KNX BACnet SERVER



Content

Hardware and Software Properties	4
Communication Scheme	5
Latest Technologies	6
Client App Introduction	7
Configuration Web Application	.12

Connection Diagram and General Concept



General Concept

Bektasic KNX Server is an integrated device, which have onboard automation extensions (KNX, RS485) .

It is a powerful communication center with Linux OS and hosted server services.

The server comes with a software concept. The configuration can be done with embedded web server application. Once configured, the users can use their mobile applications downloaded from app stores immediately.

The system is designed to serve multiple users at once by providing solution for most common needs of up-to-date smart homes.

Hardware and Software Properties

Hardware:

- DIN Rail Box (3 fuse length)
- 64 Bit Quad Core Cortex A53 1.5GHz
- 1GB DDR3 Ram
- 8 GB eMMC5
- Gigabit Ethernet RJ45
- Embedded KNX/EIB Bus interface
- Fault tolerant RS485
- Wide power supply range 12 30 VDC
- Typical power consumption: 3 Watt

Software:

- Linux Kernel >4
- Web Server for configuration
- HTML 5 Websockets Server: Protocol version «8» and «13» (RFC6455)
- 2048 Bit SSL Security
- Supports multiple clients at once

Communication Scheme

There are two ports open for communication:

- 1. Embedded Web Server for configuration (Port 80, 443)
- 2. Websockets Server for client applications (Port 8080)



For typical usage only port 3800 is needed to be accessable from Internet for client applications. Configuration port is not recommended to open to Internet for enhanced security.

Websockets connection is an event based connection type: When a KNX Telegram is received, it is transmitted between pairs within miliseconds.

Latest Technologies

HTML5 Websockets:

HTML5 Web Sockets provide an enormous step forward in the of the real-time scalability web. HTML5 Web Sockets can provide a 500:1 or-depending on the size of the HTTP headers—even a 1000:1 reduction in unnecessary HTTP header traffic and 3:1 reduction in latency. That is not iust an incremental improvement; that is a revolutionary jump—a quantum leap!



Security:

HTTPS (also called HTTP over Transport Layer Security (TLS)) is a communications protocol for secure communication over a computer network which is widely used on the Internet. HTTPS consists of communication over Hypertext Transfer Protocol (HTTP) within a connection encrypted by Transport Layer Security, or its predecessor, Secure Sockets Layer. The main motivation for HTTPS is an authentication of the visited website and protection of the privacy and integrity of the exchanged data.

Client App Introduction

The app is available for Andorid and iOS platforms, they can freely be downloaded from Google Play or App Store.

The whole configuration is done at the server side. The client only needs server credentials to retrieve configuration files. Within seconds, the app is ready for controlling home.



For an effective and user friendly usage, a home plan background may be used. If there is no picture available there is still possibility to use list based peripherals.

Background pictures, button pictures, the scale and colors all can be configured easily in the web application.

Pages Navigation:

There is a parameter to show up peripherals on page at a zoom level. When you pinch to zoom on page, peripherals appear at some point. This feature helps avoiding mess of many buttons in small areas. Placing several hundreds of buttons on a single page is possible.



When buttons appear there are two interaction type. One tapping on button and one the sliding over the button. The arcs on both side of icon indicate there is possibility to slide object to select a value in a range.



General object types:

- Command Button: Single click (for example turning on/off a lamp)
- Menu Button: Single click opens a menu to show up multiple command buttons. Suitable for termostats and sun shaders which include many actions.
- Detectors: Shows the status of a sensor.
- Labels: Any static text or dynamically updated text from real time data obtained from KNX group object.
- Chime: Rings a preloaded melody.

User Friendly Button Usages:

Selecting a value in a range can be done by sliding the object. The arcs on both side of icons indicate the object is draggable.



Menu buttons enable using multiple commands in a hierarchy.



Scenes:

Scenes are one click automated action series. For example "Leave Home" Scene can be programmed as turning off all lights and standing by heating system.

۲	Scenes		
	Good Morning		
	Welcome		
	Night		
	Away Home		

Configuration Web Application

Chrome browser is recommended for the web application. Just enter server's address and you will find the login page. Default username/password is admin/admin.

You are encouraged to create a new user and delete this default account for security purposes.

	BEKTAS 🍅
	Sign in
Email/Username	þdmin
Password	
	🛔 Login

Users menu list : Username : admin Passwort : admin

Projects menu list configurations. On a single server creating multiple configurations is possible. This helps creating different user interfaces and privileges to use peripherals within-the same system infrastructure.

Projects

Building a user interface with peripherals

my_home1	% 42 m							
Creation date	Fri, Aug 18, 2017 3:23 PM							
Last modified	Sat, Nov 16, 2019 3:59 PM							
Shared Users	Manage							
Pages	1 Manage							
Scenes	1 Manage							
Create A New Project								

Every project can have multiple pages. Pages are containers for peripherals.



Every project can have own scenes. This scenes can be used by project's users. Programming section is very similar to Scenes. However scenes are triggered by user, programs are triggered automatically under certain conditions.



Peripherals' controls (buttons) can be added on to the page by red icons right bottom of the page.



Peripherals definitions are guided by wizards. This wizards have several options categorized in a user friendly manner.

Add New Command Button Object ×						
Visual Design KN	IX Properties Range Feature					
Display Name						
	Name for display purposes					
Color	#ff9800					
	The icon's color					
Icon Visual						
	Select from library					
	Select File					
	Only PNG file allowed and square size, transparent background is adviced. It is highly recommended to take existing icons as reference. Max size 240x240 pixel					
Previous	Next >					

When you hover the mouse cursor on a button, a menu appears to edit, clone and delete the object.





You can drag and drop the objects to locate the buttons on a page.

Programming section is independent from users. They are automatic actions. They can be triggered after a logical comparison.

Programming

Timer, Logic or event based automatic actions						
timer_read_rt	+ Add Condition -	+ Add Execution +	🖋 Edit	අ Clone	🛍 Remove	ON
timer every 120 sec	+ Add Condition -	+ Add Execution -	🖋 Edit	街 Clone	🛍 Remove	ON
timesender	+ Add Condition -	+ Add Execution -	🖋 Edit	街 Clone	🛍 Remove	ON
sample	+ Add Condition -	+ Add Execution -	🖋 Edit	එ Clone	🛍 Remove	OFF
test prog timer	+ Add Condition -	+ Add Execution -	🖋 Edit	එ Clone	🛍 Remove	OFF
Test On Read	+ Add Condition -	+ Add Execution -	🖋 Edit	එ Clone	🛍 Remove	OFF
test time between	+ Add Condition +	+ Add Execution +	🖋 Edit	අ Clone	🛍 Remove	ON
gchj	+ Add Condition -	+ Add Execution +	🖋 Edit	අ Clone	🛍 Remove	OFF
test	+ Add Condition -	+ Add Execution +	🖋 Edit	අ Clone	🛍 Remove	OFF

🛨 Add A New Programme

Data Management section has nice features to make your life easier.

Importing / Exporting data enables administrator to clone the 13device or backup configuration.

Importing ETS 4/5 XML File data will help KNX group addresses and will be selected by names on wizards.

First Start ETS with Project

ETS5™	-	B. B	-	
Overview Bus	Catalogs Setting	S		KNX
Projects Archive ET	S Inside	ł	KNX News	New KNX Products
+ 🗶 🛓	Search		Win Prizes Daily with the KNX Advent Calendar Game ^{01.12.2019}	True Presence® Multisensor KNX Steinel GmbH (Germany)
knx-bacnet_server_test	15.11.2019 14:05 Editing		The holiday period is around the	
CH-fuar	07.06.2019 21:17 Editing	(opportunity for KNX Association	
digital_eing	07.06.2019 21:06 Unknown	t	to hand out gifts to you. With the support of our KNX Members we	-
I-LUXUS THERMOSTAT demo	07.06.2019 19:55 Tested	i	invite you to play the KNX Advent	
Test Project Luxus Mix 12_20	31.05.2019 15:48 Unknown	3	**win KNX Devices every day**.	
I-LUXUS THERMOSTAT 1.5.4_2g	ang 27.05.2019 18:47 Unknown	*	**How does it work?** Visit the KNX Advent Calendar	
Test Project LUXUS IO	20.05.2019 11:56 Editing	(Game web page daily day	7 senses for KNX.
LXA-120-16A 1.5.1	08.05.2019 17:09 Unknown		**between the 1st and the 24th of December** and click on the door of the current date on the advent calendar. You will then see a pop- up with an image of a KNX Device. Here you have the opportunity to guess the correct answer out of 3	Welcome to the new era in building sensor technology! True Presence® provides absolutely reliable information on human presence and absence. The revolutionary technology is based on ultra-sensitive high-frequency
😰 🚇 🥭	🗐 📀 💽 🔳		<u>()</u>	DE (2:03) •

Then Go to Group Adresses and Export Group Adresses

III ETS5™ - knx-b	acne	et_server_test			-	-		_ 0	X
ETS Edit W	/ork	place Commissioning	Diagnostics Apps Wine	dow					^ 🕜
👩 Close Projec	ct	🎤 Undo \land Redo	Reports Work	kplace 🔹 🧾 Catalogs	Diagnostics				
Group Addresses		× Diagnostics							<
Group Address	ses •						^	o ×	
+ Add Middle (Grou	ps 💌 🗙 Delete 📩 🛛	ownload 💌 🕕 Info 🔹 🛃	🕽 Reset 🧳 Unload 🔹 🕯	Print	Search		Q	
: Group Addre			••	Description	Pass Throu				0
🖻 🛅 Dynamic F	*	Download	,		No				0
🕨 🔡 1 Linie1		Read Value							*
	器	Add Middle Groups	Ctrl + Shift + A						
	×	Delete	Del						
	3<	Cut	Ctrl + X						
	Р	Сору	Ctrl + C						
		Paste							
	0	Paste Special	Ctrl + V						
	\cong	Paste Extended							
		Export Group Address	es						
		Import Group Address	ses						
		Properties	Alt + Enter						
📀 🛛 🖳	(🥝 📜 🧿	🔰 🗎 🛷		(2)	DE (2:03)	 att € 	») 13:00 9) 01.12.2	6 019

Save it as xml File

ETS5 [™] - knx-bacnet_server_test		-		X
ETS Edit Workplace Commis	sioning Diagnostics Apps Window		-	^ (?
💿 Close Project 🧳 Undo 🔌	Redo Reports Workplace Catalogs Diagnostics			
Group Addresses X Diagnostic	s			<
Group Addresses	0 ×		• 🛛 🗡	
🕂 Add Middle Groups 🖃 🗙 D	Export Group Addresses	arch	Q	2
😨 Group Addresses 🔹	Output Forma			0
Dynamic Folders	XML CTS4 Format) CSV CSV (ETS3 Format)			
🕨 🔠 1 Linie1	CSV Format			*
	3/1 - three columns, Main/Middle/Sub group separated			
	1/3 - Group address name/Main - Middle - Sub group			
	1/1 - Name/Address			
	🔵 3/3 - Main - Middle - Sub group name/Main - Middle - Sub group address			
	Export with header line			
	CSV Separator			
	Tabulator			
	Comma			
	Semicolon			
	Export File Name			
	D:\knx_bacnet_proj_15_11_19.xml Browse			
📀 🖳 🥭 🚞	🍳 🖸 🛅 🛷	(2:03) • atl	(↓)) 13:08 01.12.20	3)19

Import it to KNX BACnet Server



Format can be used marked in green.

For Example DSPT-1-1 1Bit from DSPT-1-1 till DSPT-1-23.

Example XML File

<?xml version="1.0" encoding="utf-8" standalone="yes"?>
<GroupAddress-Export xmlns="http://knx.org/xml/ga-export/01">
<GroupRange Name="1" RangeStart="2048" RangeEnd="2303">
<GroupAddress Name="DP" Address="1/0/0" />
<GroupAddress Name="DP1" Address="1/0/1" Description="1 bit switch" DPTs="DPST-1-1" />
<GroupAddress Name="DP1" Address="1/0/2" Description="1 bit boolean" DPTs="DPST-1-2" />
<GroupAddress Name="DP1" Address="1/0/3" Description="1 bit enable" DPTs="DPST-1-3" />
<GroupAddress Name="DP1" Address="1/0/4" Description="1 bit enable" DPTs="DPST-1-3" />
<GroupAddress Name="DP1" Address="1/0/4" Description="2.001 switch control" DPTs="DPST-2-1" />
<GroupAddress Name="DP1" Address="1/0/6" Description="3.007 dimming control" DPTs="DPST-3.7" />
<GroupAddress Name="DP1" Address="1/0/6" Description="5.001 percentage 100%" DPTs="DPST-5-1"/>
<GroupAddress Name="DP1" Address="1/0/10" Description="6001 percentage" DPTs="DPST-6-1" />
<GroupAddress Name="DP1" Address="1/0/10" Description="7.001 2 byte unsigned pulses" DPTs="DPST-7-2" />

<GroupAddress Name="DP" Address="1/0/12" Description="8*001 2 byte signed pulses difference" DPTs="DPST-8-1" />

<GroupAddress Name="DP" Address="1/0/14" Description="9.001 temperature" DPTs="DPST-9-1" />
<GroupAddress Name="DP" Address="1/0/15" Description="9.002 temp difference" DPTs="DPST-9-2" />
<GroupAddress Name="DP" Address="1/0/16" Description="10.001 time" DPTs="DPST-10-1" />
<GroupAddress Name="DP" Address="1/0/17" Description="11.001 date" DPTs="DPST-11-1" />
<GroupAddress Name="DP" Address="1/0/18" Description="12.* 4 byte unsigned" DPTs="DPST-12-1" />
<GroupAddress Name="DP" Address="1/0/19" Description="13* 4 byte signed" DPTs="DPST-13-1" />
<GroupAddress Name="DP" Address="1/0/20" Description="14* 4 byte float" DPTs="DPST-14-0" />
</GroupRange>

</GroupAddress-Export>

Press Allocate All it to BACnet and your KNX available bidirectional on both world.

		4			-0-	0	<u>^</u>		_		a due	- !
BE	KTAS	6	🕜 Status	© KNX	錄 BACr	net <u>Å</u> Users	[⊗] Projects	S 🖑 Programming	🖾 Plot	🖻 Data	adm	nn ≠
BACnet - KNX Addresses Match Table You can create a matching table here for communication between protocols												
BACnet Settings BACnet Values Modbus TCP Settings KNX Group Address BACnet Address (1-999) Add												
	#	KNX Gr	oup Address		B	ACnet Address		Data Conversion Type		Last Value		
This is Result after allocate all Datapoints. Data Conversion Type will be automatically chosen.												
BEKT	AS		?) Status	© KNX	戀 BACı	net <u></u> Users	⊗ Proje	cts 🛛 🖑 Programmi	ng 🖂 P	Plot 🖻 Data		admin
BACnet - KNX Addresses Match Table												

You can create a matching table here for communication between protocols

BA	Cnet Settings BACnet Values	Modbus TCP Set	ttings		
KNX	Group Address	BACn	et Address (1-999) Add Deallocat	e All	
#	KNX Group Address	BACnet Address	Data Conversion Type	Last Value	
1	1/1/9 (Setpoint Room)	M001	9.001 2 Byte Float 9.001-9.028	21.4	🛍 Deallocat
2	1/1/8 (Room Temperature)	M002	9.001 2 Byte Float 9.001-9.028	19.87	🛍 Deallocat
3	1/2/1 (L1_Salloon Sconce)	M003	1.001 1 bit 1.001-23 switch/on-off •	-1	🛍 Deallocat
4	1/1/12 (Dateserver)	M004	11.001 Date v	2122019	🛍 Deallocat
5	1/1/13 (Timeserver)	M005	10.001 Time of day	1157	🛍 Deallocat
б	1/1/14 (DTP_6_8bit_signed)	M006	6.001 1 Byte signed 6.001-6.003 (-127127)	-1	🛍 Deallocat
7	1/1/15 (DTP_7_16_bit_unsigned)	M007	7.001 2 Byte pulses (065535) *	-1	🛍 Deallocat



Bektasic invisible control systems GmbH

Alte Bruchsaler Straße 28 69168 Wiesloch Germany

Phone : +49 6222 / 38 43 007 Telefax : +49 6222 / 38 43 008

Mail to:info@bektasic.de