

## DS651 Inter-Loc V Analog Isolation Kit

(P/N: IL5-ANA-ISO-000)

### Overview

The Inter-Loc V Analog Isolation Kit provides convenient access to the programmable analog inputs and outputs on Inter-Loc V Dynamometer and Throttle controller cards. Screw terminal connections on the interface board eliminate the need to wire directly into the high-density ANALOG I/O connectors on the controller cards. In addition, industry standard 5B modules can be installed to provide analog isolation on any or all of the analog I/O channels.

### Contents

The following items are included in the base kit.

QTY	ITEM
1	Isolation board (DS651) in a DIN-rail mountable frame.
1	2 meter cable
1	5B49-05 isolation module
1	DS651_Manual.pdf (this document)

### Setup and Configuration

- 1) Install a 5B49-05 isolation module for each analog output channel that requires isolation and set the appropriate switch to the ISO position. All other switches should be set to the BYP position.
- 2) Install a 5B41-03D isolation module for each analog input channel that requires isolation and set the appropriate switch to the ISO position. All other switches should be set to the BYP position.
- 3) A shunt at JP1 has been installed at the factory. In rare instances, it may need to be removed as explained in the Reference section of this document. Remove JP1 if needed.
- 4) If any 5B modules are installed, connect a +5VDC 3A supply to TB6.
- 5) Connect the isolation board to the appropriate ANALOG I/O connection on the Inter-Loc V using the provided 2 meter "VGA" extender cable.
- 6) Configure the function of each Programmable Analog Output (or Input) in the Inter-Loc V as explained in the Inter-Loc V User's Manual.

## **Isolation**

Electrical isolation on each analog channel is provided by industry standard 5B modules. Their use (on a per channel basis) is entirely optional. Each channel contains a slide switch that enables/disables the respective 5B module. If a module is not installed, place the switch in the BYP (bypass) position. This creates a direct electrical connection between the Terminal Block (i.e. TB1 – 5) and the corresponding analog channel. If a 5B module is installed, place the switch in the ISO (isolation) position; this (electrically) places the 5B module into the signal path.

NOTE: An installed 5B module can still be bypassed by placing the corresponding switch in the BYP position.

NOTE: The (-) terminals of all bypassed input and output channels (i.e. those channels with the switch in the BYP position) are electrically connected together creating the risk of ground loops, etc.

At the present time, only two types of 5B are supported. No other modules should be used.

Channel Type	Module P/N
Analog Output	5B49-05
Analog Input	5B41-03D

## **Potentiometer Connection (TB7)**

The isolation board contains a Terminal Block for the connection of a potentiometer (POT). This POT can be used to generate a unipolar analog voltage to feed back into one of the analog input connections. This input can ultimately be used for prototyping or diagnostics, or may be the main analog input device for your system.

The end terminals of the POT should be connected to the POT- and POT+ terminals on TB7. The wiper arm terminal of the POT can be connected to one of the analog inputs (i.e. IN+ terminal on TB4 or TB5).

TB7 provides a +15VDC reference via a series-connected 5K resistor; thus, with no POT connected, the open circuit voltage between the POT+ and POT- terminals is +15VDC. If a 10K POT is connected, the voltage range at the wiper arm will be 0 to +10VDC.

If directly connected to one of the analog inputs (i.e. switch in the BYP position), the POT will experience some loading effects since the input impedance of the Inter-Loc V analog input channels is 92.8K ohms. The following table summarizes the available voltage range for several POT values when connected to one of the analog input channels. If a 5B module is installed (and enabled) on the respective input channel, no loading effects exist and a 10K ohm pot can be used

POT value (kohm)	Available Voltage
10	+ 9.660 volts
12	+10.207 volts
15	+10.819 volts
20	+11.509 volts
25	+11.968 volts

## Reference

A summary of each component and its function is listed below.

Item	Description
5B1 – 3	5B modules for electrical isolation of the Inter-Loc V analog output channels are optionally installed at these locations. Use a 5B49-05 module ( $\pm 10V$ input, $\pm 10V$ output, 400Hz BW) at each location as needed. NOTE: one module is included in the base kit. Contact DyneSystems to order additional modules.
5B4 – 5	5B modules for electrical isolation of the Inter-Loc V analog input channels (dyno controller cards only) are optionally installed at these locations. Use a 5B41-03D module ( $\pm 10V$ input, $\pm 10V$ output, 10kHz BW) at each location as needed.
SW1 – 5	These switches are used to enable/disable isolation of the respective analog input or output channel. If the channel does not require isolation and/or the respective 5B module is not installed, the corresponding switch must be in the BYP (bypass) position. Conversely, if a 5B module IS installed for the respective channel and you wish to use it for isolation, the corresponding switch must be in the ISO (isolation) position.
TB1 – 3	(+) and (-) connections for each analog output channel. Note that the (-) connections for all non-isolated input and output channels (i.e. those with the respective switch in the BYP position) are electrically connected to each other in the Inter-Loc V.
TB4 – 5	(+) and (-) connections for each analog input channel. Note that the (-) connections for all non-isolated input and output channels (i.e. those with the respective switch in the BYP position) are electrically connected to each other in the Inter-Loc V. The EXC- and EXC+ terminals are for future use and should not be connected.
TB6	Provides +5V excitation for this interface board. Only required if any 5B modules are installed. A +5VDC 3A supply is required if all five modules are installed.
TB7	Provides a connection for an external potentiometer.
JP1	The common terminal from your power supply (i.e. COM terminal on TB6) must be connected to the analog commons of all inputs at one (and only one) point in the entire system. The 5B modules require this. This connection is made by keeping the factory-installed shunt in place at JP1. If your system requires this connection to be made elsewhere, remove the shunt from JP1. This is also shown on the accompanying schematic diagram.
F1	5A / 250V Fuse.
CON1	Provides connection to ANALOG I/O connector on Inter-Loc V controller card. Pin descriptions are listed below.
R4 – 5	NOT USED. For future use.
CJC4 – 5	NOT USED. For future use.

CON1

Signal	Pin		Description	Notes
IL5 Programmable Analog Output 1	<b>1</b>		± 10 volt output	
Common		<b>6</b>		
Common			<b>11</b>	
IL5 Programmable Analog Output 2	<b>2</b>		± 10 volt output	
		<b>7</b>		
			<b>12</b>	
IL5 Programmable Analog Output 3	<b>3</b>		± 10 volt output	
Common		<b>8</b>		
Common			<b>13</b>	
Analog Input 1	<b>4</b>		± 10 volt input	1
+15 volts with 5K series resistor		<b>9</b>		2,3
+15 volts with 5K series resistor			<b>14</b>	2
Analog Input 2	<b>5</b>		± 10 volt input	1
Common		<b>10</b>		
Common			<b>15</b>	

**NOTES:**

- 1) Dynamometer controller cards only. Not available when connected to a Throttle Controller card.
- 2) Only available with Rev C (or later) DS603 and DS604 boards. Pins are not connected on earlier versions of these boards.
- 3) Typically not connected since some VGA cables only have 14 conductors (wire #9 omitted).