

DVRT-Link™ -LXRS®

Understanding the Calibration

Overview

The DVRT-Link™ -LXRS® Wireless Displacement Node supports all LORD MicroStrain® DVRT® Displacement Transducers. Each DVRT® is calibrated at the factory with its particular DVRT-Link™ -LXRS®. The factory calibration is stored in the non-volatile memory (EEPROM) of the DVRT-Link™ -LXRS® and will be read by Node Commander® software. This technical note provides further understanding of this calibration.

Certificate of Calibration

A Certificate of Calibration is shipped with each system. In Figure 1 we see the Calibration Summary which identifies the DVRT® and the DVRT-Link™ -LXRS® by serial number. It is important that the 'pair' be kept together; mixing various DVRT® and DVRT-Link™ -LXRS® invalidates the specific calibration. Our example shows an HSG-DVRT-6 which has a 6 mm measurement stroke. In Figure 2 we see the details of the Linear Fit calibration including the Sensor Output vs. Displacement graph showing -3 to +3 mm displacement (6 mm full scale) over a 0 to 3 volt range. This is further reduced to a Slope of 2.22402 mm/V and an Offset of -3.5171 mm.

Certificate of Calibration	
This document certifies that the equipment referenced below meets published specifications.	
Date of Calibration:	6/26/2012
Sensor Model:	HSG-DVRT-6
Sensor Serial Number:	1225-113
Signal Conditioner Model:	DVRT-LINK
Signal Conditioner Serial Number:	2421-199
-3dB Bandwidth:	800
Slope (mm/V):	2.22402 *
Offset(mm):	-3.3517
Calibrated by:	
Calibration Temperature (deg C):	22
Calibration Frequency:	Static (< 2Hz)
Warm up time:	>15 minutes †
Customer:	ABC Company
* NOTE: For the calibration to be valid the fixture material must be a polymer or 300 series stainless steel	
† For maximum stability please allow 15 minutes warm-up after the system is initially powered.	
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Williston, VT 05495	
USA	
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sales@microstrain.com	
For questions concerning this certificate, please call MicroStrain, Inc. for an applications engineer.	

Figure 1: Calibration Summary

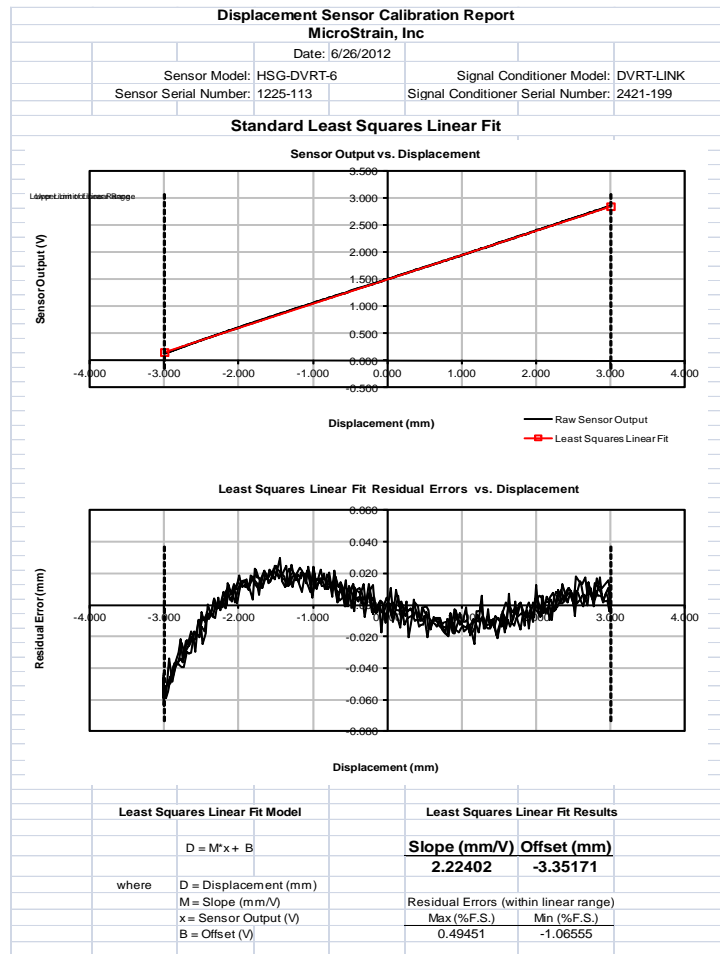


Figure 2: Linear Fit

Functional Test Checklist

A Functional Test Checklist, as shown in Figure 3, is also shipped with each system. This checklist is primarily targeted at final tests performed on the DVRT-Link™ -LXRS® electronics. Additionally, a calculation is performed to convert the Slope, arrived at in the Linear Fit and reported as mm/V (millimeters per volts), to a Slope reported in mm/bits (millimeters per bit). As shown on the checklist, a Slope of 0.001628921 mm/bits is derived from the formula: 2.22402 mm/V x (3 volts / 4096 bits). By way of further explanation, the DVRT-Link™ -LXRS® excites the sensor circuit with 3 volts and employs a 12-bit A/D converter, hence the '3 volts / 4096 bits'. Figure 4 shows the 0.001628921 Slope read out from the DVRT-Link™ -LXRS® and displayed in the Channel Configuration screen in Node Commander®. Note that the Offset arrived at in the Linear Fit is not used; the Offset is specific to the factory calibration test fixture. This Offset may be adjusted by the user to suit their particular needs.

DVRT-Link-LXRS Functional Test Checklist			Revision C
Date	3/13/13		DVRT Serial
Test Tech.	NA		1225-0113
Serial Number	2421-199-008K1		DVRT-link slope*
Mfg. Address	199		0.001628921
Lot Number	008K1		
Part Number	6318-1000		
Firmware Version	7.29		
Radio Frequency	2.475		
Channel	25		
Functional Tests:		pass	Custom Notes:
1. General Communication Test		PASS	
2. Bootloader Test		PASS	
3. Channel 1 Input Test		PASS	
4. Trigger / Datalogging Test		PASS	
5. Battery Recharge Test		PASS	
6. Temperature Sensor Test		PASS	
7. Range Test		PASS	
8. Sleep Current		PASS	
*Slope calculated from the sensor calibration sheet: Slope (mm/V) x (3V/4096 bits)			
Slope from demod-dc	2.22402		
	0.001628921		
offset from demod-dc	-3.3517		

Figure 3: Functional Test Checklist

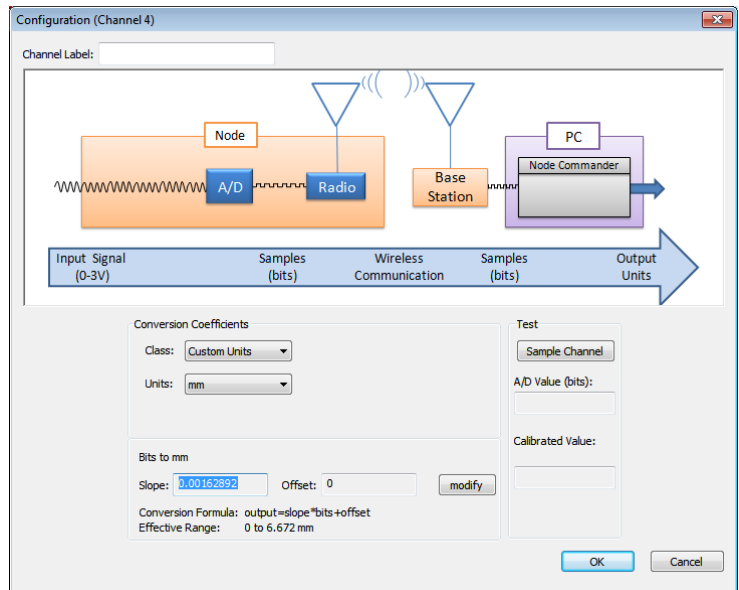


Figure 4: Channel Configuration screen

Support

LORD MicroStrain® support engineers are always available to expand on this subject and support you in any way we can.