LORD Sensing TECHNICAL NOTE

V-Link-200[®] Wireless Sensor Programmable Low-Pass Filter

Contents	
FILTER OVERVIEW	1
CONFIGURABLE LPF	2
FREQUENCY RESPONSE	2
ANTI-ALIASING	4
SWITCHED EXCITATION	4

FILTER OVERVIEW

The V-Link-200 wireless sensor node uses low-pass filters (LPF) for anti-aliasing and to reduce signal noise. Each differential channel contains a passive LPF located before the INAMP and a programmable LPF prior to the analog to digital conversion. The programmable LPF uses a 3rd order Sallen-Key configuration. Combined, the filters achieve a flat passband and approximately 40 dB/ decade roll-off. A block diagram of the V-Link-200 and Bode plots for each filter setting are available below.

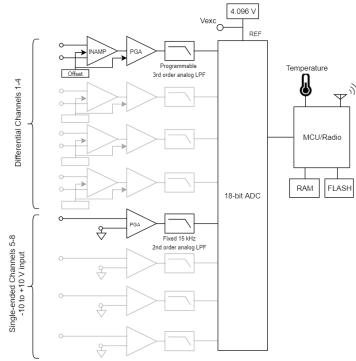


Figure 1. V-Link-200 Electrical Block Diagram.

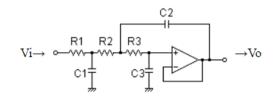


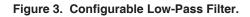
Figure 2. V-Link-200 Programable Low-pass Filter using 3rd-order Sallen-Key Configuration.



CONFIGURABLE LPF

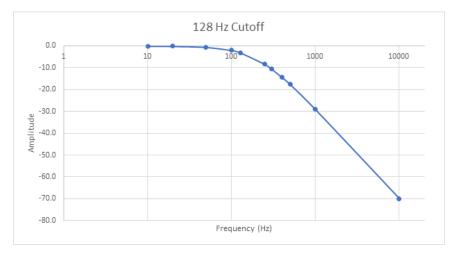
Using SensorConnect, users can independently configure the filter for each differential input channel.

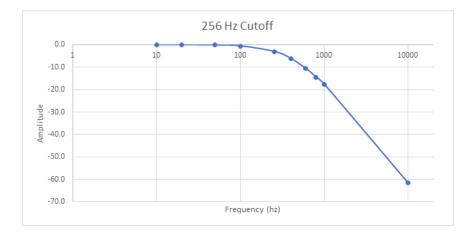
Anti-Aliasing Filter			128 Hz	
Channel(s)	Filter Cutoff		4,000 Hz	
Differential (ch1)	128 Hz	Ŧ		
			2,000 Hz	- 1
Differential (ch2)	128 Hz	Ŧ	1,024 Hz	- 1
Differential (ch3)	128 Hz	•	500 Hz	
	120112		256 Hz	
Differential (ch4)	128 Hz	v	100.11	
	L		128 Hz	



FREQUENCY RESPONSE

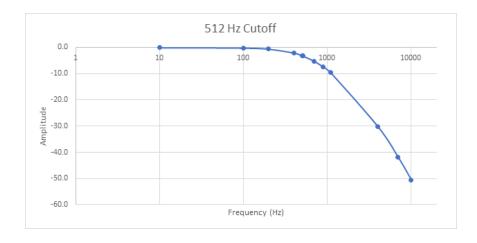
The following images are Bode plots displaying the frequency response of the V-Link-200 differential channel filters.

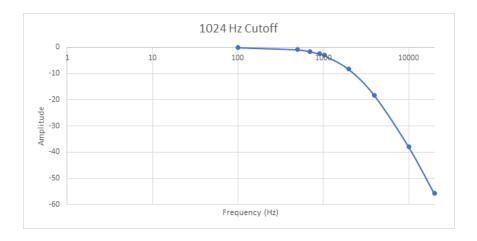


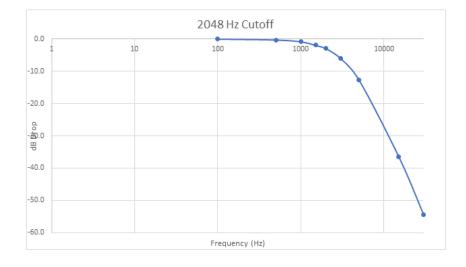




LORD Sensing TECHNICAL NOTE

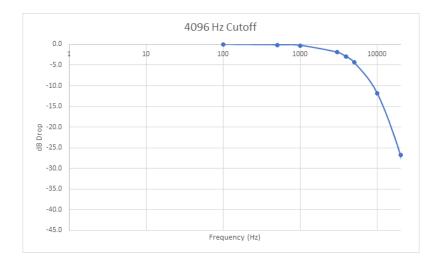








LORD Sensing TECHNICAL NOTE



ANTI-ALIASING

The default mode for the V-Link-200 is to power the sensor continuously while sampling. To ensure proper anti-aliasing, leave the "Sensor Always On" feature enabled and set the configurable low-pass filter to 1/2 of the sample rate or lower.

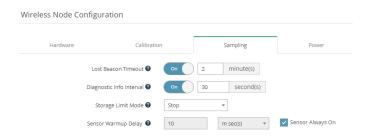


Figure 4. Screenshot of SensorConnect V-Link-200 Configuration Screen.

SWITCHED EXCITATION

Extend the battery life of the V-Link-200 significantly by duty cycling power to the sensor. Disable "Sensor Always On" and set an appropriate Sensor Warmup Delay. This is appropriate for applications that do not require anti-aliasing.

LORD Sensing MicroStrain

459 Hurricane Lane Suite 102 Williston, VT 05495 • USA www.microstrain.com

Customer Support Center (in United States & Canada) Tel: +1.802.862.6629 Email: sensing_sales@LORD.com | sensing_support@LORD.com For a listing of our worldwide locations, visit LORD.com



©2019 LORD Corporation Subject to change without notice