

Touch Encoder

Programming Manual

TE OS Version 1.0.0 or greater (includes UtilityApp)



Revision History

Revision	Date	Description
A	2/19/2018	Original Release
B	2/27/2018	Changes to the example message in section 2.5.2 Rephrased the meaning of Byte 7 in section 2.5.2
C	3/6/2018	Changed Byte message in section 3.1
D	7/25/2018	Changed pinout on M12 to reflect production pinout
E	8/24/2018	Added Programming Harness Information
F	10/17/2018	Updated images to reflect latest app update
G	1/31/2019	Updated Touch Encoder Image
H	4/22/2019	Added Touch Zones in Photo Widget
I	7/10/2019	Added New Menu Widget in section 13
J	8/28/2019	Updated with Latest Firmware update instructions

Table of Contents

1	What's included?	1
2	Download App	1
3	Utility Application	3
4	Create and Save a new project	6
5	Basic App Navigation	8
6	Uploading and Sizing an Image	9
7	Defining Touch Zones in Photo	10
8	Widget Configuration	11
9	Setting Home Screen	14
10	Defining Program Flow	15
11	Exploring New Ring Widget	16
12	Slider Gauge	18
13	Menu Widget	19
14	Bar Widget	20
15	Lighted Icon Multi-value Widget	22
16	Configure Keypad Widget	24
17	Text Box with Icon Widget	25
18	Download Program to SDK via USB	26
19	Download Program to SDK via Wi-Fi	27
20	Programming Harness	29
21	Connections	31

1 What's included?

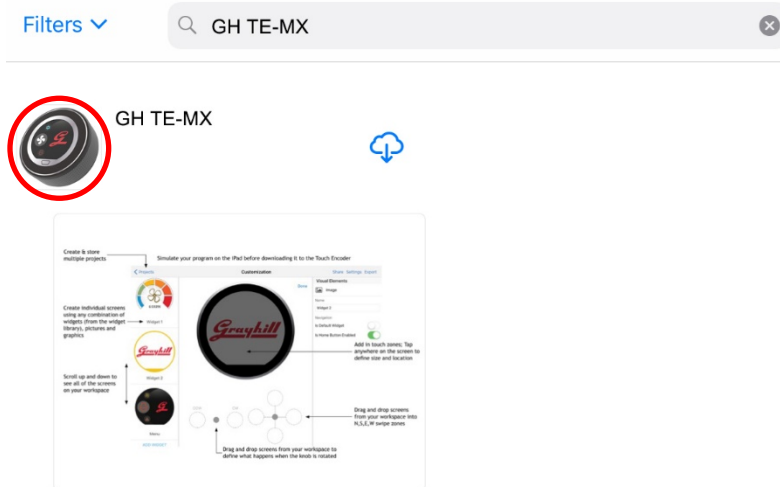


1. Touch Encoder Development Module
2. CANbus Interface Cable
3. Red Programming Cable
4. Power to USB Cable
5. Power Supply Wall Mount
6. White USB Micro B to USB Type A Adapter Cable
7. Thumb drive

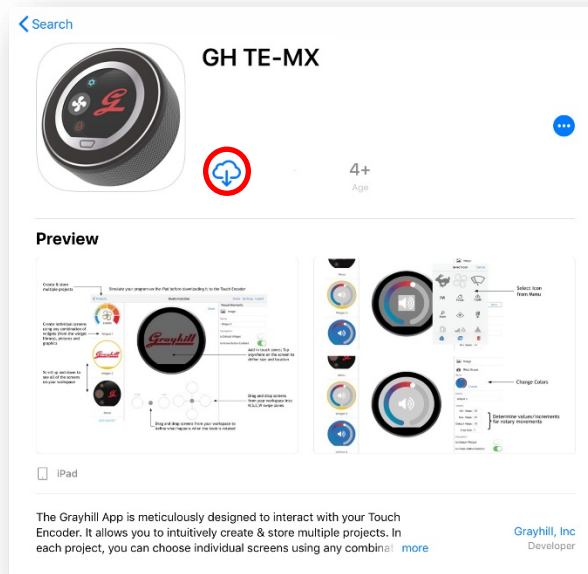
* iPad is included if tablet version is ordered

2 Download App

2.1 Search for “Grayhill” on App Store with iPad



2.2 Download App



2.3 Registration: Enter info and receive verification code in email

Registration [Next](#)

Name

Your Name

Company

Exmaple, Inc

Email

email@example.com

[<](#) **Verify Your Email**

Verification Code

[Submit](#)

3 Utility Application

3.1 TE Utility App

Power the Touch Encoder SDK with the red programming cable and USB thumb drive. If screen appears as below, and you wish to install the newest firmware and app, please visit www.touchencoder.com/programming



For latest Touch Encoders, the screen will appear as below. To update your Touch Encoder firmware, visit www.touchencoder.com/programming for instructions.



3.2 Utility Functions



3.2.1 Info

Tap the Info button to get the current Touch Encoder firmware revision.



3.2.2 Comm

Tap the COMM button to set the communication protocol and baudrate.

3.2.3 Calibrate

Please contact us per information on the last page.

3.3 Update Functions



3.3.1 Project

Go to the project button to update the project on the Touch Encoder. There can be multiple projects loaded on the USB. Scroll to select the .zip file of your choosing.

3.3.2 System

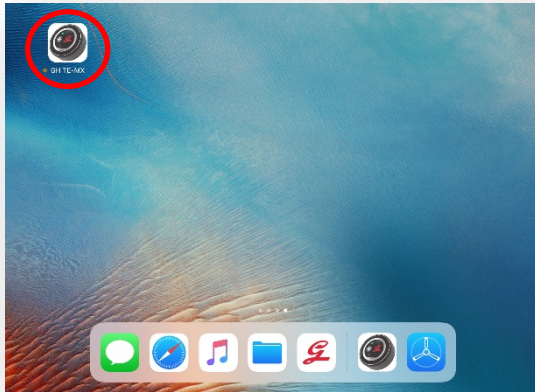
Go to the system button to update the operating system and other required system files on the Touch Encoder. For update instructions, Please visit www.touchencoder.com/programming

	
TE OS Version < 1.0.0 (no UtilityApp)	TE OS Version 1.0.0 or greater (includes UtilityApp)
Firmware Update Guide Firmware Download	Firmware Update Guide Firmware Download
Programming Manual USB Protocol Document CANbus Protocol Document Download App (Grayhill) to iPad	Programming Manual USB Protocol Document CANbus Protocol Document Download App (GH TE-MX) to iPad

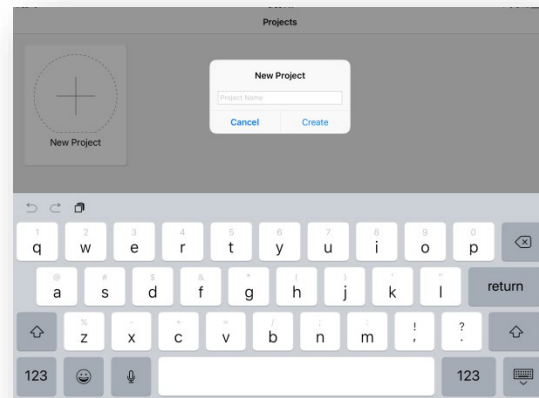
Click here 

4 Create and Save a new project

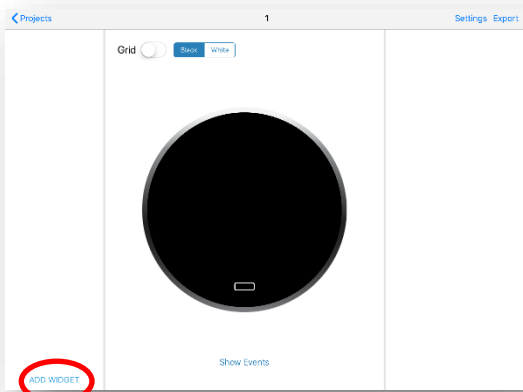
Open App



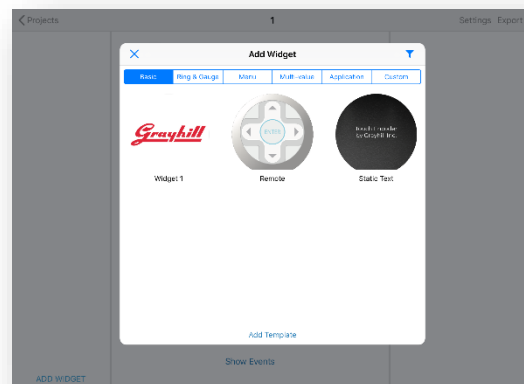
Name Project



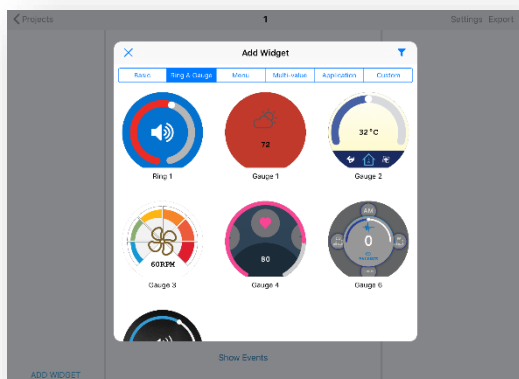
Add Widget



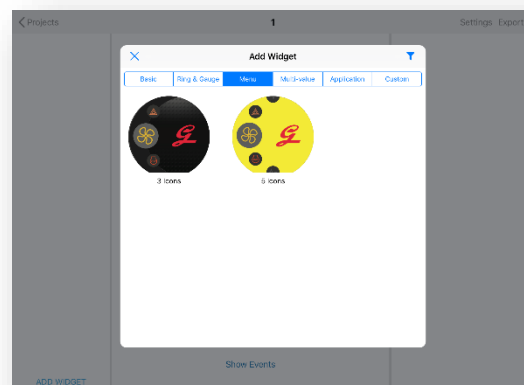
Basic Widgets



Ring & Gauge Widgets

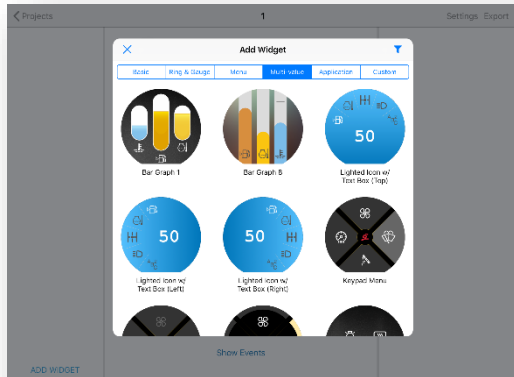


Menu Widgets

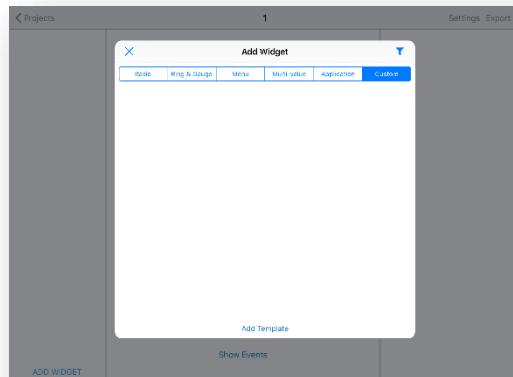


Application Widgets: Market Dependent

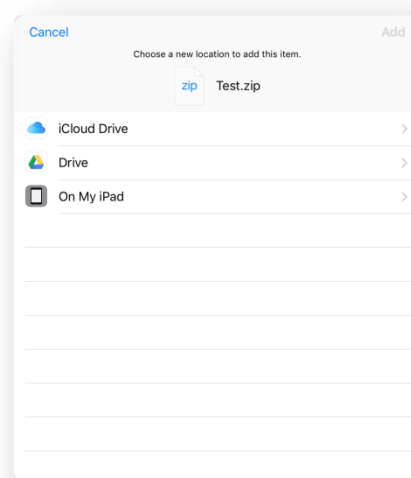
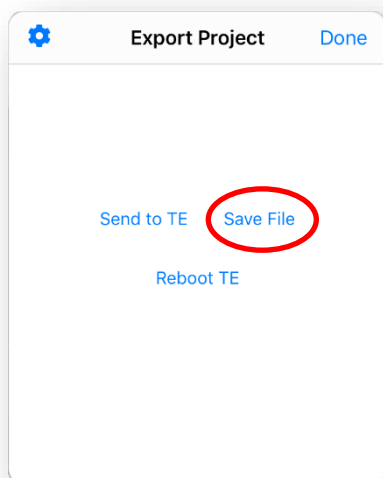
Multi-value Widgets



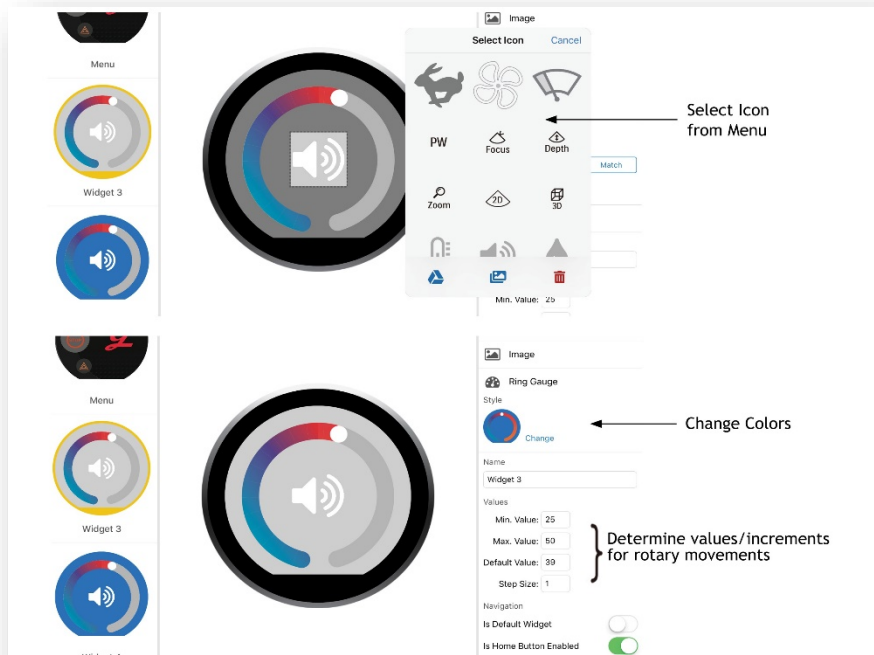
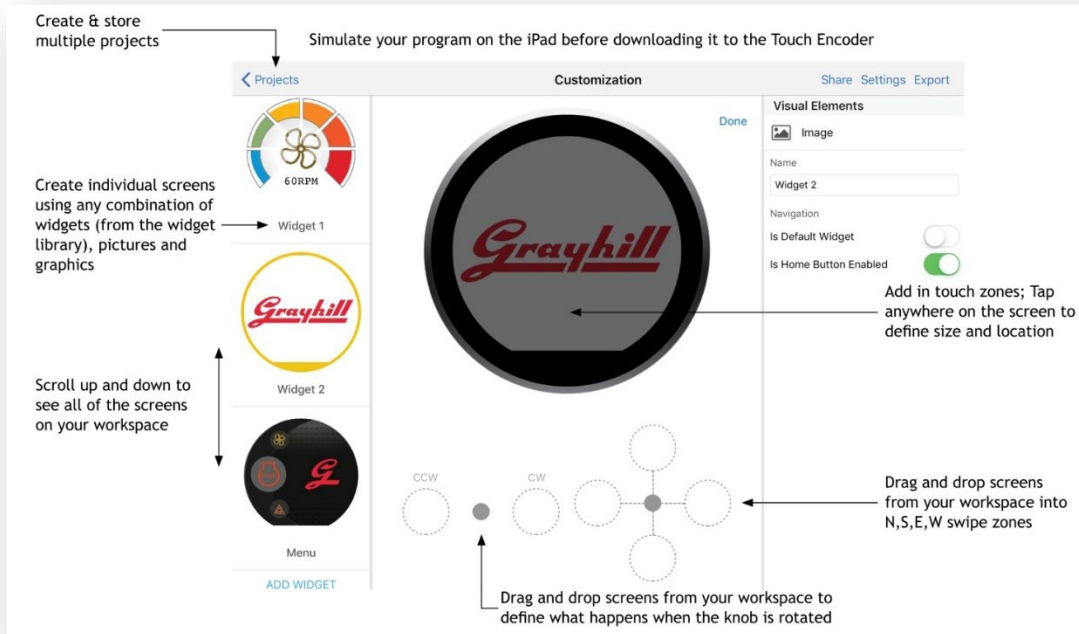
**For Complete Custom Widgets, Please Contact
Us per Info on the Last Page**



Choose to save in iCloud, Google Drive, or on your iPad

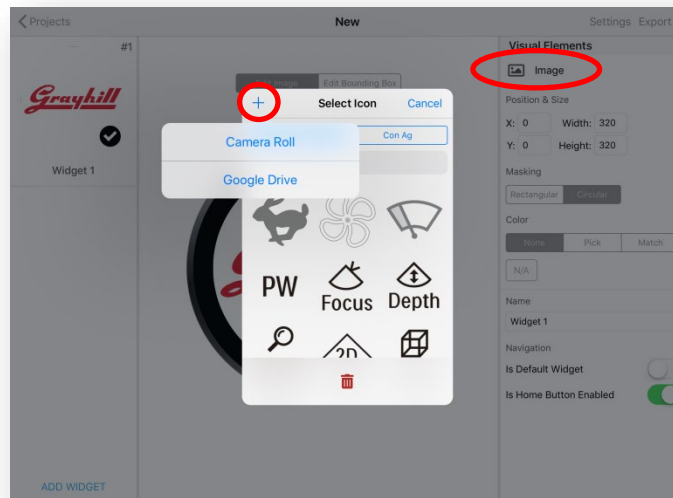


5 Basic App Navigation



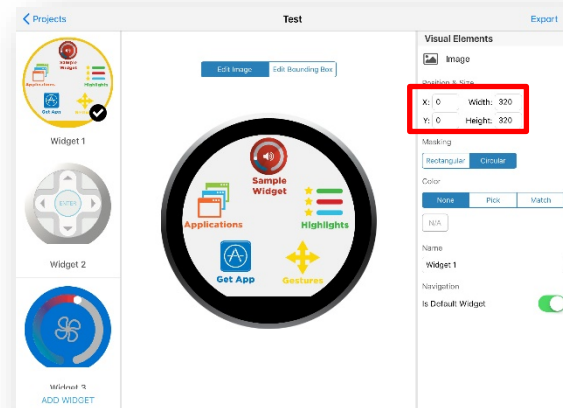
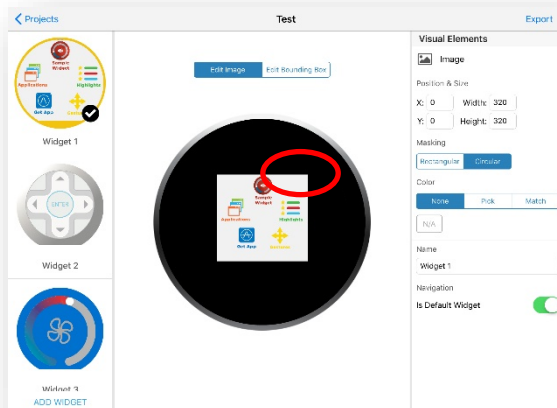
6 Uploading and Sizing an Image

Tap on “Image”, then “+” to fetch images from Google Drive or Camera Roll



Select Image

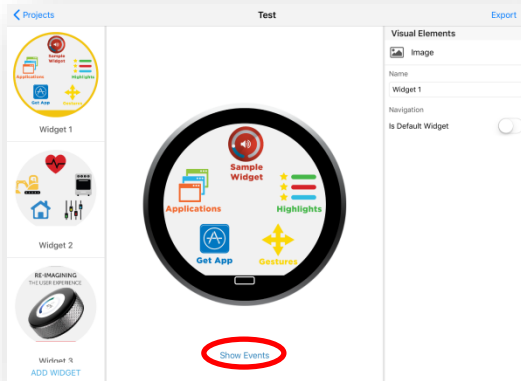
Reposition and Resize Image



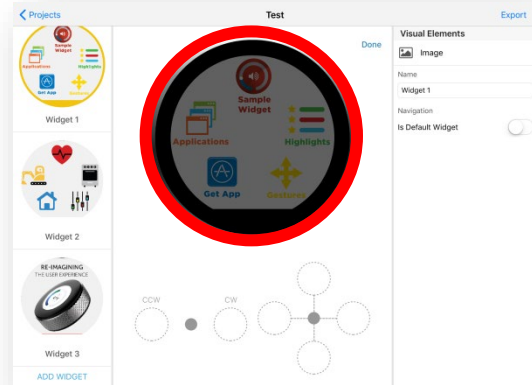
*** Repositioning and resizing can be done by tapping and dragging on image corners or inputting locational and dimensional values**

7 Defining Touch Zones in Photo

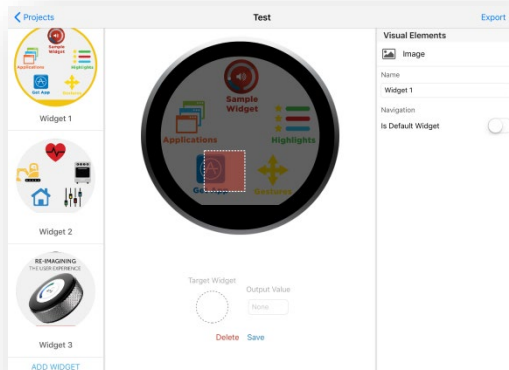
Tap on 'Show Events'



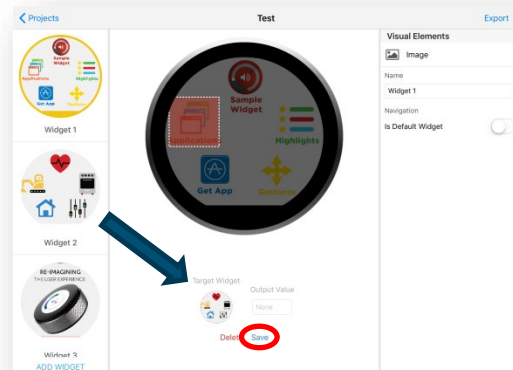
Tap anywhere on Touch Encoder Screen



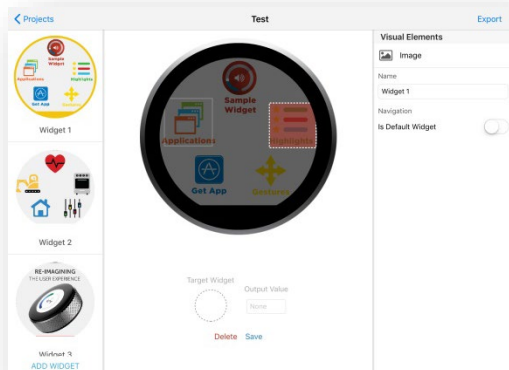
Drag corners to resize, and drag box to reposition



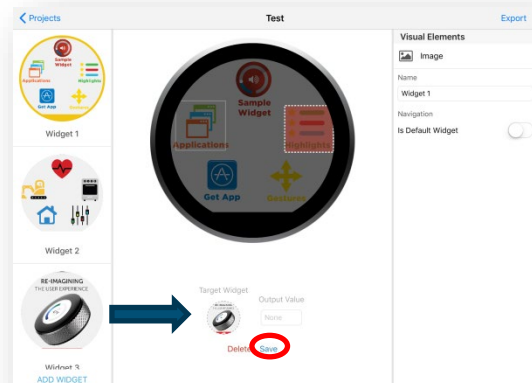
Drag Widget on the left to Target, and tap 'Save'



For more Touch Zones, Tap on screen again

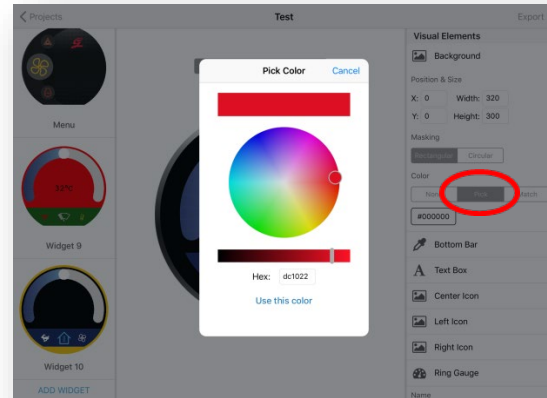
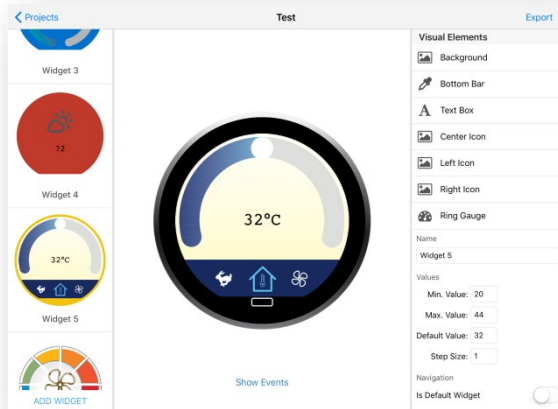


Drag Widget on the left to Target, and tap 'Save'

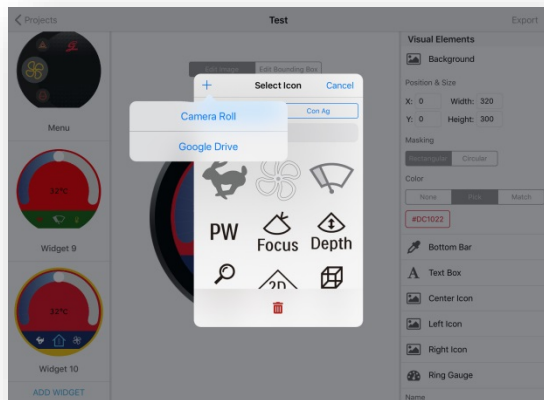


8 Widget Configuration

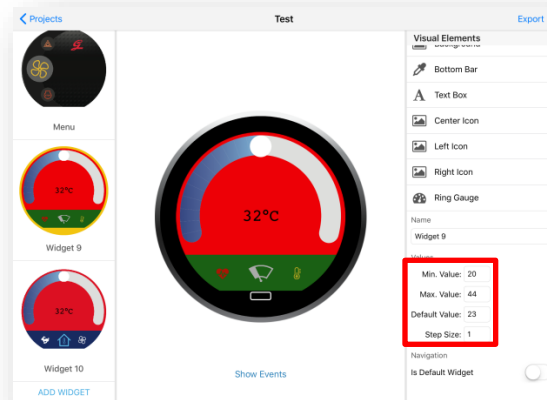
Pick any widget and select background colors



Choose Icons from Library

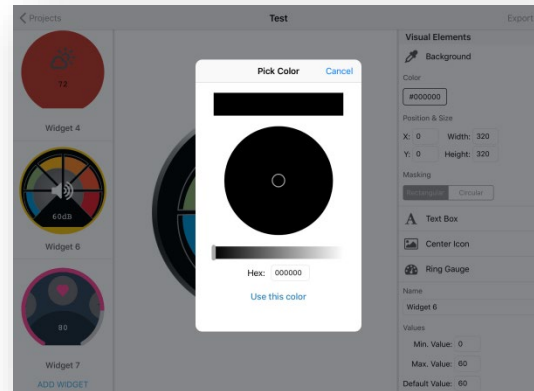
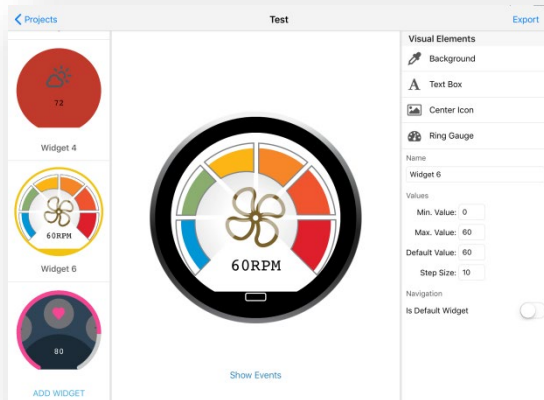


Customize Values

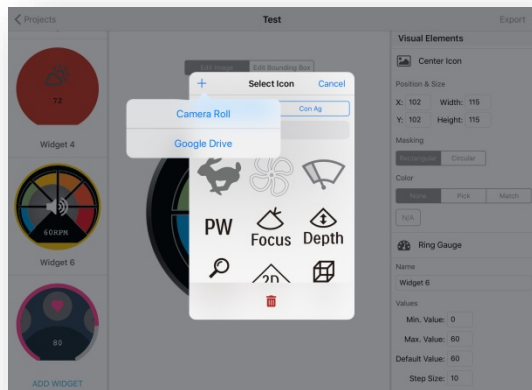


*** Customizable values include Max, Min, Default, and Step Size**

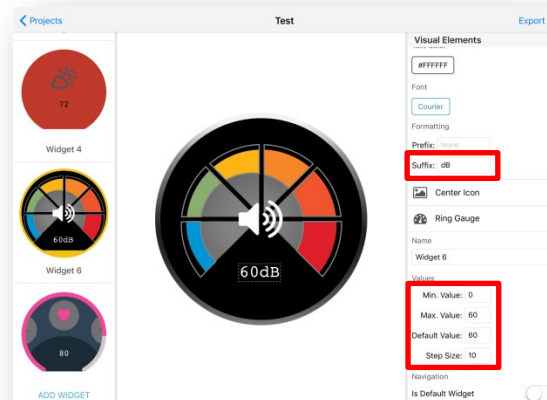
Pick any widget and select background color



Choose Icons from Library

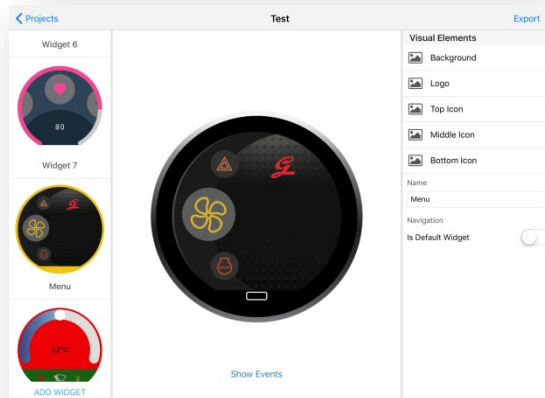


Customize Values

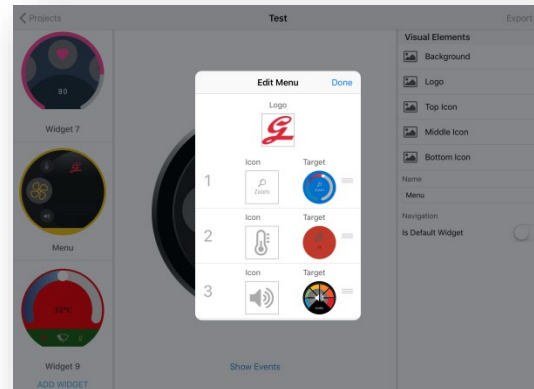


*** Customizable values include Max, Min, Default, incremental Step Size values, and Suffix (measurement unit)**

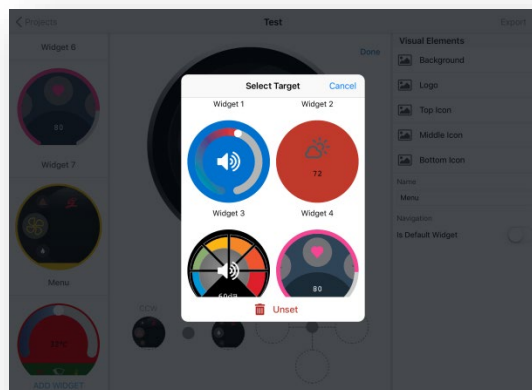
Select Menu Widget



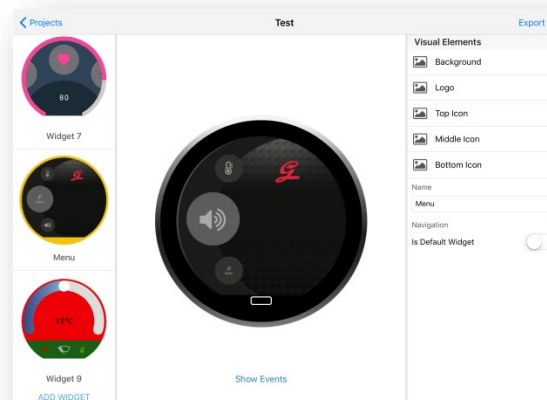
Customize Icons and Target Widgets



Choose Widgets from Workspace

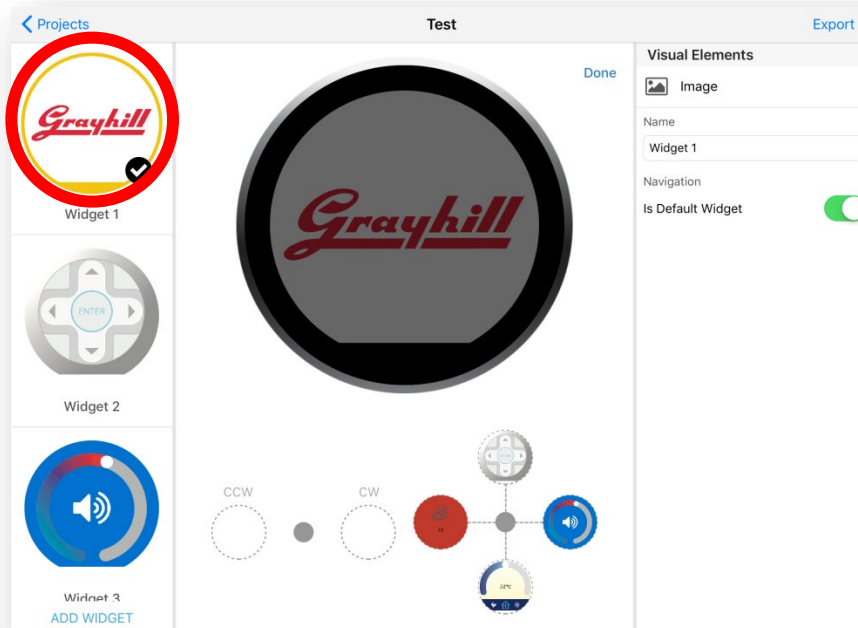


New Menu



9 Setting Home Screen

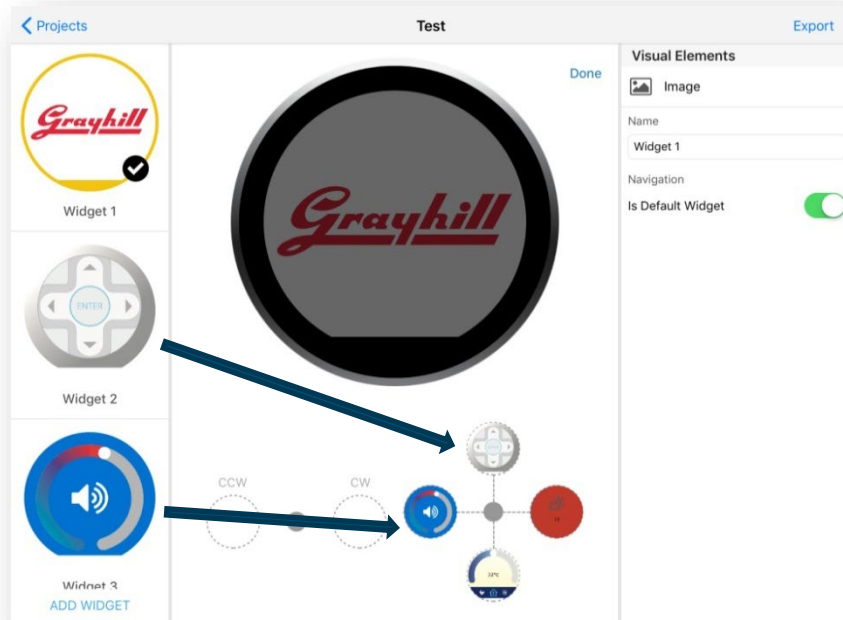
Double tap any widget to set as home screen



10 Defining Program Flow

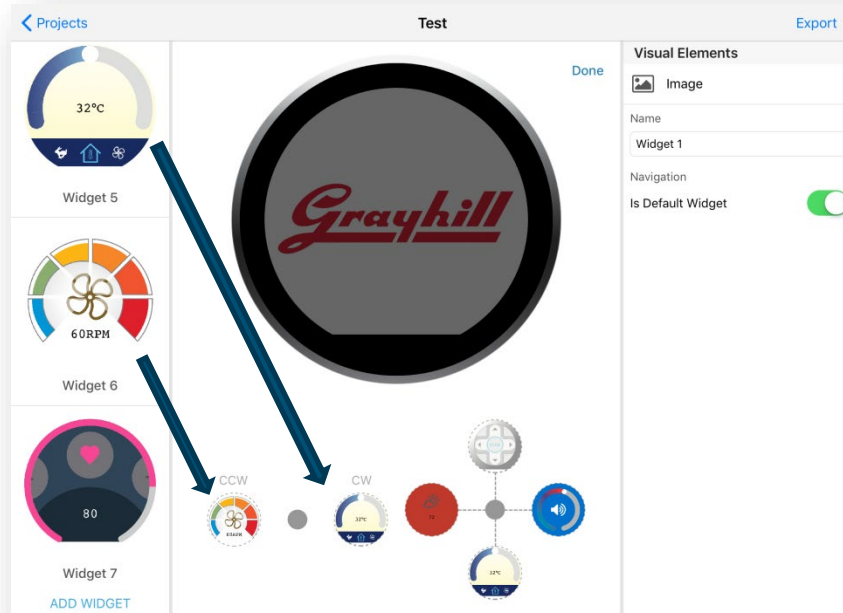
10.1 Swipe Logic

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



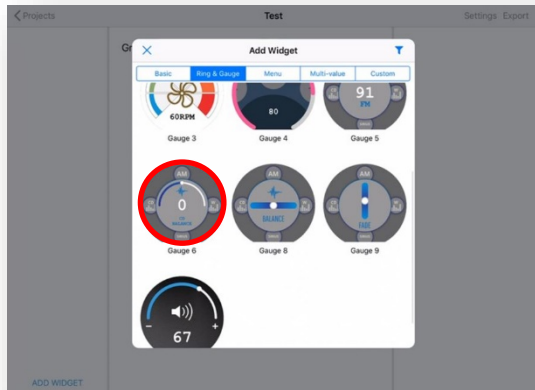
10.2 Rotation Logic

Drag and Drop any
widgets to
Clockwise and
Counter-Clockwise
target locations

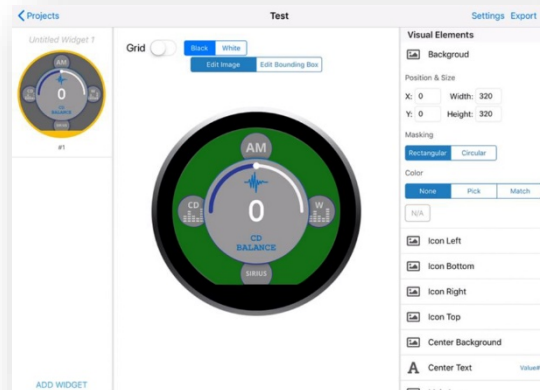


11 Exploring New Ring Widget

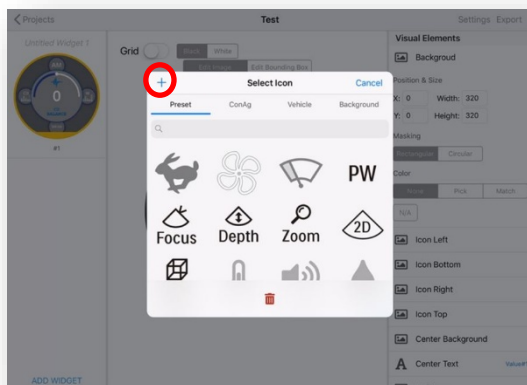
Select Widget



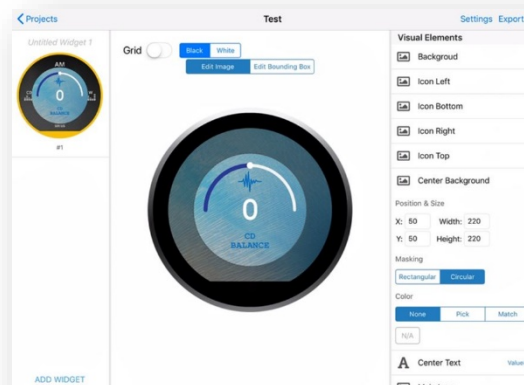
Tap 'Background' and Green Zone



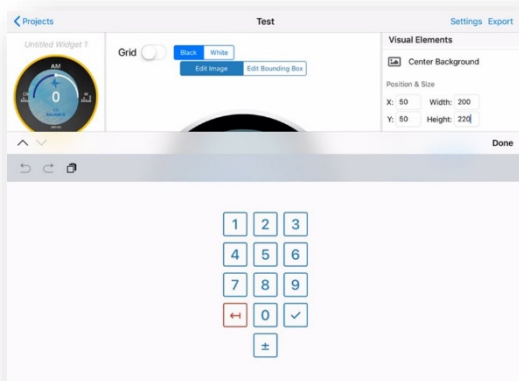
Import Image or Select Icons below



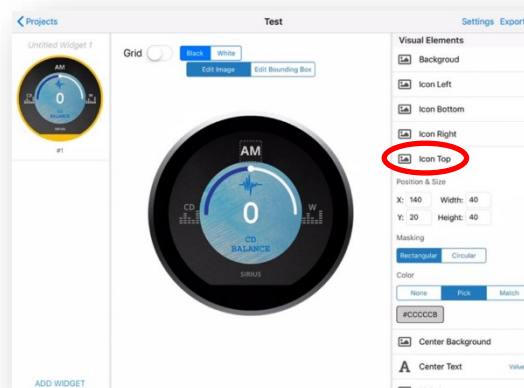
Define Masking Shape



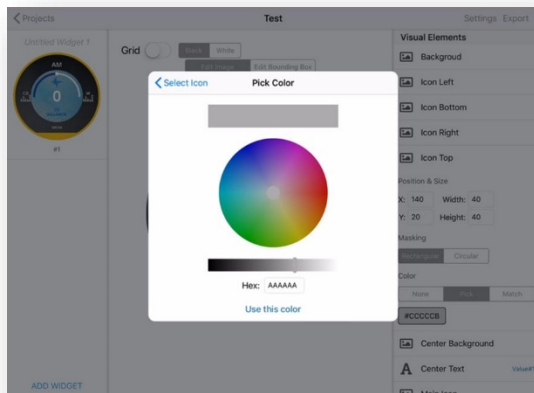
Resize Masking Measured in Pixels



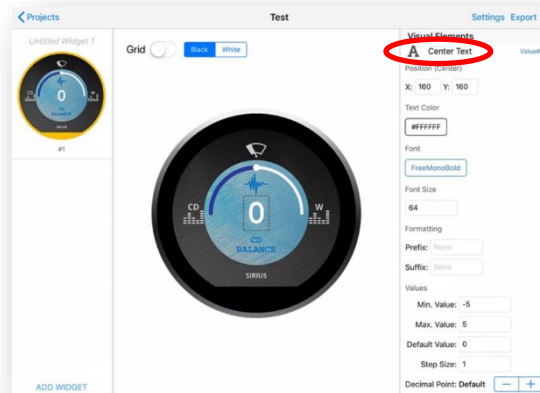
Edit Top Icon



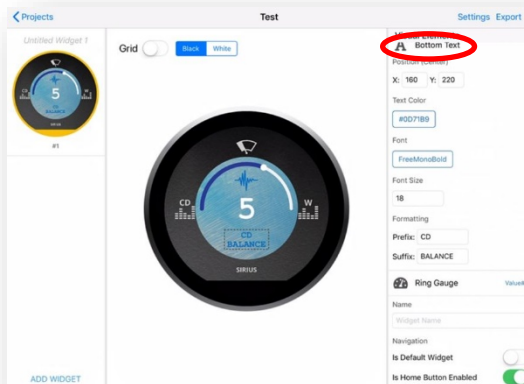
Pick Icon Color



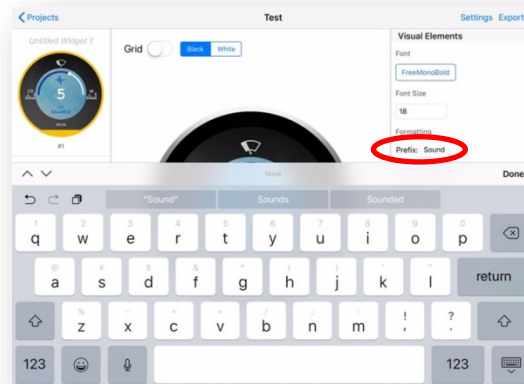
Modify Center Text with Options Listed



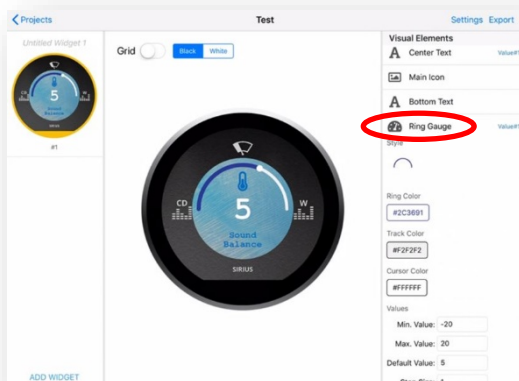
Change Bottom Text



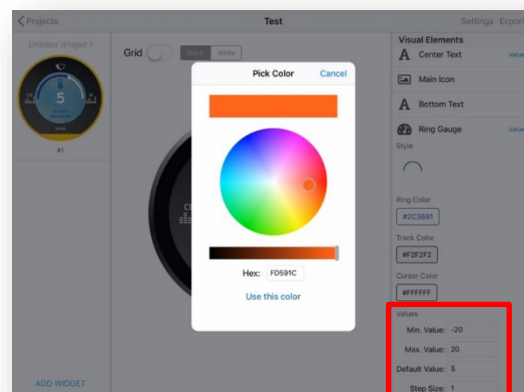
Customize Prefix and Suffix



Modify Ring Gauge

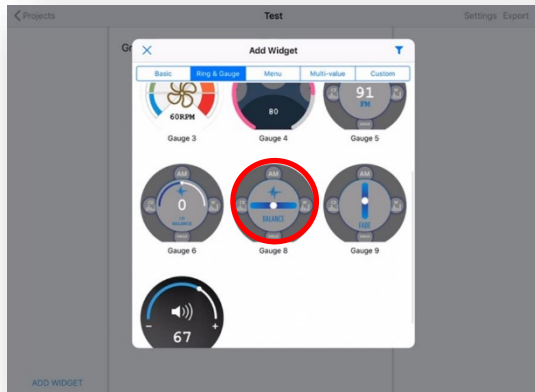


Select Colors and Edit Displayed Values

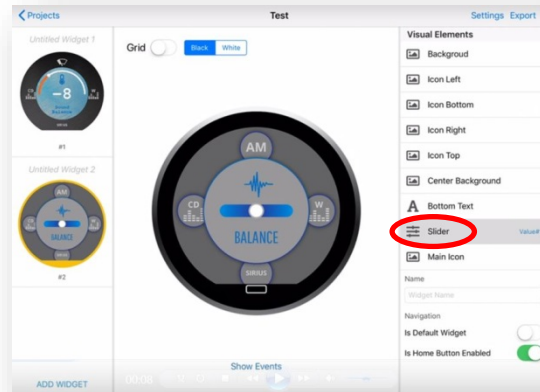


12 Slider Gauge

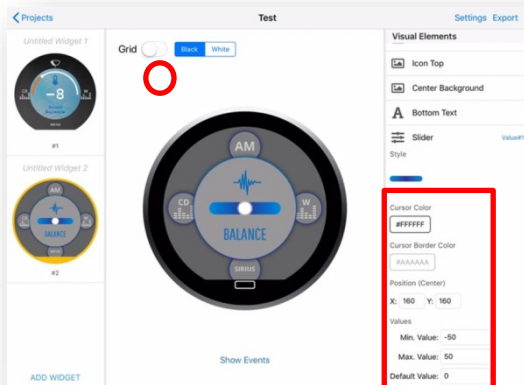
Select Widget



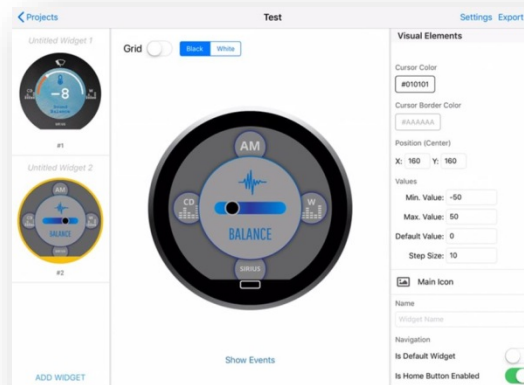
Tap on 'Slider'



Change Cursor Color, Position, and Values

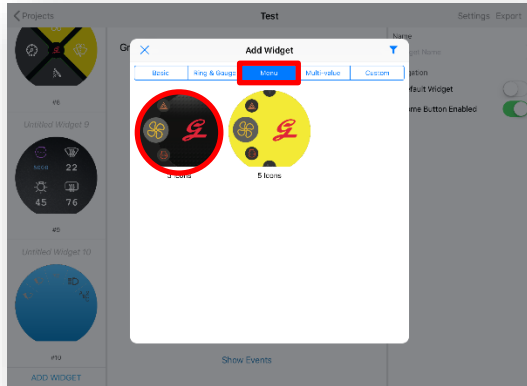


New Parameters

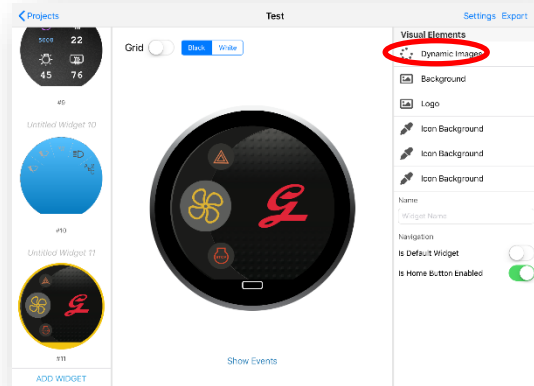


13 Menu Widget

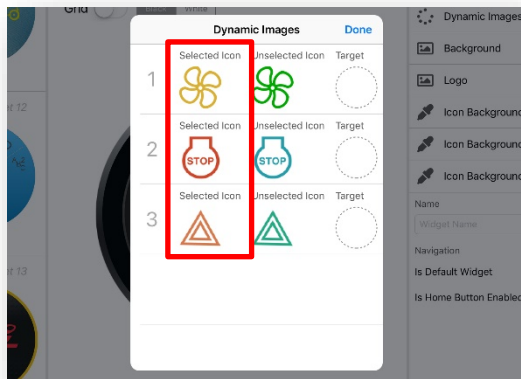
Select Widget under 'Menu'



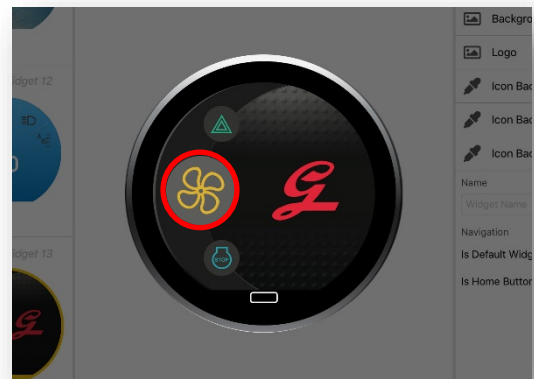
Tap on 'Dynamic Images'



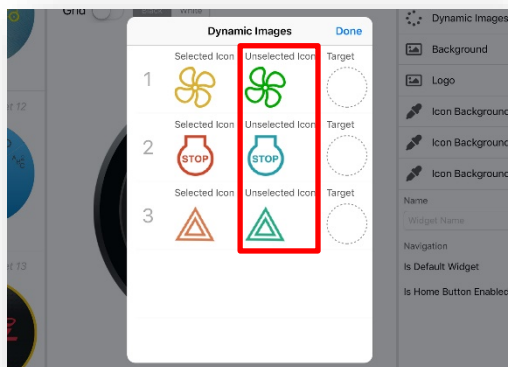
Configure Active Icons



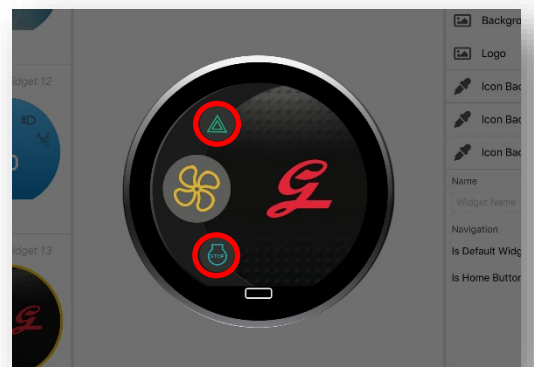
Active Icon appears
in the Center



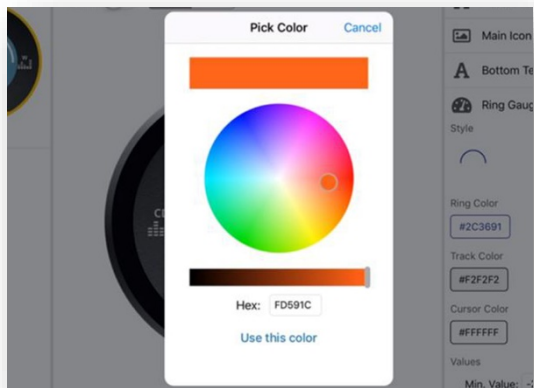
Configure Inactive Icons



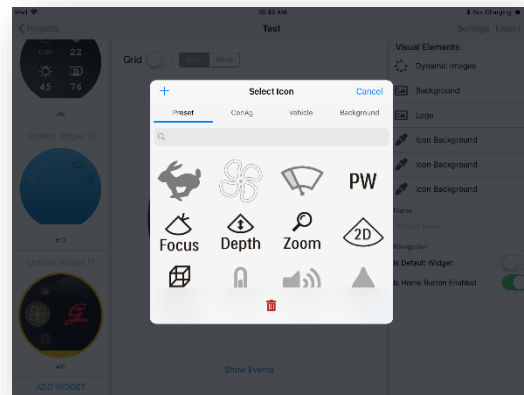
Inactive Icons appear above
and below Active Icon



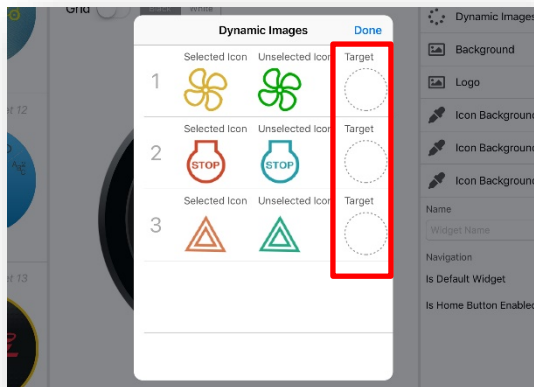
Change Icon Color



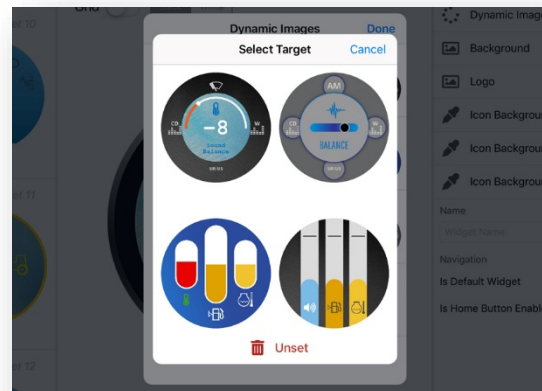
Choose other Icon Designs



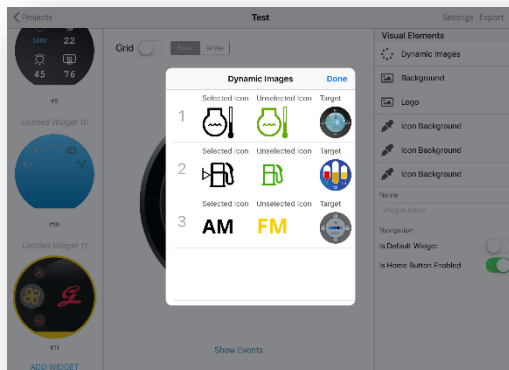
Configure Icon Targets



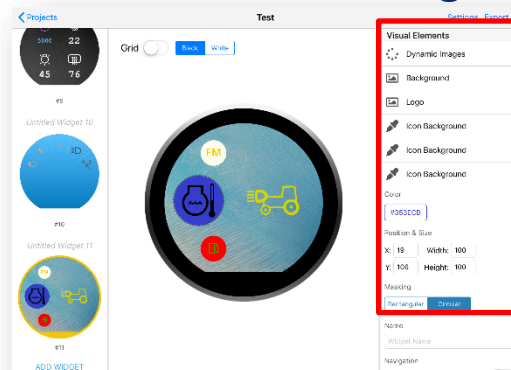
Choose from Created Widgets as Targets



Sample Configuration

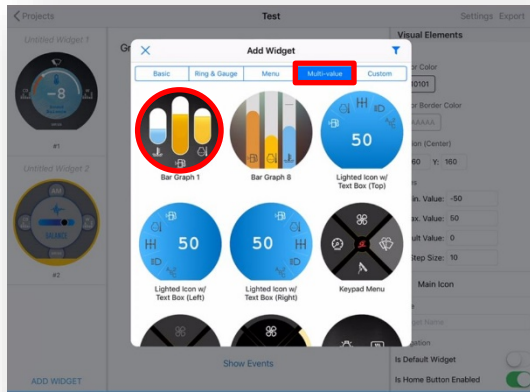


Change Backgrounds for Icons and Entire Widget

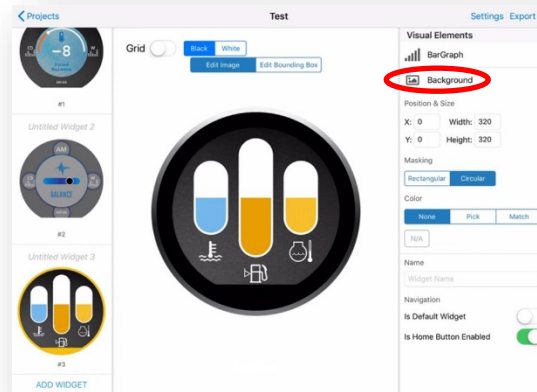


14 Bar Widget

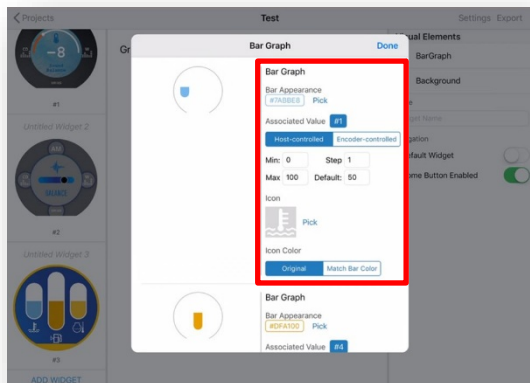
Select Widget under 'Multi-value'



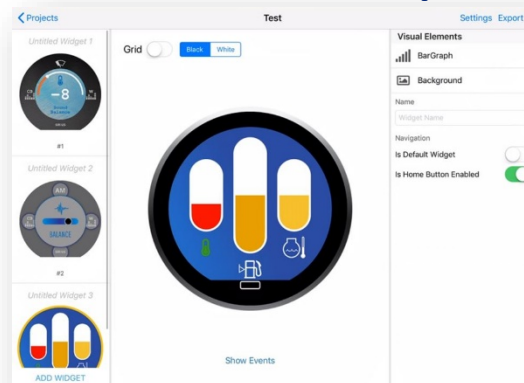
Edit 'Background' Settings



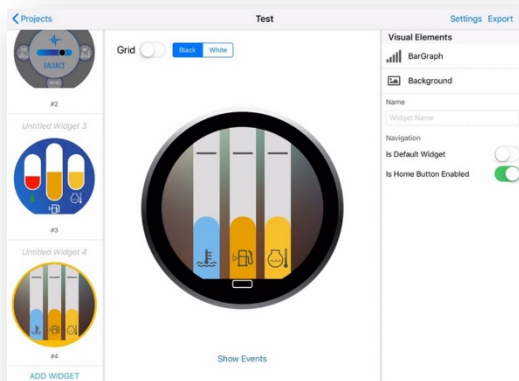
Customize Bar Graph Aesthetics, Values, and Control Device



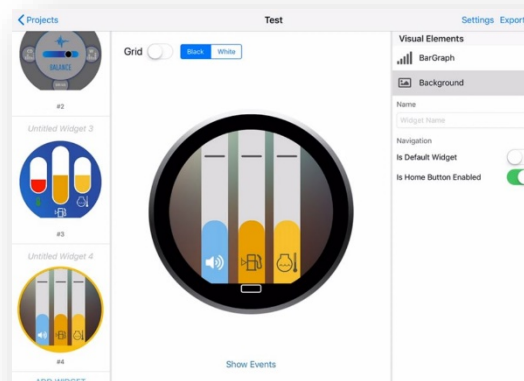
Notice changes on Background and Left Bar Graph



Configure another Widget Similarly

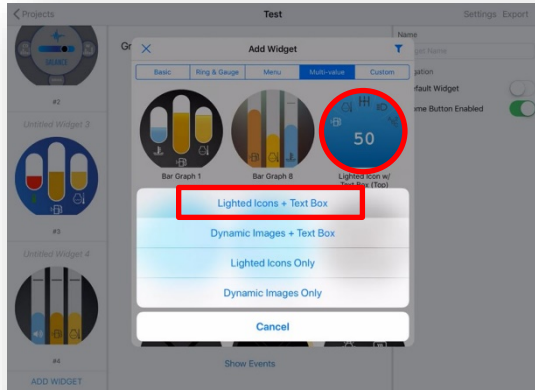


Notice changes on Left Icon and Its Color

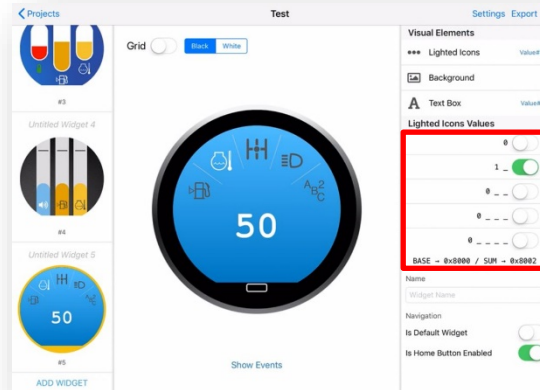


15 Lighted Icon Multi-value Widget

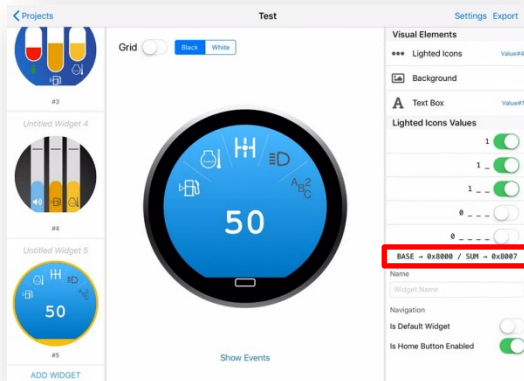
Select Widget



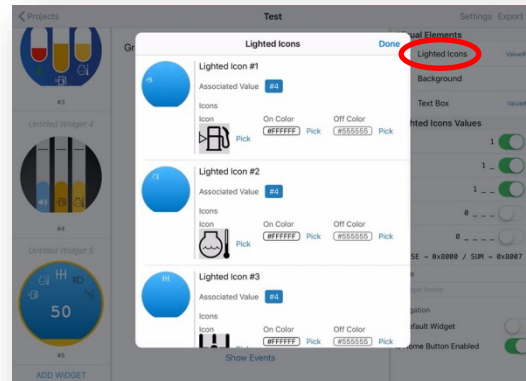
Set Icons 'On' and 'Off'



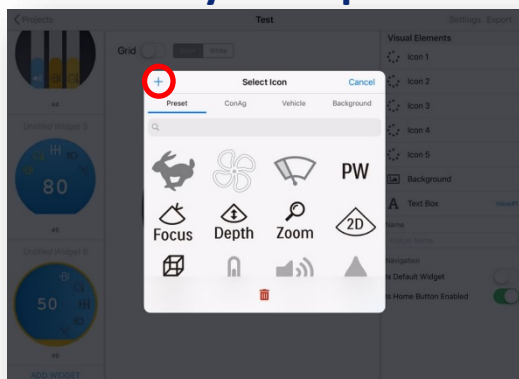
Notice Changes on Bit Masking



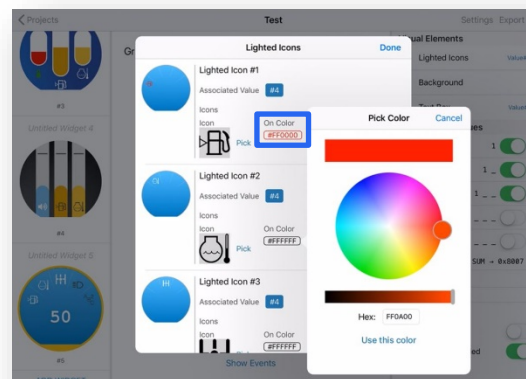
Tap on 'Lighted Icons'



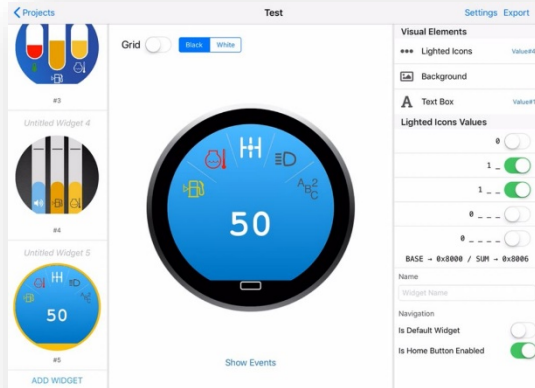
Customize Icons from Library or Import



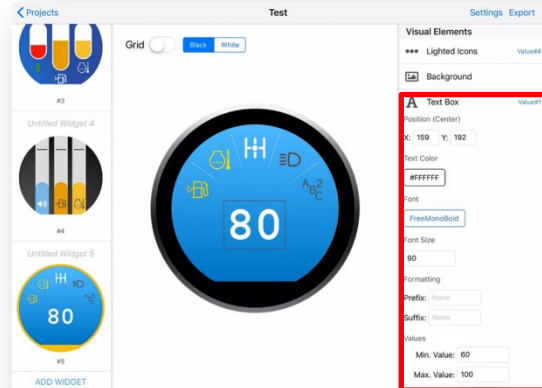
Change Icon Colors for 'On' and 'Off' States



Notice Icon Color Changes per Previous Customization

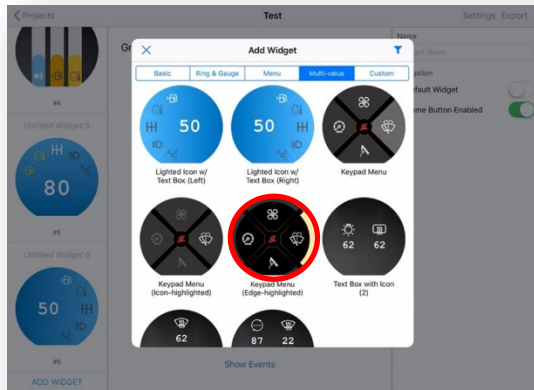


Configure Text Box with Settings Below

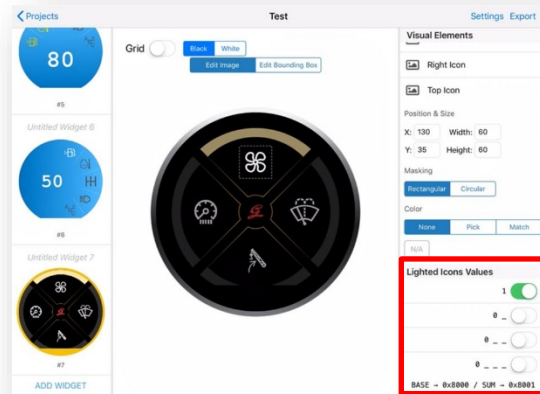


16 Configure Keypad Widget

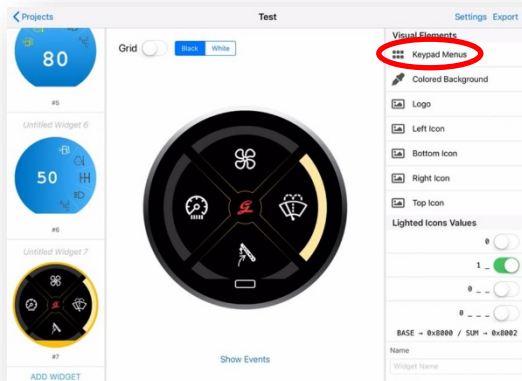
Select Widget



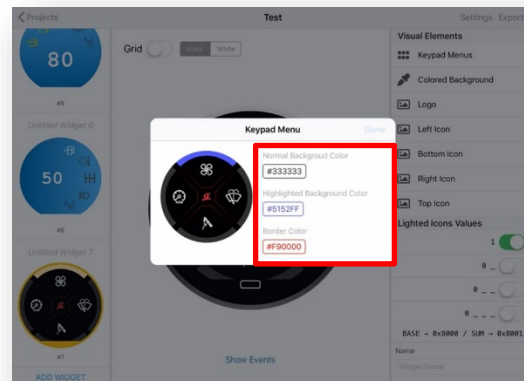
Set Icons 'On' and 'Off'



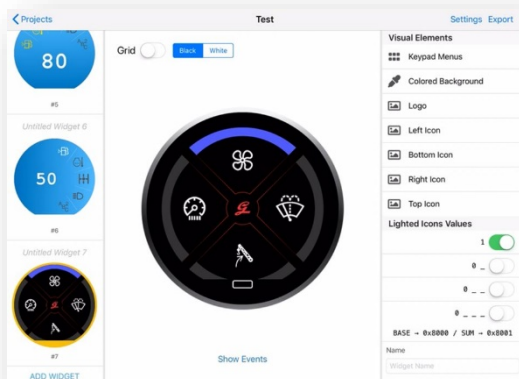
Tap on 'Keypad Menus'



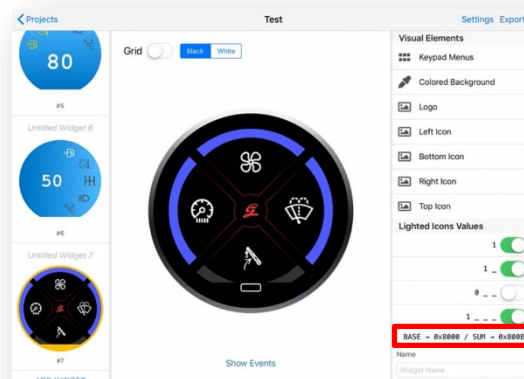
Change Color Settings



See Updates take Effect

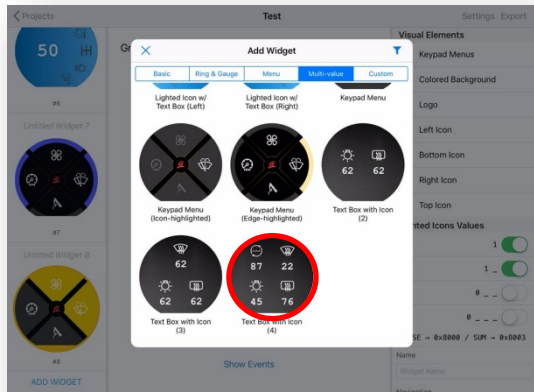


Notice Changes in Bit Masking

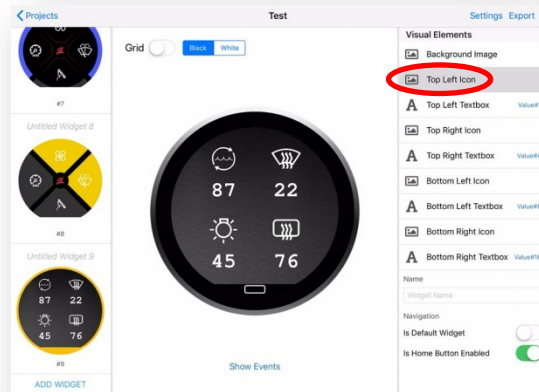


17 Text Box with Icon Widget

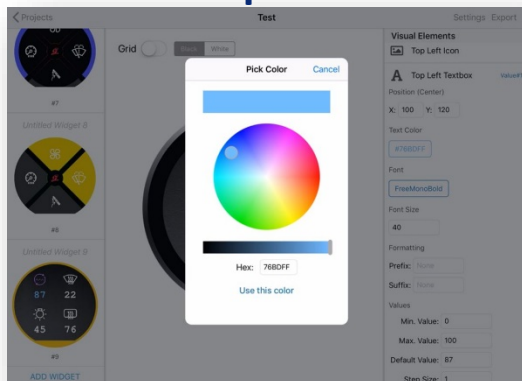
Select Widget



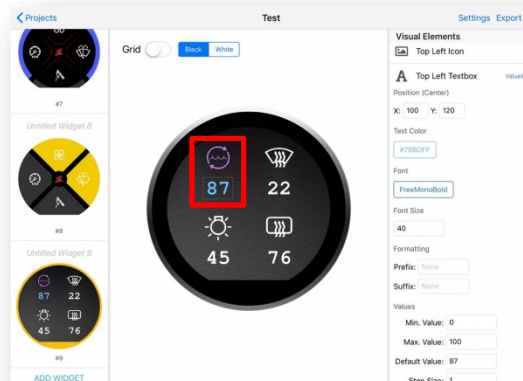
Tap on 'Top Left Icon'



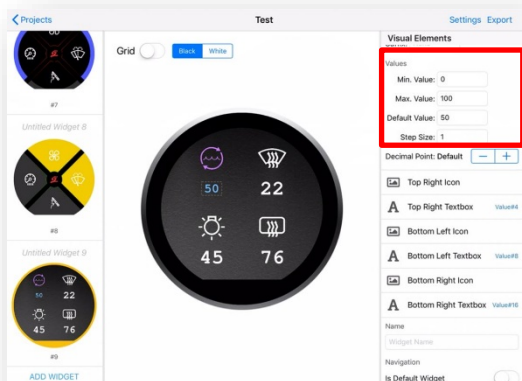
Make Selection from Color Scale or Input Hex Code



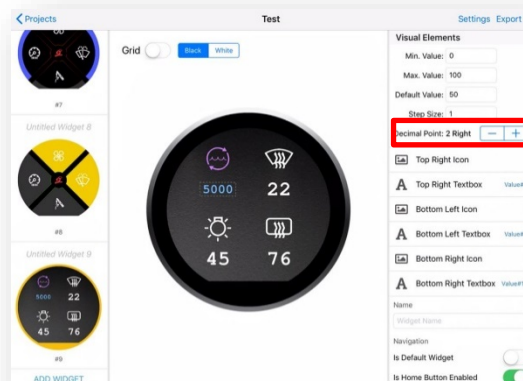
Tap on 'Top Left Textbox'



Change Values and Font



Change number of Digits in Textbox

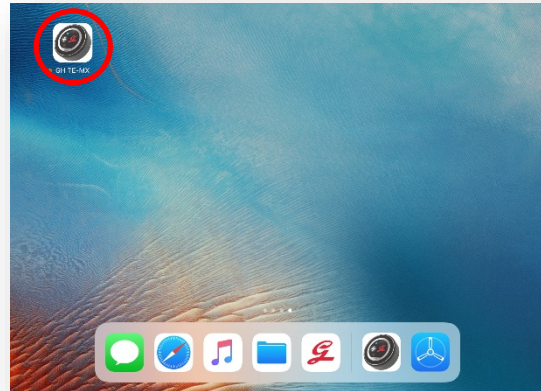


18 Download Program to SDK via USB

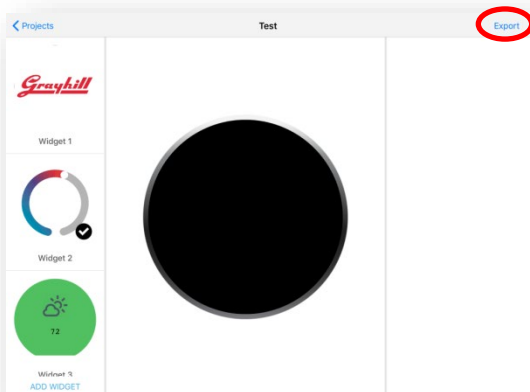
Plug in USB



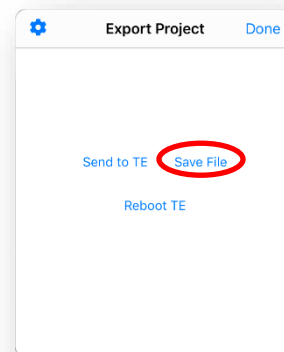
Open App



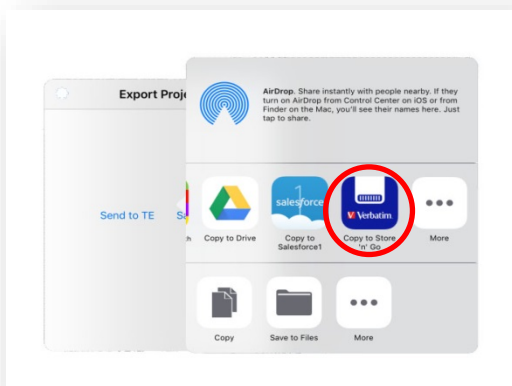
Tap on 'Export'



Tap on 'Save File'



Tap on Storage Icon



Connect USB to Red Cable, Power on

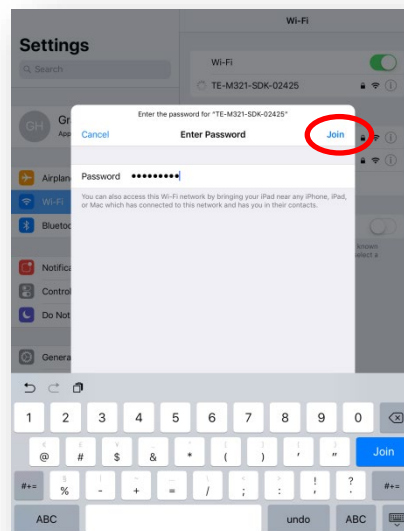


Follow Instructions. Once update is complete, reboot SDK by removing power cable for at least 5 seconds

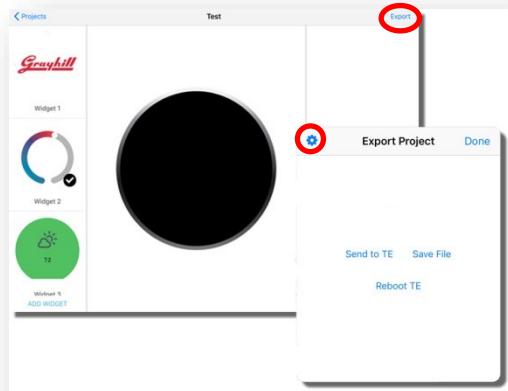


19 Download Program to SDK via Wi-Fi

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



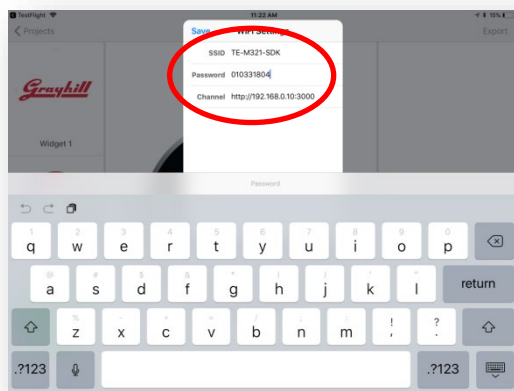
“Export”, then hit “gear” icon



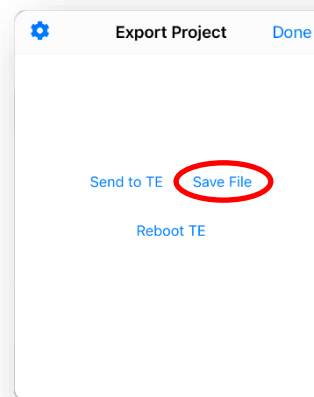
Model Number and Serial Number



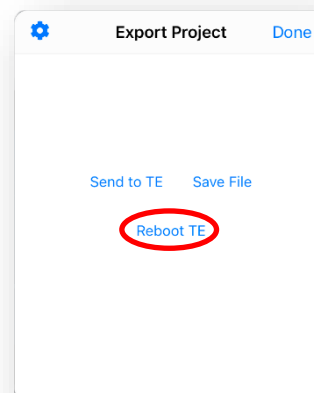
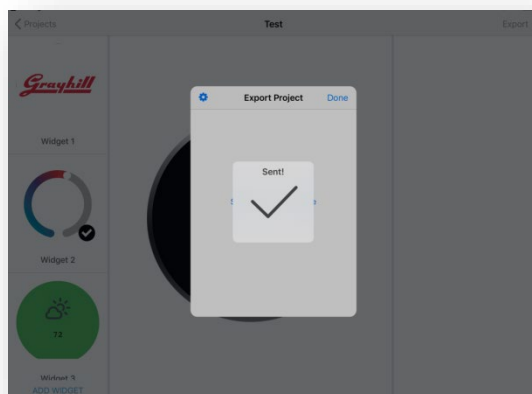
Input from previous step and save



Tap on ‘Send to TE’

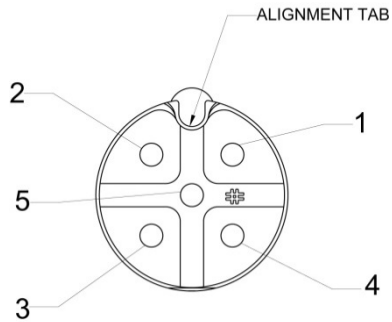


Follow Instructions on SDK. Once update is complete, reboot by tapping on ‘Reboot TE’



20 Programming Harness

Connector Pinouts



M12 Mating Connector:
AMPHENOL HDM12PF05A1STM

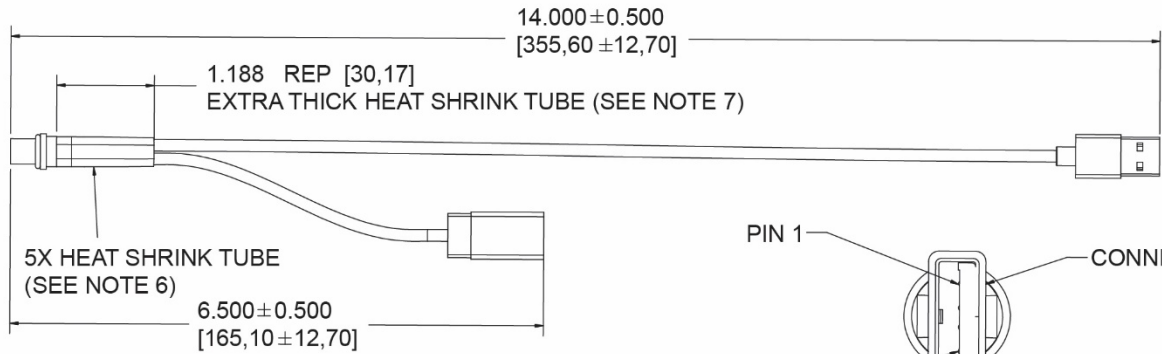
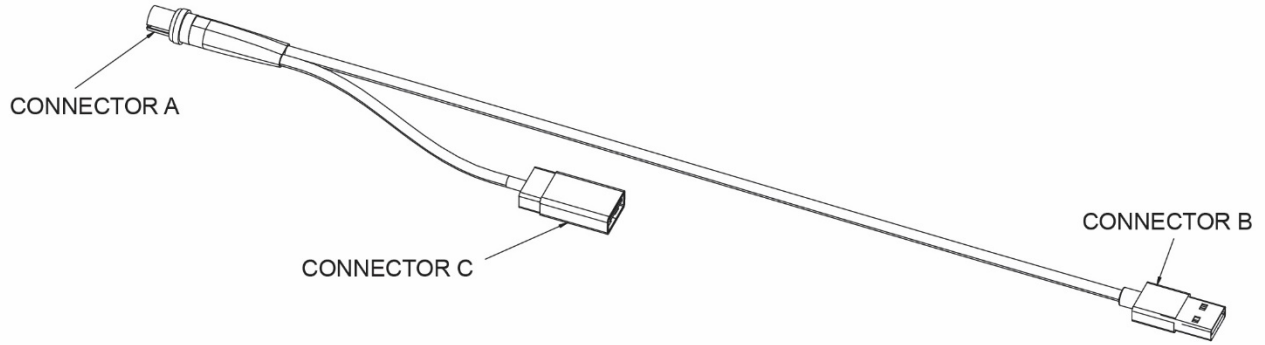
	USB	CAN
1	MODE	MODE
2	VIN	VIN
3	GND	GND
4	USB_D+	CAN_H
5	USB_D-	CAN_L

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.

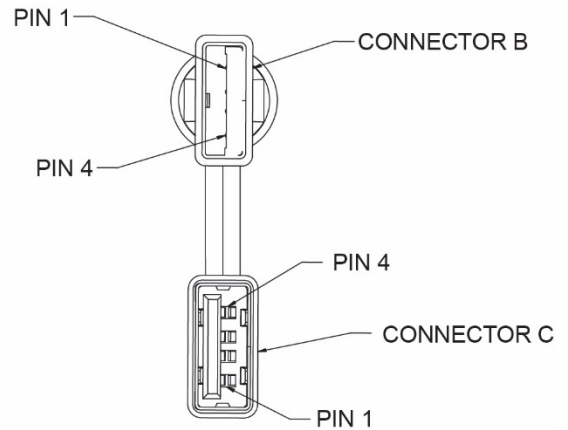
Programming Harness for Production Units

GRAYHILL P/N T18908 - USED FOR PROGRAMMING MODE ONLY

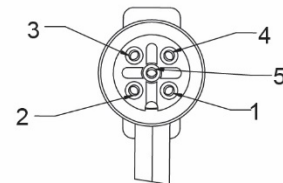


NOTES:

1. CONNECTOR A IS NORCOMP INC. P/N: 858-005-203RSU4 WITH METAL NUT REMOVED.
2. WIRE WITH USB CONNECTORS B & C IS TRIPP LITE P/N: U024-003 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.



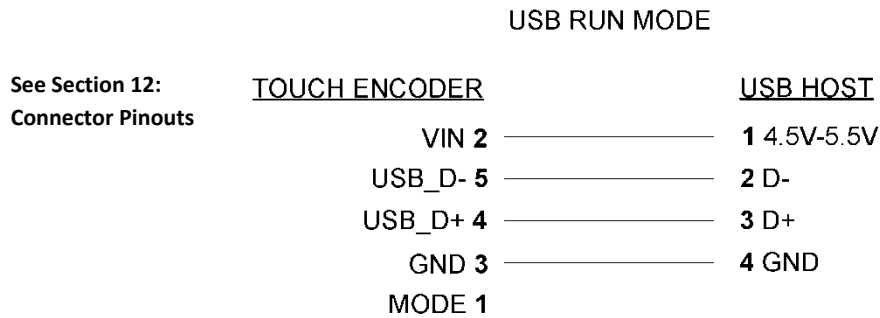
WIRE #	CONNECTOR A	CONNECTOR B	CONNECTOR C	COLOR	DESCRIPTION
	PIN	PIN	PIN		
1	1	N/A	4	BLACK	MODE
2	2	1	1	RED	V _{in}
3	3	4	4	BLACK	GND
4	4	N/A	3	GREEN	USB+
5	5	N/A	2	WHITE	USB-



Connector A Pinout

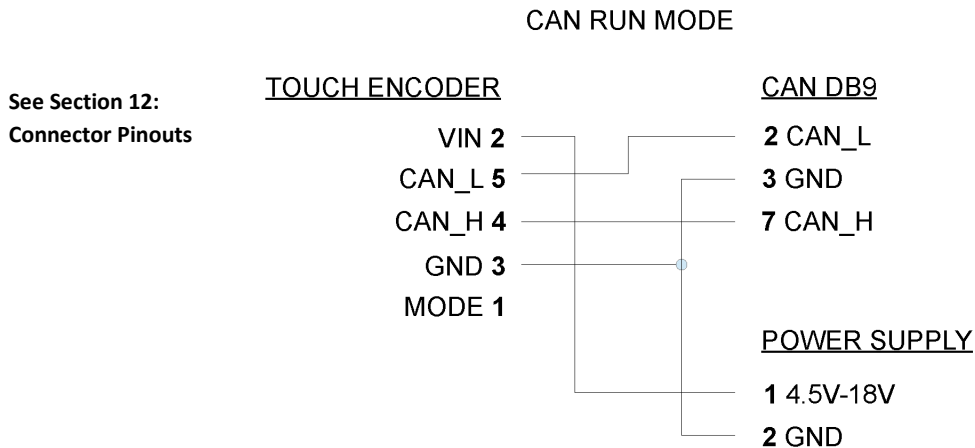
21 Connections

USB run mode:

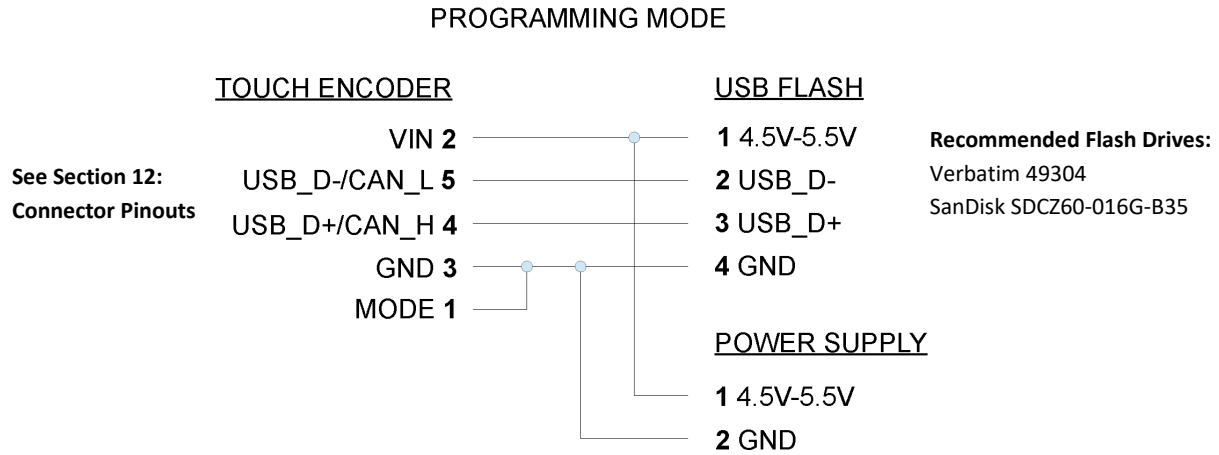


Note: The Touch Encoder can be powered from an external source or directly from the USB if the source capability is high enough (>250mA.)

CAN run mode:



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.



561 Hillgrove Avenue
La Grange, IL 60525
web: www.grayhill.com
e-mail: te@grayhill.com
phone: +1 (708) 354-1040

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.