The MTx is a small and accurate 3DOF Orientation Tracker. It provides drift-free 3D orientation as well as kinematic data: 3D acceleration, 3D rate of turn (rate gyro) and 3D earth-magnetic field. The MTx is an excellent measurement unit for orientation measurement of human body segments and other applications requiring very low profile and light-weight sensor units.

**Features**
- accurate full 360 degrees 3D orientation output
- highly dynamic response combined with long-term stability (no drift)
- 3D acceleration, 3D rate of turn and 3D earth-magnetic field data
- all solid state miniature MEMS inertial sensors inside
- compact design
- high update rate
- accepts synchronization pulses
- individually calibrated for temperature, 3D misalignment and sensor cross-sensitivity

**Fields of use**
- biomechanics
- exercise and sports
- virtual reality
- animation

The MTx uses 3 rate gyros to track rapidly changing orientations in 3D and it measures the directions of gravity and magnetic north to provide a stable reference. The systems real-time algorithm fuses the sensor information to calculate accurate 3D orientation, with a highly dynamic response and stable over time.

With the MTx Development Kit, the MTx can easily be integrated in any system or (OEM) application.

The MTx is available in a stand-alone, as well as an Xbus version. On the Xbus, Xsens’ digital data bus, multiple MTx’s can easily be used simultaneously, enabling ambulatory and cost-effective measurement of human body motion.
Output

3D orientation (Quaternions/Matrix/Euler angles)
3D acceleration
3D rate-of-turn
3D earth-magnetic field (normalized)
Temperature

Sensor performance

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Rate of Turn</th>
<th>Acceleration</th>
<th>Magnetic Field</th>
<th>Temperature</th>
</tr>
</thead>
<tbody>
<tr>
<td>Full Scale [standard]</td>
<td>± 1200 deg/s</td>
<td>± 17 m/s²</td>
<td>± 750 mGauss</td>
<td>-55...+125 °C</td>
</tr>
<tr>
<td>Linearity</td>
<td>0.1% of FS</td>
<td>0.2% of FS</td>
<td>0.2% of FS</td>
<td>&lt;1% of FS</td>
</tr>
<tr>
<td>Bias stability¹ (1σ)</td>
<td>0.1 deg/s</td>
<td>0.02 m/s²</td>
<td>0.5 mGauss</td>
<td>0.5 °C accuracy</td>
</tr>
<tr>
<td>Noise density</td>
<td>0.1 deg/s/√Hz</td>
<td>0.001 m/s²/√Hz</td>
<td>0.5 mGauss (1σ)</td>
<td>-</td>
</tr>
<tr>
<td>Alignment error</td>
<td>0.1 deg</td>
<td>0.1 deg</td>
<td>0.1 deg</td>
<td>-</td>
</tr>
<tr>
<td>Bandwidth [standard]</td>
<td>40 Hz</td>
<td>30 Hz</td>
<td>10 Hz</td>
<td></td>
</tr>
</tbody>
</table>

Interfacing

Max update rate: 512 Hz (calibrated sensor data)
Operating voltage: 4.5 - 15 V
Power consumption: 360 mW (orientation output)
Digital interface (standard): RS-232 and USB (external converter) or ‘Xbus’

Housing

Dimensions: 38x53x21 mm (WxLxH)
Weight: 30 g
Ambient temperature operating range: 0 - 55 deg Celsius

Options and product code

<table>
<thead>
<tr>
<th>Interface</th>
<th>Full Scale Acceleration</th>
<th>Full Scale Rate of Turn</th>
</tr>
</thead>
<tbody>
<tr>
<td>RS-232</td>
<td>1.7 g (17 m/s²)</td>
<td>150 deg/s</td>
</tr>
<tr>
<td>RS-485</td>
<td>5 g (50 m/s²)</td>
<td>300 deg/s</td>
</tr>
<tr>
<td>Xbus</td>
<td>10 g (100 m/s²)</td>
<td>1200 deg/s</td>
</tr>
</tbody>
</table>

Product code: MTx- ###A##G##
Standard version: MTx- 28A33G25
Standard Xbus version: MTx- 49A33G25

Other options on request. Surcharges may apply.

1 1σ standard deviation of zero-mean angular random walk
2 in homogenous magnetic environment
3 may depend on type of motion
4 deviation over operating temperature range (1σ) specifications subject to change without notice