

## 1. Factory Raw Data Packet M (output packet)

### Factory Raw Data ('FM' = 0x464D)

Preamble	Packet Type	Length	Payload	Termination
0x5555	0x464D	0x74	<FM payload>	<CRC (U2)>

This packet contains raw sensor data for factory monitoring and debugging. The raw sensor data is fixed point, 4 bytes per sensor, LSB first, for 3 sensor chips, 7 sensors per chip in the following order: accels(Ux,Uy,Uz); gyros(Ux,Uy,Uz); temp(chip). *There is no additional scaling – sensors data provided as is.*

This packet intended for data collection from OpenIMU330 unit during calibration and debugging.

Due to big packet length OpenIMU330 baudrate needs to be set to 115200 or higher.

Byte Offset	Name	Format	Scaling	Units	Description
0	xAccelCounts1	I4	-	counts	Ux accelerometer (Chip#= sensorSubset *4)
4	yAccelCounts1	I4	-	counts	Uy accelerometer (Chip#= sensorSubset *4)
8	zAccelCounts1	I4	-	counts	Uz accelerometer (Chip#= sensorSubset *4)
12	xRateCounts1	I4	-	counts	Ux angular rate (Chip#= sensorSubset *4)
16	yRateCounts1	I4	-	counts	Uy angular rate (Chip#= sensorSubset *4)
20	zRateCounts1	I4	-	counts	Uz angular rate (Chip#= sensorSubset *4)
24	TempCounts1	I4	-	counts	Temperature (Chip#= sensorSubset *4)
28	xAccelCounts2	I4	-	counts	Ux accelerometer (Chip#= sensorSubset *4+1)
32	yAccelCounts2	I4	-	counts	Uy accelerometer (Chip#= sensorSubset *4+1)
36	zAccelCounts2	I4	-	counts	Uz accelerometer (Chip#= sensorSubset *4+1)
40	xRateCounts2	I4	-	counts	Ux angular rate (Chip#= sensorSubset *4+1)
44	yRateCounts2	I4	-	counts	Uy angular rate (Chip#= sensorSubset *4+1)
48	zRateCounts2	I4	-	counts	Uz angular rate (Chip#= sensorSubset *4+1)
52	TempCounts2	I4	-	counts	Temperature (Chip#= sensorSubset *4+1)
56	xAccelCounts3	I4	-	counts	Ux accelerometer (Chip#= sensorSubset *4+2)
60	yAccelCounts3	I4	-	counts	Uy accelerometer (Chip#= sensorSubset *4+2)
64	zAccelCounts3	I4	-	counts	Uz accelerometer (Chip#= sensorSubset *4+2)
68	xRateCounts3	I4	-	counts	Ux angular rate (Chip#= sensorSubset *4+2)
72	yRateCounts3	I4	-	counts	Uy angular rate (Chip#= sensorSubset *4+2)
76	zRateCounts3	I4	-	counts	Uz angular rate (Chip#= sensorSubset *4+2)
80	TempCounts3	I4	-	counts	Temperature (Chip#= sensorSubset *4+2)
84	xAccelCounts4	I4	-	counts	Ux accelerometer (Chip#= sensorSubset *4+3)
88	yAccelCounts4	I4	-	counts	Uy accelerometer (Chip#= sensorSubset *4+3)
92	zAccelCounts4	I4	-	counts	Uz accelerometer (Chip#= sensorSubset *4+3)
96	xRateCounts4	I4	-	counts	Ux angular rate (Chip#= sensorSubset *4+3)
100	yRateCounts4	I4	-	counts	Uy angular rate (Chip#= sensorSubset *4+3)
104	zRateCounts4	I4	-	counts	Uz angular rate (Chip#= sensorSubset *4+3)
108	TempCounts4	I4	-	counts	Temperature (Chip#= sensorSubset *4+3)
112	sensorSubset	U2	-	number	Multiply by 4 to get first sensor chip number in the packet
114	sampleIdx	U2	-	number	Sample idx. Packets with the same sample idx present sensors data taken at the same moment of time.

## 2. Scaled sensors Packet M (output packet)

### Multiple Scaled Sensors Data ('SM' = 0x534D)

Preamble	Packet Type	Length	Payload	Termination
0x5555	0x534D	0x3C	<SM payload>	<CRC (U2)>

This packet contains scaled sensors data for monitoring up to 4 sensor chips. Sensor data is fixed point, 2 bytes per sensor, MSB first, for 3 sensor chips, 7 sensors per chip in the following order: accels(Ux,Uy,Uz); gyros(Ux,Uy,Uz); temp(chip). *Scaling is the same as in S0/S1 packets*

Due to big packet length baudrate needs to be set to 57600 or higher.

Byte Offset	Name	Format	Scaling	Units	Description
0	xAccel1	I2	$20/2^{16}$	G	X accelerometer (Chip#= sensorSubset *4)
2	yAccel1	I2	$20/2^{16}$	G	Y accelerometer (Chip#= sensorSubset *4)
4	zAccel1	I2	$20/2^{16}$	G	Z accelerometer (Chip#= sensorSubset *4)
6	xRate1	I2	$7 \cdot \pi / 2^{16}$ [ $1260^\circ / 2^{16}$ ]	rps(dps)	X angular rate (Chip#= sensorSubset *4)
8	yRate1	I2	$7 \cdot \pi / 2^{16}$ [ $1260^\circ / 2^{16}$ ]	rps(dps)	Y angular rate (Chip#= sensorSubset *4)
10	zRate1	I2	$7 \cdot \pi / 2^{16}$ [ $1260^\circ / 2^{16}$ ]	rps(dps)	Z angular rate (Chip#= sensorSubset *4)
12	Temp1	I2	$200/2^{16}$	deg. C	Temperature (Chip#= sensorSubset *4)
14	xAccel2	I2	$20/2^{16}$	G	X accelerometer (Chip#= sensorSubset *4)
16	yAccel2	I2	$20/2^{16}$	G	Y accelerometer (Chip#= sensorSubset *4)
18	zAccel2	I2	$20/2^{16}$	G	Z accelerometer (Chip#= sensorSubset *4)
20	xRate2	I2	$7 \cdot \pi / 2^{16}$ [ $1260^\circ / 2^{16}$ ]	rps(dps)	X angular rate (Chip#= sensorSubset *4)
22	yRate2	I2	$7 \cdot \pi / 2^{16}$ [ $1260^\circ / 2^{16}$ ]	rps(dps)	Y angular rate (Chip#= sensorSubset *4)
24	zRate2	I2	$7 \cdot \pi / 2^{16}$ [ $1260^\circ / 2^{16}$ ]	rps(dps)	Z angular rate (Chip#= sensorSubset *4)
26	Temp2	I2	$200/2^{16}$	deg. C	Temperature (Chip#= sensorSubset *4)
28	xAccel3	I2	$20/2^{16}$	G	X accelerometer (Chip#= sensorSubset *4)
30	yAccel3	I2	$20/2^{16}$	G	Y accelerometer (Chip#= sensorSubset *4)
32	zAccel3	I2	$20/2^{16}$	G	Z accelerometer (Chip#= sensorSubset *4)
34	xRate3	I2	$7 \cdot \pi / 2^{16}$ [ $1260^\circ / 2^{16}$ ]	rps(dps)	X angular rate (Chip#= sensorSubset *4)
36	yRate3	I2	$7 \cdot \pi / 2^{16}$ [ $1260^\circ / 2^{16}$ ]	rps(dps)	Y angular rate (Chip#= sensorSubset *4)
38	zRate3	I2	$7 \cdot \pi / 2^{16}$ [ $1260^\circ / 2^{16}$ ]	rps(dps)	Z angular rate (Chip#= sensorSubset *4)
40	Temp3	I2	$200/2^{16}$	deg. C	Temperature (Chip#= sensorSubset *4)

42	xAccel4	I2	$20/2^{16}$	G	X accelerometer (Chip#= sensorSubset *4)
44	yAccel4	I2	$20/2^{16}$	G	Y accelerometer (Chip#= sensorSubset *4)
46	zAccel4	I2	$20/2^{16}$	G	Z accelerometer (Chip#= sensorSubset *4)
48	xRate4	I2	$7 \cdot \pi / 2^{16}$ [1260°/2 <sup>16</sup> ]	rps(dps)	X angular rate (Chip#= sensorSubset *4)
50	yRate4	I2	$7 \cdot \pi / 2^{16}$ [1260°/2 <sup>16</sup> ]	rps(dps)	Y angular rate (Chip#= sensorSubset *4)
52	zRate4	I2	$7 \cdot \pi / 2^{16}$ [1260°/2 <sup>16</sup> ]	rps(dps)	Z angular rate (Chip#= sensorSubset *4)
54	Temp4	I2	$200/2^{16}$	deg. C	Temperature (Chip#= sensorSubset *4)
56	sensorSubset	U2	-	number	Multiply by 4 to get first sensor chip number in the packet
58	sampleIdx	U2	-	number	Sample idx. Packets with the same sample idx present sensors data taken at the same moment of time.
60	Master Bit Word	U2		bitmask	Master BIT word same as in S0/S1 packets