

Scaling a Counter Node frequency input to an analog output

OVERVIEW

A QS18 retroreflective sensor detects a strip of reflective tape on a rotating shaft. The QS18 output is used as a discrete input to a DX80 Counter Node to determine the frequency (speed) of shaft rotation. The user would like this frequency to be converted to an analog output on a DX80 Gateway.

This example uses a DX80G9M6S4P4M2M2 Gateway and DX80N9X2S4A2 Node, and Banner’s User Configuration Tool (UCT).

1. To use Counter Input 2 on the Node as a frequency counter, device DIP Switch 7 should be in the OFF position.
2. Verify the Node’s Device DIP switches and Counter DIP switches are set up as necessary for this application.



Device Settings	DIP Switches							
	1	2			5	6	7	8
Rotary switch address mode	OFF*							
Extended address mode	ON							
Host configured (override switches)		OFF*						
Use switch settings		ON						
Discrete IN #1 Sinking (NPN)					OFF*			
Discrete IN #1 Sourcing (PNP)					ON			
Discrete IN #2 Sinking (NPN)						OFF*		
Discrete IN #2 Sourcing (PNP)						ON		
Counter 2: frequency (rate) counter							OFF*	
Counter 2: event counter							ON	
Report rate 16 seconds								OFF*
Report rate 1 second								ON

* Default configuration

Counter Input 1	Switches			
	1	2	3	4
Low threshold (0.25V)	OFF*			
High threshold (1.5V)	ON			
Debounce enabled		OFF*		
Debounce disabled		ON		
Self-energized input			OFF*	OFF*
Enable PNP (sourcing)			OFF	ON
Enable NPN (sinking)			ON	OFF

* Default configuration

Counter Input 2	Switches			
	5	6	7	8
Debounce enabled	OFF*			
Debounce disabled	ON			
Self-energized input		OFF*	OFF*	
Enable PNP (sourcing)		OFF	ON	
Enable NPN (sinking)		ON	OFF	
Low threshold (0.25V)				OFF*
High threshold (1.5V)				ON

* Default configuration

3. Use the UCT tool to map the frequency input on the Node to an analog output on the Gateway. The Null value corresponds to the minimum frequency (in Hz) that will be proportional to the minimum analog output value. The Span value (Hz) is the difference from the Null value that will correspond to the proportional maximum analog output value.

The screenshot below illustrates settings for a 4–20 mA analog output that is proportional to a 50 Hz to 1kHz frequency range.

The screenshot shows the 'DX80 User Configuration Tool' interface. The 'I/O Linking' tab is active. Under the 'Source' section, 'Node 1' is selected. Under the 'Destination' section, 'Gateway' is selected for I/O # 13, with a type of '4-20 mA'. The configuration for this link is as follows:

Device	I/O	Type	Device	I/O #	Type	Null (units)	Span (units)	Default Output (units)	Hold Last State
Node 1	1	Discrete	No Link	--	None	0	--	0	<input type="checkbox"/>
Node 1	2	Discrete	No Link	--	None	0	--	0	<input type="checkbox"/>
Node 1	3	Double	No Link	--	None	0	--	0	<input type="checkbox"/>
Node 1	4	Raw Value	No Link	--	None	0	--	0	<input type="checkbox"/>
Node 1	5	Analog	Gateway	13	4-20 mA	50	ALG 950	ALG 0	<input type="checkbox"/>
Node 1	6	Raw Value	No Link	--	None	0	--	0	<input type="checkbox"/>
Node 1	7	Raw Value	No Link	--	None	0	--	0	<input type="checkbox"/>
Node 1	8	Raw Value	No Link	--	None	0	--	0	<input type="checkbox"/>