Nordic Automation Systems

LoRaWAN™ IP68 PULSE READER UM3023

LoRaWAN™ IP68 pulse reader enables acquisition of data from the pulse emitting devices and transmit it wirelessly to the LoRaWAN™ network.

LoRaWAN™ IP68 pulse reader is meant to be connected to the existing devices' pulse or analog signal output. It is powered by a long-life battery.

FW < 0.5.0

OVERVIEW

Efficient

LoRaWAN™ IP68 Pulse Reader has a bidirectional, battery powered, long-range transceiver with low power consumption.

Intelligent

Real-time usage data is gathered wirelessly and processed automatically. Data is accessible from your LoRaWAN™ provider.

APPLICATIONS

Pulse metering

Frequent reporting provides a detailed usage overview. Can be used with any pulse emitting device (water, electricity, gas meter, etc.).

Analog measurement

Possible to read both 0..10V & 4mA..20mA devices

Usage detection

LoRaWAN™ Outdoor Pulse Reader can be configured to trigger mode to send alerts when usage is detected.

FEATURES

- Long range wireless data transmission
- Pulse counting
- 4..20mA interface
- 0..10V interface
- Pre-installed long-life battery
- Built-in antenna
- DIN Connector
- Trigger mode
- Configurable reporting interval
- Maintenance free - install & forget
- Easy installation
- Average life 8 years*
- Secure communication

* Lifetime depends from the device location and reporting interval.

SPECIFICATIONS

Length:	109 mm
Height:	27 mm
Width:	27 mm
Weight:	72 g
Cable length:	1 m
Operating temperature:	-20°C ... +65°C
Communication range:	up to 15 km*
Tx power:	up to +20 dBm
Rx Sensitivity:	-142 dBm
MAC Layer:	LoRaWAN™
Physical Layer:	LoRa®
Connector:	M8
Body material:	PA6
IP Rating:	IP68
Communication:	LoRaWAN™

* Communication range is dependent on the location of the sensor and nearest base station.

INPUT SPECIFICATIONS

Digital	Max Frequency:	10 kH
	(Dry contact) Operating voltage:	3 V
	(Active contact) Max voltage:	6 V
Analog	(4mA..20mA) Max input current:	40mA
	(0V..10V) Max input voltage:	20V

COMMUNICATION

Bit order:	LSB
Usage reporting:	Unconfirmed messages
Status reporting:	Confirmed messages

PORT LIST

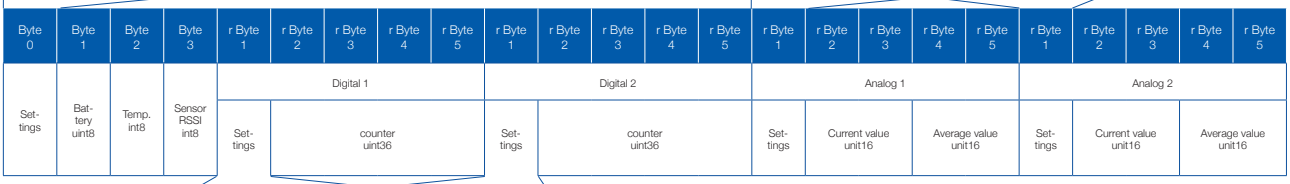
fPort	Usage	Format	Uplink	Unit	Comment
24	Status		yes	-	Defined below
25	Usage		yes	-	Defined below
50	Configuration		no	-	Defined below
99	Boot/Debug		yes	-	Defined below

For FW version < 0.5.0

fPort 24 Status Message

Bit #	Parameter	Value
0	Digital 1	0 - disabled 1 - enabled
1	Digital 2	
2	Analog 1	
3	Analog 2	
4	SSI	
5	MBUS	
6	User triggered	0 - no 1 - yes
7	RFU	

Bit #	Parameter	Value
0	Current	0 - 0..10V 1 - 4..20mA
1	RFU	
2	RFU	
3	RFU	
4	RFU	
5	RFU	
6	RFU	
7	RFU	



Bit #	Medium	Value
0	Input value during reporting	0 - low 1 - high
1	Trigger Mode	0 - dosabled 1 - enabled
2	Trigger alert	0 - false 1 - true
3	RFU	
4	Medium Type	
5		
6		
7		

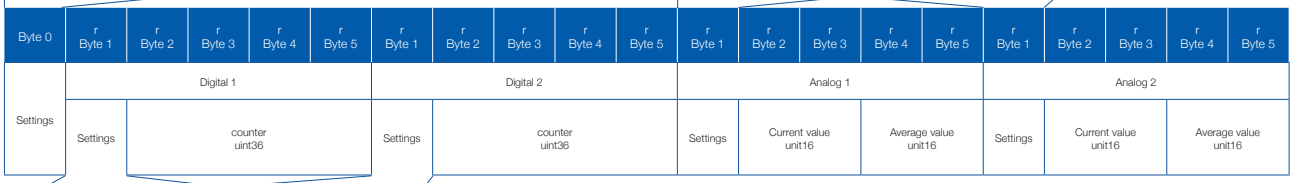
HEX value	Reporting medium
00	Pulses
01	Water in L
02	Electricity in Wh
03	Gas in L
04	Heat in Wh
..	RFU
1F	RFU

* Values only for enabled interfaces are reported. r Byte is the relative byte for the reported interface

fPort 25 Usage Message

Bit #	Parameter	Value
0	Digital 1	0 - disabled 1 - enabled
1	Digital 2	
2	Analog 1	
3	Analog 2	
4	SSI	
5	MBUS	
6	User triggered	0 - no 1 - yes
7	RFU	

Bit #	Parameter	Value
0	Current	0 - 0..10V 1 - 4..20mA
1	RFU	
2	RFU	
3	RFU	
4	RFU	
5	RFU	
6	RFU	
7	RFU	



Bit #	Medium	Value
0	Input value during reporting	0 - low 1 - high
1	Trigger Mode	0 - dosabled 1 - enabled
2	Trigger alert	0 - false 1 - true
3	RFU	
4	Medium Type	
5		
6		
7		

HEX value	Reporting medium
00	Pulses
01	Water in L
02	Electricity in Wh
03	Gas in L
04	Heat in Wh
..	RFU
1F	RFU

* Reporting in mV
** Reporting in mA

* Values only for enabled interfaces are reported. r Byte is the relative byte for the reported interface

fPort 50 Configuration Message

Byte0	Byte ...	Byte n
Header	Payload	

Different headers with their respective payloads are described below

Reporting

Byte 0	Byte 1	Byte 2	Byte 3	Byte 6	Byte 7
Header	Configuration	Usage interval (minutes)		Status interval (minutes)	
00		uint16 default - 60		uint16 default - 1440	

Bit #	Function	Value
0	Usage interval	0 - not sent 1- sent
1	Status interval	
2	RFU	
3	RFU	
4	RFU	
5	RFU	
6	RFU	
7	RFU	

* Trigger mode will enable status reporting on digital interface value change. DO NOT USE with normal pulse reading.

Digital interface configuration

Bit		Function	Value			
0		Enable	0 - disabled 1 - enabled			
1		Trigger Mode				
2	Trigger mode = 0	Send usage when no pulses	0 - no 1 - yes	Trigger mode = 1	Trigger length	00 - 1 sec 01 - 10 sec 02 - 1 min 03 - 1h
3		RFU				
4		RFU				
5		RFU				
6		RFU				
7		RFU				

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9	Byte 10	Byte 11
Header	Settings	Mode	Unit	Multiplier				True reading**			
01				float IEEE 754 Pulses in 1 unit. Default = 1				uint32			

Bit	Function	Value
0	Interface	00 - RFU 01 - Dig 1 02 - Dig 2 03 - Dig1 & Dig 2
1		
2	Mode	0 - not sent 1 - configured
3	Multiplier, Unit, True reading	
4	True reading	
5	RFU	
6	RFU	
7	RFU	

HEX value	Function
00	Pulses
01	Water in L
02	Electricity in Wh
03	Gas in L
04	Heat in Wh
..	RFU
0F	Other
20..FF	n/a

* When configuring 2 interfaces at once all the configuration part must be doubled and the interface setting must be the same for both sets. Eg: Header, Settings, Mode, Unit, Multiplier,True reading (for interface 1), Settings, Mode, Unit, Multiplier,True reading (for interface 2).

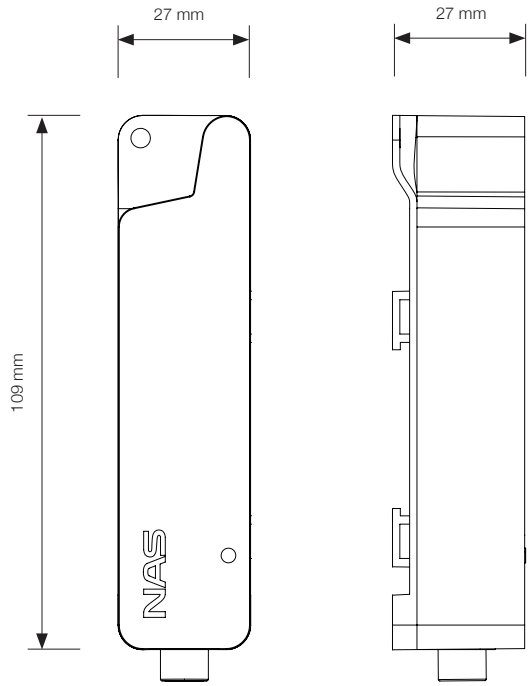
** True reading is the actual value on the meter being read.

fPort 99 Boot Message

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8
Header (HEX)	Payload							
0x00 Boot	Serial (HEX)				Firmware (HEX)			Reset reason (HEX)
0x01 Shutdown								
0x10 Error code	Error code (uint)							

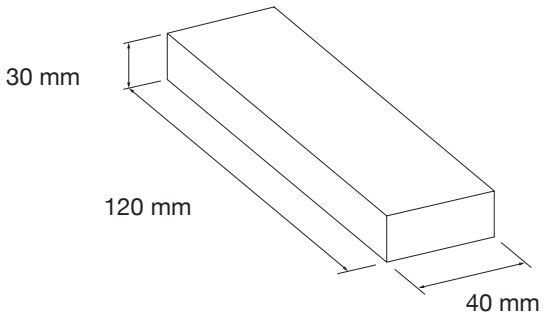
DIMENSIONS / PACKAGING

Dimensions

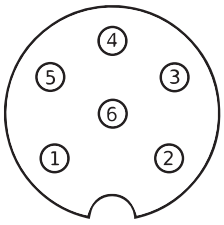


Packaging

1 pcs box



WIRING GUIDE



M8 Sensor side

Pin	Wire color	Function
1	White	Digital 1
2	Brown	Analog 1
3	Grey	Analog 2
4	Black	Common ground
5	Blue	Digital 2
6	Pink	n/a

ORDERING INFORMATION

Article / SKU	Package qty	Region	Frequency
UM3023A#0001EC	1	EU	868 MHz
UM3023B#0001AU	1	AU	922 MHz
UM3023C#0001US	1	US	915 MHz
UM3023D#0001AS	1	AS	923 MHz
UM3023E#0001CN	1	CN	780 MHz
UM3023F#0001KR	1	KR	922 MHz
UM3023G#0001EU	1	EU	433 MHz
UM3023H#0001CN	1	CN	470 MHz
UM3023I#0001IN	1	IN	866 MHz

CONTACT INFORMATION

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REVISION HISTORY

1.0 - First version

1.1 - Added communication protocol.

1.2 - Protocol improvement fw<0.5.0