Polar Measurement Data Specification for 3rd Party

Gatt Service and Characteristics Declaration

Service Name	Characteristic Name	Property	Optional Property	Security Permission	UUID
PMD Service	NA				FB005C80-02E7-F387-1CAD-8ACD2D8DF0C8
	PMD Control Point	Read, Write, Indicate		None	FB005C81-02E7-F387-1CAD-8ACD2D8DF0C8
	PMD Control Point Client Characteristic Configuration Descriptor	Read, Write		None	
	PMD Data MTU Characteristic	Notify	Indicate	None	FB005C82-02E7-F387-1CAD-8ACD2D8DF0C8
	PMD Data MTU Client Characteristic Configuration Descriptor	Read, Write		None	

Control Point Error Codes

Value	Description
0	SUCCESS
1	ERROR INVALID OP CODE
2	ERROR INVALID MEASUREMENT TYPE
3	ERROR NOT SUPPORTED
4	ERROR INVALID LENGTH
5	ERROR INVALID PARAMETER
6	ERROR INVALID STATE
7	ERROR INVALID RESOLUTION
8	ERROR INVALID SAMPLE RATE
9	ERROR INVALID G RATE
10 - 255	RFU

Frame types ACC

Frame type	Size	Description
0	3B	x, y, z 8-bit
1	6B	x, y, z 16-bit
2	9B	x, y, z 24-bit
3..255		RFU

Frame types PPG

Frame type	Size	Description

0	12B	ppg0,ppg1,ppg2,ambient 24-bit
1..255		RFU

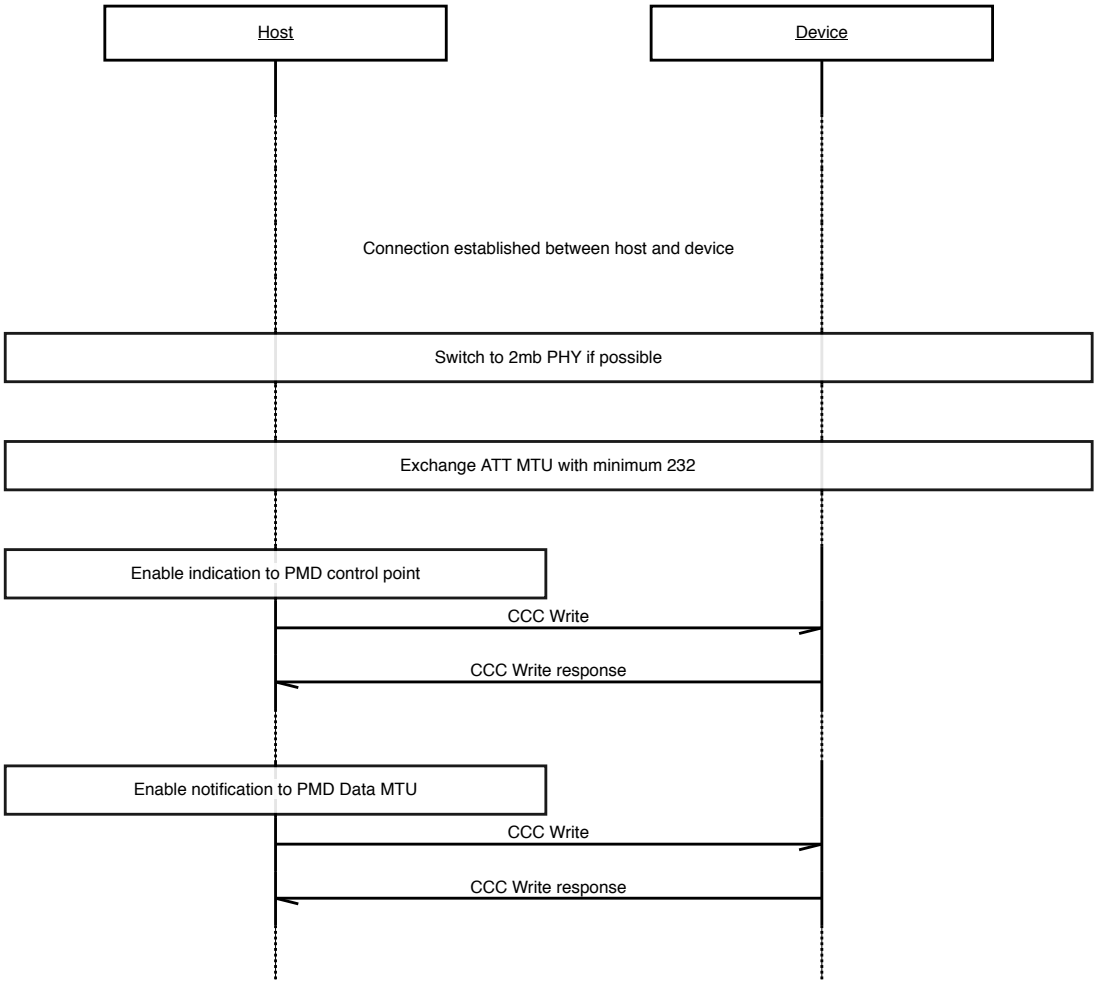
Frame types ECG

Frame type	Size	Description
0	3B	ECG μV
1..255		RFU

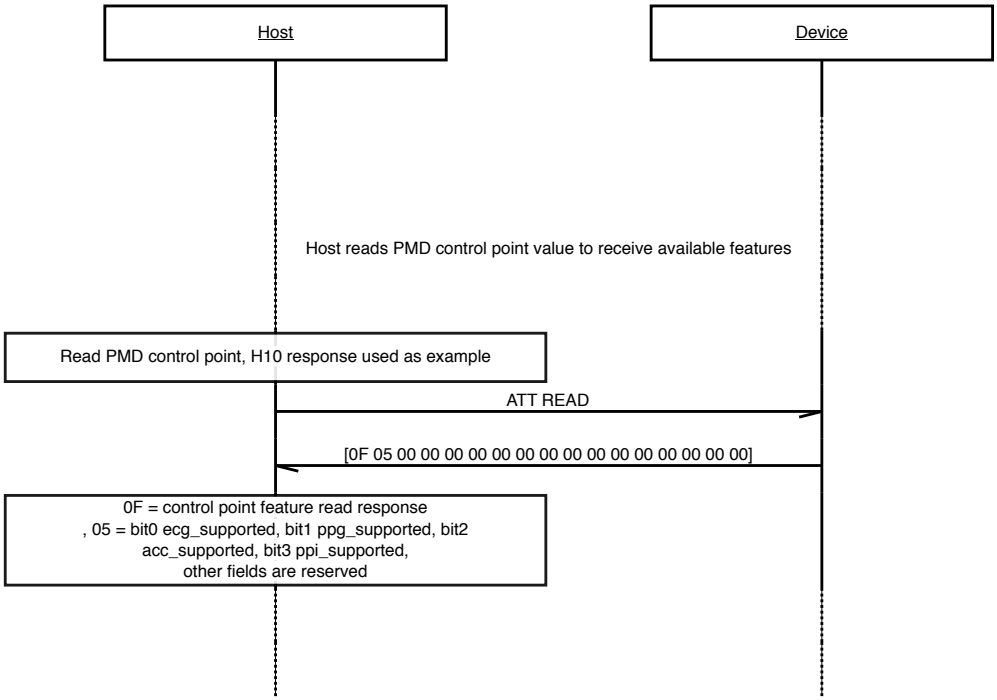
Frame types PPI

Frame type	Size	Description
0	6B	hr 8-bit, ppi ms 16-bit, error estimate 16-bit, flags 8-bit(bit0: blocker bit, bit1: skin contact status, bit2: skin contact status supported)
1..255		RFU

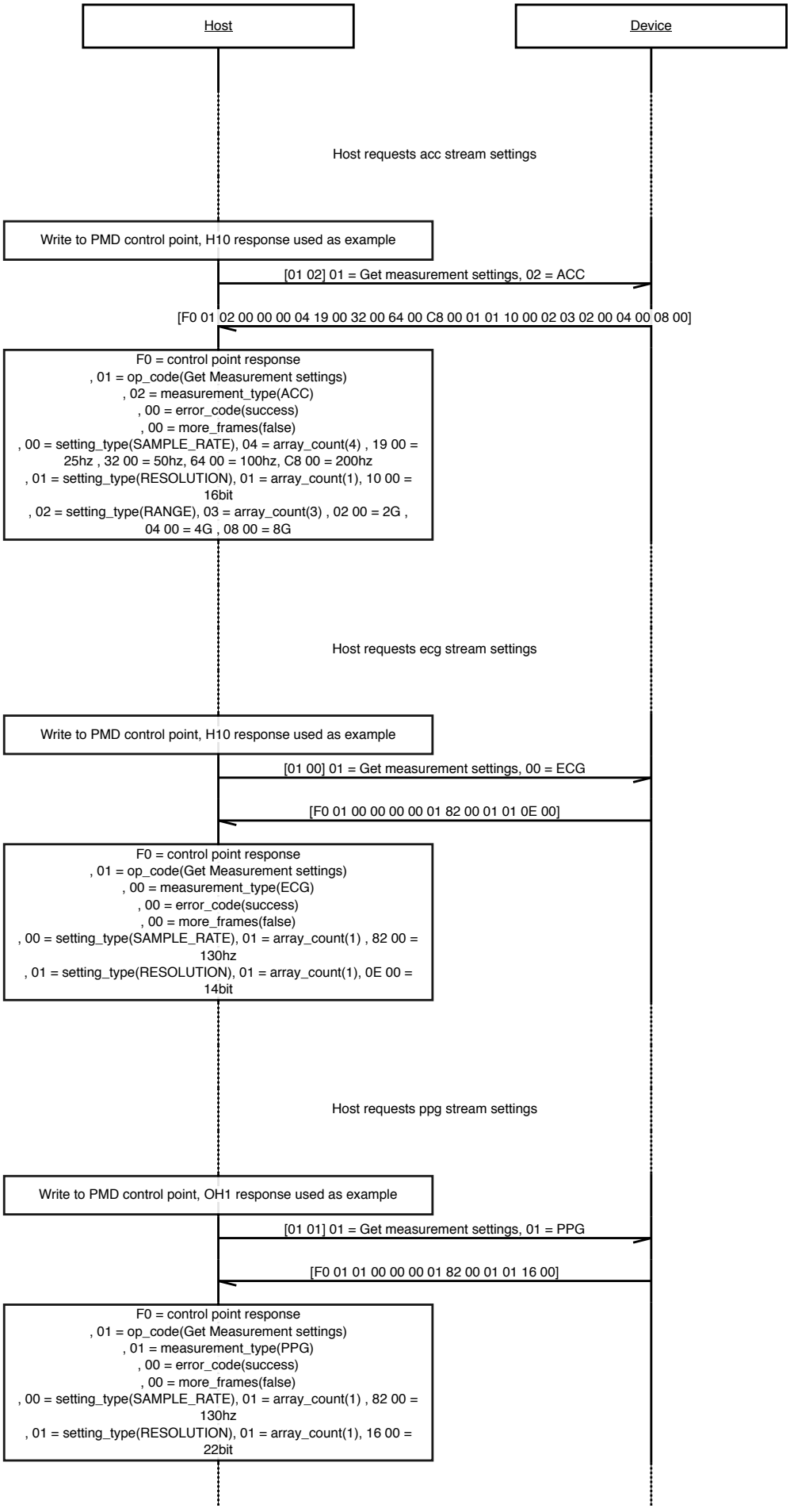
Prerequisite



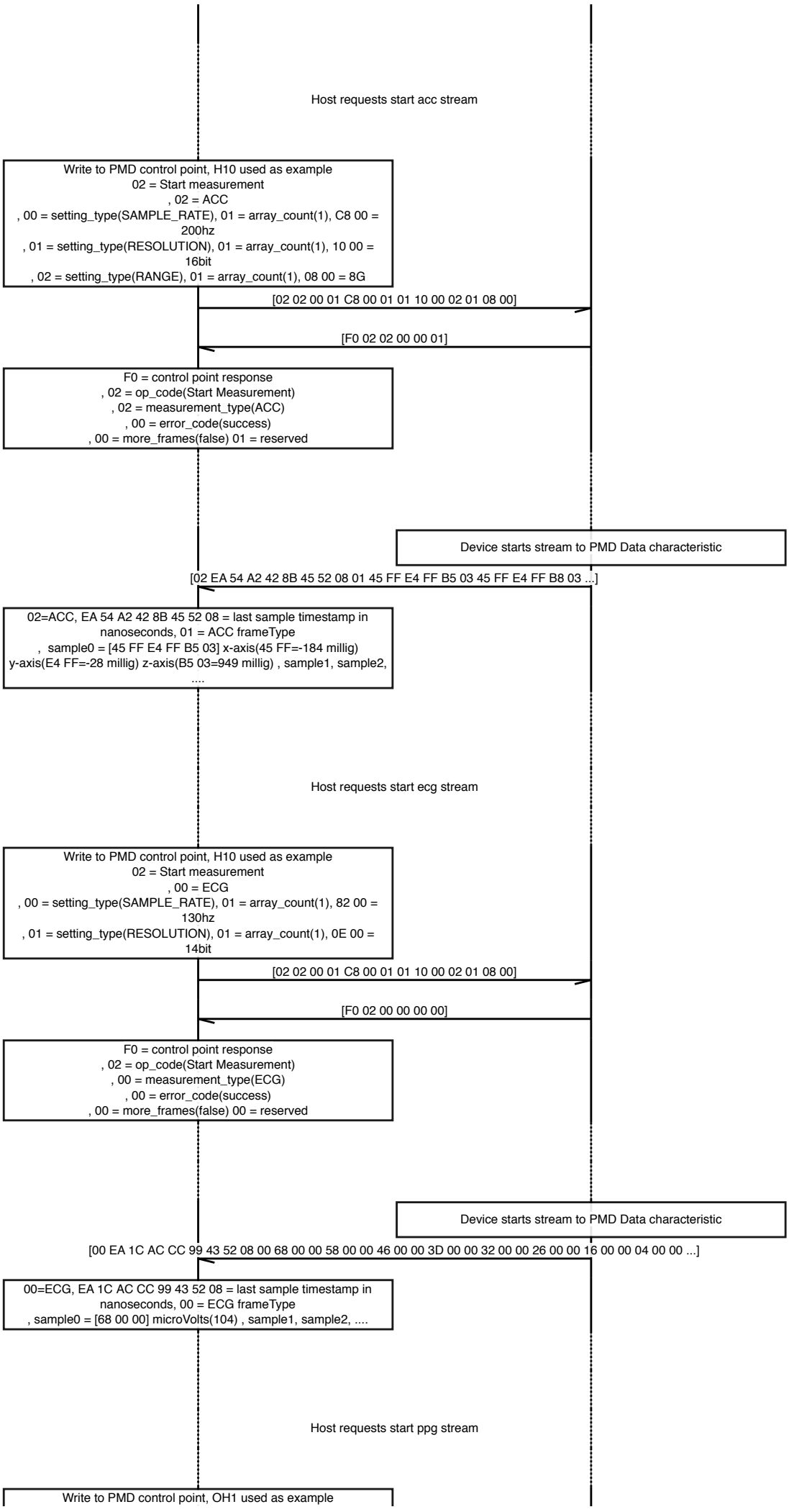
Read Features from device

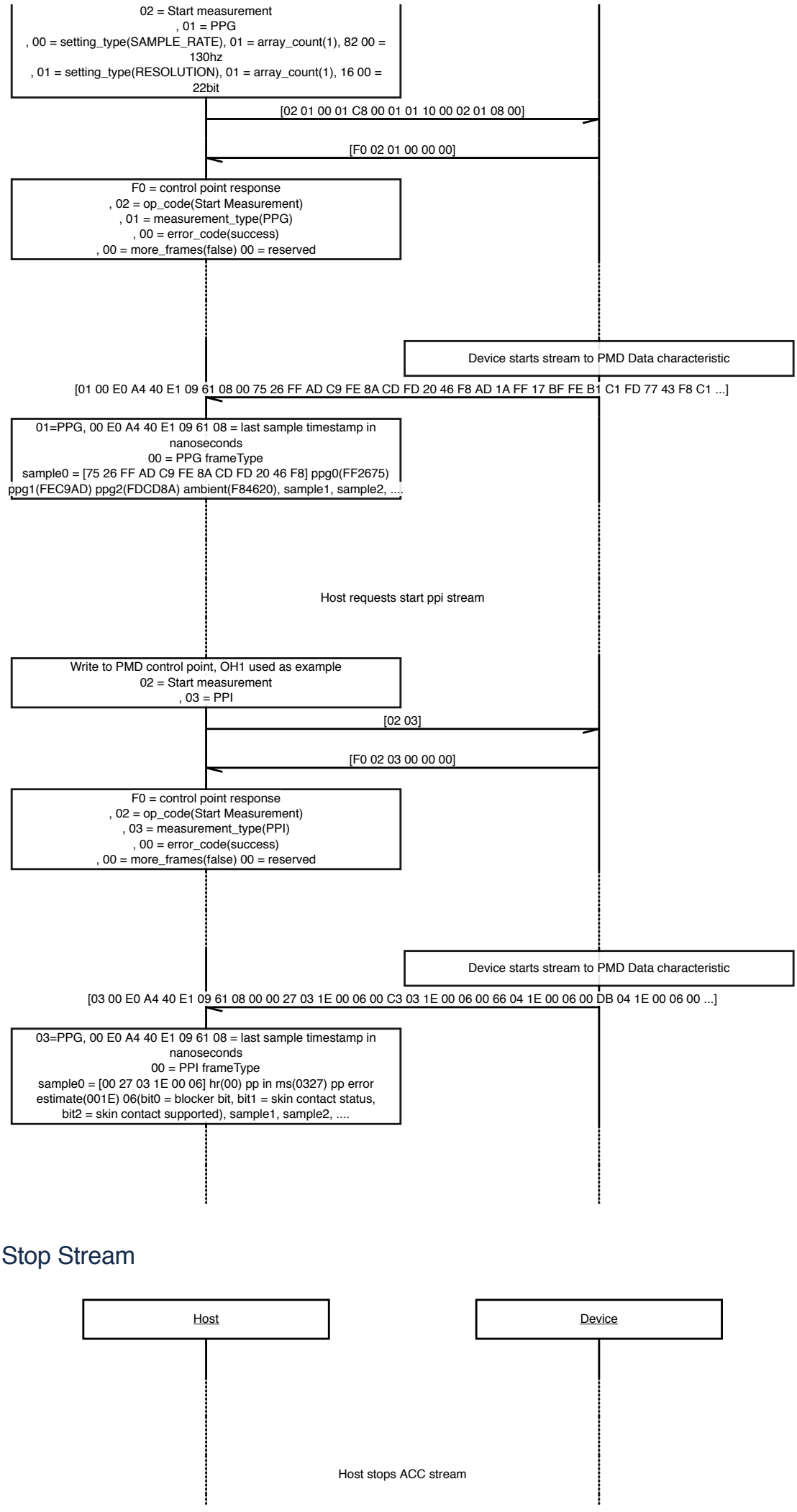


Request Stream Settings



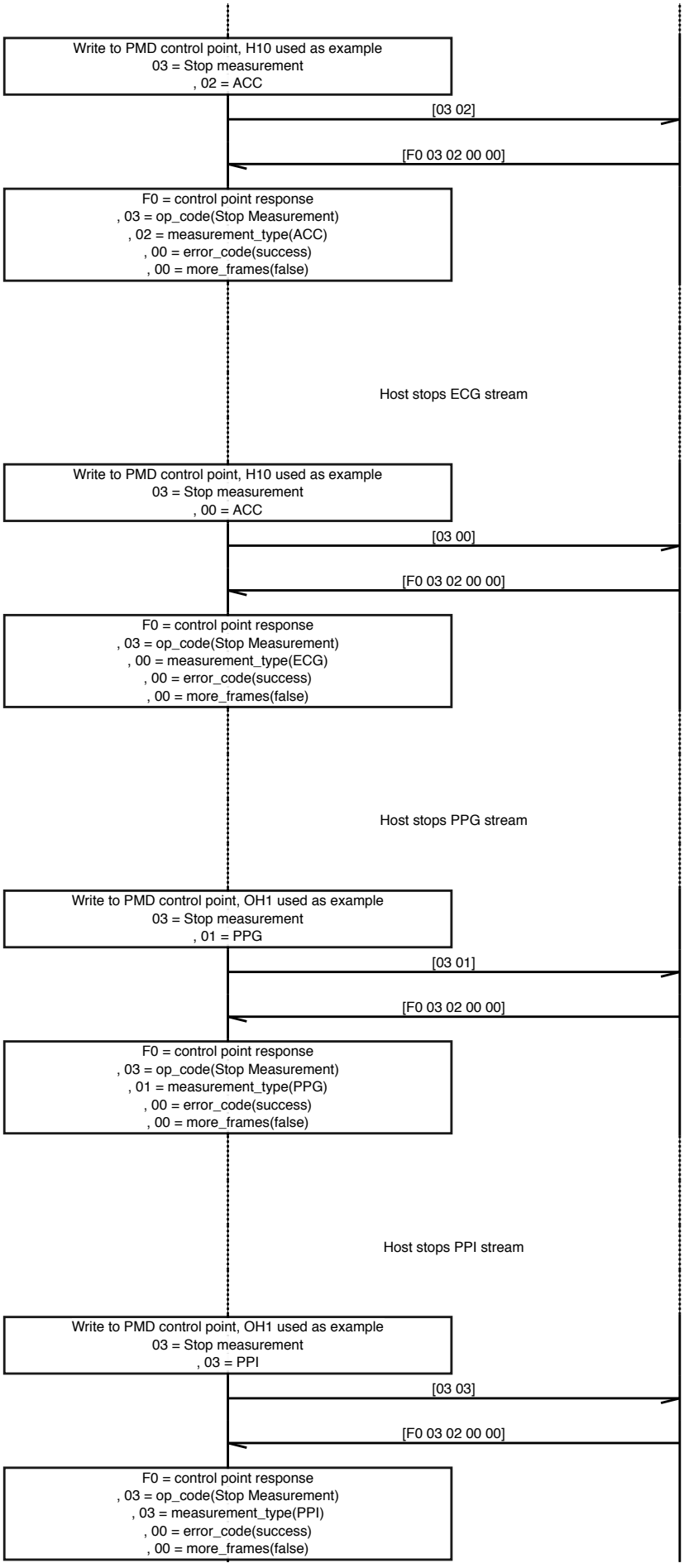
Start Stream


Host requests start acc stream
Write to PMD control point, H10 used as example
02 = Start measurement
, 02 = ACC
, 00 = setting_type(SAMPLE_RATE), 01 = array_count(1), C8 00 = 200hz
, 01 = setting_type(RESOLUTION), 01 = array_count(1), 10 00 = 16bit
, 02 = setting_type(RANGE), 01 = array_count(1), 08 00 = 8G
[02 02 00 01 C8 00 01 01 10 00 02 01 08 00]
[F0 02 02 00 00 01]
F0 = control point response
, 02 = op_code(Start Measurement)
, 02 = measurement_type(ACC)
, 00 = error_code(success)
, 00 = more_frames(false) 01 = reserved
Device starts stream to PMD Data characteristic
[02 EA 54 A2 42 8B 45 52 08 01 45 FF E4 FF B5 03 45 FF E4 FF B8 03 ...]
02=ACC, EA 54 A2 42 8B 45 52 08 = last sample timestamp in nanoseconds, 01 = ACC frameType
, sample0 = [45 FF E4 FF B5 03] x-axis(45 FF=-184 millig) y-axis(E4 FF=-28 millig) z-axis(B5 03=949 millig) , sample1, sample2, ...
Host requests start ecg stream
Write to PMD control point, H10 used as example
02 = Start measurement
, 00 = ECG
, 00 = setting_type(SAMPLE_RATE), 01 = array_count(1), 82 00 = 130hz
, 01 = setting_type(RESOLUTION), 01 = array_count(1), 0E 00 = 14bit
[02 02 00 01 C8 00 01 01 10 00 02 01 08 00]
[F0 02 00 00 00 00]
F0 = control point response
, 02 = op_code(Start Measurement)
, 00 = measurement_type(ECG)
, 00 = error_code(success)
, 00 = more_frames(false) 00 = reserved
Device starts stream to PMD Data characteristic
[00 EA 1C AC CC 99 43 52 08 00 68 00 00 58 00 00 46 00 00 3D 00 00 32 00 00 26 00 00 16 00 00 04 00 00 ...]
00=ECG, EA 1C AC CC 99 43 52 08 = last sample timestamp in nanoseconds, 00 = ECG frameType
, sample0 = [68 00 00] microVolts(104) , sample1, sample2, ...
Host requests start ppg stream
Write to PMD control point, OH1 used as example


02 = Start measurement
, 01 = PPG
, 00 = setting_type(SAMPLE_RATE), 01 = array_count(1), 82 00 = 130hz
, 01 = setting_type(RESOLUTION), 01 = array_count(1), 16 00 = 22bit
[02 01 00 01 C8 00 01 01 10 00 02 01 08 00]
[F0 02 01 00 00 00]
F0 = control point response
, 02 = op_code(Start Measurement)
, 01 = measurement_type(PPG)
, 00 = error_code(success)
, 00 = more_frames(false) 00 = reserved
Device starts stream to PMD Data characteristic
[01 00 E0 A4 40 E1 09 61 08 00 75 26 FF AD C9 FE 8A CD FD 20 46 F8 AD 1A FF 17 BF FE B1 C1 FD 77 43 F8 C1 ...]
01=PPG, 00 E0 A4 40 E1 09 61 08 = last sample timestamp in nanoseconds
00 = PPG frameType
sample0 = [75 26 FF AD C9 FE 8A CD FD 20 46 F8] ppg0(FF2675) ppg1(FEC9AD) ppg2(FDCD8A) ambient(F84620), sample1, sample2, ...
Host requests start ppi stream
Write to PMD control point, OH1 used as example
02 = Start measurement
, 03 = PPI
[02 03]
[F0 02 03 00 00 00]
F0 = control point response
, 02 = op_code(Start Measurement)
, 03 = measurement_type(PPI)
, 00 = error_code(success)
, 00 = more_frames(false) 00 = reserved
Device starts stream to PMD Data characteristic
[03 00 E0 A4 40 E1 09 61 08 00 00 27 03 1E 00 06 00 C3 03 1E 00 06 00 66 04 1E 00 06 00 DB 04 1E 00 06 00 ...]
03=PPG, 00 E0 A4 40 E1 09 61 08 = last sample timestamp in nanoseconds
00 = PPI frameType
sample0 = [00 27 03 1E 00 06] hr(00) pp in ms(0327) pp error estimate(001E) 06(bit0 = blocker bit, bit1 = skin contact status, bit2 = skin contact supported), sample1, sample2, ...

Stop Stream

Host
Device
Host stops ACC stream


Write to PMD control point, H10 used as example
03 = Stop measurement
, 02 = ACC
[03 02]
[F0 03 02 00 00]
F0 = control point response
, 03 = op_code(Stop Measurement)
, 02 = measurement_type(ACC)
, 00 = error_code(success)
, 00 = more_frames(false)
Host stops ECG stream
Write to PMD control point, H10 used as example
03 = Stop measurement
, 00 = ACC
[03 00]
[F0 03 02 00 00]
F0 = control point response
, 03 = op_code(Stop Measurement)
, 00 = measurement_type(ECG)
, 00 = error_code(success)
, 00 = more_frames(false)
Host stops PPG stream
Write to PMD control point, OH1 used as example
03 = Stop measurement
, 01 = PPG
[03 01]
[F0 03 02 00 00]
F0 = control point response
, 03 = op_code(Stop Measurement)
, 01 = measurement_type(PPG)
, 00 = error_code(success)
, 00 = more_frames(false)
Host stops PPI stream
Write to PMD control point, OH1 used as example
03 = Stop measurement
, 03 = PPI
[03 03]
[F0 03 02 00 00]
F0 = control point response
, 03 = op_code(Stop Measurement)
, 03 = measurement_type(PPI)
, 00 = error_code(success)
, 00 = more_frames(false)