ROCKSENSOR™

# Ultrasonic Open Channel Flow Meter

## RTCM


- Accuracy 1mm
- Housing Material ABS
- Ambient Temperature -40℃~70℃
- Protection Class IP67/ IP68

**Product Datasheet**

# ROCKSENSOR AT A GLANCE (ABOUT US)

Rocksensor is one of the global leaders specializing in Process Instrumentation, Research and Development and Designing of Industrial Automation Equipment. We provide highly precise pressure sensors and transmitters, flow metres, level transmitters and temperature transmitters with a prime focus to help our clients efficiently, safely and economically run complex industrial processes.

Rocksensor, headquartered in Switzerland, has its footprint in various geographical regions such as the US, Russia, South Korea, Italy, Germany, Singapore, Malaysia, Morocco, China, Taiwan, Australia, UAE, Brazil and India. Our clients come from some of the major industries such as Oil and Gas, Petrochemicals, Pharmaceuticals, FMCG, Automobiles, Water, Cement, Metal & Mining, and mainly from the Power Industry like Nuclear, Thermal, Hydro, and Solar.

Rocksensor deals in a wide range of highly accurate industrial automation instruments ensuring that even the complex industrial processes happen efficiently.

To fulfill the needs of our clients we make sure that our instruments work in even the harsh environmental conditions offering accurate recordings and communication.

We, at Rocksensor, believe in creating bonds that last a lifetime and create a success story for each and every client. Rocksensor aims to achieve a perfect fit in the global market landscape and establish our footprints across the globe.

CE

International Organization for Standardization ISO 9001

Ex ATEX

Safety Integrity Level SIL

IECEx

HART COMMUNICATION PROTOCOL

FIELDCOMM GROUP MEMBER

RoHS

RKS ROCKSENSOR

# CONTENTS

# 1. Overview

This RTCM Ultrasonic open channel flow meter is a professional economic and practical instrument during agriculture, industry research and development. It is a non-contact measurement and can be applied in even harsh environments. It measures level, flow rate and total volume of water flowing through weirs and flumes. It consists of two parts, the ultrasonic level sensor and wall mounted flow monitor/controller. The ultrasonic level sensor uses the sound wave reflection principle to detect the liquid level in the weir, and then the microprocessor calculates the corresponding f low value automatically using the related formula and characteristics of the channel. It is well suited for applications such as groundwater system flow monitoring, industrial sewage discharge monitoring, flow into water treatment plants, effluent from water resource recovery, and agriculture irrigation channels.


# 2. Advantage

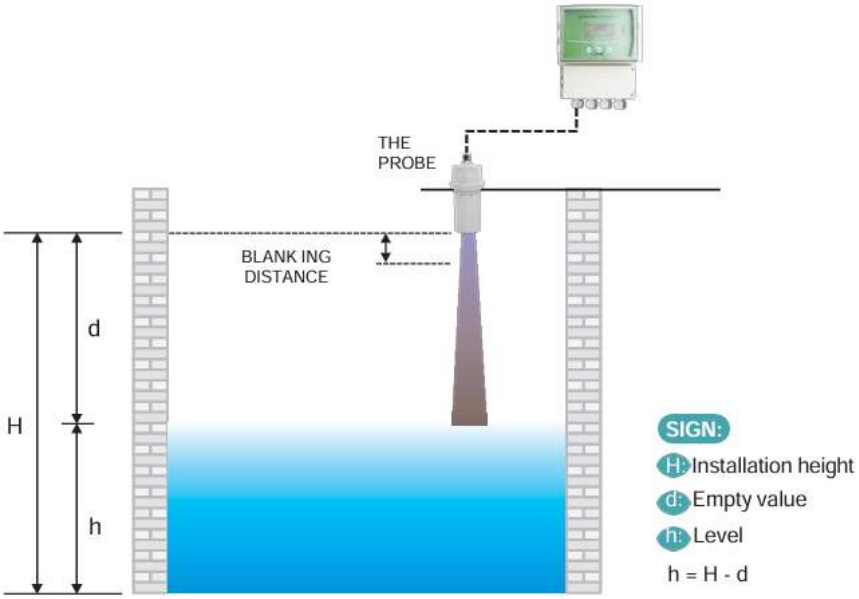
- Non-contact measurement, long service life and simple maintenance.
- High level detection accuracy. The accuracy of change in level is 1mm. For every 1mm change in the liquid level, the open channel flow rate changes accordingly. So the flow measurement is more accurate.
- Adapt to a variety of weirs/flumes and simple setup for Parshall flumes, triangular weirs (30* /45*/60* /90°/120* ) and rectangular weirs etc.
- Large screen with backlight LCD display. Displays flow rate in L/S or M3/h
- Simple programming and easy operation. A hand operator is available for easy operation. (If you need)
- Excellent anti-interference capability, low blind area and high sensitivity; The cable length between sensor and transmitter up to 1000m.
- Rugged IP67 powder coated aluminum enclosure, Sensor protection class IP68.
- Chemically resistant probe materials for maximum application flexibility
- Provided programmable 6 relays at most for alarms
- Provided 4-20mA output and RS485 serial communication (Modbus RTU).
- Customize solar power supply. Available at remote and non-powered site applications. Low power consumption, customer can choose optional 12V operating voltage Transmitter, power consumption only 2 watts.

## 3. Application

This PLCM ultrasonic open channel flow meter with a primary device (such as a flume or weir) are a cost effective solution for managing varying flow rates in unpressurized systems. Typical applications are as below:


## 4. Measuring Principle

- Using ultrasonic level technology, Open channel flow meters include a non-contacting sensor mounted above the flume or weir. By measuring the time from transmission of an ultrasonic pulse to receipt of an echo, the water level or "Head" is accurately measured.
- As the electronic flow transmitter knows the installation height H from parameters setting, it can calculate the level as follows: h = H – d.
- Since the speed of sound through air is affected by changes in temperature, the PLCM O.C.M. has integrated a temperature senor to improve accuracy.
- For determined flumes, there is a fixed functional relationship between the instantaneous flow and liquid level. The formula is Q=h (x). Q means instantaneous flow, h means liquid level in flumes. So the electronic flow transmitter can calculate the flow rate through determined flumes and the level value.




Blind Zone: The ultrasonic sensor cannot detect echoes at the same time when transmitting ultrasonic waves. When the probe is very close to the liquid surface, the emitted wave and the echo will overlap and cannot be distinguished. Within this area there is no explicit/ reliable measurement possible. This is blind zone (Blanking distance). During installation, the probe should be a certain distance higher than the maximum liquid level to prevent the liquid level from entering the blind zone.

## 5. Technical Specifications

| Parameters | Details |
|---|---|
| **Type** | RTCM |
| **Power Supply** | DC24V (±5%) 0.2A; AC220V (±20%) 0.1A; Optional DC 12V |
| **Display** | 2 lines 14 digit backlight LCD |
| **Flow Rate Range** | 0.0000~99999L/S or m3/h |
| **The Maximum of Accumulative Flow** | 9999999.9 m3 |
| **Accuracy of Change in Level** | 1 mm or 0.2% of full span (Which is greater) |
| **Resolution** | 1mm |
| **Analogue output** | One 4-20mA, corresponding to instant flow. |
| **Output Load Resistance** | 0~500Ω |
| **Relay Output** | Standard 2 relay outputs (optional up to 6 relays);<br>Upper/lower limit alarm and failure alarm corresponding to instantaneous flow or level. |
| **Serial Communication** | RS485, Modbus RTU standard protocol |
| **Ambient Temperature** | -40℃~70℃ |
| **Temperature Compensation** | Integral in probe |
| **Measure Cycle** | 1 second (Selectable 2 seconds) |
| **Parameter Setting** | 3 induction buttons / remote control |
| **Cable Gland** | PG9 /PG11/ PG13.5 |
| **Housing Material** | ABS |
| **Protection Class** | IP67 |
| **Fix** | Wall mounted |
| **Dimensions** | 248H*184W*122D(mm) |

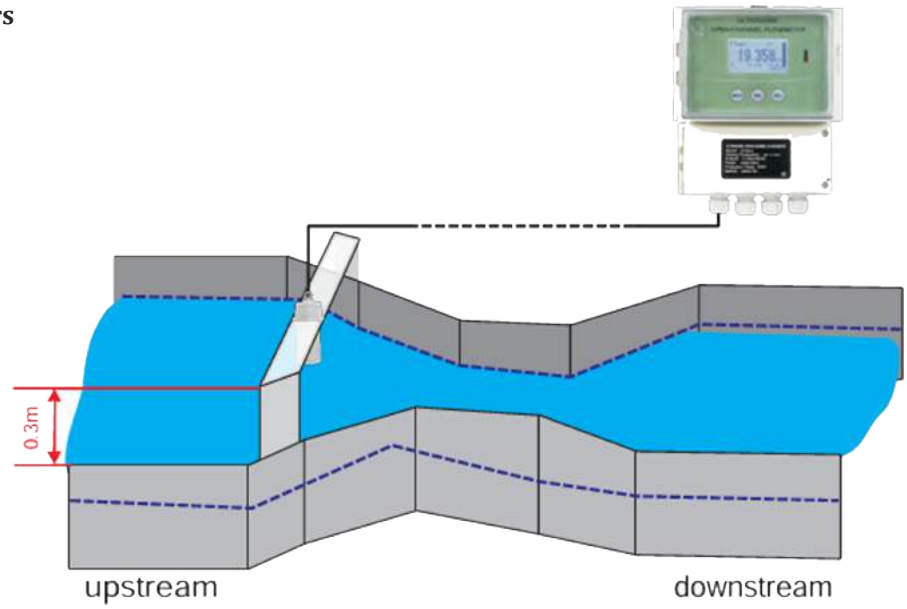
## 6. Sensors Specifications

| Parameters | Details |
|---|---|
| **Type** | LB-4 (probe) |
| **Range** | 0.00-4.00m (other range is also available) |
| **Blind Zone** | 0.20m |
| **Ambient Temperature** | -40℃~70℃ |
| **Temperature Compensation** | Integral in probe |
| **Pressure Rating** | 0.2 MPa |
| **Beam Angle** | 8° (3db) |
| **Cable Length** | 10m standard (can be extended to 1000m) |
| **Material** | ABS, PVC or PTFE (optional) |
| **Protect Class** | IP68 |
| **Connection** | Screw (G2) or flange (DN65/DN80/etc.) |

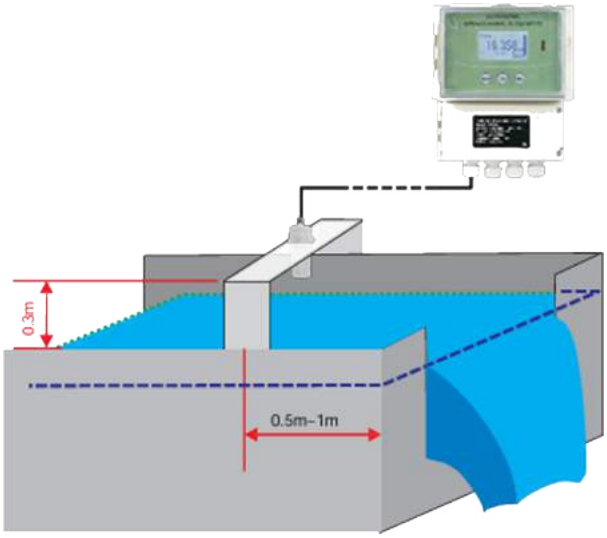
## 7. Operation

The open channel flowmeter is used together with various types of weirs/flumes to measure or monitor the total amount of water. The RTCM meter includes a selection of primary devices with preprogrammed tables to simplify the setup, including:

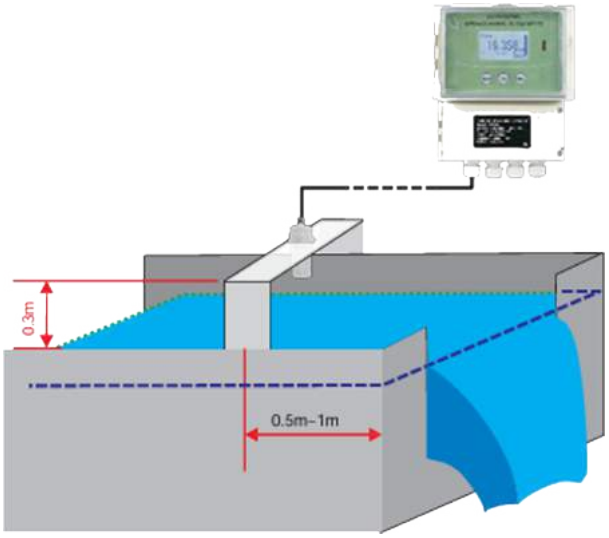
- **Parshall flumes**
- **Rectangular Weirs**
- **V-notch Weirs**




● **Parshall flumes**




● Rectangular Weirs



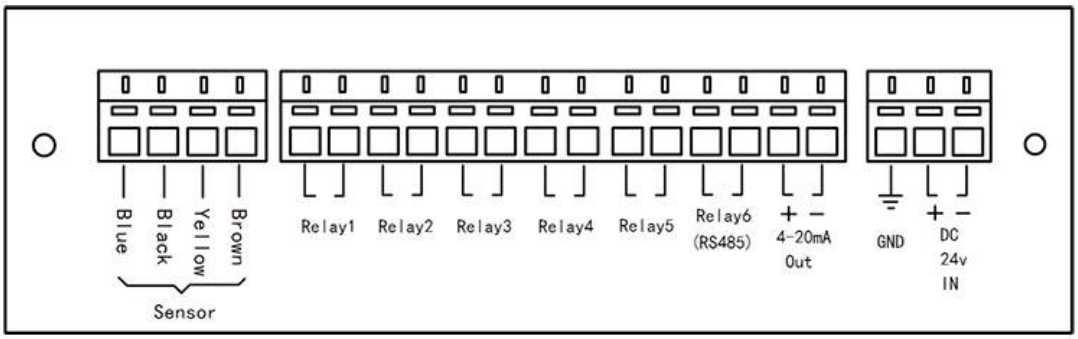

● V-notch Weirs

## 8. Display Module

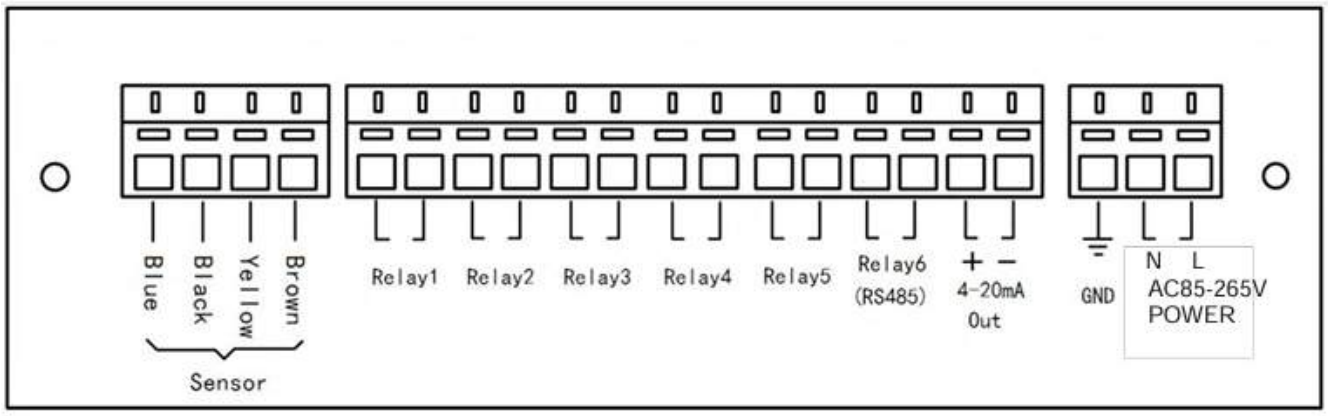

## 9. Wiring

Depending on the power supply and signal output function, the wiring diagram of the instrument is different. When the MODBUS communication function is provide, the terminal Relay 6 is used for RS485 output.

● DC24V Power Supply



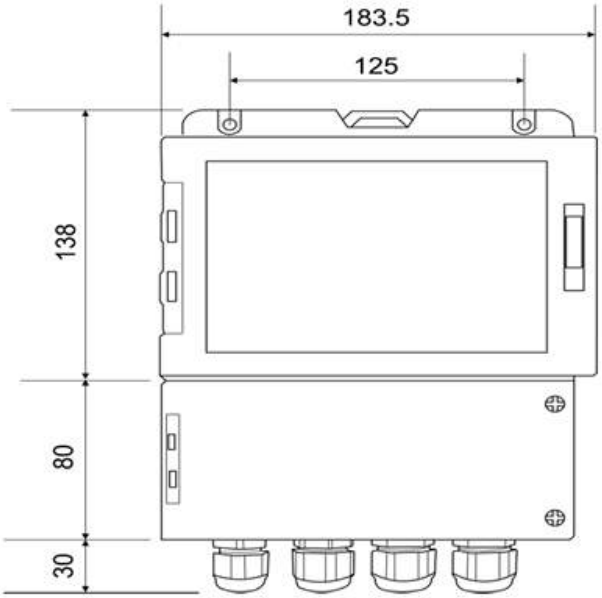
● DC24V Power Supply

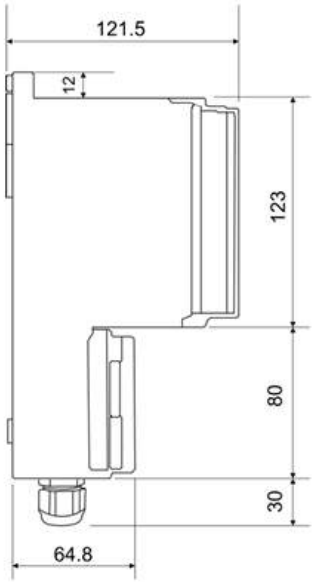


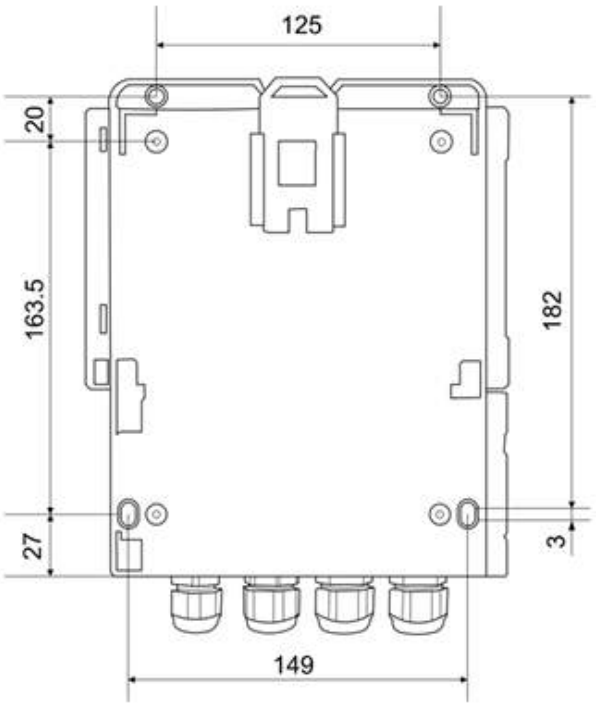

## 10. Cable

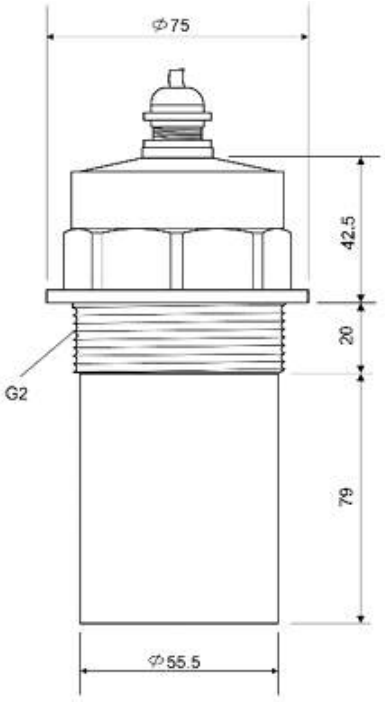
The cable between sensor and transmitter is 10m standard. Users can extend the cable if needed, the cable length can be up to 1000 meters. The lead cable of the ultrasonic probe is a 4-core shielded cable.

## 11. Mounting Dimensions



## 12. Model Selection Table

| RTCM | Ultrasonic Open Channel Flow Meter | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Code | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |

| Measure range | |
|---|---|
| RTCM (standard 4 m level range) | 4 |

| Power Supply | | |
|---|---|---|
| DC 24V | 0.2A | D |
| DC 12V | 0.2A | D(2) |
| AC 85~265V | 0.1A | A |

| Sensor Material/Process Temperature /Protection Class | |
|---|---|
| ABS/(-40-75)℃/IP68 | A |
| PVC/(-40-75)℃/IP68 | B |
| PTFE/(-40-75)℃/IP68 | C |

| Process Connection/Material | |
|---|---|
| Thread | G |
| Flange /PP | D |

| Electronic Unit | |
|---|---|
| Output 4~20mA ; Four Wire | C0 |
| Output 4~20mA and RS485 (Modbus RTU); Four Wire | C1 |

| Cable Length | |
|---|---|
| L10 | 10 m (standard) |
| LX | X cable length (Up to 1000m) |

| Cable Entry | |
|---|---|
| M | M20*1.5 |
| N | 1/2"NPT |

| Housing Material / Protection Class | |
|---|---|
| L | Aluminum / IP67 |

| Relay Output | |
|---|---|
| R2 | Standard Two Relay |
| Rx | Max 6 relay (if with RS485, max 5 relay) |

**Example:** RTCM-4DAGC0R2LML10

RTCM - Ultrasonic Open Channel Flow Meter

4 - Measure Range: RTCM (standard 4 m level range)

D - Power Supply: DC 24V; 0.2A

A - Sensor Material/Process Temperature /Protection Class: ABS/(-40-75)℃/IP68

G - Process Connection/ Material: Thread

C0 - Electronic Unit: Output 4~20mA ; Four Wire

R2 - Relay Output: Standard Two Relay

L - Housing Material/ Protection Class: Aluminum / IP67

M - Cable Entry: M20*1.5

L10 - Cable Length: 10 m (standard)

*For any customisation, contact our sales team

ROCKSENSOR™
*Sensing Beyond the Vision*

# Field Instrumentation Range

## Pressure Measurement

- Smart Differential Pressure Transmitter
- Smart Gauge Pressure Transmitter
- Smart Absolute PressureTransmitter
- Miniature Pressure Transducer without display
- Sanitary Gauge/ Absolute Pressure Transmitter
- Submersible Pressure Transmitter
- Remote Seal Differential P.T. with capillary
- Remote Seal Differential P.T. Direct Mount
- Remote Seal Gauge/Absolute P.T. with capillary
- Remote Seal Gauge/Absolute P.T. Direct Mount

## Flow Measurement

- Coriolis Mass Flowmeter
- Thermal Gas Mass Flowmeter
- Positive Displacement Flowmeter
- Electromagnetic Flowmeter
- Vortex Flowmeter
- Turbine Flowmeter
- Variable Area Flowmeter
- Clamp On Ultrasonic Flowmeter
- Inline Ultrasonic Flowmeter
- Portable Ultrasonic Flowmeter

## Level Measurement

- RADAR Level Transmitter Horn Antenna
- Compact RADAR Level Transmitter
- RADAR Level Transmitter Sanitary
- RADAR Level Transmitter
- Guided Wave RADAR Level Transmitter
- RADAR Level Transmitter Lens Antenna
- RADAR Level Transmitter Rod Antenna
- Ultrasonic Level Transmitter
- Microwave Barrier Level Switch
- Admittance Level Switch Series
- Vibrating Rod Level Switch Series
- Tuning Fork Level Switch Series

## Temperature Measurement

- Head Mount Temperature Transmitter
- Temperature Transmitter for Sanitary Applications
- DIN Rail Temperature Transmitter
- Field Mount Temperature Transmitter


## Rocksensor India Pvt. Ltd.

: B -36, Sector 67, Noida, Uttar Pradesh - 201301

## For more details, contact us on:

+91 928 948 8117 | +91 1204121469 : info@rocksensor.in : www.rocksensor.in


## Global Offices

**Global HQ & R&D Centre:**
**Rocksensor Sàrl, Switzerland**

**North America:**
**Rocksensor Automation LLC, USA**

**APAC:**
**Rocksensor Automation Co. Ltd., Shanghai**

## For more updates, follow us on:

: Rocksensor India : Rocksensor : Rocksensor : Rocksensor : Rocksensor India

©Rocksensor2024

UOCFM/RTCM/13/0424.v0

Disclaimer: Specifications & features are subject to continual improvement as an Organization Policy. Rocksensor reserves the right to make changes to the datasheet and its functions at any time without notice.