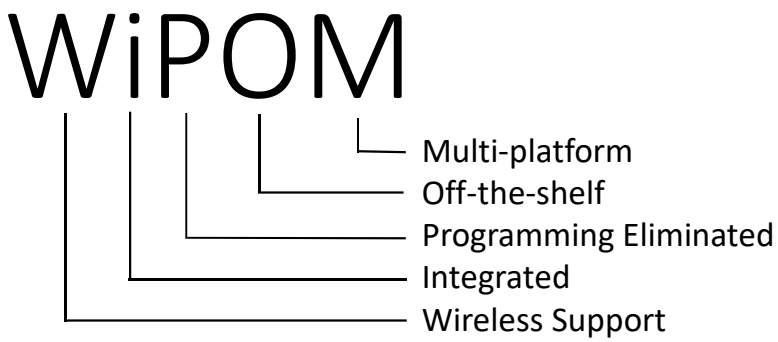


WiPOM

by BiPOM Electronics, Inc.

Presenter: Oz Murtezaoglu,
Electronics Engineer - President

Who is BiPOM ?

BiPOM was founded in 1984 with the objective of using microcontroller technologies to solve real world problems

(BiPOM = Best in Programming Of Microcontrollers)

What is WiPOM ?

A multi-platform software package and corresponding core hardware design that eliminates programming for rapid deployment of embedded and industrial IoT applications

PROBLEMS

- Projects Take Too Long To Deliver
- Products Take Too Long To Bring To Market
- Software Development Is Costly
- There aren't Enough Experienced Embedded Software Developers
- Custom Software Requires On-Going Maintenance & Field Support
- New Features Require Additional Development

SOLUTIONS

- Wipom, A Multi-Platform, Modules Software Application
- Modular Embedded Software Application That Handles Most Needs Of Embedded And IoT Applications
- Requires No Software Development By User
- Proven Software Application Eliminates Debugging
- New Features Are Continuously Being Added

RESULTS

- Cost savings of 75% to 90%" with only nominal fees for the WiPOM resources and Support.
- Time savings: 50% to 80% of "Idea to deployment" time.
- Simplicity, reliability, scalability, maintainability.

TIME & COST ADVANTAGES

Discuss and decide on hardware

Develop hardware or buy

Learn about the hardware

Develop software

Debug software

Build product

Off-the-shelf or reference design

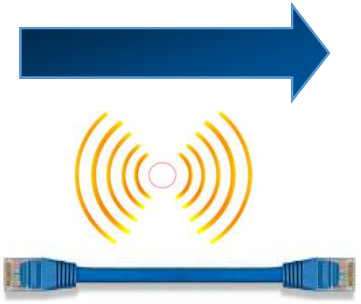
Configure WiPOM

Build product

Download Configuration

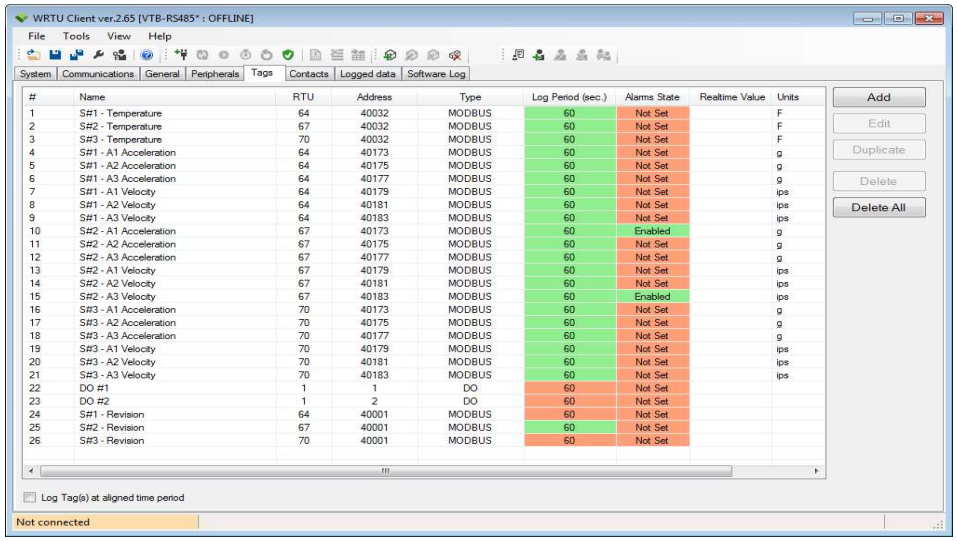
TYPICAL SETUP

WiPOM Client running on Windows PC



Ethernet, USB, Serial, Over the Air

WiPOM Software running on CloudGate



#	Name	RTU	Address	Type	Log Period (sec.)	Alarms State	Realtime Value	Units
1	S#1 - Temperature	64	40032	MODBUS	60	Not Set		F
2	S#2 - Temperature	67	40032	MODBUS	60	Not Set		F
3	S#3 - Temperature	70	40032	MODBUS	60	Not Set		F
4	S#1 - A1 Acceleration	64	40173	MODBUS	60	Not Set		g
5	S#1 - A2 Acceleration	64	40175	MODBUS	60	Not Set		g
6	S#1 - A3 Acceleration	64	40177	MODBUS	60	Not Set		g
7	S#1 - A1 Velocity	64	40179	MODBUS	60	Not Set		ips
8	S#1 - A2 Velocity	64	40181	MODBUS	60	Not Set		ips
9	S#1 - A3 Velocity	64	40183	MODBUS	60	Not Set		ips
10	S#2 - A1 Acceleration	67	40173	MODBUS	60	Enabled		g
11	S#2 - A2 Acceleration	67	40175	MODBUS	60	Not Set		g
12	S#2 - A3 Acceleration	67	40177	MODBUS	60	Not Set		g
13	S#2 - A1 Velocity	67	40179	MODBUS	60	Not Set		ips
14	S#2 - A2 Velocity	67	40181	MODBUS	60	Not Set		ips
15	S#2 - A3 Velocity	67	40183	MODBUS	60	Enabled		ips
16	S#3 - A1 Acceleration	70	40173	MODBUS	60	Not Set		g
17	S#3 - A2 Acceleration	70	40175	MODBUS	60	Not Set		g
18	S#3 - A3 Acceleration	70	40177	MODBUS	60	Not Set		g
19	S#3 - A1 Velocity	70	40179	MODBUS	60	Not Set		ips
20	S#3 - A2 Velocity	70	40181	MODBUS	60	Not Set		ips
21	S#3 - A3 Velocity	70	40183	MODBUS	60	Not Set		ips
22	DO #1	1	1	DO	60	Not Set		
23	DO #2	1	2	DO	60	Not Set		
24	S#1 - Revision	64	40001	MODBUS	60	Not Set		
25	S#2 - Revision	67	40001	MODBUS	60	Not Set		
26	S#3 - Revision	70	40001	MODBUS	60	Not Set		

A mixture of devices

Connected to each other via MODBUS or HTTP/HTTPS

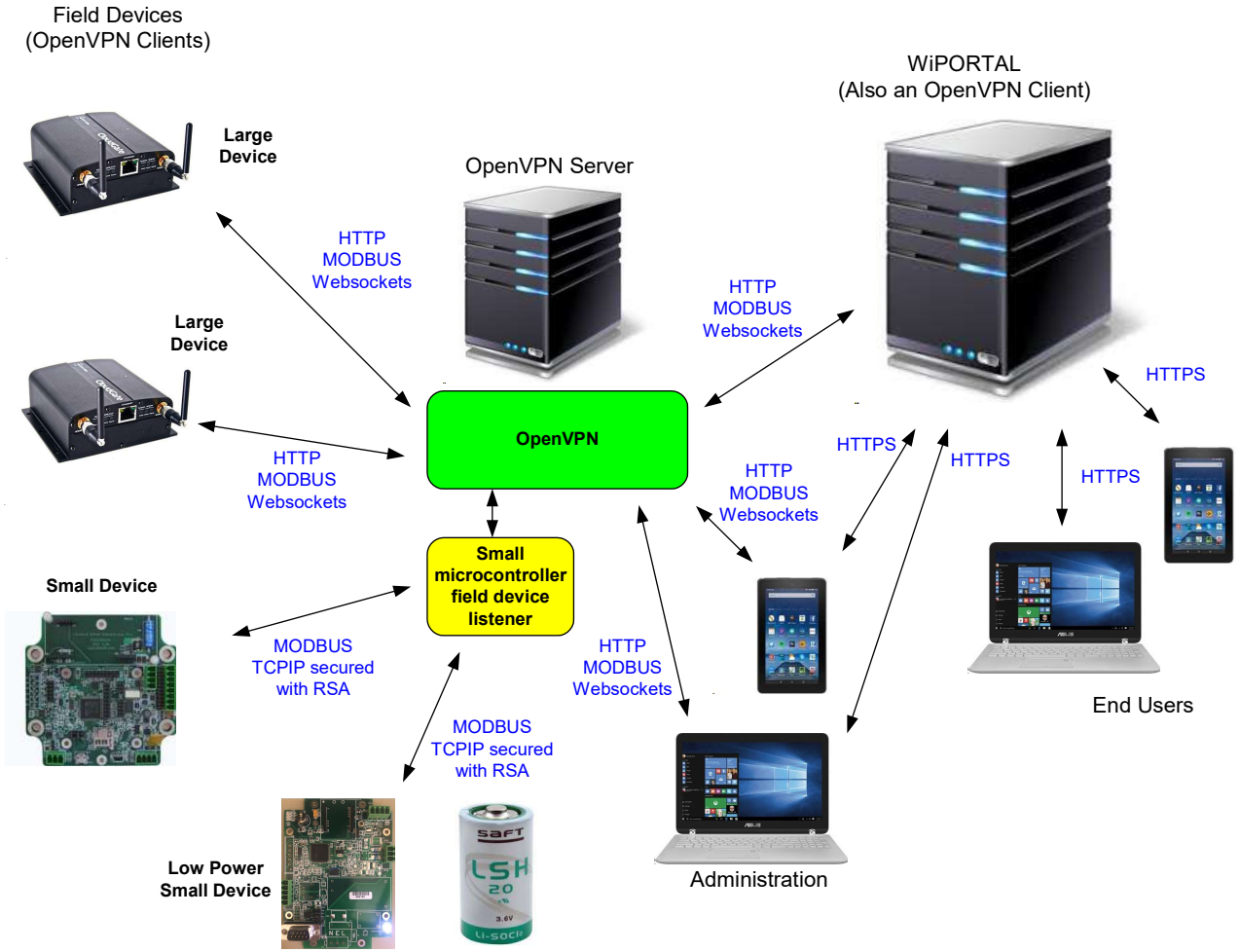
WiPOM running on some or all devices.

Some devices may have low power modes.

Security achieved through OpenVPN.

Remote firmware upgrade with bootloader on sensors and end devices.

How does it work ?



POSIX Compliant

Written in C

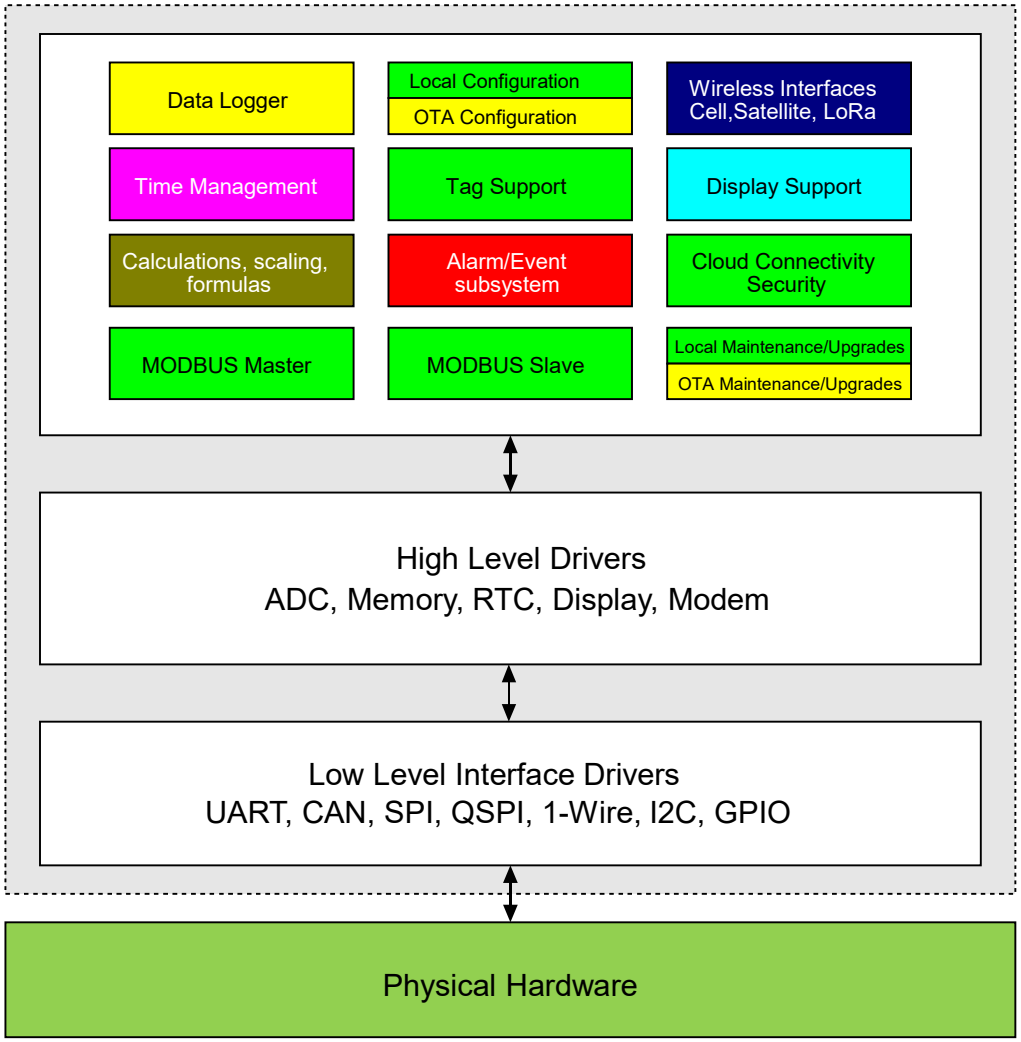
LINUX

FreeRTOS

Mbed OS

Windows

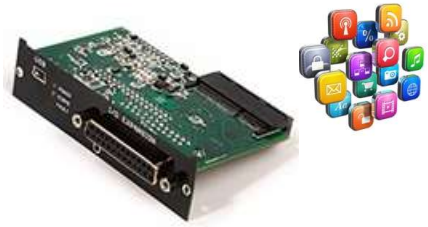
WiPOM Overview



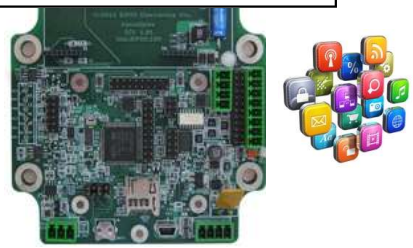
- WiPOM Client
- OpenVPN for security
- MODBUS Master (Client)
- MODBUS Simulator (Server)
- Connection Manager

SUPPORTED HARDWARE

WiPOM on Peripheral Board



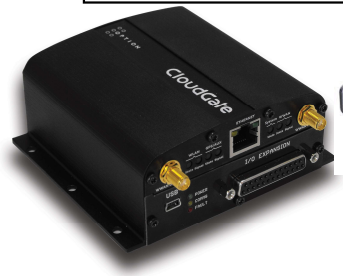
WiPOM on Cortex-M Embedded Board



WiPOM on Cortex-A Embedded Board

WiPOM on Cellular Board

WiPOM on Cellular Gateway



WiPOM on Cellular Modem

WiPOM on Embedded PC (Windows, Linux)

WiPOM on a Cortex Module

WiPOM on Cellular Module

WiPOM on a Cortex Chip

Example Application: Vibration Monitoring

Gas Compressor

Machine Saver Triaxial VTB Sensors for Impact, Vibration and Temperature monitoring

MODBUS RTU (RS485)

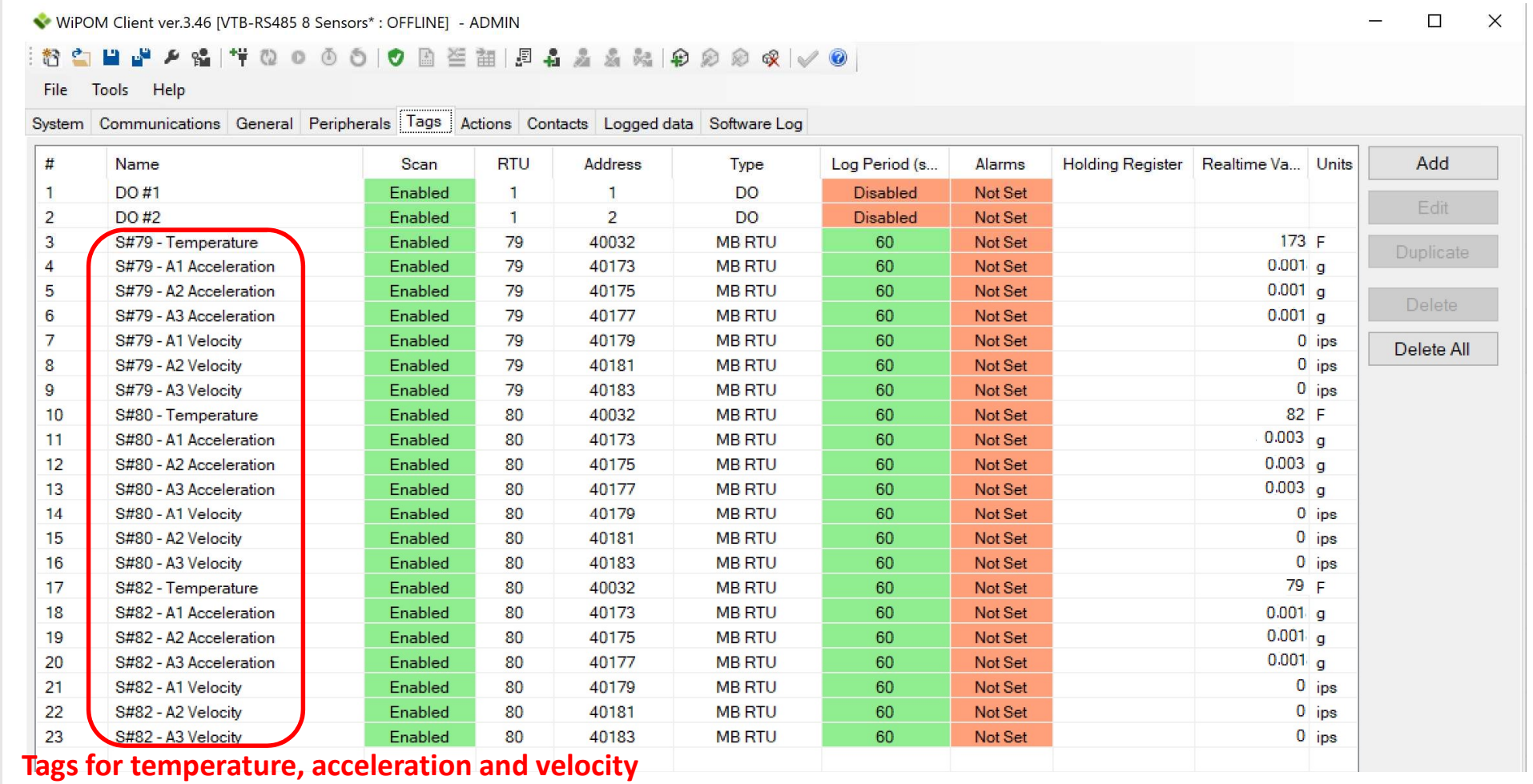
1 **Create application specific tags:**

- **Acceleration**
- **Velocity**
- **Temperature**
- **Battery Level**

2 **Configure Alarms and Actions on the tags:**

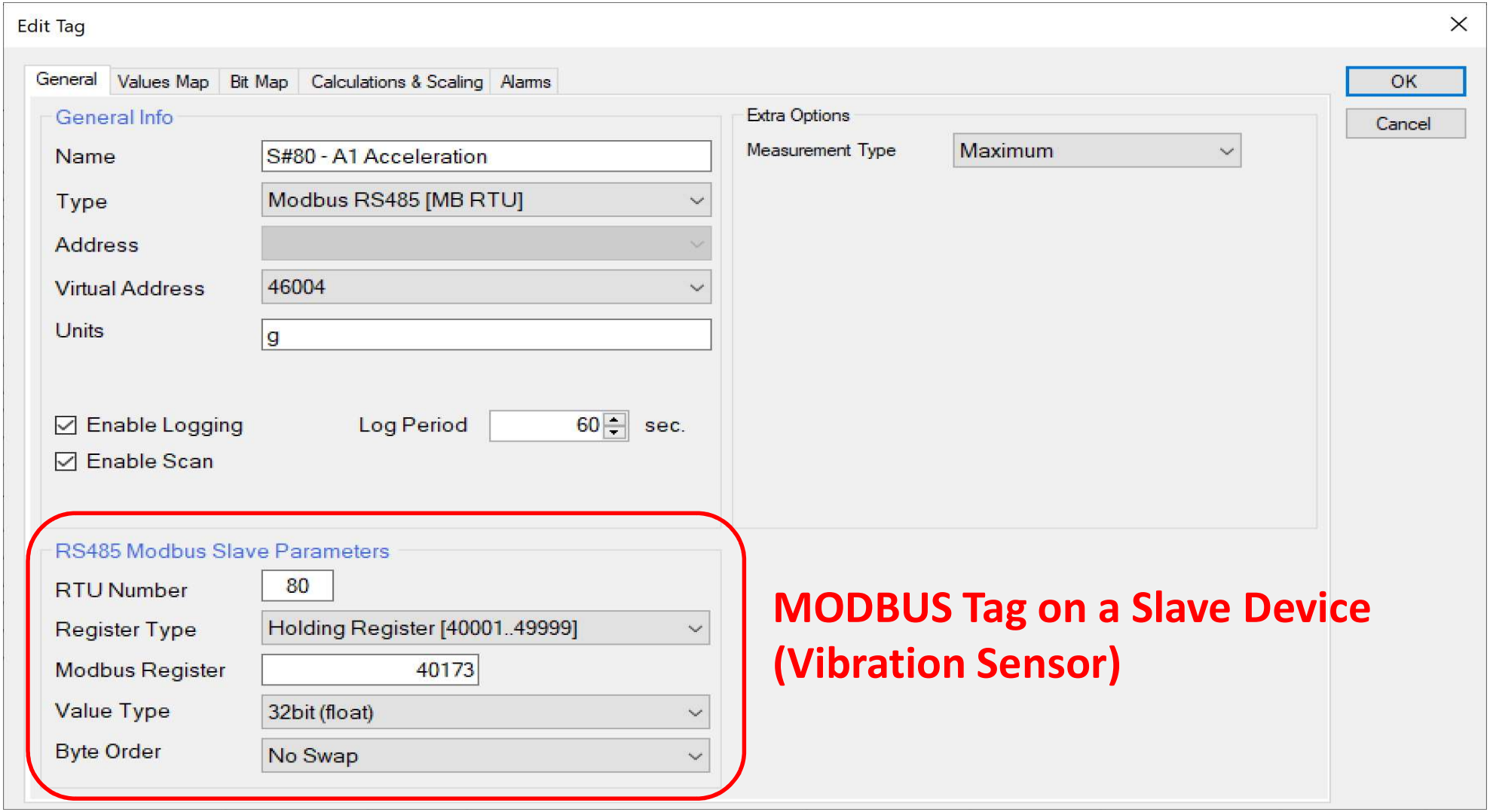
If acceleration too high, push an alarm, send SMS/email, shut down machine

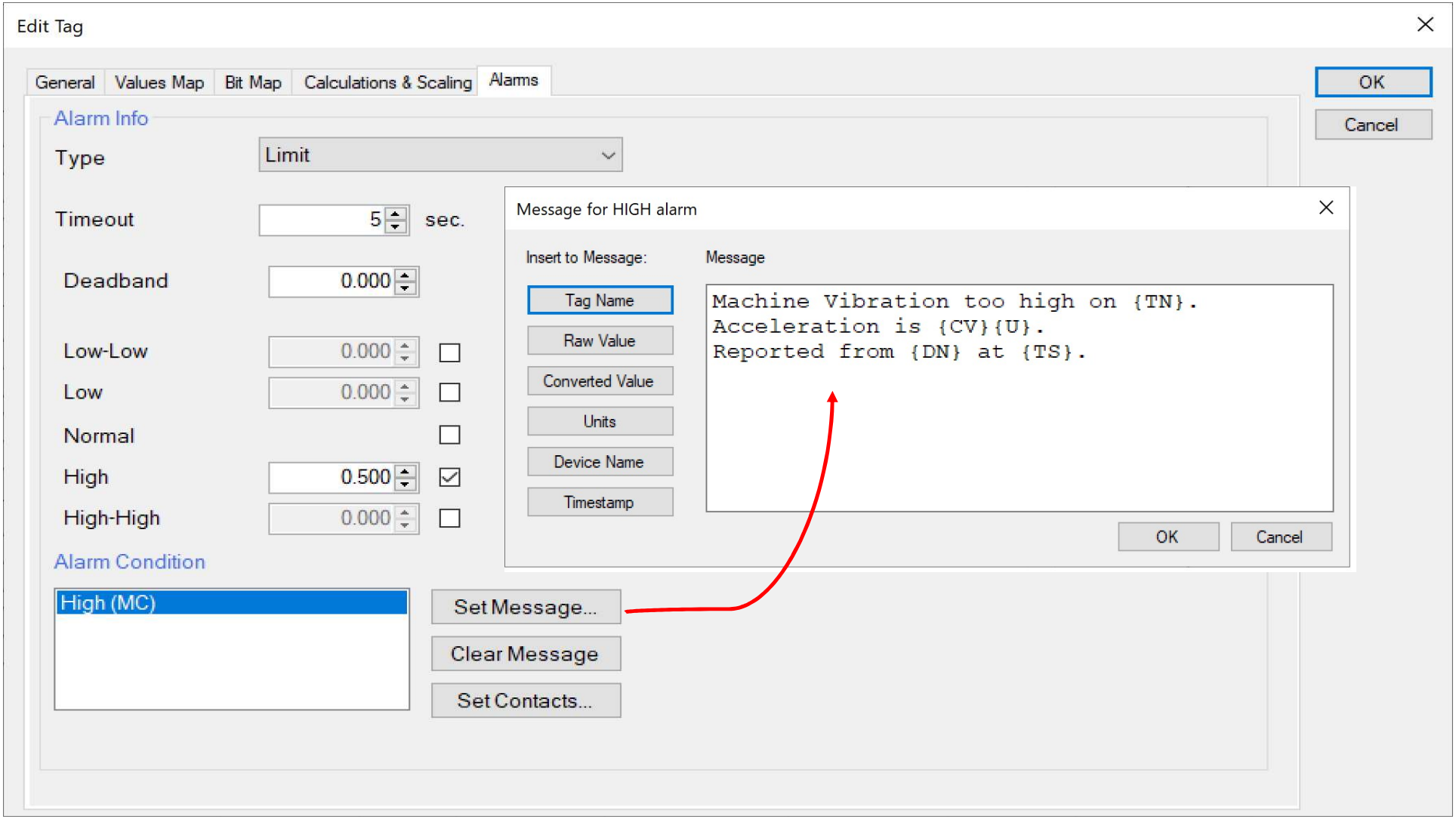
3 **Download configuration to WiPOM device and see it run**

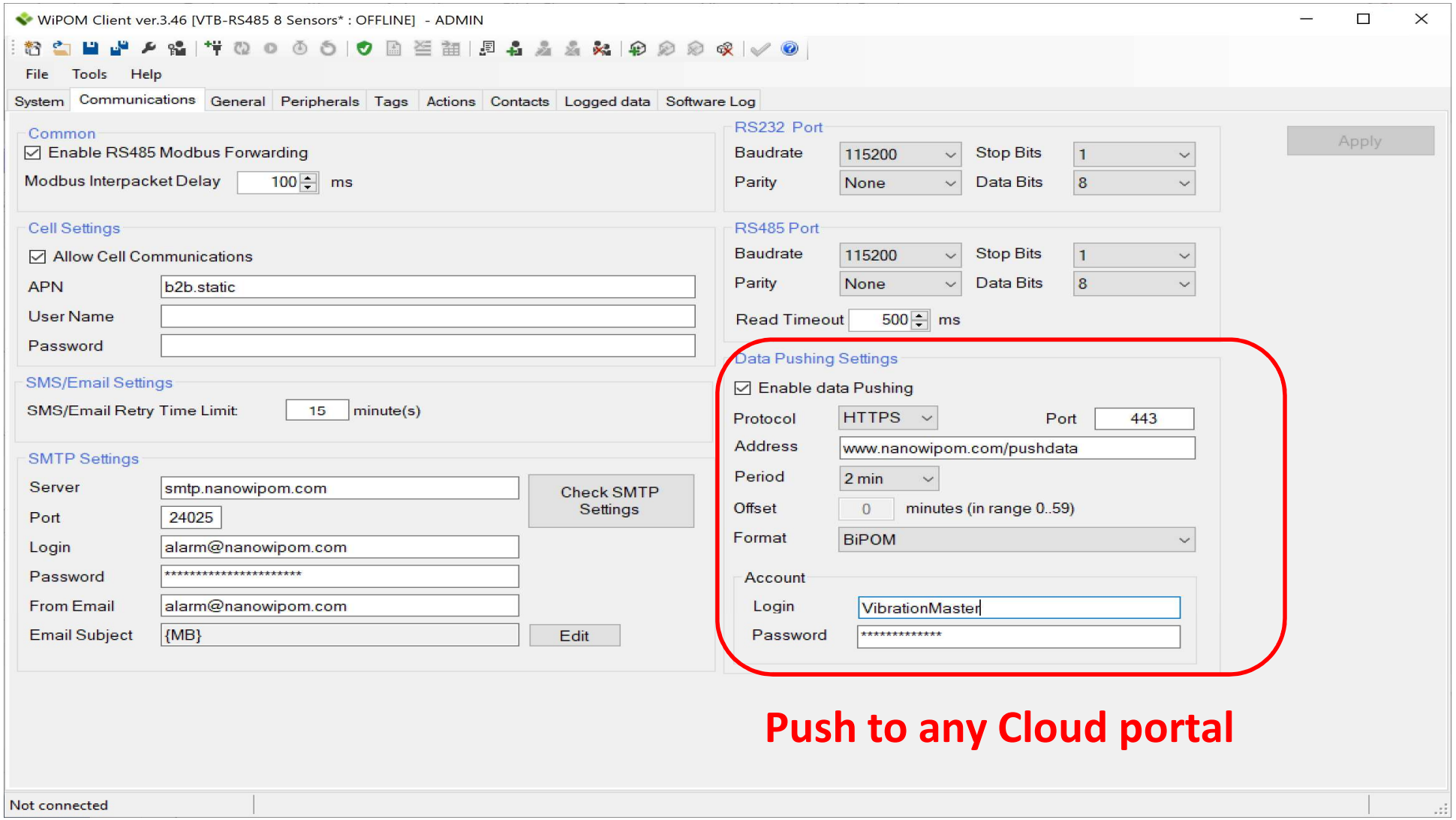


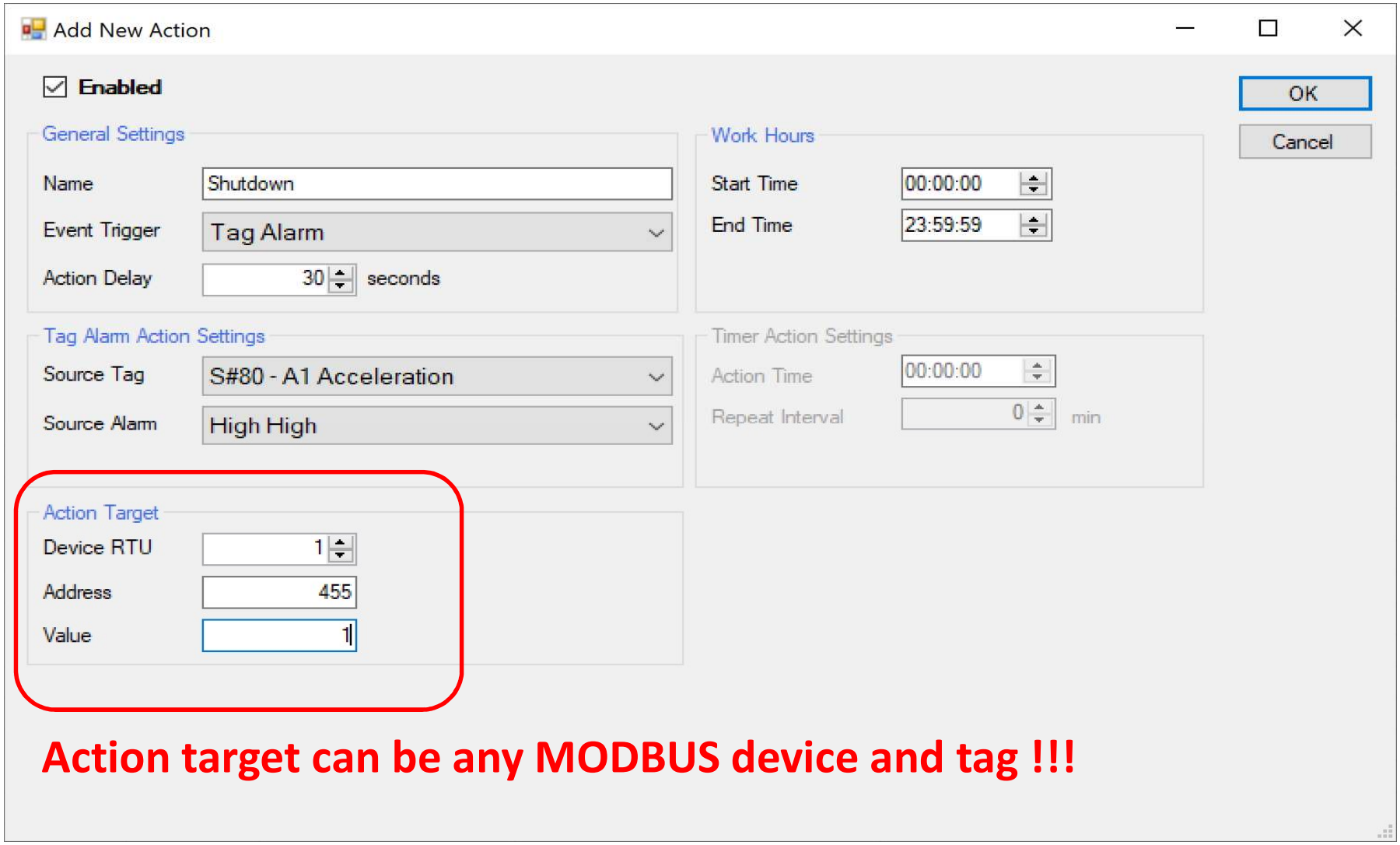
#	Name	Scan	RTU	Address	Type	Log Period (s...	Alarms	Holding Register	Realtime Va...	Units
1	DO #1	Enabled	1	1	DO	Disabled	Not Set			
2	DO #2	Enabled	1	2	DO	Disabled	Not Set			
3	S#79 - Temperature	Enabled	79	40032	MB RTU	60	Not Set		173	F
4	S#79 - A1 Acceleration	Enabled	79	40173	MB RTU	60	Not Set		0.001	g
5	S#79 - A2 Acceleration	Enabled	79	40175	MB RTU	60	Not Set		0.001	g
6	S#79 - A3 Acceleration	Enabled	79	40177	MB RTU	60	Not Set		0.001	g
7	S#79 - A1 Velocity	Enabled	79	40179	MB RTU	60	Not Set		0	ips
8	S#79 - A2 Velocity	Enabled	79	40181	MB RTU	60	Not Set		0	ips
9	S#79 - A3 Velocity	Enabled	79	40183	MB RTU	60	Not Set		0	ips
10	S#80 - Temperature	Enabled	80	40032	MB RTU	60	Not Set		82	F
11	S#80 - A1 Acceleration	Enabled	80	40173	MB RTU	60	Not Set		0.003	g
12	S#80 - A2 Acceleration	Enabled	80	40175	MB RTU	60	Not Set		0.003	g
13	S#80 - A3 Acceleration	Enabled	80	40177	MB RTU	60	Not Set		0.003	g
14	S#80 - A1 Velocity	Enabled	80	40179	MB RTU	60	Not Set		0	ips
15	S#80 - A2 Velocity	Enabled	80	40181	MB RTU	60	Not Set		0	ips
16	S#80 - A3 Velocity	Enabled	80	40183	MB RTU	60	Not Set		0	ips
17	S#82 - Temperature	Enabled	80	40032	MB RTU	60	Not Set		79	F
18	S#82 - A1 Acceleration	Enabled	80	40173	MB RTU	60	Not Set		0.001	g
19	S#82 - A2 Acceleration	Enabled	80	40175	MB RTU	60	Not Set		0.001	g
20	S#82 - A3 Acceleration	Enabled	80	40177	MB RTU	60	Not Set		0.001	g
21	S#82 - A1 Velocity	Enabled	80	40179	MB RTU	60	Not Set		0	ips
22	S#82 - A2 Velocity	Enabled	80	40181	MB RTU	60	Not Set		0	ips
23	S#82 - A3 Velocity	Enabled	80	40183	MB RTU	60	Not Set		0	ips

Tags for temperature, acceleration and velocity


Edit Tag
General
Values Map
Bit Map
Calculations & Scaling
Alarms
OK
Cancel
General Info
Name
S#80 - A1 Acceleration
Type
Modbus RS485 [MB RTU]
Address
Virtual Address
46004
Units
g
Enable Logging
Log Period
60
sec.
Enable Scan
Extra Options
Measurement Type
Maximum
RS485 Modbus Slave Parameters
RTU Number
80
Register Type
Holding Register [40001..49999]
Modbus Register
40173
Value Type
32bit (float)
Byte Order
No Swap
MODBUS Tag on a Slave Device
(Vibration Sensor)

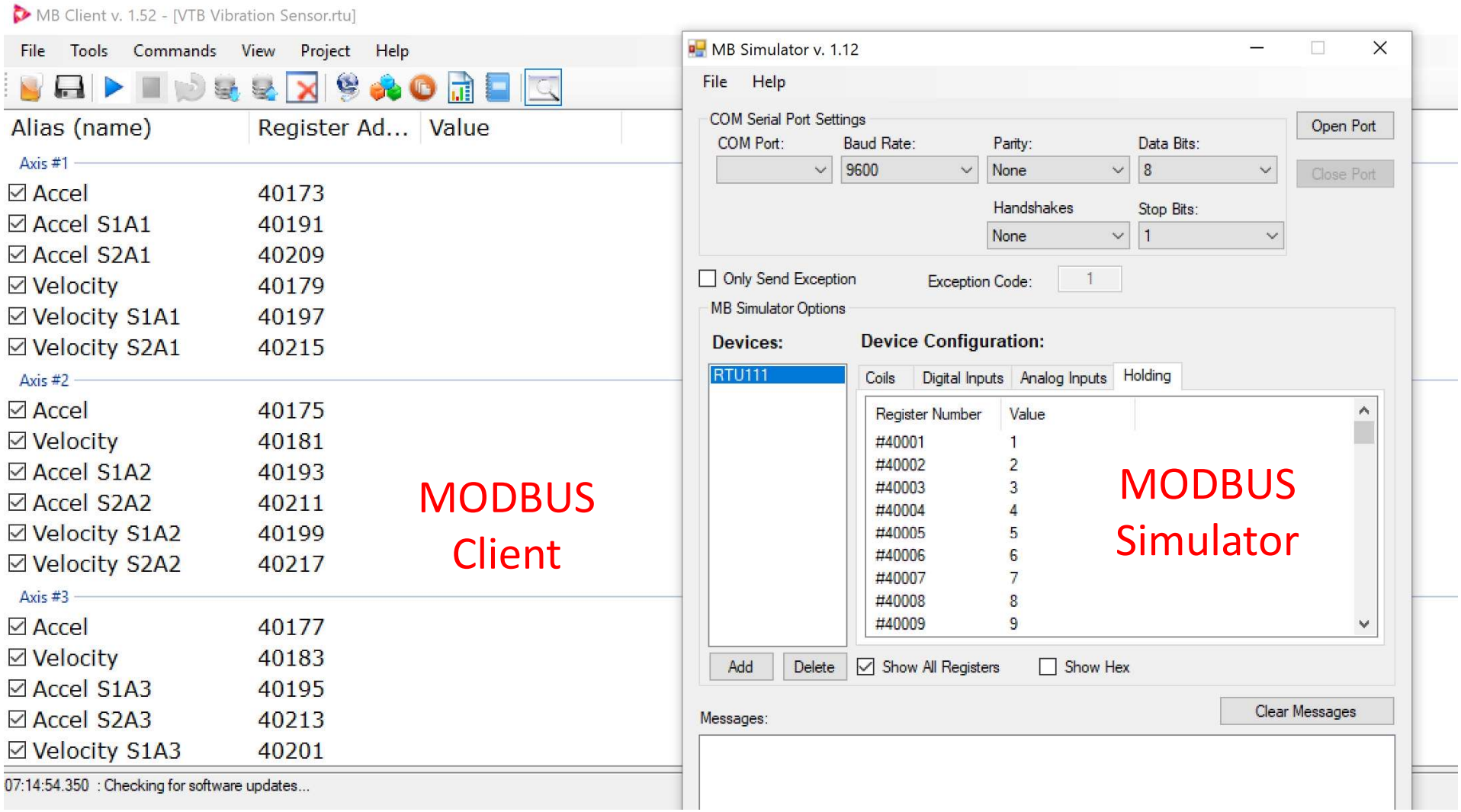

Edit Tag
General
Values Map
Bit Map
Calculations & Scaling
Alarms
OK
Cancel
Alarm Info
Type
Limit
Timeout
5
sec.
Deadband
0.000
Low-Low
0.000
Low
0.000
Normal
High
0.500
High-High
0.000
Alarm Condition
High (MC)
Set Message...
Clear Message
Set Contacts...
Message for HIGH alarm
Insert to Message:
Tag Name
Raw Value
Converted Value
Units
Device Name
Timestamp
Message
Machine Vibration too high on {TN}.
Acceleration is {CV}{U}.
Reported from {DN} at {TS}.
OK
Cancel


WiPOM Client ver.3.46 [VTB-RS485 8 Sensors* : OFFLINE] - ADMIN
File
Tools
Help
System
Communications
General
Peripherals
Tags
Actions
Contacts
Logged data
Software Log
Common
Enable RS485 Modbus Forwarding
Modbus Interpacket Delay
100
ms
Cell Settings
Allow Cell Communications
APN
b2b.static
User Name
Password
SMS/Email Settings
SMS/Email Retry Time Limit:
15
minute(s)
SMTP Settings
Server
smtp.nanowipom.com
Port
24025
Login
alarm@nanowipom.com
Password
From Email
alarm@nanowipom.com
Email Subject
{MB}
Check SMTP Settings
Edit
RS232 Port
Baudrate
115200
Stop Bits
1
Parity
None
Data Bits
8
RS485 Port
Baudrate
115200
Stop Bits
1
Parity
None
Data Bits
8
Read Timeout
500
ms
Data Pushing Settings
Enable data Pushing
Protocol
HTTPS
Port
443
Address
www.nanowipom.com/pushdata
Period
2 min
Offset
0
minutes (in range 0..59)
Format
BiPOM
Account
Login
VibrationMaster
Password
Apply
Push to any Cloud portal
Not connected


Add New Action
Enabled
OK
Cancel
General Settings
Name
Shutdown
Event Trigger
Tag Alarm
Action Delay
30
seconds
Work Hours
Start Time
00:00:00
End Time
23:59:59
Tag Alarm Action Settings
Source Tag
S#80 - A1 Acceleration
Source Alarm
High High
Timer Action Settings
Action Time
00:00:00
Repeat Interval
0
min
Action Target
Device RTU
1
Address
455
Value
1
Action target can be any MODBUS device and tag !!!

WiPOM

- **WiPOM Software Features:**
- Connect over cellular, RS232, RS485, ethernet or USB
- Read device configuration, including tag configuration
- Configure device, date/time, calibration, RS485 port
- Check hardware status and health information
- Add/edit/delete tags
- Configure alarm conditions individually for each tag
- Configure SMS and email for each tag
- Manage contact list for SMS and email support
- Configure conversion parameters for tag value
- Engineering Unit support
- Alarm on limits, value changed, exact value
- Scaling and calculations
- Bit map and values map definitions
- Start / stop logger
- System Diagnostics
- Upgrade firmware
- Read collected data, events and alarms
- Export data, events and alarms in Excel format
- Analog and digital I/O support
- I2C and RS485 MODBUS peripheral support
- Secure cloud connectivity using HTTPS data push
- OpenVPN support
- Over the air or local connection for configuration



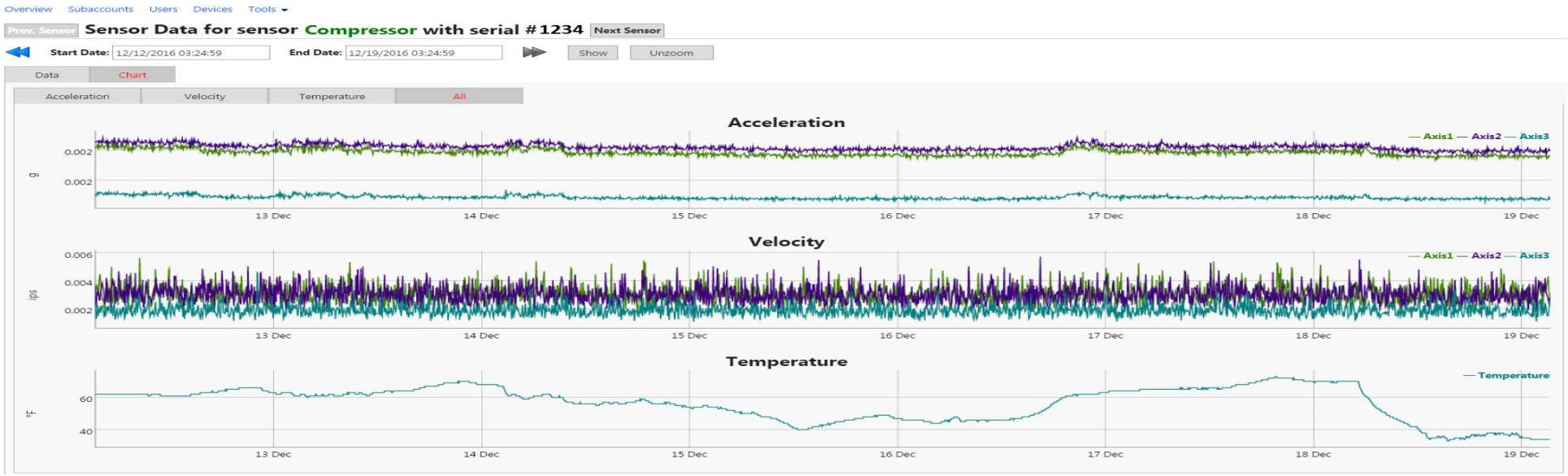
BiPOM Web Portal - **WiPORTAL**

For customers who do not have an extensive IT Department yet need real-time remote data reporting and critical “Alerts”, BiPOM now offers WiPORTAL. It is a simplified, low-cost, cloud server that provides timely and critical information 24/7.

This service has been in operation for over 6 years with many customers. It is effective, reliable, low-cost and yet provides easy, password protected access, real-time data and immediate alerts with customer selected thresholds. Custom formats and alerts are provided to fit individual customer needs. If you use WiPOM, this is immediately available. Please contact sales@bipom.com for signing up.

MODES:
- Cellular
- Satellite
- Radio
- Wi-Fi
- Bluetooth
- ZigBee™
- DigiMesh™
- Monnit™
- GPS

Applications
- Oil & Gas
- Irrigation
- Metering
- Energy
- Machine Protection
- Factory Automation



Version History

WiPOM 1.0 is in field use since 2012

WiPOM 2.0 is scheduled for Q4 2019, currently running on 10 pilot projects

Future Plans:

- Full duplex communications instead of polling
- Web based configuration
- Websockets for real-time web updates

Special Thanks to our contributing partners:
Metrologics (Integration), GetWireless (Distribution), Option (Gateways), Machine Saver (Sensors)

Questions ?