Firmware output sample format

Output data order:

The serial data to be sent from the firmware to software must be of the below order inorder for the software to receive and process the data properly. Ensure that the baud rate for the serial communication is 115200.

Parameter	Values to be sent	Datatype	Size	Sample data
Device ID	Given by REUDE	String	1	REU-MTB-001
Current PWM value	Latest PWM value sent to ESC	float	1	1100
RPM	Latest RPM value of the motor	float	1	1500
Current	Current drawn by motor, in Amps	float	1	40
Voltage	Latest voltage of the battery, in Volts	float	1	50
Thrust	Latest thrust value measured	float	1	15
Torque	Latest torque value measured	float	1	5
Ambient temperature	Ambient temperature at the setup area	float	1	30
Maximum temperature	Maximum temperature value among the thermal camera array (or) the single-point temperature sensor array	float	1	35
StartMarker 1	0xAA	hexadecimal	1	0xAA
StartMarker 2	0xBB	hexadecimal	1	0xBB
Thermal data	An array of temperature values (image[height][width]) from a thermal camera	float	32 x 24 (or) 320x240 (or) 640x480	img[32][24]
EndMarker 1	0xDD	hexadecimal	1	0xDD
EndMarker 2	0xEE	hexadecimal	1	0xEE
StartMarker 3	0xAA	hexadecimal	1	0xAA
StartMarker 4	0xBB	hexadecimal	1	0xBB

RGB data	RGB frame data - a multi-dimensional array (image[height][width][3]) where each element represents a pixel's colour value.	hexadecimal	320x240 (or) 640x480	image[320][240][3]
EndMarker 3	0xDD	hexadecimal	1	0xDD
EndMarker 4	0xEE	hexadecimal	1	0xEE

An example of the data output:

[Note: Thermal data array is of size 32x24 and RGB image resolution used for the example is 32x24]

REU-MTB-
001,1000,0,61.91,0.00,2.00,1.00,31.21,0xAA,0xBB,29.52,29.76,29.17,29.11,28.98,28.90,29.32,29.10,29.03,28.71,28.27,28.58,28.42,28.40,28.26,28.30,28.25,28.40,28.39,28.23,28.38,28.33,28.43,29.03,30.31,30.70,31.18,31.20,31.49,31.80,33.09,33.20,29.31,28.80,28.92,28.73,28.92,28.71,29.49,29.29,29.01,28.83,28.43,28.57,28.33,28.40,28.41,28.30,28.27,28.28,28.50,28.47,28.30,28.31,28.42,28.74,31.00,30.89,31.17,31.36,31.32,31.67,32.98,33.03,28.81,29.11,28.99,28.94,28.69,28.86,29.40,29.81,29.30,29.04,28.58,28.32,28.22,28.36,28.30,28.33,28.31,28.36,28.22,28.34,28.38,28.45,28.57,29.07,31.04,30.93,31.23,31.12,31.35,31.64,32.80,33.53,28.89,29.02,28.91,28.89,28.91,28.79,29.60,29.88,29.94,29.42,28.59,28.41,28.26,28.27,28.23,28.61,28.37,28.33,28.35,28.42,28.42,28.42,28.67,29.16,31.09,30.94,31.12,31.13,31.49,31.52,32.74,33.65,28.76,28.81,28.77,29.01,28.67,28.76,29.25,29.43,30.27,30.36,29.10,28.87,28.67,28.37,28.33,28.55,28.52,28.48,28.54,28.56,28.54,28.58,28.82,30.14,30.96,30.56,30.43,30.57,31.10,31.77,32.83,33.66,29.12,28.74,28.98,28.68,28.67,28.57,29.20,29.49,30.24,30.35,29.57,29.57,29.14,29.04,28.72,28.70,28.71,28.69,28.72,28.80,29.02,28.71,29.30,30.34,30.92,30.79,30.46,30.58,30.86,31.65,32.93,33.08,28.96,29.15,29.13,28.92,28.54,28.53,28.83,29.22,29.72,30.35,30.50,30.66,30.49,30.65,30.50,30.49,29.88,29.86,29.76,29.90,30.04,30.33,30.38,30.89,30.71,30.73,30.27,30.52,31.13,31.91,32.34,32.39,29.14,28.91,28.79,28.84,28.62,28.48,28.70,28.86,28.71,29.17,30.05,30.14,30.23,30.13,30.72,30.64,30.27,30.39,30.15,30.37,30.21,30.15,30.61,30.59,30.30,30.32,30.31,30.66,31.15,31.51,32.04,31.70,29.01,29.01,28.75,28.93,28.43,28.51,28.45,28.44,28.18,28.10,28.10,28.34,28.29,28.49,28.77,29.22,29.40,29.49,29.68,29.58,29.14,29.24,29.31,29.65,29.72,29.89,30.23,30.45,31.03,31.06,31.22,30.96,28.76,28.89,28.79,28.72,28.38,28.42,28.52,28.56,28.46,28.30,28.25,28.17,28.21,28.09,28.31,28.47,28.55,28.63,28.72,28.94,28.98,28.83,28.93,28.82,29.12,29.21,30.03,30.01,30.47,30.56,30.67,30.42,28.68,28.62,28.57,28.28,28.43,28.35,28.41,28.50,28.14,28.32,28.07,28.33,28.34,28.40,28.36,28.42,28.51,28.51,28.24,28.52,28.43,28.89,28.85,28.97,28.96,28.82,29.23,29.40,29.21,29.31,29.50,29.29,28.42,28.39,28.49,28.56,28.37,28.26,28.28,28.51,28.20,28.10,28.22,28.40,28.25,28.16,28.14,28.33,28.36,28.18,28.47,28.27,28.35,28.30,28.72,28.77,28.83,28.91,28.97,29.16,28.68,28.58,28.98,28.93,28.72,28.72,28.35,28.47,28.22,28.27,28.15,28.17,28.35,28.05,28.22,28.41,28.23,28.25,28.29,28.46,28.35,28.54,28.16,28.29,28.27,28.33,28.42,28.59,28.43,28.50,28.53,28.70,28.34,28.81,28.72,29.07,28.59,28.46,28.60,28.33,28.26,28.24,28.20,28.34,28.04,28.08,28.26,28.32,28.28,28.29,28.32,28.27,28.40,28.27,28.35,28.17,28.31,28.29,28.27,28.54,28.58,28.48,28.57,28.56,28.48,28.65,28.71,28.83,28.41,28.55,28.67,28.41,28.19,28.18,28.17,28.20,28.

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16,28.19,28.23,28.26,28.23,28.42,28.47,29.25,29.58,28.97,29.08,28.94,29.26,28.57,28.79,28.
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0x8F, 0x8F, 0x87, 0xC0, 0xC0, 0xB8, 0xBF, 0xBF, 0xB5, 0xBF, 0xBF, 0xB5, 0xBD, 0xBD,
0xB5, 0xBA, 0xB9, 0xB4, 0xBC, 0xBB, 0xB6, 0xBC, 0xBD, 0xB8, 0xBE, 0xBF, 0xBA,
0xBE, 0xC0, 0xBB, 0xBE, 0xC3, 0xBD, 0xBF, 0xC4, 0xBE, 0xC0, 0xC5, 0xBF, 0xB7, 0xBC,
0xB6, 0xC7, 0xCC, 0xC6, 0xCC, 0xD1, 0xCB, 0xBC, 0xC1, 0xBB, 0xBD, 0xC2, 0xBC, 0xC1,
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0xBD, 0xBC, 0xB7, 0xC0, 0xC1, 0xBC, 0xC3, 0xC5, 0xC0, 0xC6, 0xCB, 0xC7, 0xC4, 0xCA,
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0x5B, 0x56, 0x55, 0x5A, 0x66, 0x66, 0x68, 0x7E, 0x7E, 0x80, 0x7C, 0x7C, 0x7C, 0x85, 0x85,
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0xCE, 0xC9, 0xCF, 0xCE, 0xC9, 0xCA, 0xCA, 0xC2, 0xC6, 0xC7, 0xBF, 0xC3, 0xC6, 0xBD,
0xC5, 0xC6, 0xBE, 0xC9, 0xCA, 0xC2, 0xCC, 0xC9, 0xC0, 0xCA, 0xC6, 0xBD, 0xCC, 0xC5,

0xBD, 0xD0, 0xC7, 0xC0, 0xD0, 0xC7, 0xC0, 0xD6, 0xCD, 0xC6, 0xC4, 0xBD, 0xB7, 0xCA,
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0x12, 0x14, 0x0F, 0x0F, 0x11, 0x15, 0x15, 0x15, 0x19, 0x19, 0x19, 0x1A, 0x1A, 0x18, 0x25,
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0x1E, 0x13, 0x18, 0x1B, 0x12, 0x1D, 0x1D, 0x13, 0x2C, 0x25, 0x1B, 0x3A, 0x2E, 0x22,
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0x9B, 0xDD, 0xCA, 0xC4, 0xC7, 0xBD, 0xBB, 0xC8, 0xC6, 0xC7, 0xC8, 0xCD, 0xD1, 0xC2,
0xCB, 0xD2, 0x14, 0x14, 0x1C, 0x22, 0x22, 0x2A, 0x08, 0x09, 0x0E, 0x0E, 0x0F, 0x14, 0x09,
0x0A, 0x0F, 0x02, 0x03, 0x07, 0x0A, 0x0B, 0x0F, 0x10, 0x11, 0x13, 0x07, 0x07, 0x09, 0x12,
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0x15, 0x0E, 0x27, 0x1E, 0x17, 0x40, 0x2F, 0x25, 0x50, 0x35, 0x2A, 0x52, 0x32, 0x25, 0x58,
0x32, 0x25, 0x42, 0x1C, 0x0F, 0x7C, 0x5C, 0x51, 0xD5, 0xBD, 0xB3, 0xD7, 0xCA, 0xC4,
0xC5, 0xC1, 0xC0, 0xCC, 0xD1, 0xD4, 0xB8, 0xC1, 0xC6, 0x0A, 0x0A, 0x12, 0x22, 0x22,
0x2A, 0x0E, 0x0F, 0x14, 0x09, 0x0A, 0x0F, 0x07, 0x08, 0x0D, 0x0D, 0x0E, 0x13, 0x07, 0x08,
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0x1F, 0x4B, 0x2D, 0x23, 0x4F, 0x29, 0x1C, 0x4D, 0x22, 0x12, 0x6A, 0x3F, 0x2E, 0x41, 0x1C,
0x0C, 0x9D, 0x80, 0x72, 0xED, 0xDC, 0xD2, 0xC1, 0xBC, 0xB8, 0xC5, 0xC9, 0xCA, 0xC7,
0xD1, 0xD3, 0x04, 0x07, 0x0C, 0x17, 0x1A, 0x1F, 0x0E, 0x11, 0x16, 0x02, 0x05, 0x0A, 0x09,
0x0A, 0x0F, 0x0D, 0x0E, 0x13, 0x0E, 0x0F, 0x13, 0x09, 0x0A, 0x0E, 0x06, 0x05, 0x0A,
0x0C, 0x0C, 0x0E, 0x14, 0x14, 0x16, 0x17, 0x17, 0x19, 0x16, 0x16, 0x18, 0x14, 0x14, 0x16,
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0x13, 0x11, 0x14, 0x1F, 0x13, 0x13, 0x28, 0x13, 0x10, 0x61, 0x40, 0x37, 0x55, 0x2E, 0x1F,
0x6D, 0x40, 0x2D, 0x5B, 0x2C, 0x18, 0x6C, 0x42, 0x2C, 0x58, 0x37, 0x24, 0xD6, 0xC3,
0xB4, 0xD2, 0xC9, 0xC0, 0xCD, 0xCF, 0xCA, 0xBF, 0xC8, 0xC5, 0x06, 0x09, 0x0E, 0x14,
0x17, 0x1C, 0x11, 0x14, 0x19, 0x05, 0x08, 0x0D, 0x0C, 0x0D, 0x12, 0x14, 0x15, 0x1A, 0x10,
0x11, 0x15, 0x0C, 0x0D, 0x11, 0x0A, 0x09, 0x0E, 0x10, 0x0F, 0x14, 0x17, 0x17, 0x19, 0x1A,
0x1A, 0x1C, 0x1A, 0x1A, 0x1C, 0x1A, 0x1A, 0x1C, 0x1D, 0x1D, 0x1F, 0x1E, 0x1F, 0x23,
0x0F, 0x16, 0x1C, 0x0C, 0x13, 0x1B, 0x13, 0x16, 0x1D, 0x12, 0x10, 0x15, 0x1D, 0x12, 0x16,
0x27, 0x13, 0x12, 0x5C, 0x3E, 0x36, 0x74, 0x4D, 0x3E, 0x76, 0x47, 0x33, 0x7E, 0x4E, 0x37,
0x81, 0x55, 0x3C, 0x72, 0x4E, 0x36, 0xC0, 0xA9, 0x97, 0xD7, 0xCE, 0xBF, 0xCD, 0xCE,
0xC6, 0xC6, 0xCD, 0xC6, 0x0D, 0x10, 0x15, 0x11, 0x14, 0x19, 0x14, 0x18, 0x1B, 0x07,
0x0B, 0x0E, 0x11, 0x12, 0x16, 0x1E, 0x1F, 0x23, 0x13, 0x14, 0x18, 0x10, 0x11, 0x15, 0x0D,
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