# Revision History

<table>
<thead>
<tr>
<th>Revision</th>
<th>Date</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>A</td>
<td>2/19/2018</td>
<td>Original Release</td>
</tr>
<tr>
<td>B</td>
<td>2/27/2018</td>
<td>Changes to the example message in section 2.5.2</td>
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<tr>
<td></td>
<td></td>
<td>Rephrased the meaning of Byte 7 in section 2.5.2</td>
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<tr>
<td>C</td>
<td>3/6/2018</td>
<td>Changed Byte message in section 3.1</td>
</tr>
<tr>
<td>D</td>
<td>7/25/2018</td>
<td>Changed pinout on M12 to reflect production pinout</td>
</tr>
<tr>
<td>E</td>
<td>8/24/2018</td>
<td>Added Programming Harness Information</td>
</tr>
<tr>
<td>F</td>
<td>10/17/2018</td>
<td>Updated images to reflect latest app update</td>
</tr>
<tr>
<td>G</td>
<td>1/31/2019</td>
<td>Updated Touch Encoder Image</td>
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1 What’s included?

1. Touch Encoder Development Module
2. CANbus Interface Cable
3. Red Programming Cable
4. Power to USB Cable
5. Power Supply Wall Mount
6. White USB Micro B to USB Type A Adapter Cable
7. Thumb drive

* iPad is included if tablet version is ordered

2 Download App

2.1 Find app on App Store with iPad

Questions? Please contact TE@Grayhill.com
2.2 Download

2.3 Registration: Enter info and receive verification code in email
3 Create and Save a new project

Open App

Name Project

Add Widget

Basic Widgets

Ring& Gauge Widgets

Menu Widgets

Questions? Please contact TE@Grayhill.com
Choose to save in iCloud, Google Drive, or on your iPad
4 Basic App Navigation

- Create & store multiple projects
- Simulate your program on the iPad before downloading it to the Touch Encoder
- Create individual screens using any combination of widgets (from the widget library), pictures and graphics
- Scroll up and down to see all of the screens on your workspace

5 Uploading and Sizing an Image

Questions? Please contact TE@Grayhill.com
Tap on “Image”, then “+” to fetch images from Google Drive or Camera Roll

Select Image

Reposition and Resize Image

* Repositioning and resizing can be done by tapping and dragging on image corners or inputting locational and dimensional values
6 Widget Configuration

Pick any widget and select background colors

Choose Icons from Library

Customize Values

* Customizable values include Max, Min, Default, and Step Size
Pick any widget and select background color

Choose Icons from Library

Customize Values

* Customizable values include Max, Min, Default, incremental Step Size values, and Suffix (measurement unit)
Select Menu Widget

Customize Icons and Target Widgets

Choose Widgets from Workspace

New Menu
7 Setting Home Screen

Double tap any widget to set as home screen
8 Defining Program Flow

8.1 Swipe Logic

Drag and Drop any widgets to Up, Down, Left, and Right

8.2 Rotation Logic

Drag and Drop any widgets to Clockwise and Counter-Clockwise target locations
Defining Touch Zones

Tap on ‘Show Events’

Tap anywhere on Touch Encoder Screen

Drag corners to resize, and drag box to reposition

Drag Widget on the left to Target, and tap ‘Save’

For more Touch Zones, Tap on screen again

Drag Widget on the left to Target, and tap ‘Save’
10 Download Program to SDK via USB

Plug in USB
Open App

Tap on ‘Export’
Tap on ‘Save File’

Note to select between CAN or USB Output Interface

Tap on Storage Icon
Connect USB to Red Cable, Power on

Questions? Please contact TE@Grayhill.com
Follow Instructions. Once update is complete, reboot SDK by removing power cable for at least 5 seconds

11 Download Program to SDK via Wi-Fi

Go to Settings → Wi-Fi → Choose network that begins with “TE-M321”; Enter 9-digit S/N as password located on SDK label: reference next page; Tap on “Join” which might take several attempts to establish connection. Then go back to Grayhill app.
“Export”, then hit “gear” icon

Input from previous step and save

Tap on ‘Send to TE’

Note to select between CAN or USB Output Interface

Follow Instructions on SDK. Once update is complete, reboot by tapping on ‘Reboot TE’
12 Programming Harness

Connector Pinouts

<table>
<thead>
<tr>
<th>USB</th>
<th>CAN</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 MODE</td>
<td>MODE</td>
</tr>
<tr>
<td>2 VIN</td>
<td>VIN</td>
</tr>
<tr>
<td>3 GND</td>
<td>GND</td>
</tr>
<tr>
<td>4 USB_D+</td>
<td>CAN_H</td>
</tr>
<tr>
<td>5 USB_D-</td>
<td>CAN_L</td>
</tr>
</tbody>
</table>

For Touch Encoder serial numbers less than A100000 please contact Grayhill for pinout detail.

If MODE Pin is floating at power up, the Touch Encoder will assume run mode operation. If Mode pin is connected to GND externally at startup, the Touch Encoder will assume programming mode. The Touch Encoder will download updates from a USB mass storage device (if connected) and update the Touch Encoder accordingly.
Programming Harness for Production Units

GRAYHILL P/N T18908 - USED FOR PROGRAMMING MODE ONLY

CONNECTOR A

CONNECTOR B

CONNECTOR C

14.000 ± 0.500
[355.60 ± 12.70]

1.188 REP [30,17]
EXTRA THICK HEAT SHRINK TUBE (SEE NOTE 7)

5X HEAT SHRINK TUBE
(SEE NOTE 6)

6.500 ± 0.500
[165.10 ± 12.70]

NOTES:
1. CONNECTOR A IS MORCOMP INC. P/N: 858-005-203R6U4 WITH METAL NUT REMOVED.
2. WIRE WITH USB CONNECTORS B & C IS TRIPP LITE P/N: UD24-003 OR EQUIVALENT
3. CONNECTOR A PINS TO CONNECT TO CORRESPONDING CONNECTOR B & C TERMINALS ON THE CONNECTOR (SEE TABLE).
4. WIRE LENGTH SHOULD BE MEASURED WITH WIRES STRAIGHT.
5. WIRE PULLOUT FORCE MUST BE 2 LBS. MINIMUM.
6. 5X HEAT SHRINK TUBING TO BE USED OVER CONNECTOR A CONNECTIONS.
7. EXTRA THICK HEAT SHRINK TUBING TO BE USED OVER CONNECTOR A CONNECTIONS.

<table>
<thead>
<tr>
<th>WIRE #</th>
<th>CONNECTOR A</th>
<th>CONNECTOR B</th>
<th>CONNECTOR C</th>
<th>COLOR</th>
<th>DESCRIPTION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>PIN</td>
<td>PIN</td>
<td>PIN</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>1</td>
<td>N/A</td>
<td>4</td>
<td>BLACK</td>
<td>MODE</td>
</tr>
<tr>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>RED</td>
<td>Vin</td>
</tr>
<tr>
<td>3</td>
<td>3</td>
<td>4</td>
<td>4</td>
<td>BLACK</td>
<td>GND</td>
</tr>
<tr>
<td>4</td>
<td>4</td>
<td>N/A</td>
<td>3</td>
<td>GREEN</td>
<td>USB+</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>N/A</td>
<td>2</td>
<td>WHITE</td>
<td>USB-</td>
</tr>
</tbody>
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Connector A Pinout
13 Connections

USB run mode:

<table>
<thead>
<tr>
<th>TOUCH ENCODER</th>
<th>USB HOST</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIN 2</td>
<td>1 4.5V-5.5V</td>
</tr>
<tr>
<td>USB_D- 5</td>
<td>2 D-</td>
</tr>
<tr>
<td>USB_D+ 4</td>
<td>3 D+</td>
</tr>
<tr>
<td>GND 3</td>
<td>4 GND</td>
</tr>
<tr>
<td>MODE 1</td>
<td></td>
</tr>
</tbody>
</table>

Note: The Touch Encoder can be powered from an external source or directly from the USB if the source capability is high enough (>250mA.)

CAN run mode:

See Section 12: Connector Pinouts

<table>
<thead>
<tr>
<th>TOUCH ENCODER</th>
<th>CAN DB9</th>
</tr>
</thead>
<tbody>
<tr>
<td>VIN 2</td>
<td>2 CAN_L</td>
</tr>
<tr>
<td>CAN_L 5</td>
<td>3 GND</td>
</tr>
<tr>
<td>CAN_H 4</td>
<td>7 CAN_H</td>
</tr>
<tr>
<td>GND 3</td>
<td></td>
</tr>
<tr>
<td>MODE 1</td>
<td></td>
</tr>
</tbody>
</table>

POWER SUPPLY

1 4.5V-18V
2 GND
Programming mode:

Note: Load files to FLASH drive and plug into socket. Touch Encoder only samples MODE pin during power up, so be sure this occurs after connecting harness and FLASH drive.
About Grayhill

Grayhill, Inc. is a privately held firm which designs and manufactures intuitive human interface solutions that make life simpler, safer and more efficient. Standard products include optical and Hall Effect encoders, discrete and Hall Effect joysticks, rotary switches, keypads, and pushbuttons; all with finely tuned haptics. Grayhill specializes in creating ergonomic panels and product shells that integrate various interface technologies, including displays, our components, and gesture recognizing multi-touch technology. With headquarters in La Grange, Illinois, and multiple state-of-the-art facilities around the world, Grayhill’s team has the full engineering, product development and manufacturing expertise to deliver both standard and customized products quickly and cost-effectively. To learn more about Grayhill’s products and capabilities, visit www.grayhill.com.