Tutorial for HCi Design Studio

HCi **D**esign **S**tudio
HCiRX and HCiRW

Rev100

Contents

1. Applicable Products

HCi Design Studio 1.4.x is the common programming platform for a variety of Honeywell products, including the HCiRX and HMI. While the majority of this tutorial applies to each of these products, not all features are available on every model. Please refer to the data sheet of the specific model for more information.
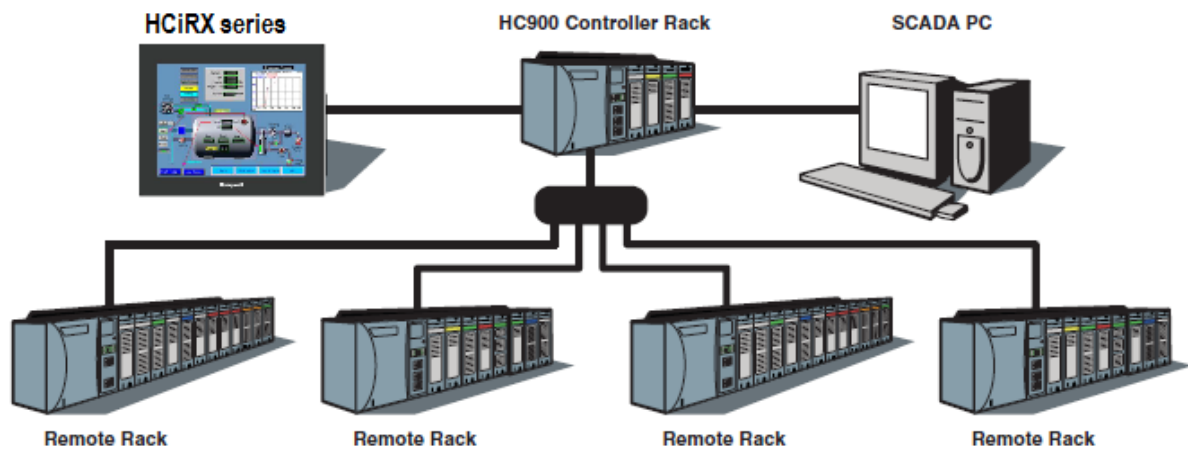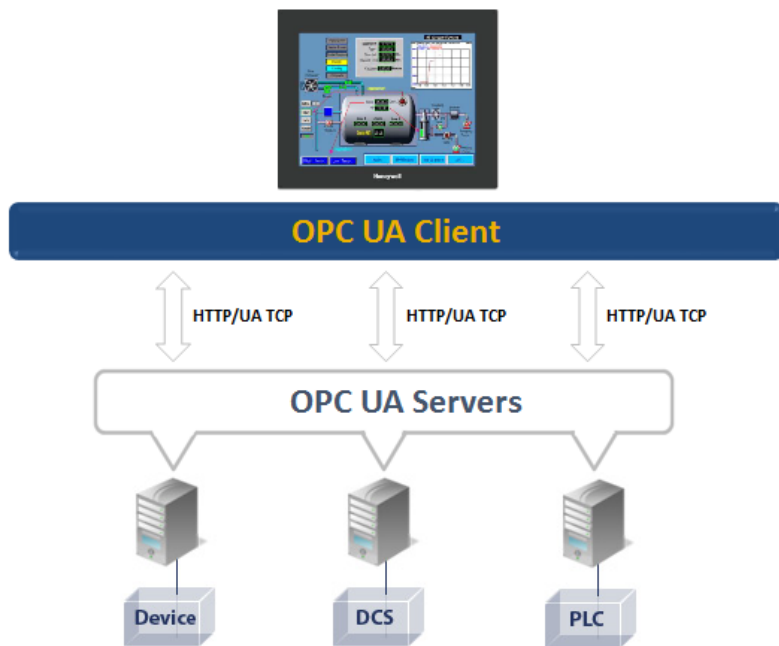
2.Protocols

Description

With upto three serial ports, and two Ethernet ports capable of running four protocols, the HCiRX is the most powerful communications platform available today. Pick the best-in-class PLC, drive, temperature controllers, etc. for your next machine. The Honeywell HCiRX will make sure they communicate seamlessly to one another.

BENEFITS
• Save time by avoiding communication card setup and programming in PLCs and other devices.
• Embedded drivers for all major automation manufacturers (200+).
• No extra hardware required when adding new equipment.
EXAMPLE
A machine manufacturer provides extra functionalities for his customer by displaying all of the process data from the multiple devices necessary for his plastic injection units.
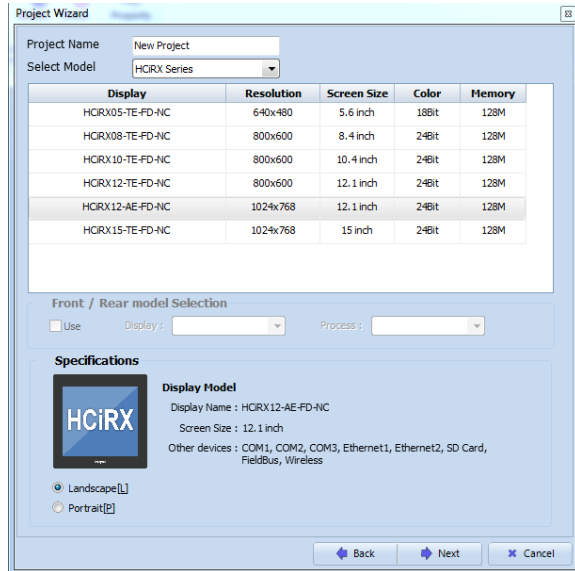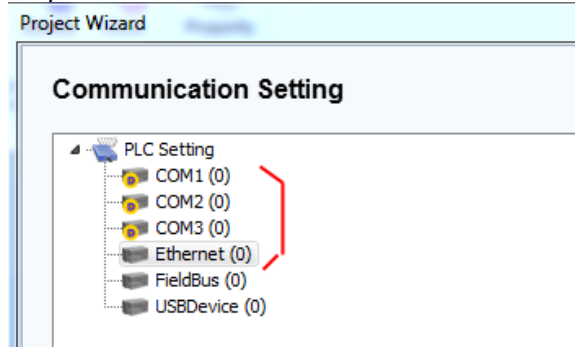
3. Project creating

Step1

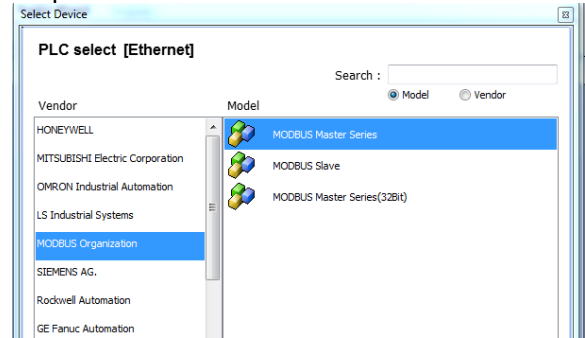Please click 'New Project' to create a project, otherwise, Open an existing file from PC

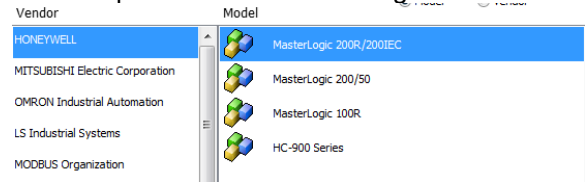## Step 2

Select a suitable model with the screen size.
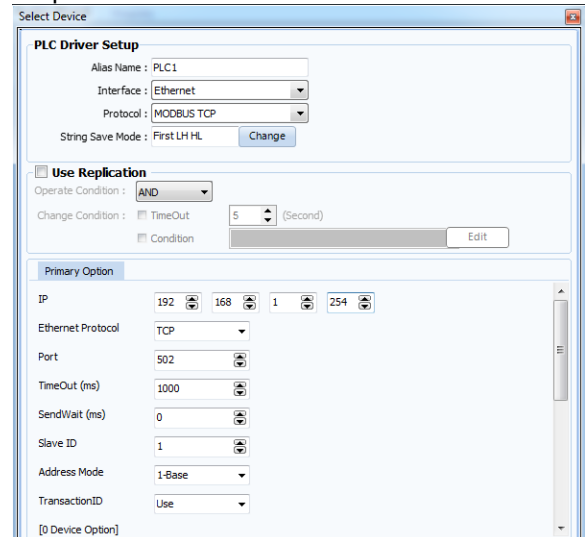

Step 3.

Step 4.

Controller drivers
Select a protocol or driver for target controller
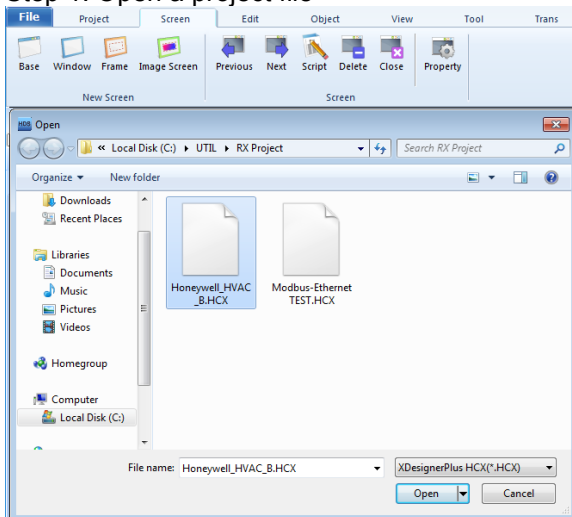

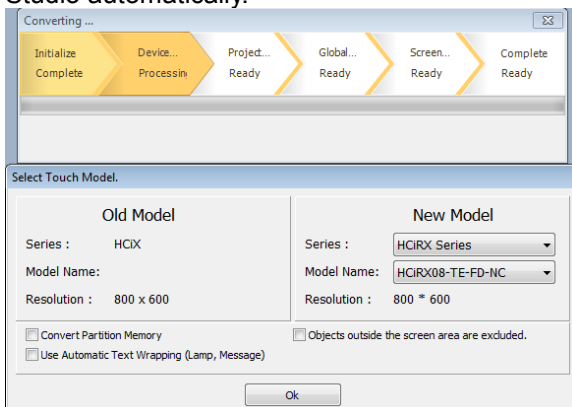## Step 5.

4. Open the Project file

In case of the project file generated as above steps(page 5), it's very easy to open a project file, and can be modified.

Now, we can try to convert the project file generated in XDesigner Plus(for HCiX series).

Step 1. Open a project file

Step 2. Started to convert to newest Design Studio automatically.

About options during converting.

1) Convert Partition Memory :
   -Checked : applied the partition info of the XDesginerPlus
   -Un-checked : applied the partition info of the new Design Studio

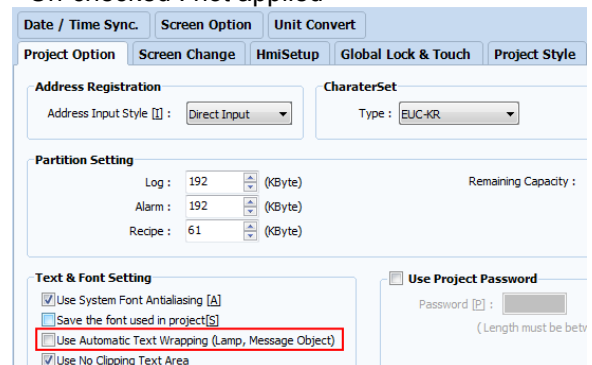2) Objects outside the screen area are excluded
   -Checked : Tags only in the screen are converted normally
   - Un-checked : All tags in this project are converted automatically.

3) Use Automatic Text Wrapping (Lamp, Message)
   -Checked : this option is applied to the converted project as below picture
   - Un-checked : not applied

Description

With the HCiRX's powerful protocol converter, you have the ability to exchange data between any and all connected devices. With a few clicks of the mouse, you can map a setpoint from a PLC to a variable speed drive, or provide a PLC program with information as to the status of a PID controller.

BENEFITS

- Save time by avoiding communication card setup and programming in PLCs and other devices.
- Exchange data between connected devices seamlessly.
- No extra hardware required when adding new equipment.

EXAMPLE

An OEM provides options for end users on his weighing system. By connecting optional devices to available communication ports on the HCiRX, exchanging data with the controller is done in minutes with no extra programming or hardware necessary.
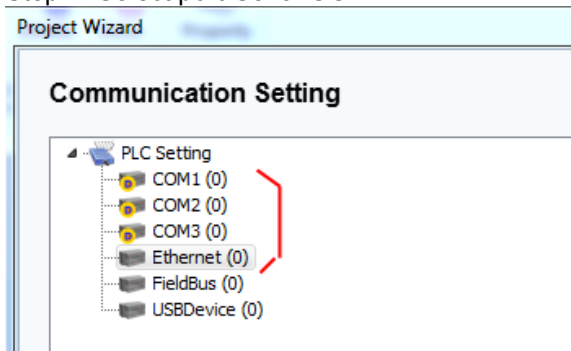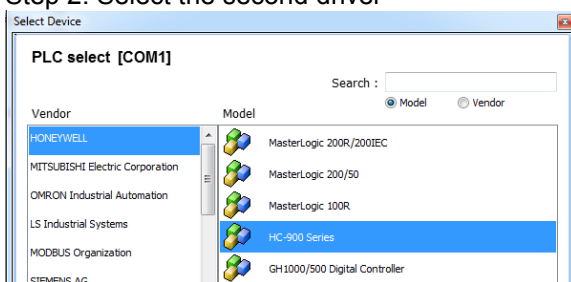
Status Bar and the infos

6. Configuration for other ports
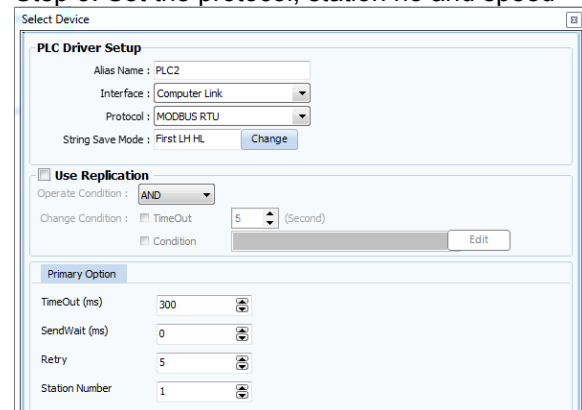
Serial pots
Step 1. Select port-Serial COM1
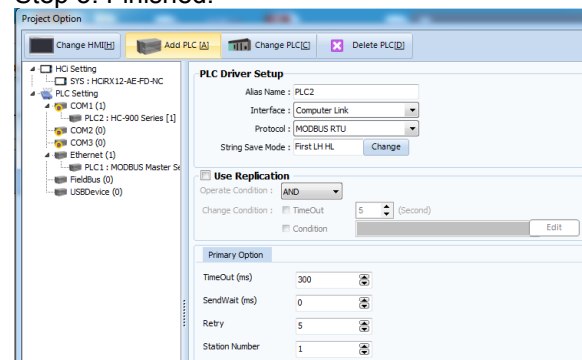

Step 2. Select the second driver

Step 3. Set the protocol, station no and speed

Step 4. For other ports, the configs are same as above
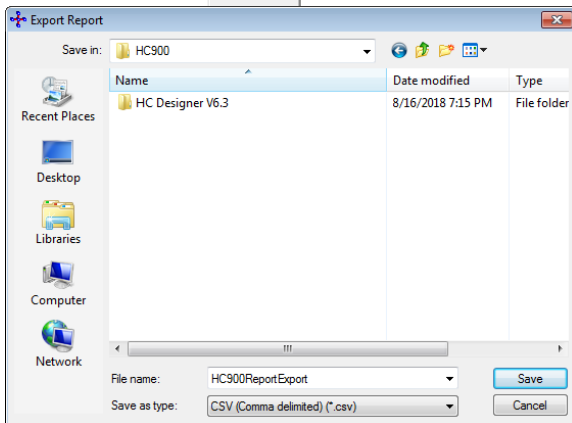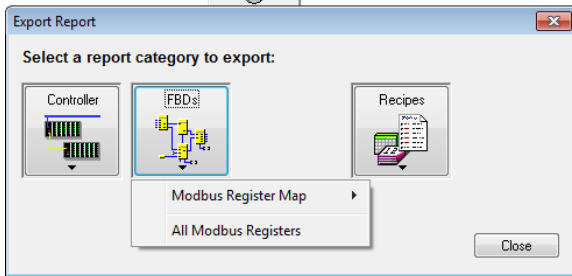
Step 5. Finished.

For more details, please refer to the HCi Design Studio user's manual.

7. Loading the register map for HC900

"HDS(HCi Design Studio)", can accept the report issued from 'HC Designer' for HC900.
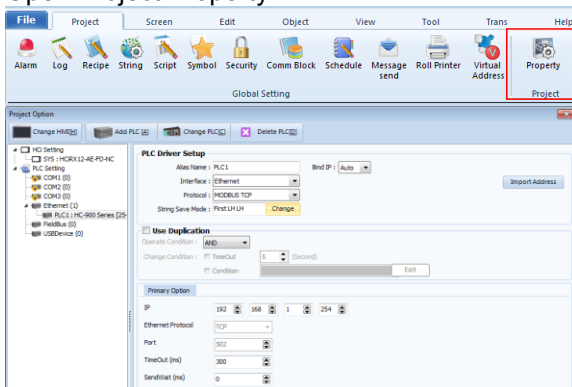
Step 1. Export Report in HC Designer(HC900)

Set a file name and path to save into PC
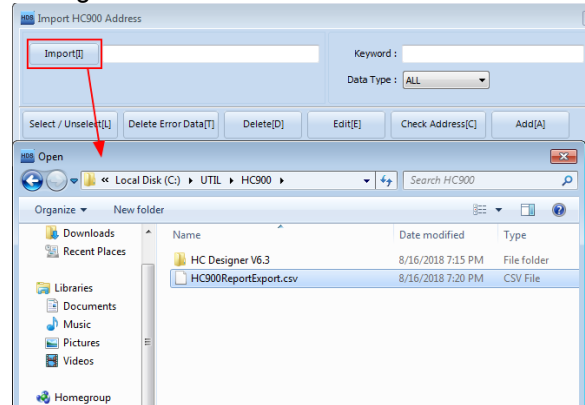Check the list in MS-Excel

Please define the 'Access' for Signal/Variables
Step 2. Import the map on HCD
Open Project Property

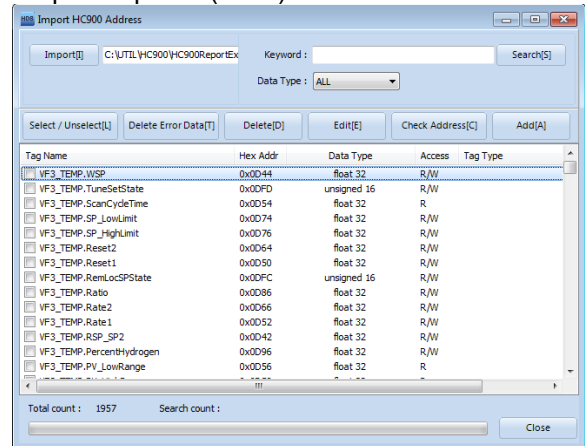Step3. Click PLC(Controller) type from PLC setting

Click 'Import' button and select a target file(report from HC900) to load the register map. *.csv

Step 4. Imported(**Note**)

Step 5. Apply the Modbus register
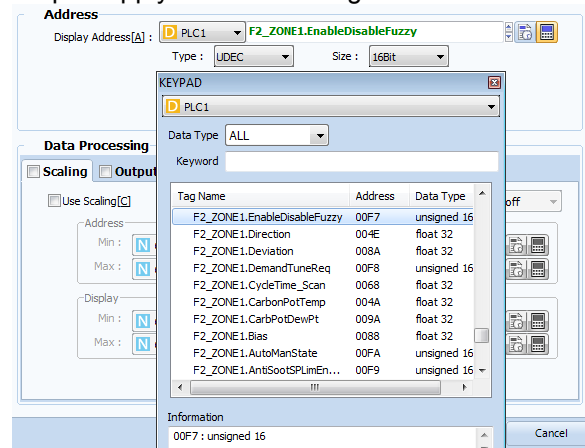
(**Note**) When it's required to import the register map several times, please delete the previous map and re-inport.

8.Configuring the map in HCi Design Studio thru "Symbol Manager"

Step 1. Create a Project
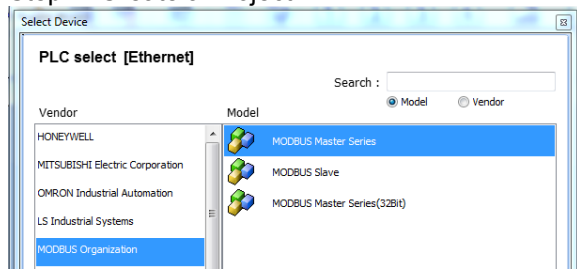
Select a device

Step 2. Click [Project]-[Symbol]

Step 3. Add a group

Step 4. Edit the map for interface in MS-Excel

Copy the list in Excel and paste them into HCD.

Step 5. Assign the symbol(address) into each tag

Data Logging

Description
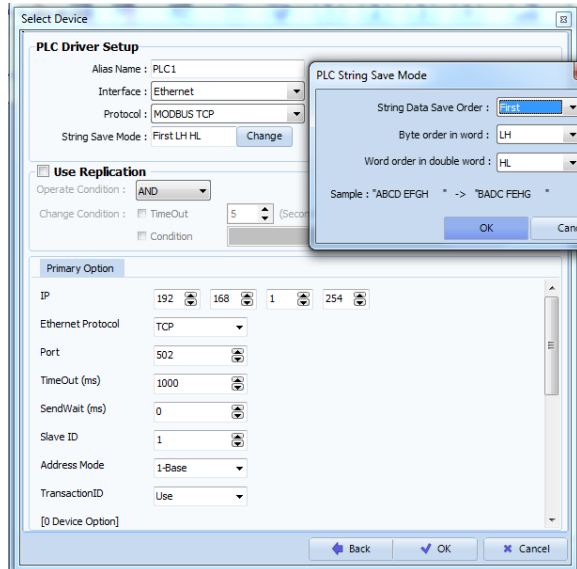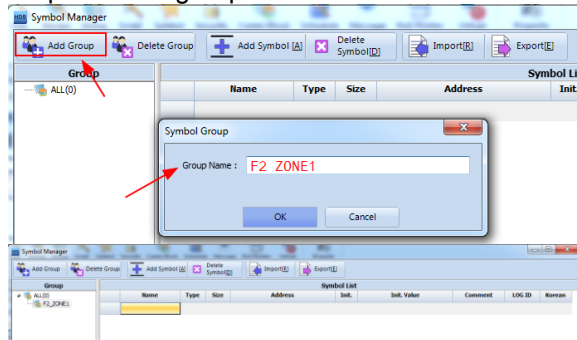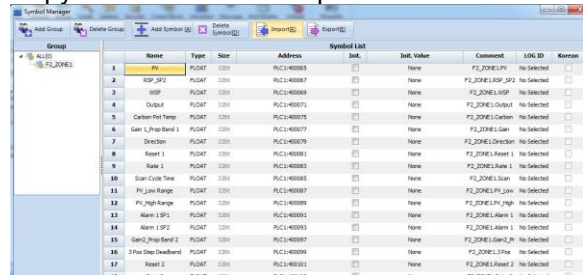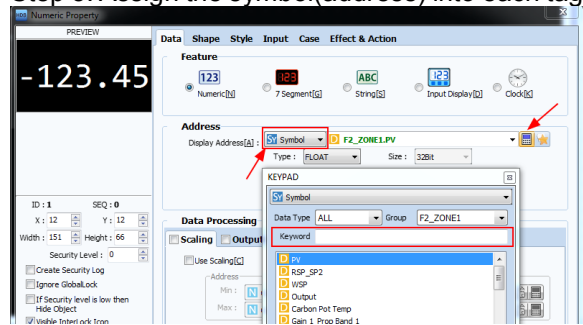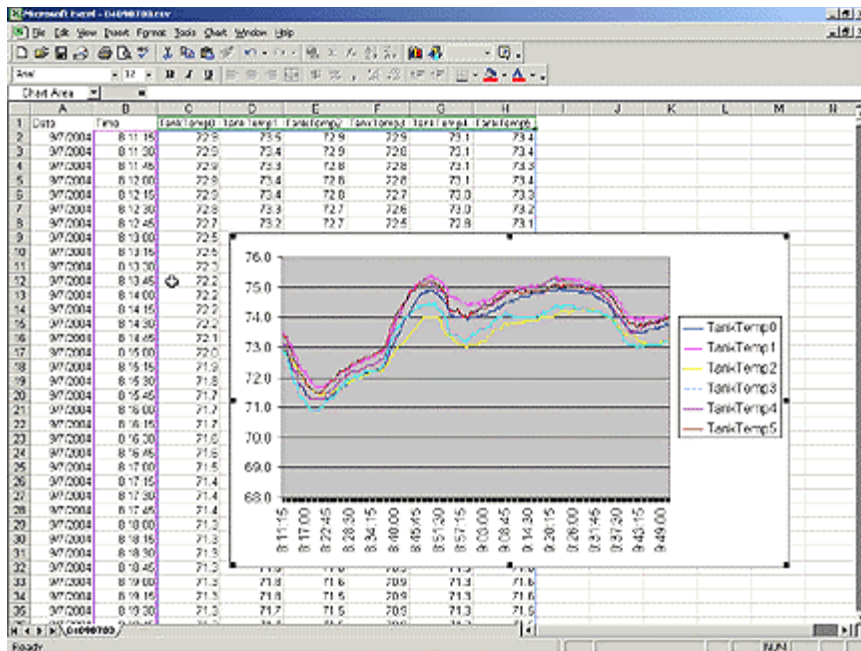

The HCiRX will log tags at user-programmable rates/period/activating conditions, and automatically time/date stamp them. This information is stored in open CSV file format, allowing you to access the data with virtually any application, including Microsoft Office applications.

BENEFITS
- Record your system's performance for faultfinding or process improvement.
- Facilitate preventive maintenance by monitoring critical areas of your system.
- Built in data logger provides "IT-Ready" data in CSV file format.

EXAMPLE

A cold storage facility uses the HCiRX to monitor and record multiple refrigerators data to ensure that the food is kept at safe temperatures. If a problem occurs, the HCiRX notifies the appropriate personnel before unsafe conditions are reached. Further, by monitoring the refrigeration system's response to events, such as a door causing a temperature rise, the health of the system can be evaluated.

9. Data Logging steps

Step 1. Select a Log icon

Step 2. Enter Log Setting
Input the address type and how many words to save in to memory per file
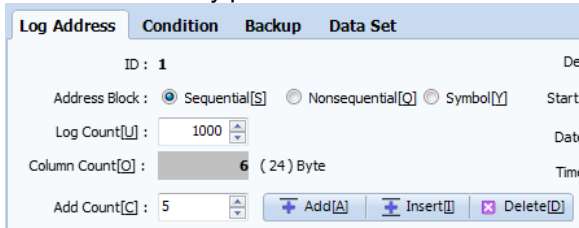
Set the Address and format for time/date
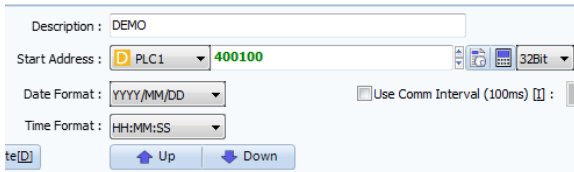
Step 3. Define the Condition for logging
Whenever a bit is activated, logging will be
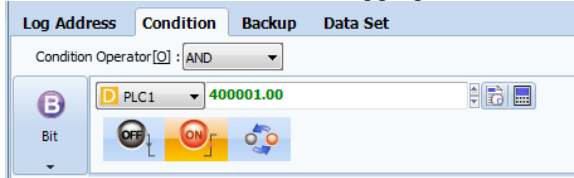
Step 4. Check the config info on real time
Define the 'Estimated occupied memory' automatically calculated,
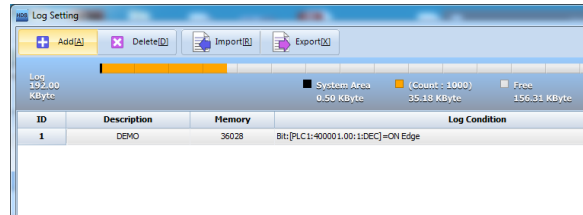
Step 5 'Add' more files for logging

Step 6 Import the edited file(config format) from PC

Step 7 Export the edited file(config format) to PC
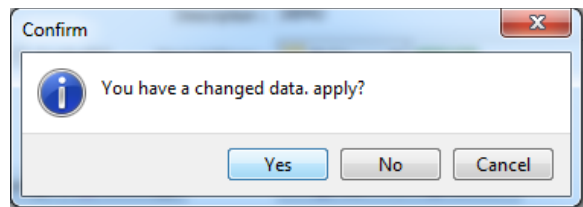
In this example, whenever bit [addr:400001.0] is ON, HCiX will try to log the data counts=5 words from [Addr:400100], 32bit data unit.

Data logging completed!

Logged data to SD card or copy to USB memory stick on menu
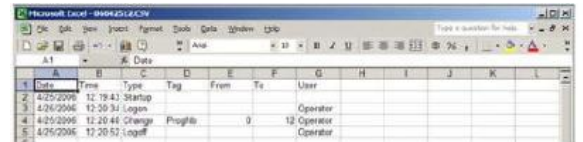
10. Alarm Configuration Steps

Step 1. Enter Alarm setting

Step 2. Add group
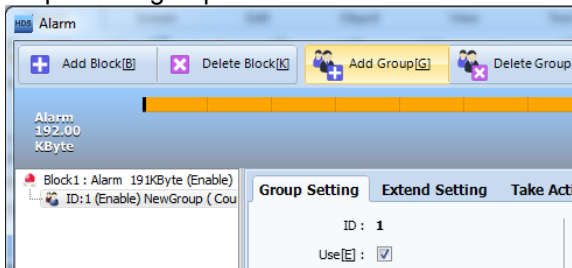
Step 3. Configure the Alarm info
Address, Add count(or click 'Add'),
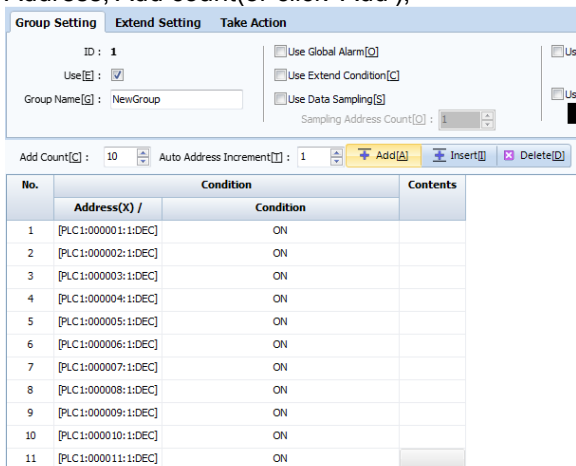
Click calc pad beside address data column.
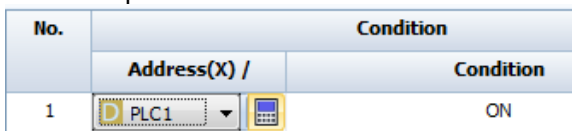
Input address directly.
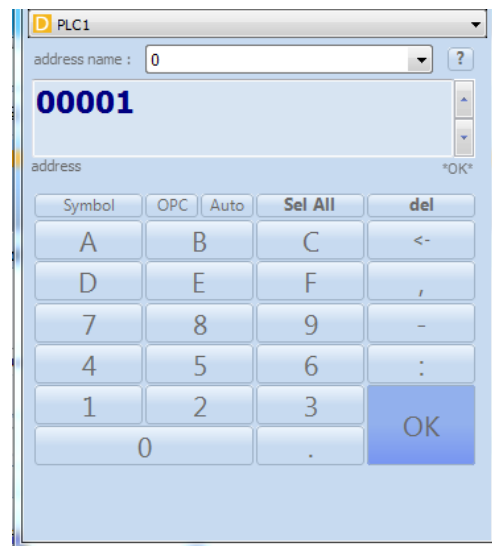
Set the alarm message.

Step 4. Import and Export the data
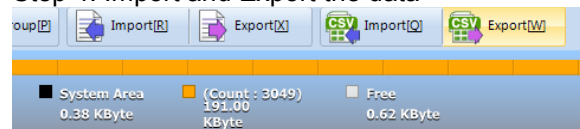
Step 5. the CSV data, Import from PC or Export to PC. CSV data is editable in MS-Excel.
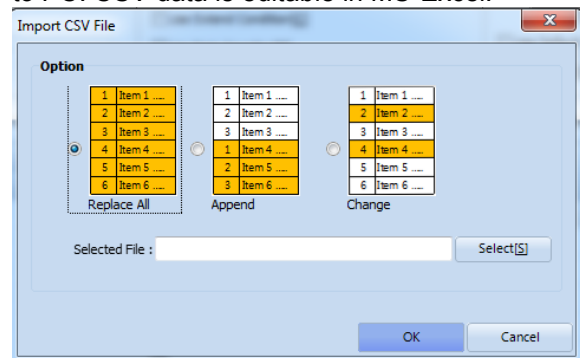
Step 6. Repeat the above steps to add more alarms and edit the existed data

Completed!
Logged data to SD card or copy to USB memory stick on menu

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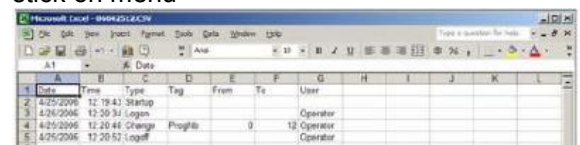
11. Security Manager

The Security Manager provides multi-user, multilevel password protection. The advanced security page access or operator actions as well as any data changes for later review.

Step 1. Enter the Security configuration window.

Step 2. Check 'Use Security Level'
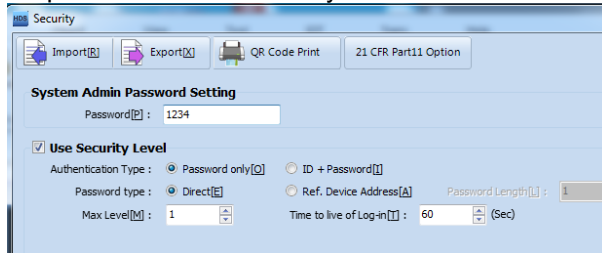
-Authentication and Password type
-Add and Edit multi-Level password group
-Set the time for keeping the input, 'Time to live Log-in'

Step 3. Input the Identified info and password data
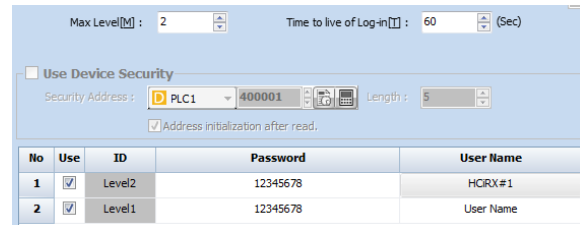
Step 4. Assign this password data into any tags

BENEFITS
• Protect your machine from unauthorized operators and manage users and rights easily.
• Log all user actions for production follow up.
• Get the history of all your parameter modifications for faultfinding and maintenance.

EXAMPLE
An OEM specializing in sterilization equipment provides his customer with multi-user password protection for his autoclaves system. Production error due to operator failure can be found with the security logger. This allows management to review operator access when quality issues arise

Several models of the HCiRX series HMIs offer one SD card port for backup externally. The HCiRX can be configured to automatically synchronize files to and from the SD card or internal memory for file transfers. The HCiRX may also be configured to automatically retrieve a new configuration file, as well as the necessary firmware files, to change the unit's configuration without a PC.

BENEFITS
• Retrieve the data log files using a SD card.
• Transfer new recipe information to the panel's SD card without a PC.
• Update the unit's configuration via SD card.
• Data backup to other device, including USB memory stick.

EXAMPLE
A customer can have an employee visit their remote sites to retrieve log files, as well as to update any recipe information, while simultaneously updating the unit's configuration file to the latest revision. The employee need not have a PC, or any training regarding the use of HCi Design Studio – a simple memory stick is all that is required.

12. Using Ext. Memory

Purpose : Configuration and Firmware updates
The config for external memory(SD card) is able
to do in Alarm, Log setting separately.

Step 1. Config in Log setting
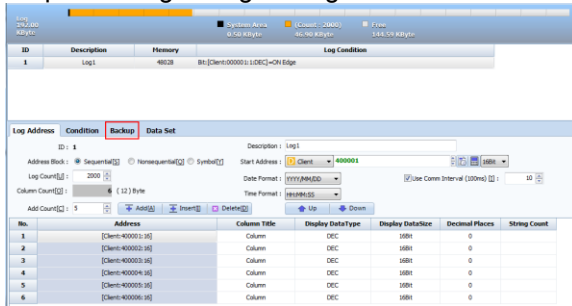
Step 2. Check the Backup storage = SD Card

Step 3. Occupied memory rate
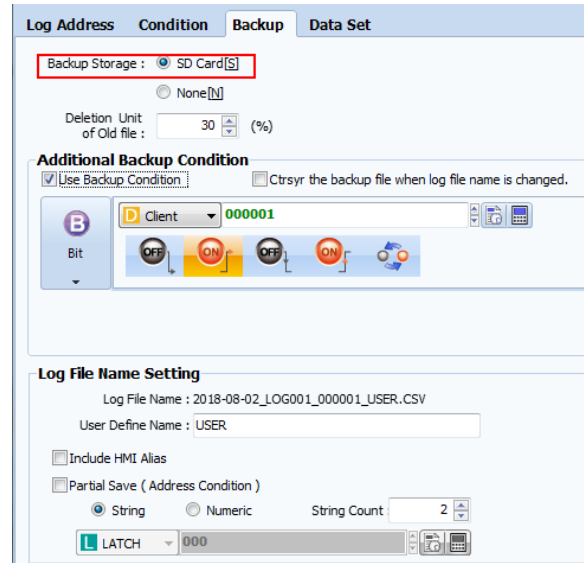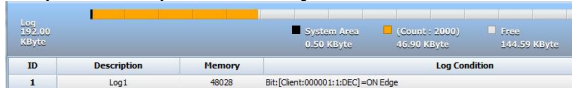
DESCRIPTION

The Emulator provides a unique facility to design and test your application. This not only allows you to test the user interface portion of your HCiRX HMI configuration.

BENEFITS
• Test your database directly on computer; no hardware required.
• View the web server and log files to preview data available for your customer.
• Simplify database development and save time by testing your program enhancement straight away.

EXAMPLE
A special purpose machine manufacturer develops a new database for each new project. The emulator gives him the opportunity to review and test his database design before hardware delivery, saving time when performing on-site commissioning.

13. Offline Simulator

Step 1. Menu select, [Menu]-[Trans]
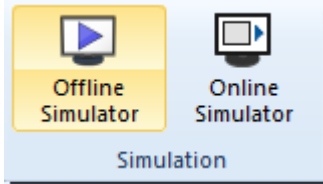
Step 2. Select 'Offline Simulator=Emulator'
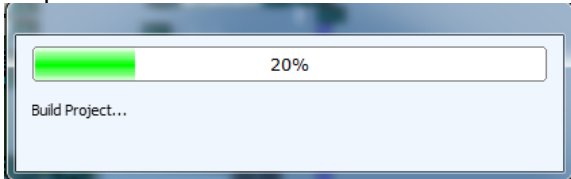
Step 3. Run Simulator

Step 4. Select 'Online Simulator', connection with controller

Please check the connecting status and targeted controllers.

Description

Several models of the HCiRX series HMIs offer one USB host port for support of various devices, including USB memory sticks. The HCiRX can be configured to automatically synchronize files to and from the USB memory or internal memory for file transfers. The HCiRX may also be configured to automatically retrieve a new configuration file, as well as the necessary firmware files, to change the unit's configuration without a PC.

BENEFITS
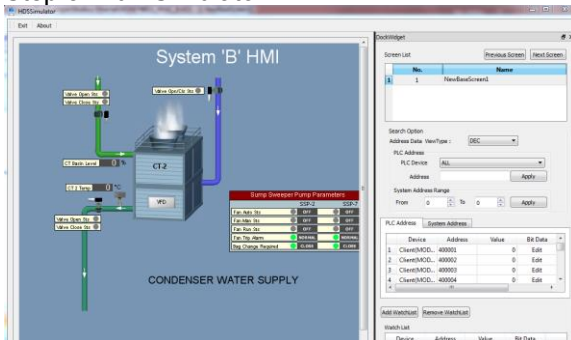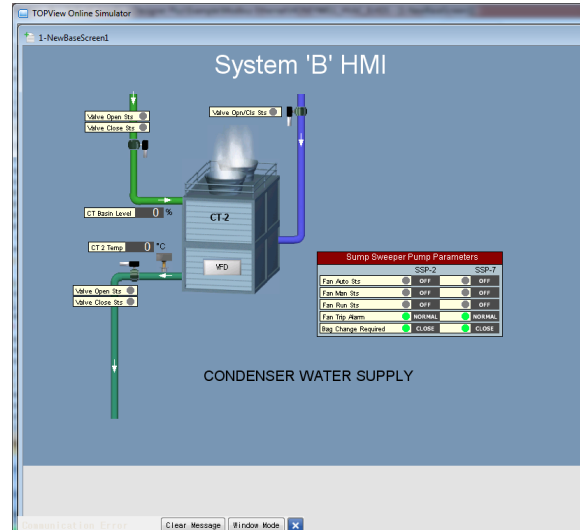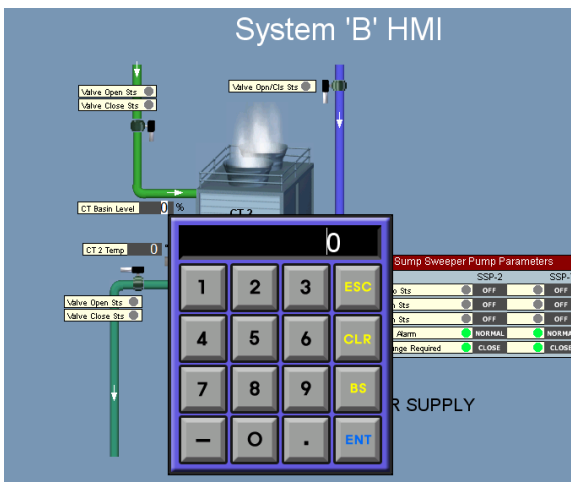• Retrieve the data log files using a USB memory stick from SD card or internal memory.
• Update the unit's configuration via USB memory stick.
  Firmware update, data backups, etc

EXAMPLE
A customer can have an employee visit their remote sites to retrieve log files, as well as to update any recipe information, while simultaneously updating the unit's configuration file to the latest revision. The employee need not have a PC, or any training regarding the use of Station Designer – a simple memory stick is all that is required.

14. Configuring USB Memory Stick Support
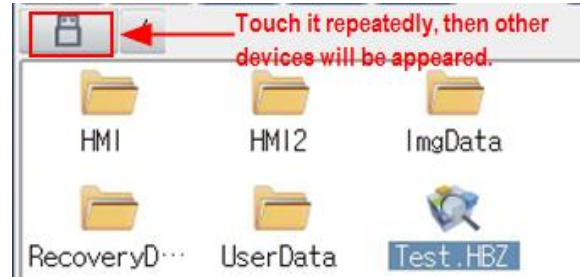

14-1. Configuration and Firmware updates

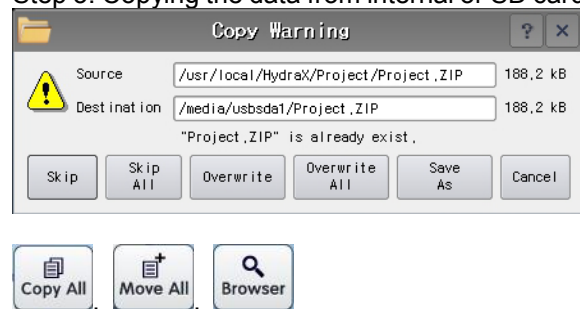When the menu is activated, touch the top side of the screen, and then drag down it into below side.

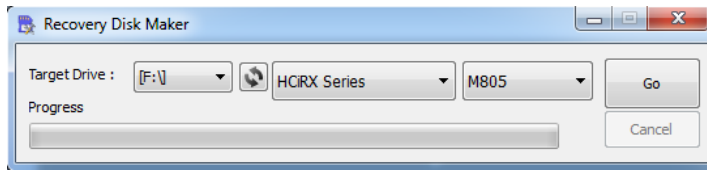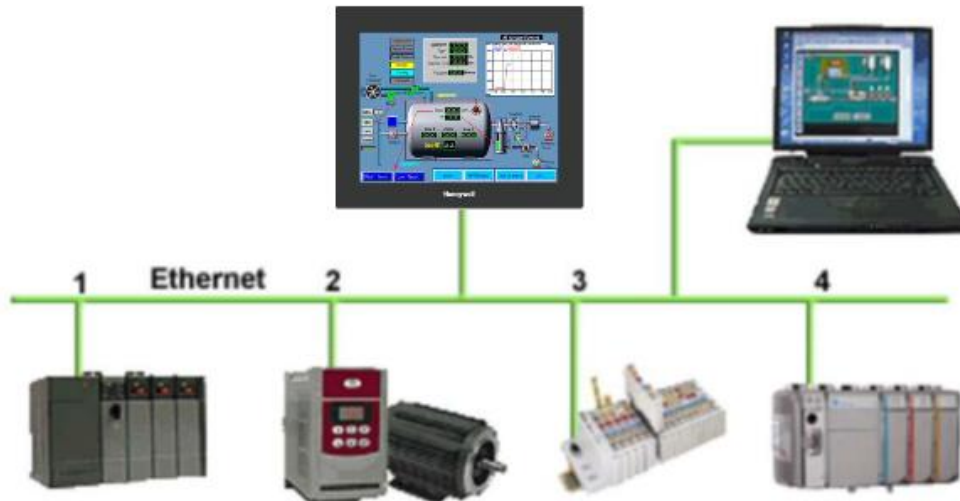Step 1. Click 'Browser'

Step 2. Change the devices

Step 3. Copying the data from internal or SD card.

14.2 Recovery Disk

With an Ethernet port capable of running four protocols, in addition to all of the serial ports, the HCiRX is the most powerful communications platform available today. Pick the best-in-class PLC, drive, temperature controllers, etc. for your next machine. The Honeywell HCiRX will make sure they communicate seamlessly to one another.

BENEFITS
• Connect any Ethernet enabled equipment to the HMI and access the device's data.
• Up to 4 different protocols provide extensive communication on Ethernet with more than 16 built in drivers for easy programming.
• Gateway functionalities to transfer data from any HMI serial port to Ethernet and vice versa.

EXAMPLE
A customer wanted to connect his existing Ethernet based PLC to a drive, which was also equipped with Ethernet. By using the protocol capability of the HCiRX series HMI, the customer integrated the two easily.
By upgrading existing machines with the HCiRX series HMI, the customer immediately added Ethernet connectivity to them – something that was previously considered too costly. Now these machines are capable of providing production data, without the risk associated with attempting to upgrade the PLC.

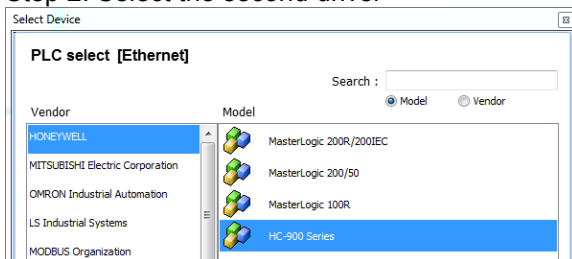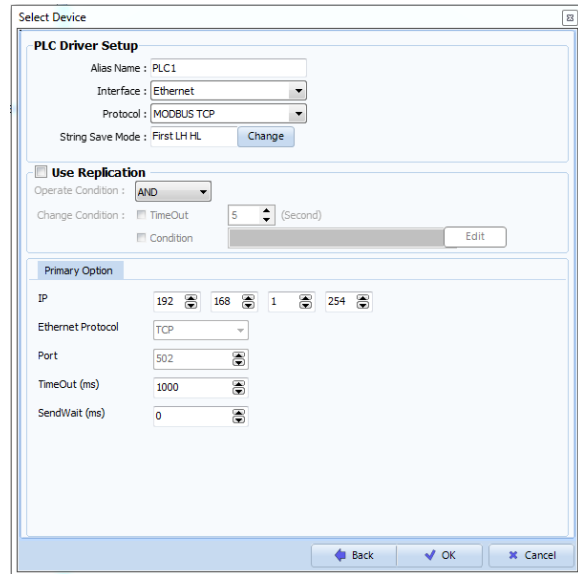# 15. Serial communication

Step 1. Select port-Ethernet comm
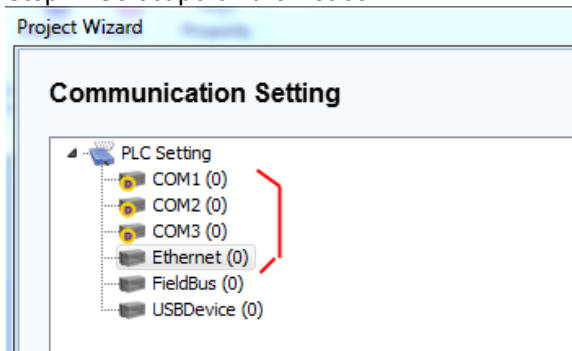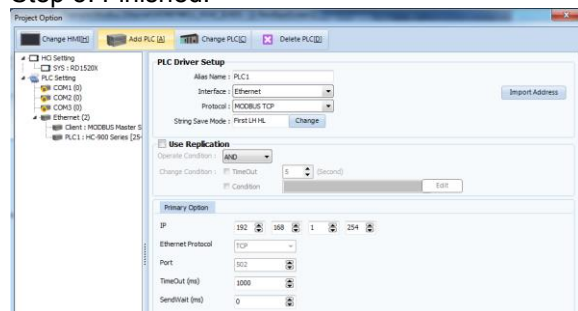

Step 2. Select the second driver

Step 3. Set the protocol, station no and speed

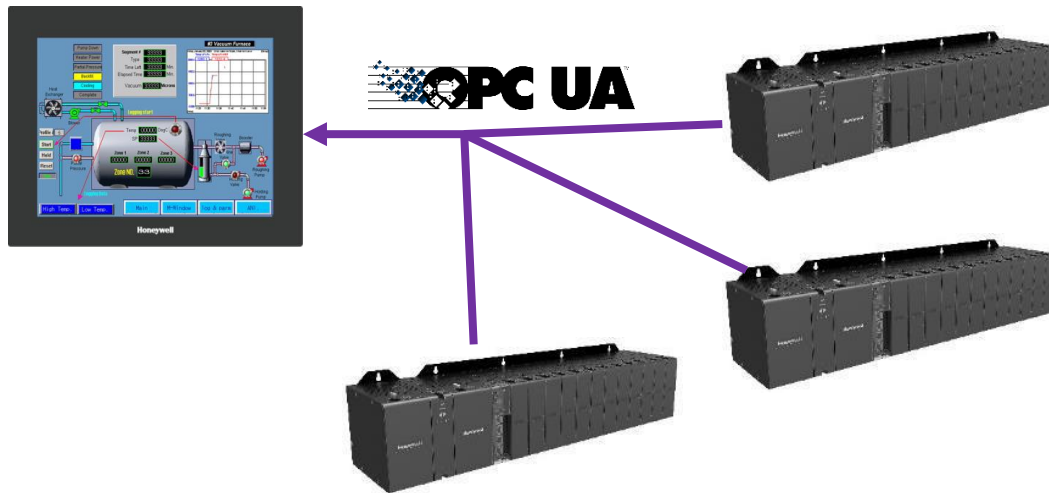Step 4. For other ports, the configs are same as above

Step 5. Finished.

For more details, please refer to the HCi Design Studio user's manual.

Description

HCiRX support OPC UA Client internally, user can create and configure an OPC UA to communicate with the controllers(OPC UA servers).

BENEFITS

• Connect any Ethernet enabled equipment to the HMI and access the device's data.
• Able to monitor the data from Honeywell devices via OPC UA of one protocol
• Convert the protocol to other data for general controllers

EXAMPLE

A customer wanted to connect his existing PLC(Ethernet based) to some controllers, which was also equipped with Ethernet. By using the protocol capability of the HCiRX series HMI, the customer integrated the simple via OPC UA.

The ML200 OPC UA module has the following features.
- Message encryption function
- Certificate authentication function
- User security function
- Variable read / write function
- Variable monitoring through subscription (MonitoredItem) function
- Alarm / Event function for variables
- History function for variables

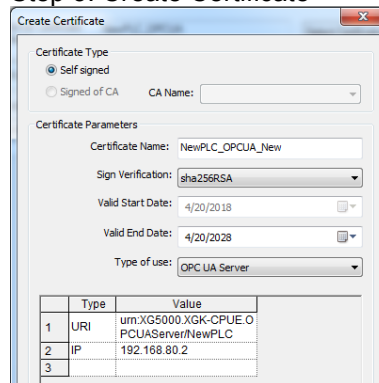The maximum performance specifications of ML200 OPC UA module are as follows.
- Up to 10 OPC UA clients can be connected (The OPC UA module can establish a session with OPC UA 10 clients).
- Up to 7000 OPC UA variable settings are available.
- Up to 10 subscription channels can be registered per session, and up to 50 subscription channels can be registered in one module.
- Up to 1000 variables (MonitoredItem) can be registered per subscription channel, and up to 5000 variables (MonitoredItem) can be registered in one module
- ML200 OPC UA Server supports Security Profiles which are No Security, 128Rsa15 Sign, 128Rsa15 Sign & Encrypt, 256 Sign, 256 Sign & Encrypt, 256Sha256 Sign, 256Sha256 Sign & Encrypt.
- Up to 100 alarms / events can be registered for LimitLevel and OffNormal.
- History function can save a total of 3000 histories for up to 64 variables
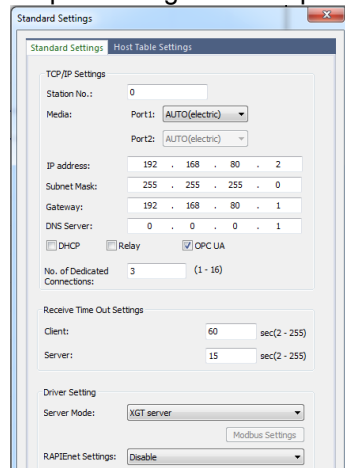
16. Interface with ML200 PLC

Step 1. Firmware in the Enet module
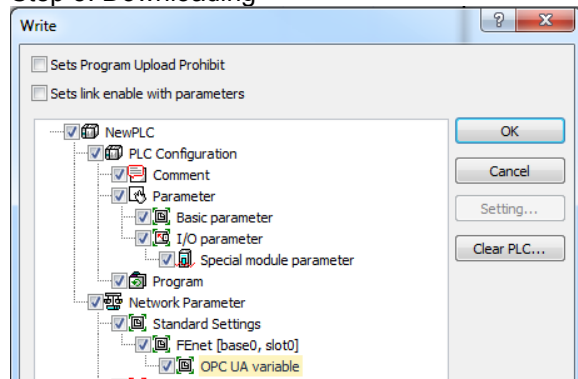**Check and upgrade if necessary**

Step 2. Config the basic parameters
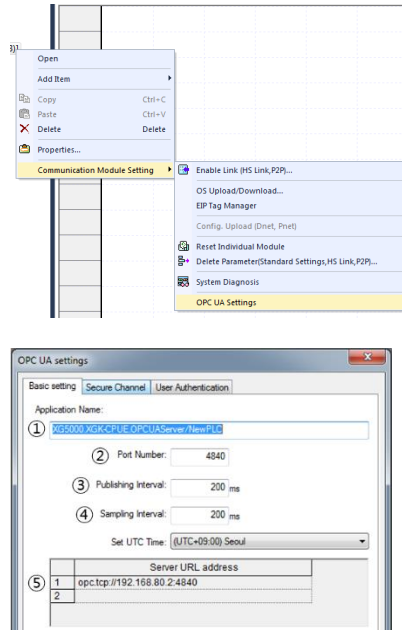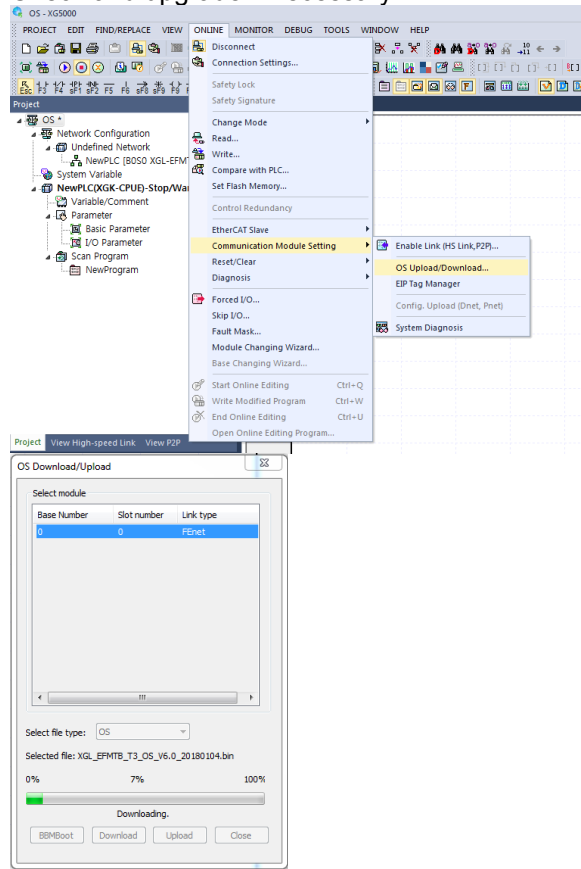
Step 3. Create Certificate
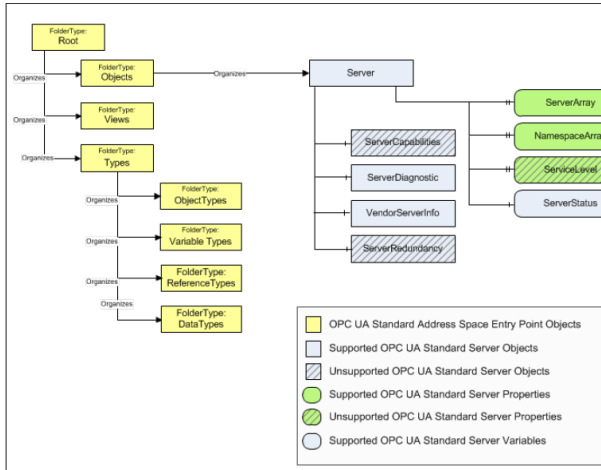

Step 4. Setup variables
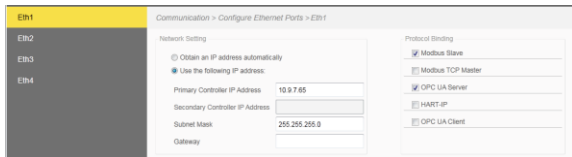

Step 5. Downloading

17. Interface with ControlEdge PLC with OPC UA

ControlEdge PLC can publish the variables for OPC UA automatically to Experion and other client.

Hierarchy of OPC UA in ControlEdge PLC

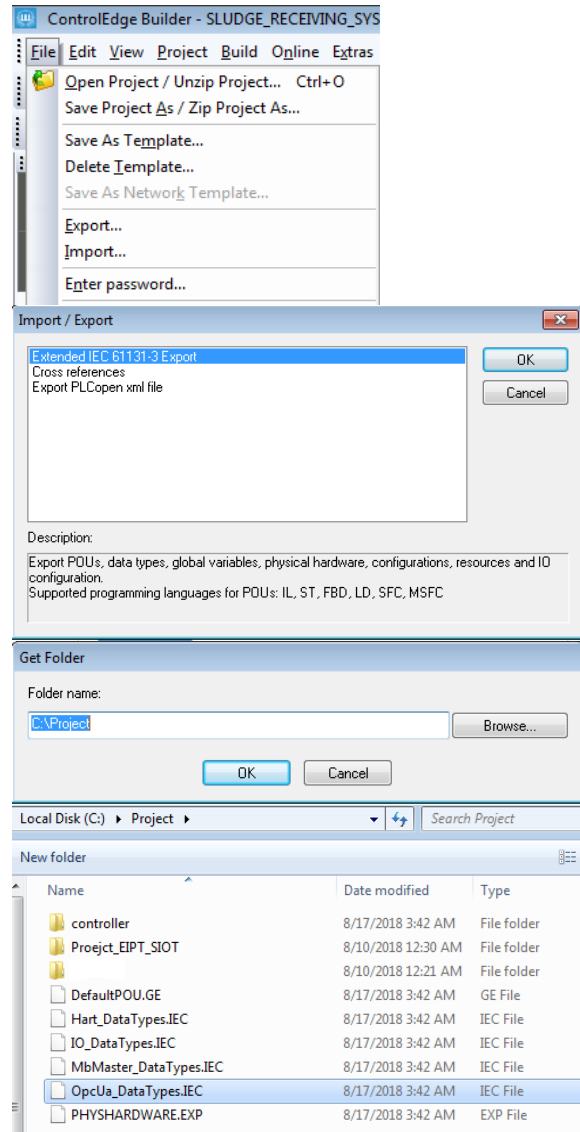Step 1. Configure Ethernet Ports, and select ETH1 or ETH2

Step 2. Under Network Setting, select Use the following IP address and enter the IP address of the Ethernet port.

Step 3. Under Protocol Binding, select OPC UA Server.
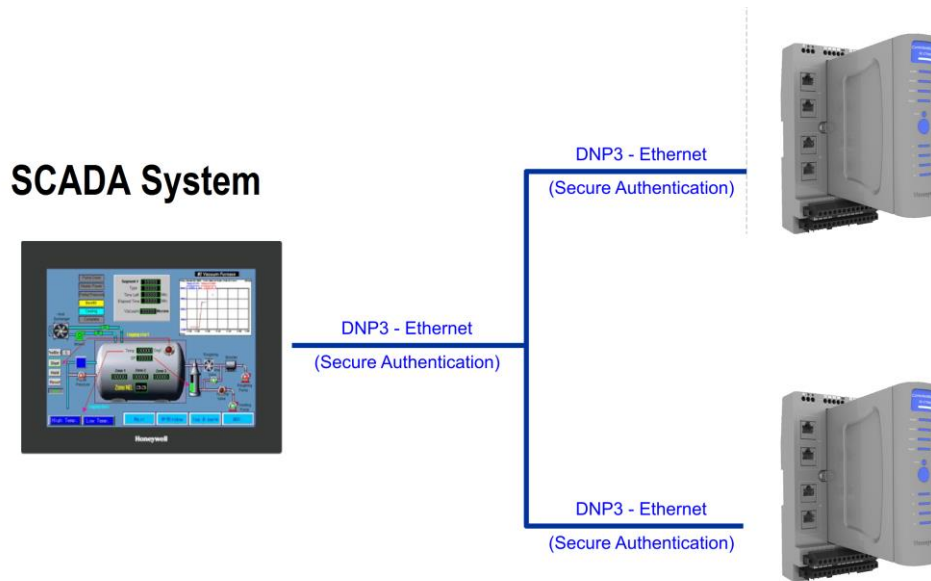
Step 4. OPC UA server configuration

Step 5. Export the GV list externally.

Select "Export" to generate the list for interface.

Step 6. Server Endpoint URL
opc.tcp://192.168.1.10:4840
opc.tcp://192.168.2.10:4840

Description

HCiRX support DNP3.0 client internally, user can create and configure an OPC UA to communicate with the controllers(DNP3 servers).

BENEFITS
• Connect any Ethernet enabled equipment to the HMI and access the device's data.
• Able to monitor the data from Honeywell devices via DNP3 of one protocol
• Convert the protocol to other data for general controllers
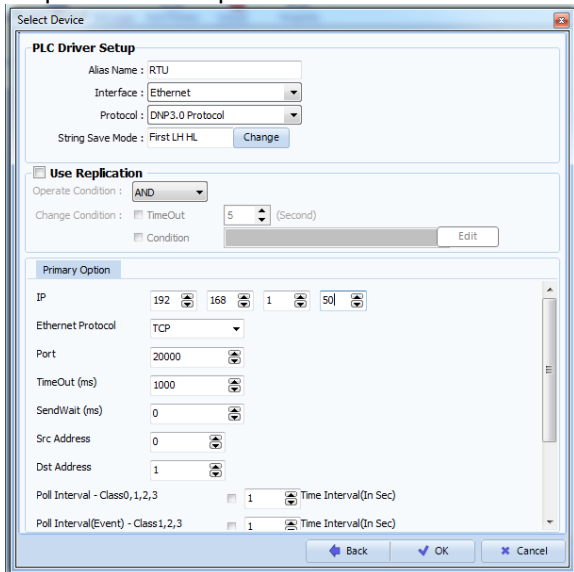
EXAMPLE
A customer wanted to connect his existing PLC(Ethernet based) to some controllers, which was also equipped with Ethernet. By using the protocol capability of the HCiRX series HMI, the customer integrated the simple via DNP3.
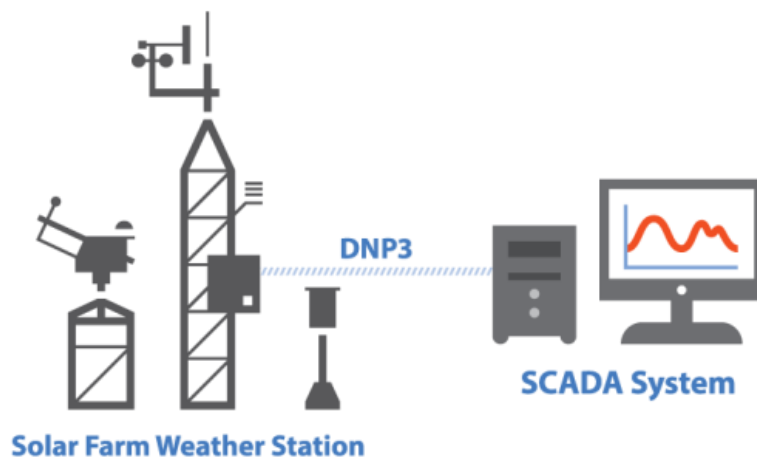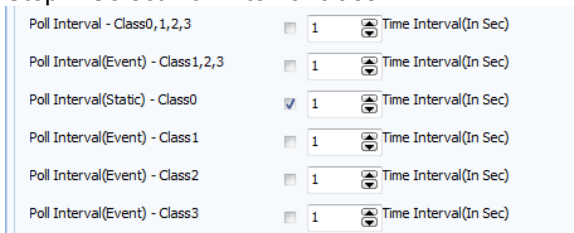
18. Configuring PLC driver setup for DNP3

Step1. Driver setup

Address, Protocol type, Port No and Dest Address
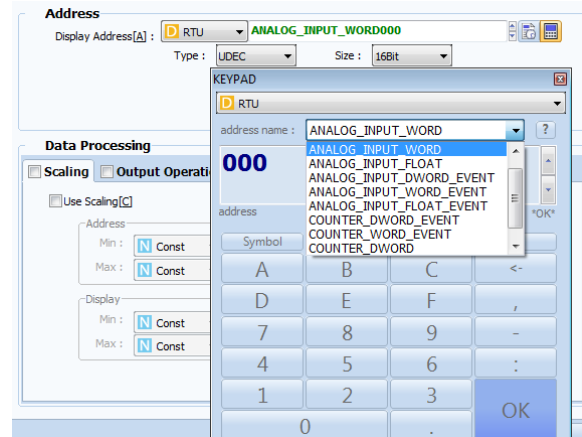
Step2. Select Poll Interval class

Step3. Address in ControlEdge RTU

Step4. Config Address in Design Studio for HCiRX

(1)for Reading in bit
    BIT_INPUT_FLAG
    BIT_INPUT_FLAG_EVENT

(2)for Reading in bit
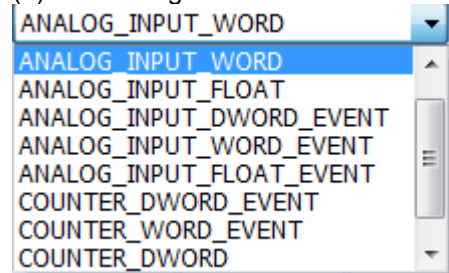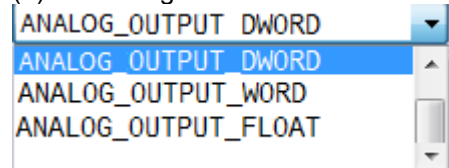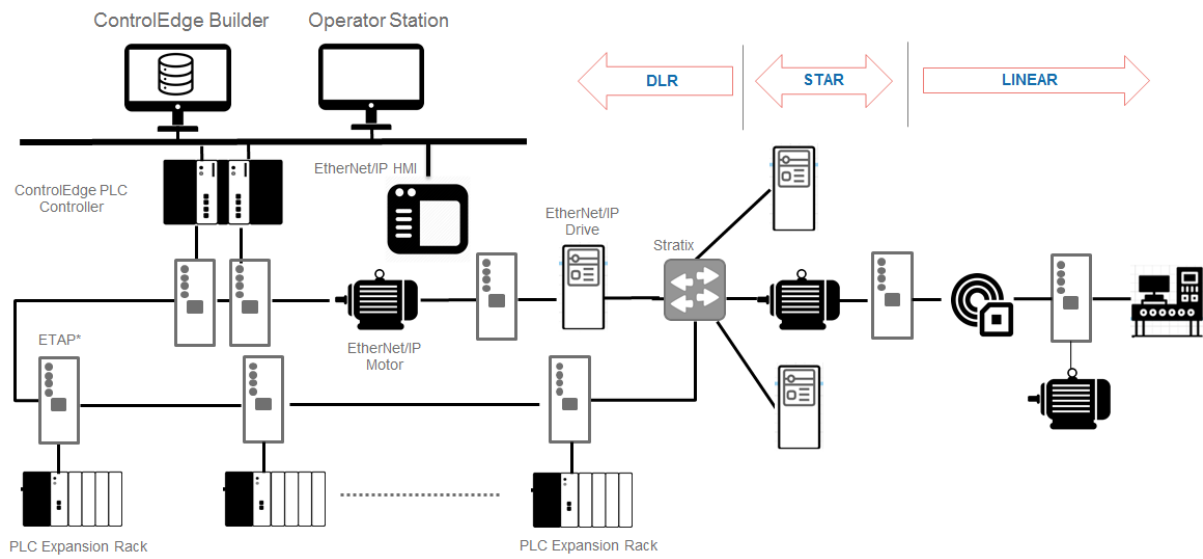

(3)For Writing in Bit
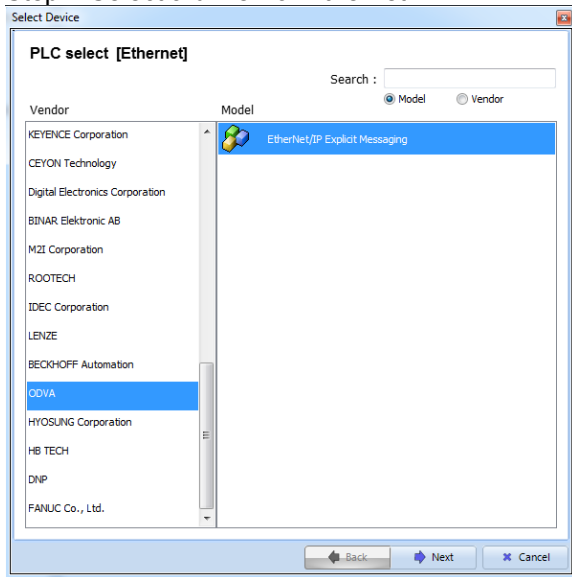   BIT_OUTPUT_FLAG

(4)For Writing in Word

Description

TBEN-L1-8DIP-8DOP_R2.7.eds
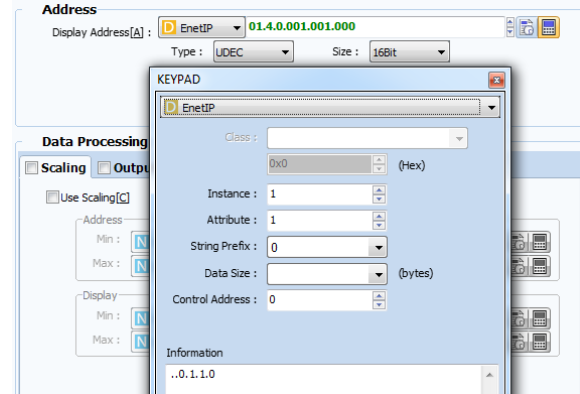
19. Ethernet/IP configuration

Step1. Select a driver for Ethernet/IP

Step2. Config Enet/IP
IP Address, Port No

Step3. Setting on tags

Step4. Register map

□ EIP Input				
Turckaiao_Input	_30_6811451_E...	VAR_GLOBAL	Turckaiao_Input	%IB0
turckdido_Input	_30_6811451_E...	VAR_GLOBAL	turckdido_Input	%IB96
□ EIP Output				
Turckaiao_Output	_30_6811451_E...	VAR_GLOBAL	Turckaiao_Output	%QB0
turckdido_Output	_30_6811451_E...	VAR_GLOBAL	turckdido_Output	%QB96
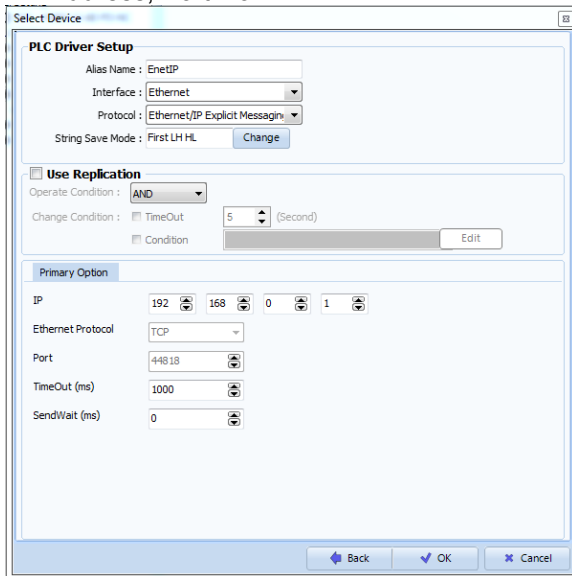
From ML PLC

Index	Ch	Operation mode	I/O type	Connection type	Function	Parameter	Parameter contents	Conditional flag
0	0	Explicit Client			2. Generic READ	Parameter	Service Code(Hex):e Class(Hex):4 Instance(Hex):1b Attribute(Hex):3	_T200MS

| Transmission period(ms)	Time out	Data type	tag settings		Data count
			Local tag	Remote tag	
		ARRAY[0..66] OF BYTE	test/%MB2		67

Description
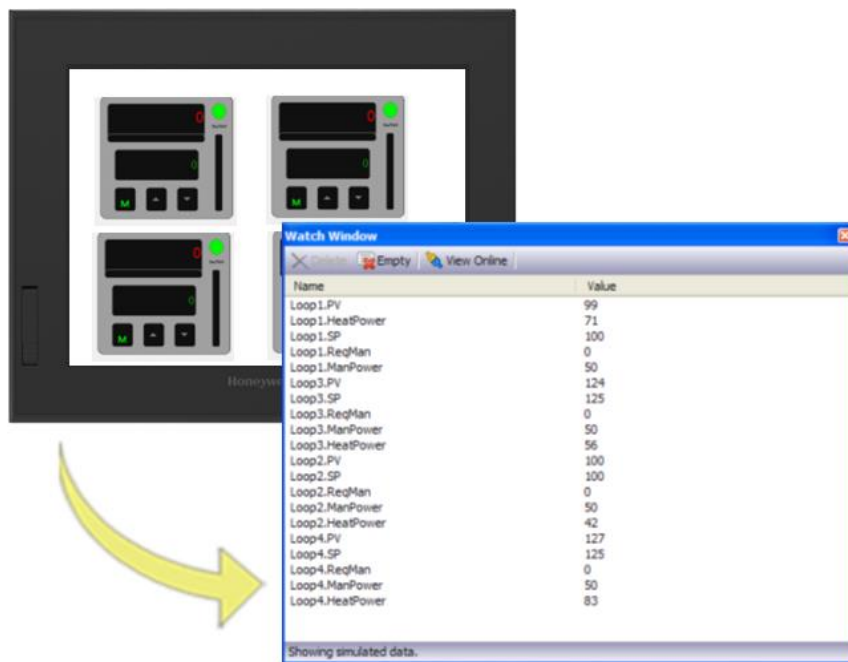
With the List feature in Project property, tags can be viewed live within HCi Design Studio. Viewing tags on-line offers an easy means of troubleshooting problems, reducing engineering time.
Online simulator is a helpful tool for this, to communicate with controller on real time.

BENEFITS
• Reduce engineering time by verifying that the data is valid, based on variables.
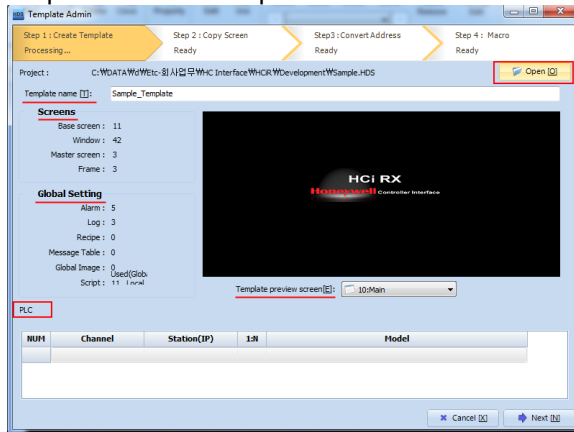• View tags over Ethernet to troubleshoot systems remotely.

EXAMPLE
A technician uses the Watch Window to quickly find tag-mapping errors by comparing the PLC's data with the HCiRX tags, saving valuable commissioning time.
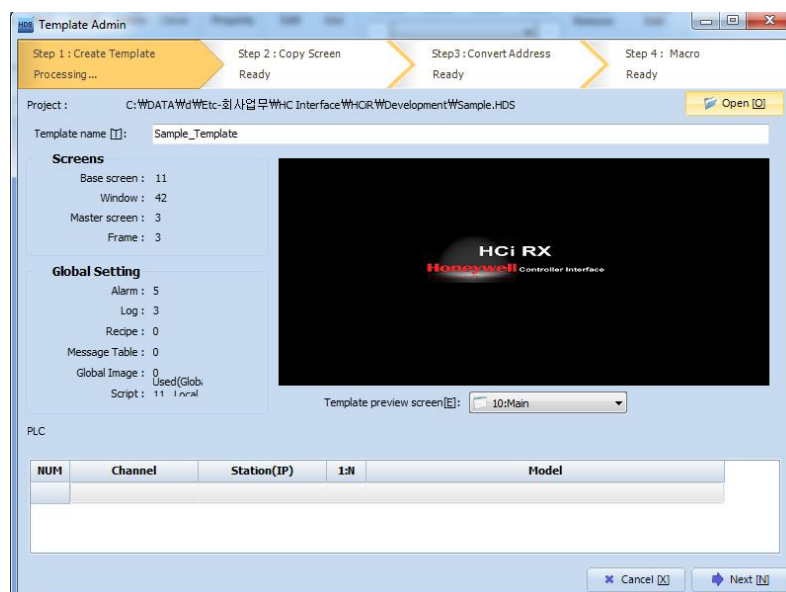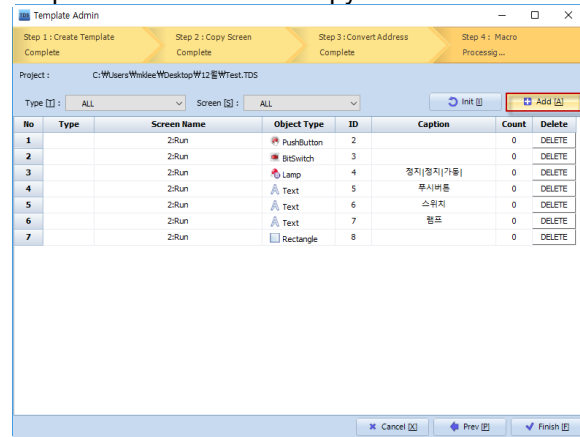
20. Templates and Viewing

You can use templates to easily and conveniently make drawing projects with similar layouts. A template provides the basic structure of a drawing project, unit of screen only. For partial template(widget), please refer to the 'User Libray'.
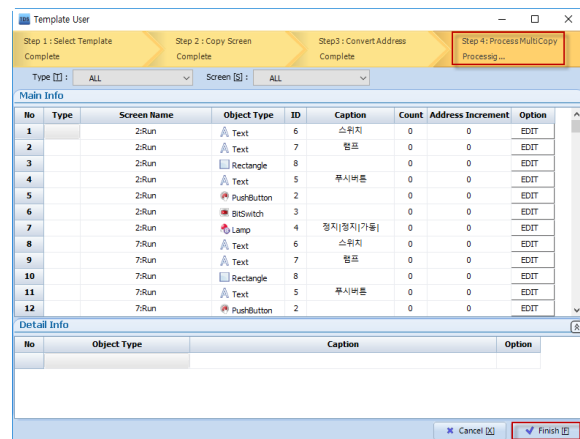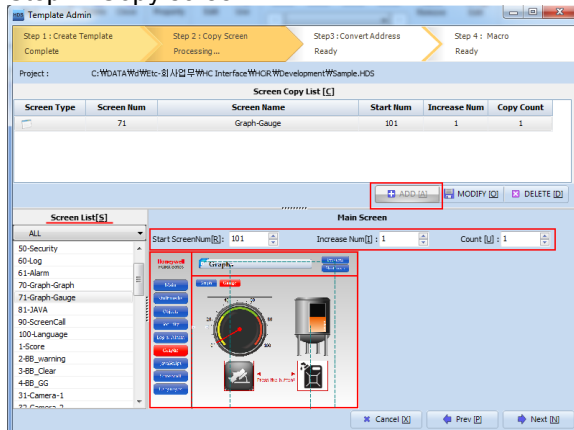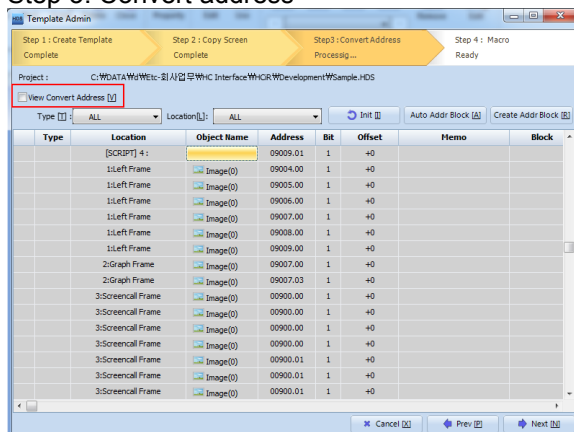
Step 1. Create a Template

Step 2. Copy screen

Step 3. Convert address

Step 4. Macro and multi copy
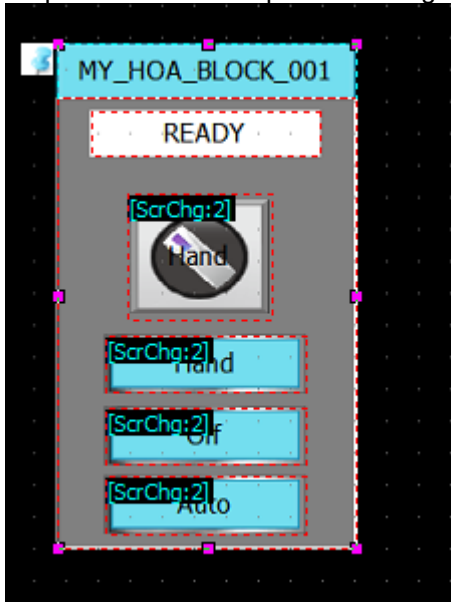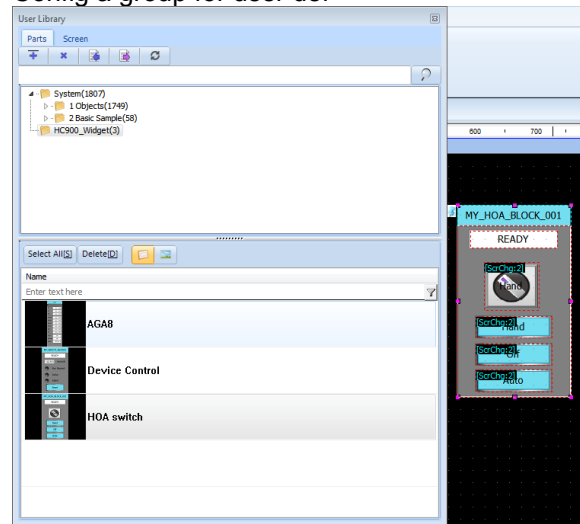
21. User Library(Widget)

User can make the useful partial templates and use the template like a widget.

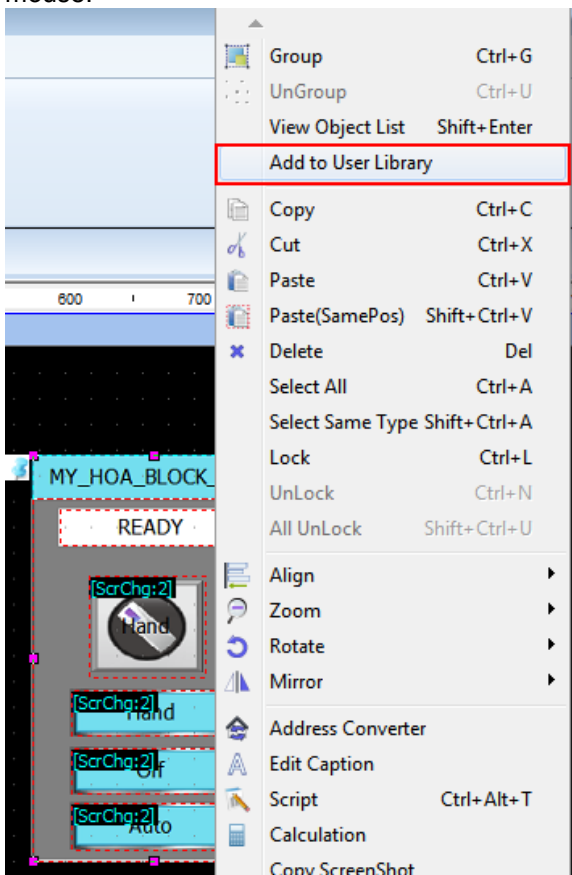Step1. Create the template including some tags.

Step 3. Register the tags
Config a group for user def

Step2. Add User Library.
Drag the targeted tags and click right-button of mouse.

22. USB Host

Description

USB printer

USB Thermal Camera

USB keyboard and Mouse

USB Barcode scanner

BENEFITS
• Expandability to interface with devices wide and variable
• Export the report via Printer, PCL5 or later
• Thermal camera to measure the infrared image
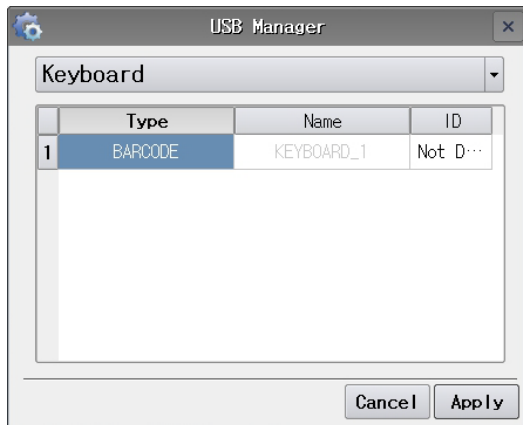• High usability widely via keyboard and Mouse onto HCiRX

EXAMPLE
A technician can Capture the infrared image via Thermal Camera and take the data from Bar code scanner, generate the report via printer.
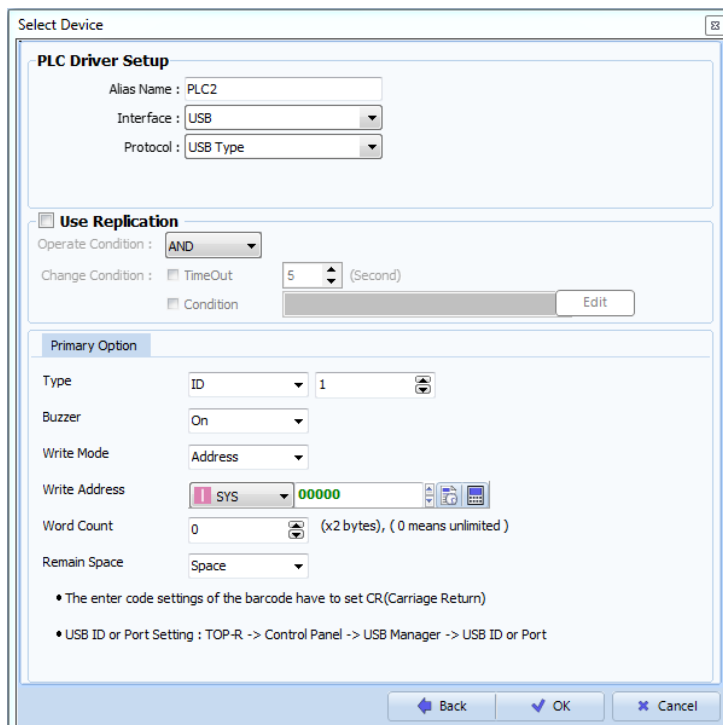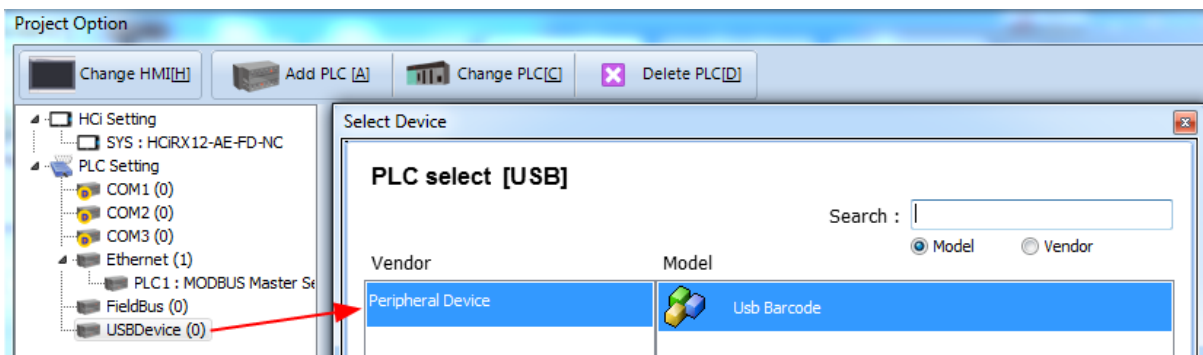
22-1 Interface with USB Barcode scanner

Please make sure the scanner can support "keyboard wedge". User can test in MS-Excel if it's able.

 Setting on Control Panel – Menu on HCiRX

'Write Address', detected data from scanner will be saved from the address sequentially.
For more details, please refer to the user manual.

22-2. USB keyboard and Mouse

Scanned keyboard info in Control Panel - Menu

22-3 USB Printer