

## Connecting several EVO sensors simultaneously to create a multi-directional sensing array



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# 1. Introduction

This document describes two methods to use multiple Terabee distance measurement sensors simultaneously, for example to build an anti-collision system for ground robots or drones. You might require multiple sensors to cover different angles of your platforms.

There are two main options to use several sensors simultaneously:

1. Use the HUB Evo to connect multiple ToF distance sensors
2. Change the I2C address of each sensor on an I2C bus

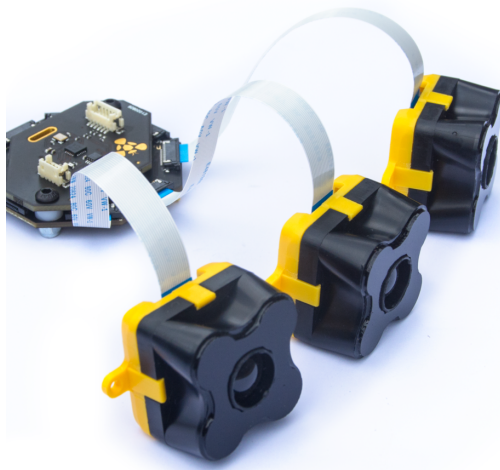
Both options are explained in detail in the following pages.

## 2. HUB Evo

The Hub Evo option is the easiest way to use multiple sensors simultaneously.

Hub Evo enables you to connect up to 8 TeraRanger Evo distance sensors and synchronizes distance measurements from each sensor, triggering these in a sequence that avoids crosstalk.

The Hub Evo communicates via USB as standard. But you can also mount the UART communication board, included with the TeraRanger Evo Hub, to gain a serial interface. The distances measured by the sensors will be provided in an easy format to your host computer.



You can do your own array with the following components.  
Example: for six Evo 60m sensors :

[Terabee Hub EVO](#) X 1

[Terabee Evo 60m](#) X 6 (HUB backboard option) You can choose between Evo Mini, 3 m, 15 m, 40 m and 60 m sensors (or a combination of these sensors).

[Flat Flex Cables](#) X 1 (pack of 8 cables) Choose your desired length

These items can be ordered on the [Terabee website](#), or through our [Reseller network](#).

### 3. Changing the I2C address

Evo Sensors (15m, 40m, 60m and Mini) have a 49, in decimal, I2C address assigned as default. This section explains how to change the I2C address. Sensors will work as slaves on the I2C bus when the I2C address is changed.

*This procedure should be only used for users with experienced knowledge in electronics. Malfunctions can occur if the I2C address and related parameters are improperly set.*

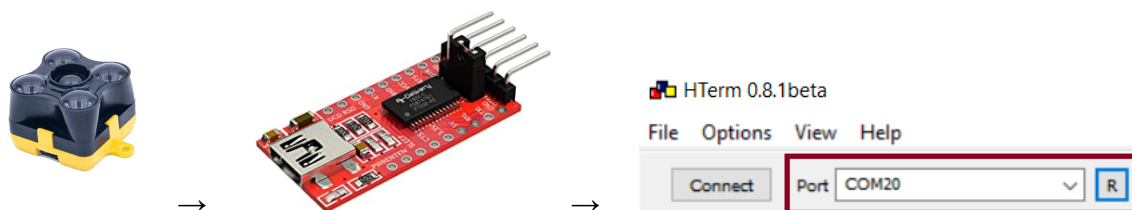
This procedure should be only used for users with experienced knowledge in electronics. Malfunctions can occur if the I2C address and related parameters are not properly set.

#### Method

Terminal emulation software is necessary to change the I2C address of the Evo Sensors. Hterm, available on the Terabee Website, is a Terminal Emulation Software used as an example here.

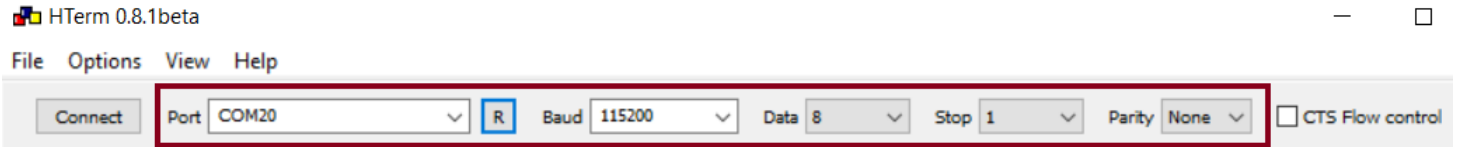
There are two methods to connect the sensors to the terminal emulation software:

1. You can connect directly to the computer via the USB backboard
2. You will need a FTDI to USB adapter if you have the I2C/UART backboard only



The following list will guide you step-by-step:

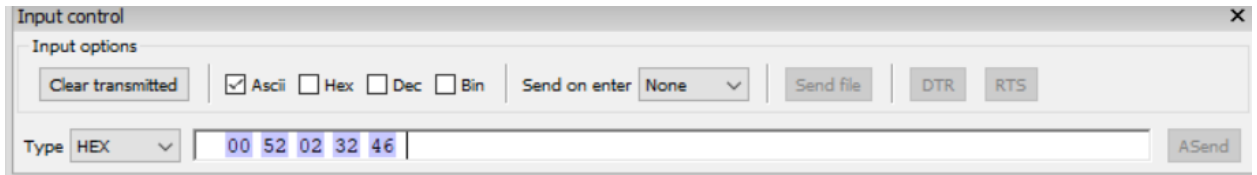
- Connect the Sensor to the USB backboard or FTDI
- Connect the USB cable to the COM port of the computer
- Open Hterm
- Find the Com port (press R to refresh com port list)
- Communication parameters:
  - Baud Rate** - 115200
  - Data** - 8 bits
  - Stop bits** -1
  - Parity** - None
  - HW Flow control:** Non



- Click on the **“Connect”** button once the right COM port and the parameters are correctly set. Check the message in the bottom right corner of the software.
- If you see **“Connect to COMx”** ( where COMx is the selected COM port) it confirms the right connection.

**Connect to COM20 (b:115200 d:8 s:1 p:None)**

- To change the Evo Sensor’s base address **0x31** to **0x32** (50 in decimal) send an HEX command **“00 52 02 32 + CRC-8”** checksum. Send the command through USB by pressing Enter.



- If you don’t know how to calculate the CRC-8 checksum you can use the following LINK [CRC-8 calculator](#).
- Please fill the table as shown below. Remember 0x32 is your new desired I2C.

CRC-8 calculator example:

CRC width

Bit length:  CRC-8  CRC-16  CRC-32  CRC-64

---

CRC parametrization

Predefined  Custom

---

CRC detailed parameters

Input reflected:  Result reflected:

Polynomial:

Initial Value:

Final Xor Value:

---

CRC Input Data

String  Bytes  Binary string

Show reflected lookup table:  (This option does not affect the CRC calculation)

---

**Calculate CRC!**

**Result CRC value: 0x46**

If you require more information or assistance please contact Terabee at [terabee.sales@terabee.com](mailto:terabee.sales@terabee.com).

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