

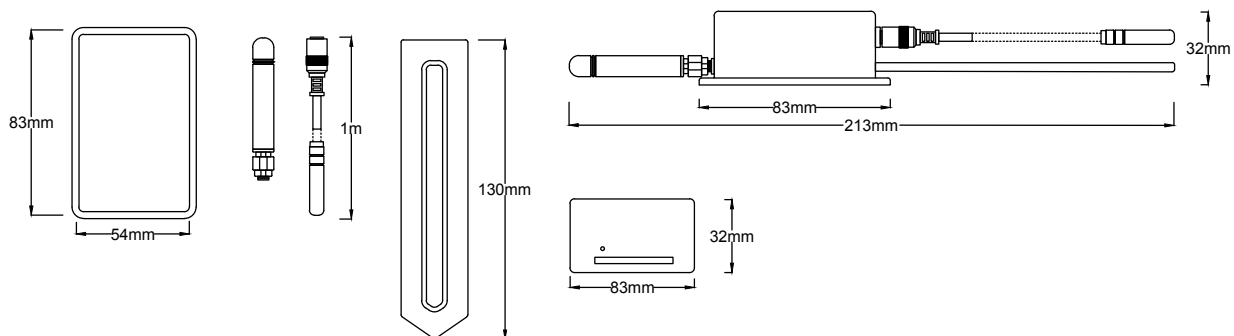
SKYAGR1

Soil Monitoring Sensor

Skysens SKYAGR1 is LoRaWAN based cost-effective, easy to use soil moisture and temperature monitoring solution for landscaping, farming and other application areas.

- ✓ Linear moisture reading.
- ✓ Suitable for outdoor usage.
- ✓ Excellent long-term stability.
- ✓ LED interface.
- ✓ Low power consumption compared with other technologies.
- ✓ Adjustable sensor reading interval from network
- ✓ Ready with end-to-end software application.
- ✓ Magnetic restart function.

Application Areas : Agricultural fields, greenhouse areas, stadiums, farms, landscaping applications, etc.



Dimensions	54 x 83 x 32 mm Probe: 100 mm	Available Frequencies	All
Weight	150 gr (apprx)	Temperature Sensitivity	0.5 C between -10 and +85 C
Casing	ABS with RoHS Compliancey	Humidity Sensitivity	1% RH between 20% and 80%
Antenna	+3 dBi external	Operating Conditions	-40°C to +80°C & 0% RH to 100% RH
Expected Battery Life	Minimum 5 Years with 30 min Interval	Battery	3.6V Lithium AA

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PRODUCT IMAGES, BUTTONS AND PLUG-INS



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PAYLOAD STRUCTURE – Uplink

Sample Payload: 0x00E90320000000000000000000000000000000000000E1000

Byte 0	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5
Temperature MSB	Temperature LSB	Humidity MSB	Humidity LSB	Reserved	Reserved

Byte 6	Byte 7	Byte 8	Byte 9	Byte 10	Byte 11
Reserved	Reserved	Reserved	Reserved	Reserved	Reserved

Byte 12	Byte 13	Byte 14	Byte 15	Byte 16	Byte 17
Reserved	Reserved	Reserved	Reserved	Battery MSB	Battery LSB

Byte 18
Reserved

- Note: Temperature is multiplied by 10, divide by 10 to find temperature value. Battery information is given in mV form.
- Note: For moisture calculation take moisture MSB and moisture LSB bytes, convert them to decimal directly. Use following formula to convert raw data to real moisture percentage:

$$\text{Moisture in Percentage(\%)} = -0.2017 \times \text{RawMoisture} + 192.96$$

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PAYLOAD STRUCTURE – Downlink

Interval Change Downlink

Following message should be sent to the device in order to change message period of the device.

Interval Change Command	
Port	Message
0x0B	0x02T ₀ T ₀ T ₁ T ₁ T ₂ T ₂ T ₃ T ₃

T values at the above table are time values in seconds and hexadecimal form. Must be sent in MSB first form. For example, 0x0200000384 message should be sent to the device in order to set message interval to 900 seconds. (0x384H = 900) These values can take from 1 minute to 6 hours.

Reset Downlink

Following message should be sent to the device in order to reset the device.

Reset Command	
Port	Message
0xFA	0x01

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Reset Operation

Bring the magnet close to the magnetic area and hold, red LED must light for a while and start blinking. When you see the blinking take the magnet away. The device gets reset by this operation and after every reset operation, the device goes into sleep mode by blinking red LED twice.

Wake Up

To exit sleep mode and take the device to the normal operation mode, bring the magnet close to the magnetic area button until you see the red LED light. When you see red light take the magnet away and the device will go into normal operation mode by blinking red LED a couple of times.

OTAA Mode

The device requests OTAA join to the server after the device wakes up and goes into the normal operation mode. OTAA requests are represented by the blinking red LED once per request. When the device successfully joins to OTAA mode red LED lights for a while.

Communication

The device indicates uplink communication by blinking red LED once and downlink communication by blinking red LED once.

ABP

For ABP please contact SKYSENS.

Error Behaviour

The first time device with a hardware problem is energized, it flashes the red led at the intervals of five hundred milliseconds, to indicate there is a hardware problem.