RAK2560 WisNode Sensor Probe IO Datasheet

Overview

Description

The **Probe IO** is an accessory for the Sensor Hub solution platform. It supports modules with various communication protocols like RS-485, SDI-12, 4-20 mA signal, and DI/DO. This accessory can work with RAKwireless modules to ensure the best solution for your project.

> **NOTE**
>
> - The Probe IO could not be used as a standalone product. You need the RAK2560 WisNode Sensor Hub in order to use this probe.

Product Features

- Support one RS-485 device[1]
- Support one SDI-12 device[1]
- Support one 4-20 mA device[1]
- Support two DO (dry contact)[1]
- Support one DI[1]
- Supply 5 V / VIN / 24 V (0.5 A) power
- One-wire protocol[1]
- Waterproof (IP67-rated for the probe body)

> **NOTE**
>
> [1] - Custom or 3rd party sensors cannot be connected to the Probe IO Sensor Hub. If the desired sensor is not available in the SensorHub Solutions , reach us at support@rakwireless.com and we will check the compatibility of your desired sensor.

Specifications

Overview

Dimensions

The **Probe IO** dimensions are 74 x 33 x 26 mm. There is one physical port for connection to the Sensor Hub with a 50 cm cable length. The **Probe IO** is IP67-rated and suitable for outdoor use. The device is designed to meet the UL/EN60950-22 standard.

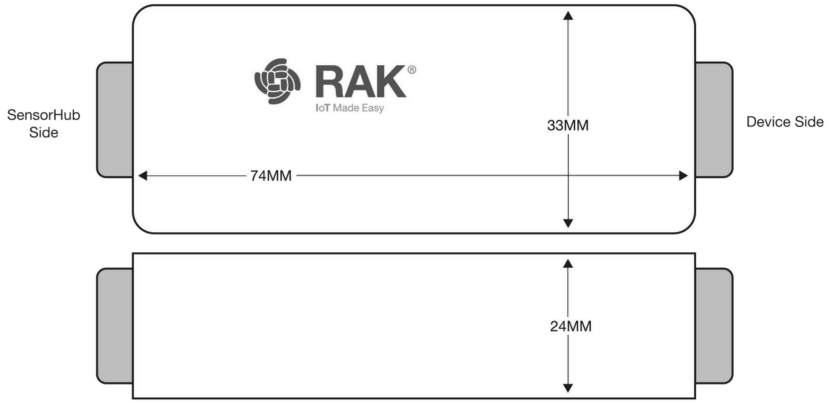

Figure 1: RAK2560 WisNode Probe IO dimensions

Block Diagram

RAK2560's **Probe IO** uses MCU STM32L051C8 for a control center. The **Probe IO** supports four (4) types of device interfaces and DI/DO to control or monitor the working environment directly.

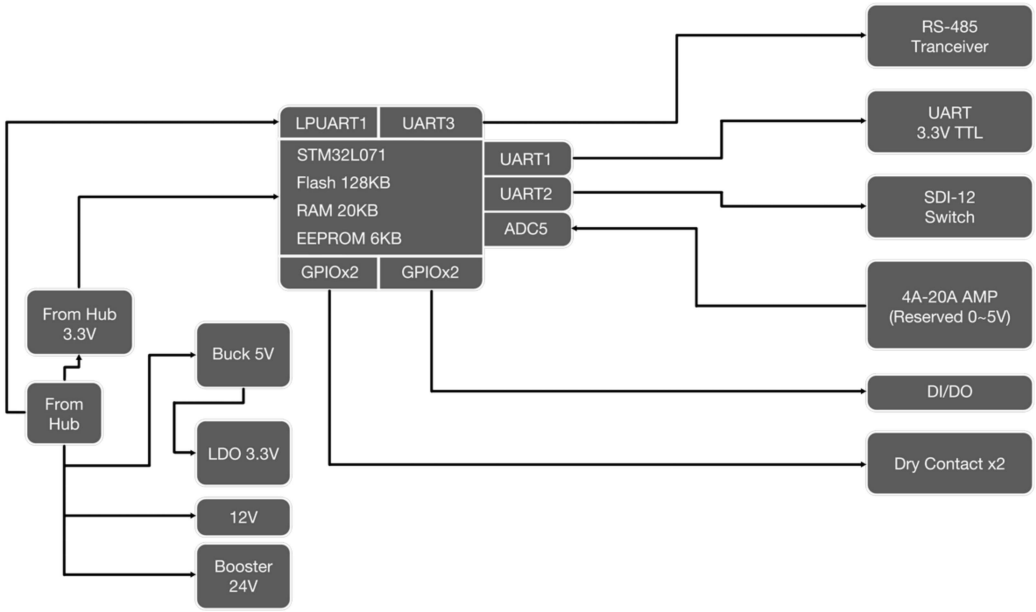

Figure 2: RAK2560 WisNode Probe IO block diagram

Hardware

The hardware specification is categorized into four (4) parts. It shows the pinouts of the Probe IO and their corresponding functions and diagrams. It also covers the power supply and environmental characteristics that include the tabular data of the functionalities and standard values of the RAK2560 WisNode Probe IO.

Pin Definition

Connector (Sensor Hub Side)

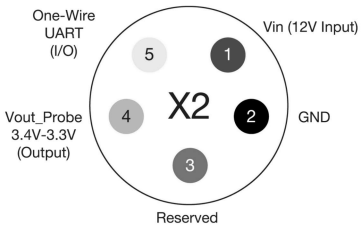

Figure 3: RAK2560 WisNode Probe IO connector

Pin No.	Name	Type	Description	Remarks
1	Vin	PI	12 V_{DC} supply	Input 5~16 V
2	GND	-	Ground	-
3	Reserved	IO	Not defined	Reserved for future use
4	Vcc_Probe	PI	Power supply for the probe	3.3 V_{DC} support mode; 3.4 V battery mode
5	One-wire UART	IO	Communication with probe	

Probe IO PCBA

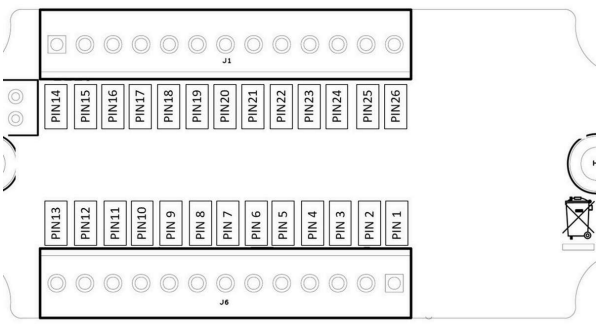

Figure 4: RAK2560 WisNode Probe IO PCBA pin definition

J1	Name	Description
Pin 14	485_A+	RS-485 port
Pin 15	485_B-	RS-485 port
Pin 16	UART1_TX	MCU UART-TX
Pin 17	UART1_RX	MCU UART-RX
Pin 18	GND	-
Pin 19	GND	-
Pin 20	4-20mA_IN	4-20 mA analog in
Pin 21	GND	-
Pin 22	GPIO1	MCU GPIO
Pin 23	GPIO2	MCU GPIO
Pin 24	GPIO3	MCU GPIO
Pin 25	GND	-
Pin 26	SDI-12_IN	-

J6	Name	Description
Pin 1	DO0_OUT	Dry contact out
Pin 2	DO0_COM	Dry contact common
Pin 3	DO1_OUT	Dry contact out
Pin 4	DO1_COM	Dry contact common

J6	Name	Description
Pin 5	DI	Dry contact in
Pin 6	DI_COM	Dry contact common
Pin 7	DC3v3_OUT	Supply 150 mA
Pin 8	GND	-
Pin 9	GND	-
Pin 10	VIN	Adapter power
Pin 11	GND	-
Pin 12	DC24V	Supply current 1 A
Pin 13	5V0	Supply current 1 A

Standard Type for Probe IO

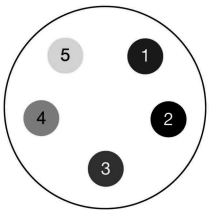

Figure 5: RAK2560 WisNode Probe IO SP11 device side

Type	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5
RS-485	VIN/24 V	GND	NC	B-	A+
SDI-12	VIN/24 V	GND	NC	NC	Data
4-20	VIN/24 V	GND	NC	NC	Signal-in
DO	VIN/24 V	GND	NC	DO0_COM	DO0_OUT
DI	VIN/24 V	GND	NC	DI_COM	DI

Power Supply

The **Probe IO** must be supplied through the 3.4 ~ 3.6 V SP11 Pin 4 from the main body of the Sensor Hub. The module's power is only supplied through the VIN / 24 V of SP11 Pin 1.

Power Consumption

Mode	Condition	Min	Typical	Max
Active mode	Read sensor data	3.2 mA	3.5 mA	3.6 mA
Sleep mode	Sleep mode	40 uA	60 uA	90 uA

Environmental Requirements

Operating Conditions

Parameter	Min	Typical	Max
Normal operating temperature	–30° C	+25° C	+80° C

Sensor Connection Diagram

The **RAK2560** can support both Sensor Probes and Probe IO in all possible combinations.

> **NOTE**
>
> If you buy a Probe IO sensor solution like the soil moisture sensor, you will need a Probe IO to connect it with the Sensor Hub. To integrate an additional Probe IO into your configuration, the Sensor Hub requires an external 12 V_{DC} power supply. It cannot operate on batteries.

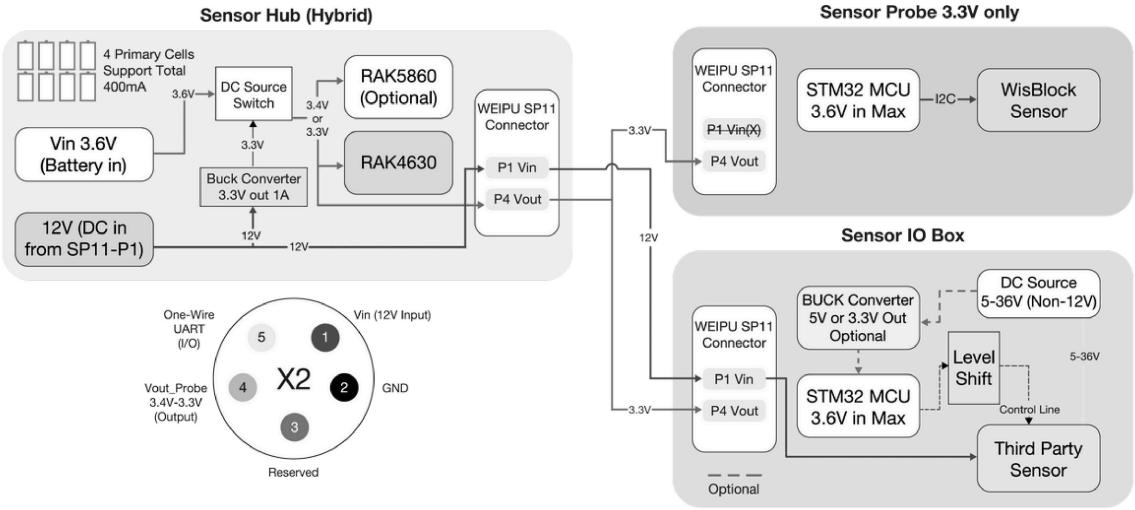

Figure 6: RAK2560 WisNode Probe IO connection schematics

Certification

Innovation, Science and Economic Development Canada

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