

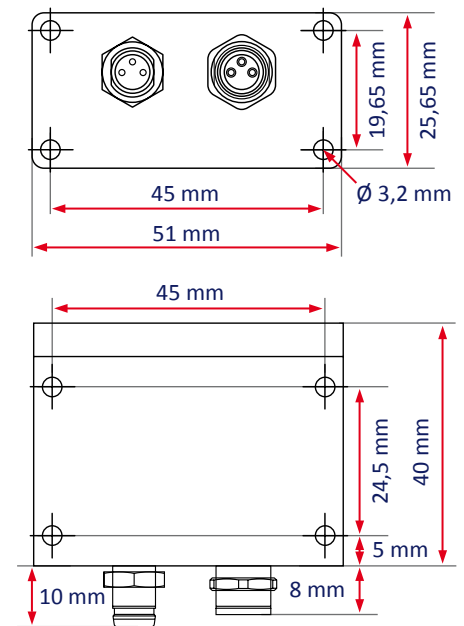
Technical data

IMU S003

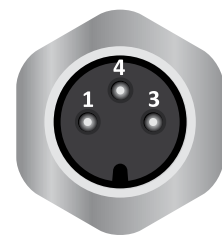
Datasheet V1.33 2019



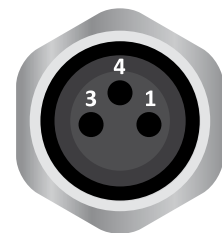
IMU dimensions



Connections at IMU



1: 24 V 4: 5 V 3: GND



3: GND 4: TX 1: RX

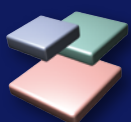
General data IMU S003	
Function:	Gyroscope and Accelerometer
Housing dimensions (H x W x D):	25,65 x 51 x 40 mm
Housing material:	Polyamide
Protection class:	IP 53
Weight:	40 g
Mounting:	M3 Screws 30 mm/ 45 mm
Orientation range:	360° about all axes
Orientation resolution:	16 bit
Supply voltage:	Pin 1: 7 to 40 V DC; Pin 4: 5 V DC
Connections on the IMU:	Plug M8 3-Pin for Supply voltage Socket M8 3-Pin for Interface RS-232
Operating temperature:	- 40 to + 85 °C
Communications interface:	RS-232 (RX and TX Signal at 12 V level)
Serial protocol:	See Communication Protocol for IMU Driver on the back of this page

Accelerometer	
Accelerometer scale:	$\pm 2 \text{ g} / \pm 4 \text{ g} / \pm 8 \text{ g} / \pm 16 \text{ g}$ selectable
Accelerometer resolution:	14 bit
Accelerometer noise density:	150 $\mu\text{g}/\sqrt{\text{Hz}}$ (AOM;WSF)
Accelerometer tolerance at 25 ° C:	$\pm 1\%$ (AOM; WSF)
Accelerometer temperature sensitivity:	$\pm 0.03 \text{ \%}/^\circ\text{C}$ (AOM;WSF)
Accelerometer cross axis sensitivity:	$\pm 1 \text{ \%}$ (AOM;WSF)

Gyroscope	
Gyro scale:	± 125 to $\pm 2000^\circ/\text{sec}$ selectable
Gyro resolution:	16 bit
Gyro noise density:	0.1°/ sec (GOM; WSF)
Gyro tolerance at 25 ° C:	$\pm 1\%$ (GOM; WSF)
Gyro non-linearity:	$\pm 0.05\%$ (GOM; WSF)
Gyro temperature sensitivity:	$\pm 0.016 \text{ \%}/^\circ\text{C}$ (GOM; WSF)
Gyro cross axis sensitivity:	$\pm 1 \text{ \%}$ (GOM; WSF)

WSF WITHOUT SENSOR FUSION
 AOM ACCELEROMETER ONLY MODE
 GOM GYRO ONLY MODE

More information on www.insystems.de
 or on request info@insystems.de



Communication Protocol for IMU Driver

Serial communication - RS232

Baud Rate: 57600

data bits: 8

stop bit: 1

parity: none

IMU driver works in polling mode i.e. data is sent from IMU to driver whenever data is queried.

Data packet: 26 bytes

```
{ ,$', 0x02, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0, 0x00, 0x00, ,\r', ,\n' }
```

byte 1 : 0x24
byte 2 : 0x02
byte 3: Quaternion w LSB
byte 4: Quaternion w MSB
byte 5: Quaternion x LSB
byte 6: Quaternion x MSB
byte 7: Quaternion y LSB
byte 8: Quaternion y MSB
byte 9: Quaternion z LSB
byte 10: Quaternion z MSB
byte 11: angular velocity LSB
byte 12: angular velocity
byte 13: angular velocity
byte 14: angular velocity MSB
byte 15: acceleration x axis MSB
byte 16: acceleration x axis LSB
byte 17: acceleration y axis MSB
byte 18: acceleration y axis LSB
byte 19: reserved
byte 20: reserved
byte 21: reserved
byte 22: reserved
byte 23: counter
byte 24: crc
byte 25: 0x0D
byte 26: 0x0A

crc calculation : bitwise xor of byte 3 to byte 23.

1. 0x64: reply with "Done"
2. 0x65: reply with "Done"
3. 0x73: reply with the State of Calibration, reply true when the calibration is done
4. 0x71: reply with the Firmware Version
5. 0x76 : query data packet (data packet as mentioned above)

