

Key Features

- ▶ Compact & Lightweight
- ▶ Dust & Water Resistant
- ▶ Software Development Kit
- ▶ Robotiq Gripper Ready
- ▶ High Precision Low Drift
- ▶ Versatile, Low Latency Connectivity



Configurations

MiniONE is offered in various kit configurations tailored to different needs. Each kit includes a predefined set of components, all of which are also available for individual purchase. Customers may order these components separately as spare parts or create a custom configuration as required. The kits and spare parts are available for purchase also in our store.

Ordering number	Description
KIT-MIN-UART	MiniONE 6-axis F/T sensor with serial and USB Interface kit
KIT-MIN-USB	MiniONE 6-axis F/T sensor with USB interface kit

Technical Specifications

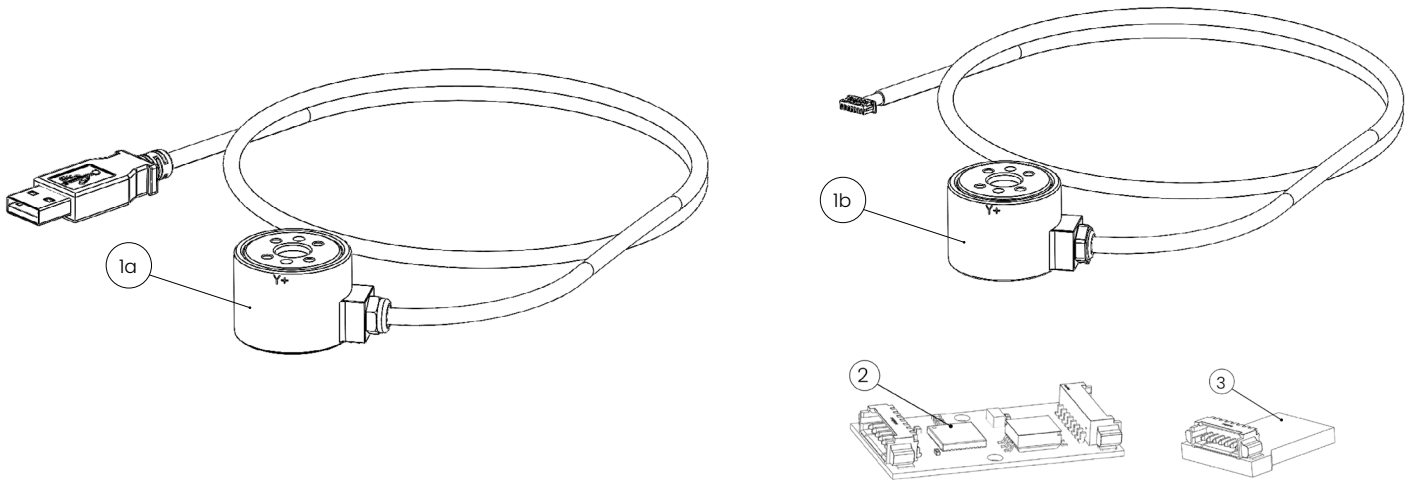
Please refer to the table for all sensor specifications. For additional information, feel free to consult our team of engineers at info@botasys.com.

	F_x	F_y	F_z	M_x	M_y	M_z
Range	80 N	80 N	1000 N	1.5 Nm	1.5 Nm	1.5 Nm
Overload limit*	250 N	250 N	300 N	3.5 Nm	3.5 Nm	3.5 Nm
NFR**	150 mN	150 mN	100 mN	1.8 mNm	1.8 mNm	0.9 mNm
Size (D x H)	30 mm x 23.2 mm					
Weight	~ 30 grams					
Maximum sampling rate	800 Hz					
IMU	-					
Gyroscope	-					
Acceleration	-					
Power supply	5 V, 1.0 W					
Ingress protection	Dust and water resistant					
Operating temperature	0°C – 55°C					
BFT-MN2S-SER-UB (KIT-MIN-USB)				BFT-MN2S-SER-ML (KIT-MIN-UART)		
Communication	USB			USB, 3.3V UART, RS422, RS485, RS232		
Protocol	Bota Serial Protocol Family			Bota Serial Protocol Family, MODBUS RTU		

* Overload limit values are simulated using FEA methods. Real-life results may deviate from simulation results.

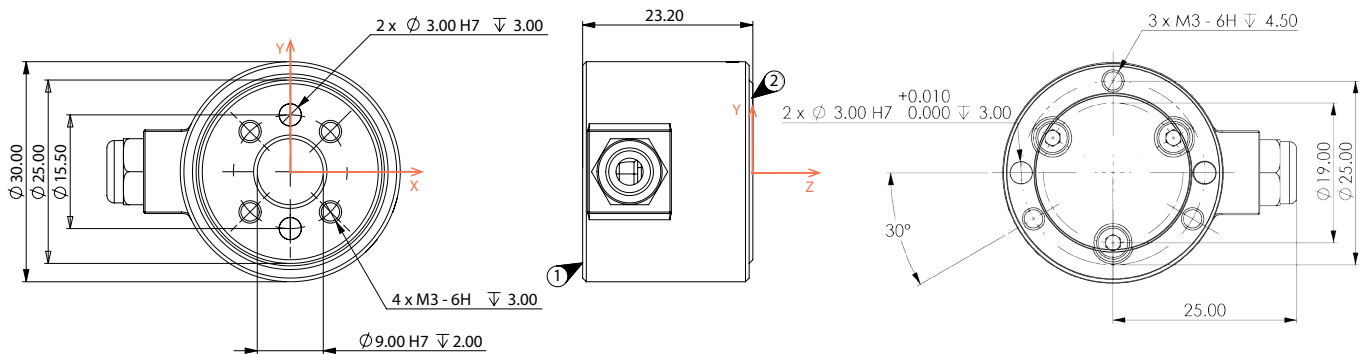
** NFR (noise-free resolution) refers to (6σ) peak-to-peak noise distribution of sensor signal at 100 Hz.

List of components



#	Component	Description	Included in configuration
1a	BFT-MN2S-SER-UB	MiniONE 6-axis F/T sensor with USB interface	KIT-MIN-USB
1b	BFT-MN2S-SER-ML	MiniONE 6-axis F/T sensor with serial and USB Interface	KIT-MIN-UART
2	ACC-MOL-SER-BD	Serial RS 232/422/485/TTL Adapter for MiniONE Uart	KIT-MIN-UART
3	ACC-MOL-USB-BD	USB Adapter for MiniONE Uart	KIT-MIN-UART

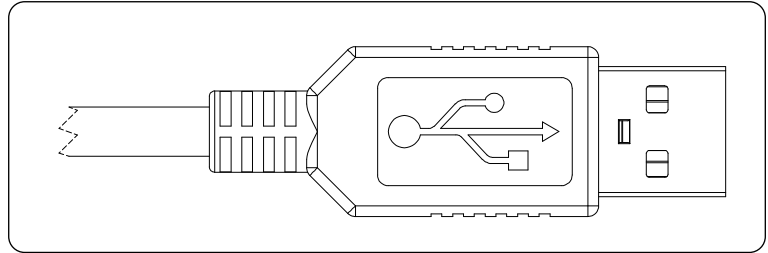
Mechanical Dimensions



Connector Pinout

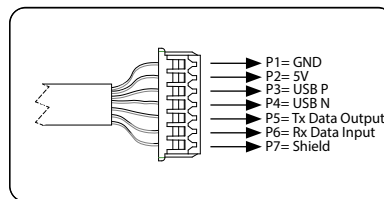
BFT-MN2S-SER-UB (KIT-MIN-USB)

The MiniONE USB sensor comes with 2.5m USB cable for the easiest possible integration. The sensor is powered directly from the computer and it interface through a virtual serial port. This connection can be used for configuring and operating the sensor.



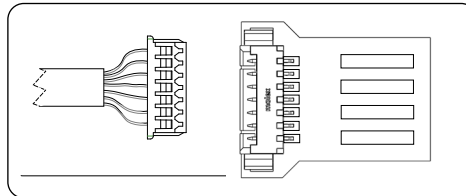
BFT-MN2S-SER-ML (KIT-MIN-UART)

MiniONE Serial comes with 2.5m cable that includes Power, USB and 3.3V TTL UART signals. Intended for integration with a variety of systems or when a compact USB connection is required. Two cable adapter are included one USB and one Serial adapter.



USB Adapter

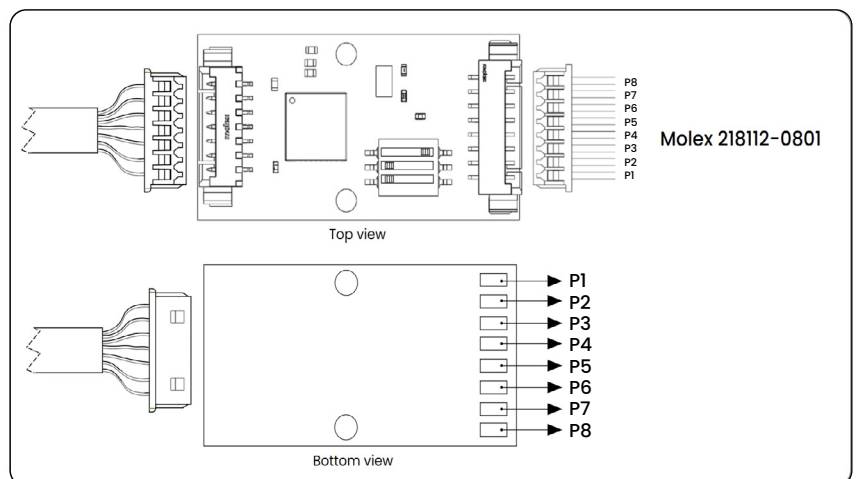
The USB adapters should be used for configuring the sensor, or/and when a compact USB connector is required compared to MiniONE USB sensor. This adapter will power the sensor and interface through a virtual serial port.



RS 232/422/485/TTL Adapter

This adapter is a breakout board for the serial signals and a converter from UART to RS422, RS232 or RS485 using the dip switches to select the different options (see table below). The adapter comes with an 8 pin miniature connector to be used by the system or alternatively solder pads are available on the bottom of the board.

RS 232/422/485/TTL adapter PinOUT	
P1	GND
P2	5V
P3	TTL Tx (Data Output)
P4	TTL Rx (Data Input)
P5	422 Tx- / 485 B (Data Output)
P6	422 Tx+ / 485 A / 232 Tx (Data Output)
P7	422 Rx- (Data Input)
P8	422 Rx+ / 232 Rx (Data Input)



Mode Selection			Serial Standard	Termination
SW1:1	SW1:2	SW1:3		
ON	OFF	X	RS232	
OFF	ON	ON	RS485	ON
ON	ON	ON	RS422	ON
OFF	ON	OFF	RS485	OFF
ON	ON	OFF	RS485	OFF

For more information, please refer to the [user manual](#).

Crosstalk

Crosstalk in multi-axis force-torque sensors refers to the measurements in other axes when the sensor is excited only in a single axis. Crosstalk is reported as the percentile deviation from reference with respect to the full scale of that axis. Bota Systems provides a crosstalk certificate for your sensor tested according to [ISO 21612:2021](#) standard upon request. An exemplary crosstalk table is provided below as a reference.

Affected axis	F_x	F_y	F_z	M_x	M_y	M_z
F_x (%)	–	0.00	0.05	0.02	1.17	0.18
F_y (%)	0.01	–	0.07	1.40	0.12	2.08
F_z (%)	0.08	0.03	–	1.66	0.32	0.01
M_x (%)	0.03	0.67	0.09	–	0.03	0.13
M_y (%)	0.13	0.36	0.22	0.85	–	0.07
M_z (%)	0.23	0.06	0.03	0.67	0.68	–

Signal Noise

Signal noise is any unwanted modification that may arise during capture, storage, transmission, processing, or conversion of a communication signal. The upper limits for the standard deviation of noise distribution are reported in the following tables.

Sampling rate		F_x	F_y	F_z	M_x	M_y	M_z
100 Hz	BFT-MN2S-SER-XX	20 mN	25 mN	12 mN	0.3 mNm	0.3 mNm	0.2 mNm

Software

Integration

Bota Systems offers a complete software suite for rapid integration.

C++ and Python drivers are available for seamless integration into existing codebases or systems. A ROS 2 driver is also provided, built on the ROS 2 control framework for quick deployment. This driver includes pre-configured settings for the sensor.

Sensor Setup Tool

A web based application app.botasys.com is available for setting up and commissioning your sensor in no time without the need for drivers or installs. Setup the communication protocol, filtering, update rate and all other parameters of the sensor in no time without the need for reading the manual.

