



## Rapid Controls TDD2 Quick Start Guide

This document aims to provide a step-by-step setup procedure to enable you to use your TDD2 display as quickly as possible. This guide will concentrate on setting up the TDD2 to display correct position information. If you have questions after reading this guide, please refer to the TDD2 manual. If you do not have a TDD2 manual, visit the Rapid Controls website, [www.rapidcontrols.com](http://www.rapidcontrols.com).

### I. Connections

#### A. Connector JP1

Connector JP1 provides the TDD2 with power and the connection to the transducer. The following pins must be connected (**NOTE: MTS and Balluff Colors Codes are specified below, other sensor manufacturers may be different**):

Pin 1 is connected to power (15 or 24VDC, see transducer specifications) and to the transducer power input wire (MTS: red or brown; Balluff: brown).

Pin 2 is connected to ground and the transducer ground wire (MTS: white; Balluff: blue).

Pin 3 is connected to the transducer CLK+/INT+ wire (MTS: yellow; Balluff: yellow).

Pin 4 is connected to the transducer CLK-/INT- wire (MTS: green; Balluff: pink).

Pin 5 is connected to the transducer DATA+/GATE+ wire (MTS: pink; Balluff: gray).

Pin 6 is connected to the transducer DATA-/GATE- wire (MTS: gray; Balluff: green).

Pins 7 and 8 are digital inputs. See the TDD2 manual for more information.

Pins 9 and 10 can be used for SSI chip select or external SSI clock input. See the TDD2 manual for more information.

Pin 11 is the analog output common.

Pin 12 is the analog output voltage source.

Pin 13 is Can High for MTS CANbus interface. Attach to CAN High line of CAN transducer. The termination resistor is supplied internal to the TDD2. If the cable exceeds 20 feet terminate at the Sensor end.

Pin 14 is Can Low for MTS CANbus interface. Attach to CAN Low line of CAN transducer. The termination resistor is supplied internal to the TDD2. If the cable exceeds 20 feet terminate at the Sensor end.

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**A. Other Connectors**

Connector JP2 is the RS232, RS485 and CANbus interface and is detailed in the TDD2 manual.

| TDD2 Pin | Description | PC DB9 6 Pin  |
|----------|-------------|---------------|
| 4        | Gnd         | 5             |
| 6        | RS-232 TX   | 2             |
| 3        | RS-232 RX   | 3             |
|          | RTS – CTS   | 7 Jumper to 8 |
|          | DTR – DSR   | 4 Jumper to 6 |

Table 3: TDD to PC cable

**II. Powering Up the Unit**

After verifying that all connections are correct, apply power to the TDD2. A LED test and software date should appear, followed by a continuously updated position readout or an error message. If no software date appears, verify that power is connected to the unit properly.

**III. Basic Operation and Initial Setup**

This section guides you through setting up the TDD2 to get a position reading. Refer to the TDD2 Manual for more information.

**A. Front Panel**

The front panel has four switches labeled (left to right): ‘Shift’, ‘Right/Left’, ‘Up/Down’, and ‘OK/Cancel’. The Right/Left, Up/Down, and OK/Cancel switches each have two functions, depending on whether the Shift switch is pressed at the same time. Table 1 shows the key press resulting from pressing the switches with and without the Shift switch.

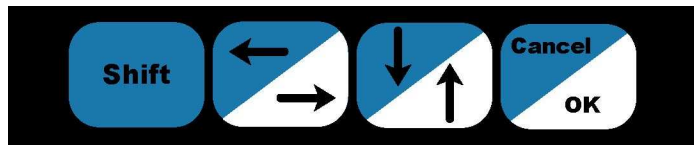


Figure 1: The Front Panel Switches

|                        | Right/Left | Up/Down | OK/Cancel |
|------------------------|------------|---------|-----------|
| Function Without Shift | Right      | Up      | OK        |
| Function With Shift    | Left       | Down    | Cancel    |

Table 1: Shifted Switch Functions

**B. Front Panel Menu and Navigation**

The front panel menu may be entered at any time by holding down the ‘Up/Down’ and ‘Right/Left’ buttons simultaneously for two seconds. To enter a submenu or edit an item, press OK. To select the next item in the menu press Left or Right. When editing a list value, press Up or Down to select the appropriate value. To edit a floating point or integer value, press Left or Right to select the digit and press Up or Down to change the value of that digit. Press OK to activate changes. To exit the menu or return to a previous menu level, press Cancel.

**C. G-Series Auto Detection**

If you have a G-Series type transducer, no setup is necessary. At start up, the TDD2 will download the transducer type, gradient and number of recirculations directly from the transducer and configure the TDD2 as needed. See the TDD2 manual for details.

#### D. Units Setup

The display provides the following units: inches, feet, millimeters, centimeters, and meters. If another unit choice is desired, it may be derived from one of the five basic units by using a scale value. (See the TDD2 Manual for more information.)

Changing the current units setting will affect most floating-point configuration values of the TDD2. This can be used to enter values in alternate units. Simply select the alternate units, change one or more settings, and change the units back to the normally desired units setting. The configuration value changed will automatically be converted to the new units

The default unit is inches. To change this setting, enter the front panel menu. Select position ( **POSITION** ) and press OK. Once in the position menu, select units ( **UNITS** ) and press OK. Select the desired unit and press OK.

#### E. Transducer Type

The TDD2 must be configured for the type of transducer that is currently connected.

To enter the transducer menu, first enter the Front Panel menu and press Right until you see transducer ( **TRANSDCR** ) in the display, then press OK. This is where all transducer specific setup items may be set or modified. To edit the transducer type, press right until you see transducer type ( **TYPE** ) in the window and press OK. Supported transducer types are Start/Stop, PWM, CANbus, CANopen, SSI Graycode, and SSI Binary. These transducer types, display and paragraph number are shown below in Table 2. Press Up until you see the type of transducer that is connected, then press OK.

| Transducer Type | TDD2 Display |
|-----------------|--------------|
| SSI Graycode    | SSI GrA      |
| SSI Binary      | SSI bi B     |
| CANbus          | CANBUS       |
| CANopen         | CANOPn       |
| PWM             | PULSE        |
| Start/Stop      | StartSt      |

Table 2: Transducer Types and Display

#### F. Resolution

Setting the resolution is necessary for SSI Graycode, SSI Binary, CANbus, and CANopen type transducers. The resolution may be obtained from the transducer datasheet.

To enter the resolution, enter the Front Panel Menu, and press Right until you see position ( **POSITION** ) in the display and press OK. Press Right until you see resolution ( **RESOLU** ) and press OK. Enter the correct resolution of your transducer by selecting the digit with Left or Right and set the digit with Up or Down. Once the correct resolution has been entered, press OK.

#### G. Gradient

Setting the gradient is necessary for Start/Stop and PWM type transducers. The gradient information may be obtained from the transducer housing or in the datasheet.

To enter the gradient, enter the front panel menu and press Right until you see transducer ( **TRANSDCR** ) in the display and press OK. In the transducer menu, press Right until gradient ( **GRADIE** ) is displayed. Press OK. Use the Left and Right key presses to select the digit and use Up or Down to modify the value. Press OK when you are finished.

You may also set the number of magnets and hold off while you are in this menu. See the TDD2 Manual for more information.

#### H. Recirculations

Setting the number of recirculations is only necessary for PWM type transducers. The information may be found in the transducer data sheet.

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To enter the number of recirculations, enter the front panel menu and press Right until you see transducer ( **trnsdcr** ) in the display and press OK. press Right until recirculations ( **recirc** ) is shown. Press OK. Press Up or Down to select the correct number and press OK.

### **I. Number of Bits**

The number of bits must be set for SSI (Graycode and Binary) type transducers. The TDD2 supports up to 32 bits. The number of bits and additional information may be found in the transducer data sheet or documentation.

To set the number of bits, enter the front panel menu and press Right until you see transducer ( **trnsdcr** ) in the display and press OK. Then, press Left until you see SSI bits ( **SSI bits** ) and press OK. Use the Left and Right key presses to select the digit and Up or Down to modify it. Press OK when the number of bits is entered correctly. Also, in the transducer menu, the SSI Error Value and Error Mask may be set to configure error reporting. See the TDD2 manual for details.

### **J. Finishing Up**

After all necessary information has been entered, exit the front panel menu. The TDD2 will be displaying the position. As the magnet moves the display will change appropriately. If it does not show position refer to the trouble shooting section.

#### **1. Saving**

In order to keep the changes you made, they must be saved to the EEPROM before shutting down the TDD2. Enter the Front Panel Menu and press Right until save ( **SAVE** ) is displayed. Press OK. The TDD2 will display "SAVING". Press Cancel to return to the position display.

Moving the magnet on the transducer shaft should cause the position readout of the TDD2 to change. You may want to adjust the scale for any mechanical advantages. Additional TDD2 features include limit switches, analog output, digital inputs and front panel actions. See the TDD2 manual for more information.

#### **2. Troubleshooting**

If 'ERR 01' appears instead of position readout, verify the connection of the transducer. If '[- - -]' appears instead of position readout, verify that a magnet is on the transducer shaft. If either of these messages appear and the transducer connection and magnet placement has been verified, refer to the TDD2 manual for further help.

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