

Key Features

- ▶ High accuracy force feedback for demanding applications
- ▶ Zero hysteresis & minimal drift
- ▶ Robust design & high stiffness
- ▶ Easy mounting and robot setup
- ▶ SRS integration with extended functionality available.
- ▶ Integrated IMU (acceleration and angular rate)

Configurations



Ordering number	Description
KIT-ROKS-TX2	Rokubi EtherCAT F/T sensor kit for Staubli TX2-40/60
KIT-MEDS-TX2	Medusa EtherCAT F/T sensor kit for Staubli TX2-40/60

List of Accessories

Please refer to the table for all sensor specifications. For additional information, feel free to consult our team of engineers at support@botasys.com

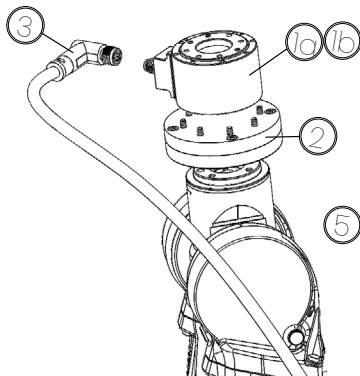


Figure 1

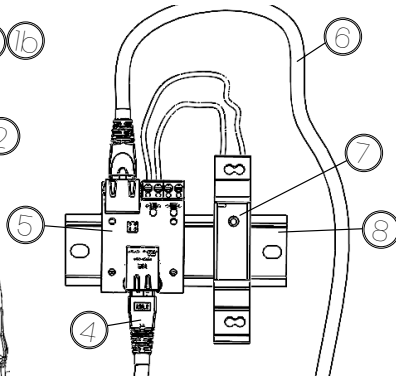


Figure 2

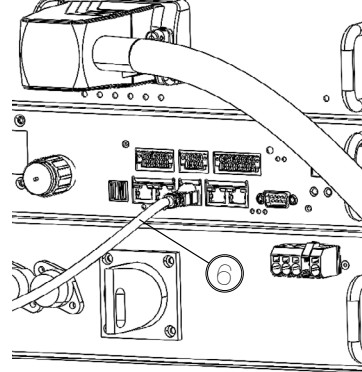


Figure 3

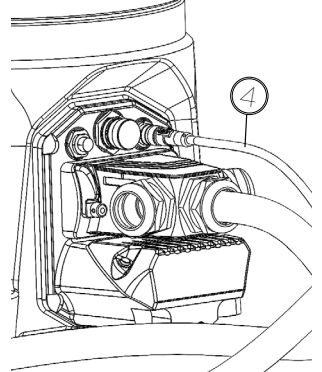


Figure 4

#	Included in the kit	Description	Included in configuration
1a	BFT-ROKS-ECAT-M8	Rokubi Side 6-axis FT sensor with EtherCAT interface	KIT-ROKS-TX2
1b	BFT-MEDS-ECAT-M8	Medusa Side 6-axis FT sensor with EtherCAT interface	KIT-MEDS-TX2
2	ACC-ROK-TX240/60	Rokubi/Medusa Adapter for TX2-40 Staubli	All configurations
3	ACC-M12MRD-4Q-M8-ANGLE	Custom length cable with M12 angled to M8 angled for Staubli	All configurations
4	PRT-RJ45-M12FSD-4Q-5M	5m IP67 Ethernet CAT5e, shielded, 4-pin, RJ45 to Socket str M12, D-coded	All configurations
5	ACC-POE-AB	Din rail PoE injector/splitter mode A/B	All configurations
6	ACC-RJ45-RJ45	Cat6 RJ45 to RJ45 ethernet cable	Optional
7	PSU-DIN-12V-15W	15W 12V DIN rail power supply	Optional
8	ACC-DIN-RAIL	20 cm DIN rail	Optional

Mechanical Interface

The Staubli TX2-40/60 Kit includes all the necessary components to connect and operate the Staubli TX2-40 or TX2-60 with the sensor (**BFT-ROKS-ECAT-M8 [1a]** or **BFT-MEDS-ECAT-M8 [1b]**). To mount the sensor on the robot flange, the adapter (**ACC-ROK-TX240/60 [2]**) is recommended, which works for both kit configurations. This adapter is composed of two parts and includes all the screws and pins needed for its proper assembly on the robot **[Figure 6]**. It has minimum size and weight making it the most lightweight and compact sensor for Staubli robots. It is possible to design custom adapters if additional end-of-arm tooling needs to be mounted. The kits include the necessary cabling to wire the sensor inside **[Figure 7]** and outside **[Figure 5]** of the control box. The cabling and all the connections on the robot side are **IP67 rated**.

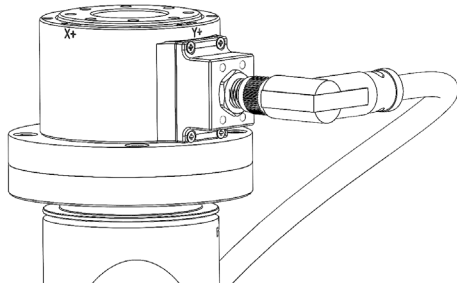


Figure 5

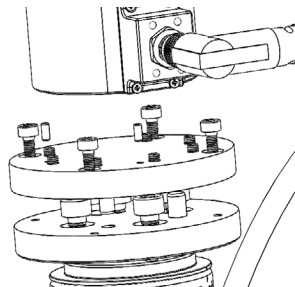


Figure 6

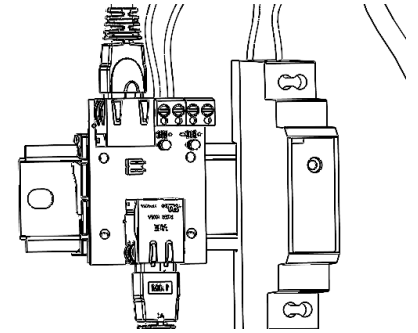


Figure 7

Electrical Interface

F/T Sensor to TX2-40/60

The sensor is wired using the customized cable provided in the kit (**ACC-M12MRD-4Q-M8-ANGLE [3]**). The cable connects to the robot's forearm connection via the M12 connector (J1218).

It is recommended to secure the cable with ties to minimize parasitic measurements from the sensor cable and other mounted tool accessories.

TX2-40 to Control Box

The kit also includes the necessary hardware to connect the robot to the PoE. This is done using the cable (**PRT-RJ45-M12FSD-4Q-5M [4]**). The cable connects via the M12 port at the base of the robot (J1217), as shown in **[Figure 10]**, and the other end connects via RJ45 to the PoE, which is also provided in the kit (**ACC-POE-AB [5]**). **[Figure 11]**

The PoE (**ACC-POE-AB [5]**) can be installed on a DIN Rail (**ACC-DIN-RAIL [8]**) along with a 9-48V power supply (**PSU-DIN-12V-15W [7]**). The DIN Rail (**ACC-DIN-RAIL [8]**) and 12V power supply (**PSU-DIN-12V-15W [7]**) can be shipped optionally with the kit. The sensor is powered in PoE Mode A. Therefore, the power supply needs to be connected to the VCC1 connector of the PoE board, as shown in the image in **[Figure 11]**.

Finally, the PoE will be connected to the EtherCAT master of the control box using an RJ45-to-RJ45 cable (**ACC-RJ45-RJ45 [6]**). This cable is also optionally shipped with the kit. **[Figure 12]**

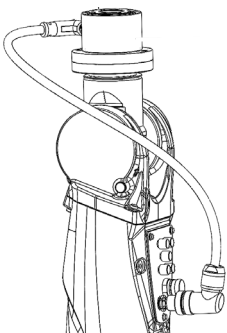


Figure 9

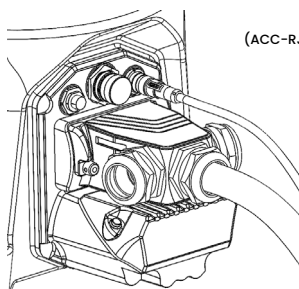


Figure 10

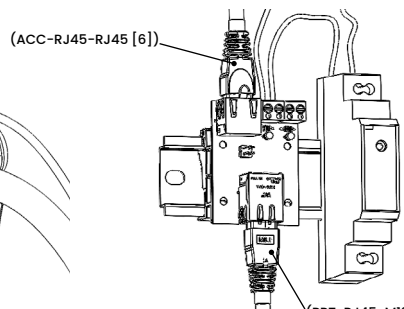


Figure 11

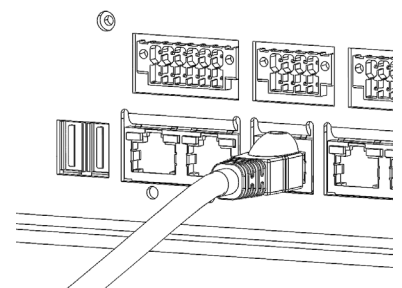


Figure 12

Software Interface

Stäubli Robotics Studio (SRS)

Add the sensor as tool to your cell:

- ▶ Open the cell
- ▶ Insert the sensor assembly (Rokubi_assembly.wrl) **[Figure 13]**
- ▶ Create a new "tool"
- ▶ Edit the tool and adjust the reference frame to correspond with the robot flange
- ▶ Adjust the tool handler to correspond to the sensor frame (see specification sheet)
- ▶ Add tool to the robot handler

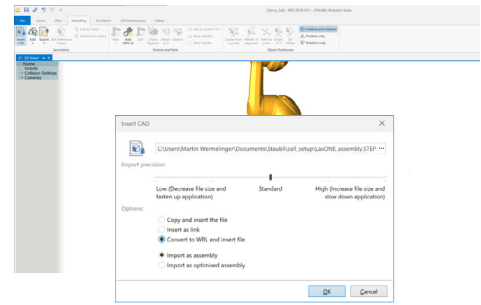


Figure 13

Create EtherCAT connection to the sensor:

In the cell explorer select the controller and press the "Physical IOs" button. In the "Physical IOs" press the "Add IO boards" button. Follow the steps from the controller manual on how to import a new network device and add it to the bus. **[Figure 14]**

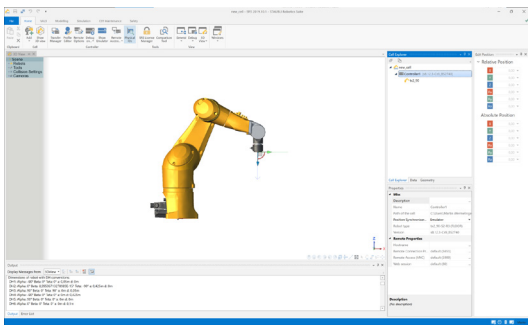


Figure 14

Import the "bota_slave_esi.xml" network device description file and add the EtherCAT slave to your bus topology. **[Figure 15]**

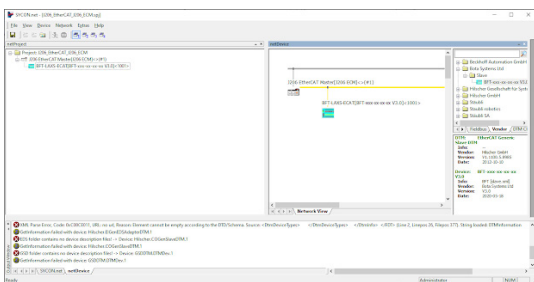


Figure 15

Use the sensor in an application

Add the example applications into the SRS directory of the cell you are using: Staubli > SRS > CellName > ControllerName > usr > usrapp

The example application contain the following directories:

- ▶ /types: Custom types and libraries used to define and transform forces and torques.
- ▶ /exampleApplication: An example to show how to read, offset, and filter the sensor in a separate thread.
- ▶ /polishSurface: An example that shows how the sensor is used to follow the contour of the surface.

Optional:

- ▶ /gravityCompensation: Custom types and libraries used to estimate and compensate the inertial parameters of the tool.
- ▶ /testGravityComp: run online estimation and compensation of inertial parameters of the attached tool (e.g. tool gravity compensation)

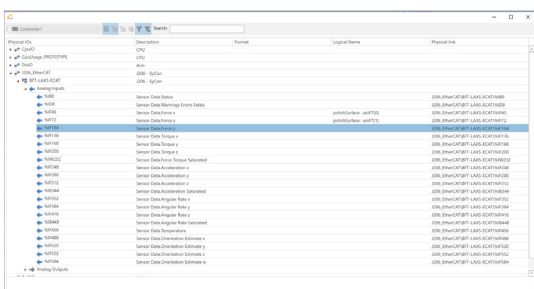


Figure 16

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