Renesas Synergy™ S7G2

BACnet® Demo Kit (SK-S7G2) Quick Start Guide

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Introduction

This quick start guide describes the Renesas BACnet® Demo Kit set up. Highlighted components in this solution includes a Renesas SK-S7G2 starter kit which is using Renesas Synergy™ S7G2 Microcontroller Group and **Honeywell**™ commercial product, BACnet® Fixed Function Thermostat. Using this Renesas Synergy™ SK-S7G2 Starter Kit, developers can easily start to evaluate on Renesas BACnet® solution. Contact your nearest Renesas sale offices to request a live demonstration or kit for development.

Target Device

R7FS7G27H3A01CFC

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1. Kit Contents

The following components are included in the kit:

1. BACnet® Demo Suitcase #1 include
   - SK-S7G2 Starter Kit
   - RS485 Interface Board
   - CAT5 cable

2. BACnet® Demo Suitcase #2 include
   - BACnet® Fixed Function Thermostat (Honeywell™)
   - BAC Router
   - RS485 Interface Cable
   - 5 Vdc power supply
   - AC/AC wall mount 24 volt Adaptor

2. Features

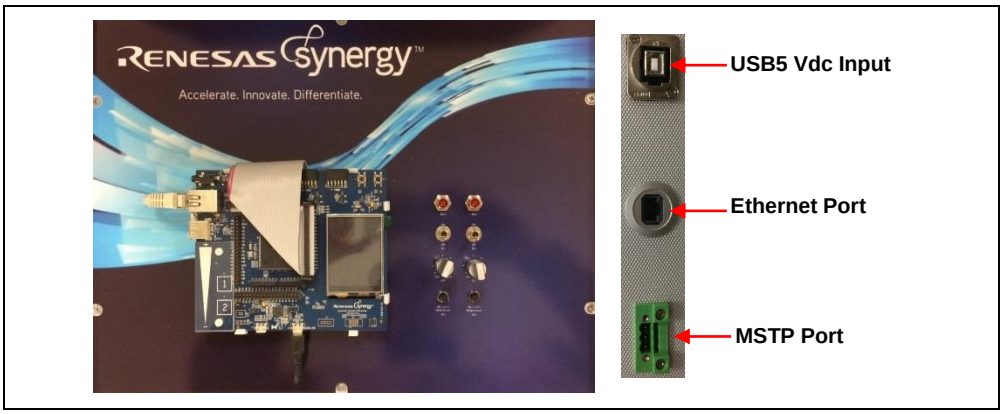
2.1 BACnet® MS/TP Demo

- BACnet® Demo Suitcase #1 include
    a. 2 temperature sensors
    b. 2 potentiometer
    c. 2 toggle switches
    d. 2 Light indicators
- BACnet® Demo Suitcase #2 include
    a. BACnet® Fixed Function Thermostat (Honeywell™)
    b. BAC Router

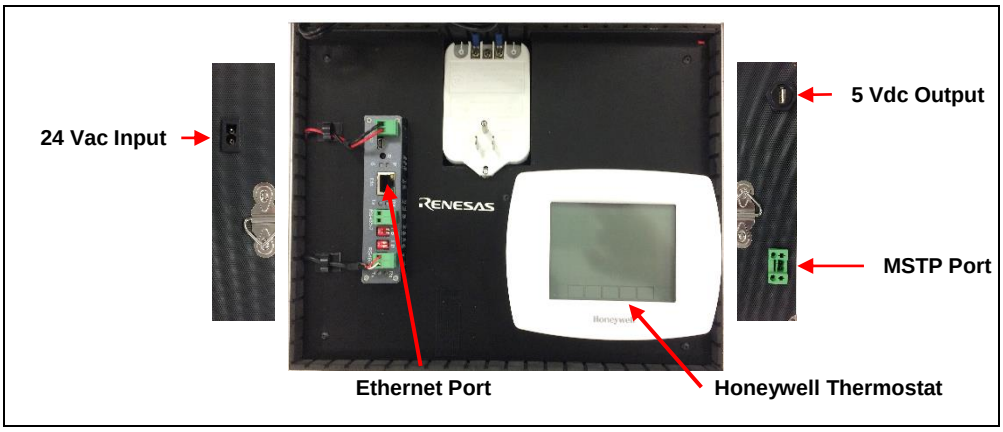
2.2 BACnet® I/P Demo

- Demo Suitcase #1 include
    a. 2 temperature sensors
    b. 2 potentiometer
    c. 2 toggle switches
    d. 2 Light indicators

BACnet® Demo Suitcase #1

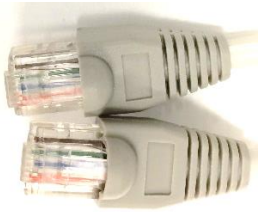


BACnet® Demo Suitcase #2



3. Device Components

3.1 BACnet® Demo Suitcase #1

Components	*Pictures*
BACnet® Demo Suitcase #1 including following items	
Renesas Synergy™ SK-S7G2 Starter Kit	
RS485 Interface Board	
USB A male to B male cable	
Ethernet Cable Cat5 standard	

3.2 BACnet® Demo Suitcase #2

Components	*Pictures*
BACnet® Demo Suitcase #2 including following items	
BACnet® Fixed Function Thermostat	
BAC Router	
Regulated 1.5 amp power supply Input : 24 VDC/VAC Output : 1.5 to 29VDC (adjustable)	
AC/AC Wall Mount 24 Vac Adapter (40W)	
Twisted cable for MSTP connection between Suitcase #1 and Suitcase #2	

4. Setting up the BACnet® Demo

First, download the BACeye network explorer from MBS onto a PC from below web link.

http://www.baceye.com/kostenlos-testen

Note: Official BACeye license is needed to install for demonstrating this BACnet® demo.

Second, program the target SK S7G2 Starter Kit with appropriate firmware using one of the hex files.

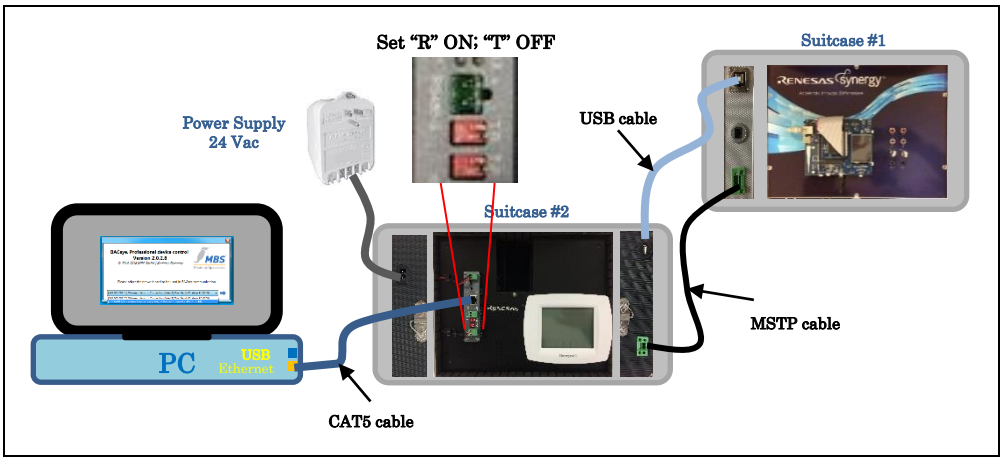
a. Use "bacnetdemo-MSTP-suitcase.hex" file for MSTP demo (default setting)
b. Use "bacnetdemo-IP-suitcase.hex" for IP demo

Third, setup the wiring connection for either default BACnet® MSTP Demo or BACnet® IP Demo as described in Section 4.1 (A) or (B) respectively, and setup Ethernet port as described in Section 4.2. Finally it is ready to operate the BACnet® Demo for demonstration.

4.1 Connection for BACnet® Demo

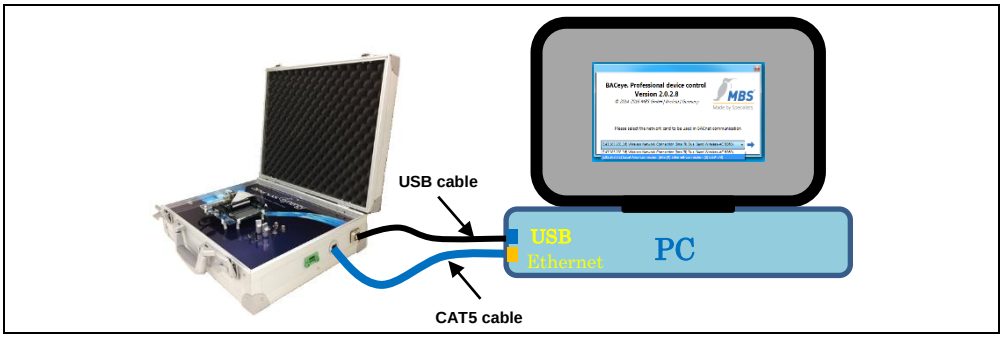
(A) MSTP Demo, Suitcase #1 and #2

Step 1. Set BAC Router switch setting "R" to ON and "T" to OFF position.
Step 2. Connect MSTP cable between Suitcase #1 and Suitcase #2
Step 3. Connect USB A male to B male cable between Suitcase #1 and Suitcase #2
Step 4. Connect CAT5 cable between the PC and BAC Router at Suitcase #1
Step 5. Connect Wall Mount 24 Vac Adapter to Suitcase #1 and plug in to power outlet



(B) IP Demo, Suitcase #1

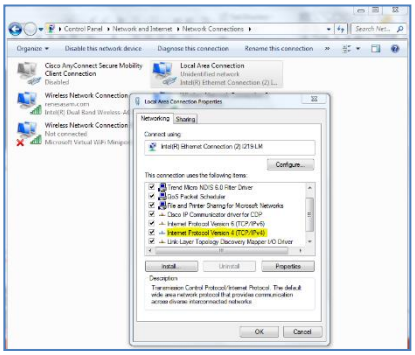
Step 6. Connect CAT5 cable between the PC and Suitcase #1
Step 7. Connect USB cable male B to Suitcase #1
Step 8. Connect USB cable male A to PC USB port for power ON



4.2 Setting up Ethernet port (TCP/IP configuration) for BACnet® Demo

Step 1. Right Click and select Properties to open Local Area Connection from Control panel, Network connection.

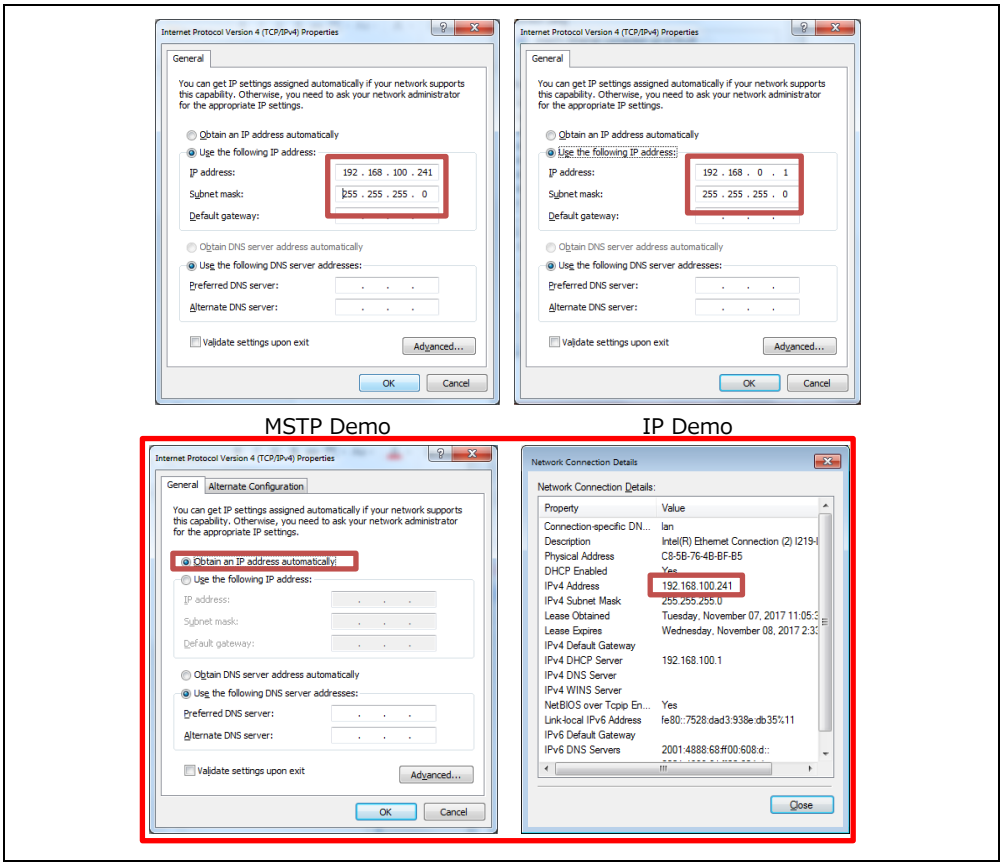
Step 2. Select Internet Protocol Version 4 (TCP/IPv4) and click Properties button



Step 3. Set IP address either "**192.168.100.241**" for MSTP demo or "**192.168.0.10**" IP demo

Step 4. Set Subnet mask to "**255.255.255.0**"

(Note: When selecting "Obtain an IP address automatically" option, you need to check IPv4 Address in Local Area Connection Status for clicking "Detail" button.)



Step 5. Click "OK" button to store the setting and then click "Close" button in Local Area Connection Properties box to complete the configuration.

Step 6. Enable the Local Area Connection to get TCP/IP connection

Step 7. Connect Power supply to the appropriate Suitcase and CAT5 cable per respective connection diagram.

Step 8. Power up the appropriate Suitcase to test the network connection.

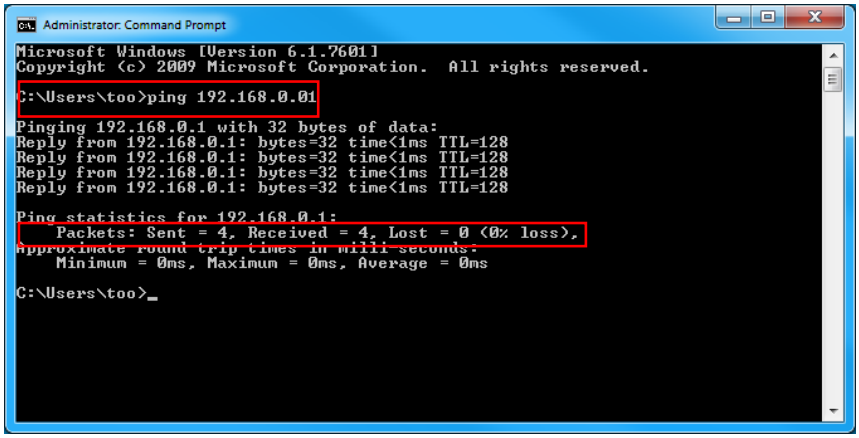
Step 9. Open Command Prompt Windows and type "**ping 192.168.100.241**" or (IPv4 Address if assigned by system) for MSTP demo or "**ping 192.168.0.111**" for IP demo

Step 10. Receive the message "**Packages: Sent = 4, Received = 4, Lost = 0 <0% loss>**"
If not, the TCP/IP network is not connect to BAC Router switch and check the network setting

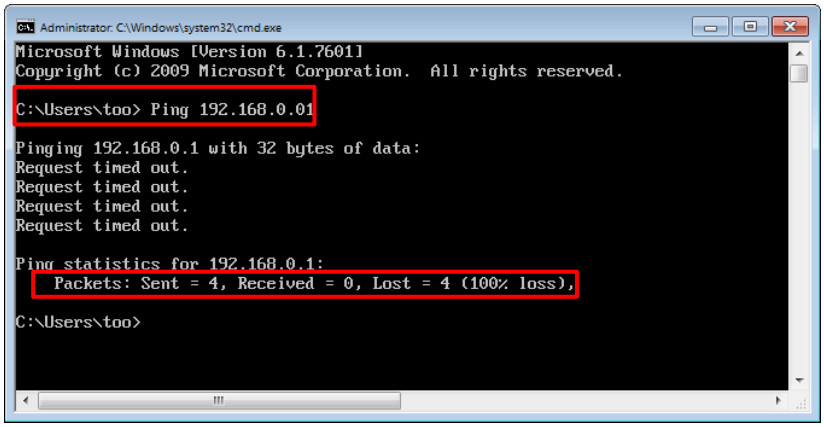
Step 11. The TCP/IP network connection between PC and target is established successful.

Step 12. Close the Command Prompt Windows.

Successful TCP/IP connection establishment, Lost = 0 (0% loss)



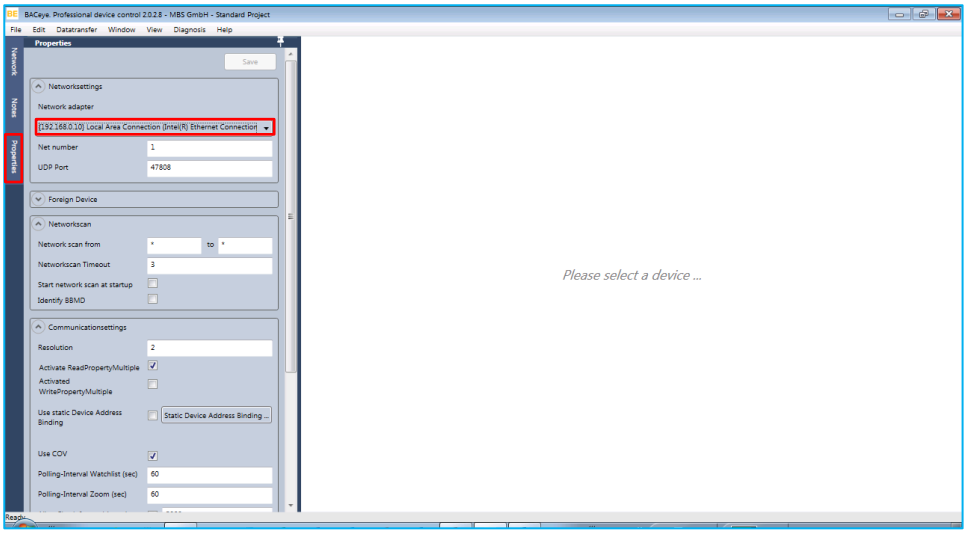
Failed TCP/IP connection establishment, Lost = 4 (100% loss)



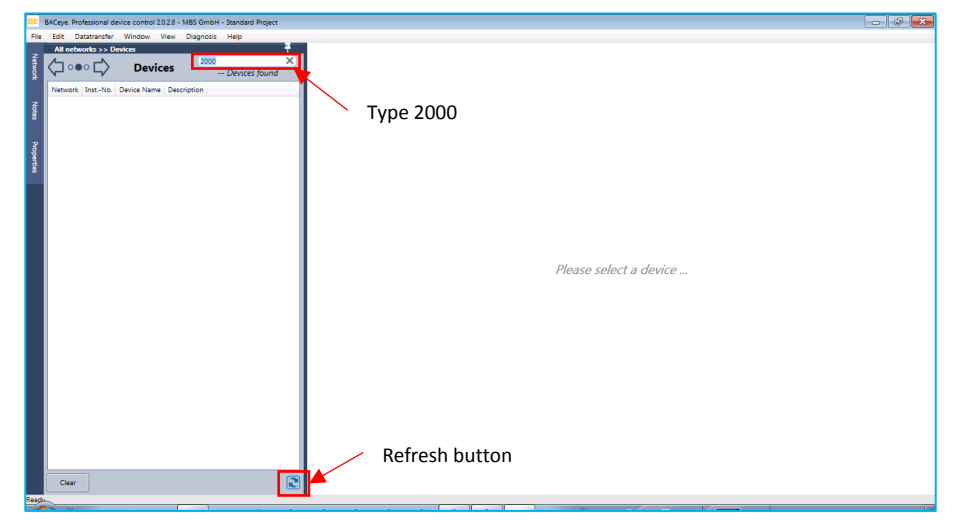
5. The BACnet® MSTP Demo Operation

Step 1. Open BACeye application in the PC and select Local Area Network connection “192.168.100.241” that assigned and tested or IPv4 Address assigned by system for MSTP demo.

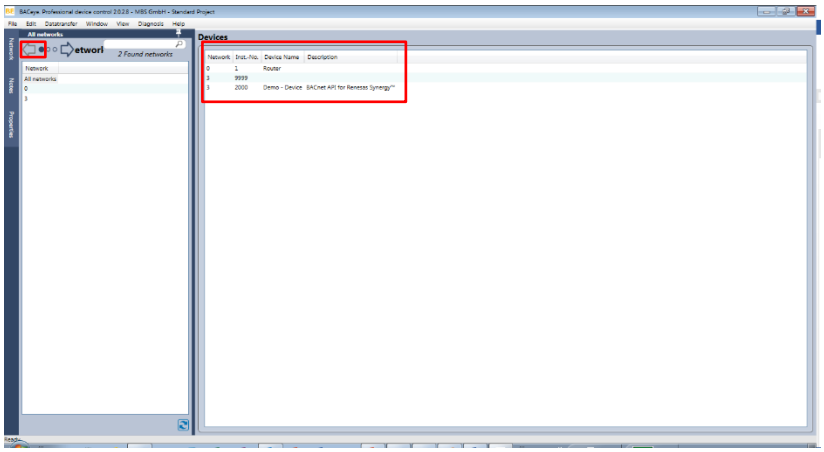
Step 2. Select Properties tag and check the Network Adaptor port number correctness from Step 1.



Step 3. Select Network tag and type “2000” in device search and click “Refresh” button

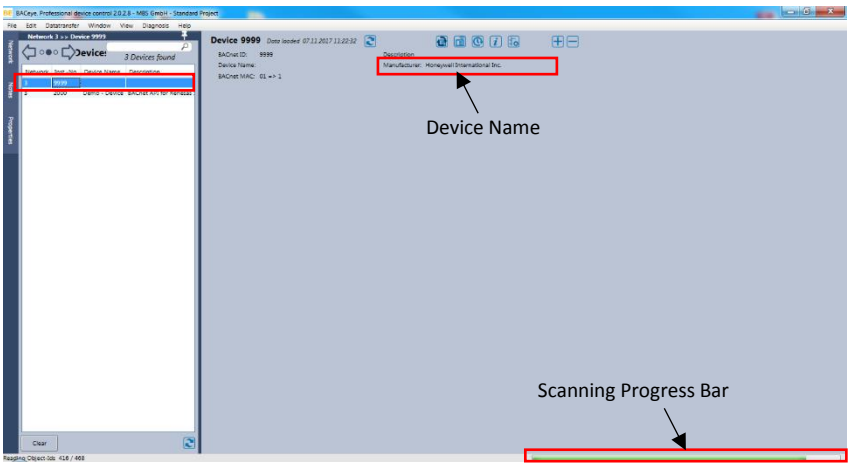


Step 4. Click back arrow (Network button) to check number of Notes in the connected network.
The All Networks Windows shows the numbers of devices in the network



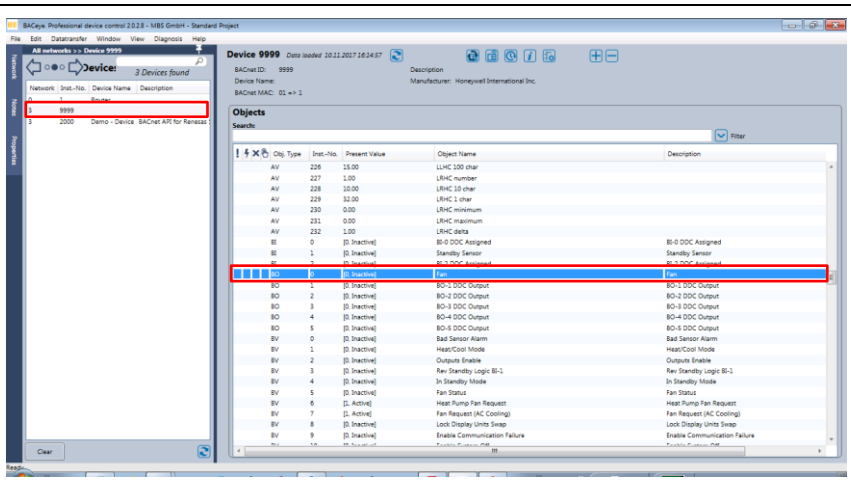
Step 5. Click forward arrow (Device button) and select one of the Devices listed in the Windows.

- Once selected the device, shows the device name on the screen and scan the object.
- Wait to complete scanning

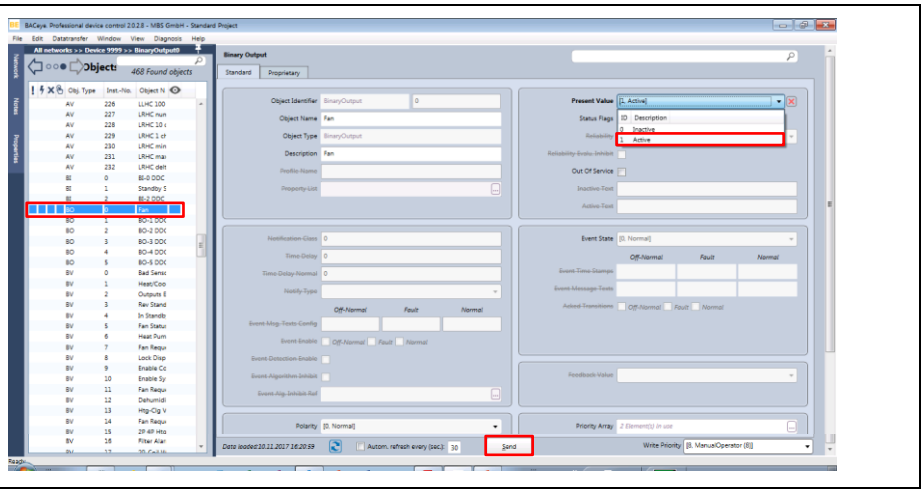


Step 6. Show the list of objects in the selected device.

- Select one of the objects by double clicking on the object.
  (Here select BO 0 "Fan" for test)

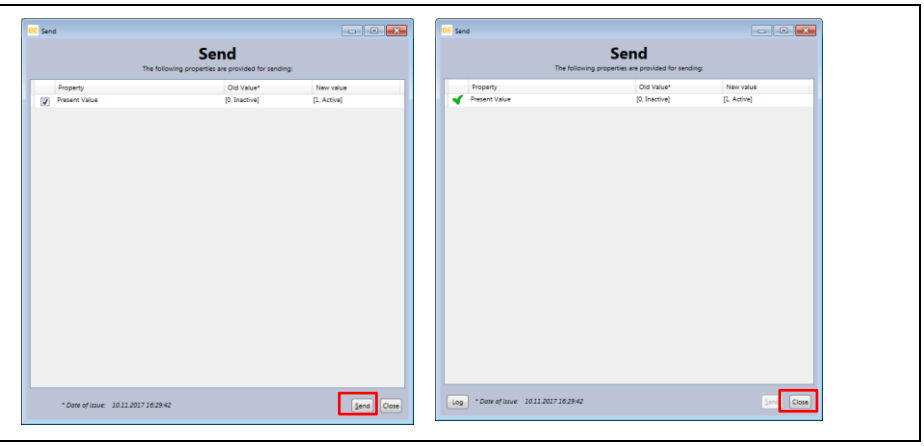


Step 7. Change the Present Value to [1] Active for testing. Then click to send button.

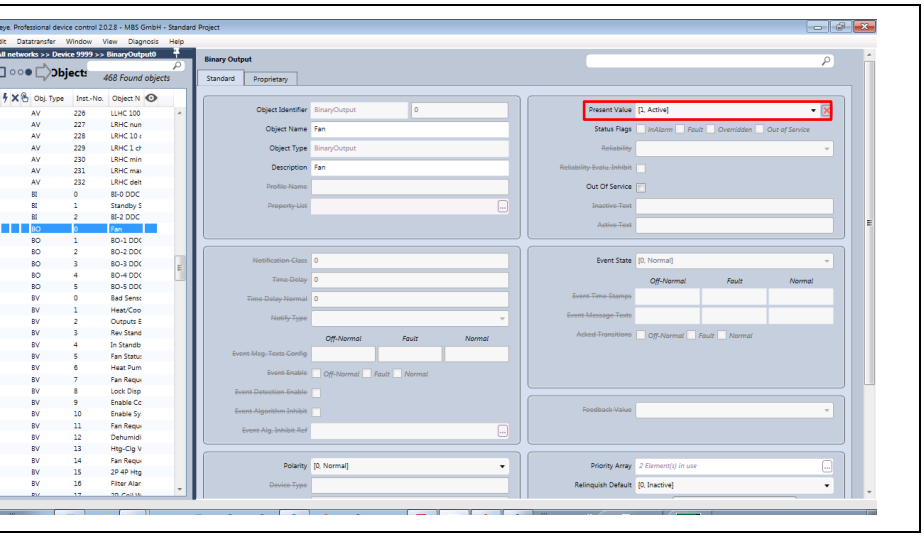


Step 8. When pop up the Send message box,

- Click Send Button to change the attribute setting.
- Then click Close Button to return the Object Windows.



Step 9. Show updated value in object Windows. When object BO 0 “Fan” is active, light up the Green LED in the Suitcase #2. (Try object BO 0”Fan” for value [0] Inactive to turn off the Green LED)

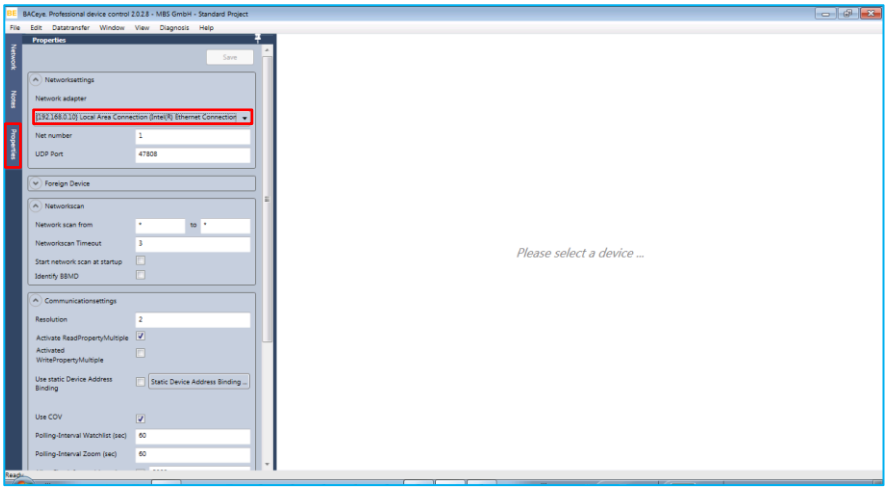


Step 10. Try other Objects in the listed Devices.

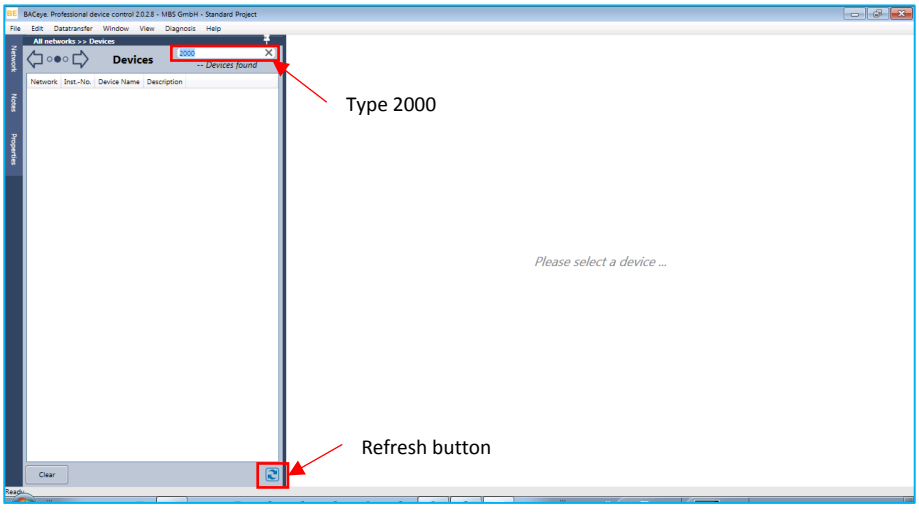
6. The BACnet® IP Demo Operation

Step 1. Open BACeye application in the PC and select Local Area Network connection “192.168.0.10” that assigned previously for IP demo.

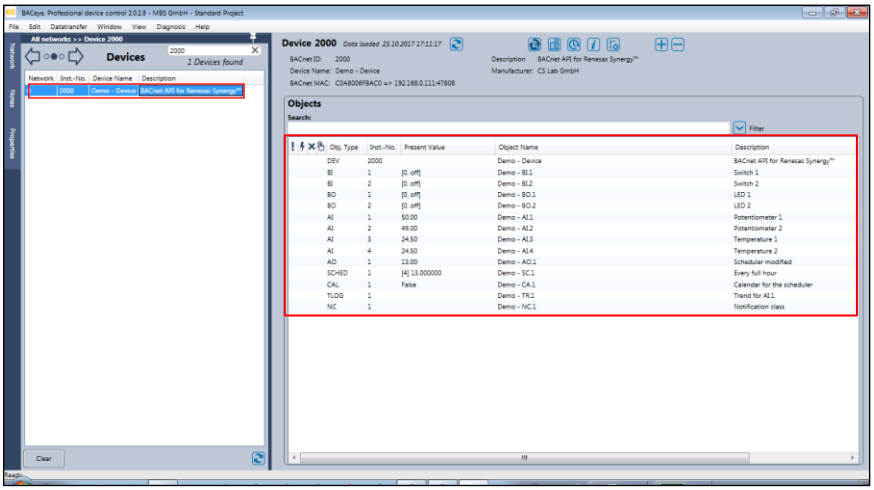
Step 2. Select Properties tag and check the Network Adaptor port number correctness from Step 1.



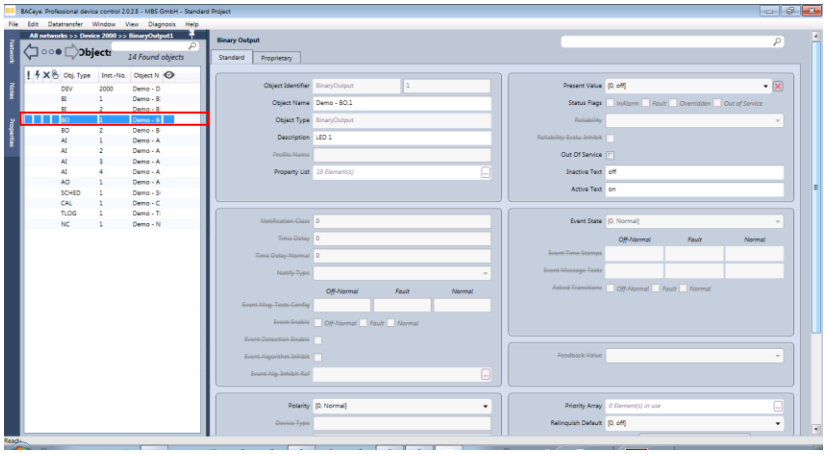
Step 3. Select Network tag and type “2000” in device search and click “Refresh” button



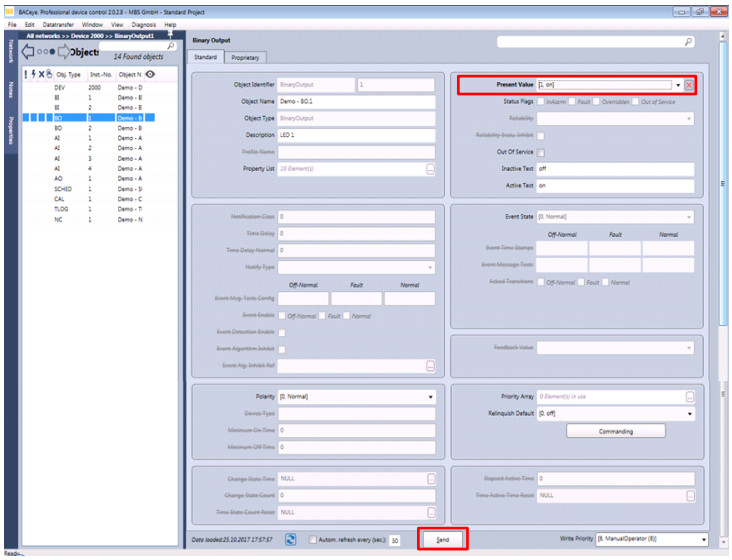
Step 4. Select device “2000” in device list will show the list of device objects in the Device filed



Step 5. Double click on object Demo - BO.1 and show the Binary Output object BO.1.

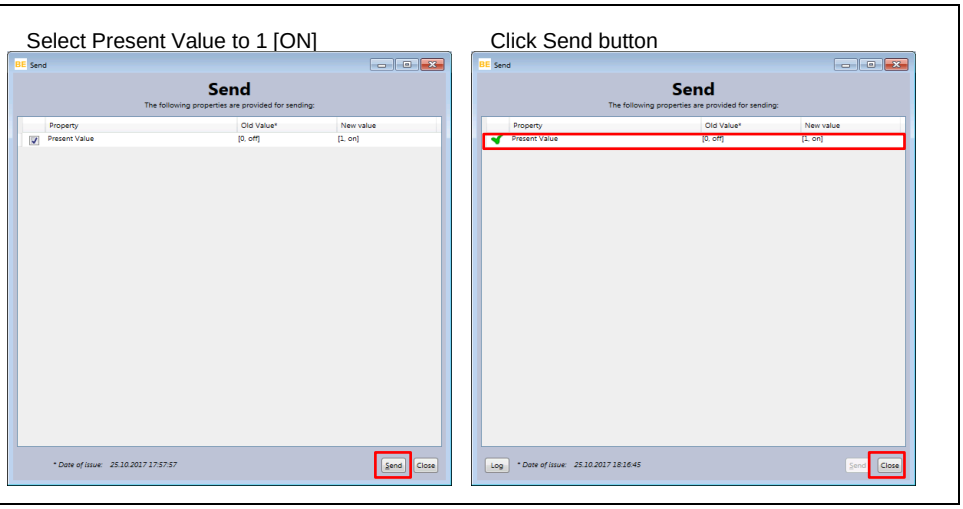


Step 6. Change Present Value to 1 [ON] and click send button.

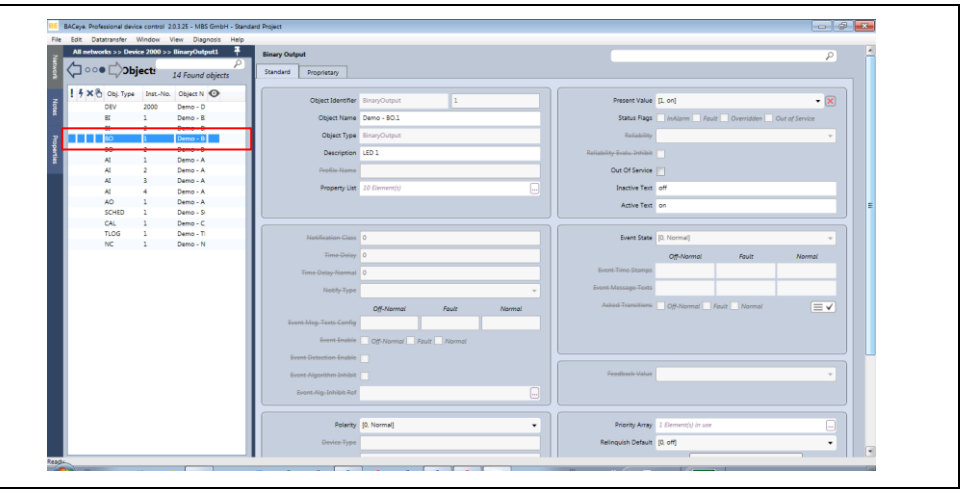


Step 7. Press Send button with checked Present Value 1 [ON]. In Suitcase #1, RED LED #1 is turned ON. Try again Present Value 0 [OFF] to turn off the RED LED #1 in Suitcase #1.

Step 8. When pop up the Send message box, click Close Button to return the Binary Output.



Step 9. Can try others object shown in the Binary Output for testing.

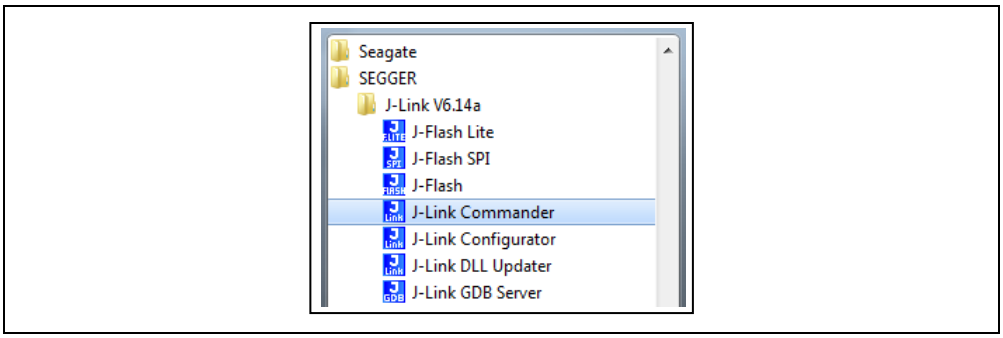


7. Programming to the SK-S7G2 Starter Kit

Step 1. Attach to PC USB connector via USB cable to Suitcase #1.

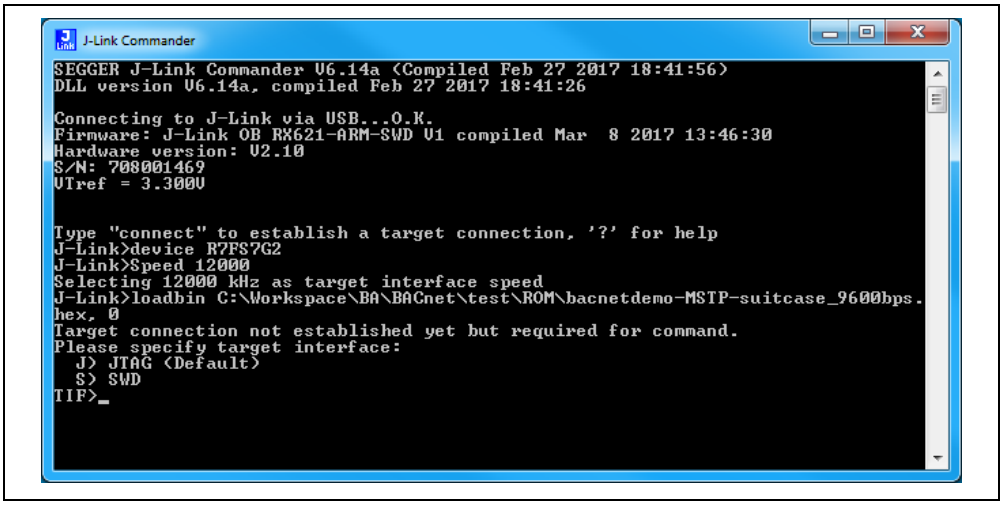
Step 2. Open J-Link Commander from Start menu in All Programs, SEGGER folder.

(Note: SEGGER J-Link download link: https://www.segger.com/downloads/jlink)

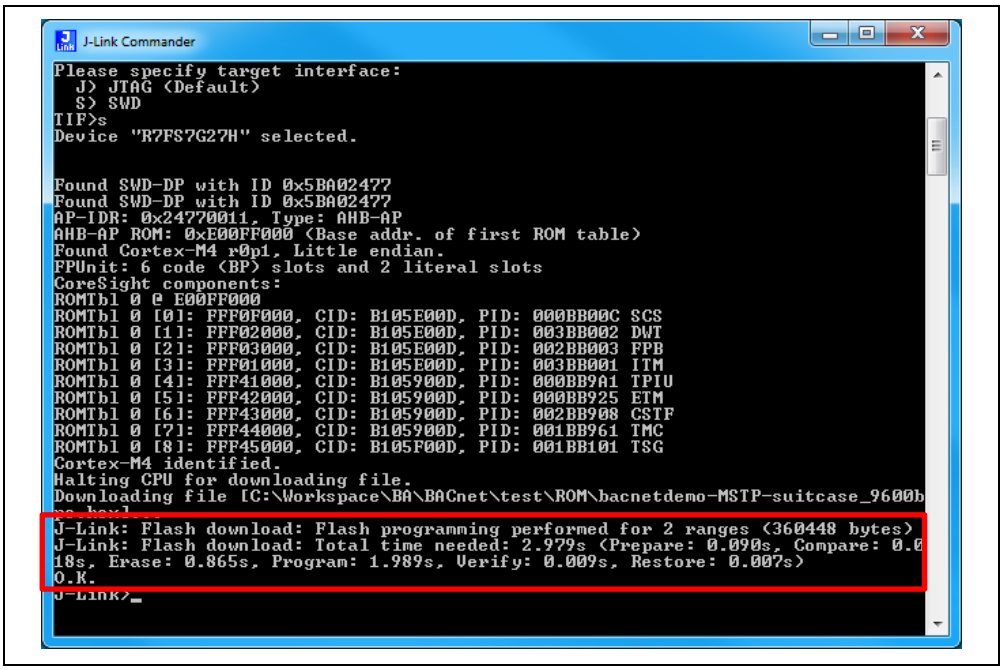


Step 3. Enter the below commands to program target device.

1. Device R7FS7G2H
2. Speed 12000
3. loadbin C:\...\ROM_Synergy\file_name.hex, 0



4. Note: This BACnet® Demo Kit includes following Hex files for respective modules
   a. BACnet® IP demo: bacnetdemo-IP-suitcase.hex
   b. BACnet® MSTP demo: bacnetdemo-MSTP-suitcase_9600bps.hex



5. If programming is successful, will get “OK” message
6. After programming, disconnect the Suitcase #1 from the PC to evaluate.

Website and Support

Renesas Electronics Website
http://www.renesas.com/

Inquiries
http://www.renesas.com/contact/

Revision History

		Description	
Rev.	**Date**	**Page**	**Summary**
1.00	Nov 15, 2017	–	Initial Release

General Precautions in the Handling of Microprocessing Unit and Microcontroller Unit Products

The following usage notes are applicable to all Microprocessing unit and Microcontroller unit products from Renesas. For detailed usage notes on the products covered by this document, refer to the relevant sections of the document as well as any technical updates that have been issued for the products.

1. Handling of Unused Pins

   Handle unused pins in accordance with the directions given under Handling of Unused Pins in the manual.

   — The input pins of CMOS products are generally in the high-impedance state. In operation with an unused pin in the open-circuit state, extra electromagnetic noise is induced in the vicinity of LSI, an associated shoot-through current flows internally, and malfunctions occur due to the false recognition of the pin state as an input signal become possible. Unused pins should be handled as described under Handling of Unused Pins in the manual.

2. Processing at Power-on

   The state of the product is undefined at the moment when power is supplied.

   — The states of internal circuits in the LSI are indeterminate and the states of register settings and pins are undefined at the moment when power is supplied.
   In a finished product where the reset signal is applied to the external reset pin, the states of pins are not guaranteed from the moment when power is supplied until the reset process is completed.
   In a similar way, the states of pins in a product that is reset by an on-chip power-on reset function are not guaranteed from the moment when power is supplied until the power reaches the level at which resetting has been specified.

3. Prohibition of Access to Reserved Addresses

   Access to reserved addresses is prohibited.

   — The reserved addresses are provided for the possible future expansion of functions. Do not access these addresses; the correct operation of LSI is not guaranteed if they are accessed.

4. Clock Signals

   After applying a reset, only release the reset line after the operating clock signal has become stable. When switching the clock signal during program execution, wait until the target clock signal has stabilized.

   — When the clock signal is generated with an external resonator (or from an external oscillator) during a reset, ensure that the reset line is only released after full stabilization of the clock signal. Moreover, when switching to a clock signal produced with an external resonator (or by an external oscillator) while program execution is in progress, wait until the target clock signal is stable.

5. Differences between Products

   Before changing from one product to another, i.e. to a product with a different part number, confirm that the change will not lead to problems.

   — The characteristics of Microprocessing unit or Microcontroller unit products in the same group but having a different part number may differ in terms of the internal memory capacity, layout pattern, and other factors, which can affect the ranges of electrical characteristics, such as characteristic values, operating margins, immunity to noise, and amount of radiated noise. When changing to a product with a different part number, implement a system-evaluation test for the given product.

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(Rev.3.0-1 November 2016)

RENESAS

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