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**BULLETIN  
 BUL-017**

## Electric Transmission Installation and Setup

### Introduction

The Electric Transmission Module is a customized version of the standard External I/O DI7/DO7 module.

Special software is loaded to read the PWM signal and convert it to contact closures. The following PWM percentages convert to relay outputs:

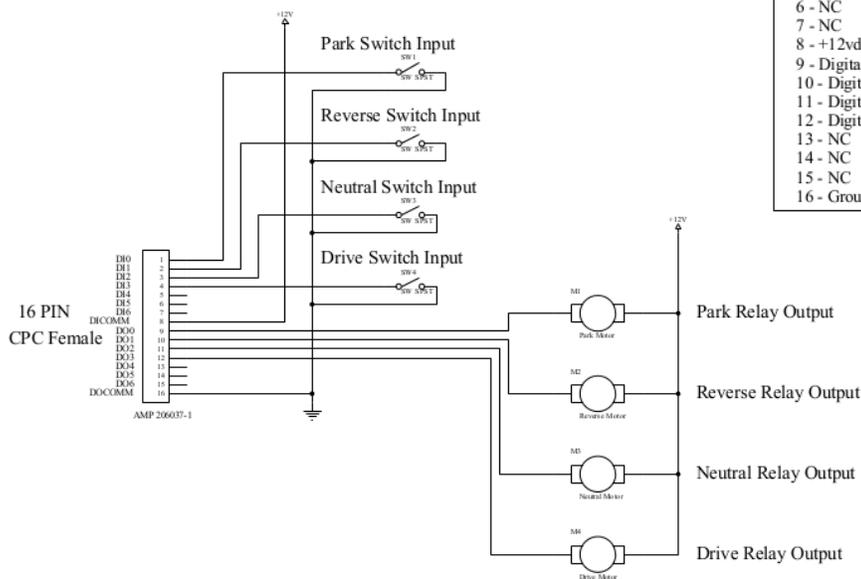
- 0% - Relay Output 0 - Park
- 40% - Relay Output 1 - Reverse
- 70% - Relay Output 2 - Neutral
- 100% - Relay Output 3 - Drive

### Installation and setup

1. Prior to installation of the module, a vehicle-specific cable must be constructed to connect the vehicle's transmission to port J1 on the Electric Transmission Module. The module's package includes the circular plastic connector (CPC) connector, pins, and backshell necessary to construct the J1 connection on a cable. The cable should be constructed based on the vehicle and according to the following specifications.

16 Pin Male CPC Panel Mount

1 - Digital Input #0, Park Switch Input
2 - Digital Input #1, Reverse Switch Input
3 - Digital Input #2, Neutral Switch Input
4 - Digital Input #3, Drive Switch Input
5 - NC
6 - NC
7 - NC
8 - +12vdc, Positive side of battery
9 - Digital Output #0, Park Relay Output
10 - Digital Output #1, Reverse Relay Output
11 - Digital Output #2, Neutral Relay Output
12 - Digital Output #3, Drive Relay Output
13 - NC
14 - NC
15 - NC
16 - Ground, Negative side of battery



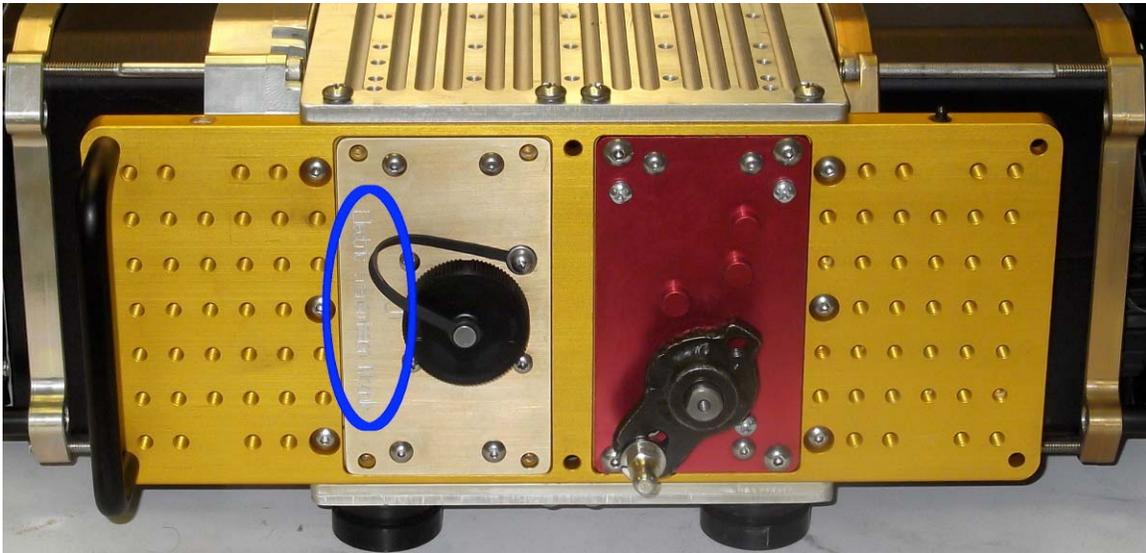
2. Empty the transmission bay and install the Electric Transmission Module, as follows:
  - a. With the Pronto4 unit powered down and the power cable disconnected, use an 8/32" hex driver to remove the four outermost screws from the existing Transmission Module or cover plate.
  - b. Manually remove the Transmission Module or cover plate.
  - c. With the part number and serial number label up and the faceplate engraving away from the brake servo, carefully slide the Electric Transmission Module into the empty bay, ensuring that the module remains square to the frame.
  - d. Use an 8/32" hex driver to secure the module into the bay with four screws (removed in step 2.a.).

**CAUTION**

Inserting an upside-down module may cause system damage.

**CAUTION**

Inserting a misaligned module may cause system damage.

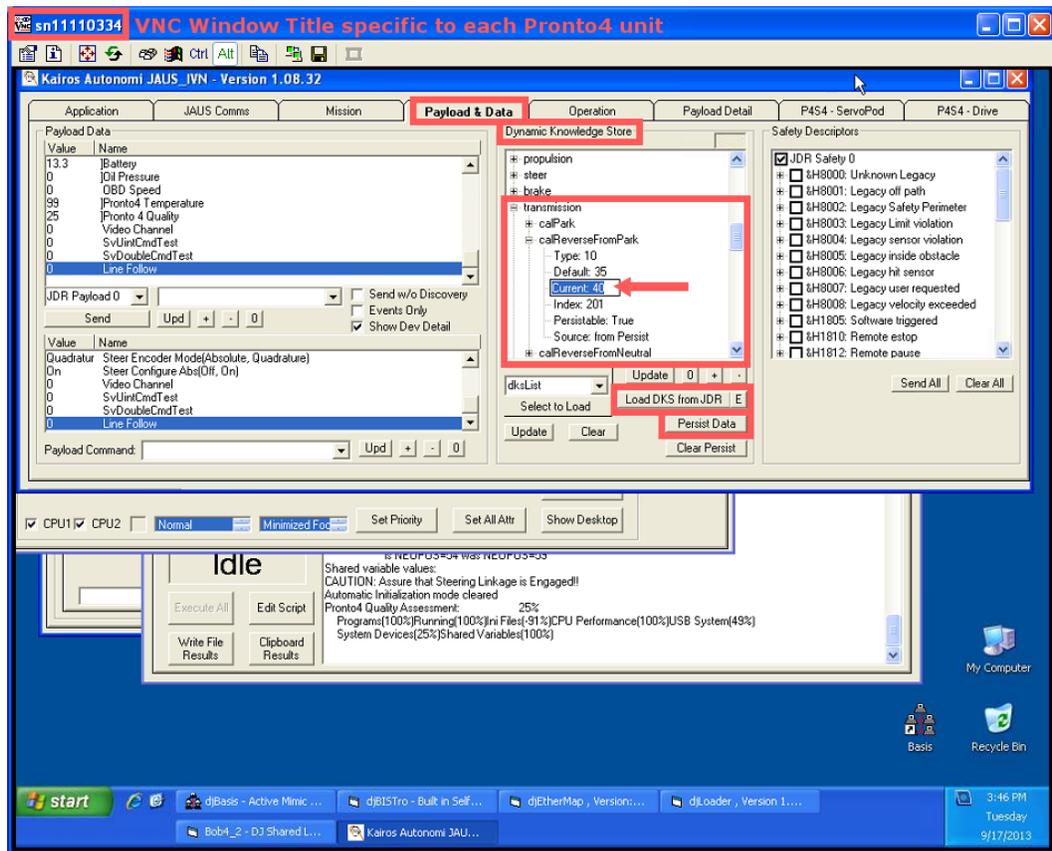




3. Ensure there is a safety operator in the driver’s seat, with seat belt secured, clear of all controls, including the steering wheel, and in a position to activate controls, including the brake pedal.
4. Connect the power cable and boot up the Pronto4 unit according to existing system procedures and documentation.
5. Boot up the Operator Control Unit (OCU) according to existing system procedures and documentation.
6. Configure the transmission setpoints, *as follows*:
  - a. On the OCU, in Shepherd, under the “Assets” Tab, select the robot asset, and click the “VNC” button. This will open up a virtual connection to the Pronto4 computer (refer to image on next page).
  - b. In the VNC window, in JAUS\_IVN, on the “Payload & Data” tab, in the “Dynamic Knowledge Store area, scroll to then expand the “Transmission” section.
  - c. In the expanded “Transmission” section, expand the “calReverseFromPark” section.
  - d. Click & hold the “Current” value until it highlights.
  - e. Type in “40”, press the “Enter” key, then press the “Persist Data” button.
  - f. Repeat steps 9-11 for:

calPark	0
calReverseFromPark	40
calReverseFromNeutral	40
calReverse	40
calNeutralFromReverse	70
calNeutralFromForward	70
calNeutral	70
calForward	100

- g. Click the “Load DKS from JDR” button. This will refresh the DKS area’s values.
- h. Expand the Transmission’s calReverse, calNeutral, and calForward sections and verify the values entered were properly retained.
- i. Close the VNC window.



7. Verify Electric Transmission Module and Kairos software are interacting correctly, *as follows*:
  - a. On the OCU, in Shepherd, under the “Assets” Tab, select the robot asset, and click the “Login” button.
  - b. Under the “Tele•Op/Remote” tab, in the “Action” are, click the “Tele•Op On” button.
  - c. Hold the tele-op controller’s deadman button and control the vehicle up through each gear (i.e. Park → Reverse, Reverse → Neutral, Neutral → Drive).
  - d. Hold the tele-op controller’s deadman button and control the vehicle down through each gear (i.e. Drive → Neutral, Neutral → Reverse, Reverse → Park).
  - e. Release the tele-op controller’s deadman button.
8. The Electric Transmission Module has now been successfully installed and setup.