

V-LINK[®] DEMOD-DC[®]



Using the DEMOD-DC[®] with the V-Link[®]

Overview

MicroStrain's [V-Link[®]](#) wireless voltage node has 3 single ended analog input channels designed to acquire and digitize any 0-3 volts DC sensor at 12 bits and transmit the data wirelessly to a host computer. MicroStrain's [DEMOD-DC[®]](#) miniature signal conditioner accepts DC power and provides trimmed analog output for any of MicroStrain's DVRT[®] displacement transducers. The DEMOD-DC[®] can be connected to the V-Link[®]'s single ended analog channels and its analog displacement data can be digitized and transmitted to a host computer. This technical note discusses how to do this integration and assumes the user has some familiarity with both devices.

DEMOD-DC[®] Customization

The standard DEMOD-DC[®] is designed to be powered with 6 to 16 volts DC. However, the V-Link[®] only provides 3 volt excitation. This therefore requires customization of the DEMOD-DC[®] at the factory to support a V-Link[®] connection. To accomplish this, the power regulation circuit of the DEMOD-DC[®] is disarmed, allowing the 3 volts supplied by the V-Link[®] to directly power the DEMOD-DC[®]'s circuitry. Each factory customized DEMOD-DC[®] and its accompanying color-coded 3-wire pigtail cable are marked with a tag, 'Input 3 Volts Only!!!'.

Wiring

- Connect your DVRT[®]'s lead cable to the 4-pin LEMO connector of the DEMOD-DC[®].
- Connect the Micro DB-9 connector of the color-coded 3-wire pigtail cable to the DEMOD-DC[®].
- Connect the 3 flying leads to the V-Link[®] as shown in [Figure 1](#).
 - Blue lead to either Ain5, Ain6 or Ain7; Ain5 shown in figure.
 - Purple lead to GND.
 - Green lead to P+.

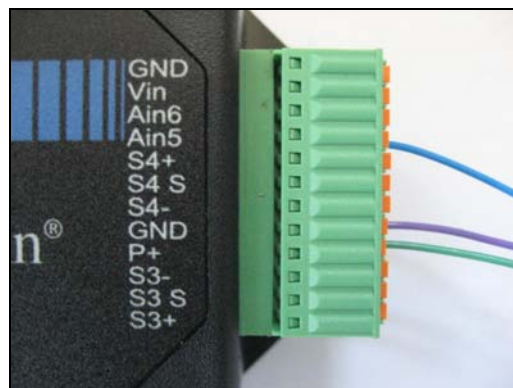


Figure 1

Operation with Node Commander[®] software

- Turn the V-Link[®] on, launch Node Commander[®], and establish communication with the node.
- Right-click the node and a drop-down menu will appear.
- Click Configure and the Configuration screen will appear.
- Click the Channels tab.
- Check (to enable) Channel 5 (our Ain5 example) and uncheck all other channels.
- Click the Configure button to the far right of Channel 5 and the Configuration screen for Channel 5 will appear as shown in **Figure 2**.

Figure 2

- In the Class drop-down box, select 'Custom Units'.
- In the Units drop-down box, select 'mm'.
- On the first page of your DVRT[®]'s Certificate of Calibration, you will find the calibrated Slope (mm/V) coefficient.
- For our example we will use the value '2.83234' shown in **Figure 3**.

	Date of Calibration:	5/24/2010	<u>Sensor Color Key</u>	
			__	black
	Sensor Model:	SG-DVRT-8	__	red
	Sensor Serial Number:	1221-2159	__	blue
			__	green
	Signal Conditioner Model:	DEMOD-DC	__	yellow
	Signal Conditioner Serial Number:	3118-4640	__	white
	-3dB Bandwidth:	800		
	Slope (mm/V):	2.83234	*	
	Offset(mm):	-4.1876		

Figure 3

- Using the formula, below we are able to find 'mm/bit' which is required for the Convert Bits To... input on the Configuration screen:
 - **0.002074 mm/bit = 2.83234 mm/volt * 3 volts / 4096 bits**
 - where mm/bit is the Configuration Slope input required by Node Commander[®],
 - where mm/volt is the calibrated Slope of the DVRT[®],
 - where 3 volts is the V-Link[®]'s excitation, and
 - where 4096 bits is the resolution of the V-Link[®]'s 12-bit A/D converter.

- Click the Modify button.
- Enter 0.002074 into the Slope box.
- Enter 0 into the Offset box.
- Click the Lock button.
- Click OK and the Channel 5 Configuration screen will disappear.
- Click the Streaming tab.
- Uncheck the Continuous Streaming checkbox.
- Enter 6000 (~8 seconds) into the Sweeps box.
- Click Apply.
- Click OK and the Configuration screen will disappear.
- Right-click the node and a drop-down menu will appear.
- Click Stream and click Start to stream the node.
- After about ~4 seconds, exercise the DVRT[®] through its linear stroke and you will observe a streaming output similar to the graph shown in **Figure 4**.

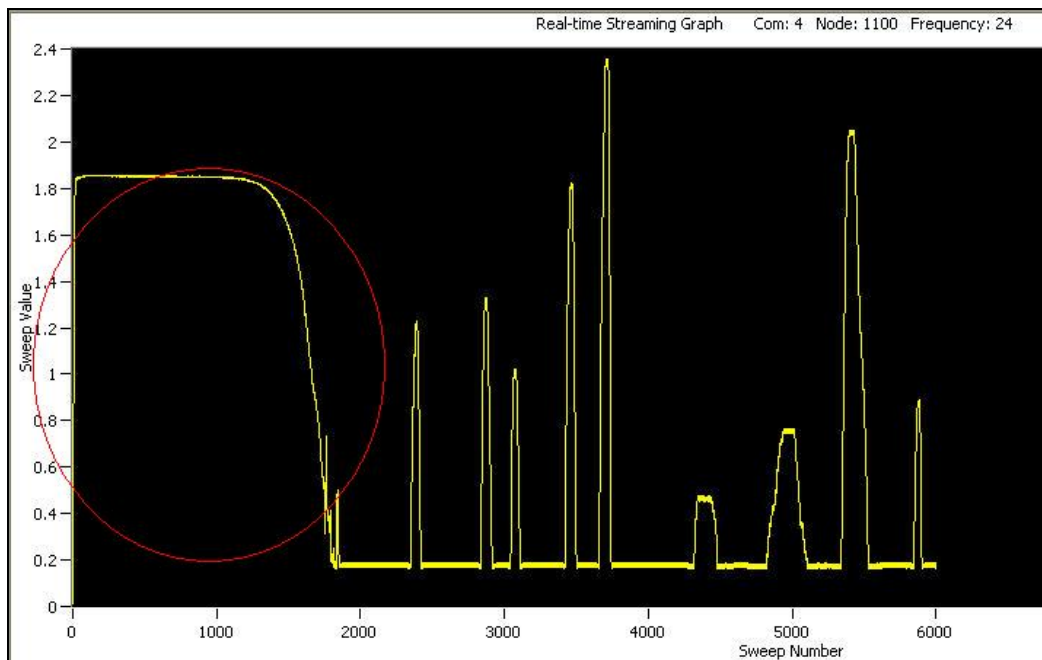


Figure 4

- **Important Note:** During the first ~2.5 seconds of the streaming session, the DEMOD-DC[®] is charging up its capacitors and the V-Link[®]'s output should be disregarded. Once the capacitors are charged, the output is accurate. This charging period must be taken into account during any streaming, high speed streaming or datalogging session. Low duty cycle operation is not recommended with the DEMOD-DC[®] and V-Link[®] combination.