



Hood Technology Corporation 30 August 2009
Blade Vibration Sensor Interface - BVSI Model 5.22

Overview

The BVSI receives analog blade tip sensor signals and converts them into time of arrival and blade pluse amplitude data.

General Specifications

An integrated approach to non-contact blade and vibration monitoring.

- Any analog sensor (optical, variable reluctance, eddy current, capacitive, etc.).
- Sensor Signal Conditioning (high pass, low pass, gain, etc.).
- Time of Arrival and Pulse Height measurement.
- Connects to sensors using BNC or through DB9 from Hood Technology™ optical or eddy current preamps.
- Requires use with the Hood Technology™ Blade & Vibration Monitor System.

Size: 11" x 8.5" x 2.75" / 28 cm x 22 cm x 7 cm

Weight: 4.8 pounds / 2.2 kilograms

Interface Board

Performs a range of functions including:

- Provides power to Hood Technology™ preamplifier
- Determines blade passage on a repeatable feature of the analog pulses generated by the sensors.
- TTL pulse indicating time-of-arrival and an additional pulse indicative of pulse magnitude indicating tip clearance.
- Settings adjustable using Hood Technology™ software or push button menu on BVSI.

Features

Time of Arrival Logic offers two choices to find a distinctive pattern in the analog signal to generate a blade passage pulse:

- Triggering at a fixed voltage on the rising edge of the pulse. Recommended for signals already in TTL form and saturated signals such as optical sensor signals.
- Adaptive triggering on the falling edge of the pulse. The trigger level is adjustable between 0% and 90% of the pulse's peak value.

Invert Signal: Eddy current or capacitive sensors may be installed with opposite polarity so that pulse goes negative then positive.

Hold Off : Hold off period prevents any blade detection from occurring after a pulse has been triggered. The Hold Off period can be set to guarantee single detection per blade and noise elimination.

Measuring Pulse Magnitude: The peak values of the analog pulses generated by the sensors can be indicative of tip -clearance.

High pass, low pas, bias adjust and gain.

Connectors & Switches:

68 Pin SCSI Connector: Used to communicate with data acquisition software, both for parameter selection and data (Time of Arrival and Magnitude).

DB-9 Input: Accepts input from Hood Technology™ preamps and provides power to preamps.

R-J45 Output: Outputs each channel analog signal to the A/D card. Is viewed in the acquisition software digital oscilloscope.

Removable Power Cord

Manual On/Off Switch

3 BNC input: Accepts 3rdparty sensor signals and IRIG.

2 BNC output: User definable.

Parameters With Associated Ranges and Values.

Parameter	Min Value	Max Value
Gain	-25	25
High Pass Filter Cutoff	0 Hz	3397 Hz
Low Pass Filter Cutoff	23 kHz	1496 kHz
Offset	-7 V	+7 V
Arm level	0.055 V	4.995 V
Trigger Edge	Rising/Falling	N/A
Trigger Level	0 %	90 % of max value attained
Hold Off	0.2 μ s	4984 μ s
Decay Rate	Slow/fast	N/A

1. Electrical Characteristics

1.1 Power Out to sensor conditioning boxes: sub-D9

Table 1: subD9 Power Output

Voltage	Location
Ground	Sub-D9 Pin 6, 7, 8, 9
+12VDC	Sub-D9 Pin 4
12VDC	Sub-D9 Pin 5

1.2 Input Signals

WARNING: Do not exceed rails (7V).

Table 2 : Input Signal Characteristics

Usable Range:	6.5V, protected
Channel 1:	BNC or Sub -D9 Pin 1
Channel 2:	BNC or Sub -D9 Pin 2
Channel 3:	BNC or Sub -D9 Pin 3
Bandwidth (Analog):	DC to 2 MHz
Cross Talk	< 0.01%
Noise	< 3mV at 10 x gain

1.3 Output Signals

SCOPE A/B: BNC. Select signal by pushing the Scroll buttons.

Any signal available on SCOPE A is available on SCOPE B. Available signals are in Table 4.

Table 3: Multiplexed Output Signals

Sig	Input signal after high-pass, gain, invert
Arm	Arming level, 50mV to 5V
Trigger	Triggering level, ground to 90% x Arm
TOA	Time -Of-Arrival pulse, 5V, width set by hold-off selection from 1.4usec to 2msec
MAG	Peak-held pulse amplitude

1.4 SCSI 3 to National Instrument Board

SCSI 3 Connector:

For the SCSI3 pin-out, refer to National Instruments PCI6602 board documentation. The following outputs are connected to the PCI6602 counters:

Table 4: Output Pulse to Counter

Channel 1 TOA & Magnitude	6602 Counter 0
Channel 1 TOA	6602 Counter 1
Channel 2 TOA & Magnitude	6602 Counter 2
Channel 2 TOA	6602 Counter 3
Channel 3 TOA & Magnitude	6602 Counter 4
Channel 3 TOA	6602 Counter 5



1750 COUNTRY CLUB ROAD
HOOD RIVER, OR 97031

T: 541.387.2288
F: 541.387.2266

This document, as well as the equipment and software described in it, may be used only in accordance with the terms set forth by the specific usage agreement between Hood Technology and the user.

The content of this document is furnished for informational use only, is subject to change without notice, and should not be construed as a commitment by Hood Technology. Hood Technology assumes no responsibility or liability for any errors or inaccuracies that may appear in this document.

This material may not be transferred either in their original form or after being incorporated into other end items, without written approval of Hood Technology.