

Mako V2

Technical Data Sheet

Industrial WiFi, LoRa RF, Modbus PLC.

Optimised for remote locations with IoT capabilities



MV2-T

Transistor Digital Output

MV2-TG

Transistor Digital Output
GNS Navigation

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Mako V2 Description

Smithtek's **Mako V2 PLC** is built around three core principles:

- **Reliability**
- **Simplicity**
- **Future proof**

Combining an ultra-fast PLC with full IoT capability, its versatile design allows it to operate as either a master or slave controller. With embedded LoRa RF, Wi-Fi, GPS, and a compact footprint, it's ideal for remote applications. Its built-in IoT connectors enable direct integration with internet-based control and monitoring services.

V-NET configuration software uses an intuitive drag-and-drop interface, making it accessible to all skill levels. Equipped with modern communications protocols, IoT connectors, and classic PLC tools, it gives users flexibility and creative control like never before.

The Mako V2 breaks traditional barriers as it steps into the future of control.

Application Use:

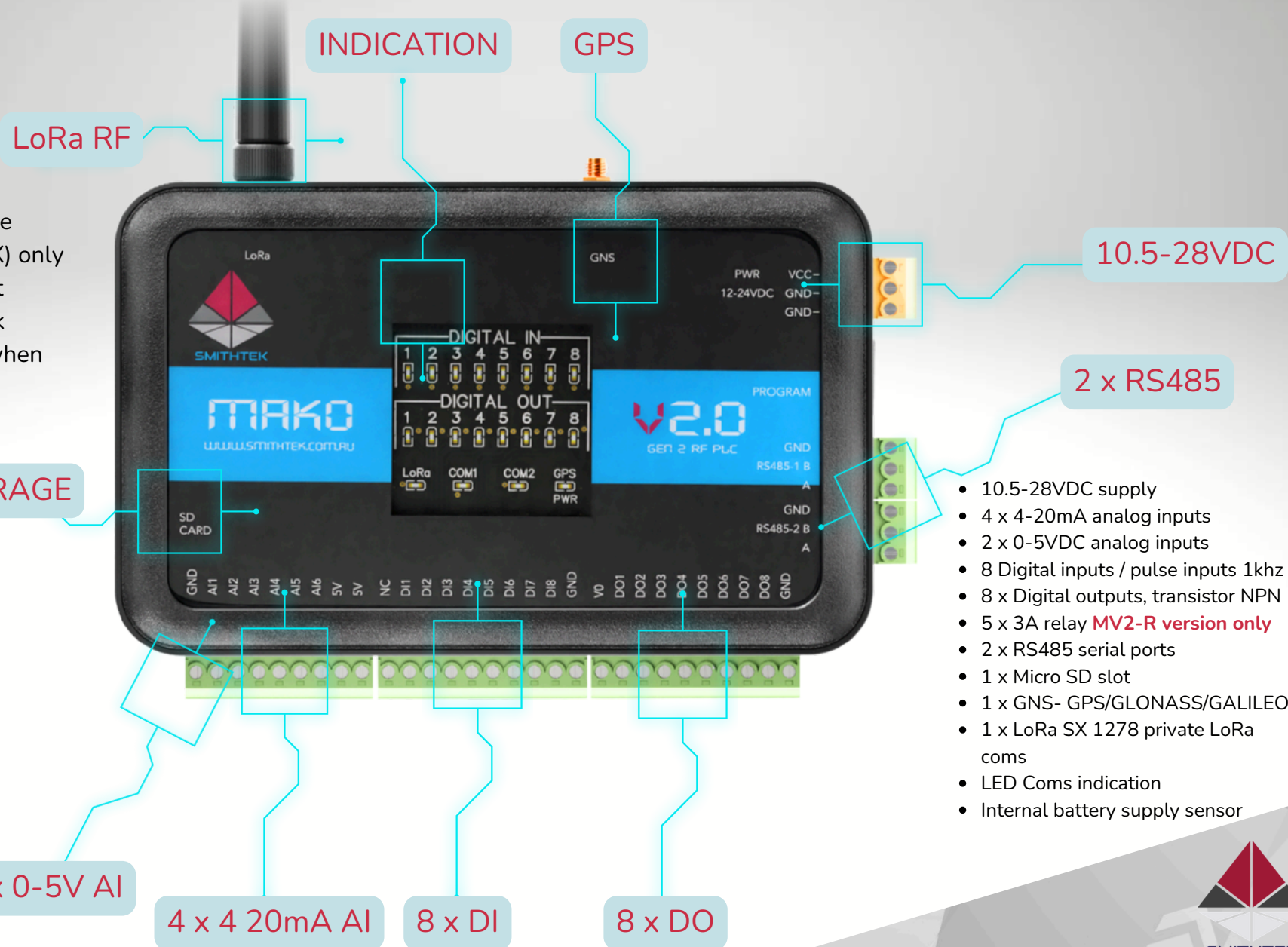
- Remote control & monitoring of assets.
- Agriculture, farming.
- Mining, resources sector.
- Pump control, irrigation control., bore control.
- Remote communities.
- Water treatment, UV disinfection, flow meters.
- Tank monitoring and control.
- Survey-data logging, environmental sensors.
- Generators, remote control and monitoring.
- Power stations, remote control and monitoring
- Parks and public areas.
- Mobile plant machines and skids.



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Device Layout



Indicator LED's

- All indicator LED's will activate when they receive a signal (RX) only
- The GPS indicator will flash at 1hz when it has a satellite lock
- Com 1 LED will be constant when uploading a program



COM1 = RS485-1
COM2 = RS485-2

- 10.5-28VDC supply
- 4 x 4-20mA analog inputs
- 2 x 0-5VDC analog inputs
- 8 Digital inputs / pulse inputs 1khz
- 8 x Digital outputs, transistor NPN
- 5 x 3A relay **MV2-R version only**
- 2 x RS485 serial ports
- 1 x Micro SD slot
- 1 x GNS- GPS/GLONASS/GALILEO
- 1 x LoRa SX 1278 private LoRa coms
- LED Coms indication
- Internal battery supply sensor



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Connection Topology



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Device Features

- 240MHz, Dual-core Xtensa® 32-bit LX6 MCU
- Multi communication ability, LoRa, WIFI, RS485
- High precision 4 20mA analog inputs.
- Low power mode
- LoRa RF, 300 to 1000Mhz range
- 15KM LOS RF communications over LoRa
- **Single** device mode, **mesh** mode, **master** slave mode
- Micro SD storage for data logging.
- GNS (GPS, GLONASS, Galileo)
- 8 Digital inputs all assignable to pulse inputs 1 to 1Khz
- 8 Digital outputs NPN transistor type
- 3A Relay version available **5 outputs**
- WiFi- IEEE 802.11, WPA2- AES
- Modbus RTU/TCP, 2 channels can act as slave or master independently
- Internal power supply sensing assignable on the V-NET software
- HTTP and HTTPS SSL security
- MQTT. 3.1 secure
- Advanced data type tools, Json, binary, packets, ASCII, base 64
- V-NET programmer IDE, simple, packed with tools to assist simplify programming functions
- Super small size, tough robust with hardened 35mm din-rail connectors



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Device Specification

Device Specs	Voltage Supply	9-28VDC
	Power Max	2.16 Watts
	Load Idle	90mA
	Load Each Relay	23mA(Relay Version)
	Operating Temperatures	40 to +85C
	Operating Humidity	0 – 95% RH (NC)
	Dimensions	160/98/34 mm
	Dimensions with Terminals Connected	178/117.5/39.5 mm
	Enclosure Material	ABS (ROHS)
	Programming Communication Method	USB Type A
	Terminals	2.54mm socket connectors WIRE SIZE 2.5MM
	Mounting Option 1	Spring load (35mm Din-rail clips)
	Mounting Option 2	Desktop
LoRa Radio	RF Type	LoRa Modulation
	RF BW	62.5-500kHz
	RF Frequency	169-915MHz
	TX Power	0-20dBm max 100mW
	Encryption	128bit AES
	Antenna Type	SMA Female
	TX Load	18.75mA at 24VDC 0.45W
	RX Load	4mA at 24VDC 0.095W
Wifi	Radio RF	2.4GHz
	Security	WPA, WPA2, WPA3 , AES
	Standards	802.11 b/g/n
	TX Power	0 - 20.5dBm
	TX Load	54mA ave at 24VDC
	Rx Load	18.75mA ave at 24VDC
IO	Digital Input	PNP open collector >10.5VDC True <6VDC False
	Digital Input	Pulse input 0.1hz to 1kHz Program debounce 0 to >99999mS
	Digital output Relay	3A max 150VDC
	Digital output Transistor	Transistor NPN Max 200mA per output
	4 20mA Analog Input	Single ended 16bit ADC
	0-5VDC Analog Input	Single ended 12bit ADC
	RS485-1	TVS protected with built in 120Ω Terminator
RS485-2	TVS protected with built in 120Ω Terminator	

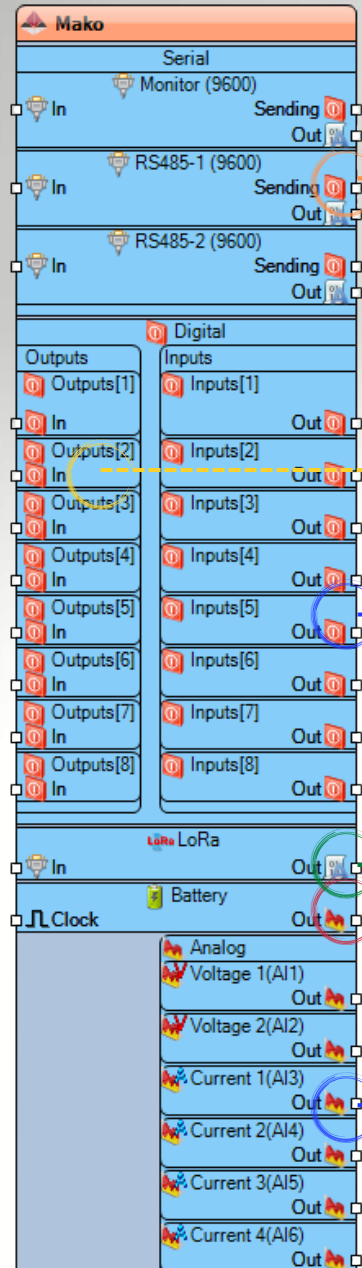
GNS	Update frequency	1Hz
	Tracking channels	32
	Positioning Precision	2.5M
	Cold start	32 seconds first fix
	Hot start	< 3 seconds from power-up
	System Features	Reads up to six satellite navigation systems and implements joint positioning, navigation.
	Navigation Satellite Systems	BeiDou ,GPS,GLONASS,Galileo
	Latitude	(DD) decimal degrees -7 decimal places
	Logitude	(DD) decimal degrees -7 decimal places
	Course	0-360 degrees
	Speed	Feet per second
	RX load	4.8mA at 24VDC , 0.115W



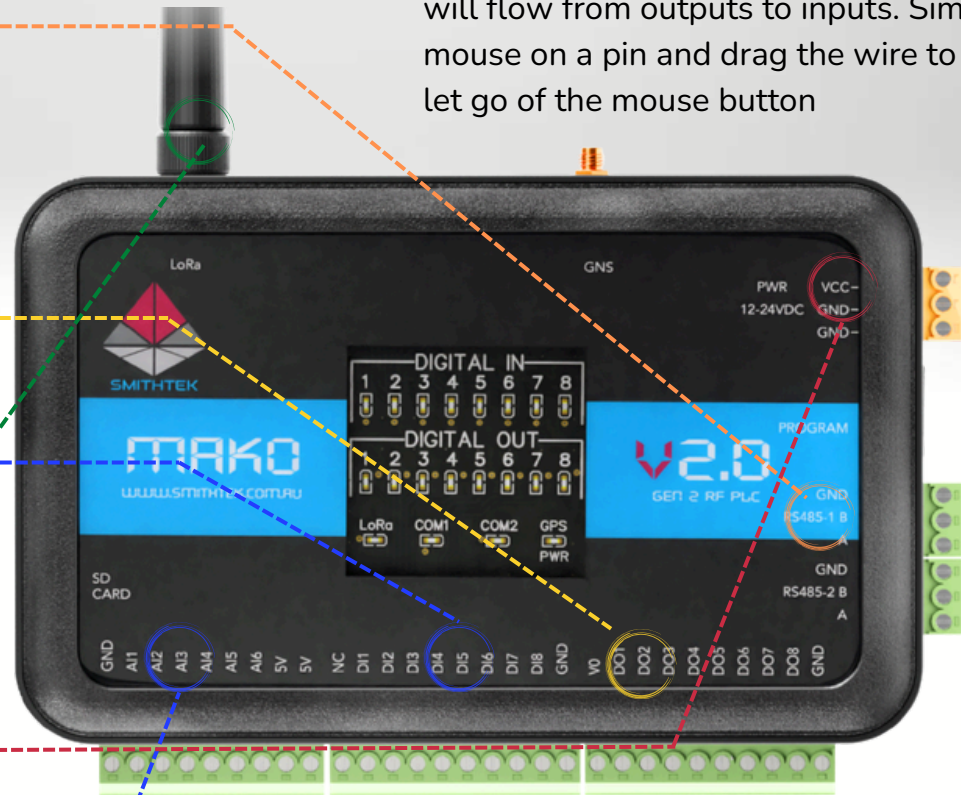
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V-NET Editor - Physical Device, Terminal Mapping



On the Mako board or any component in V-net the little square dots next to an image are called "pins" to create a program you connect (wire) from pin to pin. The data will flow from outputs to inputs. Simply click your left mouse on a pin and drag the wire to the next pin and let go of the mouse button



Output pins are always on the left.
Input pins are always on the right.
The flow of programming is left to right -->

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V-NET Interface

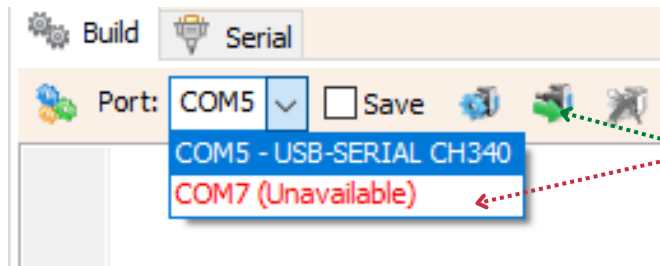


To Program the Mako you need to use the supplied USB-A to USB-A. The Mako is a USB client device.

The Mako does not needs mains DC power supply in order for it to be programmed, However, some features like the battery sense and relays on the (Relay) version may not operate correctly.

To program the Mako.

- Insert the USB to the host computer and the Mako
- **Select the correct COMS port on V-NET IDE.**
- **Press the upload button.**
- Wait for a minute for it to upload.
- Repeat as many times as you wish.



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Compliances



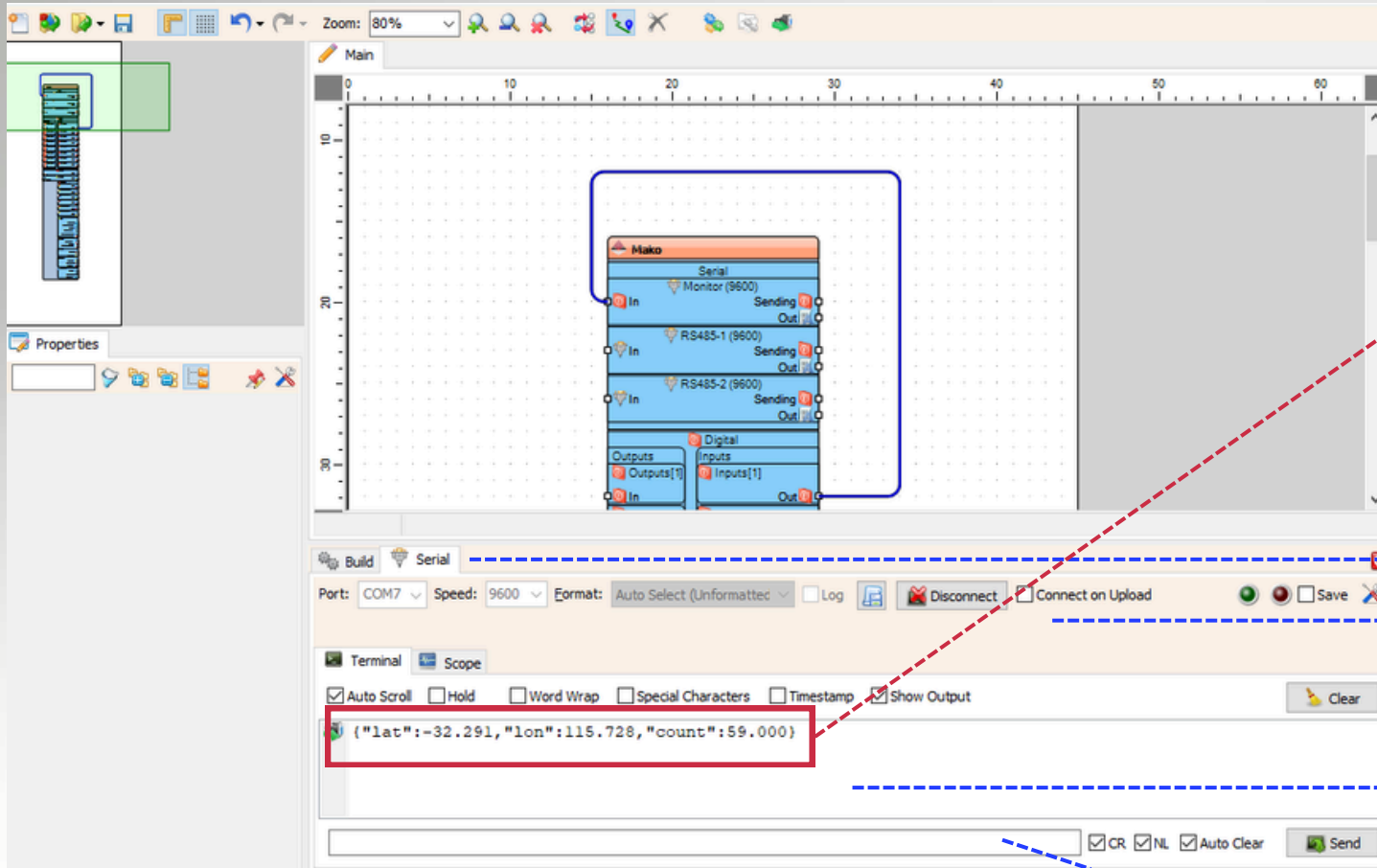
Compliances	CE	2014/30/EU
	CE	RED
	RCM	AS/NZS 4417.1, 4417.2
	RCM	AS/NZS 3820
	RCM	AS/NZS 4268
	FCC	Part 15.249
	FCC	Part 15.247



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V-NET Serial Monitor



The serial monitor window is showing GPS data that has been wired to the serial input pin.

Serial monitor

Connect / disconnect

Serial monitor display

Serial monitor Send

Serial monitor send commands

When programming the Mako using V-NET, there is a serial monitor feature that you can use. It is a very powerful tool that will not only allow you to monitor your progress but give you an understanding on how each of the components work. To use the serial monitor you simply wire from any Mako pin or component pin to the serial input pin, respectively you can wire from the serial output pin to the Mako and/or components, and send serial data back from the keyboard, like text, numbers, bool ETC. The above example shows a digital input wired to the serial monitor input pin. When the digital input changes state the serial monitor window will display 'true' or 'false'.

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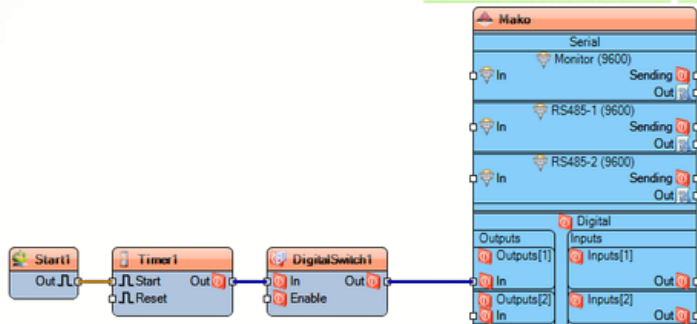
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Wiring Examples - Relay Output

Relay Output

- DO1,DO2,DO3,DO4,DO5
- DO6-Not used LED Only
- DO7-Not used LED Only
- DO8-Not used LED Only

10.5-28VDC >500mA



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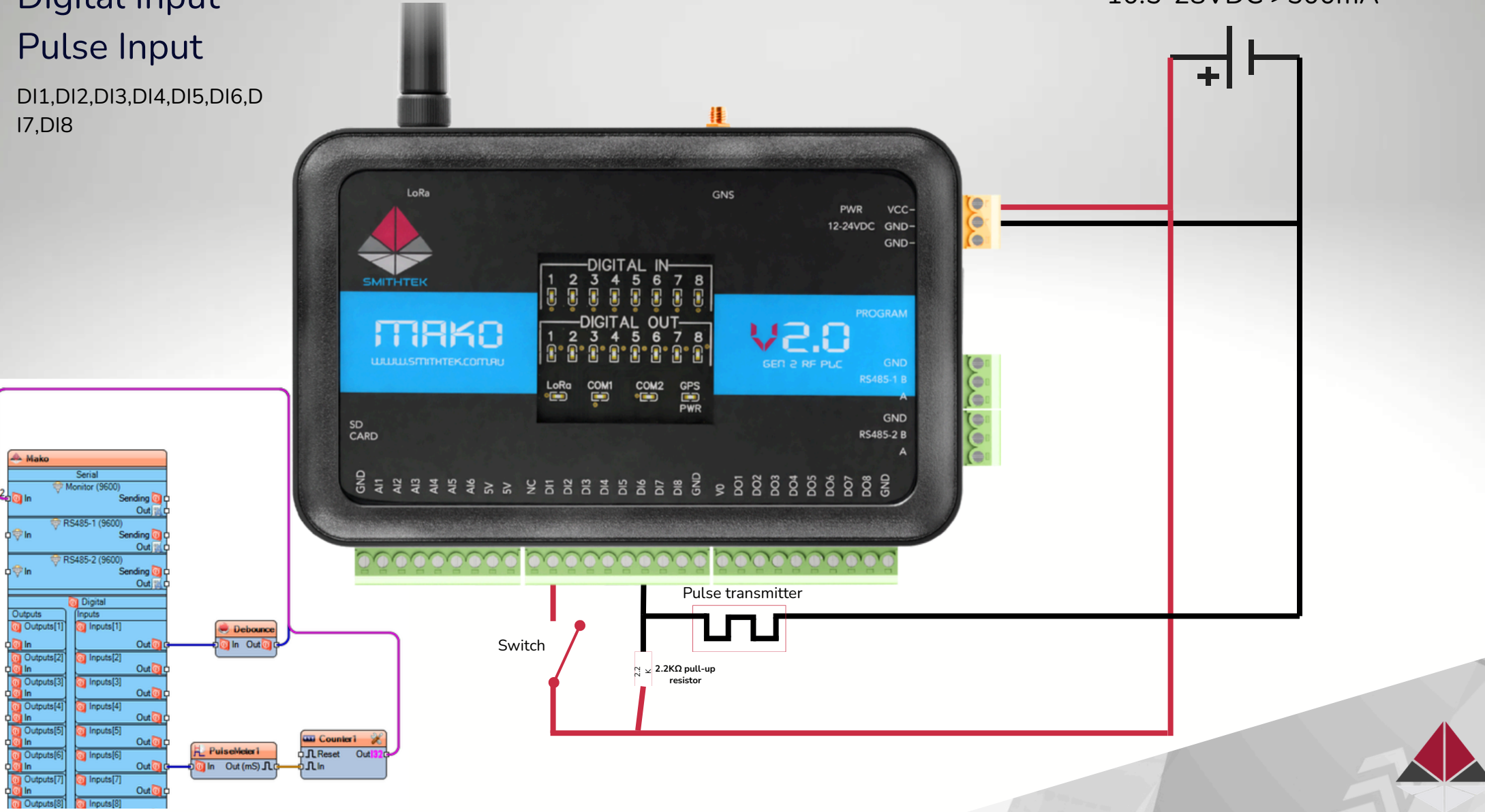
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Wiring Examples - Digital Input / Pulse Input

Digital Input Pulse Input

DI1,DI2,DI3,DI4,DI5,DI6,DI7,DI8

10.5-28VDC >500mA



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Wiring Examples - 4 20mA Analog Input

4 20mA Input

AI3,AI4,AI5,AI6

10.5-28VDC >500mA



Optional

Active 4 20mA Loop Powered

If the power supply to the Mako is different to the sensor, make sure the ground is common on this port.



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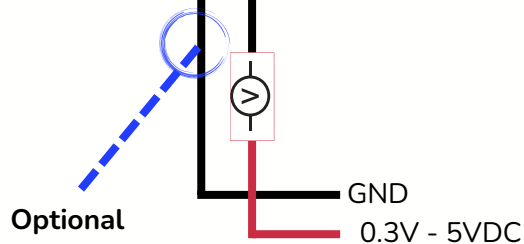
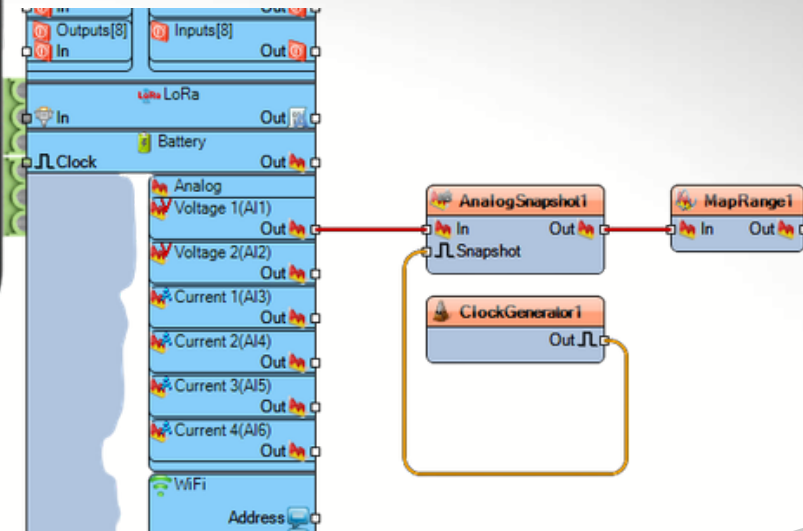
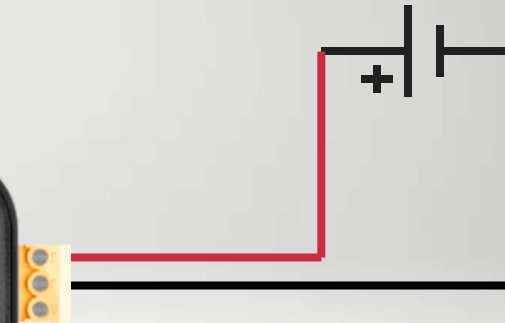
Wiring Examples - 0-5V Analog Input

0-5VDC Input

AI1 & AI2



10.5-28VDC >500mA



If the power supply to the Mako is different to the sensor make sure the ground is common on this port

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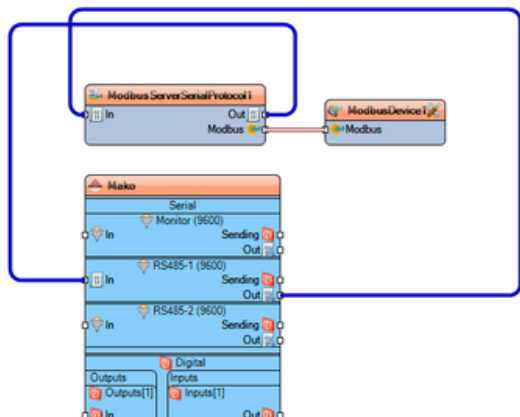
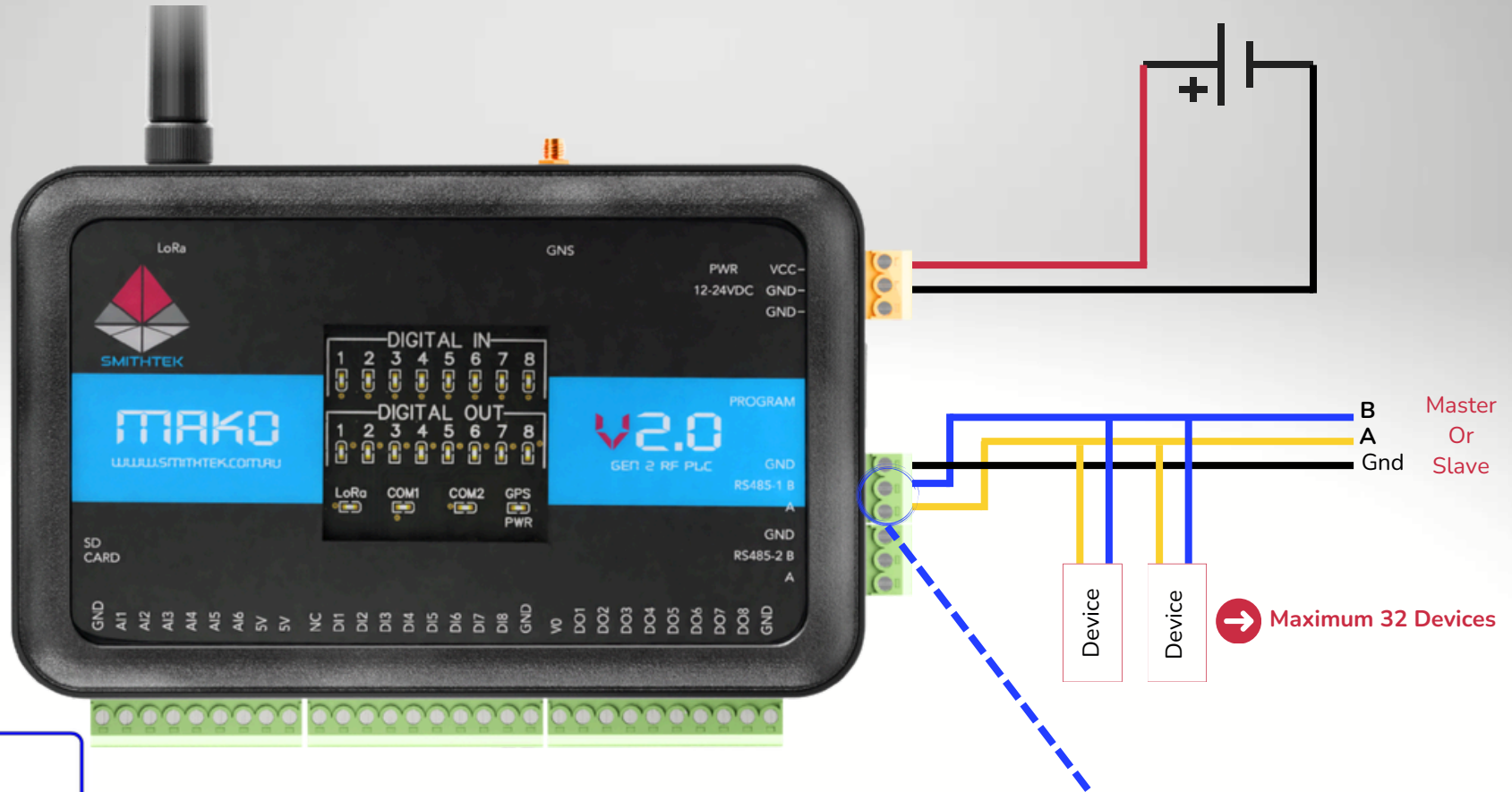
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Wiring Examples - RS485 Interface

RS485

RS485-1
RS485-2

10.5-28VDC >500mA



Both RS485 ports have built in 120Ω termination resistors. Depending on the serial protocol used both ports can act as either a **slave** or **master** device

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Warranty

Smithtek PTY LTD warrants to the original purchaser that this product will be free from defects in workmanship and materials, under normal use and conditions, for a period of one (1) year from the original invoice date. This warranty is non-transferable. During the warranty period, Smithtek PTY LTD will, at its sole discretion, repair, replace, or refund the purchase price of any defective product that is returned to us in accordance with our return policy. Smithtek PTY LTD may use new or refurbished parts or products to fulfill its warranty obligations. The customer is responsible for all shipping and handling fees associated with returning the defective product.

This warranty does not cover:

- Damage resulting from misuse, abuse, negligence, accidents, or improper use or installation
- Aesthetic damage such as scratches, dents, or stains
- Normal wear and tear
- Damage resulting from unauthorised repair or modification
- Dissatisfaction due to buyer's remorse
- Damage resulting from natural disasters, fire, theft, or acts of God
- Any condition resulting from incorrect or inadequate maintenance or care.

This warranty is in lieu of all other warranties, express or implied, including any implied warranty of merchantability or fitness for a particular purpose. In no event shall Smithtek PTY LTD be liable for any indirect, special, incidental, or consequential damages arising from the use of this product.

To make a warranty claim, please contact our customer support team at www.smithtek.com.au/support. You may be asked to provide proof of purchase, including the model number and original dated sales receipt. This warranty gives you specific legal rights, and you may also have other rights which vary from state to state or province to province.



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Returns Policy

At Smithtek PTY LTD, we want you to be completely satisfied with your purchase. If for any reason you are not satisfied, you may return your product within 30 days of delivery for a full refund of the purchase price (less shipping and handling charges).

To initiate a return, please contact our customer service department at info@smithtek.com.au.

Please have your order number and the reason for the return ready when you call. Our customer service representative will provide you with a Return Merchandise Authorisation (RMA) number, which must be included with your return. To qualify for a refund, the product must be in its original packaging and in resalable condition. Smithtek PTY LTD reserves the right to refuse a return or charge a restocking fee if the product is not returned in its original condition.

Smithtek PTY LTD will not be responsible for return shipping charges unless the product is being returned due to an error on our part. We recommend that you use a trackable shipping method and insure the package for the full value of the product. Smithtek PTY LTD will not be responsible for any lost or damaged packages.

Once we receive your return, we will process your refund within 5 business days. Refunds will be issued to the original payment method.

If you have any questions about our returns policy, please contact us at info@smithtek.com.au.



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Our Mission

At Smithtek, we are a proud family-run business dedicated to empowering industries, communities, and remote operators across Australia. Our mission is to deliver reliable, locally built telemetry and automation solutions that simplify how people monitor, control, and manage their assets, from water and energy to environmental systems.

Built on the values of trust, integrity, and innovation, we believe technology should be practical, transparent, and designed to last. Every product we create represents our family's commitment to quality, honesty, and hands-on support. By combining robust Australian hardware with intuitive cloud platforms, we help our clients gain real-time visibility, improve efficiency, and make confident decisions, wherever they are.

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