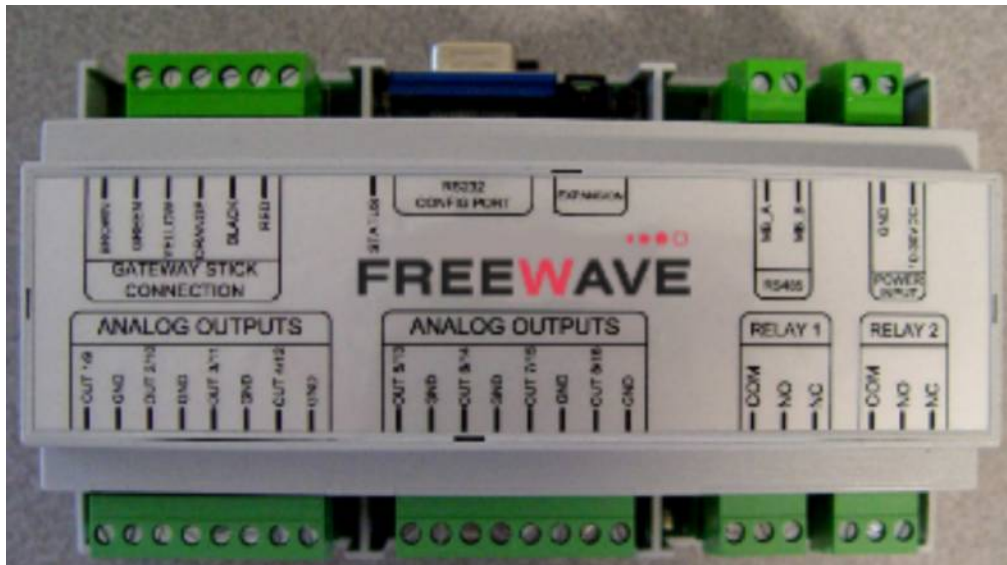


FreeWave Analog/Relay Output Module Manual



The FreeWave Analog/Relay Output Module has the following features:

- 8 Analog outputs (0-20mA or 0-5V)
- 2 Digital Relay outputs
- Wide range DC power input. 10 to 30VDC
- Easy configuration with the SignalFire ToolKit
- Expansion connector to connect second output module
- DIN Rail Mount
- Status LED
- DB9 connector for ToolKit connection to the Gateway

Analog/Relay Output Module Connections

Wire Color	Connection
RED	Positive Power
BLACK	Ground
GREEN	RS485
BROWN	RS485
ORANGE	RS-232 Debug/Programming TX
YELLOW	RS-232 Debug/Programming RX

Power must be provided by the Power Input screw terminals (10-30VDC). The Module power requirements at 12VDC at 17mA plus an average of 25mA for the Gateway stick. In addition if any outputs are used as current outputs, 20mA must be available for each current output used.

The RS485 terminals provide access to the Gateway Modbus interface for an alternate data connection to the Gateway.

To connect a second module for additional outputs, simply use the provided expansion cable and connect the second module to the first. The secondary module must have a jumper installed on the "SLAVE" pins near the expansion connector. On the secondary module only the two analog output and two relay output connectors may be used.

Status LEDs

The Analog/Relay output module has a single green LED available for communication diagnostics.

Status LED	Description
Slow Flash (3 second pause)	System is running at least one remote node is connected.
Fast Flash (1 second pause)	System is running but no remote nodes have connected
Solid On	No communication with the Gateway Stick

In addition there is a green LED near each relay output that turn on while the relay is energized.

Operation

Gateway stick is configured to map node data to the analog outputs. When a node reports an updated value to the gateway the configured output will reflect that value.

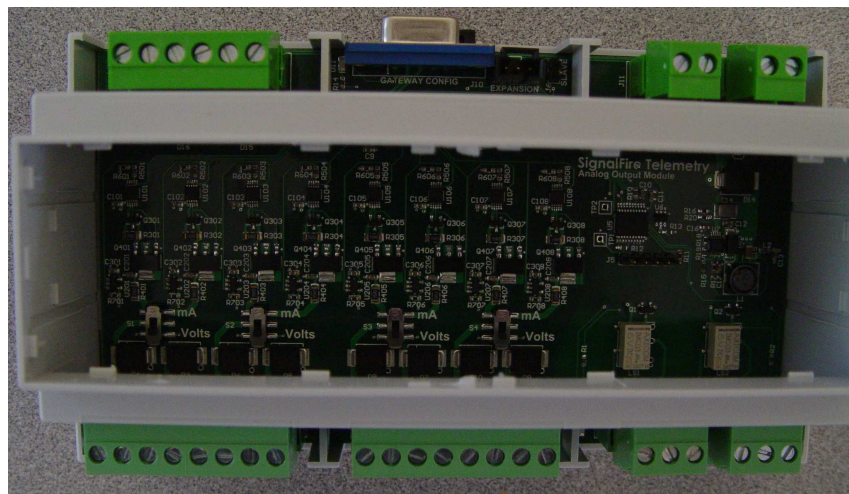
If a node times out of the gateway the analog output will fail a pre-configured fail value (the default fail value is 0).

In addition if the analog/relay output module stops receiving updates from the gateway for 5 minutes, all outputs will be set to 0 and both relays will de-energize.

Configuration

The Analog/Relay output module requires only simple configuration using the ToolKit to map/scale the remote data to a given output.

The analog outputs may operate in either current (0-20mA/4-20mA), or voltage (0-5V/1-5V). The output mode must be set by slide switches inside the module. To do this first remove the cover using a small flathead screwdriver, the cover is held on by clips.



Analog/Relay Module with cover removed

Each switch controls a pair of outputs. For example the switch all the way to the left (S1) sets both output 1 and output 2 to either mA or Volts. See table below for switch mapping.

Switch	Outputs
S1	1 and 2
S2	3 and 4
S3	5 and 6
S4	7 and 8

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To configure the Analog/Relay outputs in the software ToolKit first connect to the DB9 port of the module connected the Gateway stick to your PC. Open the ToolKit and connect to the gateway.

In the Gateway configuration window, go to the 'File' menu and select 'Analog/Relay Output Module'. This will open the configuration window below.

Output Module 1

Source Node						Output Module 1 Analog Settings					
	Slave ID	Node Type	Register Address	Register Type	Current Register Value	Output Mode	Low Register Value	equals Low Output of...	High Register Value	equals High Output of...	Fail with Output Value...
► A1	1	Sentinel Analog	3001-Current(uA)	16bit UINT	14431	mA	4000	4	20000	20	3.5
A2	0	None	0	16bit UINT	Unknown	mA	0	0	0	0	0
A3	0	None	0	16bit UINT	Unknown	mA	0	0	0	0	0
A4	0	None	0	16bit UINT	Unknown	mA	0	0	0	0	0
A5	0	None	0	16bit UINT	Unknown	mA	0	0	0	0	0
A6	0	None	0	16bit UINT	Unknown	mA	0	0	0	0	0
A7	0	None	0	16bit UINT	Unknown	mA	0	0	0	0	0
A8	0	None	0	16bit UINT	Unknown	mA	0	0	0	0	0

Source Node						Output Module 1 Relay Settings				
	Slave ID	Node Type	Register Address	Register Type	Current Register Value	Energize Relay when...	Value	De-energize Relay when...	Value	Fail with Output State...
► D1	0	None	0	16bit UINT	Unknown	Greater than	0	Less than	0	De-energized
D2	0	None	0	16bit UINT	Unknown	Greater than	0	Less than	0	De-energized

☐ Secondary Module

Temporarily Override Output Settings
Output: A1 Value: 0 ☐ mA ☐ V

Success

For each output a rule to control that output must be defined. For example in the configuration window above analog output 1 is defined to be controlled by Slave ID 1 which is a Sentinel-Analog source node. The uA register 3001 is selected. This register is then scaled so that 4000uA is equal to an output of 4mA and 20000uA is equal to an output of 20mA. In addition the 'Fail with Output Value' is set to 3.5mA.

The current register value column displays the latest register value the gateway has for the defined source node/register. Hitting the refresh button will update the current register values.

After editing any of the rules, click on the 'Write Output Settings to Gateway' to store the rules in the gateway.

Any rules that are not defined (Node Type set to 'none') will cause those channels to be set to 0.

Temporary Output Overrides

It is possible to temporarily override an output to a defined value for testing. At the bottom of the window simply select the output channel to override, enter the override value and click the 'Set Output' button. This will force the selected output channel to the set value for 5 minutes or until the 'Clear Output Overrides' button is pressed. This is useful for testing. Note that the channel will be highlighted in yellow when the override is active.

Success

Temporarily Override Output