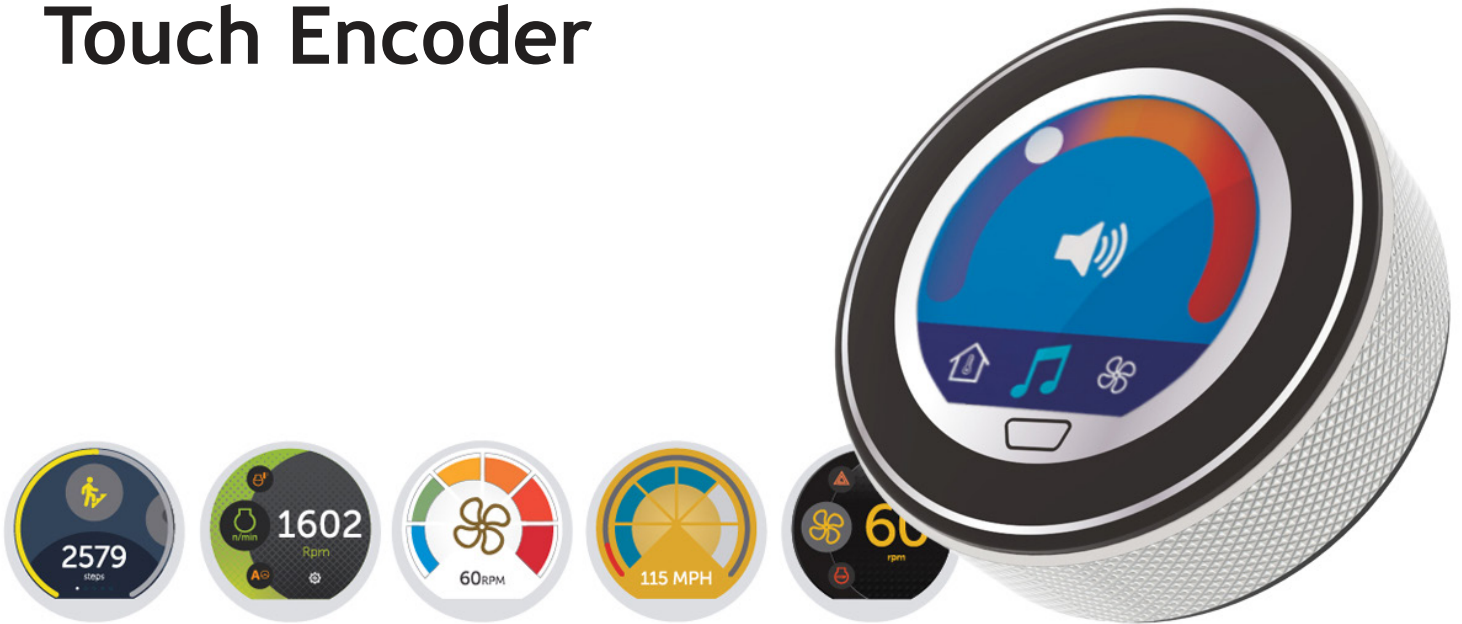


# Reimagining the User Experience

## Touch Encoder



### KEY FEATURES

- Replaces many traditional user input devices (such as switches, keypads, pushbuttons, displays, etc.) with a simple, easy to use device
- Optimal front panel footprint
- Supported gestures: Tap + Swipe + Turn
- High resolution display: 330 PPI (320 X 300)
- Quick user interface development
  - Intuitive tablet based development platform
  - Library of configurable standard widgets
- Stores hundreds of screens (32MB memory)
- Incorporates pictures: PNG, JPEG, etc.
- Field upgradable application and firmware
- Robust: sealed to IP67, high impact strength, chemical resistant
- 1,000,000 encoder cycles
- USB 2.0 or CAN J1939 communications with host device

### MATERIALS

- Cover lens: polyester
- Knob: 304 stainless steel with optional black chrome finish or silicone grip
- Rear housing: nylon
- Mounting nut: nylon
- RoHS 2018/863 compliant

### TOUCHSCREEN/DISPLAY

- Optically bonded display and touchscreen for excellent sunlight readability
- Touchscreen construction: high resolution PCAP ITO

## General

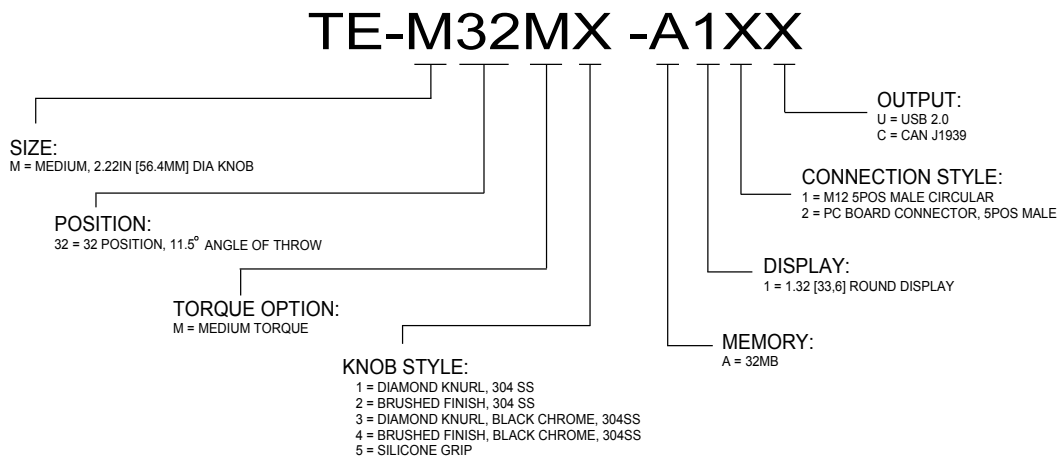
|                                                            |
|------------------------------------------------------------|
| Device Diameter (O.D.): 2.200 in (55.88 mm) Nominal        |
| Display Diameter (V.A.): 1.320in (33.50 mm) Nominal        |
| Touchscreen: Projected Capacitive                          |
| Display - Type: Round Color TFT LCD, 320 X 300             |
| Display - Brightness: 200 Cd/m2                            |
| Positions/Revolution: 32                                   |
| Connector Style: M12 5-Pin Connector or PC Board Connector |

## Environmental

|                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------------|
| Operating Temp. Range: -20 to 65 °C                                                                                                     |
| Storage Temperature: -30 to 70 °C                                                                                                       |
| Humidity: 95% @ 65 °C                                                                                                                   |
| Mechanical Shock: ANSI EP455 5.14.1                                                                                                     |
| Seal (Electronics): IP67                                                                                                                |
| Radiated Immunity: IEC 61000-4-3 80 - 2700 MHz 10 V/M                                                                                   |
| Conducted Immunity: IEC 61000-4-6 LEVEL 2 - 130 dBµV, 150 KHz to 80 MHz                                                                 |
| ESD: IEC 61000-4-2: 8 kV Contact; 15 kV Air                                                                                             |
| Vibration (Random): 50 - 2000 Hz, 2hr Each Axis ANSI EP455 5.15.2                                                                       |
| Chemical Resistance: Designed to survive repeated exposure to most chemicals found in Medical, Off-Highway, and Industrial applications |
| Solar Radiation: ISO 4892.2 Method B                                                                                                    |
| Power Frequency Magnetic Field: Meets IEC 61000-4-8, 100 A/m                                                                            |
| Electrical Fast Transient/Burst: IEC 61000-4-4 ±1kV Coupling Clamp                                                                      |
| Conducted Emissions: EN 55011, EN55032 Class B                                                                                          |
| Radiated Emissions: EN 55011, EN55032 FCC Part 15 Class B                                                                               |

For more information, contact us at [TE@grayhill.com](mailto:TE@grayhill.com)

## Part Numbers



## Mechanical

|                                             |
|---------------------------------------------|
| Pushout Force (Max): 45 lbs (200 N)         |
| Pullout Force (Max): 45 lbs (200 N)         |
| Side Load Force: 45 lbs (200 N)             |
| Lens Hardness: 2H                           |
| Lens Impact: IK5                            |
| Mounting Torque (Nominal): 4 - 10 in-lbs    |
| Mounting Torque (Max): 14 in-lbs            |
| M12 Connector Torque (Max): 14 in-lbs       |
| M12 Connector Pull-Out: 15 lbs (66.7 N)     |
| Mounting Alignment (Maximum): < 1Deg        |
| Weight (Production Unit): 4.25 oz (120.6 g) |

## Electrical Function

|                                                                      |
|----------------------------------------------------------------------|
| Operating Voltage: SDK: 4.75 to 5.25 Vdc; Component: 4.75 to 18 Vdc; |
| Max Operating Power: 1.5 W @ Max Brightness                          |
| Memory: 32MB                                                         |
| Standby Power Mode: < 100 mW                                         |
| Sleep Mode Wakeup Time: 500 mSec                                     |
| Boot Time: 5 Seconds to 0.5.                                         |
| USB Interface: 2.0 Full Speed Composite Device                       |
| CANbus Interface: J1939 Compliant                                    |

## Encoder Function

|                                                                     |
|---------------------------------------------------------------------|
| Initial Rotational Torque: 3.50 ± 2.00 in-oz (Medium Torque Option) |
| Rotational Life: 1,000,000 Cycles                                   |
| Detent Type: Ball Spring                                            |
| Encoder Sensing Technology: Hall Effect                             |

**Software Development Kit P/N: TE-M321-SDK (without iPad) & TE-M321-SDKT (with iPad)** \* iPad is a registered trade mark of Apple Corporation

### Inside the Kit:

- Touch Encoder Development Module
- CANbus Interface Cable
- Red Programming Cable
- Power to USB Cable
- Power Supply Wall Mount
- Thumb drive
- White USB Micro B to USB Type A Adapter Cable



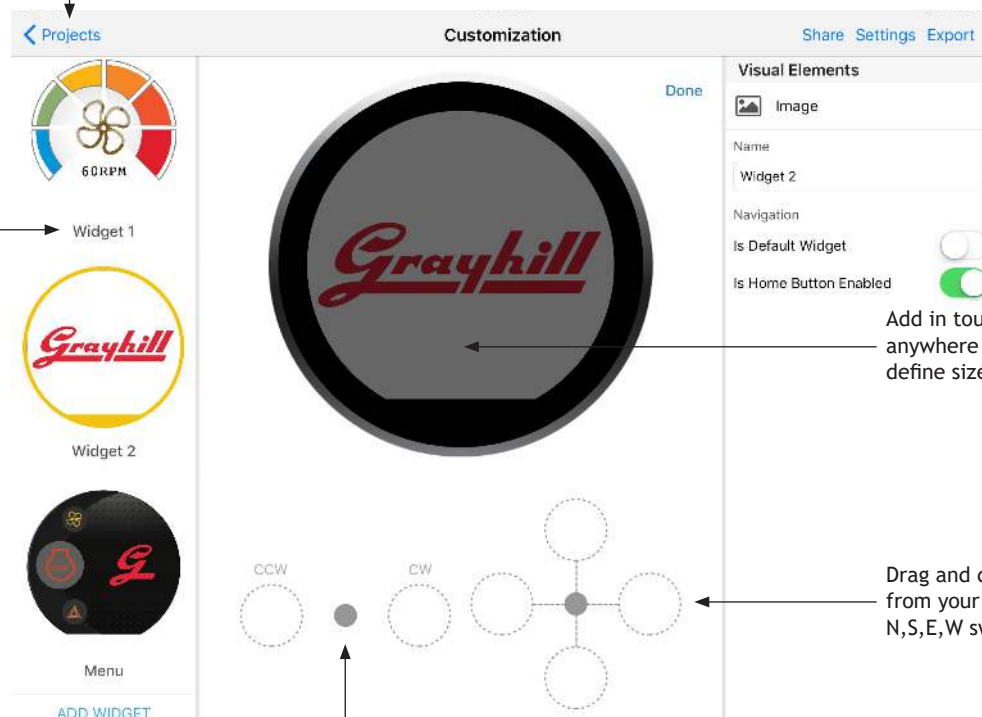
# Simple, Intuitive Application Development using Grayhill Glib App

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

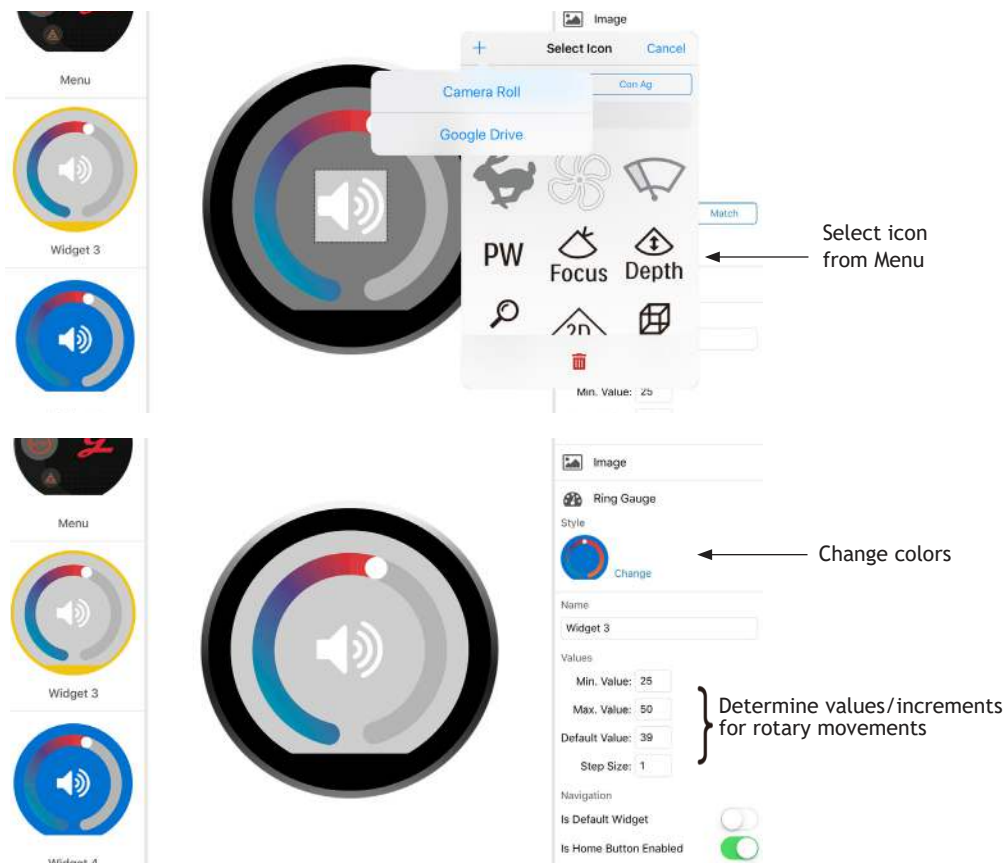


Add in touch zones; Tap anywhere on the screen to define size and location

Drag and drop screens from your workspace into N,S,E,W swipe zones

Drag and drop screens from your workspace to define what happens when the knob is rotated

## Fully Customizable Standard Widgets

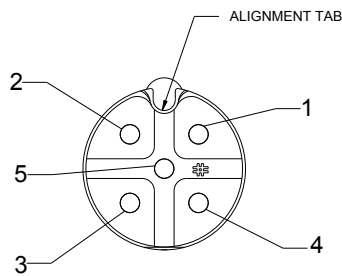


Select icon from Menu

Change colors

Determine values/increments for rotary movements

## Pin Numbering Detail



| CONNECTOR OUTPUT |        |       |
|------------------|--------|-------|
| PIN #            | USB    | CAN   |
| 1                | MODE   | MODE  |
| 2                | VIN    | VIN   |
| 3                | GND    | GND   |
| 4                | USB_D+ | CAN_H |
| 5                | USB_D- | CAN_L |

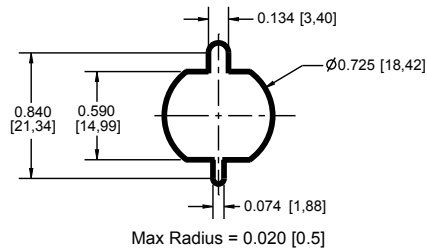
To put device in programming mode:  
Connect mode pin #1 to GND at power up.  
Leave mode pin #1 open for run mode  
(normal operation)

### Mode Pin Truth Table @ Power up

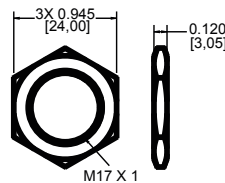
|              |      |
|--------------|------|
| Program Mode | GND  |
| Run Mode     | Open |

## Mounting Information

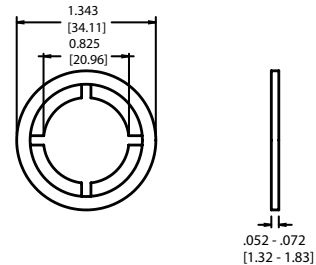
Suggested Mounting Pattern  
IN [MM]



Standard Plastic Mounting Nut  
IN [MM]

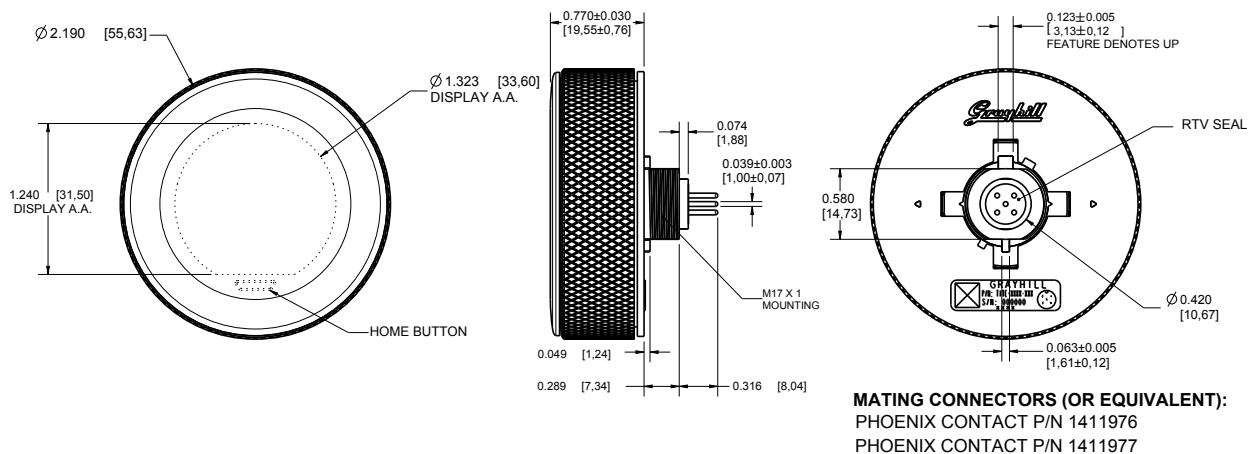


Packaging Retainer (remove before use)  
IN [MM]



## Dimensions

### TE-M32MX-A12X (PC Board 5-Position Male) IN [MM]



### TE-M32MX-A11X (M12 5-Position Male) IN [MM]

