

883M Digital Triaxial Accelerometer

Setup Instructions and Manual



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Revision History

Version	Date	Comments
1.0	2024-12-06	First version
1.1	2025-04-08	Add Recommended Topologies
1.2	2025-04-25	Update Utility UI photographs
1.3	2025-07-10	Update photographs & Add Velocity New Filter
1.4	2025-10-21	Update utility and weblink
97052 rev A	09/26	Update Modbus table with kurtosis measurement Length change of timewave & spectrum data Formatting alignment

1. Introduction

The 883M is a high-precision triaxial MEMS vibration sensor that simultaneously detects overall, True-peak, temperature, time waveform, FFT spectrum, and other values. Its robust and reliable design, and communication through standard RS485 interface and Modbus RTU protocols make it ideal for applications in semiconductor industry equipment condition monitoring, predictive maintenance, and automated integration.

1.1 Features

- Triaxial synchronous measurement with real-time status indication through LED lights.
- Detection overall of vibration acceleration, velocity (ISO 10816, ISO/TR 17243-1), and displacement.
- Synchronous measurement of temperature.
- Extraction of time-domain waveforms and calculation of FFT spectra.
- Detection of True-peak for real-time prediction of bearing condition.
- IP67 design suitable for harsh environments and clean room process areas.

1.2 Applications

- Monitoring of semiconductor industry and advanced process equipment condition.
- Industrial automation process monitoring.
- Monitoring of machine tools in machining processes.
- Integration applications of IoT and big data.
- Monitoring of operational condition in transportation vehicles and aircraft.

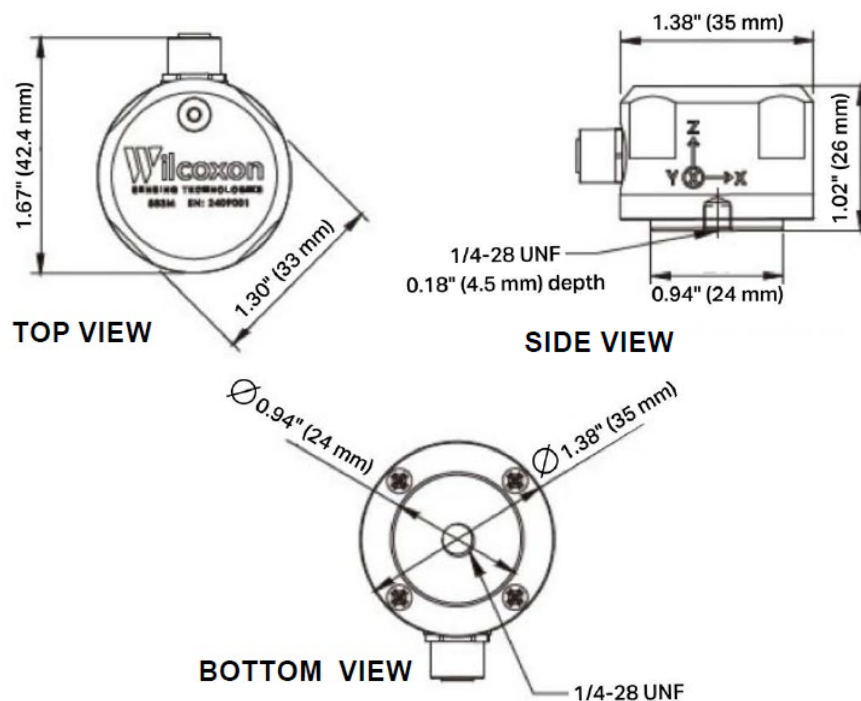
2. Specifications

2.1 Measurement Specification

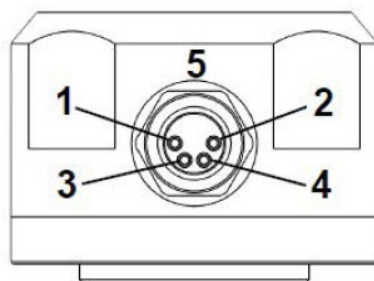
DYNAMIC	
Acceleration range	±16 g-peak
Resolution	0.488mg
Frequency response, ± 3 dB	2Hz~5kHz
Resonance frequency	6.9 kHz
CALCULATED VIBRATION METRICS (X, Y, AND Z AXES)	
Acceleration, RMS	2 Hz - 1 kHz; 10 Hz - 5 kHz
Acceleration, peak	2 Hz - 1 kHz; 10 Hz - 5 kHz
Velocity, RMS	2 Hz - 1 kHz; 10 Hz - 1 kHz; 10 Hz - 5 kHz
Velocity, peak	2 Hz - 1 kHz; 10 Hz - 1 kHz; 10 Hz - 5 kHz
Displacement, RMS	2 Hz - 1 kHz; 10 Hz - 1 kHz
Displacement, peak	2 Hz - 1 kHz; 10 Hz - 1 kHz
Temperature	-20° to +70° C
True peak	Fs @ 13.333kHz
Spectrum	0 Hz - 5 kHz, 6145 lines
Time wave	13,333 samples, 1 second
Other Features	crest factor, standard deviation, kurtosis
COMMUNICATION	
Interface	RS485
Protocol	Modbus RTU
Recommended baud rate	9,600 or 115,200 bps
Max. baud rate	921,600 bps
ELECTRICAL	
Power	6 - 24 VDC
LED Indicator	1 (RGB)
ENVIRONMENTAL AND MECHANICAL	
Dimension	35mm dia. x 26 mm h
Weight	75 grams
Sealing	IP67
Case material	
upper	A6061 aluminum
lower	303 stainless steel
Connector	4-socket M8
Mating connector	4-pin M8
Mounting	adhesive mount via sensor flat base screw mount adapter ¹ (optional)

	magnet mount adapter ¹ (optional)
Operating temperature	-20° to +70° C
Storage temperature	-20° to +80° C
Shock limit	5,000 g
Operation humidity	5 - 95% RH
Certification	CE

2.2 Sensor Measurement Direction and Dimensions

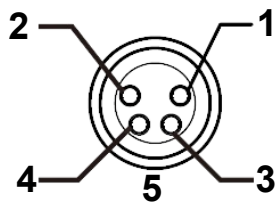
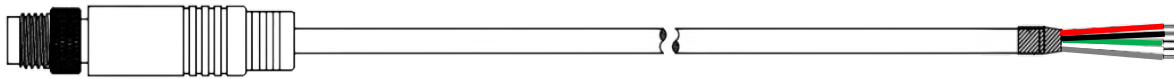


2.3 Sensor Pin Definition



Connections	
Function	Connector pin
power	1
ground	2
signal +	3
signal -	4
shield	5 (housing)

2.4 Cable Pin Definition (Optional)



Cable connections		
Function	Connector pin	Cable color
power	1	red
ground	2	black
signal +	3	green
signal -	4	white
shield	5 (housing)	--

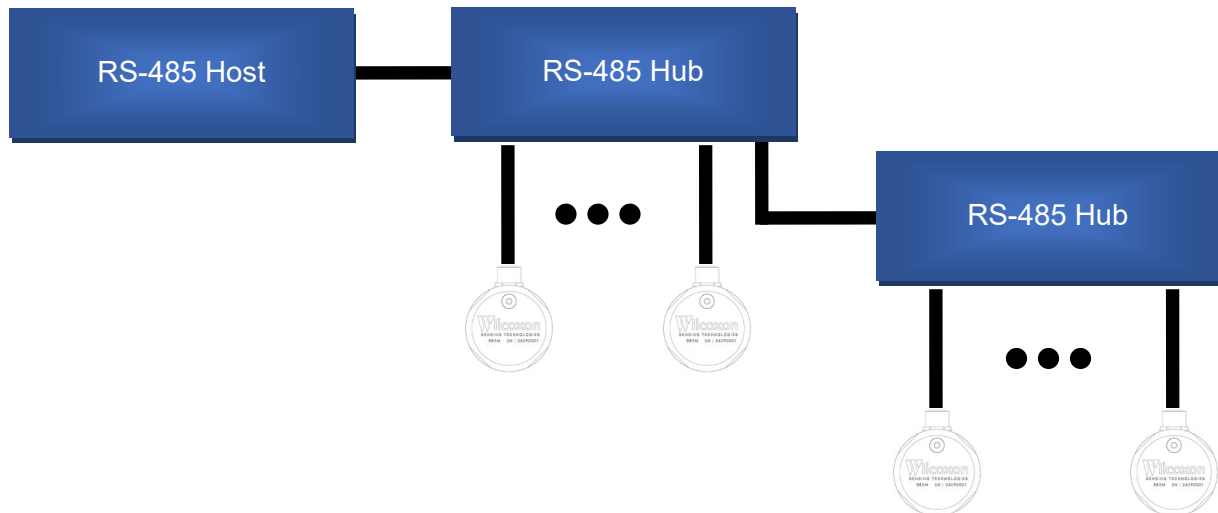
2.5 Sensor LED Indicator



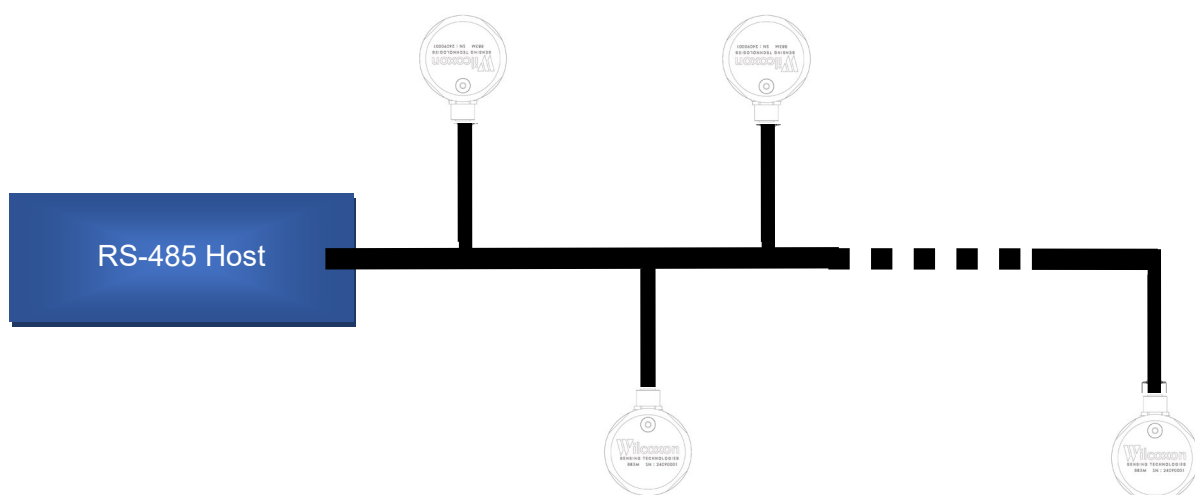
Sensor LED indicator		
LED	Description	Status
	white light, briefly on	power-on, self-test in progress
	blue light, flashing	standby mode
	green light, flashing	data transmission in progress
	blue light, constantly on	sensor abnormality detected
	red light, flashing	firmware update in progress

2.6 Recommended Topologies

Star topology: When multiple 883M units are installed, it is advisable to connect an RS-485 hub to the RS-485 bus, forming a star topology to enhance data transmission stability in the RS-485 network.

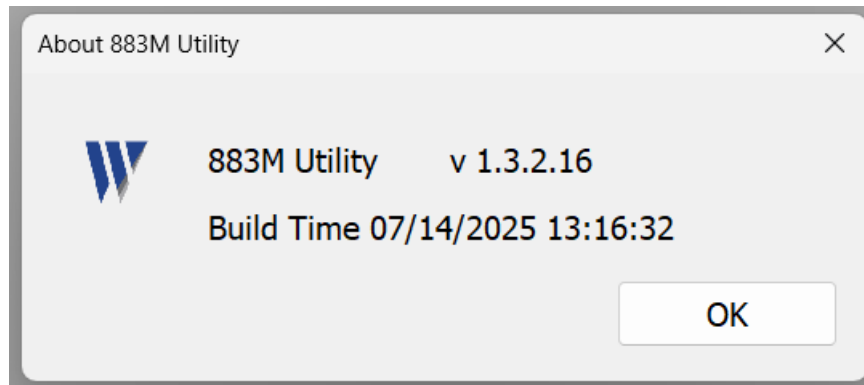


Bus topology: When implementing a bus topology, it is advisable to minimize the length of RS-485 stub branches, lower the baud rate for 883M data transmission, or add a termination resistor at the end of the RS-485 bus to enhance data transmission stability.



3. 883M Utility

The most current version of the utility is available on the Wilcoxon website at wilcoxon.com/883M.



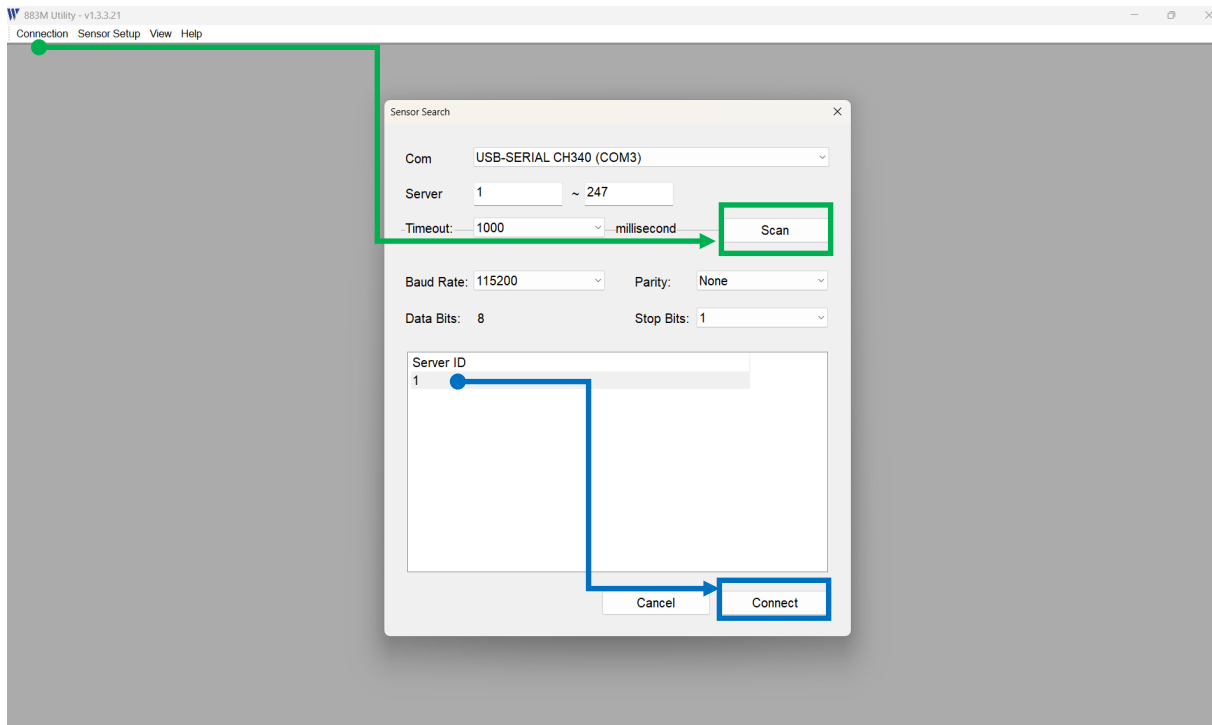
3.1 Setup and Measurement Procedures

Users can connect the 883M sensor to a computer using the included 883M Utility software and an RS485 to USB converter (optional) to configure communication protocols, update firmware, and view vibration data. The 883M-ADAP provides a 6ft connection between the sensor and RS485-USB adapter, complete with AC output plug to power the sensor and connect to the Utility software.



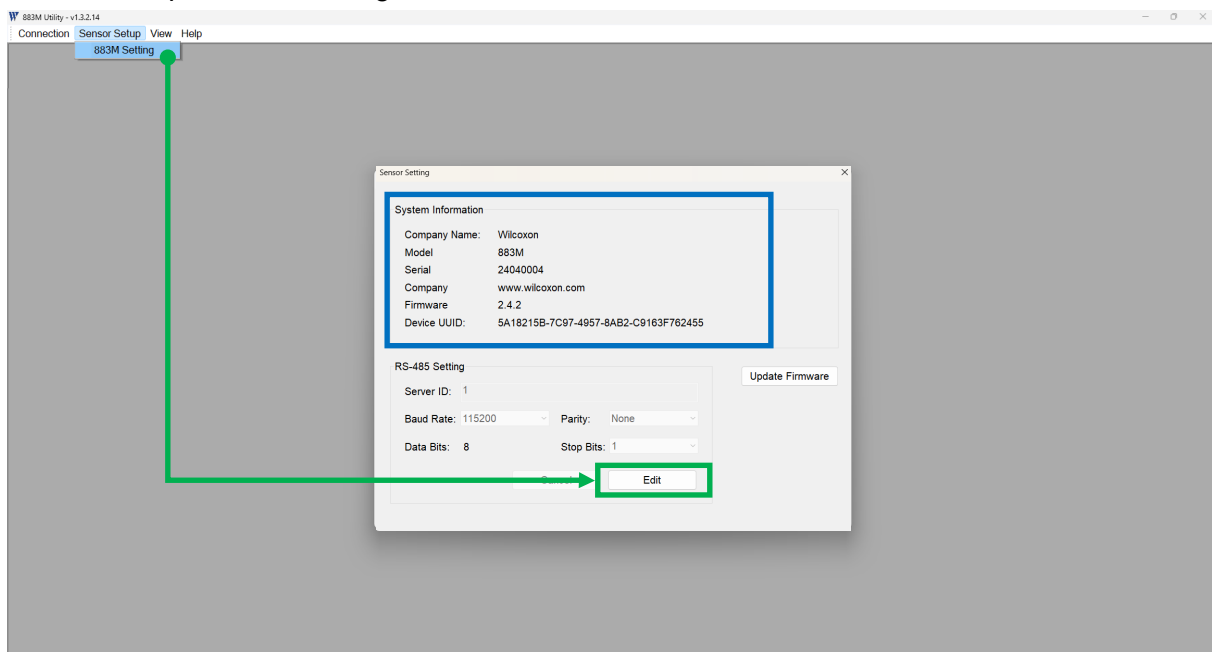
3.1.1 Connection Settings

Connection > Search > Scan > Server ID > Connect



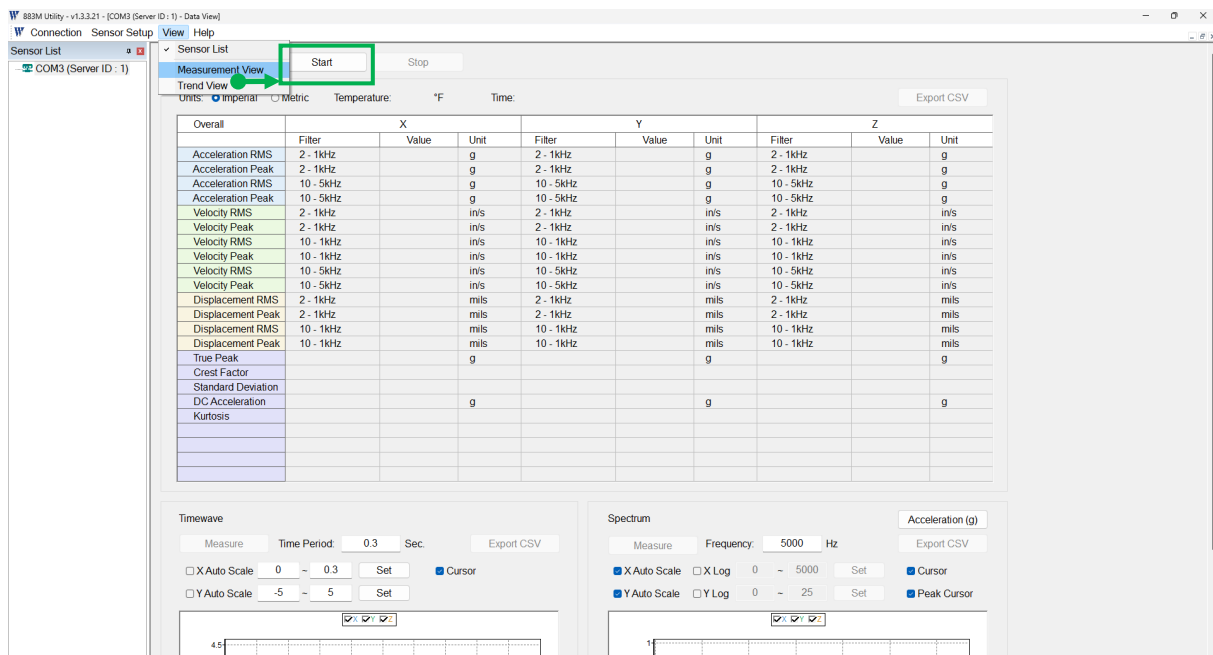
3.1.2 Communication Protocol Configuration

Sensor Setup > 883M Setting > Edit > Write to Sensor



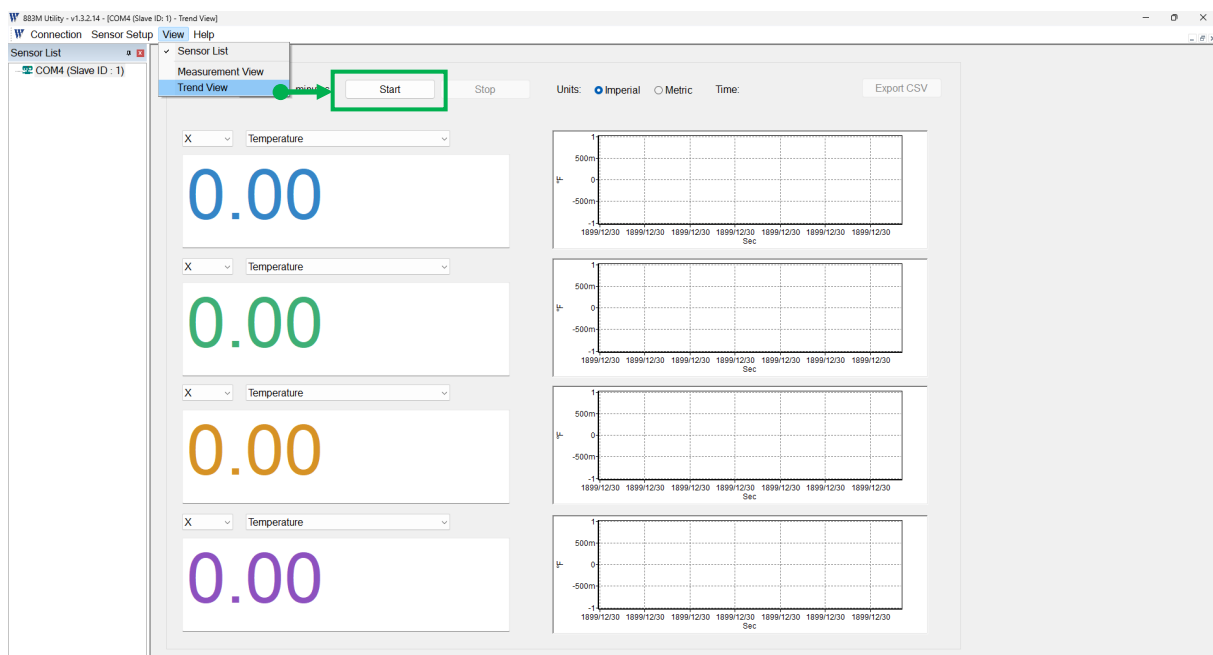
3.1.3 View Vibration Data

View > Measurement View > Start



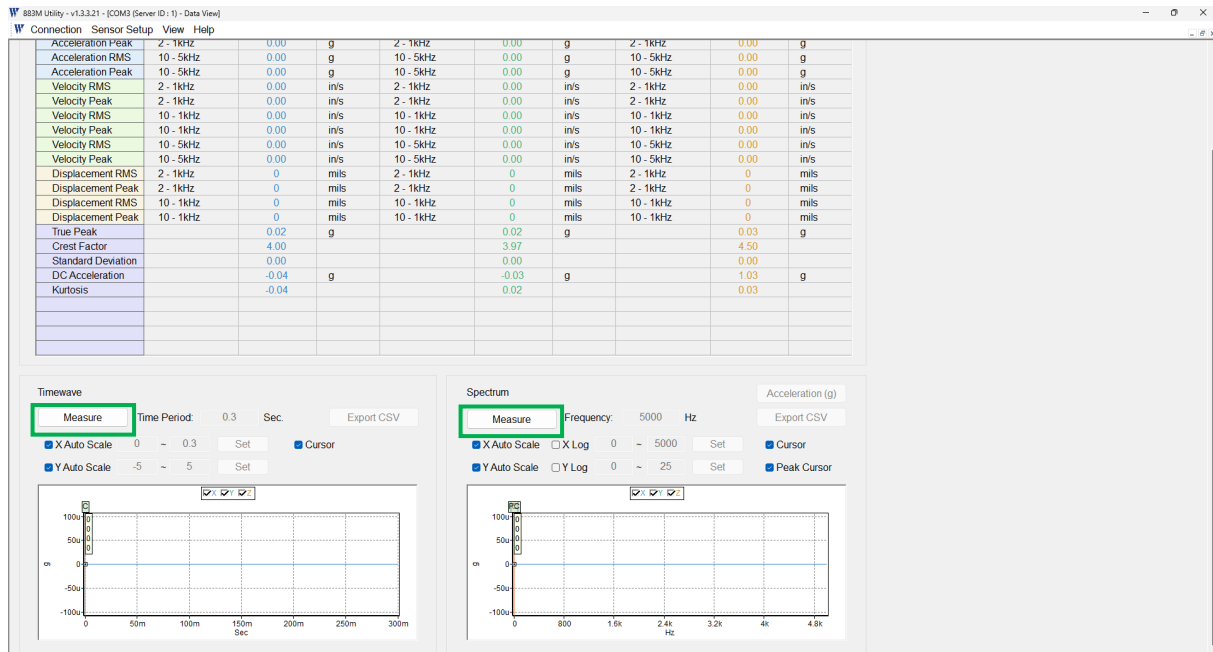
3.1.4 View Overall Trend Data

View > Trend View > Start



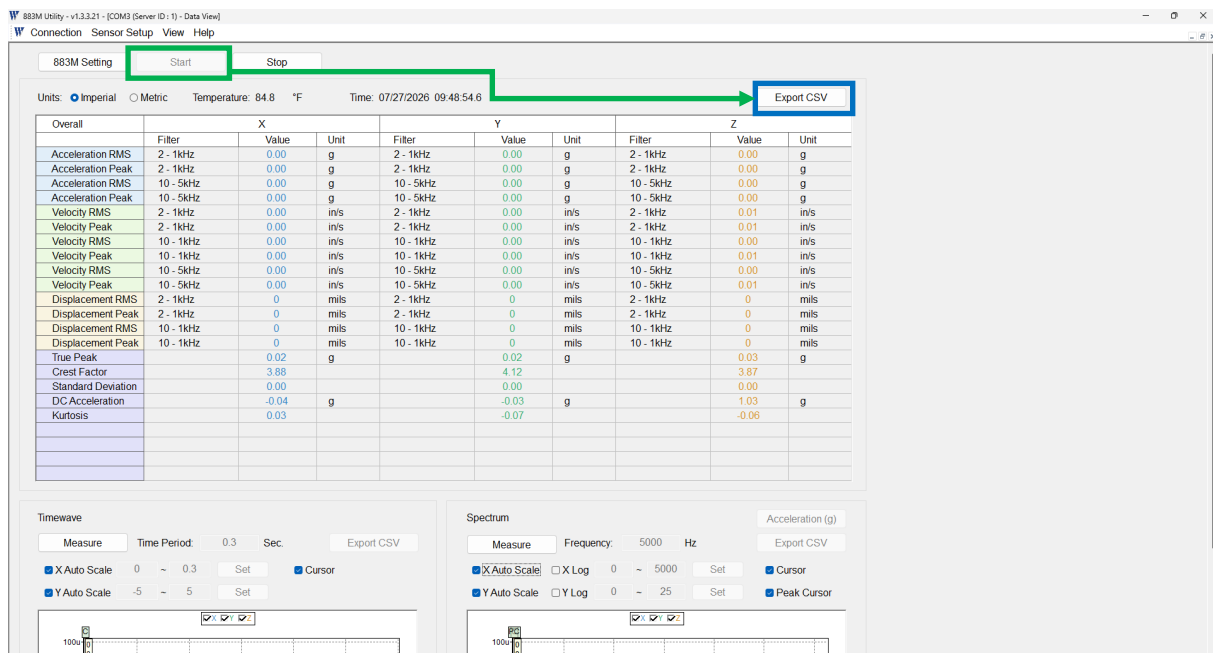
3.1.5 View Time Waveform and FFT Spectrum

Measure, Timewave and Spectrum



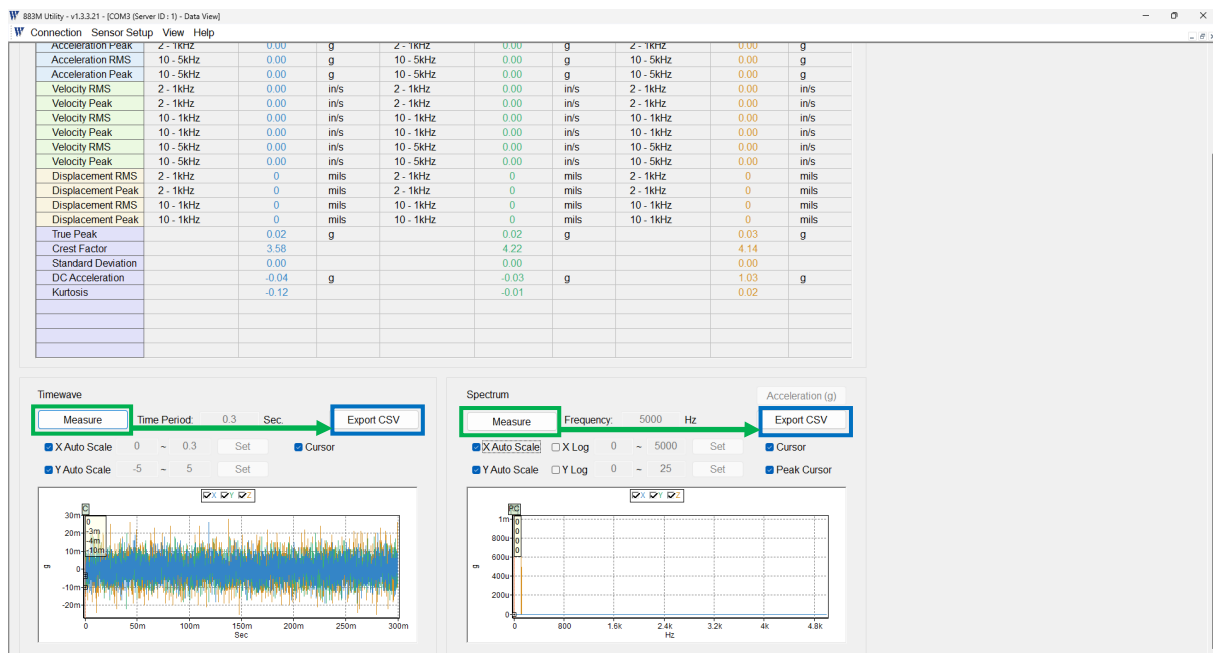
3.1.6 Export Overall Vibration as CSV

Start > Export CSV



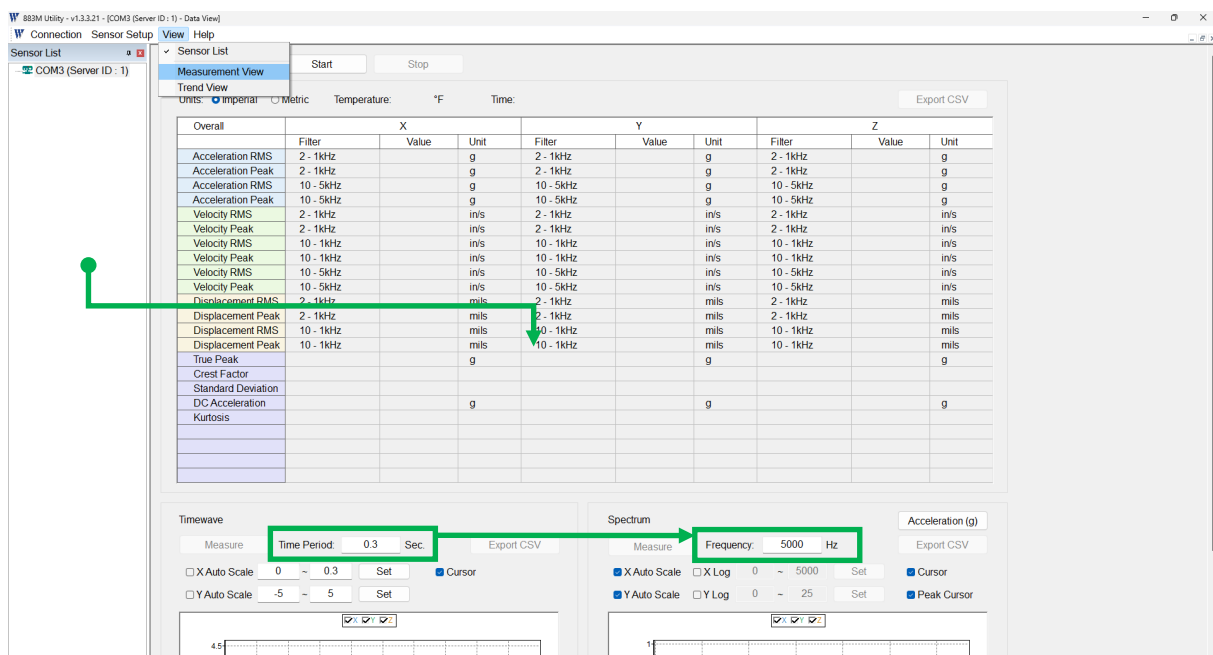
3.1.7 Export Time Waveform and FFT Spectrum as CSV

Measure > Export CSV, Timewave and Spectrum



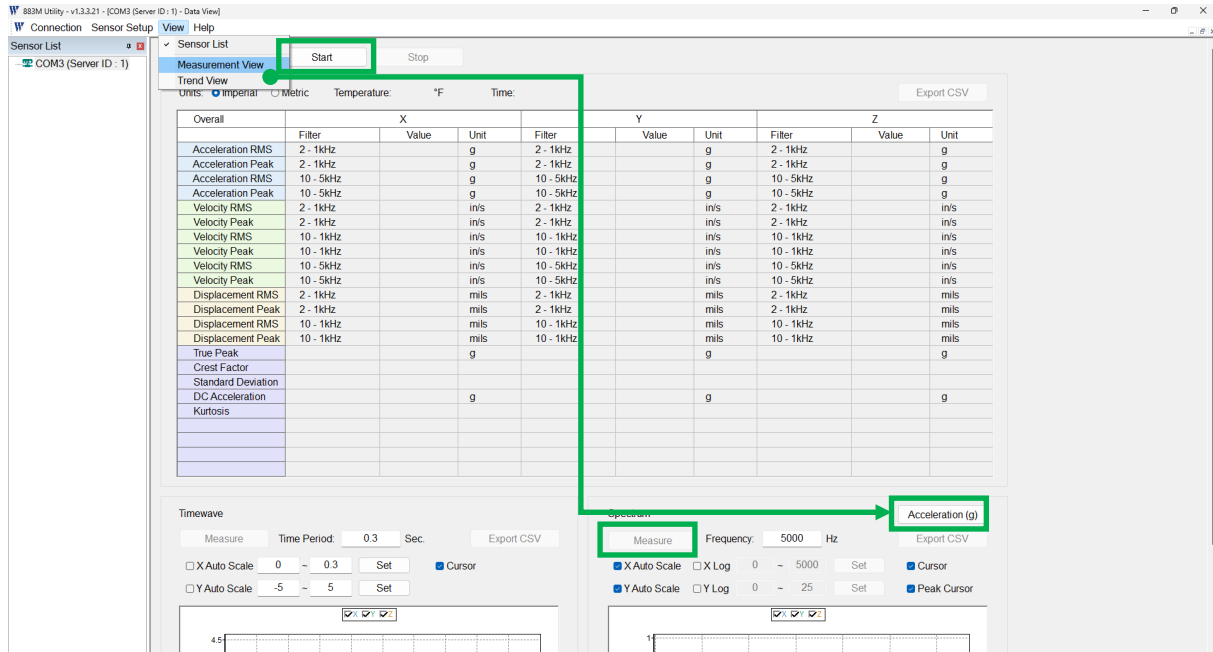
3.1.8 Waveform Size and FFT Bandwidth Settings

View > Measurement View > Edit Value (before Start)



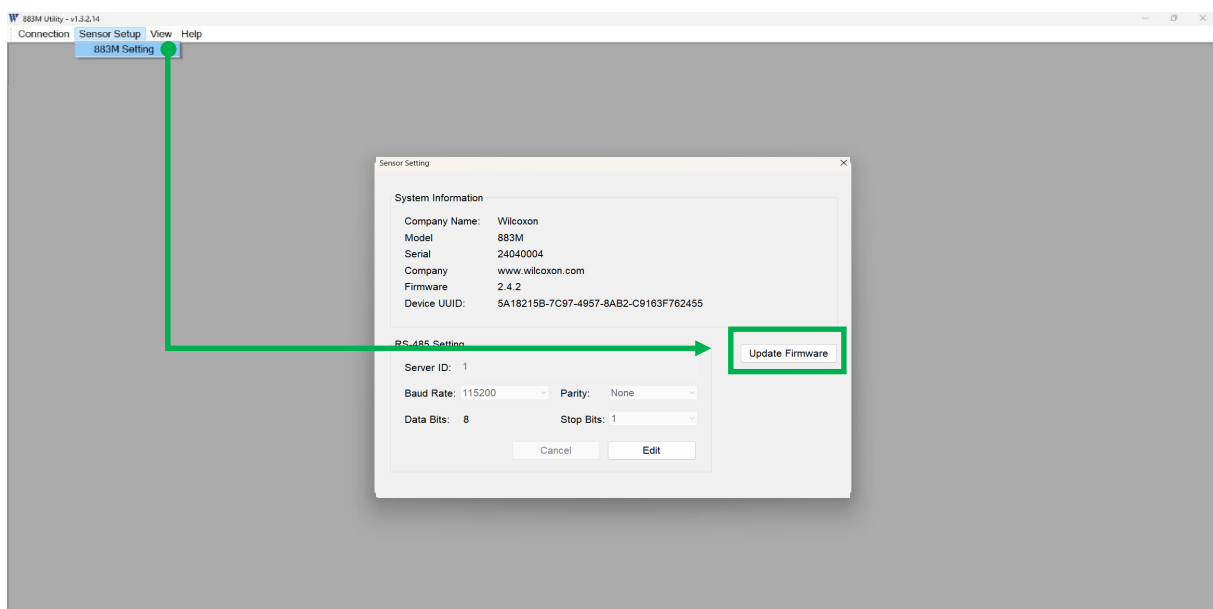
3.1.9 FFT Measurement Type Settings

View > Measurement View > Switch Type by clicking Acceleration(g)/ Velocity(in/s)/ Velocity(mm/s) button > Start > Measure



3.2 Update Firmware

Sensor Setup > 883M Setting > Update Firmware



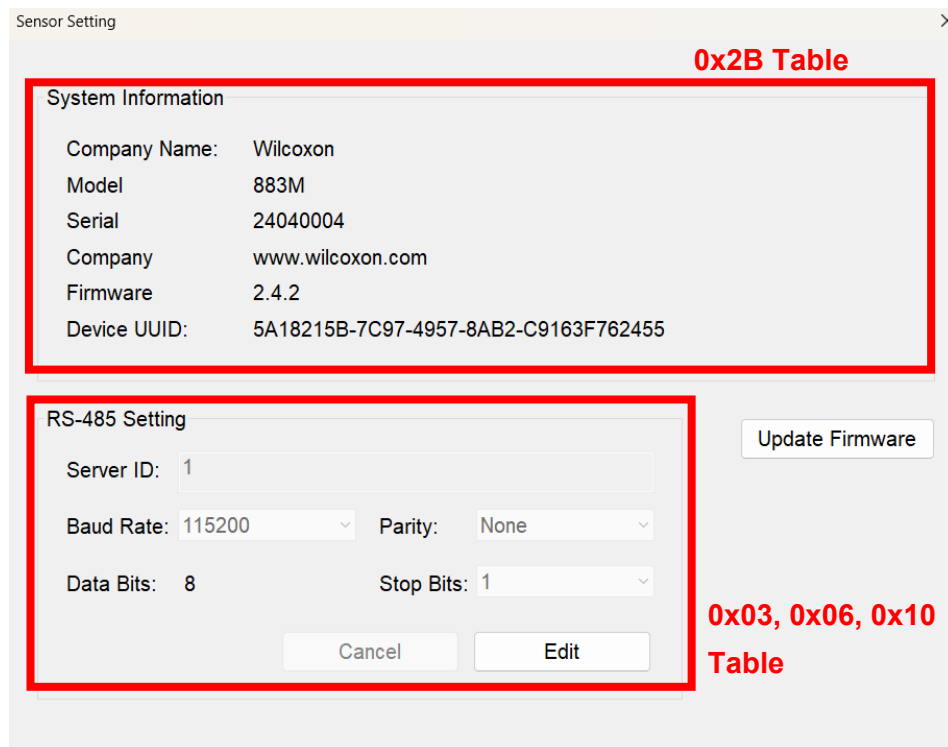
4. Modbus Instructions

4.1 Modbus RTU Format

ServerID	Function Code	Data	CRC
1 byte	1 byte	0 up to 252 bytes	2 bytes

4.2 Modbus RTU Functions

Code (Hex)	Definition	Description
0x03	Read Holding Table	Read current sensor settings
0x04	Read Input Table	Read measurement data
0x06	Write Single Register	Modify individual sensor settings
0x10	Write Multiple Registers	Modify multiple sensor settings
0x2B	Read Device ID	Read sensor ID
0x80	Exception Responses	Error codes



The screenshot shows a 'Sensor Setting' window with two main sections highlighted by red boxes:

- System Information (0x2B Table):** This section contains the following details:
 - Company Name: Wilcoxon
 - Model: 883M
 - Serial: 24040004
 - Company: www.wilcoxon.com
 - Firmware: 2.4.2
 - Device UUID: 5A18215B-7C97-4957-8AB2-C9163F762455
- RS-485 Setting (0x03, 0x06, 0x10 Table):** This section contains configuration fields:
 - Server ID: 1
 - Baud Rate: 115200
 - Parity: None
 - Data Bits: 8
 - Stop Bits: 1

Additional elements in the window include an 'Update Firmware' button and 'Cancel'/'Edit' buttons at the bottom.

4.3 0x03(3) Function Code Details

Use 0x03 function to read settings from ILA devices.

4.3.1 0x03(3) Settings Table

Address	Data Format	Default	Description
0x0000	unsigned int16	0x0009	Baud Rate: 0x0006:1200 bps 0x0007:2400 bps 0x0008:4800 bps 0x0009:9600 bps 0x000A:19200 bps 0x000B:38400 bps 0x000C:57600 bps 0x000D:115200 bps 0x000E:230400 bps 0x000F: 460800 bps 0x0010: 921600 bps
0x0001	unsigned int16	0x0008	Data Bits: 0x0008: 8 bits
0x0002	unsigned int16	0x0000	Data Parity: 0x0000: None 0x0001: Even 0x0002: Odd
0x0003	unsigned int16	0x0001	Stop Bits: 0x0001: 1 bit 0x0002: 2 bits
0x0004	unsigned int16	0x0001	Modbus Slave ID: 0x0001~0x00F7: 1~ 247
0x0200	unsigned int16	0xEEEE	Table Data Ready for Read When register value=0x0000, use the function code 0x04 to get corresponding data.

Address	Data Format	Default	Description
0x0201	unsigned int16	0x1FCA	Delta Frequency of FFT: Unit: 0.0001 Hz 0x1F75: 0.8053 Hz 0x1F81: 0.8065 Hz 0x1F8D: 0.8077 Hz 0x1F99: 0.8089 Hz 0x1FA6: 0.8102 Hz 0x1FB2: 0.8114 Hz 0x1FBE: 0.8126 Hz 0x1FCA: 0.8138 Hz 0x1FD6: 0.8150 Hz 0x1FE3: 0.8163 Hz 0x1FEF: 0.8175 Hz 0x1FFB: 0.8187 Hz 0x2007: 0.8199 Hz 0x2013: 0.8211 Hz 0x2020: 0.8224 Hz
0x0202	unsigned int16	0x1D4C	Delta Time of Timewave: Unit: 0.00000001 second 0x1D9B: 0.00007579 second 0x1D90: 0.00007568 second 0x1D85: 0.00007557 second 0x1D79: 0.00007545 second 0x1D6E: 0.00007534 second 0x1D62: 0.00007522 second 0x1D57: 0.00007511 second 0x1D4C: 0.00007500 second 0x1D41: 0.00007489 second 0x1D35: 0.00007477 second 0x1D2A: 0.00007466 second 0x1D1F: 0.00007455 second 0x1D14: 0.00007444 second 0x1D09: 0.00007433 second 0x1CFE: 0.00007422 second
0x0203	unsigned int16	0x0000	FFT Type: 0x0000: Acceleration (0.001g) 0x0001: Velocity (0.01in/s) 0x0002: Velocity (0.1mm/s)

4.3.2 0x03(3) Function Usage

Request

Function code	1 Byte	0x03
Starting Address	2 Bytes	0x0000 to 0xFFFF
Quantity of Registers	2 Bytes	1 to 125 (0x7D)

Response

Function code	1 Byte	0x03
Byte count	1 Byte	2 x N*
Register value	N* x 2 Bytes	

*N = Quantity of Registers

Error

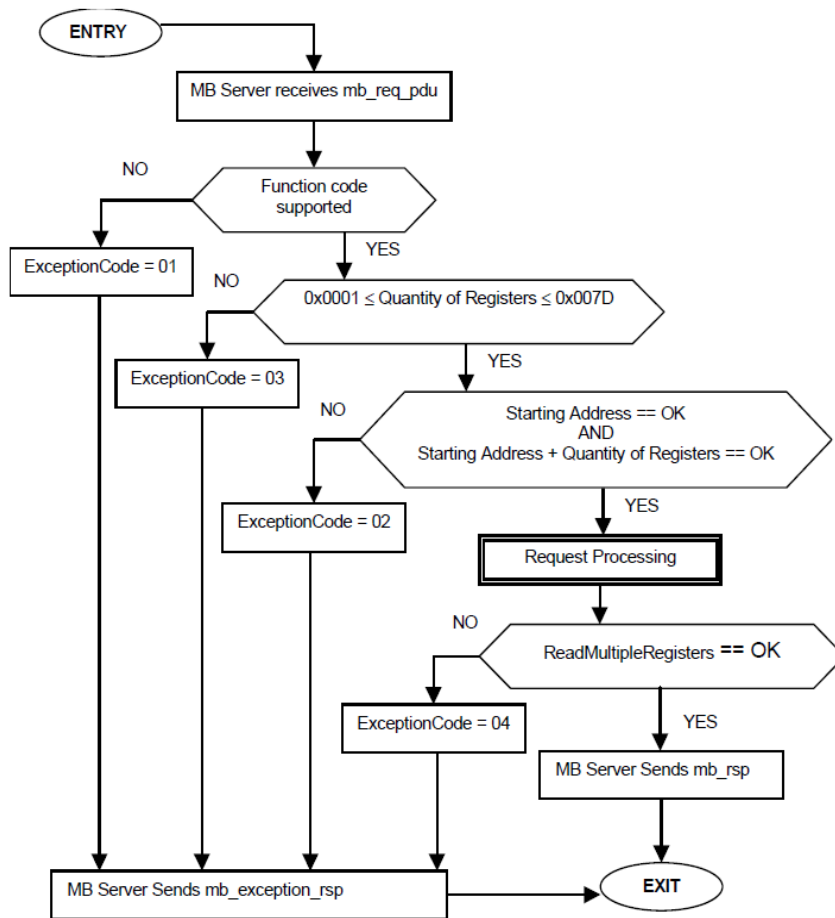
Error code	1 Byte	0x83
Exception code	1 Byte	01 or 02 or 03 or 04

Here is an example of a request to read registers 108 – 110:

Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Function	03	Function	03
Starting Address Hi	00	Byte Count	06
Starting Address Lo	6B	Register value Hi (108)	02
No. of Registers Hi	00	Register value Lo (108)	2B
No. of Registers Lo	03	Register value Hi (109)	00
		Register value Lo (109)	00
		Register value Hi (110)	00
		Register value Lo (110)	64

The contents of register 108 are shown as the two byte values of 02 2B hex, or 555 decimal. The contents of registers 109–110 are 00 00 and 00 64 hex, or 0 and 100 decimal, respectively.

4.3.3 0x03(3) Function State Diagram



4.4 0x04(4) Function Code Details

4.4.1 0x04(4) Settings Table

Measurement Value (Metric)			
Address	Data Format	Unit	Description
0x0000	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) RMS, X
0x0001	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) RMS, Y
0x0002	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) RMS, Z
0x0003	N/A	N/A	(Read Return 0x0000)
0x0004	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) Peak, X
0x0005	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) Peak, Y
0x0006	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) Peak, Z
0x0007	N/A	N/A	(Read Return 0x0000)
0x0008	unsigned int16	0.1 m/s ²	Acceleration (2Hz~1kHz) RMS, X
0x0009	unsigned int16	0.1 m/s ²	Acceleration (2Hz~1kHz) RMS, Y
0x000A	unsigned int16	0.1 m/s ²	Acceleration (2Hz~1kHz) RMS, Z
0x000B	N/A	N/A	(Read Return 0x0000)
0x000C	unsigned int16	0.1 m/s ²	Acceleration (2Hz~1kHz) Peak, X
0x000D	unsigned int16	0.1 m/s ²	Acceleration (2Hz~1kHz) Peak, Y
0x000E	unsigned int16	0.1 m/s ²	Acceleration (2Hz~1kHz) Peak, Z
0x000F	N/A	N/A	(Read Return 0x0000)
0x0010	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) RMS, X
0x0011	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) RMS, Y
0x0012	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) RMS, Z
0x0013	N/A	N/A	(Read Return 0x0000)
0x0014	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) Peak, X
0x0015	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) Peak, Y
0x0016	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) Peak, Z
0x0017	N/A	N/A	(Read Return 0x0000)
0x0018	unsigned int16	0.1 m/s ²	Acceleration (10Hz~5kHz) RMS, X
0x0019	unsigned int16	0.1 m/s ²	Acceleration (10Hz~5kHz) RMS, Y
0x001A	unsigned int16	0.1 m/s ²	Acceleration (10Hz~5kHz) RMS, Z
0x001B	N/A	N/A	(Read Return 0x0000)
0x001C	unsigned int16	0.1 m/s ²	Acceleration (10Hz~5kHz) Peak, X
Measurement Value (Metric)			
Address	Data Format	Unit	Description
0x001D	unsigned int16	0.1 m/s ²	Acceleration (10Hz~5kHz) Peak, Y
0x001E	unsigned int16	0.1 m/s ²	Acceleration (10Hz~5kHz) Peak, Z

0x001F	N/A	N/A	(Read Return 0x0000)
0x0020	unsigned int16	0.1 mm/s	Velocity (10Hz~1kHz) RMS, X
0x0021	unsigned int16	0.1 mm/s	Velocity (10Hz~1kHz) RMS, Y
0x0022	unsigned int16	0.1 mm/s	Velocity (10Hz~1kHz) RMS, Z
0x0023	N/A	N/A	(Read Return 0x0000)
0x0024	unsigned int16	0.1 mm/s	Velocity (10Hz~1kHz) Peak, X
0x0025	unsigned int16	0.1 mm/s	Velocity (10Hz~1kHz) Peak, Y
0x0026	unsigned int16	0.1 mm/s	Velocity (10Hz~1kHz) Peak, Z
0x0027	N/A	N/A	(Read Return 0x0000)
0x0028	unsigned int16	0.1 mm/s	Velocity (10Hz~5kHz) RMS, X
0x0029	unsigned int16	0.1 mm/s	Velocity (10Hz~5kHz) RMS, Y
0x002A	unsigned int16	0.1 mm/s	Velocity (10Hz~5kHz) RMS, Z
0x002B	N/A	N/A	(Read Return 0x0000)
0x002C	unsigned int16	0.1 mm/s	Velocity (10Hz~5kHz) Peak, X
0x002D	unsigned int16	0.1 mm/s	Velocity (10Hz~5kHz) Peak, Y
0x002E	unsigned int16	0.1 mm/s	Velocity (10Hz~5kHz) Peak, Z
0x002F	N/A	N/A	(Read Return 0x0000)
0x0030	unsigned int16	um	Displacement (2Hz~1kHz) RMS, X
0x0031	unsigned int16	um	Displacement (2Hz~1kHz) RMS, Y
0x0032	unsigned int16	um	Displacement (2Hz~1kHz) RMS, Z
0x0033	N/A	N/A	(Read Return 0x0000)
0x0034	unsigned int16	um	Displacement (2Hz~1kHz) Peak, X
0x0035	unsigned int16	um	Displacement (2Hz~1kHz) Peak, Y
0x0036	unsigned int16	um	Displacement (2Hz~1kHz) Peak, Z
0x0037	N/A	N/A	Reserved (read return 0x0000)
0x0038	unsigned int16	um	Displacement (10Hz~1kHz) RMS, X
0x0039	unsigned int16	um	Displacement (10Hz~1kHz) RMS, Y
0x003A	unsigned int16	um	Displacement (10Hz~1kHz) RMS, Z
0x003B	N/A	N/A	(Read Return 0x0000)
0x003C	unsigned int16	um	Displacement (10Hz~1kHz) Peak, X
0x003D	unsigned int16	um	Displacement (10Hz~1kHz) Peak, Y
Measurement Value (Metric)			
Address	Data Format	Unit	Description
0x003E	unsigned int16	um	Displacement (10Hz~1kHz) Peak, Z
0x003F	N/A	N/A	(Read Return 0x0000)

0x0040	unsigned int16	0.01 g	True peak, X
0x0041	unsigned int16	0.01 g	True peak, Y
0x0042	unsigned int16	0.01 g	True peak, Z
0x0043	N/A	N/A	(Read Return 0x0000)
0x0044	unsigned int16	0.01	Crest Factor, X
0x0045	unsigned int16	0.01	Crest Factor, Y
0x0046	unsigned int16	0.01	Crest Factor, Z
0x0047	N/A	N/A	(Read Return 0x0000)
0x0048	unsigned int16	0.01	Standard Deviation, X
0x0049	unsigned int16	0.01	Standard Deviation, Y
0x004A	unsigned int16	0.01	Standard Deviation, Z
0x004B	N/A	N/A	(Read Return 0x0000)
0x004C	signed int16	0.01 g	DC Acceleration, X
0x004D	signed int16	0.01 g	DC Acceleration, Y
0x004E	signed int16	0.01 g	DC Acceleration, Z
0x004F	N/A	N/A	(Read Return 0x0000)
0x0050	signed int16	0.1 °C	Temperature
0x0051	N/A	N/A	(Read Return 0x0000)
0x0052	N/A	N/A	(Read Return 0x0000)
0x0053	N/A	N/A	(Read Return 0x0000)
0x0054	N/A	N/A	(Read Return 0x0000)
0x0055	N/A	N/A	(Read Return 0x0000)
0x0056	N/A	N/A	(Read Return 0x0000)
0x0057	N/A	N/A	(Read Return 0x0000)
0x0058	signed int16	0.01	Kurtosis, X
0x0059	signed int16	0.01	Kurtosis, Y
0x005A	signed int16	0.01	Kurtosis, Z
0x005B	N/A	N/A	(Read Return 0x0000)
0x005C	N/A	N/A	(Read Return 0x0000)
0x005D	N/A	N/A	(Read Return 0x0000)
0x005E	N/A	N/A	(Read Return 0x0000)
Measurement Value (Metric)			
Address	Data Format	Unit	Description
0x005F	N/A	N/A	(Read Return 0x0000)
0x0060	N/A	N/A	(Read Return 0x0000)

0x0061	N/A	N/A	(Read Return 0x0000)
0x0062	N/A	N/A	(Read Return 0x0000)
0x0063	N/A	N/A	(Read Return 0x0000)
0x0064	unsigned int16	0.1 mm/s	Velocity (2Hz~1kHz) RMS, X
0x0065	unsigned int16	0.1 mm/s	Velocity (2Hz~1kHz) RMS, Y
0x0066	unsigned int16	0.1 mm/s	Velocity (2Hz~1kHz) RMS, Z
0x0067	N/A	N/A	(Read Return 0x0000)
0x0068	unsigned int16	0.1 mm/s	Velocity (2Hz~1kHz) Peak, X
0x0069	unsigned int16	0.1 mm/s	Velocity (2Hz~1kHz) Peak, Y
0x006A	unsigned int16	0.1 mm/s	Velocity (2Hz~1kHz) Peak, Z

Measurement Value (Imperial)			
Address	Data Format	Unit	Description
0x0100	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) RMS, X
0x0101	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) RMS, Y
0x0102	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) RMS, Z
0x0103	N/A	N/A	(Read Return 0x0000)
0x0104	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) Peak, X
0x0105	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) Peak, Y
0x0106	unsigned int16	0.01 g	Acceleration (2Hz~1kHz) Peak, Z
0x0107	N/A	N/A	(Read Return 0x0000)
0x0108	N/A	N/A	(Read Return 0x0000)
0x0109	N/A	N/A	(Read Return 0x0000)
0x010A	N/A	N/A	(Read Return 0x0000)
0x010B	N/A	N/A	(Read Return 0x0000)
0x010C	N/A	N/A	(Read Return 0x0000)
0x010D	N/A	N/A	(Read Return 0x0000)
0x010E	N/A	N/A	(Read Return 0x0000)
0x010F	N/A	N/A	(Read Return 0x0000)
0x0110	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) RMS, X
0x0111	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) RMS, Y
Measurement Value (Imperial)			
Address	Data Format	Unit	Description
0x0112	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) RMS, Z
0x0113	N/A	N/A	(Read Return 0x0000)

0x0114	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) Peak, X
0x0115	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) Peak, Y
0x0116	unsigned int16	0.01 g	Acceleration (10Hz~5kHz) Peak, Z
0x0117	N/A	N/A	(Read Return 0x0000)
0x0118	N/A	N/A	(Read Return 0x0000)
0x0119	N/A	N/A	(Read Return 0x0000)
0x011A	N/A	N/A	(Read Return 0x0000)
0x011B	N/A	N/A	(Read Return 0x0000)
0x011C	N/A	N/A	(Read Return 0x0000)
0x011D	N/A	N/A	(Read Return 0x0000)
0x011E	N/A	N/A	(Read Return 0x0000)
0x011F	N/A	N/A	(Read Return 0x0000)
0x0120	unsigned int16	0.01 inch/s	Velocity (10Hz~1kHz) RMS, X
0x0121	unsigned int16	0.01 inch/s	Velocity (10Hz~1kHz) RMS, Y
0x0122	unsigned int16	0.01 inch/s	Velocity (10Hz~1kHz) RMS, Z
0x0123	N/A	N/A	(Read Return 0x0000)
0x0124	unsigned int16	0.01 inch/s	Velocity (10Hz~1kHz) Peak, X
0x0125	unsigned int16	0.01 inch/s	Velocity (10Hz~1kHz) Peak, Y
0x0126	unsigned int16	0.01 inch/s	Velocity (10Hz~1kHz) Peak, Z
0x0127	N/A	N/A	(Read Return 0x0000)
0x0128	unsigned int16	0.01 inch/s	Velocity (10Hz~5kHz) RMS, X
0x0129	unsigned int16	0.01 inch/s	Velocity (10Hz~5kHz) RMS, Y
0x012A	unsigned int16	0.01 inch/s	Velocity (10Hz~5kHz) RMS, Z
0x012B	N/A	N/A	(Read Return 0x0000)
0x012C	unsigned int16	0.01 inch/s	Velocity (10Hz~5kHz) Peak, X
0x012D	unsigned int16	0.01 inch/s	Velocity (10Hz~5kHz) Peak, Y
0x012E	unsigned int16	0.01 inch/s	Velocity (10Hz~5kHz) Peak, Z
0x012F	N/A	N/A	(Read Return 0x0000)
0x0130	unsigned int16	0.1 mil	Displacement (2Hz~1kHz) RMS, X
0x0131	unsigned int16	0.1 mil	Displacement (2Hz~1kHz) RMS, Y
0x0132	unsigned int16	0.1 mil	Displacement (2Hz~1kHz) RMS, Z
Measurement Value (Imperial)			
Address	Data Format	Unit	Description
0x0133	N/A	N/A	(Read Return 0x0000)
0x0134	unsigned int16	0.1 mil	Displacement (2Hz~1kHz) Peak, X

0x0135	unsigned int16	0.1 mil	Displacement (2Hz~1kHz) Peak, Y
0x0136	unsigned int16	0.1 mil	Displacement (2Hz~1kHz) Peak, Z
0x0137	N/A	N/A	(Read Return 0x0000)
0x0138	unsigned int16	0.1 mil	Displacement (10Hz~1kHz) RMS, X
0x0139	unsigned int16	0.1 mil	Displacement (10Hz~1kHz) RMS, Y
0x013A	unsigned int16	0.1 mil	Displacement (10Hz~1kHz) RMS, Z
0x013B	N/A	N/A	(Read Return 0x0000)
0x013C	unsigned int16	0.1 mil	Displacement (10Hz~1kHz) Peak, X
0x013D	unsigned int16	0.1 mil	Displacement (10Hz~1kHz) Peak, Y
0x013E	unsigned int16	0.1 mil	Displacement (10Hz~1kHz) Peak, Z
0x013F	N/A	N/A	(Read Return 0x0000)
0x0140	unsigned int16	0.01 g	True Peak, X
0x0141	unsigned int16	0.01 g	True Peak, Y
0x0142	unsigned int16	0.01 g	True Peak, Z
0x0143	N/A	N/A	(Read Return 0x0000)
0x0144	unsigned int16	0.01	Crest Factor, X
0x0145	unsigned int16	0.01	Crest Factor, Y
0x0146	unsigned int16	0.01	Crest Factor, Z
0x0147	N/A	N/A	(Read Return 0x0000)
0x0148	unsigned int16	0.01	Standard Deviation, X
0x0149	unsigned int16	0.01	Standard Deviation, Y
0x014A	unsigned int16	0.01	Standard Deviation, Z
0x014B	N/A	N/A	(Read Return 0x0000)
0x014C	signed int16	0.01 g	DC Acceleration, X
0x014D	signed int16	0.01 g	DC Acceleration, Y
0x014E	signed int16	0.01 g	DC Acceleration, Z
0x014F	N/A	N/A	(Read Return 0x0000)
0x0150	signed int16	0.1 °F	Temperature
0x0151	N/A	N/A	(Read Return 0x0000)
0x0152	N/A	N/A	(Read Return 0x0000)
0x0153	N/A	N/A	(Read Return 0x0000)
Measurement Value (Imperial)			
Address	Data Format	Unit	Description
0x0154	N/A	N/A	(Read Return 0x0000)
0x0155	N/A	N/A	(Read Return 0x0000)

0x0156	N/A	N/A	(Read Return 0x0000)
0x0157	N/A	N/A	(Read Return 0x0000)
0x0158	signed int16	0.01	Kurtosis, X
0x0159	signed int16	0.01	Kurtosis, Y
0x015A	signed int16	0.01	Kurtosis, Z
0x015B	N/A	N/A	(Read Return 0x0000)
0x015C	N/A	N/A	(Read Return 0x0000)
0x015D	N/A	N/A	(Read Return 0x0000)
0x015E	N/A	N/A	(Read Return 0x0000)
0x015F	N/A	N/A	(Read Return 0x0000)
0x0160	N/A	N/A	(Read Return 0x0000)
0x0161	N/A	N/A	(Read Return 0x0000)
0x0162	N/A	N/A	(Read Return 0x0000)
0x0163	N/A	N/A	(Read Return 0x0000)
0x0164	unsigned int16	0.01 inch/s	Velocity (2Hz~1kHz) RMS, X
0x0165	unsigned int16	0.01 inch/s	Velocity (2Hz~1kHz) RMS, Y
0x0166	unsigned int16	0.01 inch/s	Velocity (2Hz~1kHz) RMS, Z
0x0167	N/A	N/A	(Read Return 0x0000)
0x0168	unsigned int16	0.01 inch/s	Velocity (2Hz~1kHz) Peak, X
0x0169	unsigned int16	0.01 inch/s	Velocity (2Hz~1kHz) Peak, Y
0x016A	unsigned int16	0.01 inch/s	Velocity (2Hz~1kHz) Peak, Z

X Acceleration FFT (Peak) Data (Size: 6210)			
Address	Data Format	Unit	Description (check actual values by 0x03)
0x05BF	unsigned int16	(by type)	X FFT Data (deltaF Index 0, 0Hz)
0x05C0	unsigned int16	(by type)	X FFT Data (deltaF Index 1)
0x05C1	unsigned int16	(by type)	X FFT Data (deltaF Index 2)
...	...	...	...
0x1E00	unsigned int16	(by type)	X FFT Data (deltaF Index 6209)

X Acceleration Time Waveform Data (Size: 13474)			
Address	Data Format	Unit	Description (check actual values by 0x03)
0x1E01	signed int16	0.001g	X Time Waveform Data (deltaT Index 0, 0 sec)
0x1E02	signed int16	0.001g	X Time Waveform Data (deltaT Index 1)
0x1E03	signed int16	0.001g	X Time Waveform Data (deltaT Index 2)
...	...	...	...
0x52A2	signed int16	0.001g	X Time Waveform Data (deltaT Index 13473)

Y Acceleration FFT (Peak) Data (Size: 6210)			
Address	Data Format	Unit	Description (check actual values by 0x03)
0x58BF	unsigned int16	(by type)	Y FFT Data (deltaF Index 0, 0 Hz)
0x58C0	unsigned int16	(by type)	Y FFT Data (deltaF Index 1)
0x58C1	unsigned int16	(by type)	Y FFT Data (deltaF Index 2)
...	...	...	...
0x7100	unsigned int16	(by type)	Y FFT Data (deltaF Index 6209)

Y Acceleration Time Waveform Data (Size: 13474)			
Address	Data Format	Unit	Description (check actual values by 0x03)
0x7101	signed int16	0.001g	Y Time Waveform Data (deltaT Index 0, 0 sec)
0x7102	signed int16	0.001g	Y Time Waveform Data (deltaT Index 1)
0x7103	signed int16	0.001g	Y Time Waveform Data (deltaT Index 2)
...	...	...	...
0xA5A2	signed int16	0.001g	Y Time Waveform Data (deltaT Index 13473)

Z Acceleration FFT (Peak) Data (Size: 6210)			
Address	Data Format	Unit	Description (check actual values by 0x03)
0xABBF	unsigned int16	(by type)	Z FFT Data (deltaF Index 0, 0 Hz)
0xABC0	unsigned int16	(by type)	Z FFT Data (deltaF Index 1)
0xABC1	unsigned int16	(by type)	Z FFT Data (deltaF Index 2)
...	...	...	...
0xC400	unsigned int16	(by type)	Z FFT Data (deltaF Index 6209)

Z Acceleration Time Waveform Data (Size: 13474)			
Address	Data Format	Unit	Description (check actual values by 0x03)
0xC401	signed int16	0.001g	Z Timewave data (deltaT Index 0, 0 sec)
0xC402	signed int16	0.001g	Z Timewave data (deltaT Index 1)
0xC403	signed int16	0.001g	Z Timewave data (deltaT Index 2)
...	..	...	...
0xF8A2	signed int16	0.001g	Z Timewave data (deltaT Index 13473)

*Note: check actual values from 0x0201-0x0203 by function code 0x03

4.4.2 0x04(4) Function Usage

Request

Function code	1 Byte	0x04
Starting Address	2 Bytes	0x0000 to 0xFFFF
Quantity of Input Registers	2 Bytes	0x0001 to 0x007D

Response

Function code	1 Byte	0x04
Byte count	1 Byte	2 x N*
Input Registers	N* x 2 Bytes	

*N = Quantity of Input Registers

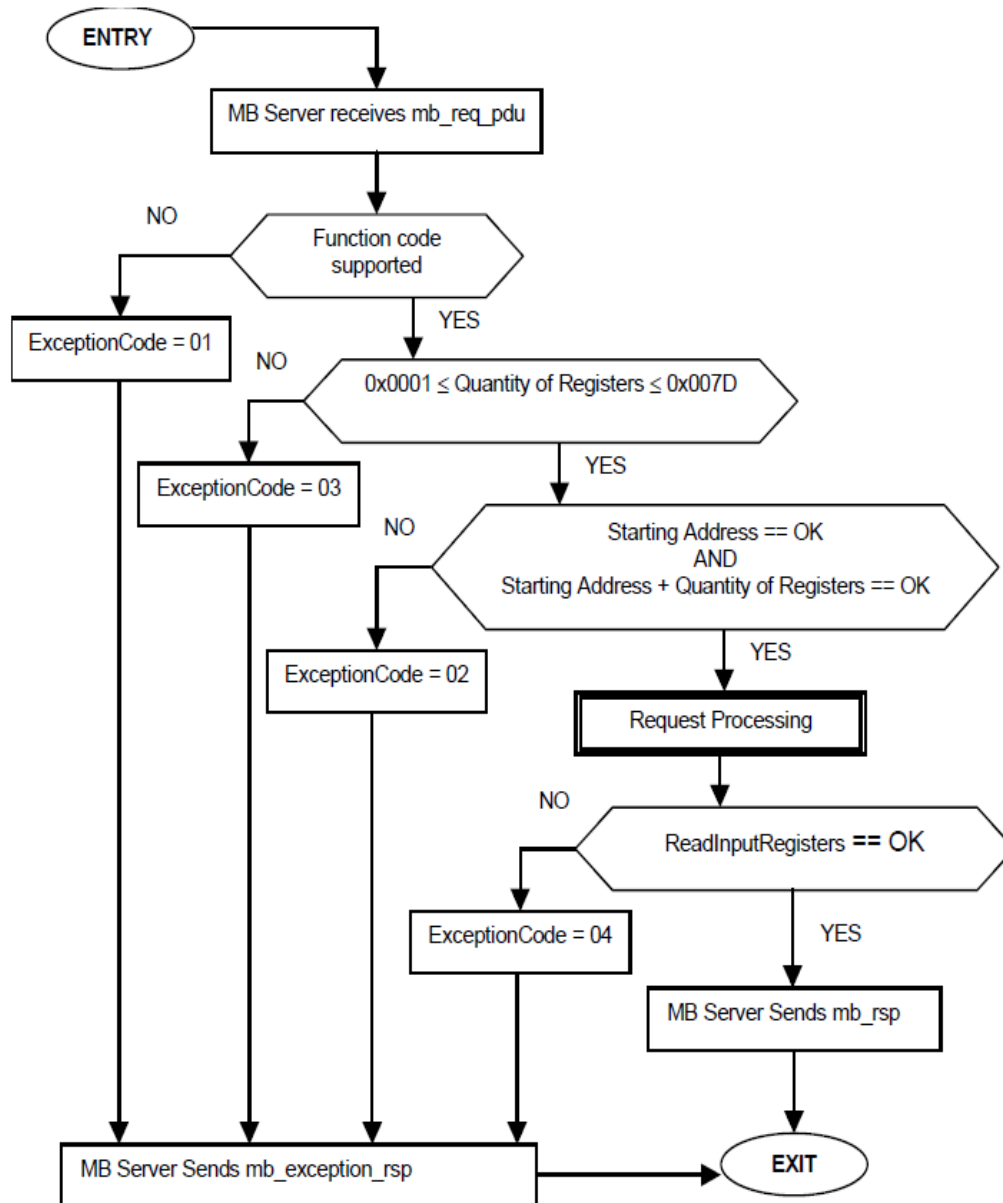
Error

Error code	1 Byte	0x84
Exception code	1 Byte	01 or 02 or 03 or 04

Here is an example of a request to read input register 9:

Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Function	04	Function	04
Starting Address Hi	00	Byte Count	02
Starting Address Lo	08	Input Reg. 9 Hi	00
Quantity of Input Reg. Hi	00	Input Reg. 9 Lo	0A
Quantity of Input Reg. Lo	01		

4.4.3 0x04(4) Function State Diagram

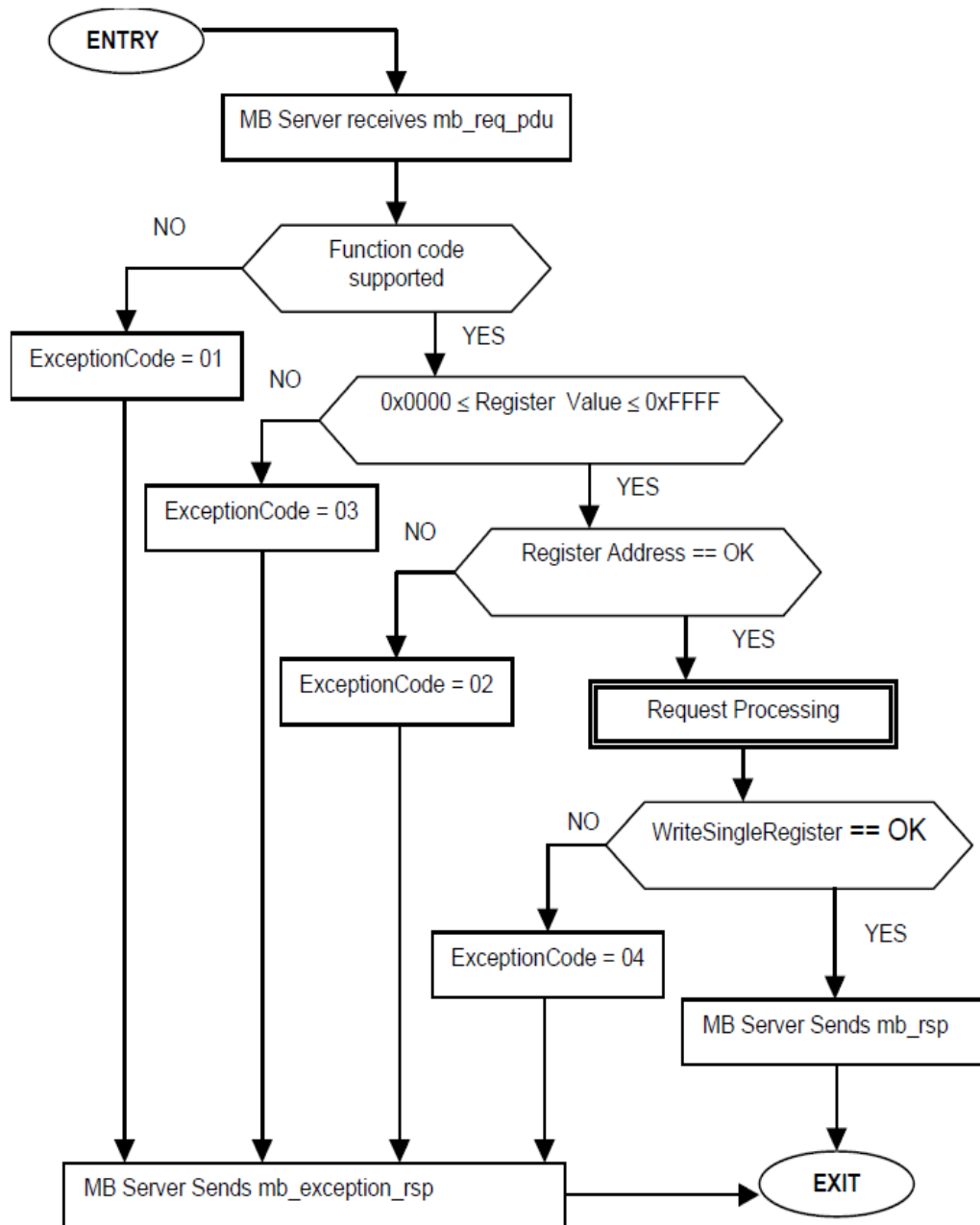


4.5 0x06(6) Function Code Details

4.5.1 0x06(6) Settings Table

Address	Data Format	Default	Description
0x0000	unsigned int16	0x0009	Baud Rate: 0x0006:1200 bps 0x0007:2400 bps 0x0008:4800 bps 0x0009:9600 bps 0x000A:19200 bps 0x000B:38400 bps 0x000C:57600 bps 0x000D:115200 bps 0x000E:230400 bps 0x000F: 460800 bps 0x0010: 921600 bps
0x0001	unsigned int16	0x0008	Data Bits: 0x0008: 8 bits
0x0002	unsigned int16	0x0000	Data Parity: 0x0000: None 0x0001: Even 0x0002: Odd
0x0003	unsigned int16	0x0001	Stop Bits: 0x0001: 1 bit 0x0002: 2 bits
0x0004	unsigned int16	0x0001	Modbus Server ID: 0x0001~0x00F7: 1~ 247
0x0200	unsigned int16	0xEEEE	Table Data Update Trigger Write 0xFFFF to do Timewave and FFT calculation Use the function code 0x03 to read this value When register value=0x0000, use the function code 0x04 to get corresponding data.
0x0203	unsigned int16	0x0000	FFT Type configuration: 0x0000: Acceleration (0.001g) 0x0001: Velocity (0.01in/s) 0x0002: Velocity (0.1mm/s)

4.5.2 0x06(6) Function State Diagram



4.6 0x10(16) Function Code Details

4.6.1 0x10(16) Settings Table

Address	Data Format	Default	Description
0x0000	unsigned int16	0x0009	Baud Rate: 0x0006: 1200 bps 0x0007: 2400 bps 0x0008: 4800 bps 0x0009: 9600 bps 0x000A: 19200 bps 0x000B: 38400 bps 0x000C: 57600 bps 0x000D: 115200 bps 0x000E: 230400 bps 0x000F: 460800 bps 0x0010: 921600 bps
0x0001	unsigned int16	0x0008	Data Bits: 0x0008: 8 bits
0x0002	unsigned int16	0x0000	Data Parity: 0x0000: None 0x0001: Even 0x0002: Odd
0x0003	unsigned int16	0x0001	Stop Bits: 0x0001: 1 bit 0x0002: 2 bits
0x0004	unsigned int16	0x0001	Modbus Server ID: 0x0001~0x00F7: 1~ 247

4.6.2 0x10(16) Function Usage

Request

Function code	1 Byte	0x10
Starting Address	2 Bytes	0x0000 to 0xFFFF
Quantity of Registers	2 Bytes	0x0001 to 0x007B
Byte Count	1 Byte	2 x N*
Registers Value	N* x 2 Bytes	value

*N = Quantity of Registers

Response

Function code	1 Byte	0x10
Starting Address	2 Bytes	0x0000 to 0xFFFF
Quantity of Registers	2 Bytes	1 to 123 (0x7B)

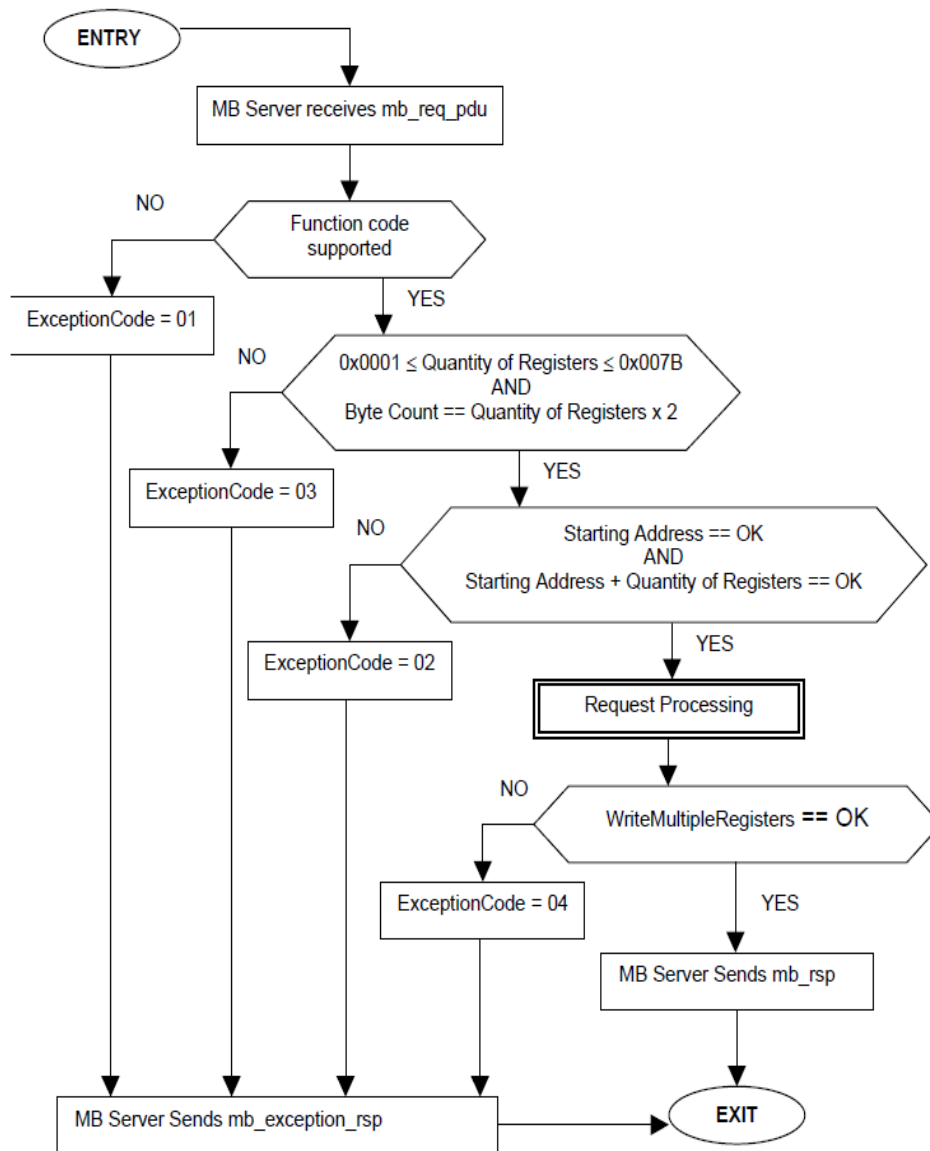
Error

Error code	1 Byte	0x90
Exception code	1 Byte	01 or 02 or 03 or 04

Here is an example of a request to write two registers starting at 2 to 00 0A and 01 02 hex:

Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Function	10	Function	10
Starting Address Hi	00	Starting Address Hi	00
Starting Address Lo	01	Starting Address Lo	01
Quantity of Registers Hi	00	Quantity of Registers Hi	00
Quantity of Registers Lo	02	Quantity of Registers Lo	02
Byte Count	04		
Registers Value Hi	00		
Registers Value Lo	0A		
Registers Value Hi	01		
Registers Value Lo	02		

4.6.2 0x10(16) Function State Diagram



4.7 0x2B(43)_0x0E(14) Function Code Details

4.7.1 0x2B(43)_0x0E(14) Function Code Details



Object Id	Object Name / Description	Type	M/O	category
0x00	VendorName	ASCII String	Mandatory	Basic
0x01	ProductCode	ASCII String	Mandatory	
0x02	MajorMinorRevision	ASCII String	Mandatory	
0x03	VendorUrl	ASCII String	Optional	Regular
0x04	ProductName	ASCII String	Optional	
0x05	ModelName	ASCII String	Optional	
0x06	UserApplicationName	ASCII String	Optional	
0x07	Reserved		Optional	
... 0x7F				
0x80	Private objects may be optionally defined.	device dependant	Optional	Extended
...				
0xFF	The range [0x80 – 0xFF] is Product dependant.			

Object ID	Object Name	Meaning	Value
0x00	Vendor Name	Company name	Wilcoxon
0x01	Product Code	Part Number	Product Number (xxxxxxxx)
0x02	MajorMinorRevision	Firmware Version	x.x.x
0x03	Vendor URL	Company website	www.wilcoxon.com
0x04	ProductName	Device UUID	12345678-1234-1234-1234-123456789012 (Format is "8-4-4-12")
0x05	Model Name	Model Name	883M

The parameter " Read Device ID code " allows to define four access types :

- 01: request to get the basic device identification (stream access)
- 02: request to get the regular device identification (stream access)

ID code	Meaning	Supported
01	request to get the device identification of category basic (stream access)	Yes
02	request to get the device identification of category regular (stream access)	Yes

4.7.2 0x2B(43)_0x0E(14) Function Usage

Request

Function code	1 Byte	0x2B
MEI Type*	1 Byte	0x0E
Read Device ID code	1 Byte	01 / 02 / 03 / 04
Object Id	1 Byte	0x00 to 0xFF

* MEI = MODBUS Encapsulated Interface

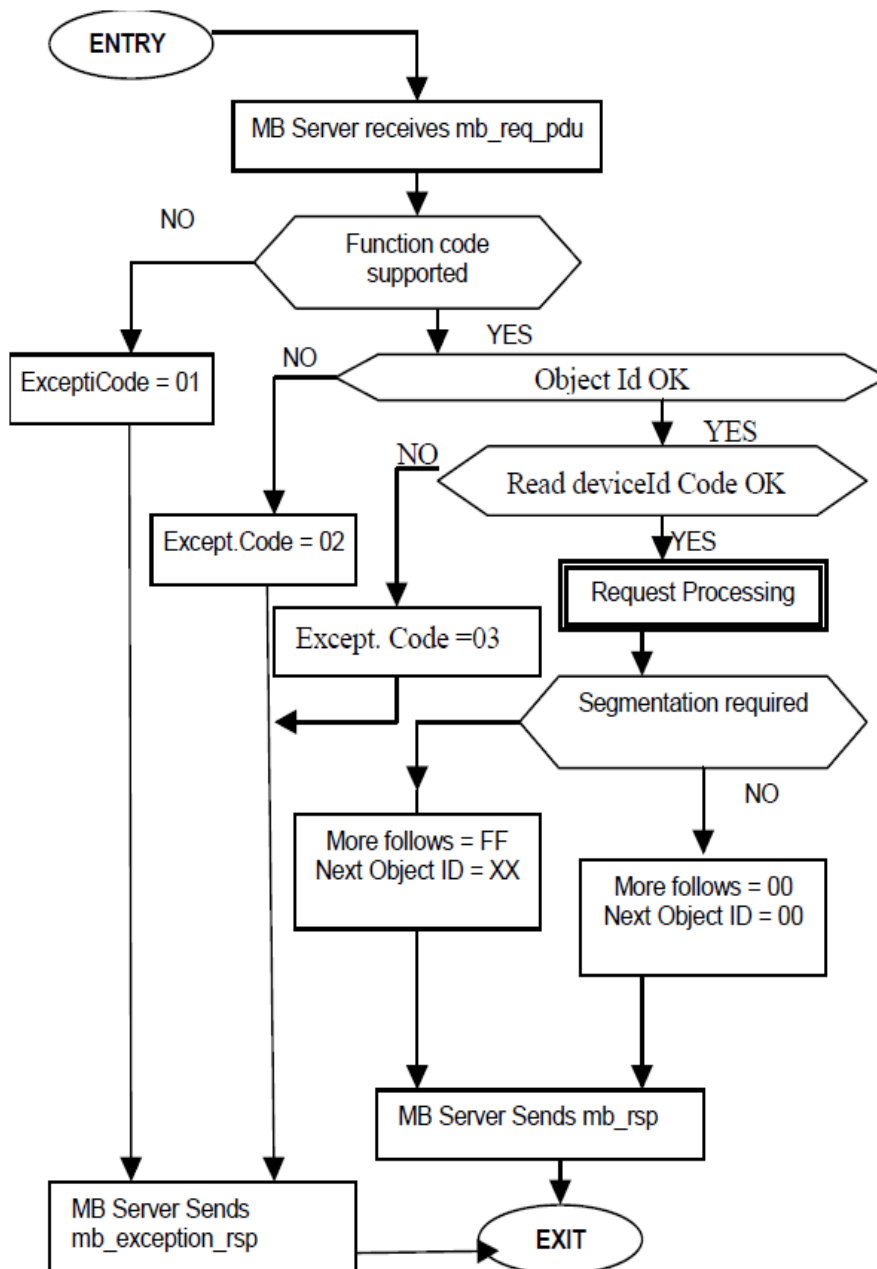
Response

Function code	1 Byte	0x2B
MEI Type	1 byte	0x0E
Read Device ID code	1 Byte	01 / 02 / 03 / 04
Conformity level	1 Byte	0x01 or 0x02 or 0x03 or 0x81 or 0x82 or 0x83
More Follows	1 Byte	00 / FF
Next Object Id	1 Byte	Object ID number
Number of objects	1 Byte	
List Of		
Object ID	1 Byte	
Object length	1 Byte	
Object Value	Object length	Depending on the object ID

Error

Function code	1 Byte	0xAB : Fc 0x2B + 0x80
Exception code	1 Byte	01 or 02 or 03 or 04

4.7.3 0x2B(43)_0x0E(14) Function State Diagram



4.7.4 0x2B(43)_0x0E(14) Function Code Example

Request start query data (01 2B 0E 01 00 70 77)

Device address: 0x01

Function code: 0x2B

MEI type: 0x0E

Read Device ID Code: 0x01 (Get the basic device identification)

Object ID: 0x00

"-CRC16"

Response (01 2B 0E 01 01 00 00 03 00 08 57 69 6C 63 6F 78 6F 6E 01 08 32 34 30 34 30 30 30 34 02 05 32 2E 32 2E 37 F1 55)

Device address: 0x01

Function code: 0x2B

MEI type: 0x0E

Read Device ID Code: 0x01

Conformity level: 0x01

More Follows: 0x00

Next Object ID: 0x00

Number Of Object: 0x03

Object ID: 0x00

Object Length: 0x08

Object Value: 'Wilcoxon' (Company Name field in ASCII, 0x57 0x69 0x6C 0x63 0x6F 0x78 0x6F 0x6E)

Object ID: 0x01

Object Length: 0x08

Object Value: '24040004' (Product Number field in ASCII, 0x32 0x34 0x30 0x34 0x30 0x30 0x30 0x34)

Object ID: 0x02

Object Length: 0x05

Object Value: '2.2.7' (Revision field in ASCII, 0x32 0x2E 0x32 0x2E 0x37)

"-CRC16"

4.8 0x80(128) Error Code Details

4.8.1 0x80(128) Error Code Details

Example of a client request and server exception response.

Request		Response	
Field Name	(Hex)	Field Name	(Hex)
Function	01	Function	81
Starting Address Hi	04	Exception Code	02
Starting Address Lo	A1		
Quantity of Outputs Hi	00		
Quantity of Outputs Lo	01		

MODBUS Exception Codes		
Code	Name	Meaning
01	ILLEGAL FUNCTION	The function code received in the query is not an allowable action for the server (or slave). This may be because the function code is only applicable to newer devices, and was not implemented in the unit selected. It could also indicate that the server (or slave) is in the wrong state to process a request of this type, for example because it is unconfigured and is being asked to return register values.
02	ILLEGAL DATA ADDRESS	The data address received in the query is not an allowable address for the server (or slave). More specifically, the combination of reference number and transfer length is invalid. For a controller with 100 registers, the PDU addresses the first register as 0, and the last one as 99. If a request is submitted with a starting register address of 96 and a quantity of registers of 4, then this request will successfully operate (address-wise at least) on registers 96, 97, 98, 99. If a request is submitted with a starting register address of 96 and a quantity of registers of 5, then this request will fail with Exception Code 0x02 "Illegal Data Address" since it attempts to operate on registers 96, 97, 98, 99 and 100, and there is no register with address 100.
03	ILLEGAL DATA VALUE	A value contained in the query data field is not an allowable value for server (or slave). This indicates a fault in the structure of the remainder of a complex request, such as that the implied length is incorrect. It specifically does NOT mean that a data item submitted for storage in a register has a value outside the expectation of the application program, since the MODBUS protocol is unaware of the significance of any particular value of any particular register.
04	SLAVE DEVICE FAILURE	An unrecoverable error occurred while the server (or slave) was attempting to perform the requested action.