

# TRILL



## touch sensing for makers

From the makers of



bela.io

## 1 Overview

Trill is a family of touch sensors designed by the team at Bela. Trill is designed as a convenient way to integrate capacitive touch sensing into interactive projects.

Trill is compatible with any system that supports I2C communication. Visit <https://github.com/BelaPlatform/Trill> or <https://github.com/BelaPlatform/Trill-Arduino> to download libraries and examples for Bela, Arduino, Teensy, as well as Linux systems such as Raspberry Pi.

To find the complete Trill documentation as well as a Get Started Guide for multiple platforms, go to <https://bela.io/trill>

## 2 Trill Sensor Types

There are five Trill sensor types: Bar, Square, Craft, Hex and Ring. Each Trill type offers different physical and sensing affordances:

Trill Type	Sensing Mode	Multi-touch?	Dimensions (W x H)
Bar	1-axis slider	Yes	112mm x 22mm
Square	2-axis pad	No*	74mm x 74mm
Craft**	30-channel breakout	Yes	54mm x 25mm
Hex	2-axis pad	No*	54mm x 54mm (edge to edge)
Ring	1-axis slider	Yes	56mm (outer), 36mm (inner)

\* Pseudo-multi-touch is possible on these sensors but due to the matrix arrangement of pads it is not possible to reliably track the position of individual touches when there is more than one present.

\*\* Trill Craft is a 30-channel breakout board for creating custom touch interfaces out of any conductive material.

### 3 Technical specification

	Unit	Value	Condition
Operating voltage (Vcc)	<i>V</i>	1.71V to 5.5V*	
Operating current	<i>mA</i>	4	3.3V, 5V
I2C bus speed	<i>kHz</i>	400(max)	

\* These are the values reported in the datasheet for the CY8C20XX6A/S. Trill devices have been tested with  $V_{cc} = 3.3V$  and  $V_{cc} = 5V$ .

### 4 Pinout

On each Trill sensor there are 6 signals present: VCC, GND, SDA, SCL, RST and EVT.

#### 4.1 About the signals

VCC is where you give power to the sensors. GND is the ground connection of the sensors. SDA is the data line of the I2C bus while SCL is the clock line of the I2C bus. RST is the reset pin: when a voltage is applied to this pin the device will reset. EVT is the event pin which is pulsed every time a scan is completed and each time a touch is detected.

#### 4.2 Trill Bar, Square, Hex, Ring

The following pinouts apply to Trill Bar, Square, Hex and Ring. Each of these sensors includes a Grove connector that attaches to the sensor and ends in pins that can be plugged into a breadboard

Pin	Signal	Color*
1	GND	Black
2	VCC	Red
3	SDA (Data)	White
4	SCL (Clock)	Yellow

\* The color listed is that of wire on the provided Grove cable.

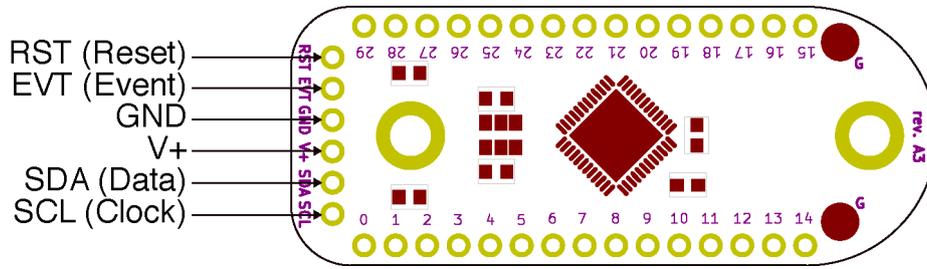
##### 4.2.1 Additional connections

The Event (EVT) and Reset (RST) signals are available as unpopulated, labelled solder pads.

Trill Ring additionally has two pads on the reverse side which can be used as capacitive buttons. These pads behave in the same way as the pins on Trill Craft: just solder a wire to the pads and connect them to any conductive material.

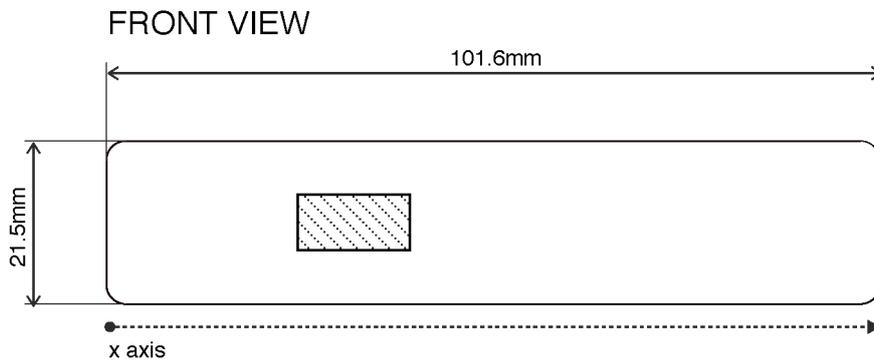
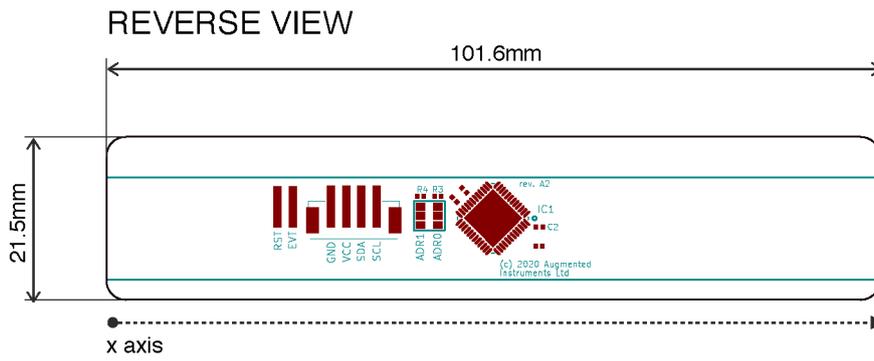
#### 4.3 Trill Craft

Trill Craft has a total of 30 pins, one for each channel of sensing (15 pins on each side). Trill Craft also has two Ground pads on the front side which are labels with a G. There are 6 additional pins which are along the shorter straight edge:



## 5 Dimensions

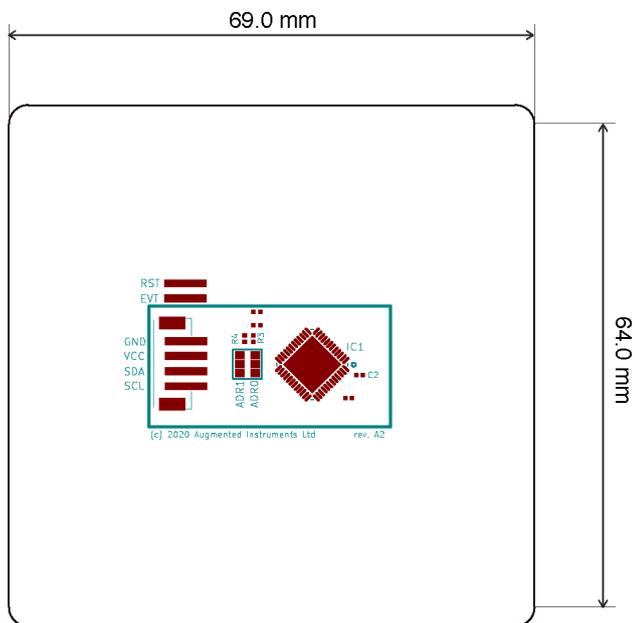
### TRILL BAR



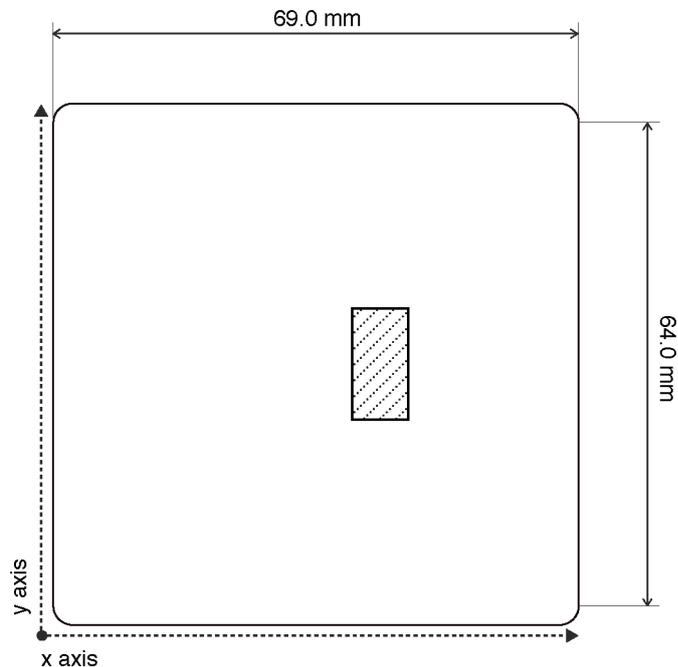
 = Location of Grove connector on reverse side

# TRILL SQUARE

REVERSE VIEW



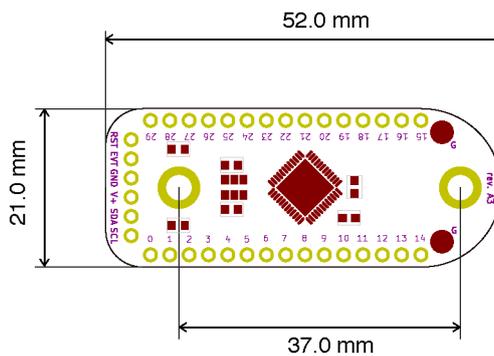
FRONT VIEW



 = Location of Grove connector on reverse side

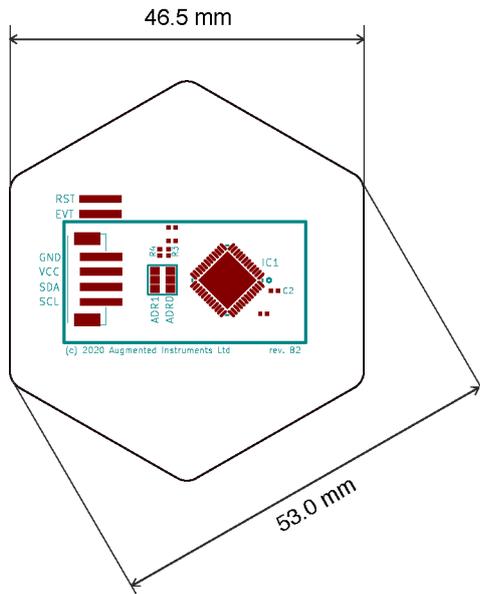
# TRILL CRAFT

FRONT VIEW

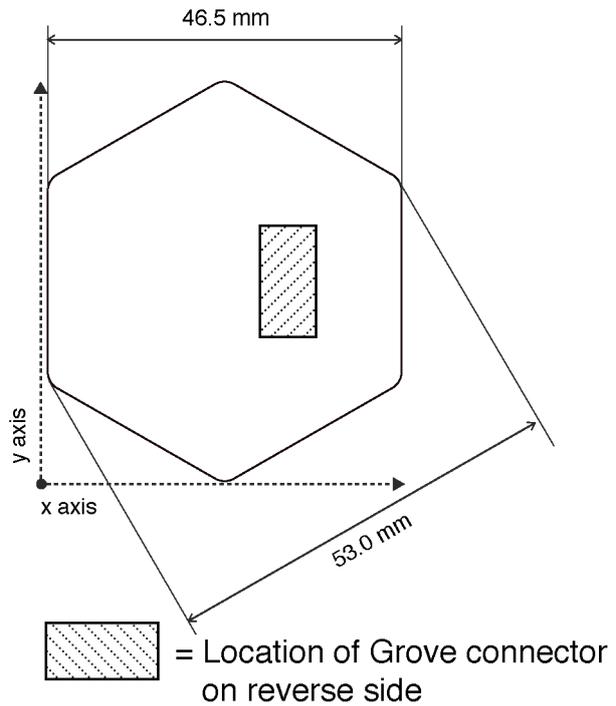


# TRILL HEX

REVERSE VIEW

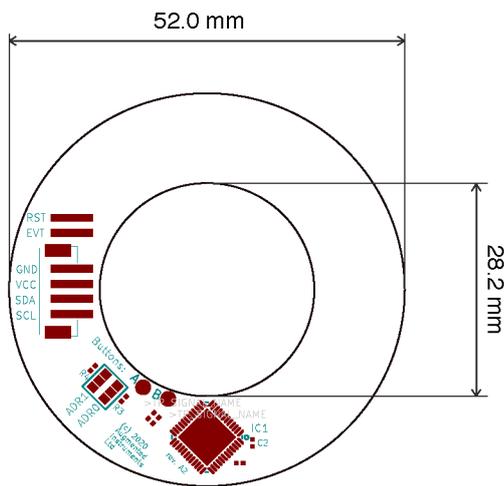


FRONT VIEW

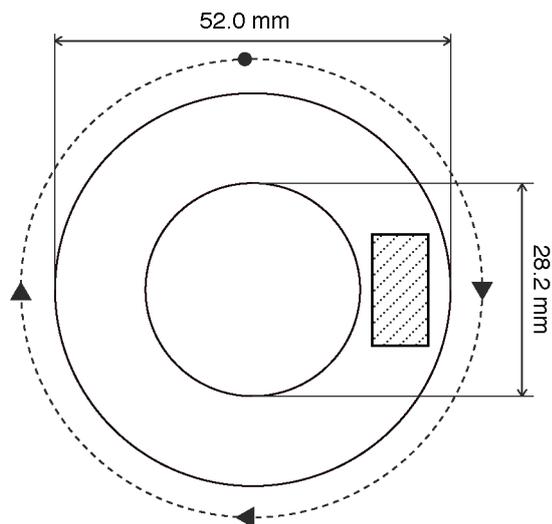


# TRILL RING

REVERSE VIEW



FRONT VIEW



 = Location of Grove connector on reverse side

Note: On Trill Ring the sensor reading is 0 at the point of origin, and values increase from 0.0 to 1.0 in the direction indicated.