



DyneSystems, Inc.

**Midwest & Dynamatic
Dynamometers**

By-Wire Throttle Configuration
for
Inter-Loc V

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.

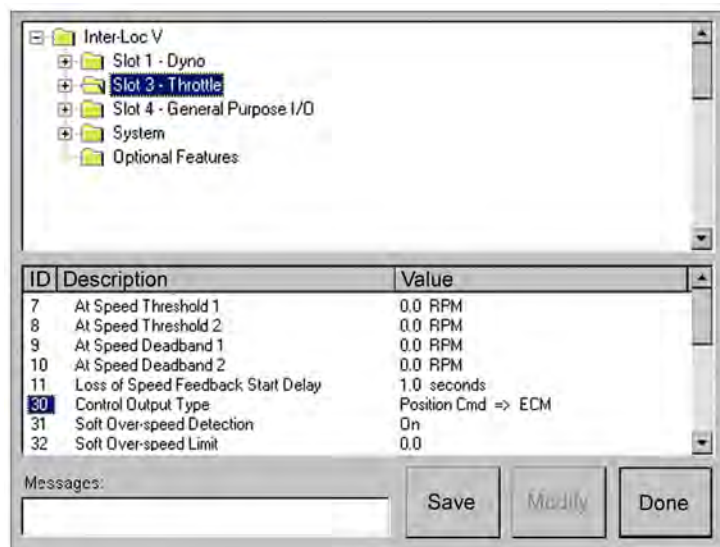
Note: Programmable Analog Outputs are low power voltage outputs with limited current sourcing capability; thus, the ECM device MUST provide its own power amplifier unit as needed.

- 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.

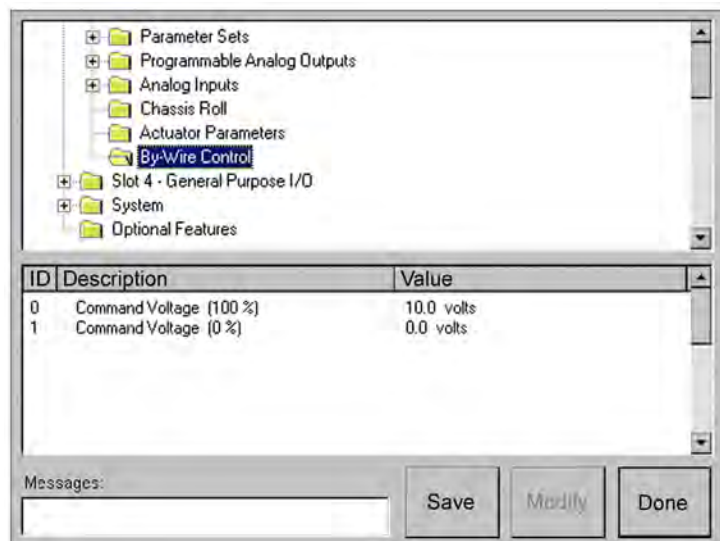
Configuring Parameters

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".

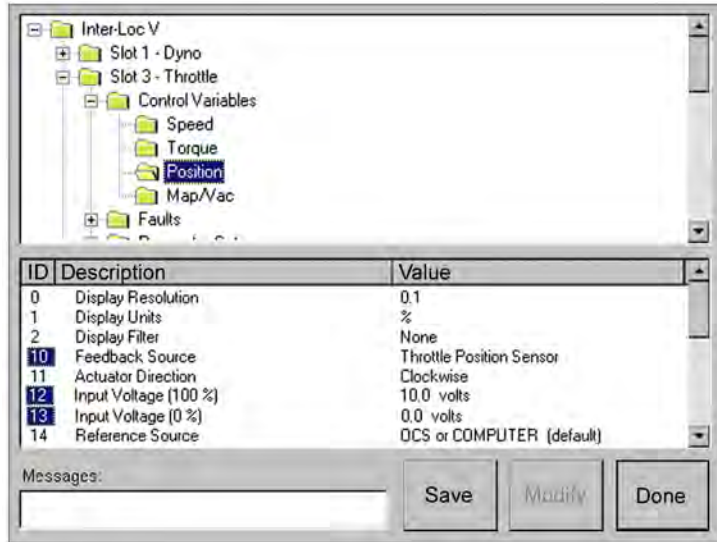


Step 2 Navigate to the *Inter-Loc V \ Slot 3 – Throttle \ By-Wire Control* folder and set parameters ID 0 and ID 1 to the 0% and 100% command voltage requirements of the ECM.



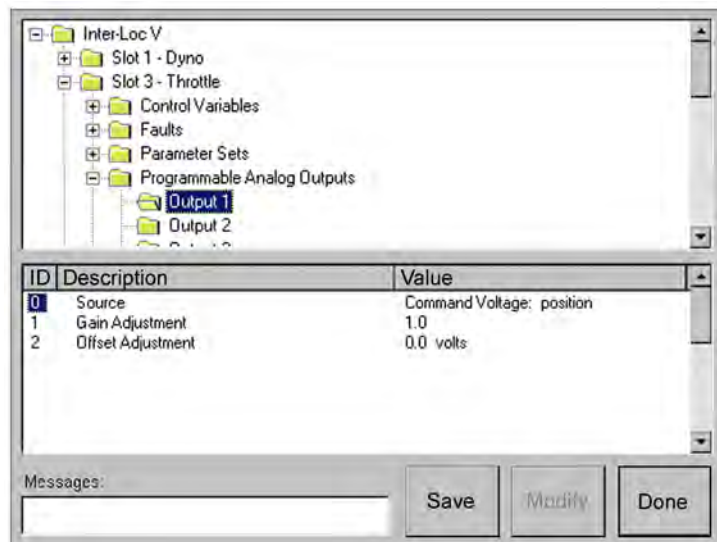
Step 3

Navigate to the *Inter-Loc V \ Slot 3 – Throttle \ 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.

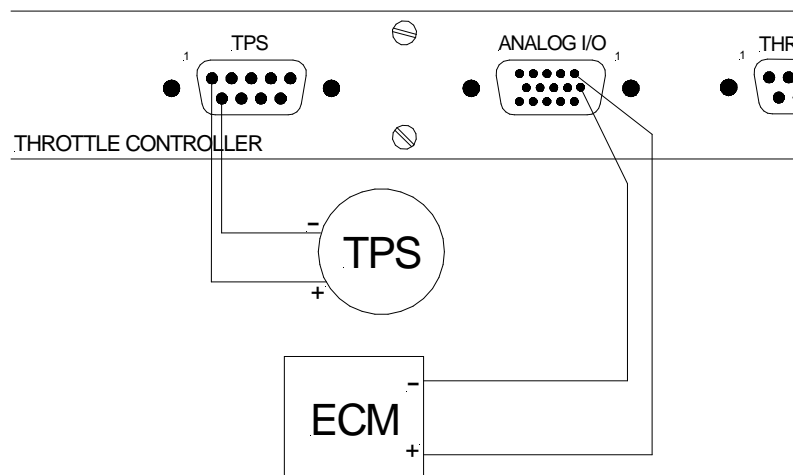
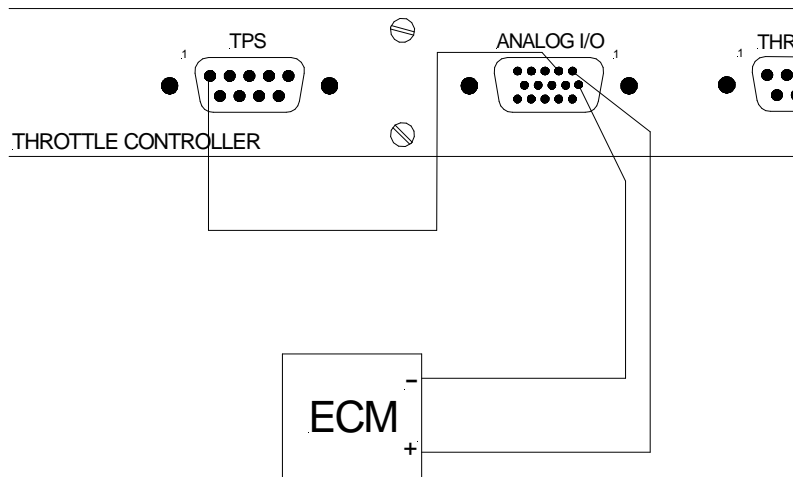


Wiring

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.



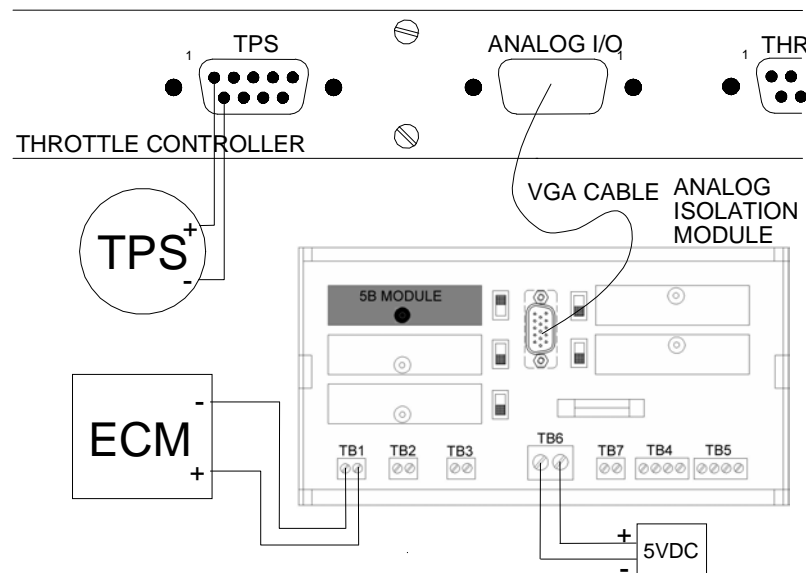
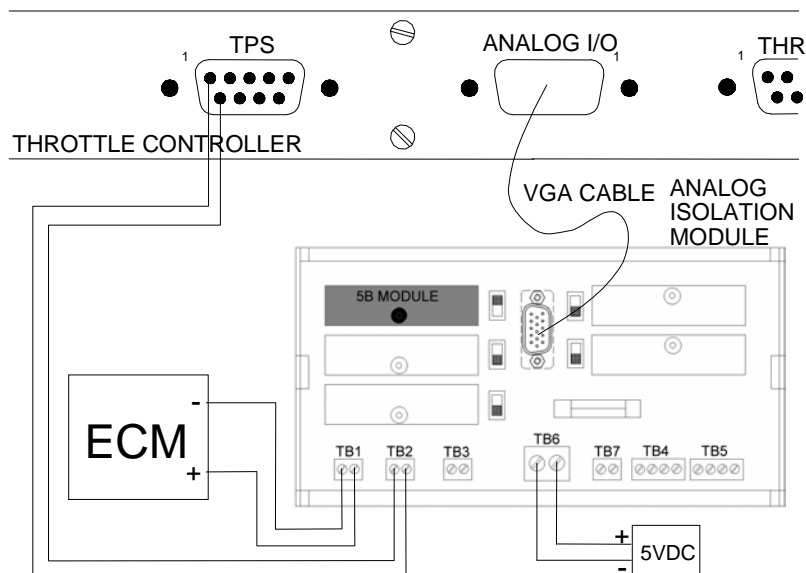
Wiring with optional Analog Isolation board (DS651)

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 | |