NOVAKON
Enrich Your Experience

iFACE Designer

Modbus Settings

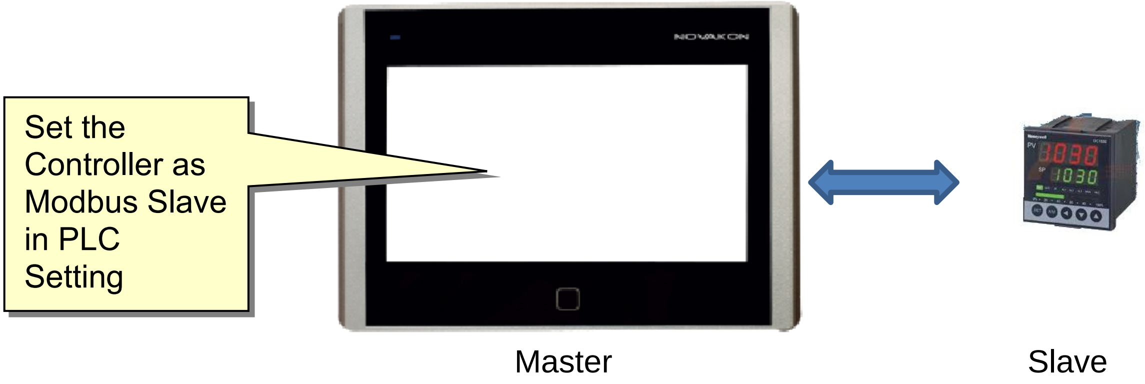
Month 2019

Version 2.01

1. Modbus Settings

1.1 HMI as Master; Controller as Slave

In【PLC Setting】, when we select the driver of 【MODBUS TCP Slave】 or 【MODBUS RTU Slave】, it means PLC is set as MODBUS Slave while HMI as MODBUS Master.



Bit Type：

1. 【DO】：Coils (Read/Write). Range：DO1~DO65536
2. 【DI】：Discrete Inputs (Read only). Range：DI1~DI65536
3. 【IR】：Input Registers (Read only). Range：IR1.0~IR65536.15
4. 【HR】：Holding Registers (Read/Write). Range：HR1.0~HR65536.15
5. 【FN5DO】：Coils (Read/Write with function code 5). Range：FN5DO1~FN5DO65536
6. 【FN6HR】：Holding Registers (Read/Write with function code 6). Range：HR1.0-HR65536.15

Register Type：

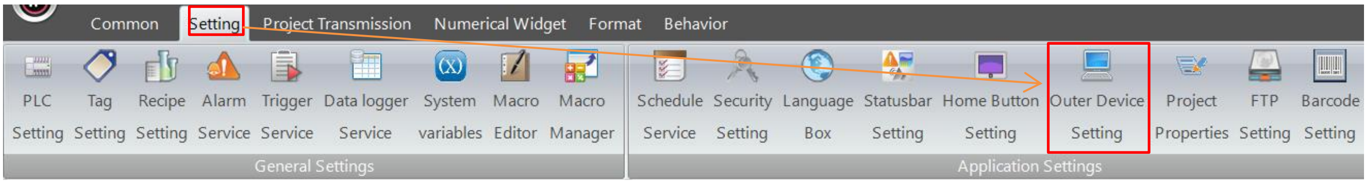
1. 【IR】：Input Registers (Read only). Range：IR1~IR65536
2. 【HR】：Holding Registers (Read/Write). Range：HR1~HR65536
3. 【IRSW】：Input Registers (Read only, only swap in 32bit data). Range：IRSW1~IRSW65536
4. 【HRSW】：Holding Registers (Read/Write, only swap in 32bit data).

   Range：HRSW1~HRSW65536
5. 【FN6HR】：Holding Registers (Read/Write with function code 6). Range：FN6HR1~FN6HR65536
6. 【FN6HRSW】：Holding Registers (Read/Write with function code 6, only swap in 32bit data). Range：FN6HRSW1~FN6HRSW65536
7. 【DI】：Discrete Inputs (Read only). Range：DI1~DI65536
8. 【DO】：Coils (Read only). Range：DO1~DO65536
9. 【FN5DO】：Coils (Read only). Range：DO1~DO65536

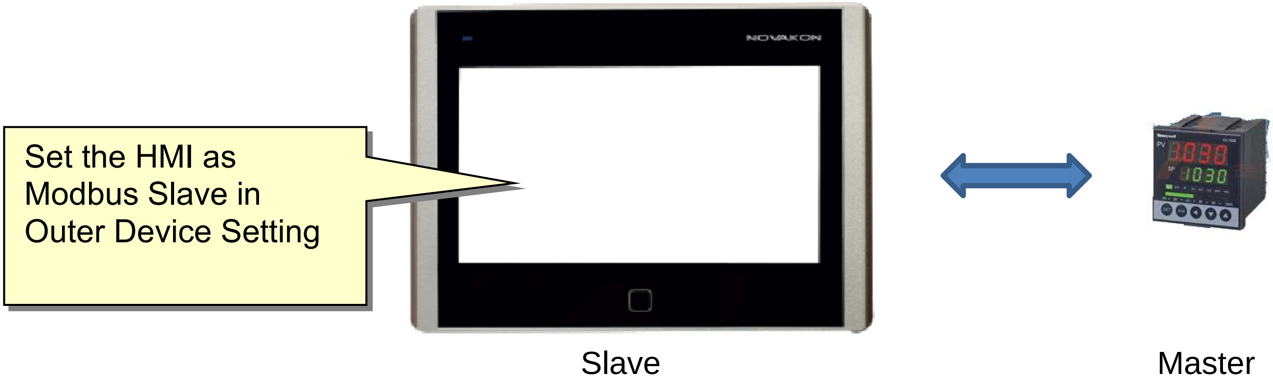
Note：the function code of Modbus write differs with the communication format of each controller. Commonly seen formats like【Code 16（0x10）】and【Code 6（0x06）】. If it is【Code 6（0x06）】, register type 【FN6HR】or【FN6HRSW】should be chosen.

1.2 Controller as Master; HMI as Slave

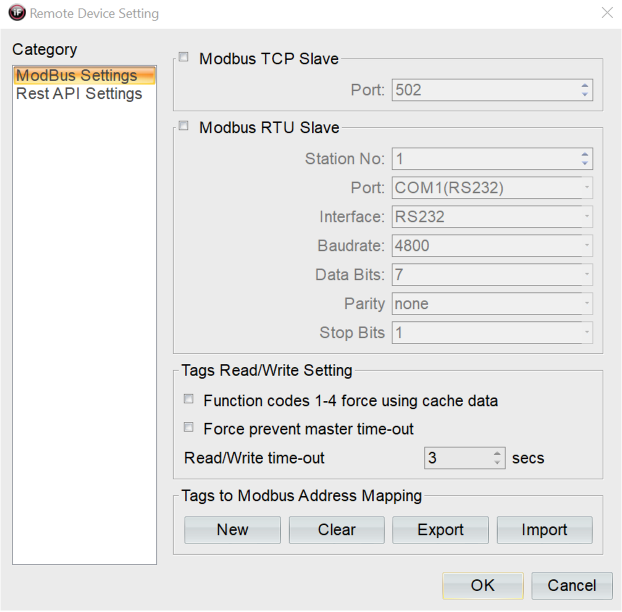
In Ribbon UI→【Setting】→【Application Settings】→Click【Outer Device Setting】to call out the setting dialog.



In such setting, it means now PLC is set as Master, HMI as Slave


Set the HMI as Modbus Slave in Outer Device Setting

In【Modbus Settings】, check the box to select the connection through either【Modbus TCP Slave】or【Modbus RTU Slave】.



Remote Device Setting

Category
- ModBus Settings
- Rest API Settings

□ Modbus TCP Slave

Port: 502

□ Modbus RTU Slave

Station No: 1
Port: COM1(RS232)
Interface: RS232
Baudrate: 4800
Data Bits: 7
Parity none
Stop Bits 1

Tags Read/Write Setting

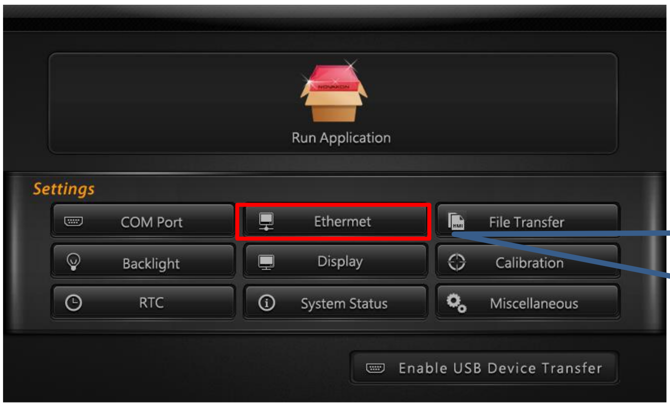
□ Function codes 1-4 force using cache data
□ Force prevent master time-out
Read/Write time-out 3 secs

Tags to Modbus Address Mapping

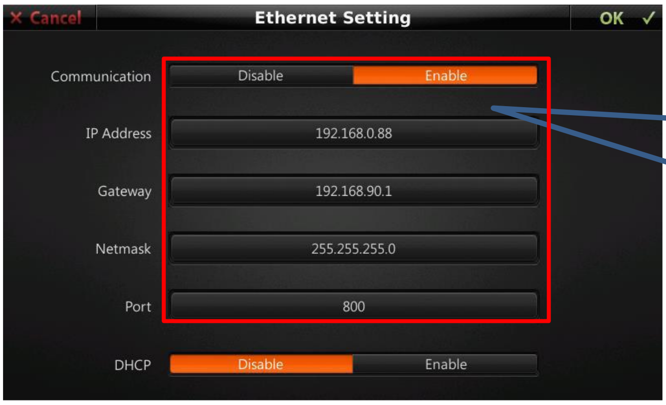
【Modbus TCP Slave】 : HMI as Modbus Slave to set the connection through Ethernet with

TCP/IP format. The IP address of the controller to be connected must be in the same network segment as the HMI.

Below picture shows how to set the IP address of HMI



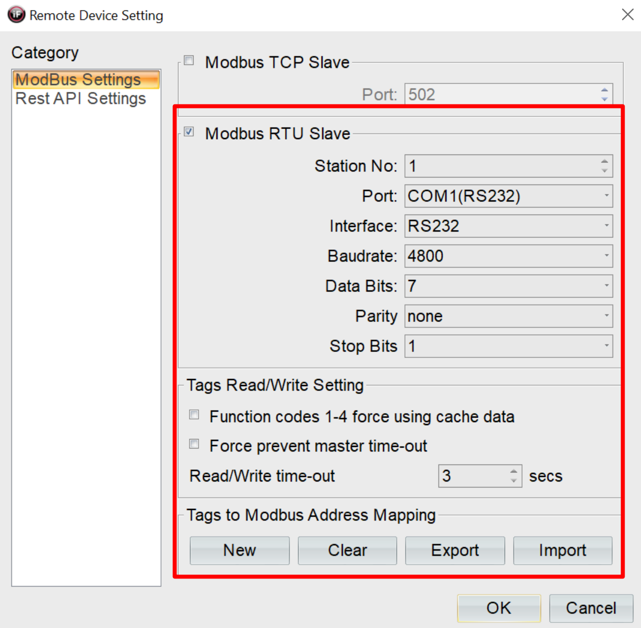
Select【Ethernet Setting】in HMI BIOS system Menu.



Communication: Disable / **Enable**
IP Address: 192.168.0.88
Gateway: 192.168.90.1
Netmask: 255.255.255.0
Port: 800
DHCP: **Disable** / Enable

Set the Ethernet parameter Communication must be 【Enable】

【Modbus RTU Slave】：HMI as Modbus Slave to set the connection through serial port with RTU format.



□ Modbus TCP Slave

Port: 502

☑ Modbus RTU Slave

Station No: 1

Port: COM1(RS232)

Interface: RS232

Baudrate: 4800

Data Bits: 7

Parity none

Stop Bits 1

Tags Read/Write Setting

□ Function codes 1-4 force using cache data

□ Force prevent master time-out

Read/Write time-out 3 secs

Tags to Modbus Address Mapping

Set the parameters of【Station No】、【Port】、【Interface】、【Baudrate】、【Data Bits】、【Parity】、【Stop Bits】to match those of your controller. Click【OK】to save the setting.

Because there is no driver selected in Modbus Slave setting to designate the register address of controller, we use HMI internal memory instead to match with the addresses of controller.

For example:

Controller (Master) address【HR1】match with HMI (Slave) address【@0】;

Controller (Master) address【HR2】match with HMI (Slave) address【@1】;

Controller (Master) address【HR1.0】match with HMI (Slave) address【@0.0】;

Controller (Master) address【HR1.1】match with HMI (Slave) address【@0.1】;

Controller (Master) address【DO1】match with HMI (Slave) address【@0.0】;

Controller (Master) address【DO2】match with HMI (Slave) address【@0.1】;

…etc.

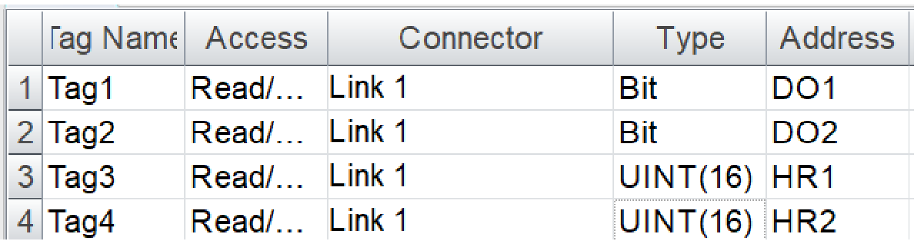
Note : 【HR】,【FN6HR】,【DO】,【FN5DO】are supported in such mapping

1.3 **Connecting two HMIs through Modbus**

A. Modbus Master Station

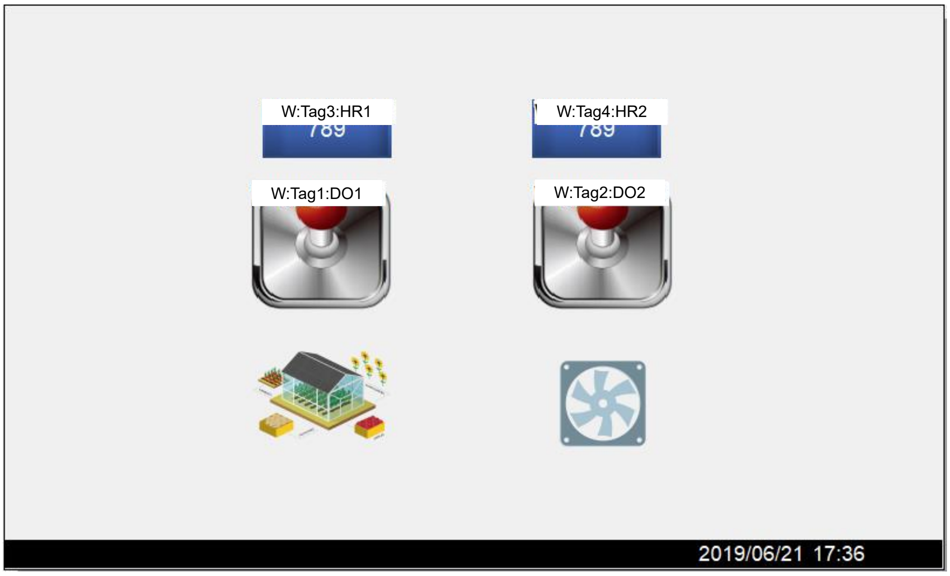
Open a new project, in【PLC Setting】select the Port to【ETHERNET】, select the controller vendor as Modbus, model as【Modbus TCP Slave】, IP Address to set exactly the IP Address of the Modbus Slave HMI, in this example,【192.16.0.58】.

1. Create tags: According to previous introduction, let us create two bit type tags【Tag1】with address of DO1, 【Tag2】with address of DO2; two numerical tags: 【Tag3】with address of【HR1】,【Tag4】of【HR2】.



	Tag Name	Access	Connector	Type	Address
1	Tag1	Read/…	Link 1	Bit	DO1
2	Tag2	Read/…	Link 1	Bit	DO2
3	Tag3	Read/…	Link 1	UINT(16)	HR1
4	Tag4	Read/…	Link 1	UINT(16)	HR2

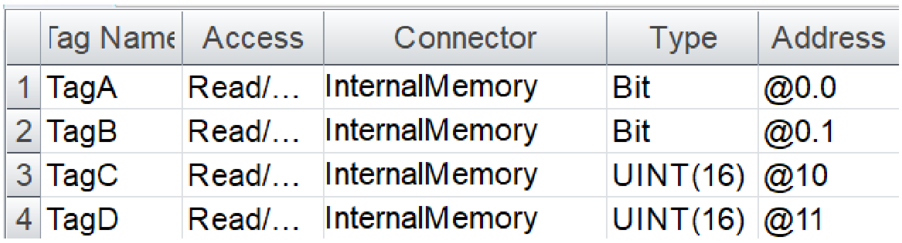
2. Drag and drop two buttons and two numerical input widgets to the screen. Set the four widgets with the four tags we created. Save and compile the project.



B. Modbus Slave Station

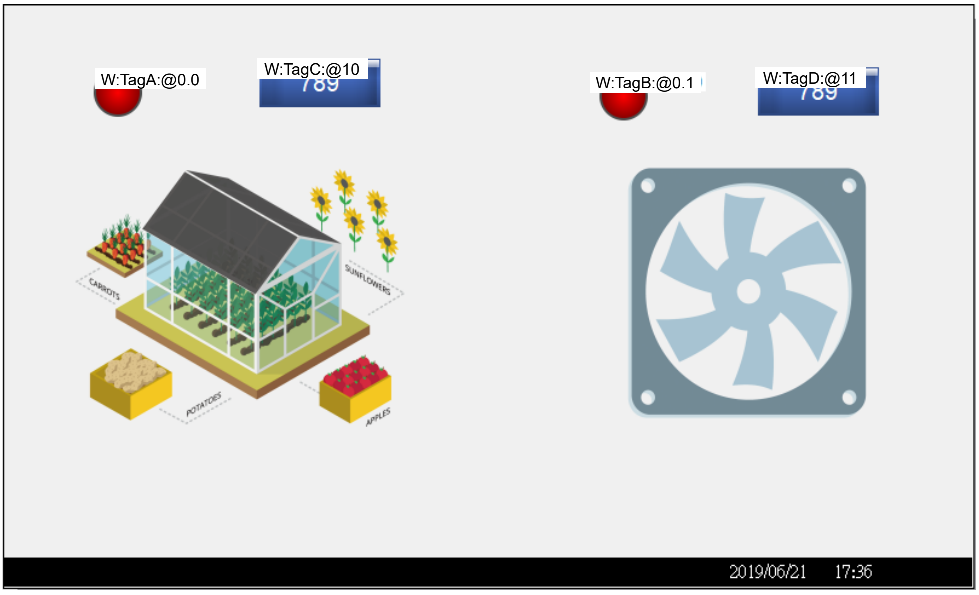
1. Create another new project. No need to select controller vendor or model in 【PLC Setting】.

2. Create tags. According to previous introduction, let us create two bit type tags 【TagA】with address of 【@0.0】, 【TagB】with address of 【@0.1】; two numerical tags: 【TagC】with address of【@10】,【TagD】of【@11】.



	Tag Name	Access	Connector	Type	Address
1	TagA	Read/…	InternalMemory	Bit	@0.0
2	TagB	Read/…	InternalMemory	Bit	@0.1
3	TagC	Read/…	InternalMemory	UINT(16)	@10
4	TagD	Read/…	InternalMemory	UINT(16)	@11

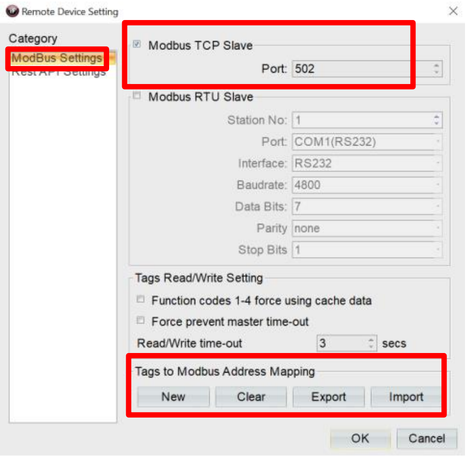
3. Drag and drop two buttons and two numerical input widgets to the screen. Set the four widgets with the four tags we created.



4. Modbus Slave Settings

Next, in Ribbon UI→【Setting】→【Outer Device Setting】to call out the setting dialog. Select【Modbus Settings】in【Category】; Set the interface and parameters for Modbus communication. In this example we use【Modbus

TCP Slave】, with default port number【502】.



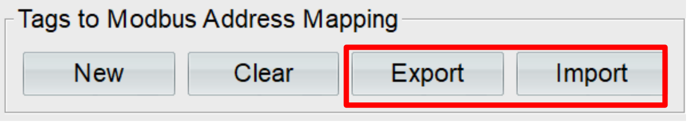
☑ Modbus TCP Slave
Port: 502

□ Modbus RTU Slave
Station No: 1
Port: COM1(RS232)
Interface: RS232
Baudrate: 4800
Data Bits: 7
Parity none
Stop Bits 1

Tags Read/Write Setting
□ Function codes 1-4 force using cache data
□ Force prevent master time-out
Read/Write time-out 3 secs

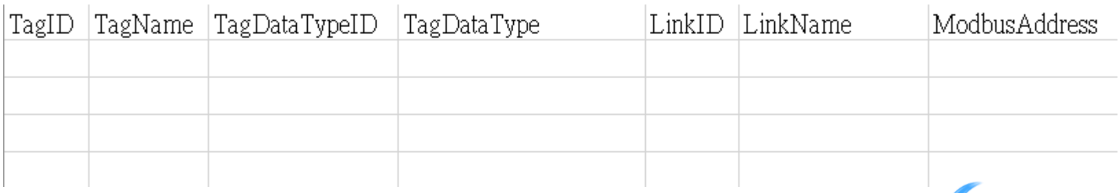
Tags to Modbus Address Mapping

C. Tags to Modbus Address Mapping



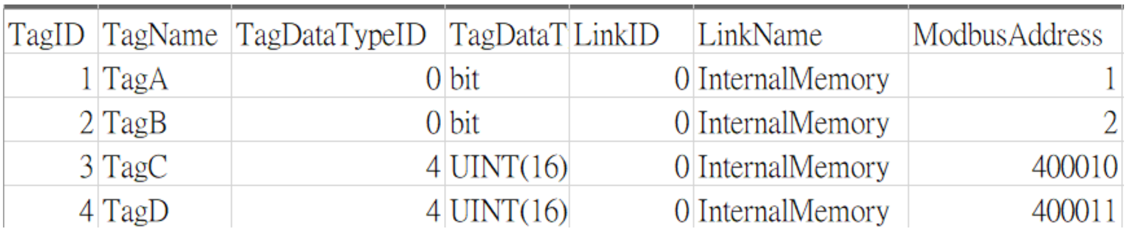
In a new project, there is no mapping table existing to import. If user is not familiar with the format of such mapping table accepted by IFACE Designer,

click【Export】to get the template for editing.



TagID	TagName	TagDataTypeID	TagDataType	LinkID	LinkName	ModbusAddress

Fill in the corresponding address and【Import】back to IFACE Designer

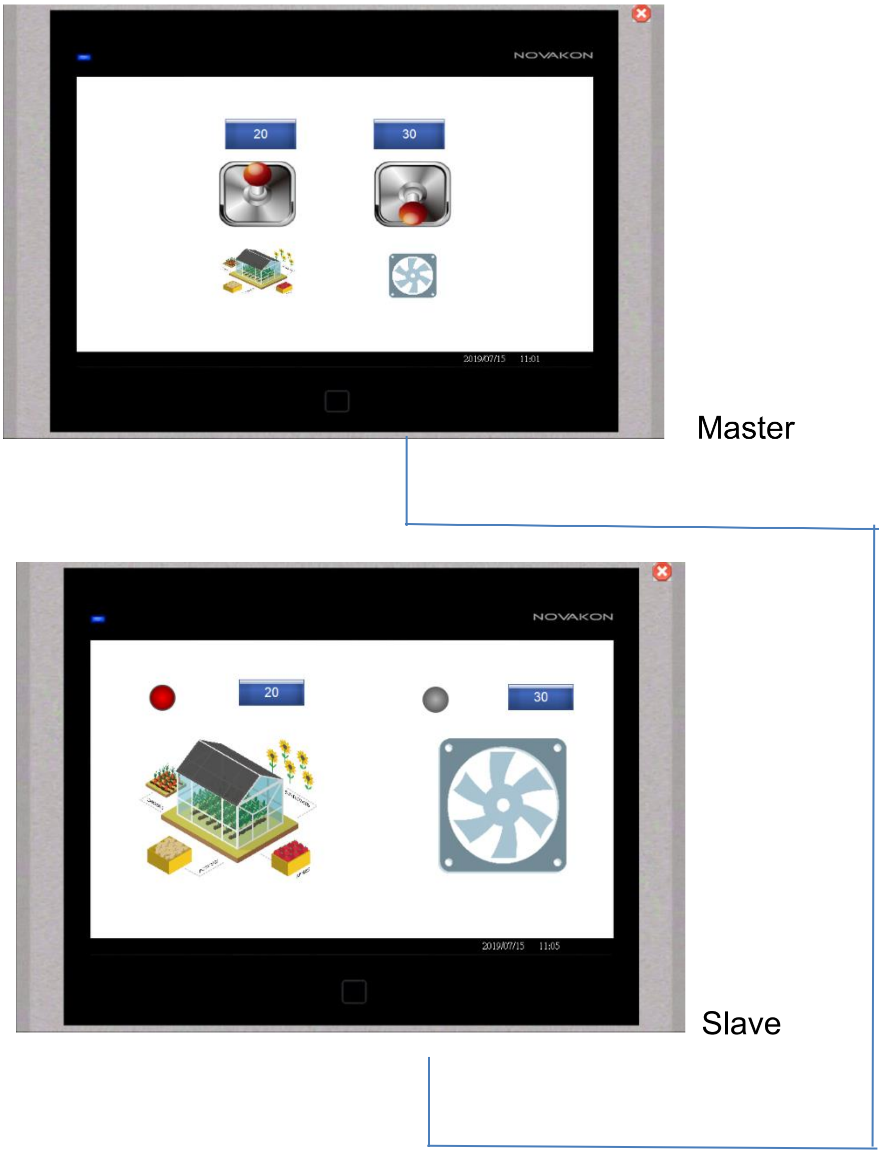


TagID	TagName	TagDataTypeID	TagDataT	LinkID	LinkName	ModbusAddress
1	TagA	0	bit	0	InternalMemory	1
2	TagB	0	bit	0	InternalMemory	2
3	TagC	4	UINT(16)	0	InternalMemory	400010
4	TagD	4	UINT(16)	0	InternalMemory	400011

5. In this example, the address mapping between Master and Slave is shown below:

Bit	Master	Slave	Word	Master	Slave
	DO1 ⟷	@0.0		HR10 ⟷	400010
	DO2 ⟷	@0.1		HR11 ⟷	400011

D. Start the connection


NOVAKON
20
30
2019/07/15 11:01
Master
NOVAKON
20
30
2019/07/15 11:05
Slave