KUKA KR4 SensONE FT Sensor Kit

Key Features

- High accuracy force feedback for demanding applications
- Zero hysteresis & minimal drift
- Robust design & high stiffness
- Easy mounting and robot setup
- EtherCAT interface with Kuka Force Torque Control
- Integrated IMU (acceleration and angular rate)

Configurations

Ordering number	Description
KIT-SENS-KUKA-KR4	SensONE T15 6-axis F/T sensor kit for KUKA KR4
KIT-DENS-KUKA-KR4	SensONE T5 6-axis F/T sensor kit for KUKA KR4

List of Components

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

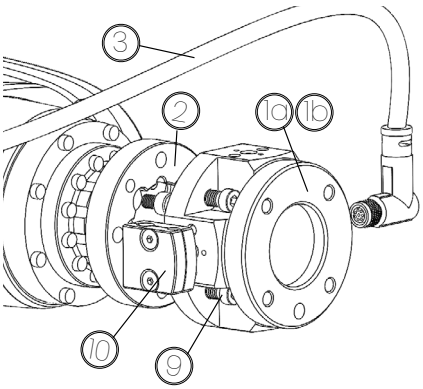

Figure 1

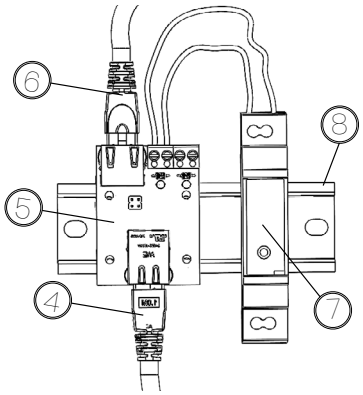

Figure 2

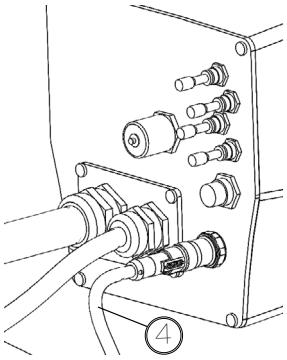

Figure 3

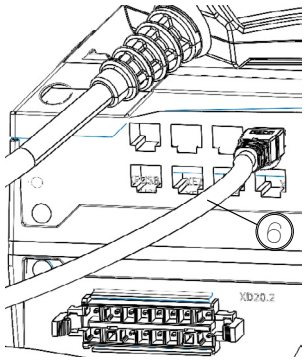

Figure 4

#	Component	Description	Included in configuration
1a	BFT-SENS-ECAT-M8	SensONE T15 6-axis F/T Sensor with EtherCAT Interface	KIT-SENS-KUKA-KR4
1b	BFT-DENS-ECAT-M8	SensONE T5 6-axis F/T Sensor with EtherCAT Interface	KIT-DENS-KUKA-KR4
2	ACC-ISO-31.5-SENS	Accessory adapter from ISO-9409-1-31.5-4-M5 to SensONE	All configurations
3	ACC-M12MRX-8Q-M8-ANGLE	Custom length cable with M12 angled to M8 angled for Kuka	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
9	ACC-SENS-MOUNT	Screw mounting kit for SensONE	All configurations
10	ACC-SENS-CLAMP	Cable holder for the sensor cable and a 5mm auxiliary cable	All configurations

Mechanical Interface

The KUKA KR 4 AGILUS FT Sensor Kit includes all the necessary components to connect and operate the KUKA KR4 Agilus with the Bota Systems sensor (BFT-SENS-ECAT-M8 [1a] or BFT-DENS-ECAT-M8 [1b]). To mount the sensor on the robot flange, the adapter (ACC-ISO-31.5-SENS [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 KUKA robots. It is possible to desgin custom adapters if additional end-of-arm tooling needs to be mounted. The kits include the necessary cabling to wire the sensor **[Figure 7]** **[Figure 5]**. The cabling and all the connections on the robot side are **IP67 rated**.

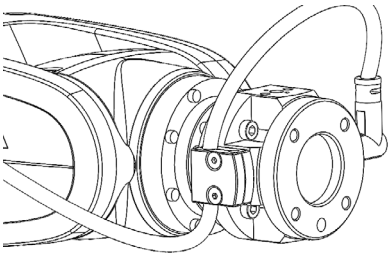

Figure 5

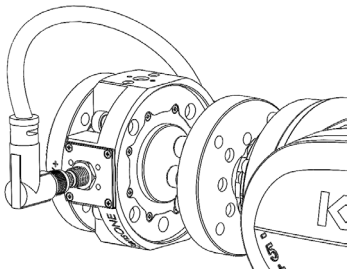

Figure 6

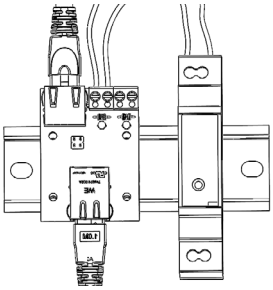

Figure 7

Electrical Interface

F/T Sensor to KUKA KR4

The sensor is wired using the customized cable provided in the kit (ACC-M12MRX-8Q-M8-ANGLE [3]). The cable connects to the robot's forearm connection via the M12 connector.

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

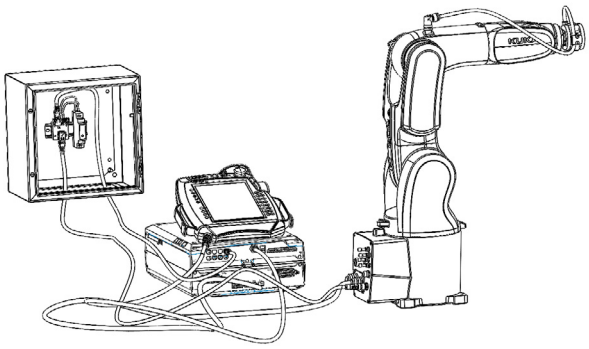

Figure 8

From KUKA KR4 to Controller

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, as shown in **[Figure 11]**, and the other end connects via RJ45 to the PoE, which is also provided in the kit (ACC-POE-AB [5]). **[Figure 10]**

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 10]**.

Finally, the PoE will be connected to the EtherCAT master of the control box (XF8) using an RJ45-to-RJ45 cable (ACC-RJ45-RJ45 [6]). This cable is also optionally shipped with the kit. **[Figure 12]**

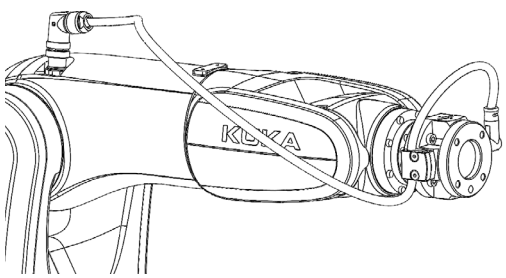

Figure 9

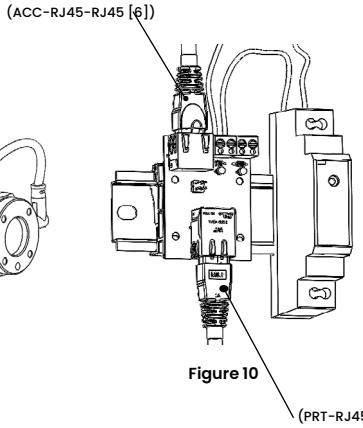

Figure 10

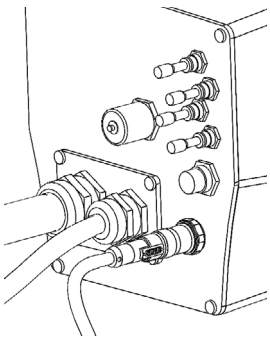

Figure 11

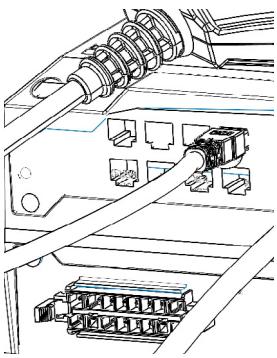

Figure 12

Software Interface

Kuka WorkVisual

In order to establish an connection with the EtherCAT sensor, the device description file needs to be imported in WorkVisual.

1. Select the menu sequence File > Import / Export. A window opens.
2. Select Import device description file. and click on Next >.
3. Click on Search.... Another window opens.
4. Select the required file format.
In the case of devices for bus systems, the type EtherCAT ESI must be selected.
5. Navigate to the directory in which the device description files are located.
6. Select the files to be imported and click on Open. A list is displayed of the device description files that are to be imported.
7. Confirm with Next >. A list is displayed of the devices that are to be imported.
8. Click on Finish. The devices are imported.
9. Close the window

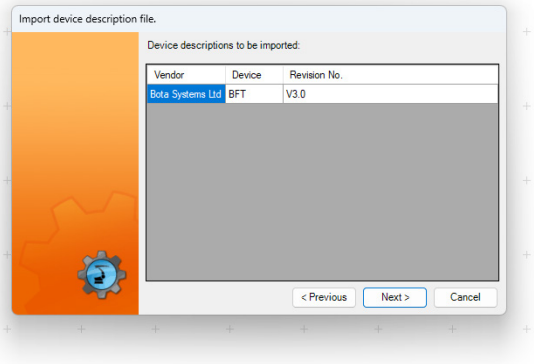

Figure 13