrates radio modules for both NFC communication with a dedicated “myWIKA wireless device” mobile application and LoRaWAN® communication version 1.0.3. The “myWIKA wireless device” mobile application is available on PlayStore (Android) and Apple strore. This technical guide provides details of the LoRaWAN® specific protocol.

1.3 Traffic

All the traffic that goes from the devices to the server (via the gateways) is called “upstream traffic”, and all the traffic that goes from the server to device (via the gateways) is called “downstream traffic”.

The key words “MUST”, “MUST NOT”, “REQUIRED”, “SHALL”, “SHALL NOT”, “SHOULD”, “SHOULD NOT”, “RECOMMENDED”, “MAY”, and “OPTIONAL” in this document are to be interpreted as described in RFC 2119.

Multi-octet fields are encoded following a “big endian” convention, a.k.a “network order”. That order of octet’s transmission is the same as the left-to-right reading order.
Bits are numbered from left to right, starting at 7, with bit 7 representing respectively the most significant bit (a.k.a MSb).

The LoRa® mark and LoRa logo are trademarks of Semtech Corporation.
LoRaWAN® is a mark used under license from the LoRa Alliance®.

14391478.03 03/2022 EN

Example

Bytes	0								1								2		
Bit	7	6	5	4	3	2	1	0	7	6	5	4	3	2	1	0	7	6	...
Value	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	2^7	2^6	2^5	2^4	2^3	2^2	2^1	2^0	2^7	2^6	...

EN

1.4 Device commissioning and activation

The PGW23.100.11 is configured for "over-the-air" activation. To follow the procedure of activation, the device is already preconfigured with specific LoRaWAN® parameters.

According to LoRaWAN® specifications 1.0.3, the device is provided with:
- A device identifier (DevEUI)
- An application identifier (AppEUI)
- An application key (AppKey)

These information must be specified to a network server in order to be able to activate and communicate with the device.

Commissioning of the device is a specific process to be performed with a LoRaWAN® network service provider. Refer to the network service provider for further details.

1.4.1 Join procedure

At power on, the module starts a LoRa® join sequence (1 try and 1 retry 3 minutes later if the first try didn't succeed). In case of fail, it goes to sleep for a random period, then launch a new join sequence. The sleep duration between 2 join sequences is defined as:
- 10 to 15 min, the first time,
- 55 to 60 min, the second time,
- 3 h 55 min to 4 h, the following times.

The device keeps this last period infinitely, until join success or reboot.

2. Protocol description

2.1 Power modes and LoRaWAN® class

The power mode of the PGW23.100.11 defines the communication class for LoRaWAN®.
Battery mode: LoRaWAN® class A

2.2 Device channel

The PGW23.100.11 device has two channels:
- 1 pressure channel
- 1 device temperature channel

Each channel represents an analog or digital value.
All enabled channels are measured periodically.

14391478.03 03/2022 EN

Alarms are processed after each measure and send to the application server if their status has changed (triggered or disappeared).
Data are sent to the application server every X measure(s) when no alarm is active or Y measures when at least one alarm is active, X and Y are defined by the end user.
One or several alarms can be configured on pressure channel.
Some parameters that are directly related to the channel can be configured.

2.3 Device configuration

A device can be configured OTA by the end user.
Several parameters can be changed such as measurement period, transmission time factor, alarms, …
When a new configuration is received, the device will use the transaction id as a configuration id to identify all the future uplink data related to this configuration.

A new configuration is active once it has been acknowledged by the device.
The configuration id 0 is reserved for default/factory configuration.

2.4 Upstream traffic

A PGW23.100.11 sends messages in five cases:

- Data message, without LoRaWAN® confirmed
- Alarm message that must be LoRaWAN® confirmed
- Sensor identification that must be LoRaWAN® confirmed
- Alarm configuration that must be LoRaWAN® confirmed
- Keep alive confirm message for data at least once a day

2.5 Downstream traffic

The Web App sends message (via the gateway) to a PGW23.100.11 to update its configuration.
A PGW23.100.11 configuration is split in 2 parts:

- Main configuration
- Configuration pressure channel

Configuration can also be reset to factory values.
Each configuration downlink must be confirmed by the device.
A downlink transaction is identified by an ID and can contain up to 16 packets. The maximum size of each packet is imposed by the LoRaWAN® specifications to 51 bytes.
Application server will also check that the current configuration indicated by the module matches its current configuration. In case of discordance, it must launch a configuration downlink procedure.

2.6 Format of data

Sensor measurement data are formatted on a scale [2,500; 12,500] corresponding to the default full scale of the device. 1 unit of measurement is equivalent of 0.01 % of the full scale of measurement of the device.
For example, a device with a pressure range of [0 ... 10 bar] transmits a 0 bar with a digital value of 2,500 and a 10 bar with a digital value of 12,500.

14391478.03 03/2022 EN

The computation of data is performed with the following formula:

$$\text{real data} = \left(\left(\frac{\text{digital value - 2500}}{10000}\right) * \text{span}\right) + \text{start of measuring range}^{1)}$$

1) Start of pressure measuring range is variable. Start for temperature measuring range is fixed

EN

Examples

Pressure:
span = 0 ... 10 bar = 10 bar → 0x09DD → 2525 → $\left(\left(\frac{2525 - 2500}{10000}\right) * 10\right) + 0 \rightarrow 0.025$ bar

For example, a digital value of 2525 on a device with a pressure range of 0 ... 10 bar (span = 10 bar) corresponds to a real pressure of 0,025 bar.

span = -1 ... 9 bar = ... 10 bar → 0x2134 → 8500 → $\left(\left(\frac{8500 - 2500}{10000}\right) * 10\right) + (-1) \rightarrow 5$ bar

For example, a digital value of 8500 on a device with a pressure range of -1 ... 9 bar (span = 10 bar) corresponds to a real pressure of 5 bar.

Temperature:
span = -40 ... +60 °C = 100 °C → 0x221D → 8733 → $\left(\frac{8733 - 2500}{10000}\right) * 100 + (-40) \rightarrow 22.23$ °C

For example, a digital value of 8733 on a device with a temperature range of -40 ... 60 °C (span = 100 °C) corresponds to a real temperature of 22.23 °C.

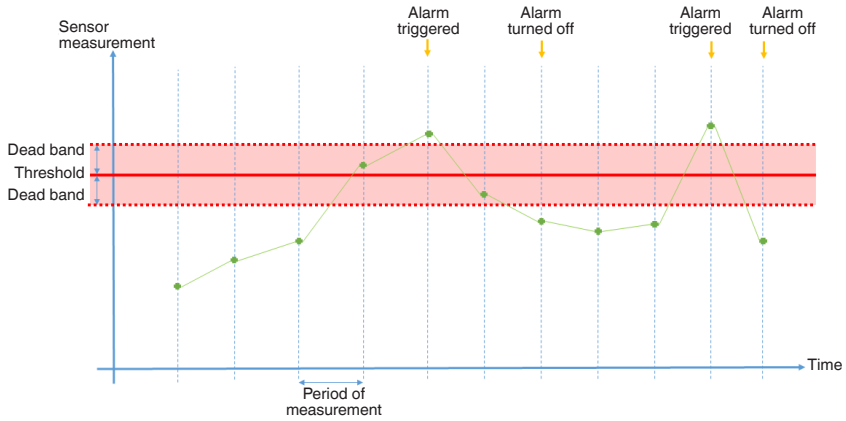
2.7 Process alarm description

Three types of process alarm can be configured on the device. This section gives a description of the 3 types of alarms and corresponding parameters.

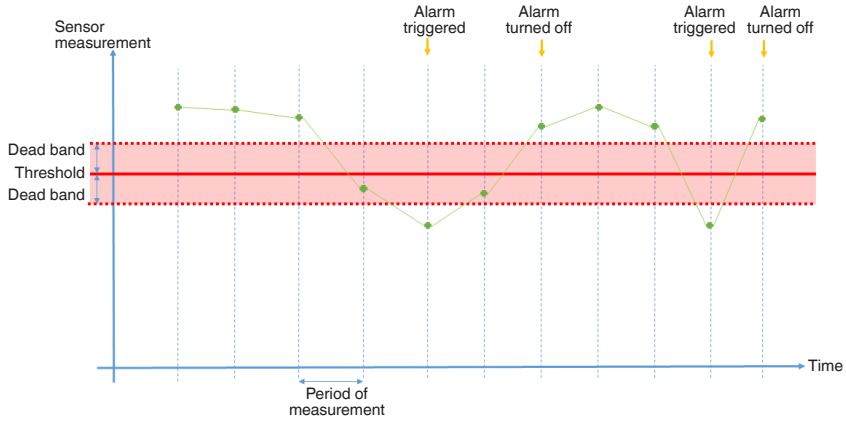
Alarm	Parameters		
	Threshold	Dead band	Delay
Rising	Value/s [2,500 ... 12,500] 0.01 % of full scale	Value/s [0 ... 10,000] 0.01 % of full scale	-
Falling	Value/s [2,500 ... 12,500] 0.01 % of full scale	Value/s [0 ... 10,000] 0.01 % of full scale	-
Rising with delay	Value/s [2,500 ... 12,500] 0.01 % of full scale	Value/s [0 ... 10,000] 0.01 % of full scale	Value/s [1 ... 65,535] in 10 s unit
Falling with delay	Value/s [2,500 ... 12,500] 0.01 % of full scale	Value/s [0 ... 10,000] 0.01 % of full scale	Value/s [1 ... 65,535] in 10 s unit
Rising slope	Value/s [0 ... 10,000] 0.01 % of full scale	-	-
Falling slope	Value/s [0 ... 10,000] 0.01 % of full scale	-	-

14391478.03 03/2022 EN

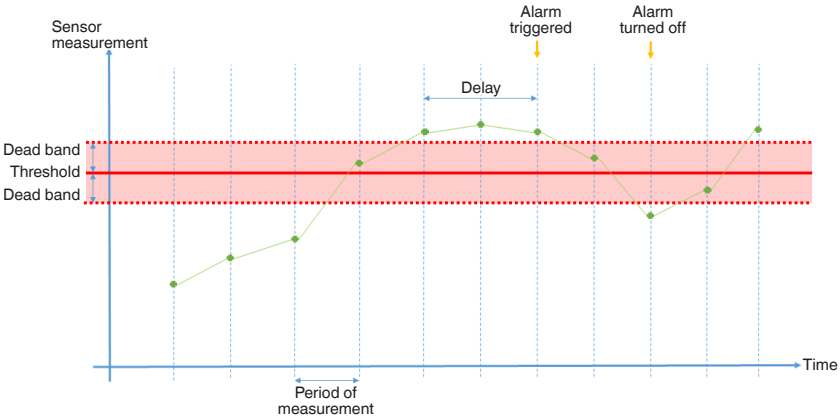
2.7.1 Rising threshold



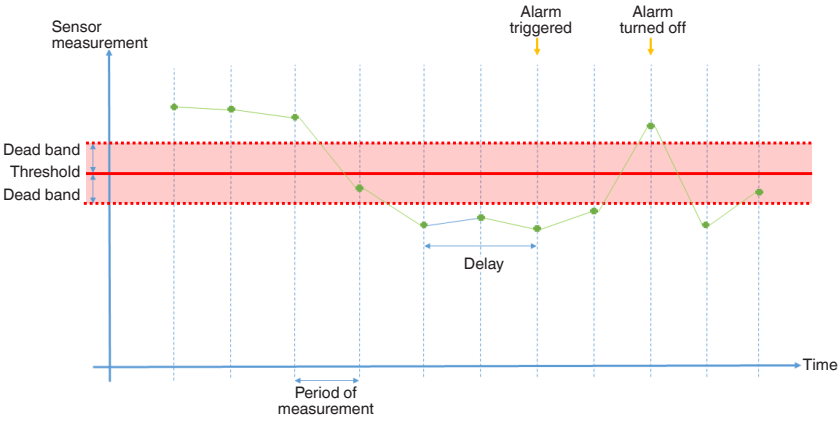
2.7.2 Falling threshold



2.7.3 Rising threshold with delay

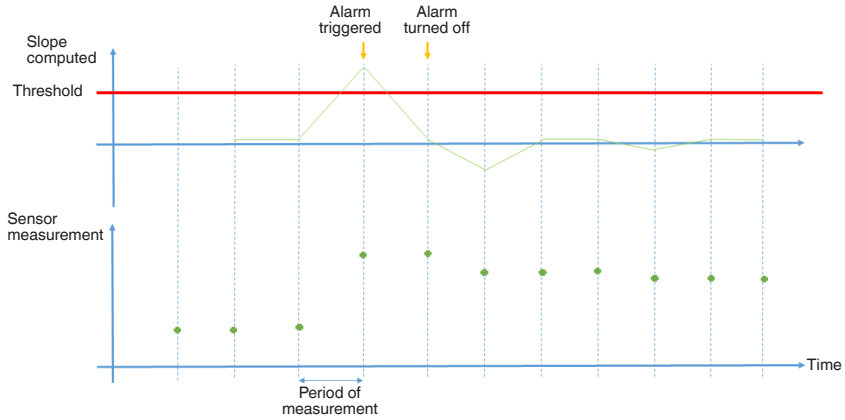


2.7.4 Falling threshold with delay

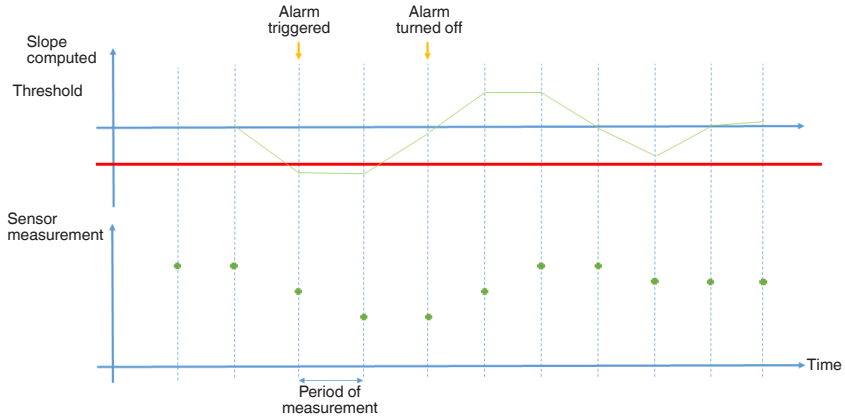


14391478.03 03/2022 EN

2.7.5 Rising slope alarm



2.7.6 Falling slope alarm



3. Upstream format

Upstream messages are defined by its type and contents.

Byte	Size (bytes)	Field	Note
0	1	Upstream message type	-
1	1	Configuration transaction ID	Current transaction configuration ID
2	-	Data	Data depending on message type
.	-	...	-

3. Upstream format

Byte	Size (bytes)	Field	Note
.	-	...	-
n	--	Data	-

EN

3.1 Upstream message type

Decoding message content depends on its type:

Hexa	Message types
0x01	Data message with no alarm ongoing
0x02	Data message with at least an alarm ongoing
0x03	Process Alarm
0x04	Sensor Failure Alarm
0x05	Technical Alarm
0x06	Configuration status
0x07	Device identification
0x08	Keep alive

3.2 Data message format

The messages are formatted as described in the following table:

Byte	Size (bytes)	Field	Note
0	1	Data message type	According upstream messages type table (0x01, 0x02)
1	1	Configuration transaction ID	Current transaction configuration ID
2	1	Battery Voltage	Value/s between [0 .. 255] (unit 0.1 V, unsigned)
3 - 4	2	Pressure value	2,500 - 12,500 value/s (unit 0.01 %)
5 - 6	2	Device temperature value	2,500 - 12,500 value/s (unit 0.01 %)

3.3 Resolution and accuracy

The LPWAN communication protocol is a standard protocol used for WIKA IoT devices. In this document, data format are presented with their full resolution (based on data format). Refer to the reference of your device for technical specifications and information about accuracy.

14391478.03 03/2022 EN

3.4 Process alarm message format

An alarm message contains any number of alerts triggered by the sensor. The first bytes of the message are formatted as described in the following table:

Byte	Size (bytes)	Field	Note
0	1	0x03	Alarm has been triggered and/or disappeared
1	1	Configuration transaction ID	Current transaction configuration ID

The end of message is composed of a sequence of alarms concatenated.

Each alarm is formatted as described in the following table:

Byte	Size (bytes)	Field	Note
n	1	Alarm type	See alarm type tables (column alarm type)
[n+1; n+2]	2	Related alarm value	See related values tables

3.4.1 Alarms types

Bit	Description	
7	0: Triggered 1: Disappeared	
6 - 3	Channel	0: Pressure
2 - 0	Analog alarm	0: Falling threshold alarm 1: Rising threshold alarm 2: Falling slope alarm 3: Rising slope alarm 4: Falling threshold alarm with delay 5: Rising threshold alarm with delay

3.4.2 Related values

Alarm type	Size (bytes)	Related value
Falling threshold	2	2,500 - 12,500 value/s (0.01 %)
Rising threshold		2,500 - 12,500 value/s (0.01 %)
Delay falling threshold		2,500 - 12,500 value/s (0.01 %)
Delay rising threshold		2,500 - 12,500 value/s (0.01 %)
Falling slope	2	[0 ... 10,000] 0.01 % of full scale
Rising slope		[0 ... 10,000] 0.01 % of full scale

Each alarm message must be confirmed by the Network Server.

3.5 Sensor failure alarm

An alarm message contains any number of alerts triggered by the sensor. The first bytes of the message are formatted as described in the following table:

Byte	Size (bytes)	Field	Note
0	1	0x04	Alarm has been triggered and/or disappeared
1	1	Configuration transaction ID	Current transaction configuration ID
2	1	Alarm type	See alarm type table
3 - 4	2	Related alarm value	-
...	...	...	...
n	1	Alarm type	See alarm type table
n+1 - n+2	2	Related alarm value	

3.5.1 Alarm types

Bit	Description	Note
7	Alarm event	0: Triggered 1: Disappeared
6 - 3	Channel	0: Pressure 1: Device temperature
2 - 0	Cause of failure (device dependent)	1: General failure

3.6 Technical alarm

Board alarms are always enable and cannot be configured by the end-user.

Byte	Field	Note
0	0x05	Alarm has been triggered or has disappeared
1	Configuration ID	Current configuration ID
2	Alarm type	See alarm type tables
3	Related alarm value in byte format	See alarm type table

3.6.1 Low temperature alarm

Low temperature alarm appears when the temperature drop below -20 °C. It disappears when the temperature rising above -17 °C. During the duration of the alarm, the transmission rate is reduced to a maximal of one measurement and one data frame per minute. Measurement rate and transmission rate are part of the configuration. For this reason, the gauge will automatically change the configuration id in the uplink frame: configuration_ID [6..0] are unchanged but configuration_ID [7] is set to 1. The previous configuration id is automatically restored (configuration_ID [7] cleared) when the alarm disappears.

Bit	Description	Values
7	Alarm event	0: Triggered 1: Disappeared
6	Generic/device dependent	1: Device dependent
5 - 0	Alarm type	Low temperature alarm type = 0

Bit	Description	Values
7 - 0	Temperature value	Temperature in °C coded on a 8 bits signed (2 sec complement)

3.7 Configuration status

The device sends this kind of message to inform about the current downlink session.

Byte	Bit	Field	Note
0	-	0x06	Configuration status
1	-	Transaction ID	Configuration ID sent for the transaction
2	7 - 4	Status	0: Packet received 1: No packet received 2: Config applied with success 3: Config rejected – At least 1 parameter is incorrect 4: Config discarded – Never received all packets 5: Config discarded – Force drop received 6: command success 7: Command failed
	3 - 0	Last packet index received	Unsigned integer from 0 to 15

Two additional bytes are added when a command (Downlink command type ≥ 0x40) i. e. not a configuration is downloaded on the device:

Byte	Bit	Field	Note
3	-	Command type	The command type used in downlink request
4	-	Command status	0x00 when the command has been successfully executed, a value different from 0x00 in case of error. Error code are defined for each command

3.7.1 Reset Battery indicator command status

Reset battery indicator command will return 0x01 if the battery capacity could not be written in EEPROM, otherwise, it will return 0x00 if succeeded.

3.8 Sensor identification message

The sensor is able to provide its identification. Generally, this message is sent after the join procedure with a confirm message.

The message is formatted as described in the following table:

Byte	Size (bytes)	Field	Note
0	1	0x07	Sensor / board identification
1	1	1	Transaction ID
2	1	Wireless module type	= 10 (PGW2x)
3 - 4	2	Wireless module firmware version	MAJOR.minor.PATCH = v[0-15].[0-15].[0-255] Hex-Coded: 0xMmPP
5 - 6	2	Wireless module hardware version	MAJOR.minor.PATCH = v[0-15].[0-15].[0-255] Hex-Coded: 0xMmPP
7 - 8	2	Sensor module firmware revision	MAJOR.minor.PATCH = v[0-15].[0-15].[0-255] Hex-Coded: 0xMmPP
9 - 10	2	Sensor module hardware revision	MAJOR.minor.PATCH = v[0-15].[0-15].[0-255] Hex-Coded: 0xMmPP
11 - 21	11	Serial number	Alphanumeric (ASCII)
22	1	Pressure type	1 = ABSOLUTE 2 = RELATIVE 3 = DIFFERENTIAL
23 - 26	4	Min range pressure	Float
27 - 30	4	Max range pressure	Float
31 - 34	4	Min range device temperature	Float
35 - 38	4	Max range device temperature	Float

14391478.03 03/2022 EN

Byte	Size (bytes)	Field	Note
39	1	Unit pressure	1 = inH_2O 2 = inHg 3 = ftH_2O 4 = mmH_2O 5 = mmHg 6 = psi 7 = bar 8 = mbar 9 = g/cm² 10 = kg/cm² 11 = Pa 12 = kPa 13 = Torr 14 = at 145 = inH_2O (60 °F) 170 = cmH_2O (4 °C) 171 = mH_2O (4 °C) 172 = cmHg 173 = lb/ft² 174 = hPa 175 = psia 176 = kg/m² 177 = ftH_2O (4 °C) 178 = ftH_2O (60 °F) 179 = mHg 180 = Mpsi 237 = MPa 238 = inH_2O (4 °C) 239 = mmH_2O (4 °C)
40	1	Unit device temperature	32 = °C 33 = °F

3.9 Keep alive

Keep alive frame is transmitted each 24 hours. This setting cannot be adjustable.

Byte	Size (bytes)	Field	Note
0	1	0x08	Keep alive
1	1	Configuration ID	Current configuration ID

Byte	Size (bytes)	Field	Note
2	1	Battery level indicator	Battery level indicator [7]: ■ 0: No new event ■ 1: New event the device has restarted since the last keep alive transmission Battery level indicator[6..0]: battery level Battery level indicator[6..0] = current estimated battery level in per cent (from 0 to 100). 0x7F is returned if an error occurred during battery capacity computing (typically an estimated load greater than the battery load)

3.10 Frame examples

3.10.1 Data frame example with no alarm present

0x01 00 23 09B9 226E

Signification	
01	Data message with no alarm on going
00	Configuration transaction ID
23	Battery voltage = 3.5 V
09B9	Pressure value = -0.11 % of full scale => -0.011 bar (for a 0 ... 10 bar gauge)
226E	Temperature value = 23.14 °C

3.10.2 Other examples of pressure values

The following table contains 4 examples of how specifically the 16-bit pressure value contained in the data frame should be decoded and translated into a measured pressure depending on the instrument nominal pressure range:

Device measurement range	16 bit pressure value	
	0x09B9 = 2,489 decimal (2,489 - 2,500) * 0.01 % = -0.11 %	**0x2DD2 = 11,730 decimal (11,730 - 2,500) * 0.01 % = 92.3 %**
0 … 10 bar device Min. pressure = 0 bar Max. pressure = 10 bar	(-0.11 % * (max - min)) - min = -0.011 bar	(92.3 % * (max - min)) - min = 9.23 bar
-100…1500 kPa device Min. pressure = -100 kPa Max. pressure = 1,500 kPa	(-0.11 % * (max - min)) - min = -101.76 kPa	(92.3 % * (max - min)) - min = 1376.8 kPa

14391478.03 03/2022 EN

3.10.3 Data frame example with alarm present

0x02 00 23 09B9 226E

Signification	
02	Data message with at least an alarm on going
00	Configuration transaction ID
23	Battery voltage = 3.5 V
09B9	Pressure value = -0.11 % of full scale => -0.011 bar (for a 0 ... 10 bar gauge)
226E	Temperature value = 23.14 °C

3.10.4 Sensor alarm frame example

0x03 00 01 19B4

Signification	
03	Sensor process alarm
00	Configuration transaction ID
01	A rising threshold alarm has been triggered
19B4	Pressure value = +40.8 % → 4.08 bar (for a 0 ... 10 bar gauge) [1)]

1) Refer to your device accuracy for proper resolution of your data

3.10.5 Board alarm frame example

0x05 00 40 EC

Signification	
05	Technical alarm has been triggered or has disappeared
00	Configuration ID
40	Device dependent alarm triggered with alarm type equal to 0 (Low temperature alarm)
EC	-20 °C

3.10.6 Data frame example with alarm present

0x02 00 23 09B9 226E

Signification	
02	Data message with at least an alarm on going
00	Configuration transaction ID
23	Battery voltage = 3.5 V
09B9	Pressure value = -0.11 % of full scale → -0.011 bar (for a 0 ... 10 bar gauge) [1]
226E	Temperature value = 23.14 °C [1]

1) Refer to your device accuracy for proper resolution of your data

3.10.7 Identification example frame

0x07 00 0A 0200 0100 0500 0100 50484F454E49585F464200 02 00000000 00002041 000020C2 00007042 07 20

Signification	
07	Frame type = device identification
00	Configuration transaction ID
0A	PGW23.100.11 module type
0200	Wireless module firmware version = 0.2.0
0100	Wireless module hardware version = 0.1.0
0500	Sensor module firmware version = 0.5.0
0100	Sensor module hardware version = 0.1.0

50484F454E49585F464200: PHOENIX_FB

Signification	
02	Pressure type = relative
00000000	Min. pressure = 0 (float)
00002041	Max. pressure = 10 (float)
000020C2	Min. device temperature = -40 (float)
00007042	Max. device temperature = +60 (float)
07	Unit pressure = bar
20	Unit device temperature = °C

14391478.03 03/2022 EN

3.10.8 Keep alive frame examples

0x08 00 3F

Signification	
08	Keep alive
00	configuration transaction ID
3F	Battery estimation at 63 %

0x08 00 82

Signification	
08	Keep alive
00	configuration transaction ID
82	Battery estimation at 2 % and the PGW23.100.11 has restarted since the last keep alive message

3.10.9 Configuration status frame examples

0x06 01 00

Signification	
06	Configuration status
01	Configuration transaction ID
00	0 = Packet received 0 = Packet index 0

0x06 01 02

Signification	
06	Configuration status
01	Configuration transaction ID
02	0 = Packet received 2 = Last packet index 2

3.10.10 Sensor failure alarm examples

0x04 00 01 19B4 09 32C8

Signification	
04	Sensor failure alarm
00	Configuration transaction ID
01	Apparition pressure general failure

EN

Signification	
19B4	Pressure value = +40.8 % of full scale [1)]
09	Apparition temperature general failure
32C8	Temperature value = 65 °C [1)]

1) Refer to your device accuracy for proper resolution of your data

0x04 00 80 19B4 88 226E

Signification	
04	Sensor failure alarm
00	Configuration transaction ID
80	Disappearance pressure general failure
19B4	Pressure value = +40.8 % [1)]
88	Disappearance temperature general failure
226E	Temperature value = 23.14 °C [1)]

1) Refer to your device accuracy for proper resolution of your data

4. Downstream format

Downstream frame must be sent as a transaction frame containing some configuration information for the device. A device must apply configuration only when it has received a complete transaction.
A transaction must be sent on air as a group of downlinks. Group size is from 1 to 16 downlinks.

4.1 Transaction header

Each downlink first bytes define a header to identify the transaction, the current downlink, and the transaction size.

Byte	Bit	Size (bytes)	Field	Note
0	-	1	Transaction ID Notice: In downstream format, configuration transaction id is equal to latest configuration transaction id received with uplink frame incremented by 1	Unsigned integer from 1 to 127
1	7 - 4	1	Downlink Index	Unsigned integer from 0 to 15
	3 - 0		Max Index of downlink in transaction	Unsigned integer from 0 to 15 = number -1

14391478.03 03/2022 EN

4. Downstream format

Byte	Bit	Size (bytes)	Field	Note
2 - ...	-	x	Payload	-

The payload is composed by any number of configuration commands.

EN

4.2 Command type supported

A command must be defined by its type according to following table.

Hexa	Command types	Size of command options
0x00	--Unused and must not be used--	-
0x01	Reset factory configuration	0
0x02	Main configuration	3
0x03	Not used	0
0x10	Disable pressure channel	0
0x11	Disable device temperature channel	0
0x20	Pressure alarm configuration	4 to 20
0x40	Reset Battery indicator	0

4.3 Command data

Command data must be parsed according to its command type.

4.3.1 Reset factory configuration

This command will force the device to return to its factory state.

Byte	Size (bytes)	Field	Note
0	1	0x01	Value: Reset Factory configuration

Factory reset configuration:

Field	Value
Measuring period	1 min
Transmission period factor without alarms	30 min
Transmission period factor with alarms	30 min
Pressure alarms	OFF

4.3.2 Main configuration

A main configuration command data section.

Byte	Size (bytes)	Field	Note
0	1	0x02	Value: Main configuration
1-2	2	Measuring time period	0: Non-authorized Unit: 10 secs 1 →10 sec / 60 → 10 min / 360 → 1h / …. up to 7.5 days
3-4	2	Transmission time period factor when all alarms are OFF	0: Non-authorized 1 ... 65,535 value as multiple of measuring period
5-6	2	Transmission time period factor if at least one alarm is ON	0: Non-authorized 1 ... 65,535 value as multiple of measuring period

4.3.3 Drop on Air Configuration

This command forces the device to discard all previous packet received and return to normal mode.

Byte	Size (bytes)	Field	Note
0	1	0x03	Drop current config

4.3.4 Disable channels

This command will disable the channel (measure and alarm).

Byte	Size (bytes)	Field	Note
0	1	0x10: Disable pressure 0x11: Disable device temperature	Channel disable = telemetry and alarms.

Note: To enable a channel, send active channel configuration with or without alarms.

4.3.5 Active channels configuration

Pressure and device temperature configuration commands have the same format.

Byte	Bit	Size (bytes)	Field	Note
0	-	1	0x20: Pressure configuration	Channel alarm configuration
1 - 2	-	2	Dead band	Defined in the same unit as the channel

Byte	Bit	Size (bytes)	Field	Note
3	7	-	Alarm 1: Falling threshold	For each alarm, bit value is Enabled (1) or disabled (0)
	6	-	Alarm 2: Rising threshold	
	5	-	Alarm 3: Falling slope alarm	
	4	-	Alarm 4: Rising slope alarm	
	3	-	Alarm 5: Falling threshold with delay	
	2	-	Alarm 6: Rising threshold with a delay	
	1 - 0	-	--Unused and must not be used--	
[4 – 20] Optional	-	2	Threshold value	Must be set if Alarm 1, 2, 5 or 6 is enabled, Ref: 0
	-	2	Slope value	Must be set if Alarm 3, 4 is enabled, Ref: 0
	-	2	Period value	Must be set if Alarm 5, 6 is enabled, 1 ... 65,535 value in 10 s unit. 0: The alarm will act as a standard threshold

4.3.6 Threshold values

Pressure threshold values are set in 0.01 % of full range (2,500 - 12,500).

4.3.7 Dead band values

Dead band values are set in 0.01 % of full range (0 ... 10,000).

4.3.8 Slopes values

Slope value is always positive but is interpreted differently for rising and falling slope. For a rising slope, the alarm will be triggered if the value rises quicker than the value. For a falling slope, the alarm will be triggered if the value falls quicker than the value.
Slope value is set in 0.01 % of full range / minute (0 ... 10,000).

EN

4.4 Frame examples

4.4.1 Main configuration

0x01 00 02 0004 0003 0003

Signification	
01	Transaction ID configuration
00	Packet 0 / 1 packet
02	Main configuration
0004	Measuring period = 4 * 10 sec
0003	Transmission ratio without alarm → period 120 sec
0003	Transmission ratio with alarm → period 120 sec

4.4.2 Reset config

0x01 00 01

Reset config	
01	Transaction ID configuration
00	Packet 0 / 1 packet
01	Reset configuration

4.4.3 Disable pressure and device temperature

0x02 00 10 11

Disable pressure and device temperature	
02	Transaction ID configuration
00	Packet 0 / 1 packet
10	Disable pressure
11	Disable device temperature

4.4.4 Configure falling treshold alarm

0x04 00 20 0064 80 1388

Signification	
04	Transaction ID configuration
00	Packet 0 / 1 packet
20	Configure pressure channel

14391478.03 03/2022 EN

Signification	
0064	Dead band = 100
80	Falling treshold alarm
1388	Threshold = 2,500

4.4.5 Configure delayed pressure alarms

0x07 00 20 0064 0C 11C4 0006 19C4 0006

Signification	
07	Transaction ID configuration
00	Packet 0 / 1 packet
20	Configure pressure channel
0064	Dead band = 100 (1.00 % of full scale)
0C	Falling threshold with delay, rising threshold with delay
11C4	Falling treshold with delay = 2,048 (20.48 % of full scale)
0006	Delay for falling treshold alarm = 6 x 10 sec = 1 min
19C4	Rising treshold with delay = 4,096 (40.96 % of full scale)
0006	Delay for rising treshold alarm = 6 x 10 sec = 1 min

4.4.6 Configure all pressure alarms

0x06 00 20 0064 FC 11C4 19C4 0001 0002 1194 0004 1964 0006

Signification	
06	Transaction ID configuration
00	Packet 0 / 1 packet
20	Configure pressure channel
0064	Dead band = 100 (1.00 % of full scale)
FC	Rising and falling threshold alarms, rising and falling slope alarms, rising and falling threshold alarms with delay
11C4	Falling threshold = 2,048 (20.48 % of full scale)
19C4	Rising threshold = 4,096 (40.96 % of full scale)
0001	Slope- = 1 (-0.01 %/min)
0002	Slope+ = 2 (0.02 %/min)
1194	Falling threshold with delay = 2,000 (20 % of full scale)
0004	Delay for falling threshold alarm = 4 * 10 sec = 40 sec
1964	Rising threshold with delay = 4,000 (40 % of full scale)
0006	Delay for rising threshold alarm = 6 * 10 sec = 1 min

14391478.03 03/2022 EN

WIKA subsidiaries worldwide can be found online at www.wika.com.

WIKA Alexander Wiegand SE & Co. KG
Alexander-Wiegand-Strasse 30
63911 Klingenberg • Germany
Tel. +49 9372 132-0
Fax +49 9372 132-406
info@wika.de
www.wika.de

14391478.03 03/2022 EN