

The logo for Xsens, featuring a stylized 'X' in orange and white, followed by the word 'sens' in white. The background is a dark blue gradient with a large, light blue arrow pointing to the right.

**xsens**



# Xsens DOT及配套软件工具

**Bryan HE**

Business Development Manager – Wearable Sensors

[bryan.he@xsens.com](mailto:bryan.he@xsens.com)

July 14th, 2020



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- KineXYZ APP
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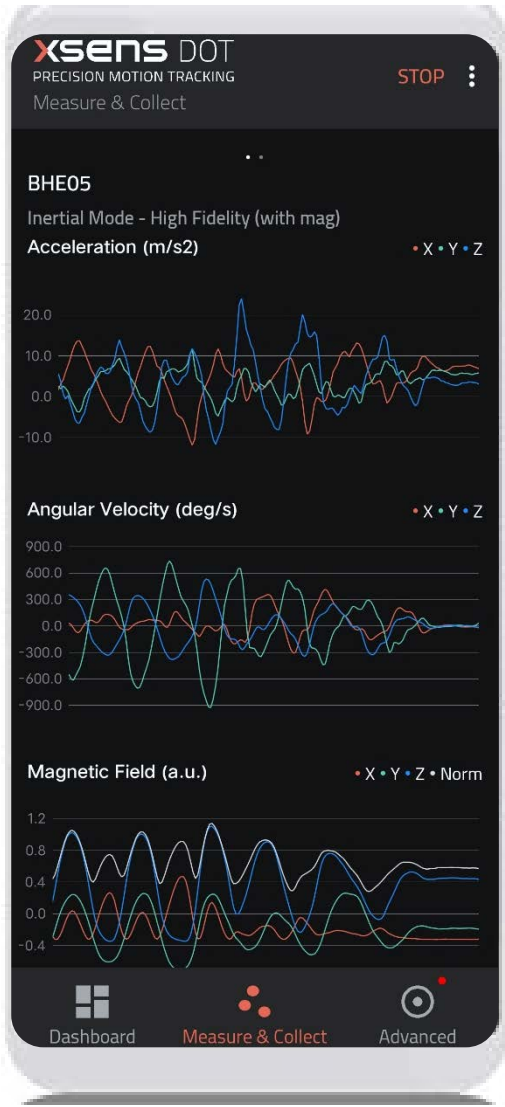


# Xsens DOT APP

安卓手机或iPhone

一个数据采集软件

**x**SENS



## Xsens DOT APP

- 平台: **安卓手机或iPhone**, 最佳适配 BLE 5.0
- 最大同时采集传感器数量: 5pcs
- 功能:
  - 实时绘制曲线
  - 采集记录数据并保存为csv文件
  - 固件升级Device Firmware Upgrade
  - 磁力计校准Magnetic Field Mapping
  - 多个传感器的航向同时归零 Heading Reset among different sensors
- 应用:
  - 大学或研究所进行数据采集, 实时数据对比观察, 将记录的csv数据再导入到例如Matlab/Python进一步研究或可视化
- 下载链接:
  - iPhone:
    - <https://apps.apple.com/cn/app/xsens-dot/id1500356542>
  - 安卓手机:
    - <https://www.xsens.cn//Public/static/dot/xsensdot-apk-v2020.1.apk>

# 样例数据1:

Time + Quaternions + Free Acceleration

时间 + 四元数 + 自由加速度

DeviceTag:	1								
FirmwareV	1.3.0								
AppVersion	2020.1								
Measurement	Sensor fusion Mode - Complete (Quaternion)								
StartTime:	2020-04-17 12:36:17.715 +0800								
Â©	Xsens Technologies B. V. 2005-2020								
PacketCount	SampleTimeFine	Quat_W	Quat_X	Quat_Y	Quat_Z	FreeAcc_X	FreeAcc_Y	FreeAcc_Z	
1	157843128	0.999925	-0.00399	6.19E-04	-0.01154	-0.01689	-0.03386	0.196673	
2	157859795	0.999924	-0.00438	8.39E-04	-0.01153	0.016682	-0.0055	0.200234	
3	157876462	0.999923	-0.00457	8.12E-04	-0.01154	0.028832	0.018985	0.197173	
4	157893129	0.999923	-0.00455	6.60E-04	-0.01154	0.020849	0.007656	0.20315	
5	157909796	0.999923	-0.00451	5.20E-04	-0.01154	0.005443	0.023482	0.199325	
6	157926463	0.999924	-0.00443	4.26E-04	-0.01155	-0.01032	-0.0251	0.201181	
7	157943130	0.999923	-0.00444	3.92E-04	-0.01156	0.0048	-0.00629	0.191854	
8	157959797	0.999923	-0.00444	3.66E-04	-0.01156	0.024616	0.014768	0.200247	
9	157976464	0.999923	-0.00442	3.12E-04	-0.01157	0.014966	0.017264	0.204667	
10	157993131	0.999923	-0.00438	2.70E-04	-0.01157	0.006422	0.005745	0.199491	
11	158009798	0.999924	-0.00436	2.45E-04	-0.01157	-0.01481	-0.00388	0.202993	
12	158026465	0.999924	-0.00435	2.32E-04	-0.01157	-0.0191	-0.00994	0.19966	
13	158043132	0.999924	-0.00437	2.29E-04	-0.01154	-0.00527	-0.00219	0.205604	
14	158059799	0.999924	-0.00437	2.06E-04	-0.01155	0.001157	0.012133	0.179529	

## 样例数据2:

Time + Euler Angles (Roll/Pitch/Yaw) + Free Acceleration  
时间 + 欧拉角 (翻滚/俯仰/偏航) + 自由加速度

DeviceTag:	BHE01							
FirmwareV	1.3.0							
AppVersion	2020.1							
Measurement	Sensor fusion Mode - Complete (Euler)							
StartTime:	2020-04-17 14:20:07.586 +0800							
Â©	Xsens Technologies B. V. 2005-2020							
PacketCount	SampleTimeFine	Euler_X	Euler_Y	Euler_Z	FreeAcc_X	FreeAcc_Y	FreeAcc_Z	
1	131079616	-0.21168	0.582361	-123.963	0.002375	0.006283	0.111822	
2	131096283	-0.21639	0.590984	-123.963	-0.00722	0.022734	0.108896	
3	131112950	-0.23287	0.606429	-123.963	-0.00909	0.007154	0.109497	
4	131129617	-0.24875	0.613803	-123.963	0.005214	0.009439	0.106875	
5	131146284	-0.25615	0.621496	-123.963	-0.00729	-0.00603	0.106699	
6	131162951	-0.26044	0.62289	-123.961	1.76E-04	-0.00323	0.098524	
7	131179618	-0.26134	0.623647	-123.96	-0.0046	-0.00734	0.109924	
8	131196285	-0.26316	0.623306	-123.96	-0.0117	0.001693	0.110188	
9	131212952	-0.26485	0.62198	-123.96	-0.01206	0.005149	0.113193	
10	131229619	-0.26692	0.619975	-123.96	0.001329	0.005011	0.101333	
11	131246286	-0.26906	0.619992	-123.961	-0.00114	-0.00656	0.118727	
12	131262953	-0.27036	0.619436	-123.962	-0.00477	-0.01314	0.113236	
13	131279620	-0.26988	0.618479	-123.962	-0.00878	0.002658	0.118878	
14	131296287	-0.2698	0.617258	-123.963	-5.80E-04	-0.00487	0.120378	

## 样例数据3:

Time + Acceleration + Angular Velocity + Mag

时间 + 加速度 + 角速度 + 磁

DeviceTag:	BHE24										
FirmwareVersion:	1.3.0										
AppVersion:	2020.1.1										
Measurement Mode	Inertial Mode - Rate quantities (with mag)										
StartTime:	2020-07-14 17:55:58.272 +0800										
© Xsens Technologies B. V. 2005-2020											
PacketCounter	SampleTimeFine	Acc_X	Acc_Y	Acc_Z	Gyr_X	Gyr_Y	Gyr_Z	Mag_X	Mag_Y	Mag_Z	
1	131683137	7.652901	-1.41687	3.209302	-1.68215	-10.1869	0.490662	-0.58618	-1.88184	-0.85742	
2	131699804	8.121233	0.708261	-0.71603	-0.64024	-10.3969	-0.02896	-0.66846	-1.88379	-0.66113	
3	131716471	7.644687	-0.08564	-0.52418	-0.19038	-10.8467	-0.15436	-0.71313	-1.88794	-0.448	
4	131733138	8.148248	0.20688	-3.79639	1.191832	-10.2787	-0.07494	-0.73022	-1.89038	-0.23022	
5	131749805	9.195146	-0.19624	-8.14007	1.81092	-6.90595	-0.33177	-0.71899	-1.8916	-0.05786	
6	131766472	8.234218	0.092825	-7.91429	1.250344	-3.27337	-1.10333	-0.70459	-1.90698	0.038086	
7	131783139	7.182106	0.913424	-6.63473	0.119139	-0.96901	-0.87914	-0.68823	-1.92212	0.06958	
8	131799806	6.82184	0.78988	-5.34342	-0.36279	-0.56227	-0.68079	-0.67139	-1.9436	0.072754	
9	131816473	6.24869	0.738753	-5.1505	-0.21146	-0.56129	-0.44885	-0.65576	-1.9519	0.08374	
10	131833140	6.260826	0.60967	-5.29944	0.150288	-0.21572	-0.22665	-0.65576	-1.95581	0.08374	
11	131849807	6.560984	0.372369	-5.82141	0.406481	0.533397	-0.23385	-0.66382	-1.95752	0.085449	
12	131866474	7.386571	0.320676	-6.94852	0.42842	2.795563	-0.61146	-0.67578	-1.96484	0.053467	
13	131883141	7.925201	1.021448	-6.19694	0.701767	6.85615	-1.02583	-0.69165	-1.97925	-0.05029	
14	131899808	8.280273	0.249658	-5.27002	1.003413	9.57169	-1.42691	-0.69604	-1.99878	-0.22949	

注: 除本文列出常见3种数据组合外, 还有其他数据组合, 请参考用户手册





# KineXYZ APP

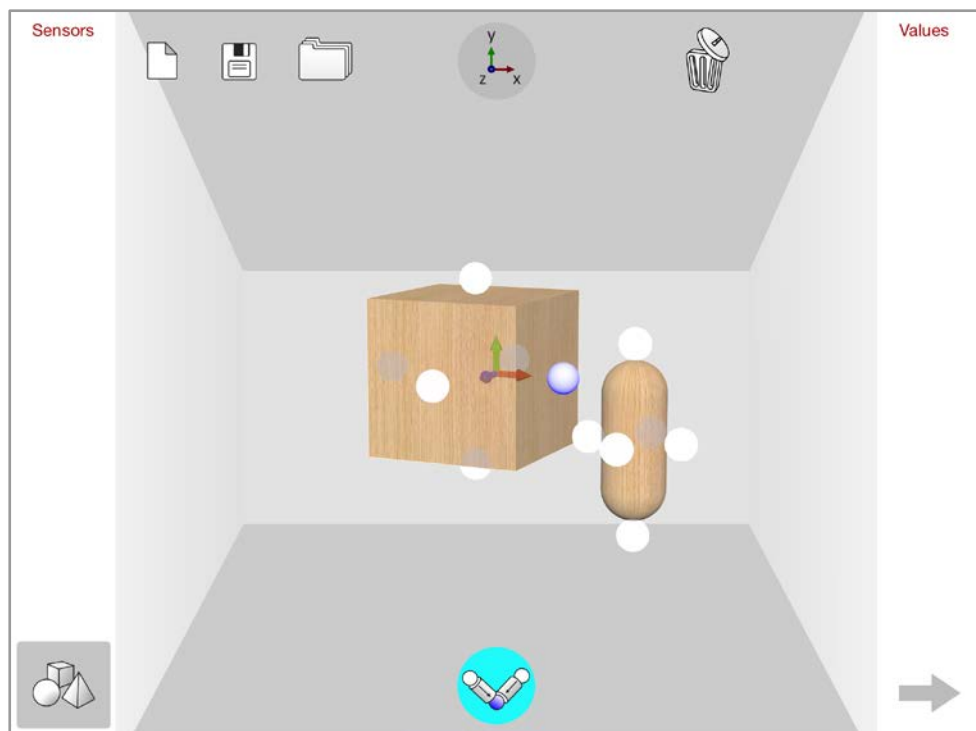
iPad

一个教育、学习的工具软件

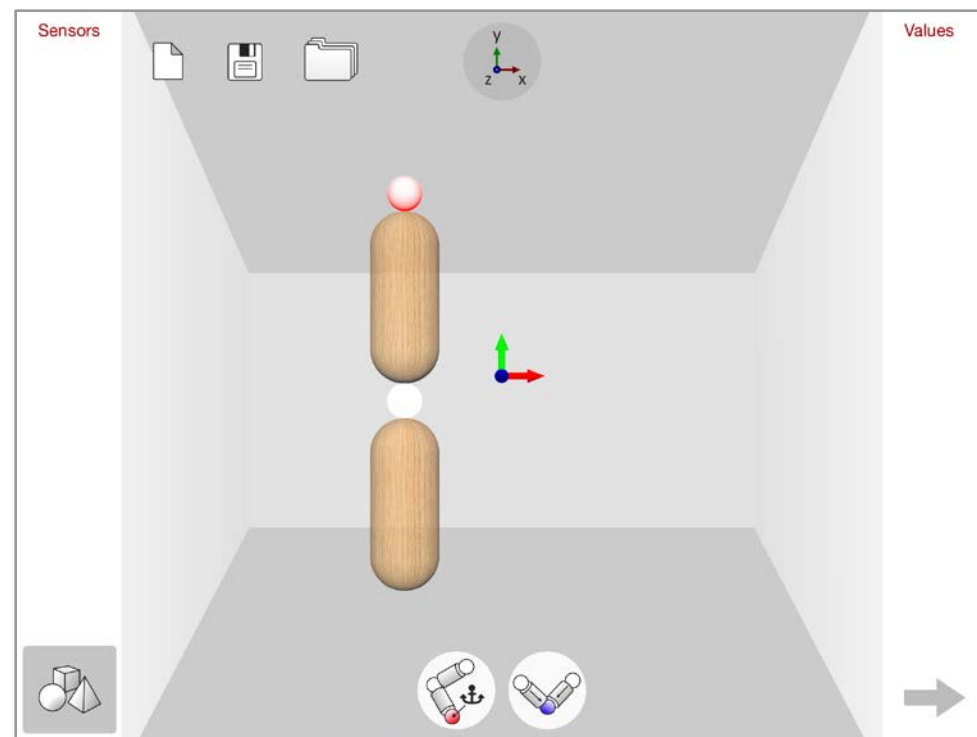
# KineXYZ APP – 一个教育、学习的工具软件

- 此软件由Xsens DOT合作伙伴开发及拥有: **ORYX Movement Solutions**
- 平台: 目前仅限iPad, 最好是蓝牙BLE 5.0版本(iPad Air 3 或 iPad Pro)
- 最大同时连接传感器数量:
  - 7pcs, 对于iPad Air 3 或iPad Pro (带BLE 5.0)
  - 5pcs, 对于旧版本iPad
- 功能:
  - 3D实时展示传感器
  - 通过简化的3D模型, 例如立方体、圆柱体、球体、胶囊等, 构建各类3D模型, 例如人体上肢, 下肢, 手臂, 或动物、机器人等, 实现实时动作展示:
    - 可创建关节约束, 进行垂直或水平方向的标定以及手动调节
  - 创建各类数据流图的数学算法, 例如计算关节角度, 位置, 翻滚/俯仰/偏航等
- 通过XML/JSON等格式将数据经过局域网实时传输到本机其他应用或其他设备(例如PC端)的其他软件(例如Unity或上位机采集软件)
- 19应用文档可作为课程教材, 针对生物力学、机械学院、自动化学院、仪器仪表、虚拟现实等专业, 例如可穿戴系统、惯性传感器、理论力学、生物力学、机器人等课程作为教学或实验工具.
- 下载链接(APPStore搜索KineXYZ):
  - <https://apps.apple.com/us/app/kinexyz/id1516231657>
- 范例视频:
  - KineXYZ Introduction Video: <https://youtu.be/TwLTRu0Dcm4>
  - Using 7pcs DOT to build lower limbs MoCap: <https://youtu.be/bRVdvstQYVQ>
- 支持网站: <https://www.kinexyz.com/>

# KineXYZ: Kinematic Models运动学模型

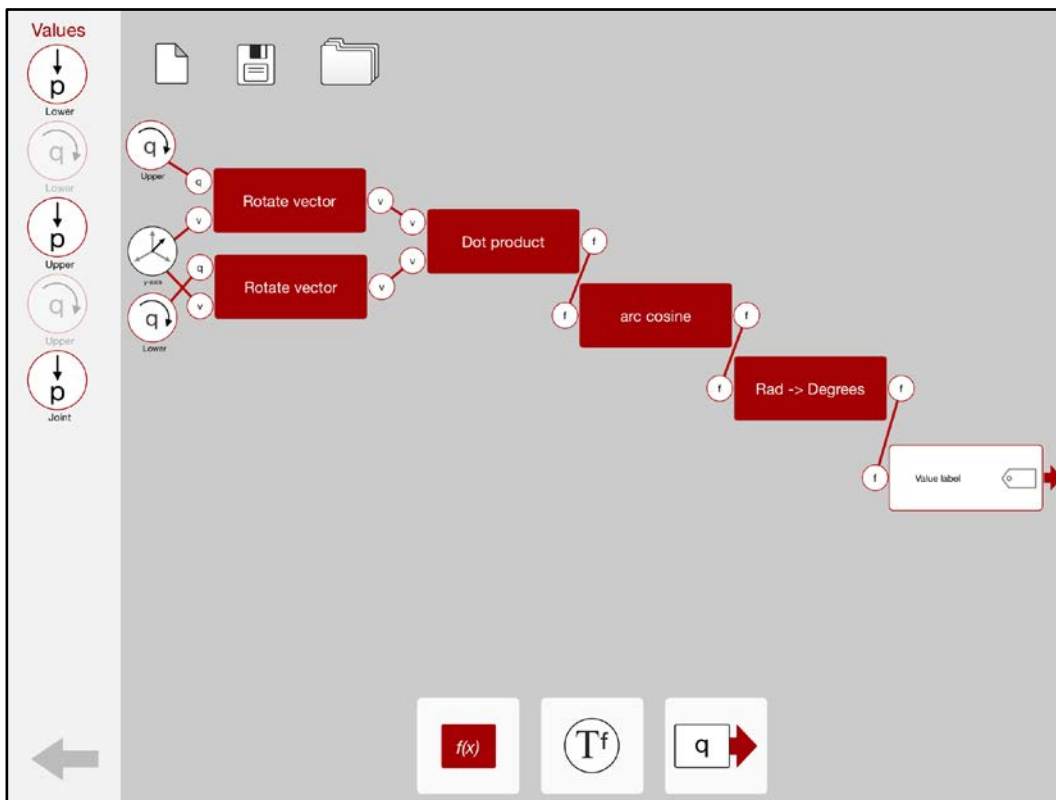


躯干及手臂的构建：  
立方体及胶囊



上臂：  
2个胶囊，并添加关节约束及固定锚点（红色点）

# KineXYZ Dataflow Diagrams: Mathematical Models 数据流程图编程：数学模型（算法）



- Assets
- AN\_001 Joint angle
- AN\_002 Streaming a value
- AN\_003 Generic functions
- AN\_004 Time derivative
- AN\_005 Interval
- AN\_008 Pitch
- AN\_009 Dice
- AN\_010 Trackball
- AN\_012 Angular velocity
- AN\_016 Basic walker
- AN\_017 Spine model
- AN\_018 Increasing data rate
- AN\_019 Position plot
- AN\_020 Position Scaling
- AN\_021 Moving Average Filtering

创建数据流程图 > 简易的编程方式  
例如计算关节角度，翻滚/俯仰/偏航，位置等

19个应用说明提供了19个编程学习案例，  
可实现关节角度计算，在3D空间行走等



# Xsens DOT Server

Windows PC/Raspberry Pi/Linux/Macbook

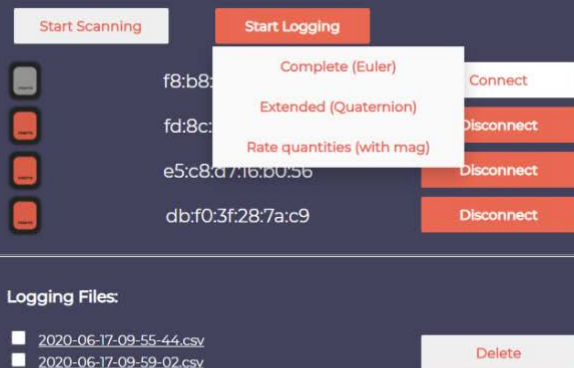
一个基于数据采集软件

一个面向PC系统应用开发者的开源编程基础

**xSENS**

# XSENS DOT

## PRECISION MOTION TRACKING



## Xsens DOT Server

- 平台: Windows/Linux/Mac, Raspberry Pi, 基于Node.JS及Noble
- 最大同时连接传感器数量: 取决于蓝牙适配器厂家型号及版本
  - 对于博通BCM20702(BLE 4.0) USB蓝牙适配器(Win 10): 可连接8个Xsens DOT
- 功能:
  - 从Windows PC(或树莓派或Macbook)采集传感器数据, 并保存为csv.
  - 代码是开源的, 并且提供了详细的编程文档, 用户可以学习如何构建这个软件, 并可自行修改代码以实现新的目标功能, 例如添加数据采集类型, 进行数据转发等
- [https://github.com/xsens/xsens\\_dot\\_server](https://github.com/xsens/xsens_dot_server)



# Xsens DOT SDK

面向安卓或iOS的软件开发人员 (手机/Pad/电视盒子)



# Xsens DOT SDK及开发文档

- Xsens DOT Quick Setup Guide
- Xsens DOT Android/iOS Programming Guide编程指南
- Xsens DOT Software Development Kit(SDK) with SDK Documentation 软件开发包及文档
- Xsens DOT User Manual用户手机
- Xsens DOT BLE Service Specifications蓝牙参数定义
- Xsens DOT Release Notes
- All download at: <https://www.xsens.com/developer>



```
double []   getAcc ()
             Get the acceleration data of packet, the unit is m/s2.

double []   getEuler ()
             Get the euler data

float []    getFreeAcc ()
             Get free acceleration data of packet.

double []   getGyr ()
             Get the gyro data of packet, the unit is RPS.

double []   getMag ()
             Get the mag data of packet, the unit is uT.

int         getPacketCounter ()
             Get the count of data packet

float []    getQuat ()
             Get the XKF orientation data of packet as quaternion.

long       getSampleTimeFine ()
             Get the timestamp of data packet.

int        getStatus ()
             Get snapshot status of packet.
```

Xsens DOT SDK的主要API如上所示





[Knowledge Base](#) > Wearable Sensor Platform

## Wearable Sensor Platform

This category provides information about the Xsens DOT wearable sensor platform.

### General Knowledge

- [DOT Reference frame and Data types](#)
- [Xsens DOT: Sensor placement](#)
- [Firmware Update for Xsens DOT](#)
- [App Creation Requirements](#)

### iOS Development

- [Xsens DOT APP Guide v2020.11 \[iOS\]](#)

### Troubleshooting

- [How to check for minimum requirements Xsens DOT](#)
- [Frequently asked questions](#)
- [How to perform a Magnetic Field Mapping on Xsens DOT](#)

### Features and New Updates

- [Overview new Features Xsens DOT v2020.1](#)
- [Xsens DOT Power Saving Mode](#)

### Android Development

- [Xsens DOT App \[Android\]: Quick Start Up Guide](#)
- [How to install the Xsens DOT App \[Android & iOS\]](#)
- [Xsens DOT App \[Android\] Guide v2020.1](#)

### Releases and Certificates

- [Xsens DOT Certifications](#)
- [Xsens DOT Release Notes and Change Logs](#)

## Xsens技术支持

- <https://base.xsens.com/hc/en-us/categories/360002285079-Wearable-Sensors-Platform>
- 常见问题
- 通用知识
- Android/iOS开发
- Troubleshooting故障排除
- 视频指导

## Xsens DOT - Applications



CARE

xsens



ACTION

xsens



WORK

xsens

xsens

# Contact Us

Xsens Netherlands

Email: [info@xsens.com](mailto:info@xsens.com)

Phone: +31 88 97367 00

Xsens Hong Kong

Email: [info@xsens.com](mailto:info@xsens.com)

Phone: +852 3618 9080

Xsens North America Inc.

Email: [info@xsens.com](mailto:info@xsens.com)

Phone: +1 310 481 1800

Xsens Shanghai

Email: [china@xsens.com](mailto:china@xsens.com)

Phone: +86 021 31760067