

The Rubix iO Modules are anywAIR iO's versatile, low-cost physical Input/Output module. They provide expandable modular monitoring and control points in a small package.

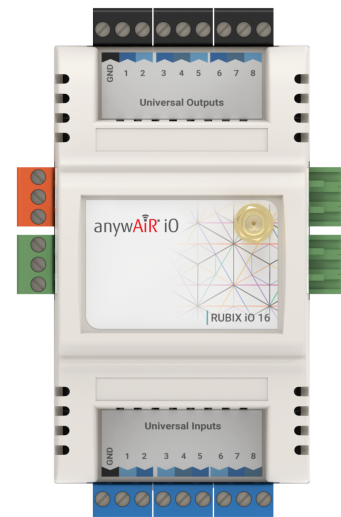
With one or more modules plugged directly into the side of a Rubix Compute, or wired via RS485, these Rubix iO Modules allow for BMS implementations of any size.

In addition to being a slave IO device, the Rubix iO Modules can be configured as standalone HVAC application controllers. With configuration and monitoring of the HVAC applications via Modbus these modules allow for low cost distributed control and central monitoring of many types of systems.

The Rubix iO Modules are a pure Modbus device, making them useful in systems even beyond the anywAIR iO platform.

Optional LoRa wireless version of the Rubix iO allows for wireless communication with the iO Modules. LoRa wireless technology provides a very long transmission range that is less susceptible to object interference than other wireless technologies.

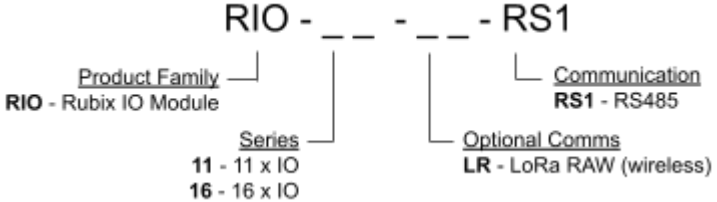
When using LoRa wireless to communicate with the Rubix iO the RS485 port can be used as a Modbus passthrough, this allows for wireless communication with any wired (RS485) Modbus device.



## Technical Data

General			
Dimensions	112mm x 65mm x 56mm or 4.41in x 2.56in x 2.20in		
Operating Temperature	0°C to 65°C		
Enclosure	ABS Plastic, DIN Rail Mount, IP40 Rated		
Power			
Power Supply	24V DC/AC ±10%		
Consumption	<b>Base:</b> 1.2W (50mA at 24 VDC), <b>Max:</b> 36W (1500mA at 24 VDC)		
Recommended Transformer Size	1050mA / 25VA (Transformer should be sized based on Base Current plus the power requirements of all connected output devices)		
Physical Ports			
RS485	1x RS485 Modbus RTU ports. 3 Wire. <b>Speed:</b> 9.6K, 19.2k, 38.4K bit/s <b>Data Bits:</b> 8 bits <b>Parity:</b> None		
LoRa RAW (optional) *Add in radio module	<b>Supported Frequencies:</b> AU915, US915, AS232, EU863 <b>Spreading Factor:</b> 7 <b>Bandwidth:</b> 250 kHz		
Low Level iO	IO-11	IO-16	Description
Universal Inputs (UI)	6	8	<b>Universal Inputs.</b> Configurable as Digital, 0-10VDC, or 10k Thermistor.
Digital Outputs (DO)	2	0	<b>Digital Outputs.</b> 0V[OFF], 12VDC[ON] (700mA).
Universal Outputs (DO)	5	8	<b>Universal Outputs.</b> 0-10VDC (50ma), OR Digital - 0V[OFF] - 12VDC[ON] (700mA).

## Ordering Information

Device Models	
	
<b>RIO-11-RS1</b>	Rubix iO-11 Modbus RS485 (without LoRa Wireless)
<b>RIO-11-LR-RS1</b>	Rubix iO-11 Modbus RS485 + LoRa Wireless
<b>RIO-16-RS1</b>	Rubix iO-16 Modbus RS485 (without LoRa Wireless)
<b>RIO-16-LR-RS1</b>	Rubix iO-16 Modbus RS485 + LoRa Wireless

## Configuration

DIP Switch Settings																																			
<b>Left Bank (SW2) - DIP 1-7</b> Modbus Address (1-127)	Modbus Address set as binary + 1. <table border="1"> <thead> <tr> <th>Address</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> <th>9</th> <th>10</th> <th>11</th> <th>12</th> <th>13</th> <th>14</th> <th>15</th> <th>16</th> </tr> </thead> <tbody> <tr> <td>Switches 1,2,3,4,5,6</td> <td>0000</td> <td>0000</td> <td>0000</td> <td>0000</td> <td>0001</td> <td>0001</td> <td>0001</td> <td>0001</td> <td>0010</td> <td>0010</td> <td>0010</td> <td>0010</td> <td>0011</td> <td>0011</td> <td>0011</td> <td>0011</td> </tr> </tbody> </table>	Address	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	Switches 1,2,3,4,5,6	0000	0000	0000	0000	0001	0001	0001	0001	0010	0010	0010	0010	0011	0011	0011	0011
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<b>Left Bank (SW2) - DIP 8</b> No Function	Must be set to 1 for normal operation. No other functionality.																																		
<b>Right Bank (SW1) - DIP 1-2</b> Operation Mode	<table border="1"> <thead> <tr> <th>Mode</th> <th>RS485 (Wired)</th> <th>LoRa Wireless*</th> <th>RS485 to Lora Passthrough**</th> <th>Factory Reset***</th> </tr> </thead> <tbody> <tr> <td>Switch 1,2</td> <td>00</td> <td>10</td> <td>01</td> <td>11</td> </tr> </tbody> </table> <p>* LoRa is only available on IO-11-LR-RS1 models.                      ** Use this setting* when connecting to 3rd party Modbus Devices.                      *** Set DIP switches, power cycle, then set back to operation mode setting.</p>	Mode	RS485 (Wired)	LoRa Wireless*	RS485 to Lora Passthrough**	Factory Reset***	Switch 1,2	00	10	01	11																								
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