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**Midwest & Dynamatic  
Dynamometers**

# **By-Wire Throttle Configuration**

for

## **Inter-Loc V**

Procedure Sheet • Version 2.02  
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## By-Wire Throttle Control

**What is By-Wire Throttle Control?** By-Wire Throttle Control is typically used when the device under test (DUT) does not require a mechanical actuator to operate the throttle, but instead has an Electronic Control Module (ECM) operating the throttle. The ECM typically uses a voltage signal to command throttle position. There are several parameters within the Inter-Loc V (Throttle Controller installed) that need to be configured to interface properly with an ECM. This information is also readily available in the Inter-Loc V User's Manual.

### Inter-Loc V Setup Overview

- The Throttle Controller "Control Output Type" parameter will be set to "Position Cmd => ECM". This setting causes the position control loop architecture to be modified for this application. See Step 1 in Configuring Parameters section.
- The Throttle Controller "By-Wire Control" feature has two parameters "Command Voltage (0 %)" and "Command Voltage (100 %)" that will be set based on the input specifications of the ECM. These settings allow you to set the output voltage levels that correspond to 0% throttle and 100% throttle. See Step 2 in Configuring Parameters section.
- The Throttle Controller position "Feedback Source" parameter will be set to "Throttle Position Sensor". This setting configures the Inter-Loc V to expect the position feedback signal to be brought in through the TPS connector located on the rear of the Throttle Controller. Also, there are two parameters "Input Voltage (0 %)" and "Input Voltage (100 %)" that will be set. These settings allow you to set the feedback voltage levels that correspond to 0% throttle and 100% throttle. See Step 3 in Configuring Parameters section.
- One or two of the "Programmable Analog Outputs" of the Throttle Controller will be configured with the "Source" set to "Command Voltage: position". This setting directs the position control voltage to the Analog Output connector on the rear of the Throttle Controller, which will be externally wired to the ECM. See Step 4 in Configuring Parameters section.

**Note:** If there is no TPS sensor installed, a second Programmable Analog Output will be configured with the "Source" set to "Command Voltage: position" and this output will be wired back in to the TPS connector in order to produce a position reading on the OCS screen.

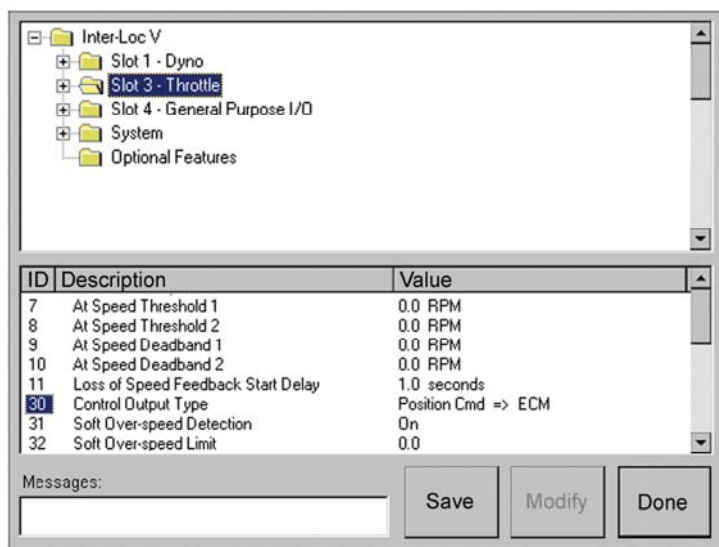
**Note:** Programmable Analog Outputs are low power voltage outputs with limited current sourcing capability; thus, the ECM device MUST provide its own power amplifier unit as needed.

- Connections to the ECM and TPS connector will be made. If an optional Analog Isolation board is installed, these connections are slightly modified. See Wiring section.

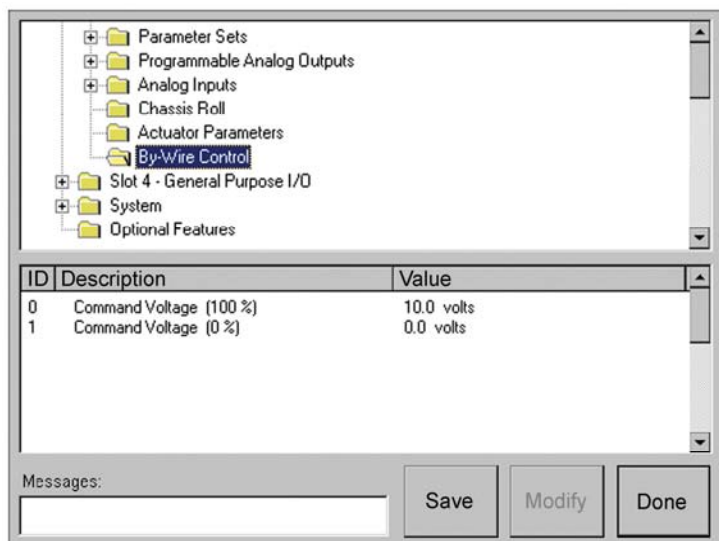
## Configuring Parameters

It is expected at this point that you have the basic knowledge of how to navigate your way through the Inter-Loc V Parameter screens and make changes (a detailed description is located in the Inter-Loc V User’s Manual). The following configuration steps assume that the Throttle Controller to be used for By-Wire is installed in Slot 3. If not, then simply substitute references to Slot 3 with the appropriate Slot number.

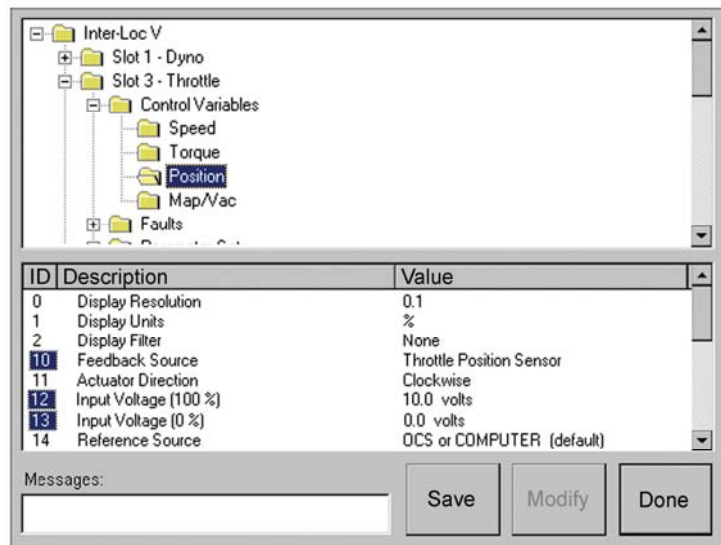
**Step 1**      Navigate to the *Inter-Loc V \ Slot 3 – Throttle* folder and set parameter ID 30 "Control Output Type" to "Position Cmd => ECM".



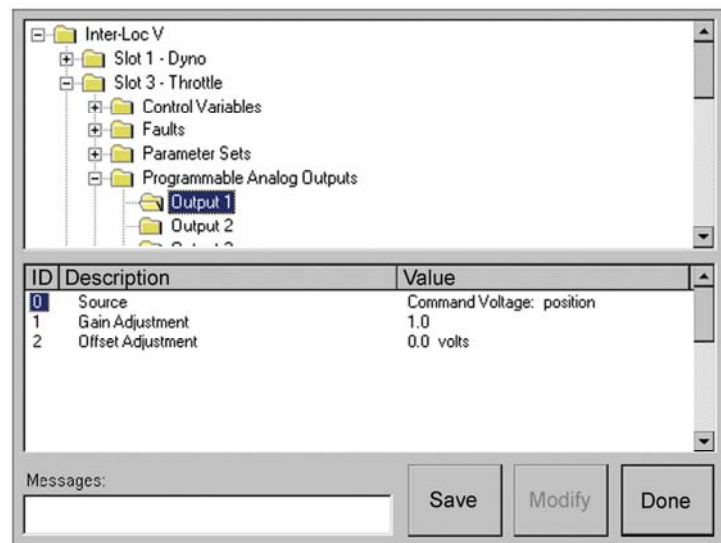
**Step 2**      Navigate to the *Inter-Loc V \ Slot 3 – Throttle \ By-Wire Control* folder and set parameters ID 0 and ID 1 to the 0% and 100% command voltage requirements of the ECM.



**Step 3** Navigate to the *Inter-Loc V \ Slot 3 – Throttle \ Control Variables \ Position* folder and set parameter ID 10 “Feedback Source” to “Throttle Position Sensor”. Also, set parameters ID 12 and ID 13 to the feedback voltage levels that correspond to 0% throttle and 100% throttle

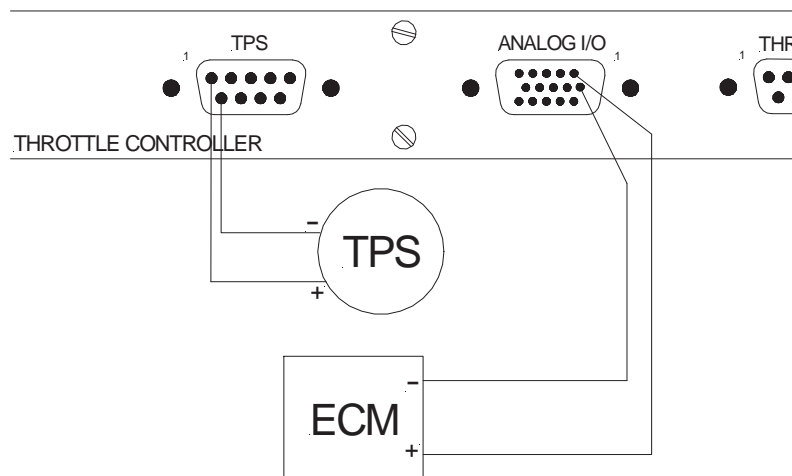
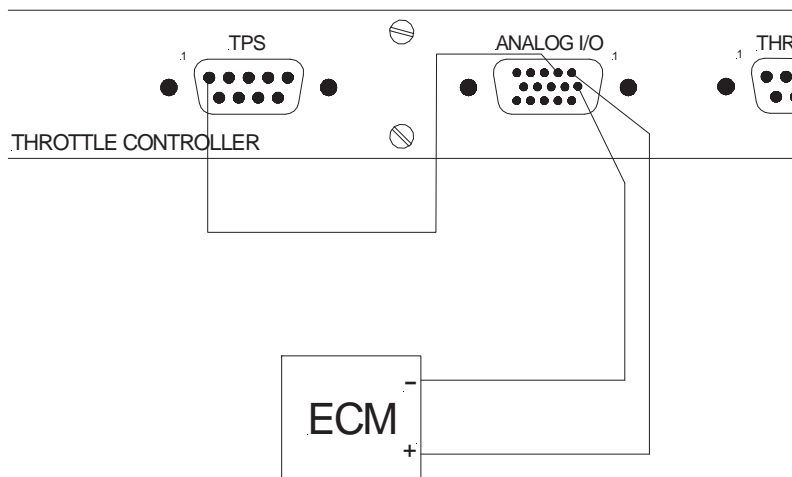


**Step 4** Navigate to the *Inter-Loc V \ Slot 3 – Throttle \ Programmable Analog Outputs \ Output 1* folder and set parameter ID 0 “Source” to “Command Voltage: position”. You will need to repeat this step for Output 2 if there is no TPS sensor in use.



## Wiring without optional Analog Isolation board (DS651)

- Step 1** Connect the ECM to pins 1(+) and 6(-) of the Analog I/O connector.
- Step 2** If there is no TPS sensor in use, connect a wire from pin 2 of the Analog I/O connector to pin 1 of the TPS connector.
- Step 3** If there is a TPS sensor in use, then connect it to pins 1(+) and 6(-) of the TPS connector.



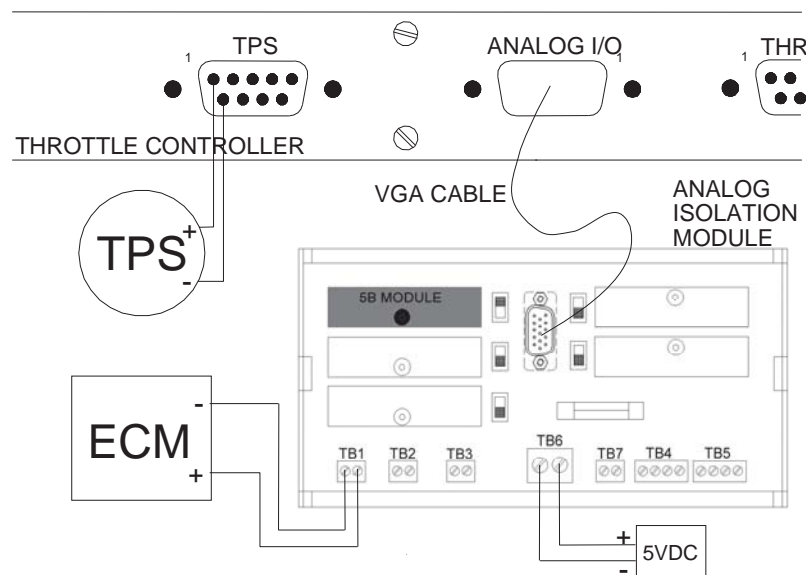
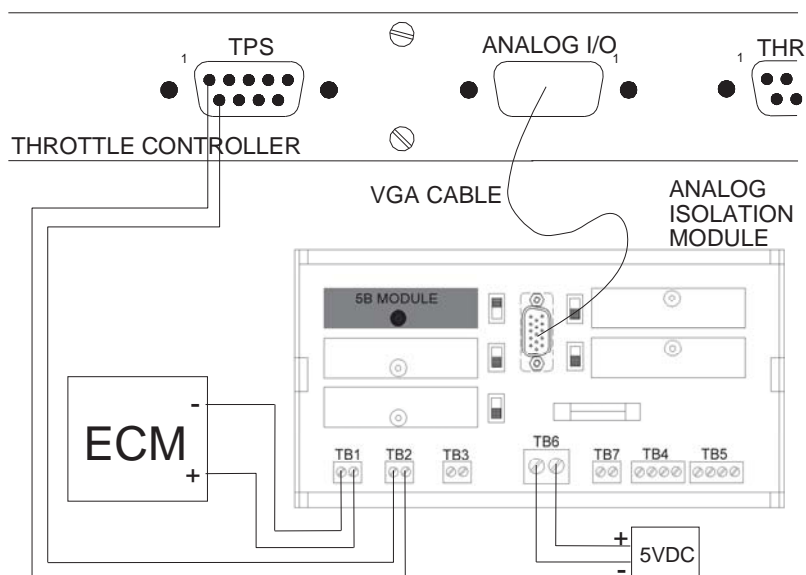
## Wiring with optional Analog Isolation board (DS651)

If an optional Analog Isolation board is part of the system (recommended), then the By-Wire connections will be wired as described below. See DS651 Manual for more information.

**Step 1** Connect TB1 on the analog isolation board to the input of the ECM.

**Step 2** If there is no TPS sensor in use, then connect a pair of wires from TB2 on the Analog Isolation board to pins 1(+) and 6(-) of the TPS connector on the rear of the Throttle Controller. Move the slide switch labeled SW2 on the Analog Isolation board to the BYP position.

**Step 3** If there is a TPS sensor in use, then connect it to pins 1(+) and 6(-) of the TPS connector on the rear of the Throttle Controller.



**ANALOG I/O**

Type: DB-15 female (VGA).

	Signal	Type	Pin			Description	
→	Programmable Analog Output 1	O	1			±10 volt output	
→	Common			6			Ai
→	Shield				11		Ai
→	Programmable Analog Output 2	O	2			±10 volt output	
	n/c			7			
	n/c				12		
	Programmable Analog Output 3	O	3			±10 volt output	
	Common			8			Ai
	Shield				13		Ai
	n/c		4				
	+15 volts with 5K series resistor			9		See notes 1 and 2 in manual	
	+15 volts with 5K series resistor				14	See notes 1 and 2 in manual	
	n/c		5				
	Common			10			Ai
	Shield				15		Ai

**TPS**

Type: DB-9 male.

	Signal	Type	Pin		Description	
→	Vin	I	1		±10 volt Throttle Position Sensor input	
→	Signal Common			6		Ai
→	Shield		2		Input signal shield	Ai
	n/c			7		
	n/c		3			
	n/c			8		
	n/c		4			
	Power Common			9		Ai
	+10 volts	O	5		Excitation for Throttle Position Sensor	