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Enabling an Intelligent Planet



WISE-S100 Intelligent Stack Light Monitoring Sensor Product Features and Configuration Training



Pop Hsu, PAE of IIOT, Advantech

Objective

Upon completion of this module, you will be able to perform the following tasks:

- Understand the role of WISE-S100 in IoT Market.
- Understand the HW feature of WISE-S100.
- Know how to do the quick setup of WISE-S100 with WISE-4051.
- Know how to setup the configuration of WISE-S100 by using ModScan
- Know how to update FW of WISE-S100.
- How to do the group configuration of WISE-S100.

Outline

- The Role of WISE-S100 in IoT market
- Basic Configuration
- Quick setup Configuration for WISE-S100
- Use ModScan to modify the setting of WISE-S100
- Update FW of WISE-S100
- Modbus Table
- Group configuration

The Role of WISE-S100 in IoT Market

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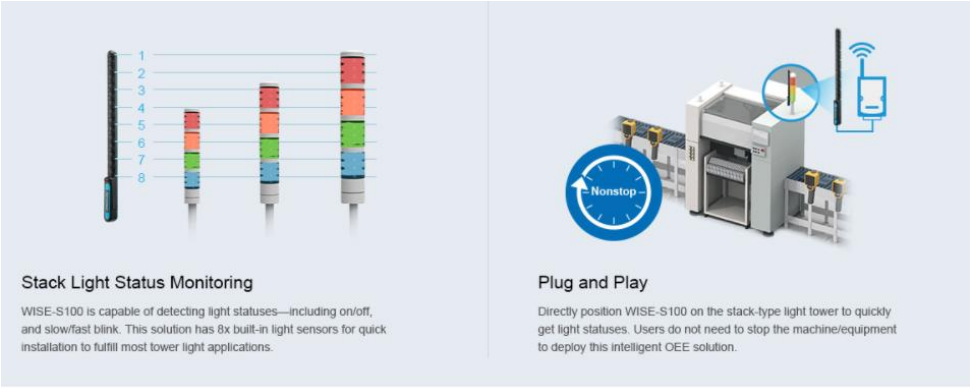
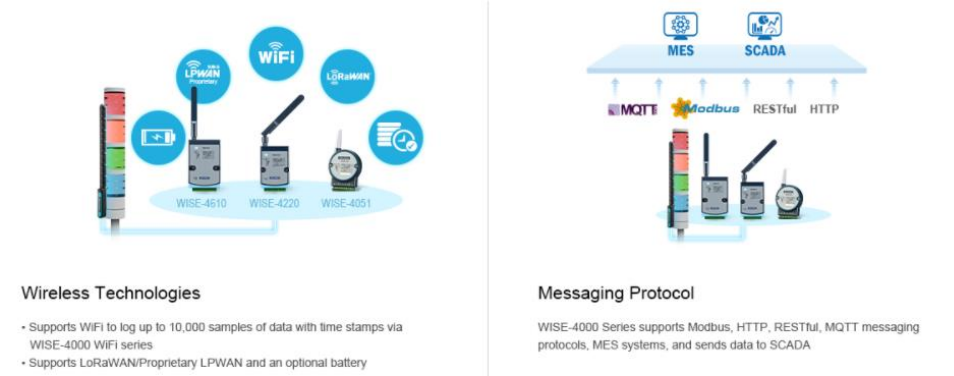
The Role of WISE-S100 in IoT Market

- WISE-S100 is an intelligent stack light monitoring sensor target to fit a variety of stack-type light tower with very easy and quick installation.



Remote Intelligent OEE Solution — When Paired with the WISE-4000 Wireless I/O Module



Intelligent OEE Solution by Wireless Remote Management



Basic information of WISE-S100

WISE-S100 Hardware Overview

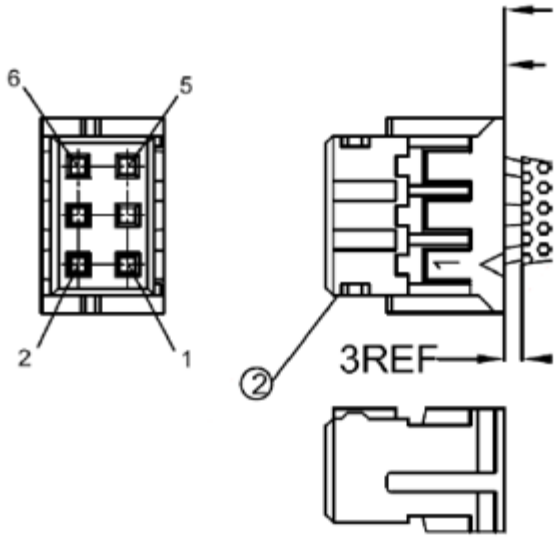


Power Supply		
Power Input	3.3~30VDC	
Power consumption	15mA	
General		
MCU	ARM Cortex-M0	
Communication Interface	RS-485 (Modbus/RTU)	
Baud Rate	9600,N,81	
Optical Sensor		
Number of Sensor	8	
Sensor Detection Rate	3Hz	
Measuring Range	20.48~83865.6 lux	
Peak Irradiance Spectral Responsivity	550nm (TYP.)	
Resolution	12bits	
Accuracy	15% (*Accuracy of measurement of fluorescent light.)	
Linearity	Input illuminance > 40 lux	2% (TYP.)
	Input illuminance < 40 lux	5% (TYP.)
Temperature Drift	0.02%/℃	
Environmental Spec		
Operating Temperature	-25~70℃	
Storage Temperature	-40~85℃	
Operating Humidity	5~95% RH	
Storage Humidity	0~95% RH	
Mechanical		
Dimension	220Lx14Wx12.8H (mm)	
Plastic Material	Polycarbonate (PC)	

Pin Definition

- Description:
  - ✓ The cable of the WISE-S100 stack light sensor is connected and installed in default package.
  - ✓ The power input of the sensor is 3.3~30VDC.

2M Cable with Wafer Box PN:1700031410-01		
1	Red	V+ In
2	Black	GND
3	Brown	DATA+
4	Yellow	MCU Interrupt
5	Orange	DATA-
6	Green	IO Interrupt



LED Definition

- Description:
  - ✓ There are two mode for WISE-S100, the user could distinguish by LED on WISE-S100.



LED	Color	Indication	Behavior
Status	Green	Steady On	Modbus/RTU Mode
		On for 5 secs	Serial Bus Mode (power saving)
		Blinking(2Hz)	Sensor Initial Error

Quick setup Configuration for WISE-S100

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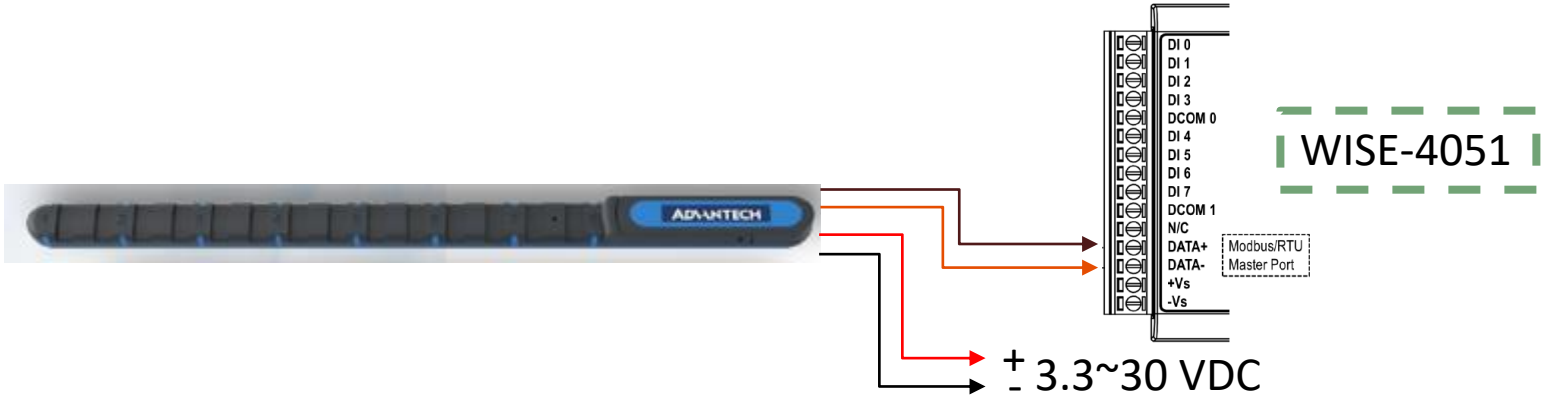
Quick Setup Operation with WISE-4051(1/3)

1. You should also notice that the indication LED is constantly on.



2. Connect the Data+ & Data- to WISE-4051.

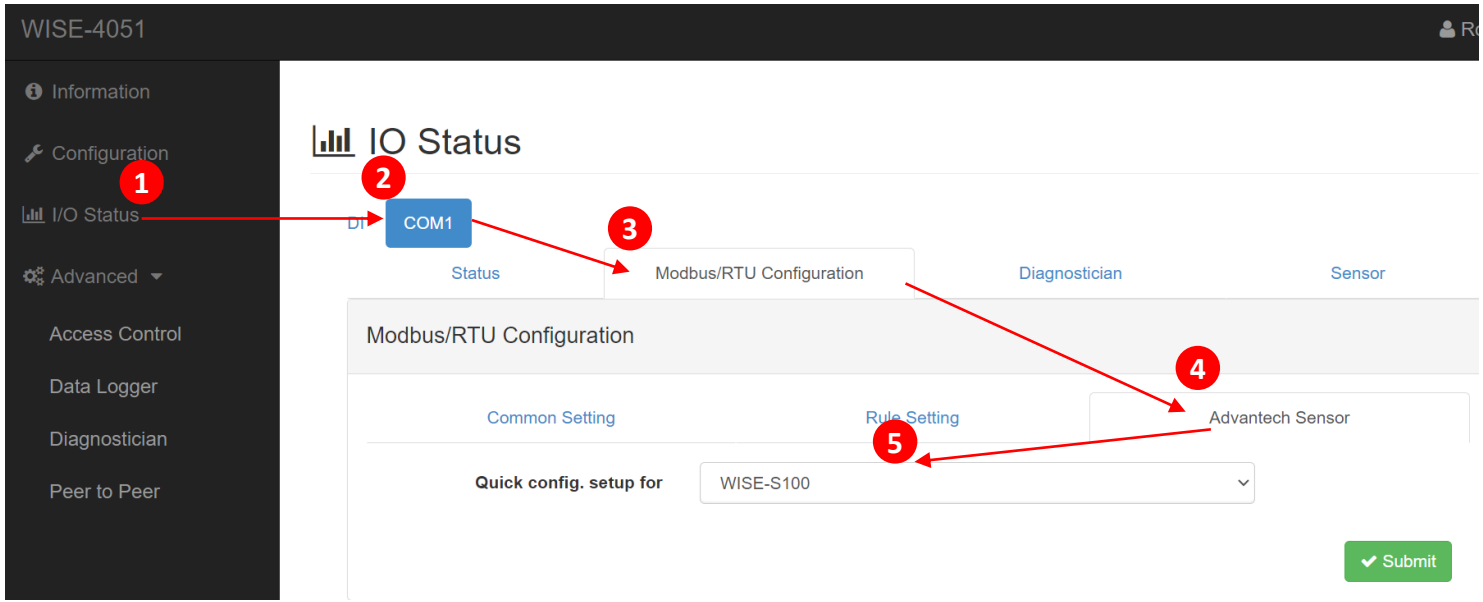


Quick Setup Operation with WISE-4051(2/3)

3. Use the quick config setup to implement all the rules of WISE-S100.

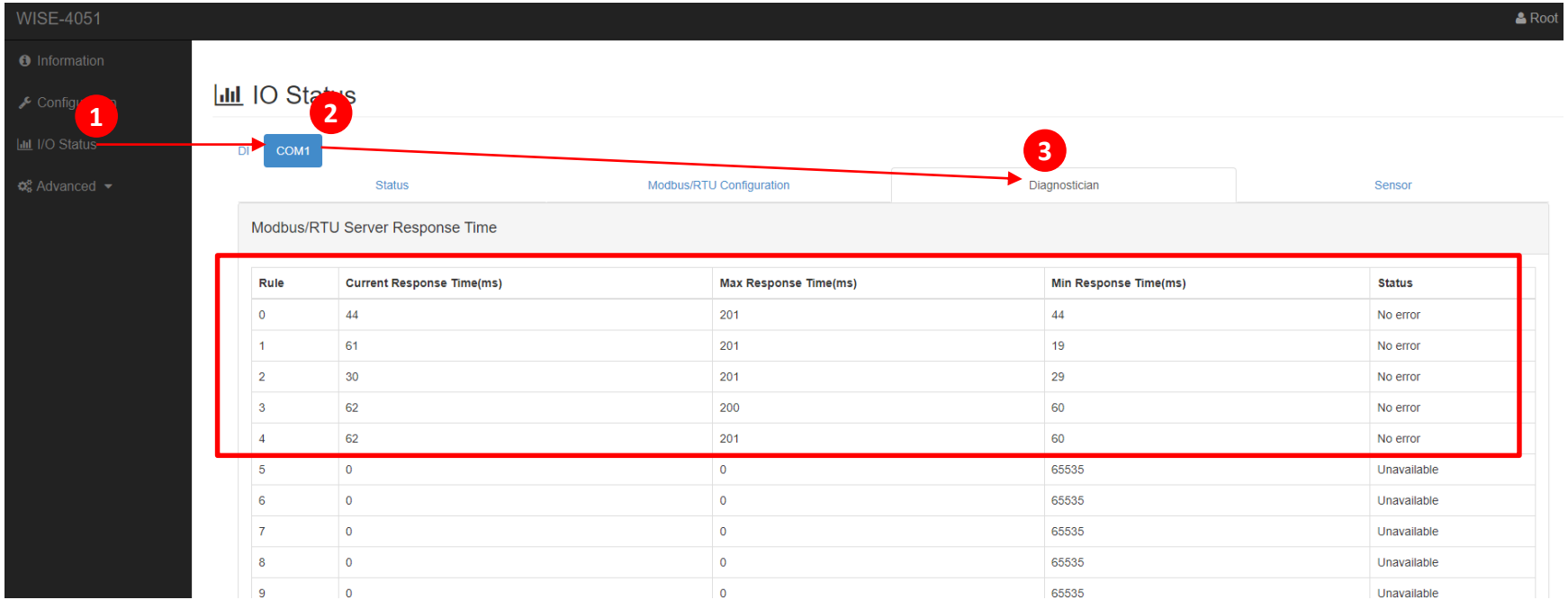
(Please UPDATE your WISE-studio to the latest version from Advantech website)

Version must be above V1.02.01 B16



Quick Setup Operation with WISE-4051(3/3)

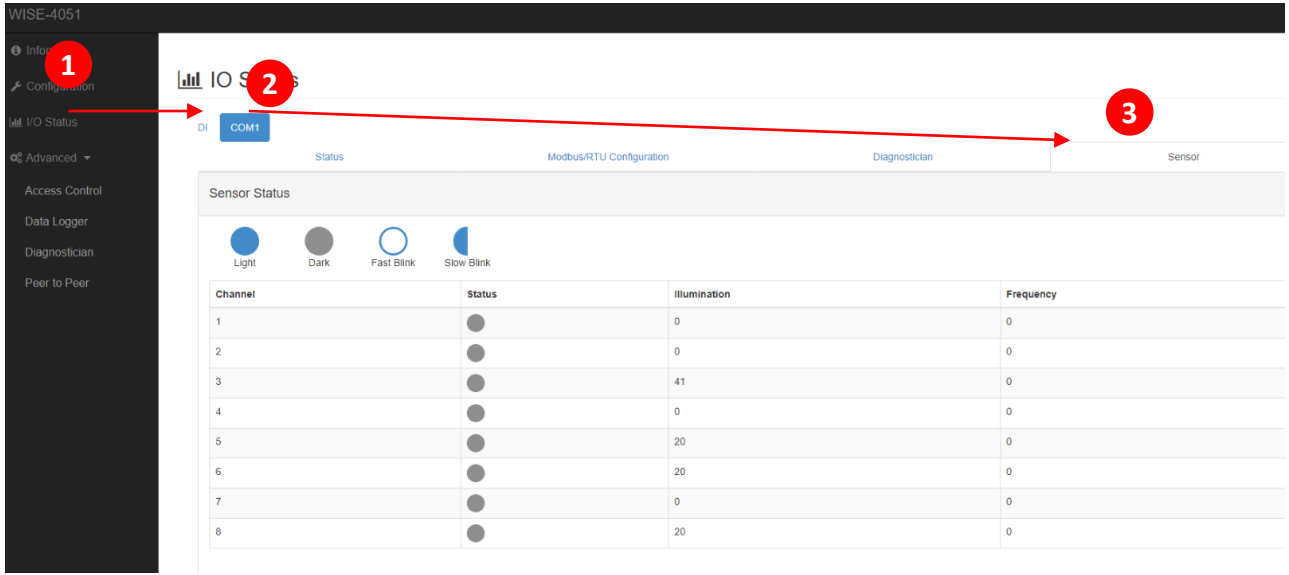
4. User can check the status of rules to confirm if all the setting is correct.



Rule	Current Response Time(ms)	Max Response Time(ms)	Min Response Time(ms)	Status
0	44	201	44	No error
1	61	201	19	No error
2	30	201	29	No error
3	62	200	60	No error
4	62	201	60	No error
5	0	0	65535	Unavailable
6	0	0	65535	Unavailable
7	0	0	65535	Unavailable
8	0	0	65535	Unavailable
9	0	0	65535	Unavailable

IO Status Page of WISE-S100 (Status)

5.This page shows the IO Status for each sensor on WISE-S100.



- ✓ Status: Indicating the current status.
- ✓ Illumination: Indication the Lux value.
- ✓ Frequency: Indication the blink frequency.

Use ModScan to modify the setting of WISE-S100

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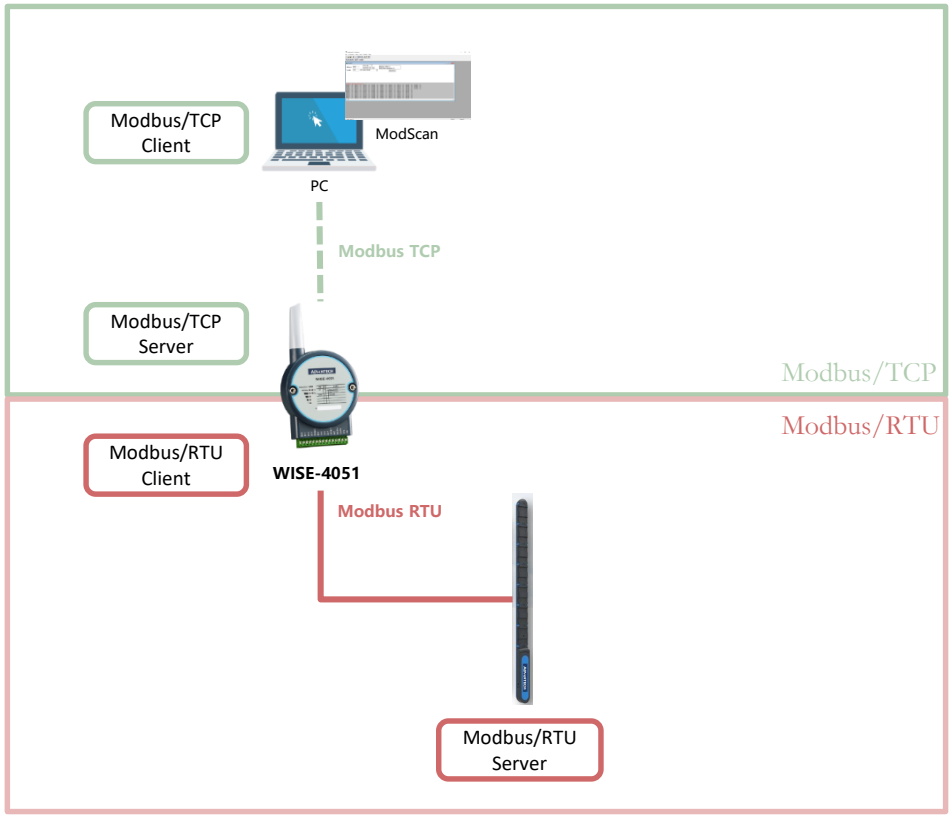
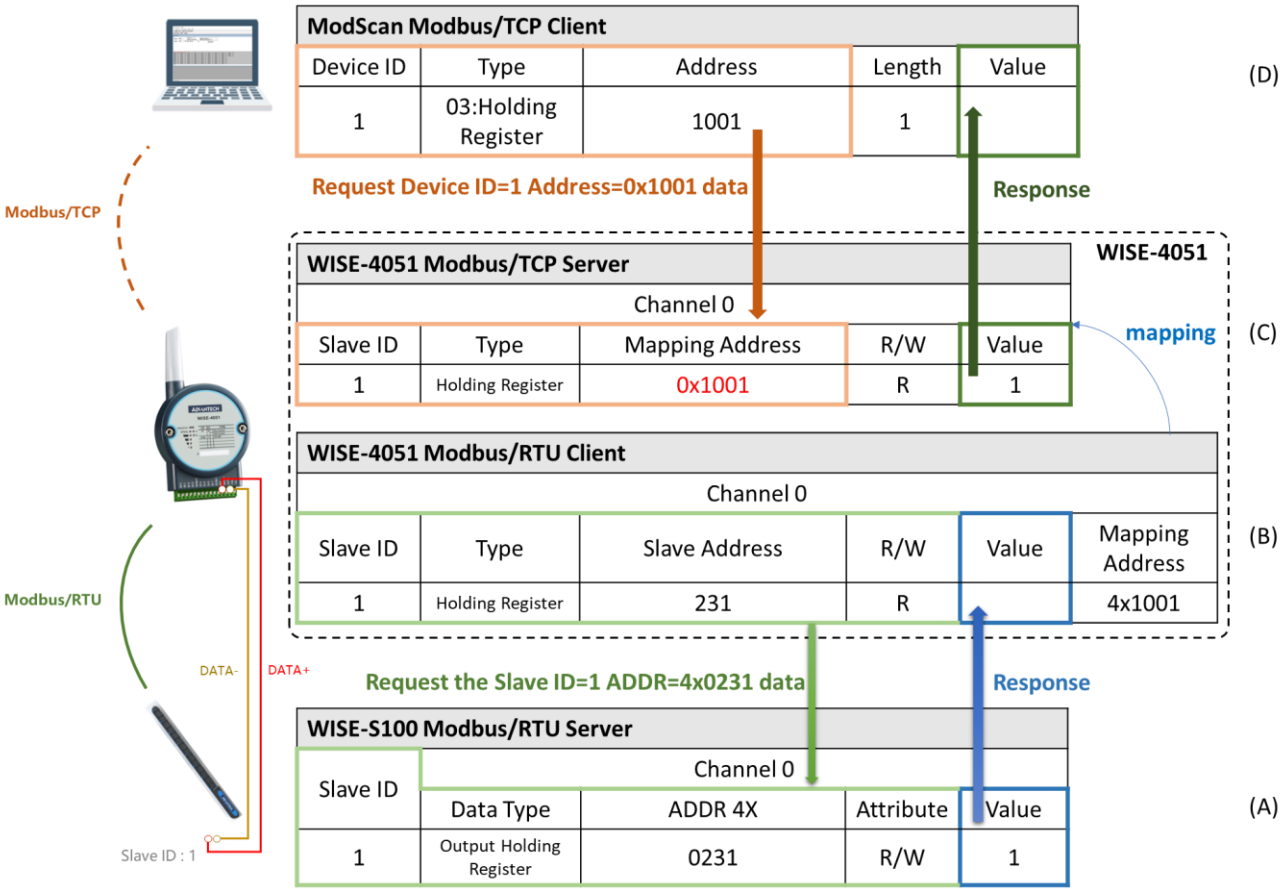
Connection Topology of WISE-S100 and Modscan

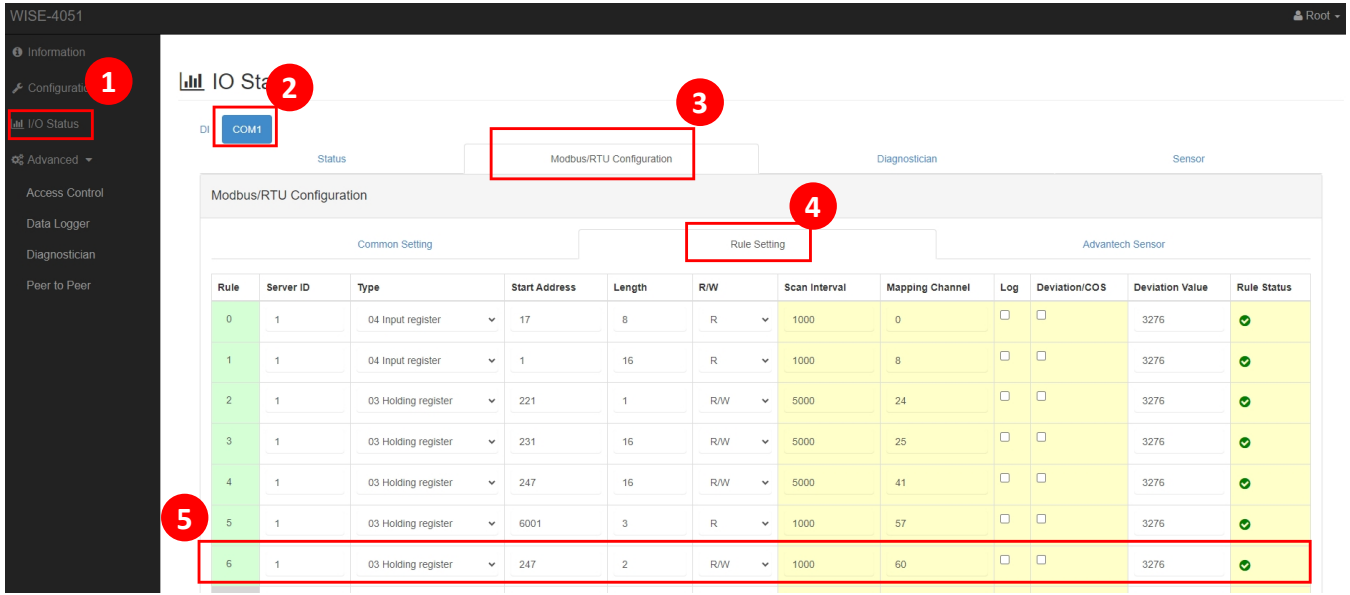


Corresponding value from WISE-S100 to Modscan



Set rules of WISE-4051 to read value of WISE-S100

- Description:
  - ✓ In this case, we will introduce how to change “**Set High Limit (Lux)”** as an example. (address 247 is high limit of sensor 1)
  - ✓ This page shows how to add a rule for WISE-4051 to read the value to WISE-4051.



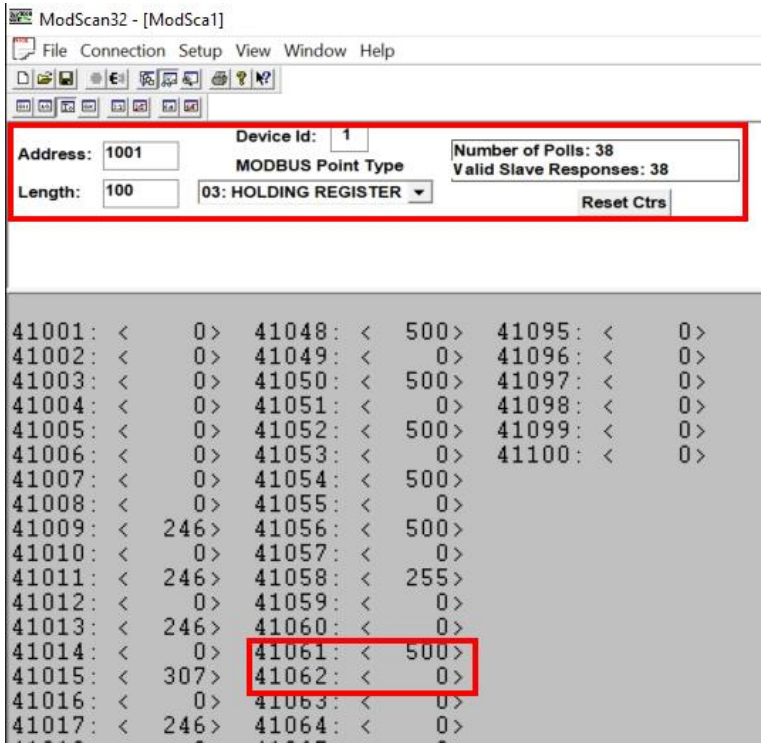
Check the value of WISE-4051 which is read from WISE-S100

- Description:
  - ✓ After the rules is set, user can check if the WISE-4051 successfully read the value from WISE-S100 by following path of WISE Studio:
    I/O status -> COM1 -> Status -> Word Status ->Channels 60&61
  - ✓ In this case, the default value of this address is 500.

60	500	No error	1	247	1061
61	0	No error	1	248	1062

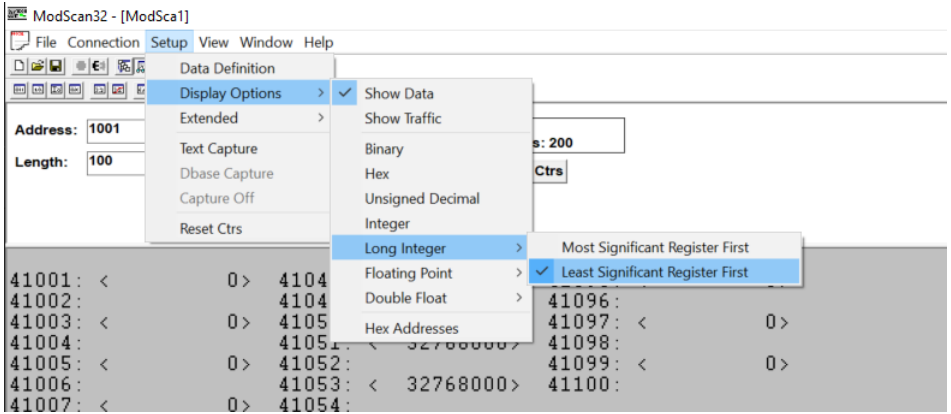
Setup of Modscan

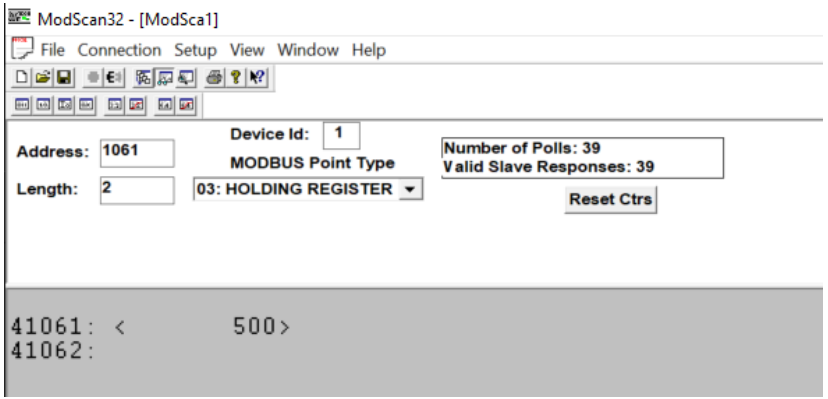
- Description:
  - ✓ Setup Modscan to read the channel value from WISE-4051 by using Modbus/TCP.



Change the data display format of Modscan

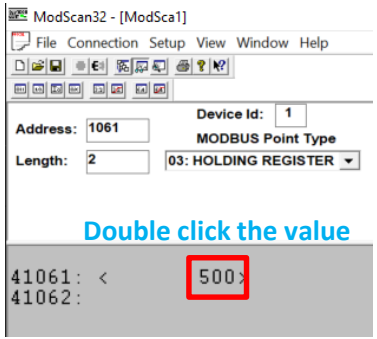
- Description:
  - ✓ Because the value of “Set High Limit” is a long integer, we need to change the way how Modscan reading the value. (This only needed if the value occupy 2 address)
  - ✓ After the setup of left picture, the value of “Set High Limit” will be shown as the right picture.(It will help the user to modify the value much easier)

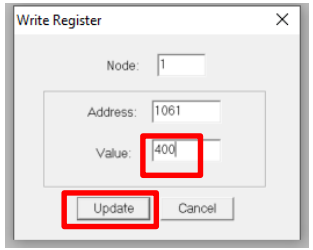


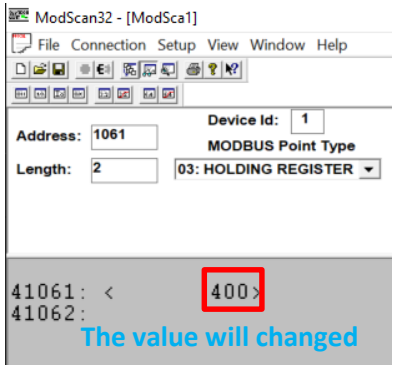


Update the value of WISE-4051 which is read from WISE-S100

- Description:
  1. Double click the value which user want to modify.
  2. Enter the value the click update.
  3. The value will be changed after user update the value.
  4. User also can check the value via WISE studio.







Check the value changed in WISE-4051 by using WSIE studio

60	400	No error	1	247	1061
61	0	No error	1	248	1062

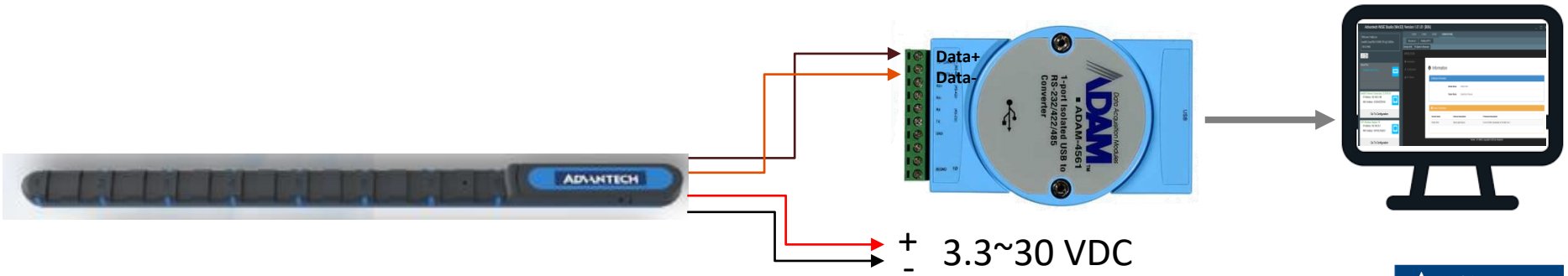
Update FW of WISE-S100

Update FW of WISE-S100 in serial bus mode

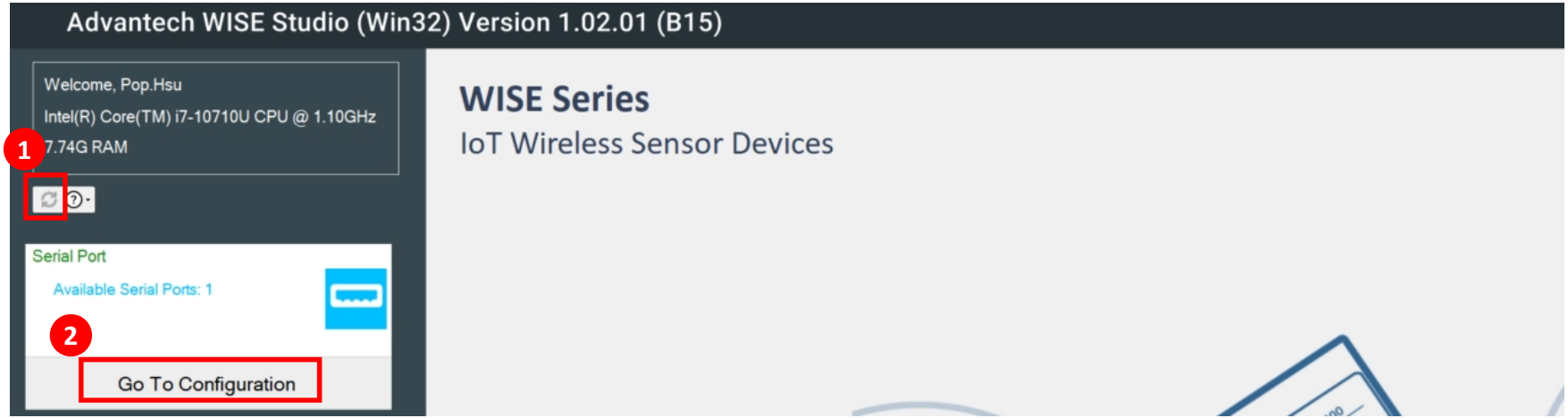
- Description:
  - ✓ WISE-S100 is default in Modbus/RTU mode when the FW is **A104B02** or above.
  - ✓ If the FW of WISE-S100 is **below A104B02**, the user **needs to do the FW update in WISE Studio at the beginning**.

- Configuration Wiring:
  - ✓ When user need to do the FW update, user needs to do the wiring as below to access WISE-S100 through WISE Studio:

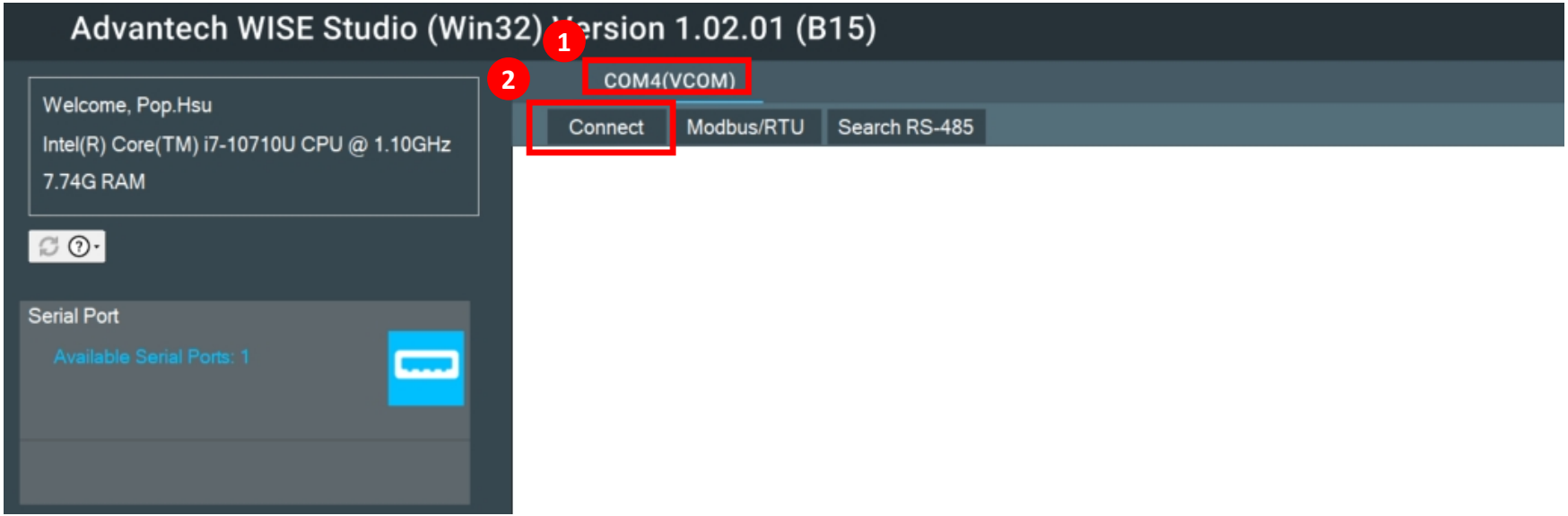
PC < --- > ADAM-4561 or any other USB to RS-485 converter < --- > WISE-S100



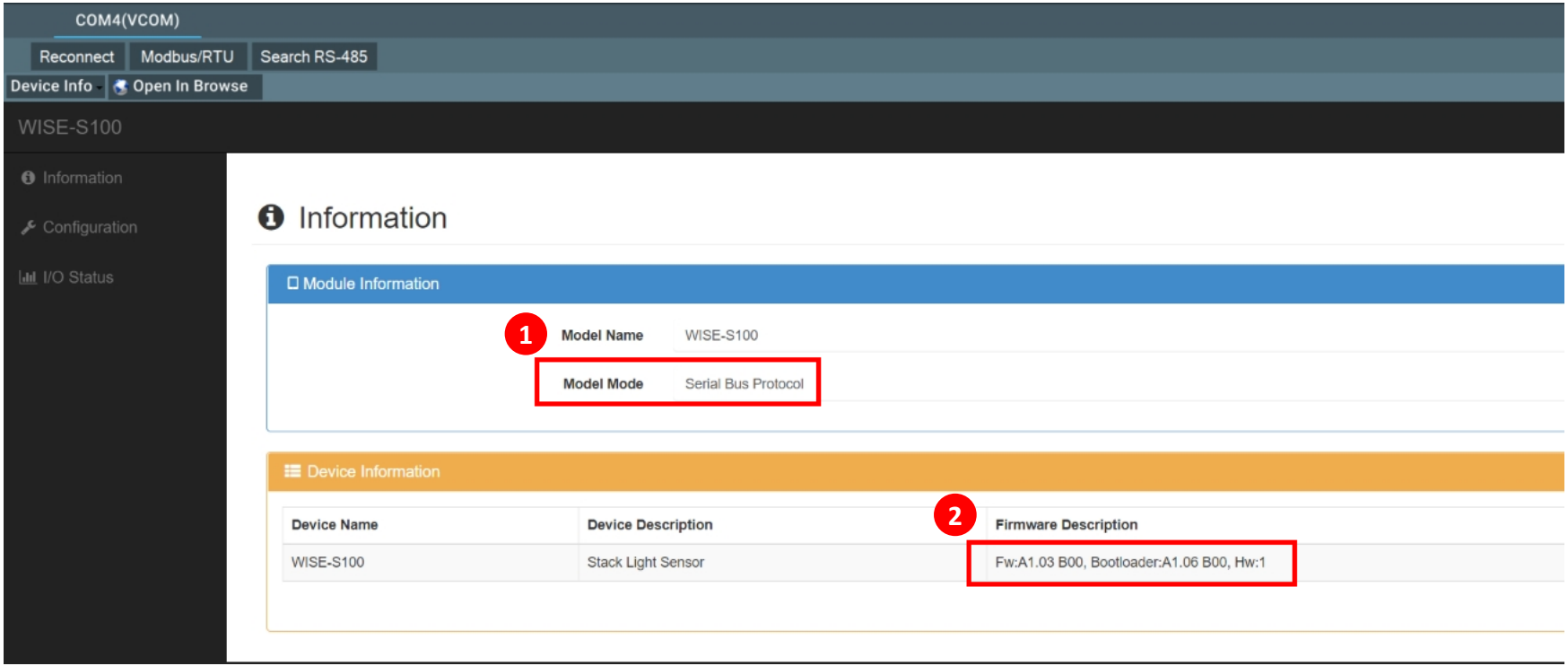
Steps to Update FW of WISE-S100 (1/5)



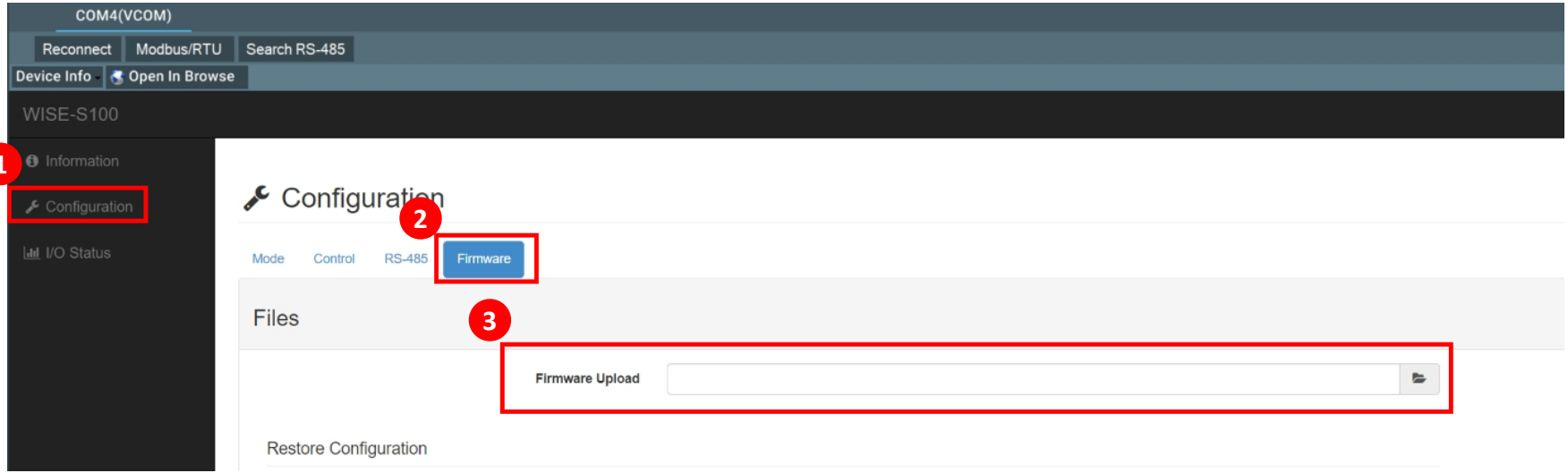
Steps to Update FW of WISE-S100 (2/5)



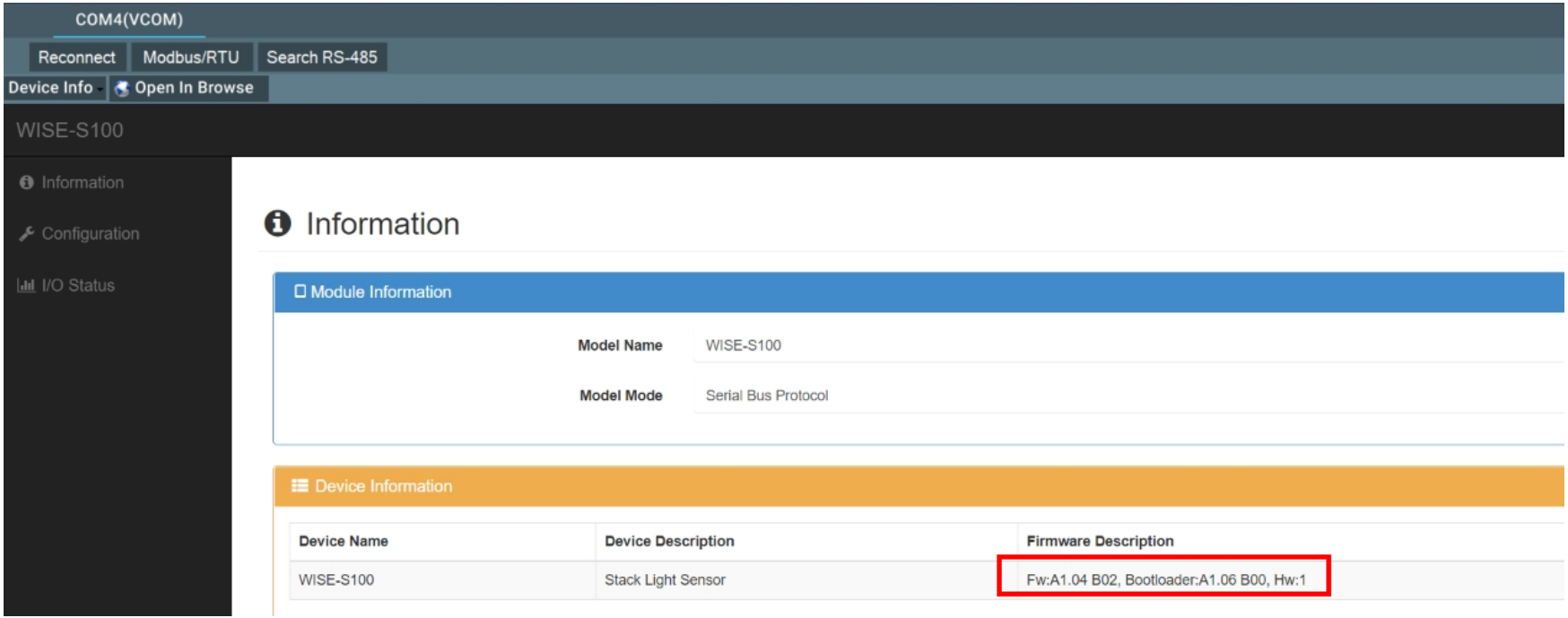
Steps to Update FW of WISE-S100 (3/5)



Steps to Update FW of WISE-S100 (4/5)



Steps to Update FW of WISE-S100 (5/5)



Modbus Table

Modbus Table (0x)

Address 0X	Ch	Description	Attribute
00033	1	Clear low state count	Write
...	...		Write
00040	8		Write
00041	1	Clear high state count	Write
...	...		Write
00048	8		Write
00049	1	Clear slow blink state count	Write
...	...		Write
00056	8		Write
00057	1	Clear fast blink state count	Write
...	...		Write
00064	8		Write
00065	1	Clear low state total time	Write
...	...		Write
00072	8		Write
00073	1	Clear high state total time	Write
...	...		Write
00080	8		Write
00081	1	Clear slow blink state total time	Write
...	...		Write
00088	8		Write
00089	1	Clear fast blink state total time	Write
...	...		Write
00096	8		Write

01033		Clear low state count (only enabled channel)	Write
...			Write
01035			Write
01036		Clear high state count (only enabled channel)	Write
...			Write
01038			Write
01039		Clear slow blink state count (only enabled channel)	Write
...			Write
01041			Write
01042		Clear fast blink state count (only enabled channel)	Write
...			Write
01044			Write
01045		Clear low state total time (only enabled channel)	Write
...			Write
01047			Write
01048		Clear high state total time (only enabled channel)	Write
...			Write
01050			Write
01051		Clear slow blink state total time (only enabled channel)	Write
...			Write
01053			Write
01054		Clear fast blink state total time (only enabled channel)	Write
...			Write
01056			Write

5501		Reset all statistic	Write

Modbus Table (4x)

Address 4X	Ch	Description	Attribute
40001~40002	1	Sensor Value (Lux)	Read
...	...		Read
40015~40016	8		Read
40017	1	Sensor Status (Low:0/High:1/Slow Blink:2/ Fast Blink:3/not-init:0xFD/ non-exist: 0xFE/ broken: 0xFF)	Read
...	...		Read
40024	8		Read
40025	1	Frequency (hundredfold)	Read
...	...		Read
40032	8		Read
40033~40034	1	Low state count	Read
...	...		Read
40047~40048	8		Read
40049~40050	1	High state count	Read
...	...		Read
40063~40064	8		Read
40065~40066	1	Slow Blink state count	Read
...	...		Read
40079~40080	8		Read
40081~40082	1	Fast Blink state count	Read
...	...		Read
40095~40096	8		Read
40097~40098	1	Low state total time (100 ms)	Read
...	...		Read
40111~40112	8		Read
40113~40114	1	High state total time (100 ms)	Read
...	...		Read
40127~40128	8		Read
40129~40130	1	Slow Blink state total time (100 ms)	Read
...	...		Read
40143~40144	8		Read

40145~40146	1	Fast Blink state total time (100 ms)	Read
...	...		Read
40159~40160	8		Read
40211		Module Name 1	Read
40212		Module Name 2	Read
40213		Module Name 3	Read
40214		Reserved for Module Name	Read
40215		Module Firmware Version 1 (Major/Minor version part)	Read
40216		Module Firmware Version 2 (Build version part)	Read
40221		Channel enable	Read/Write
40231~40232	1	Set Low limit (Lux) (Low Illumination Limit Value)	Read/Write
...	...		Read/Write
40245~40246	8		Read/Write
40247~40248	1	Set High Limit (Lux) (High Illumination Limit Value)	Read/Write
...	...		Read/Write
40261~40262	8		Read/Write
41001~41002		Sensor Value (Lux) (only enabled channel)	Read
...			Read
41005~41006			Read
41007		Sensor Status (only enabled channel)	Read
...			Read
41009			Read
41010		Frequency (hundredfold) (only enabled channel)	Read
...			Read
41012			Read
41013~41014		Low state count (only enabled channel)	Read
...			Read
41017~41018			Read

41019~41020		High state count (only enabled channel)	Read
...			Read
41023~41024			Read
41025~41026		Slow Blink state count (only enabled channel)	Read
...			Read
41029~41030			Read
41031~41032		Fast Blink state count (only enabled channel)	Read
...			Read
41035~41036			Read
41037~41038		Low state total time (only enabled channel) (100 ms)	Read
...			Read
41041~41042			Read
41043~41044		High state total time (only enabled channel) (100 ms)	Read
...			Read
41047~41048			Read
41049~41050		Slow Blink state total time (only enabled channel) (100 ms)	Read
...			Read
41053~41054			Read
41055~41056		Fast Blink state total time (only enabled channel) (100 ms)	Read
...			Read
41059~41060			Read

Address 4X	Ch	Description	Attribute
45501		Reset comm mode (Set to Serial Protocol Mode)	Write

Address 4X	Ch	Description	Attribute
46001	1~8	Mode (0 On/Off, 1 On/Off/Blink)	Read/Write
46002	1~8	Normal State (0 Normal Off, 1 Normal On)	Read/Write
46003	1~8	Filter (0 disable, 1 enable)	Read/Write
46004	1~8	Reading Illumination option (0 disable, 1 enable)	Read/Write
46005	1~8	Keep Counter Value When Poweroff (0 disable, 1 enable)	Read/Write
46006	1~8	Keep Total Time Value When Poweroff (0 disable, 1 enable)	Read/Write
46007	1	Delay Time (second)	Read/Write
46008	2		Read/Write
46009	3		Read/Write
46010	4		Read/Write
46011	5		Read/Write
46012	6		Read/Write
46013	7		Read/Write
46014	8		Read/Write
46015	1	Fast Blink Frequency Threshold (0.1Hz)	Read/Write
46016	2		Read/Write
46017	3		Read/Write
46018	4		Read/Write
46019	5		Read/Write
46020	6		Read/Write
46021	7		Read/Write
46022	8		Read/Write

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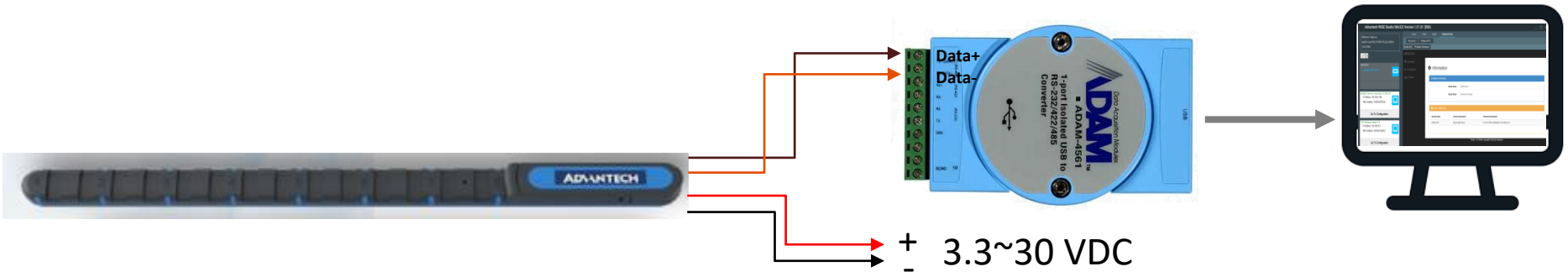
Group configuration

Group configuration by using USB to RS-485 convertor

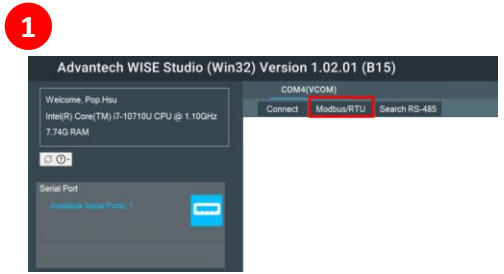
- Configuration Wiring:
  - ✓ When user need use the group configurate, user needs to do the wiring as below to access WISE-S100 through WISE Studio:

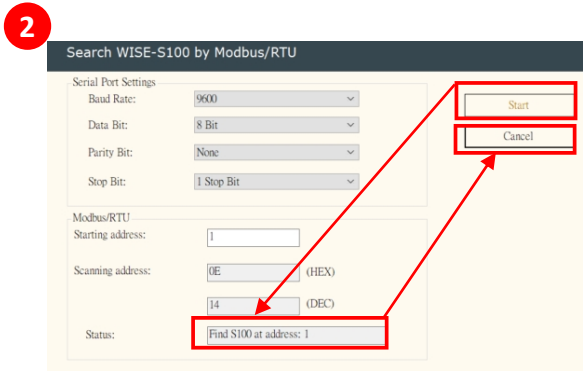
PC < --- > ADAM-4561 or any other USB to RS-485 convertor < --- > WISE-S100

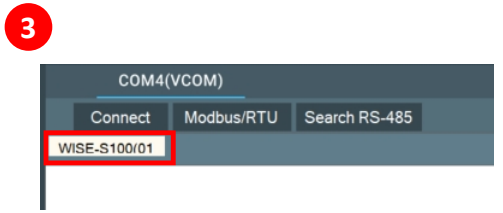


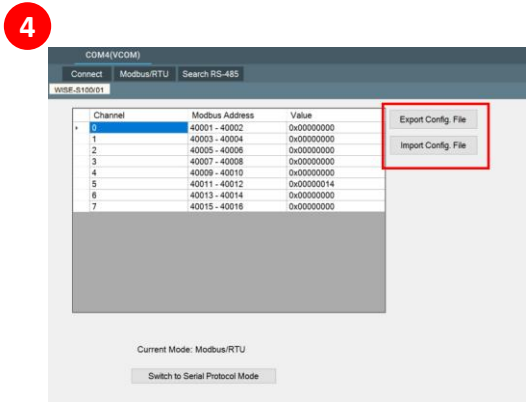
Group configuration by using USB to RS-485 convertor

- Description:
  - ✓ User can connect the WISE-S100 with WISE-Studio by following steps.
    1. Click “ModbusRTU”
    2. Enter the search page and search for the WISE-S100
    3. Click “WISE-S100(01”
    4. Export config file and import page



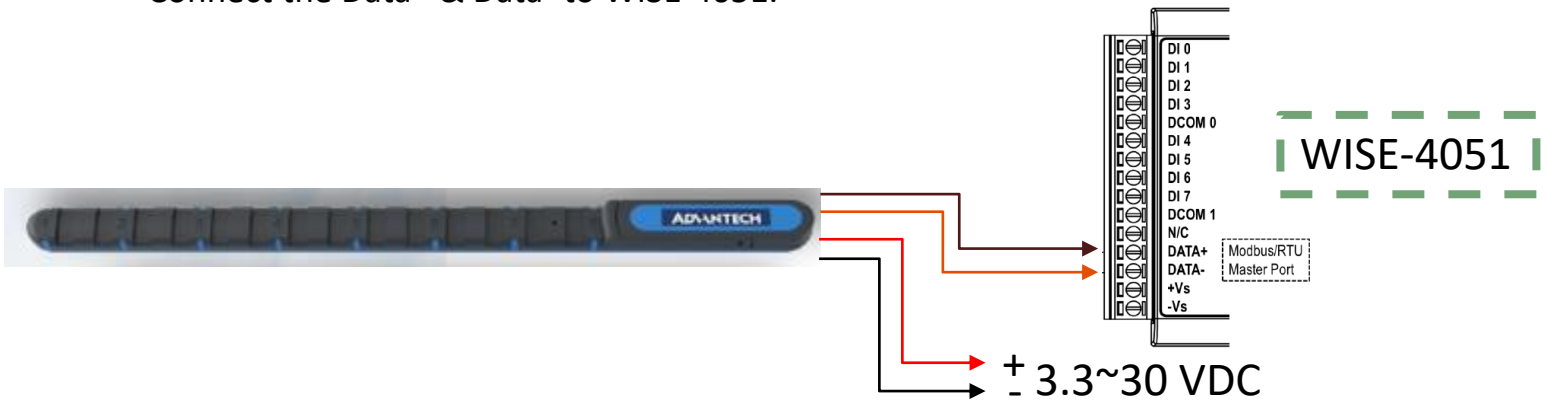






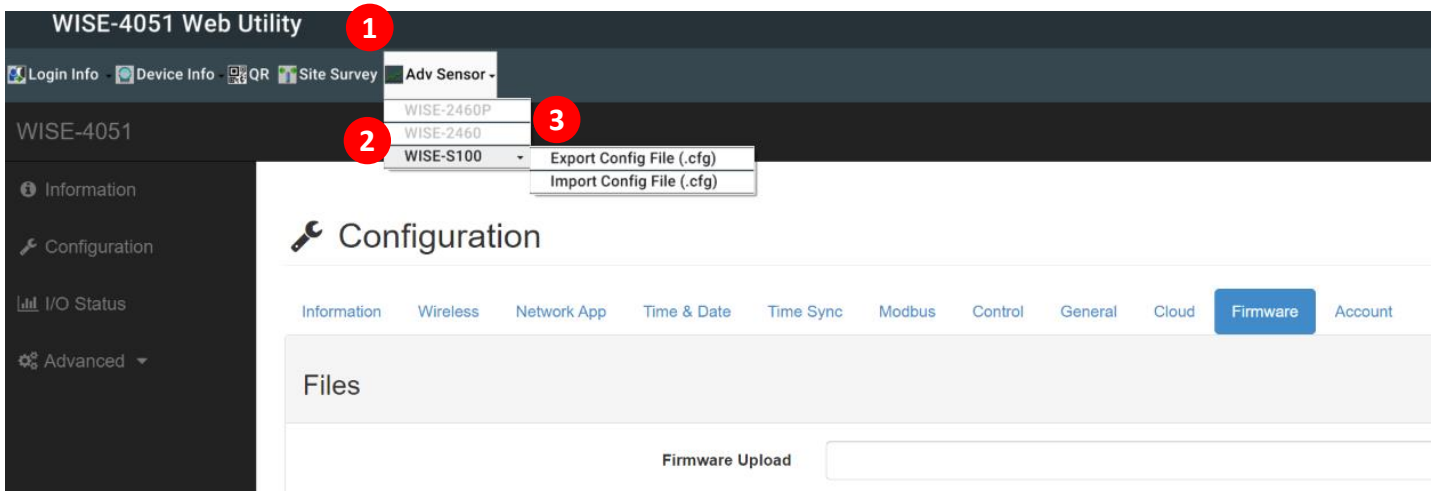
Group configuration by using WISE-4051

- Configuration Wiring:
  - ✓ Connect the Data+ & Data- to WISE-4051.



Configuration Page of WISE-S100 (3/3)

- Description:
  - ✓ User can connect the WISE-4051 with WISE-Studio (Version 1.02.01(B15))
    1. Click “Adv Sensor”
    2. Choose “WISE-S100”
    3. Export and Import configuration files.



Go Together,

We Go Far and Grow Big



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