SenseCAP Sensor Probes

Product Catalogue

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About SenseCAP

Among the first launch of Seeed IIoT product series, SenseCAP is focusing on wireless environmental sensing applications: smart agriculture, precision farming, and smart city, to name a few. It consists of hardware products (sensors, data-loggers & gateways, etc.), software services (SenseCAP Mate App, SenseCAP Web Portal, open dashboard), and API for device & data management.

About Sensor Probes

Our range of SenseCAP industrial sensor probes are designed to withstand harsh environments such as vibration and exposure to chemicals and gases, which is common in industrial applications, and our industrial range of sensors is equipped with serious IP ratings from IP66 to IP68 to ensure the products perform soundly in respective harsh environments.

SenseCAP Sensor Probes also feature process connections to ensure a secure fit in the medium being measured, along with sensor data transmitters which convert the signal to suit industrial instrumentation systems.

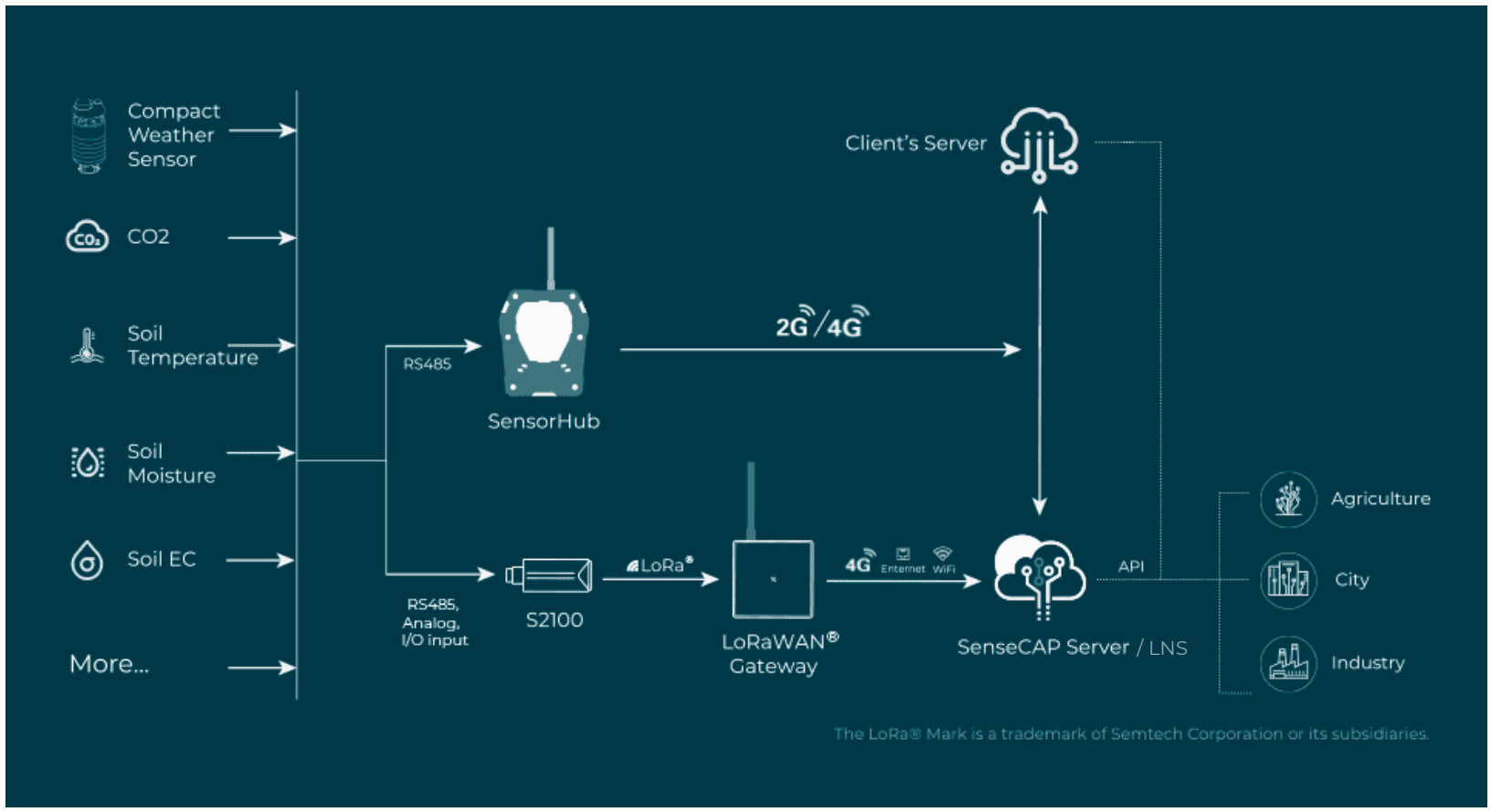
Some of the MODBUS RS485 Industrial Sensors come in two versions. The main difference is the cable connector. Please choose the version that best suits your needs:

(1) The one with hook-up wires is suggested to use with **SenseCAP LoRaWAN® Data Logger** to connect with the LoRaWAN® network, enjoying the benefits of low-power and long-range communication.

(2) The one with aviation connector already preconfigured **SenseCAP Sensor Hub 4G Data Logger** with plug-and-play experience to collect various sensor data via 3G/4G LTE.

Applications

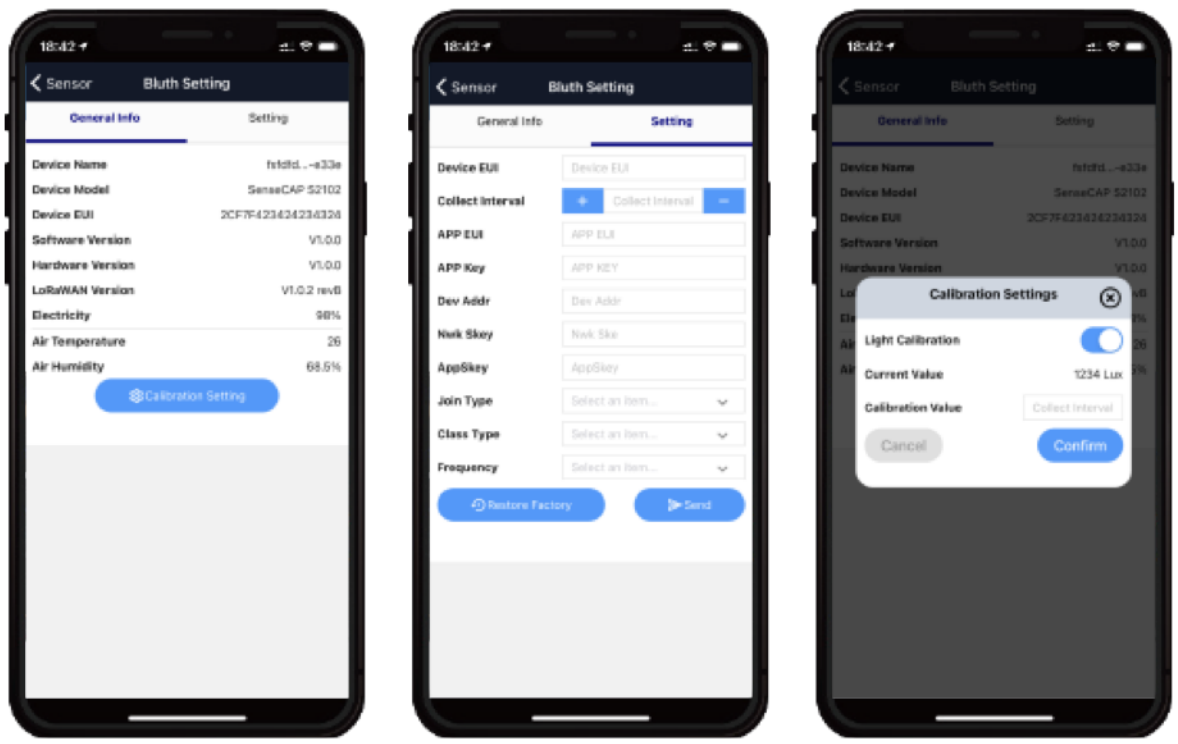
Architecture



Get Data on SenseCAP Platforms

SenseCAP Mate App

SenseCAP Mate is a standalone Bluetooth configuration tool, which can modify sensor parameters like EUI, key, frequency plan, etc.



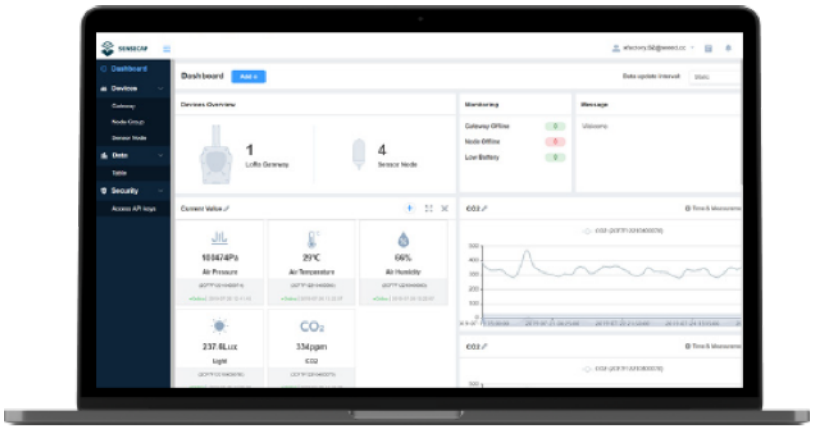
SenseCAP Portal

SenseCAP Portal is a web-based platform which enables

- Device management
- Data management
- API Access Key management

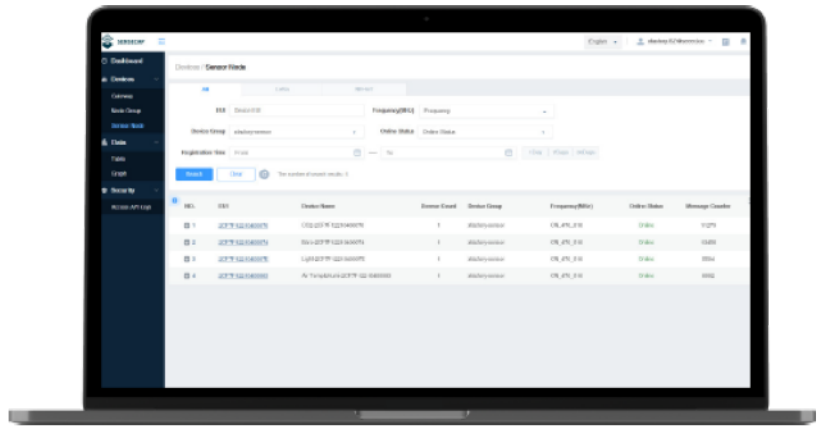
Visit SenseCAP Portal:
https://sensecap.seeed.cc

For more info, please visit:
https://solution.seeedstudio.com



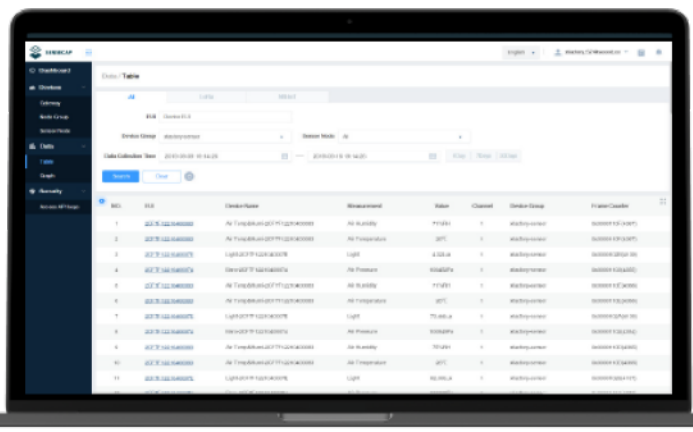
Dashboard

Including Device Overview, Data Upload Interval, Announcement, Scene Data, and Data Chart, etc.



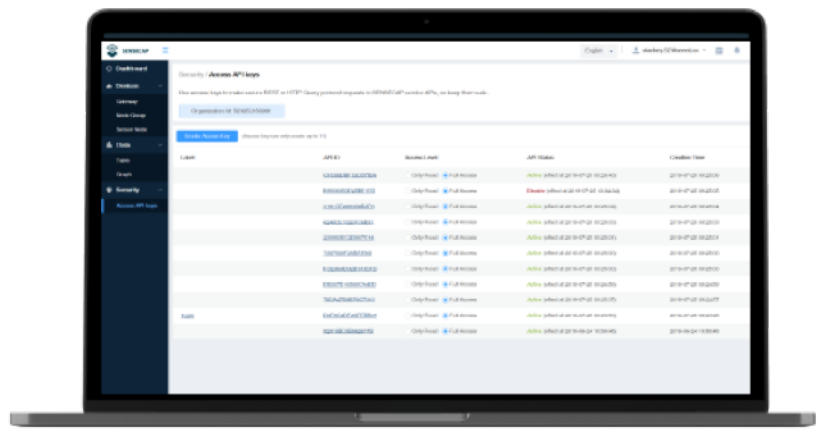
Device Management

Manage SenseCAP devices



Data Management

Manage data, including Data Table and Graph section, providing methods to search for data.



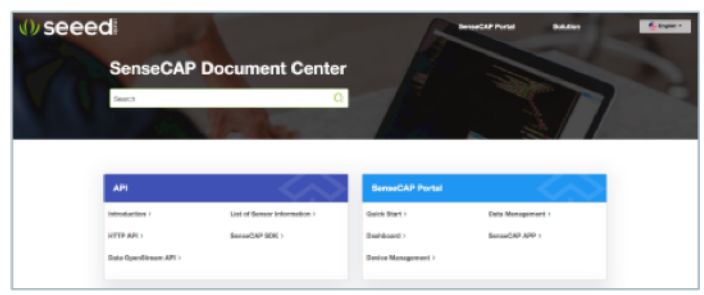
Access Key Management

Manage Access Key (to access API service), including: Key Create, Key Update, and Key Check.

Application Programming Interface (API)

SenseCAP also provides API to support further development.

Please visit this link for more info:
https://sensecap-docs.seeed.cc



Industrial-Grade MODBUS RS485 NH3 Sensor - with Waterproof Aviation Connector

SKU [101990862]

The Basic Parameters	
Product model	S-NH3-01
Supply Voltage	5 ~ 24V DC (recommended 5V power supply).
Supported Protocol	MODBUS-RTU RS485
IP Rating	IP65 (The equipment should be protected from direct sunlight and rain over long periods of time).
Operating Temperature	-40°C to 50°C (best operating temperature 20 to 35 °C).
Operating Humidity	15 to 95% RH (non-condensation) (best operating humidity 50%RH).
Ambient Pressure	Atmospheric pressure ±10%.
Cable Length	2 meters

Measurement Parameters			
	Measurement Range	Measurement Accuracy	Resolution
Ammonia (NH3)	0~100 ppm	typ. ±5%F.S, max ±10%F.S	0.1 ppm
Temperature	-40~50 °C	± 0.5 °C	0.1 °C
Humidity	10~95 %RH	± 5%	0.1 %RH

Power	
Operating Current	6mA（Max，5V DC）；3.2mA（typ.12V DC）

Performance Reference					
	Parameter	Min	Typical value	Max	Unit
RS-485 mode	Warm-up Time [1]	—	5 [2]	—	minutes
	Poll Rate [3]	—	1	—	seconds
	Response time [4]	—	30	—	seconds

[1] The time from when the sensor is powered on to when the data is read. Note the parameter when the sensor is powered on.
[2] If started in an environment with clean air it requires less time
[3] The measurement data update interval, after the power-up warm-up time, if the power supply continues, the sensor periodically updates the reading at this interval.
[4] T90＜30s

Industrial-grade MODBUS RS485 H2S Sensor - with Waterproof Aviation Connector

SKU 101990863

The Basic Parameters					
Product model	S-H2S-01				
Supply Voltage	3.3 ~ 5.5V DC (recommended 5V power supply).				
Supported Protocol	MODBUS-RTU RS485				
IP Rating	IP65 (The equipment should be protected from direct sunlight and rain over long periods of time).				
Operating Temperature	-40°C to 55°C (best operating temperature 20 to 35 °C).				
Operating Humidity	15 to 95% RH (non-condensation) (best operating humidity 50%RH).				
Ambient Pressure	Atmospheric pressure ±10%.				
Cable Length	2 meters				
Measurement Parameters					
	Measurement Range		Measurement Accuracy		Resolution
Hydrogen Sulfide (H2S)	0~100 ppm		± 5% F.S		0.1 ppm
Temperature	-40~85 °C		± 0.2 °C		0.1 °C
Humidity	10~95 %RH(non-condensation)		±5%		0.1 %RH
Power					
Operating Current	< 5mA				
Performance Reference					
	Parameter	Min	Typical value	Max	Unit
RS-485 mode	Warm-up Time [1]	—	5[2]	—	minutes
	Poll Rate [3]	—	1	—	seconds
	Response time[4]	—	30	—	seconds

[1] The time from when the sensor is powered on to when the data is read. Note the parameter when the sensor is powered on.
[2] If started in an environment with clean air it requires less time
[3] The measurement data update interval, after the power-up warm-up time, if the power supply continues, the sensor periodically updates the reading at this interval.
[4] T90＜30s

SenseCAP CO2, Temperature and Humidity Sensor with RS485 & SDI-12 , with Waterproof Aviation Connector

SKU [101991029]

The Basic Parameters	
Product model	S-CO2-03
Supply Voltage	5 ~ 24V DC (recommended 5V power supply).
Supported Protocol	Modbus-RTU RS485/ Modbus-ASCII RS485/ SDI-12 (v1.4)
IP Rating	IP65 (The equipment should be protected from direct sunlight and rain over long period of time).
Operating Temperature	0°C to 50°C
Operating Humidity	0 to 95% RH (non-condensation)
Cable Length	2 meters

Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Carbon Dioxide	0~10000ppm	±(50ppm+3%*MV)	1 ppm
Air Temperature	-40~85°C	±0.2℃	0.01°C
Air Humidity	0~100%RH	±1.8%RH	0.01%RH

Power	
Operating Current	33mA（Max，5V DC）

Performance Reference					
	Parameter	Min	Typical value	Max	Unit
RS-485 mode	Warm-up time [1]	—	123 [2]	—	s
	Measurement interval [3]	—	1000	—	ms
	Host query frequency [4]	—	1	—	Hz
	Read response time [5]	1	—	4	ms

[1] The preparation time required for the sensor to be powered on and ready to read measured values through Modbus instructions should be noted when the sensor is powered on and off for each reading.
[2] The warm-up time = (register 0x0021 value + 3); reading register 0x0000 before the warm-up time will result in 0, and the reading will be updated every second after the warm-up time; the sensor has a T90 time of 300 seconds and a T60 time of 120 seconds.
[3] The measurement data update interval, after the power-on warm-up time, if continuously powered, the sensor updates the reading periodically at this interval.
[4] Modbus master query frequency.
[5] The time required for the sensor to respond after receiving the read instruction, after the response delay register 0x0020 is set to 0.

Industrial MODBUS RS485 Air Temperature and Humidity Sensor

SKU [101990881]

General Parameters			
Product model	S-TH-01A		
Signal Output	RS485 Modbus-RTU Protocol		
Power supply	3.6-30V/DC		
Current Consumption	4mA@24V DC		
IP Rating	IP54		
Operating Temperature	-40~85℃		
Installation Methods	Wall-mounted Installation and Tube installation		
Cable Length	2m		
Connection Methods	Aviation connector and Hook-up wire		
Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Air Temperature	-40~80℃	±0.3℃	0.01℃
Air Humidity	0-100%RH	±3%RH	0.01% RH

Industrial Soil Moisture & Temperature Sensor MODBUS-RTU RS485, 0-2V Analog Voltage (S-Soil MT-02A)

With Hook-up Wires **101990668**
With Aviation Connector **314990620**

General Parameters		
Product Model	S-Soil MT-02A	
Interface	RS-485	0 - 2V voltage
Protocol	MODBUS-RTU RS485	-
Power Supply	3.6 ~ 30V DC	3.9 ~ 30V DC
Current Consumption	6mA @24V DC	6mA @24V DC
Operating Temperature	-40℃ ~ +85℃	
Storage Temperature	-40℃ ~ +85℃	
Response Time	< 1 second	
Measuring Area	A cylinder area (with the probe as the center, diameter: 7cm, height: 7cm)	
Probe Material	Food-grade stainless steel	
Seal Material	Black flame-retardant epoxy resin	
IP Rating	IP68	
Cable Length	5 meters	
Installation	All buried or probe into the media to be measured	
Device Weight	270g	

Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Soil Temperature	-40℃ ~ +80℃	± 0.5 ℃	0.1℃
Soil Moisture	From completely dry to fully saturated (from 0%RH to 100%RH of saturation)	±3% (0~53%) ±5% (53~100%)	1%RH

Industrial Soil Moisture & Temperature & EC Sensor MODBUS-RTU RS485 (S-Soil MTEC-02A)

With Hook-up Wires **101990667**
With Aviation Connector **314990621**

General Parameters			
Product Model	S-Temp&VWC&EC-02A		
Interface	RS-485		
Protocol	MODBUS-RTU RS485		
Power Supply	3.6 ~ 30V DC		
Current Consumption	6mA@24V DC (quiescent dissipation)		
Operating Temperature	-40℃ ~ +85℃		
Probe Material	Anti-corrosion special electrode		
Sealing Material	Black flame-retardant epoxy resin		
IP Rating	IP68		
Cable Length	5 meters		
Installation	All buried or probe into the media to be measured		
Device Weight	210g		
Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Soil Temperature	-40℃ ~ +80℃	± 0.5 ℃	0.1℃
Soil Moisture	From completely dry to fully saturated(from 0%RH to 100%RH of saturation)	±2% (0~50%) ±3% (50~100%)	0.03% (0~50%) 1% (50~100%)
Electrical Conductivity	0 ~ 10000 μs/cm	± 3%	Built-in temperature compensation sensor, Range: 0-50°C

Industrial Light Intensity Sensor, MODBUS-RTU RS485 &0-2V (S-Light-01)

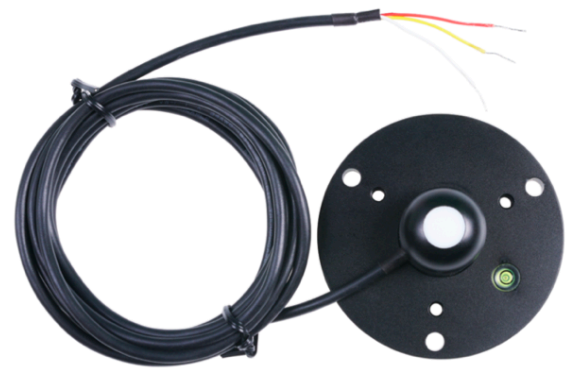
With Hook-up Wires **314990739**
With Aviation Connector **314990740**

Specifications	
Product Model	S-Light-01
Output Interface	RS485 Modbus-RTU, Analog Voltage 0-2V (Output resistance ~0ohm)
Power Supply	3.9-30V/DC
Power Consumption	7mA@24V DC
Direction Error	30°±3%,60°±6%,80°±24% (Cosine Characteristics)
IP Ratings	IP66
Operating Temperature	-40~85°C
Installation	Screw hole * 3
Cable Length	2 meters
Dimension	75*55*58mm

Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Light Intensity	0～200000 Lux	±6%	1Lux

Industrial PAR Sensor (S-PAR-02A), MODBUS-RTU RS485

With Hook-up Wires **314990733**
With Aviation Connector **314990735**



General Parameters	
Product number	S-PAR-02
Supply voltage	5V ~24V
interface	RS-485
Protocol	MODBUS-RTU RS485 (0-2.5V voltage output can be customized)
Measurement interval	1s
Linearity	Maximum deviation 1%
Response spectrum	400 ~ 700nm
stability	Year offset <2%
Response time	10 μs
Operating temperature	-30 ~ +75 ℃
Humidity	0 ~ 100% (no condensation)
Cable length	2m
Equipment net weight	300g

Measurement Parameters			
	Measurement Range	Accuracy	Resolution
PAR	0 ~ 2500 μmol/m²·s	±2%	1 μmol/m²·s

Industrial PAR Sensor (PAR-2.5V), Supporting Analog 0~2.5V Output

SKU 314990734

General Parameters			
Product number	S-PAR-02		
Supply voltage	5V ~24V		
Protocol	0-2.5V voltage output		
Measurement interval	1s		
Linearity	Maximum deviation 1%		
Response spectrum	400 ~ 700nm		
stability	Year offset <2%		
Response time	10 μs		
Operating temperature	-30 ~ +75 ℃		
Humidity	0 ~ 100% (no condensation)		
Cable length	2m		
Equipment net weight	300g		
Measurement Parameters			
	Measurement Range	Accuracy	Resolution
PAR	0 ~ 2500 μmol/m²·s	±2%	1 μmol/m²·s

Industrial Total Solar Radiation Sensor (S-ZFS-02A), MODBUS-RTU RS485

SKU: 101991047

General Parameters			
Product number	S-ZFS-01		
Supply voltage	5V ~24V		
Protocol	RS-485(Modbus/RTU)		
Linearity	Maximum deviation 1%		
stability	Year offset <2%		
Response spectrum	300~1100nm		
Response time	10ms		
Operating temperature	-30 ~ +75 ℃		
Humidity	0 ~ 100% (no condensation)		
Cable length	2m		
Equipment net weight	450g		
IP Rating	IP68		
Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Total Solar Radiation	0～2000W/㎡	±5%	1W/㎡

Industrial UV Radiation Sensor (S-ZW-01A), MODBUS-RTU RS485

SKU: 101991048

General Parameters	
Product number	S-ZW-01
Supply voltage	5V ~24V
Protocol	RS-485(Modbus/RTU)
Linearity	Maximum deviation 1%
Response spectrum	240~395nm
stability	Year offset <2%
Response time	200ms
Operating temperature	-30 ~ +75 ℃
Humidity	0 ~ 100% (no condensation)
Cable length	2m
Dimension	70mmx70mmx42.5mm

Measurement Parameters			
	Measurement Range	Accuracy	Resolution
UV Radiation	0～200W/㎡	±3%	1W/㎡

Industrial Leaf Wetness &Temperature Sensor (A), MODBUS-RTU RS485

With Hook-up Wires **314990737**
With Aviation Connector **314990738**

Specifications			
Output Interface	RS485 Modbus-RTU		
Power Supply	3.6-30V/DC		
Power Consumption	6mA@24V DC		
Measurement Technique	FDR		
IP Ratings	IP68		
Operating Temperature	-40~85°C		
Sensor Sealed	Epoxy resin		
Installation	Mounting kit		
Cable Length	2 meters		
Dimension	65*13*145mm		
Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Leaf Temperature	-40~80℃	±0.5℃	0.1℃
Leaf Wetness	0-100%RH	±5%RH	0.1% RH

Liquid Level Sensor for Water Level, Oil Level and Mild-corrosive Liquid Level Monitoring

SKU [314990619]

Specifications	
Measurement Range	0 ~ 5 meters
Cable Length	5.3 meters
Output Signal	0.5 ~ 4.5V
Accuracy	± 0.5%F.S
Zero Temperature Drift	± 0.03%F.S/℃
Sensitivity Temperature Drift	± 0.03%F.S/℃
Long-term Stability	≤0.2%F.S/year
Response Time	5ms((≤90%F.S)
Measurement Liquid	Slight corrosive liquid (water, edible oil, etc.)
Power Supply	5V DC
Overload Capacity	200%F.S
Compensation Temperature	-10℃ ~ +70℃
Medium Temperature	-40℃ ~ +80℃
Storage Temperature	-40℃ ~ +85℃
Material	304 stainless steel shell,
	316L stainless steel core,
	special rubber-insulated cable.
IP Rating	IP68
Device Weight	670g
Certifications	CE, FCC, RoHS

Industrial Liquid Level Sensor MODBUS RS485 Aviation Connector

SKU 101990860

Specifications	
Measurement Range	0 ~ 5 meters
Cable Length	5.3 meters
Output Signal	RS485 Modbus-RTU Protocol
Accuracy	± 0.25%F.S
Zero Temperature Drift	± 0.03%F.S/℃
Sensitivity Temperature Drift	± 0.03%F.S/℃
Long-term Stability	≤0.2%F.S/year
Response Time	5ms((≤90%F.S)
Measurement Liquid	Slight corrosive liquid (water, edible oil, etc.)
Power Supply	11-30V DC
Overload Capacity	200%F.S
Compensation Temperature	-10℃ ~ +70℃
Medium Temperature	-40℃ ~ +80℃
Storage Temperature	-40℃ ~ +85℃
Material	304 stainless steel shell, 316L stainless steel core, special rubber-insulated cable.
IP Rating	IP68
Device Weight	670g
Certifications	CE, FCC, RoHS

Industrial pH Sensor MODBUS-RTU RS485 & 0~2V Analog Voltage (S-pH-01A) V2.0

With Hook-up Wires **101990666**
With Aviation Connector **314990622**

General Parameters		
Product Model	S-pH-01A	
Output Interface	Analog Voltage 0-2V (Output resistance ~0ohm)	RS-485 MODBUS-RTU
Power Supply	3.6-30V/DC	3.6-30V/DC
Power Consumption	35mA@24V DC	35mA@24V DC
Start-up time	< 2 seconds	
IP Rating	Electrode: IP68; Transmitter: IP65	
Operating Temperature	-40℃ ~ 85℃	
Installation	Electrode: 3/4"NPT screw threads; Transmitter: Mounting hole	
Cable Length	Power and Signal Cable:2 meters (Customizable) Electrode Cable: 5 meters	
Dimension	Electrode: Width*Diameter 160*30mm; 3/4"NPT screw threads Transmitter: 140mm*65mm*50mm	

Measurement Parameters			
	Measurement Range	Accuracy	Resolution
pH	0 - 14PH（Can be used for a solution or semi-solid substrate）	±0.1pH	0.01pH
Temperature (Built-in junction box*)	-40℃ ~ +80℃	± 0.5 ℃	0.1℃

Industrial EC & TDS Sensor MODBUS-RTU RS485 & 0-2V Analog Voltage

With Hook-up Wires **314990634**
With Aviation Connector **314990742**

Specifications		
Output Interface	Analog Voltage 0-2V (Output resistance ~0ohm)	RS485 Modbus-RTU
Power Supply	3.9-30V/DC	3.9-30V/DC
Power Consumption (Idle)	40mA@24V DC	40mA@24V DC
Power Consumption (Max)	80mA@24V DC	80mA@24V DC
Start-up Time	< 2 seconds	
IP Ratings	Electrode： IP68	
	Transmitter： IP65	
Operating Temperature	-40 ~ +85°C	
Installation	Electrode：1/2"NPT screw threads Transmitter: Mounting hole	
Cable Length	Power and Signal Cable：2 meters or Customize Electrode Cable：10 meters	
Dimension	Electrode：1/2"NPT screw threads Transmitter：128*70*42mm	

Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Water Eletrical Conductivity	0 - 20000us/cm (Isolated Sensor Input)	0-10000us/cm, ±3%; 10000-20000us/cm, ±5%	0-10000us/cm, 10us/cm; 10000-20000 us/cm, 20000us/cm, 50us/cm
Temperature (Built-in junction box*)	-40~80°C	±0.5°C	0.1°C

RS485 MODBUS Dissolved Oxygen Sensor, Fluorescence DO Meter

SKU [314990633]

Specifications	
Measurement Method	Fluorescence Quenching
Calibration	Two-point calibration
Temperature Compensation	Automatic temperature compensation (Pt1000)
Output	RS485(Modbus/RTU)
Working Conditions	0～50℃，<0.2MPa
Storage Temperature	-5～65℃
Material	PC, stainless steel
Cable Length	5 meters
Power Consumption	0.3W@12V
Power Supply	12～24VDC（@typical 12VDC）
IP Rating	IP68

Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Dissolved Oxygen	0～20.00mg/L(0～200% saturation，25℃)	±2%F.S.±0.3℃	0.01mg/L0.1℃

RS485 MODBUS Turbidity Sensor（S-DTS210-01B)

SKU：101990793

Specifications	
Power Supply	12～24VDC（@typical 12VDC)
Calibration	Two-point calibration
Temperature Compensation	Automatic temperature compensation (Pt1000)
Output	RS485(Modbus/RTU)
Working Conditions	0～50℃，<0.2MPa
Storage Temperature	-5～65℃
Material	PC, stainless steel
Cable Length	5 meters
Power Consumption	0.2W@12V
IP Rating	IP68
Measurement Method	90° scattered light method

Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Turbidity	0 ～ 1000 NTU	±5% or ±3NTU, whichever is larger	0.1 NTU

RS485 750cm Ultrasonic Level Sensor

SKU 101991041

Specifications			
Blind zone distance	0～28 cm		
Beam angle(w/o bell-mouth)	--		
Beam angle(with bell-mouth)	≈40°		
Operating voltage	5～12 V		
Average current	＜10 mA		
Output method	RS485 Output		
IP Rating	IP 67		
Working Temperature	-15℃ ~ 60℃		
Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Distance	28 ~ 450 cm Measurement range (w/o bell-mouth）	±(1+S*0.3%)	1 mm
	28 ~ 750 cm Measurement range (with bell-mouth)		

RS485 500cm Ultrasonic Level Sensor

SKU 101991042

Specifications			
Range	25 ~ 500 cm		
Accuracy	±(1+S*0.3%)		
Resolution	1 mm		
Blind area distance	0～25 cm		
Detection angle	≈21°		
General Parameters			
Operating voltage	3.3～24 V		
Average current	＜10 mA		
Quiescent Current	15～5000 uA		
Output method	RS485 Output		
IP Rating	IP 67		
Working Temperature	-15℃ ~ 60℃		
Measurement Parameters			
	Measurement Range	Accuracy	Resolution
Distance	25 ~ 500 cm	±(1+S*0.3%)	1 mm

Industrial-Grade Optical Rain Gauge RG-15 Rain Sensor

SKU [114992321]

Parameters		
	Value	Connection Pins
Nominal Accuracy	±10%	J1 TerminalJ1 - OutJ1 - V+J1 - GND
Input Voltage	Range 5-15 VDC 50V surge on J1 Reverse polarityprotected to 50V or 3.3VDC through pin 8 on J2	
Current Drain (Not final)	110 µA nominal. (No outputs on, dry not raining)2-4 mA when raining	J2 HeaderJ2 - 1 GNDJ2 - 2 V+ (Same as J1 V+)J2 - 3 OUT (Same as J1 OUT)J2 - 4 RS232 OUTJ2 - 5 RS232 INJ2 - 6J2 - 7 MCLRJ2 - 8 3.3V
Output	NPN Open Collector Output 100 mA / 80V Max	
Operating Temperature	-40°C to +60°C (Will not detect rain when freezing)	
Output Resolution	0.01in / 0.2mm or 0.001in / 0.02mm	
RS232 Port	3.3 V	
Supported Baud Rates	1200, 2400, 4800, 9600, 19200, 38400, 57600	

Industrial-Grade Water Leak Detector IP66 RS485

SKU [314990618]

Specifications	
Power Supply	5V
Operating Current	< 30mA
Quiescent Current	< 10mA
Output Signal	watery: relay connection, dry: relay break
Cable Length	2 meters
Relay Load	(3A 250V AC) / (3A 30V DC)
Response Time	< 50ms
Measurement Medium	water
Operating Temperature	-5℃ ~ +60℃
IP Rating	IP66
Device Weight	200g

Solar Radiation Shield for Outdoor Sensor Protection - A10

SKU 114992222

Specifications	
Product Model	A10
Number of Plates	10
Materials	Engineering plastic plates; stainless steel brackets & screws.
Inner Diameter	30mm
Outer Diameter	130mm
Internal Height	135mm
Accessories for Installation	Stainless steel bracket
Operating Temperature	-40 ℃ to +85 ℃
Weight	517g

SENSECAP

Website: solution.seeedstudio.com

Sales: iot@seeed.cc

Support: sensecap@seeed.cc

Phone：+86 0755 3314 7002