Telemetry 2

I/O Interface

User Guide

Revision history—90033942

Revision	Date	Description
A	October, 2010	Initial release of the document.
B	March, 2011	Updated and enhanced content.
C	March, 2012	Completed minor updates such as correcting the internal PSU configuration value.
D	August, 2017	Rebranded the document and made minor editorial changes.

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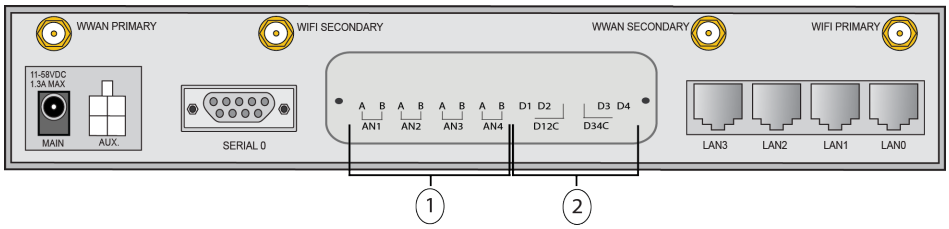
Telemetry 2 I/O Interface

The Telemetry 2 I/O Interface is a general purpose digital I/O interface for the TransPort WR41, WR44, and WR44 R. It has four Isolated analog 4-20 mA current loop I/O ports and four non-isolated digital TTL I/O ports. It can be configured as a receiver or transmitter with an internal or external power source.

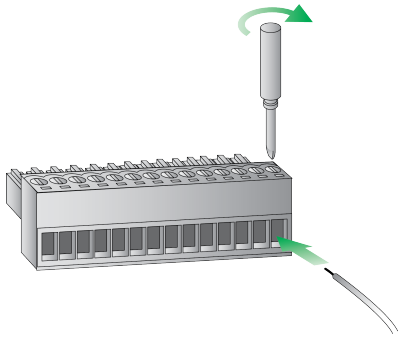
Features



1. **Analog I/O Ports** - AN1, AN2, AN3, and AN4 ports are analog current loop I/O ports consisting of two terminals (A and B) per port.
2. **Digital I/O Ports** - D1 and D2 share a single common ground on terminal D12C. D3 and D4 share a single common ground on terminal D34C. Note that D12C and D34C are electrically connected together internally.

Accessories

A 14-terminal female connector helps to facilitate easy wiring, cable management, and installation. Wires are secured to the connector via screw-down slots, and the connector is affixed tightly to the TransPort unit by tapered terminals. Recommended wire size is 16-26 AWG.



Hardware

Analog IO ports

There are four independent isolated analog 4-20 mA current loop I/O ports. Each port is protected by a 140 mA resettable fuse and a 33 V voltage suppressor.

Loop current can be provided by an external or internal power source. If the internal power source is selected, power is provided by an onboard 12-22 V, 20 mA isolated power supply. Output voltage will vary depending on the load on the PSU.

Direction of the current loop flow

- A Terminal = In
- B Terminal = Out

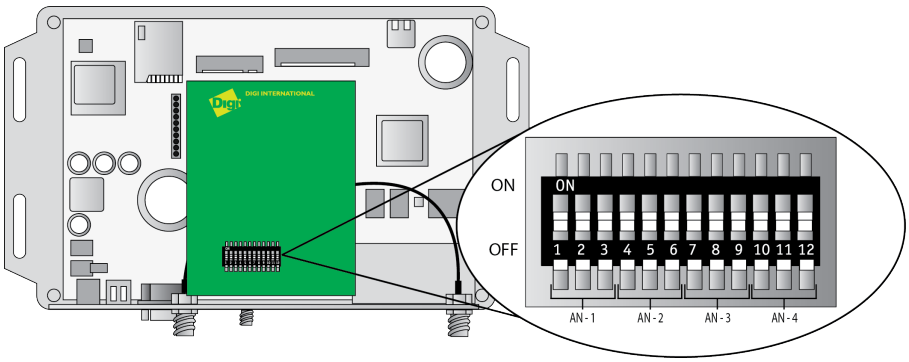
A 12-bit ADC converter changes analog to a digital current, and a 12 bit DAC converter used in the transmit direction changes digital to analog current.

Hardware configuration

The Analog I/O ports can be configured to support an internal or external PSU. Follow these steps to configure the unit accordingly.

WARNING! Access to the inside of the unit is required. This should only be done by a qualified person in an ESD protected environment.

1. Disconnect all power connections from the unit.
2. Unscrew the screws on the bottom of the unit and remove the cover.
3. Twelve DIP switches control the four I/O ports, three DIP switches per port. Configure the DIP switches accordingly (see figure).



	DIP Switch			Port
	1	2	3	AN1
	4	5	6	AN2
	7	8	9	AN3
	10	11	12	AN4
Internal PSU	OFF	ON	ON	
External PSU	ON	OFF	OFF	
[Default]	OFF	ON	ON	

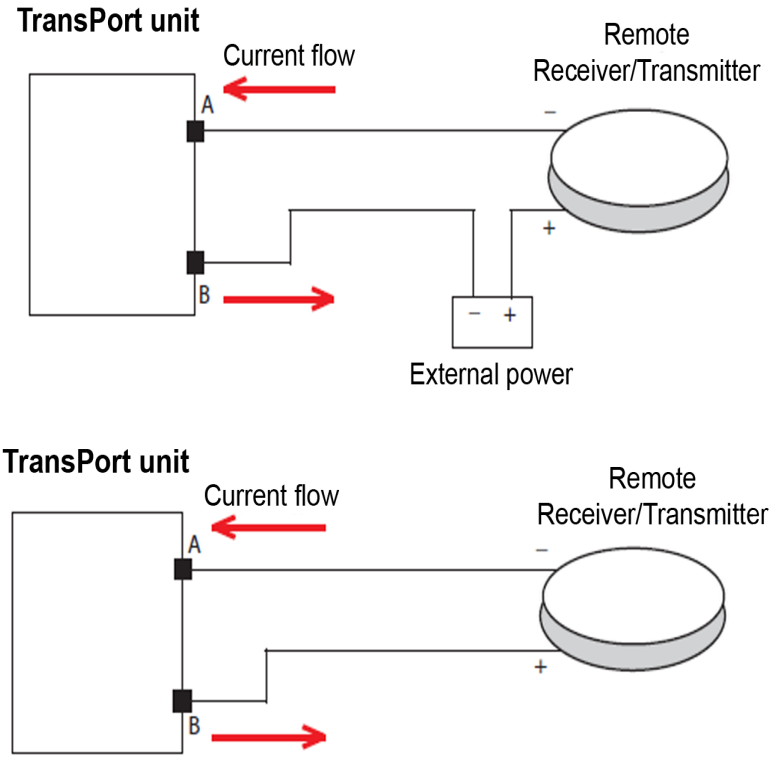
4. Replace the cover and fasten with the screws.
5. Reconnect the power connections and power-up the unit.

Wiring configuration

The following figures illustrate typical wiring configurations when used with an external or internal power source.

Note The maximum length of the cable is determined by the following factors:

- Open loop voltage over the cable
- Voltage drops over the cable
- Telemetry 2 I/O Interface
- Remote equipment



Software Configuration

You can configure the Telemetry 2 I/O interface with the CLI (command line interface). If you choose, you can build into Python or use basic scripts to automate functionality, or you can enter them manually via the CLI or SMS.

Note The CLI commands in this table are case sensitive.

telemetry2 aiotxloop	[{-A1-4 on|off}]	analog Tx current loop control
telemetry2 aiorxloop	[{-A1-4 on|off}]	analog Rx current loop control
telemetry2 aiotxdac	[{-A1-4 <dac>}]	set analog Tx current DAC
telemetry2 aiotxmA	[{-A1-4 <mA>}]	set analog Tx current mA
telemetry2 aiorx	[{-A1-4}]	show analog Rx current
telemetry2 aiocal	start x | y [{<-A1-4>}]	start analog calibration
telemetry2 aiocal	stop {<-A1-4> <mA>}	enter analog calibration values
telemetry2 aiocal	show [{<-A1-4>}]	show analog calibration data
telemetry2 aiocal	reset	wipe all analog calibration data
telemetry2 dio	[{-D1-4 on|off}]	digital I/O control
telemetry2 psu	[on|off]	internal power supply control

Loop calibration

The current-loop ports are calibrated by default and ready to use. They can also be re-calibrated in the field. The power source can be taken from either the internal or an external power source.

Electrical characteristics

Parameters	Minimum	Maximum
Voltage required by Loop Transmitter	10 V	
Voltage drop across Loop Receiver @ 20 mA		6 V
Internal power supply output voltage	12 V	22 V
Input voltage applied across terminal A-B		30 V
Accuracy	+/- 0.02 mA	

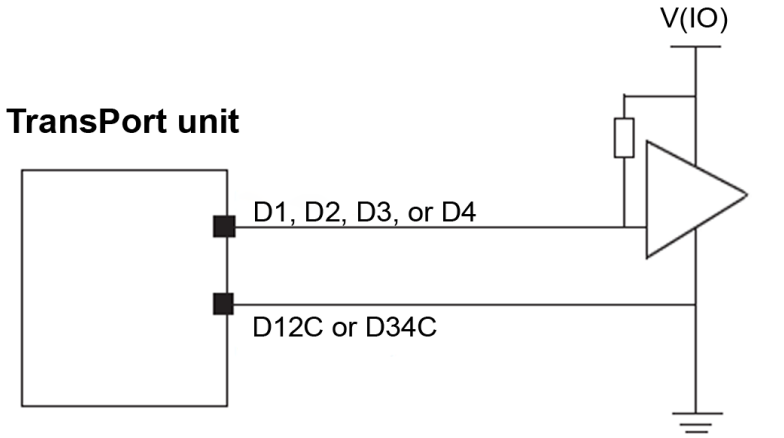
Digital I/O ports

There are four non-isolated digital I/O ports which all share a common ground.

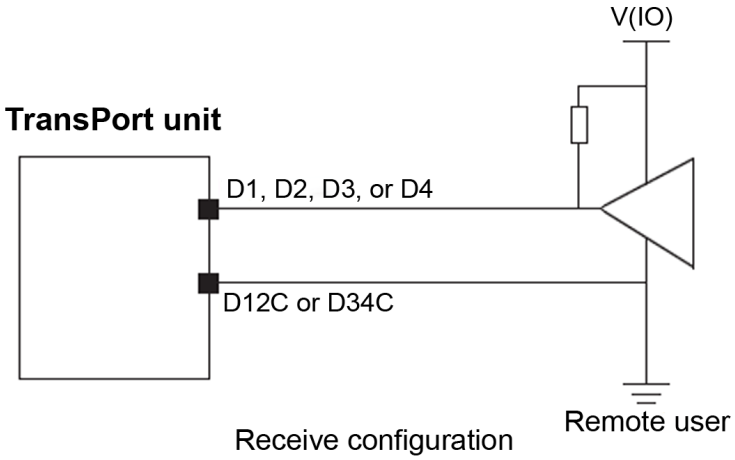
Wiring configuration

The following images illustrate typical wiring configurations for both Transmit and Receive applications.

Note Ports are in an open collector configuration and require an external pull-up resistor. Also, the ports can sink a maximum of 12 mA.



Transmit configuration



Receive configuration