

Renesas Quick Start Guide

Version: 2016, July 01



1. Overview

The CS Lab BACnet demo application for Renesas Synergy [™] provides an overview of the performance of BACnet API CS Lab GmbH and comprises the complete request scope for BACnet Advanced Application Controller (B-AAC).

The demo application includes the following BACnet objects:

- device object (Description of the BACnet device)
- binary input objects (2 switch)
- binary output objects (2 LED's)
- analog input objects (2 Potentiometer and 2 temperature sensors)
- analog output object (shows the current value of the scheduler object)
- scheduler object (with entries for every hour from Monday to Sunday)
- trend log object (distinguished values of the potentiometer on)
- calendar object (is required by the scheduler object)
- notification class object (is applied for alarms)



Architecture of Application Demo



2. Requirements

Required software

- e² studio Version 5.0.0.043
- GCC ARM Embedded 4.9 2015q3
- Renesas Synergy Software Package (SSP) 1.1.0
- Bacnetdemo of Renesas Synergy Gallery

Installation IDE

See the special installation instructions.

Installation bacnetdemo

- 1. Load Packed Project
- 2. Unpack project
- 3. Start e² studio
- 4. Import Projekt (Menue: File -> Import...)
- 5. General -> Rename & Import Existing C/C++ Project into Workspace
- 6. Allocate project name and select project from the download folder
- 7. Save settings
- 8. Project will be imported
- 9. Open File configuration.xml
- 10. Create configuration
- 11. Translate project

C/C++ - #2 studio									
Eile Edit Source Refactor N	lavigate Search Project Rene	esas Xiews Bun Window Help						27 - ST	
🔁 • 🔛 🕼 🕲 • 🐐 • 🐒	🗟 🖉 🕶 📸 • 🚳 • 🛃 •	· · · · · · · · · · · · · · · · · · ·	🚳 🧶 🛷 📲 🗐 🗐 🐑 🖝	Ø+⊊¢+	• •			Quick Access	E C/C++
Project Explorer 💠	E & 40 E						- 0	🗄 Outline 🕮 🛞 Make Target	0.0
								An outline is not available.	
		Problems II 🖉 Tasks 🖾 Cor R Benst Description	sole 🔲 Properties 🔒 Memory Resource	Usage 🐏 Smart Peth	Browser Location	Турс			⇒ = [

Start e² studio



e² Import – 🗆 X	
Select Rename and Import and Existing C/C++ Project into the workspace	
Select an import source:	
type filter text	
 ✓ ➢ General Protect Project Sector Preferences Preferences Rename & Import Existing C/C++ Project into Workspace Preferences Renesas Common Project File C/C++ Install Run/Debug Team 	
Back Next > Einish Cancel]

Import Project

e ² Import						×
Rename & Import Project Select a directory to search for existing Eclipse projects.						7
Project name: bacnetd	emo					
• Select roo <u>t</u> directory:	C:\Users\	\Downloads\bac	netdemo	~	B <u>r</u> owse.	
O Select <u>a</u> rchive file:				~	B <u>r</u> owse.	
<u>P</u> rojects:						
bacnetdemo (C:\Use	ers\ \Down	loads\bacnetdem	0)			
?	< <u>B</u> ack	<u>N</u> ext >	<u>F</u> inish		Cancel	I

Import Project (Page 2)



el C/C++ - e2 dudio									o x
Elle Edit Source Relactor Na	vigate Search Broject Rene	sas Views Bun Window Help		- Maria				Out Arms	1 minutes
per jar source entrop in	10 3 2 × ∞ 0		9 9 4 - M (S) (2)	• (1 • 10 0				Ourd Acons	<u>ि</u> 07.+-
		Problems II @ Tasks @ Console [Petron, Twenings, © others Description > @ Warnings (7 dems)	Properties 🗑 Memory Resource	Usage @: Smart Path	Browser	Туря			~ n []
0 items selected							6		

Imported project

C/C++ - bacnetdemo/configuration.uml - e2								
Eile Edit Source Refactor Navigate Segri	ch <u>Project</u> Renesas <u>Views</u> <u>Bun Window</u> <u>Help</u>							
	0 g · 6 · 7 · 6 · 6 · 6 · 6 · 6 · 8 · 8 0 · 8	A . III (1) 2	-51-9-0	· .			Quick Access	C/C++
Project Explorer 💠 📄	🎭 👻 🐃 🗇 👘 (Becnetdemo) Synergy Configuration 💠					0.0	🔠 Outline 🗉 🛞 Make Target	
v 🚰 bacnetdemo > 🖉 Includes	Summary	Summary Generate Pro						
 Studies Of erc Of years Of years<td>This effort allows you to modify the Syneargy pro BD Allow and and donce education Allow to board you is optimal Bears properties can be modified in the https: Cacha Allows configuration of the clock generation. Bears and the synear synthesis and the synthesis Allows configuration of the state within a Synteg Allows configuration of the state within a Synteg Allows configuration of the state within a Synteg Allows configuration of the messaging failure Bears Messaging Allows configuration of the messaging failure EU Allows configuration of the messaging failure Cited Sectored software components Allows configuration of the messaging failure Allows components Allows compone</td><td>pet settings stored inters view circuit in and set up y project innovokaut threads can be modified in work di borell and device interset Setroices/# # device intersets/# stores/ intersets/# stores/ interset</td><td>In the configuration the Properties view the Properties view the deployed using of conference (1) as a set of the set of the set of the set of the set of the set of the set of</td><td>Ala (configuration.or</td><td>4.</td><td></td><td></td><td></td>	This effort allows you to modify the Syneargy pro BD Allow and and donce education Allow to board you is optimal Bears properties can be modified in the https: Cacha Allows configuration of the clock generation. Bears and the synear synthesis and the synthesis Allows configuration of the state within a Synteg Allows configuration of the state within a Synteg Allows configuration of the state within a Synteg Allows configuration of the messaging failure Bears Messaging Allows configuration of the messaging failure EU Allows configuration of the messaging failure Cited Sectored software components Allows configuration of the messaging failure Allows components Allows compone	pet settings stored inters view circuit in and set up y project innovokaut threads can be modified in work di borell and device interset Setroices/# # device intersets/# stores/ intersets/# stores/ interset	In the configuration the Properties view the Properties view the deployed using of conference (1) as a set of the set of the set of the set of the set of the set of the set of	Ala (configuration.or	4.			
	0 errors, 7 warnings, 0 others							
	Description	Resource	Path	Location	Type			
	> 💩 Warnings (7 items)							
						1.00		
						60		

Create configuration



3. Additional information

Interfaces

For proper operation the demo application requires appropriate hardware at the interfaces of the Renesas Boards S7G2.

BACnet Object	Description	Board connection
BI.1	Switch 1	Port 0 Pin 5
BI.2	Switch 2	Port 0 Pin 6
BO.1	LED 1	Port 6 Pin 0
BO.2	LED 2	Port 6 Pin 0
AI.1	Potentiometer 1	Channel 0
AI.2	Potentiometer 2	Channel 1
AI.3	Temperature sensor 1	Channel 3
AI.4	Temperature sensor 2	Channel 4

Switch to MS / TP

The demo application operates with an IP-based data link. If you like to work for your example with MS / TP, you have to activate the BACNET_DATA_LINK_MSTP macro (in module bacnetdemo.c) and recompile the application. The MS / TP link operates at 9600 baud, 8 data bits, 1 stop bit and no parity and is connected to the UART channel. 3

Activation of Foreign Device

The use of a Foreign Device is 'off' by default. If you need a foreign device, you need to activate the BACNET_DEMO_WITH_FOREIGN_DEVICE macro (in module bacnetdemo.c) and recompile the application.

Memory usage

The BACnet objects require storage in RAM and ROM. The following table provides an overview of the consumption in bytes per BACnet object.

BACnet Object	RAM	ROM
DEV	113	1413
BI	53	942
ВО	11	484
AI	70	1008
AO	83	1040
CA	3	226
NC	18	290
SC	59	482
TR	149	1170