KNX BACnet SERVER

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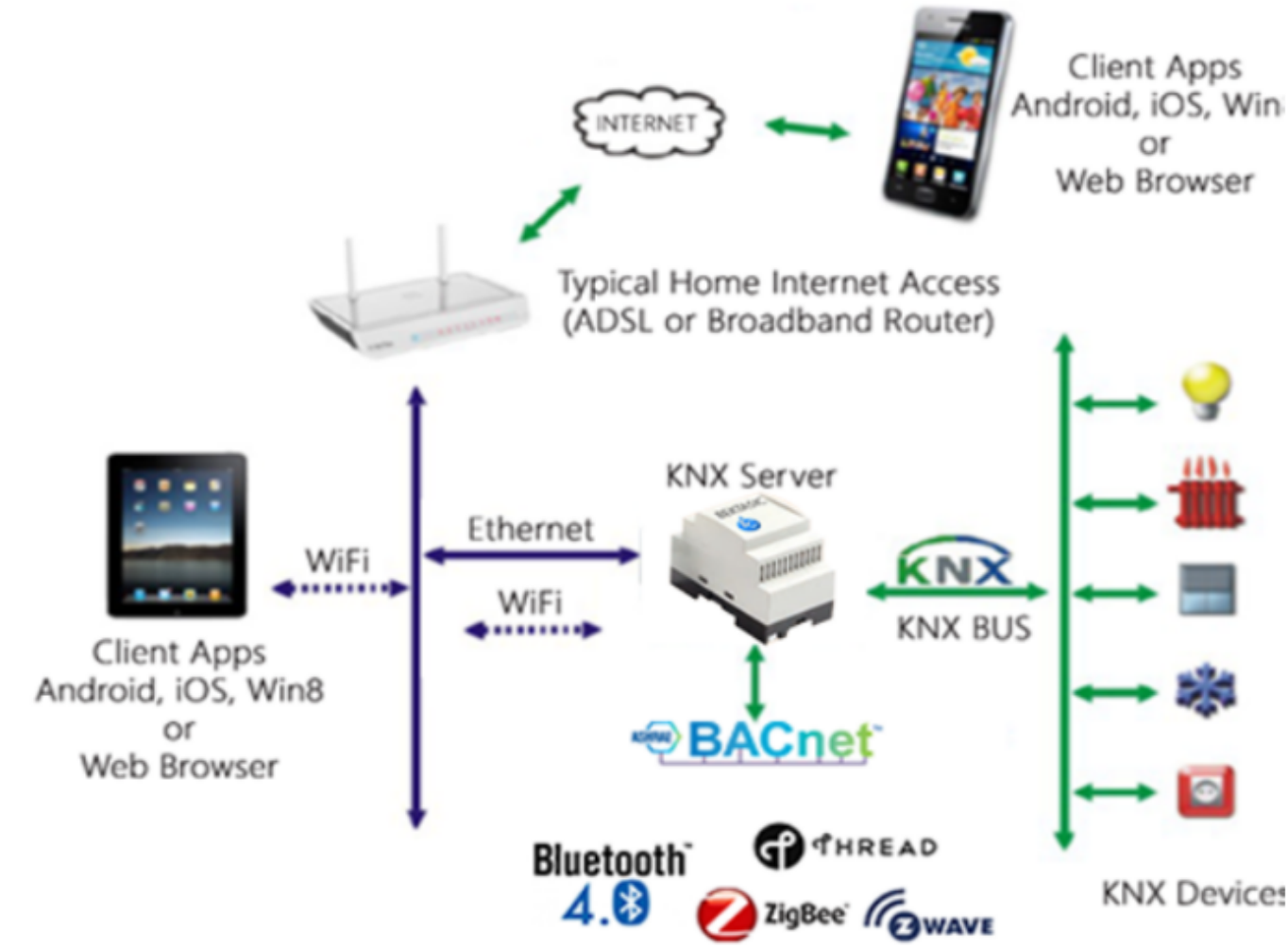
Connection Diagram and General Concept



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)

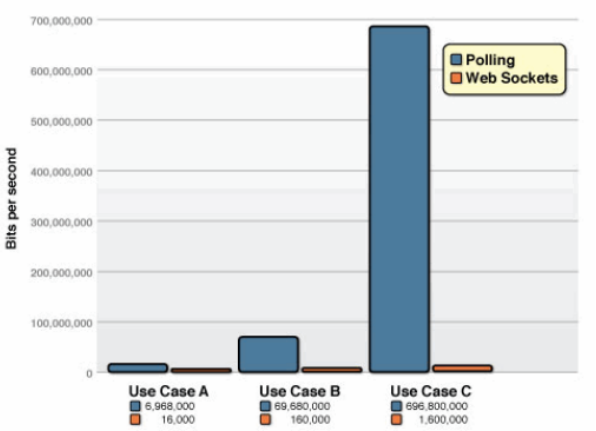
For typical usage only port 3800 is needed to be accessable from Internet for client applications. Configuration port is not recommended to open to Internet for enhanced security.

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 scalability of the real-time 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 just 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.

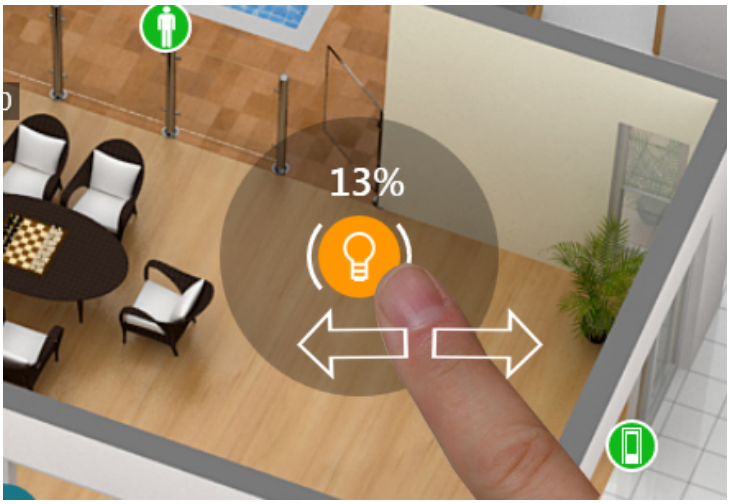
When buttons appear there are two interaction type. One tapping on button and one the sliding over the button. The arcs on both side of icon indicate there is possibility to slide object to select a value in a range.

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:

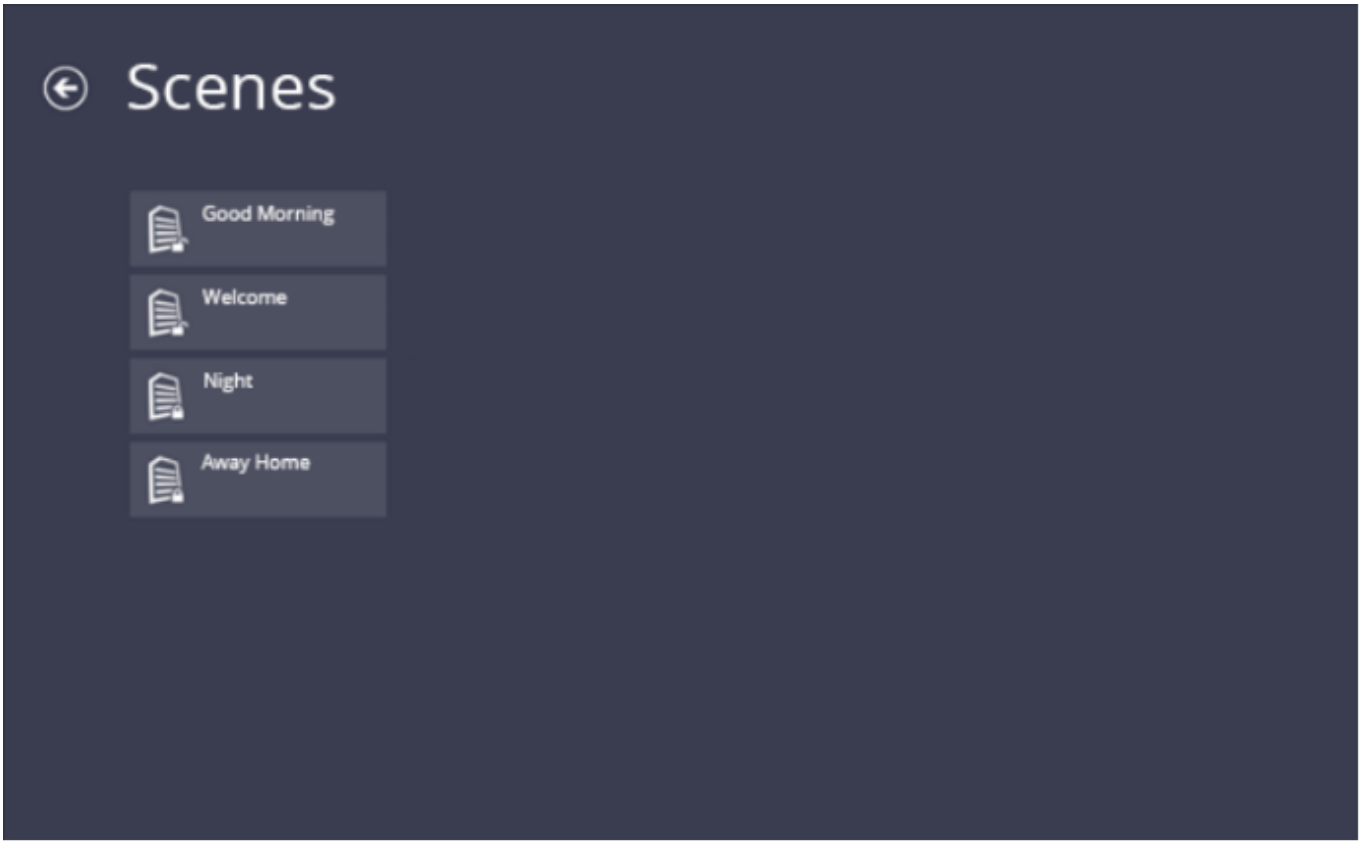
Selecting a value in a range can be done by sliding the object. The arcs on both side of icons indicate the object is draggable.



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.



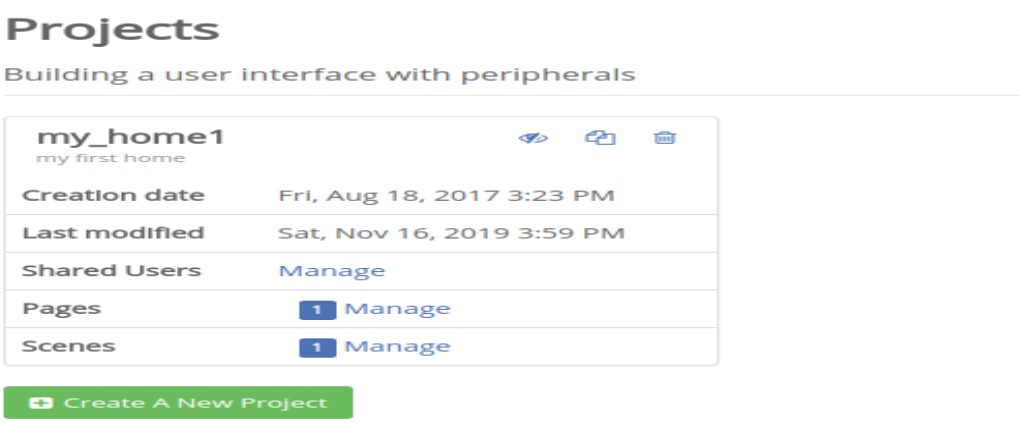
Configuration Web Application

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.

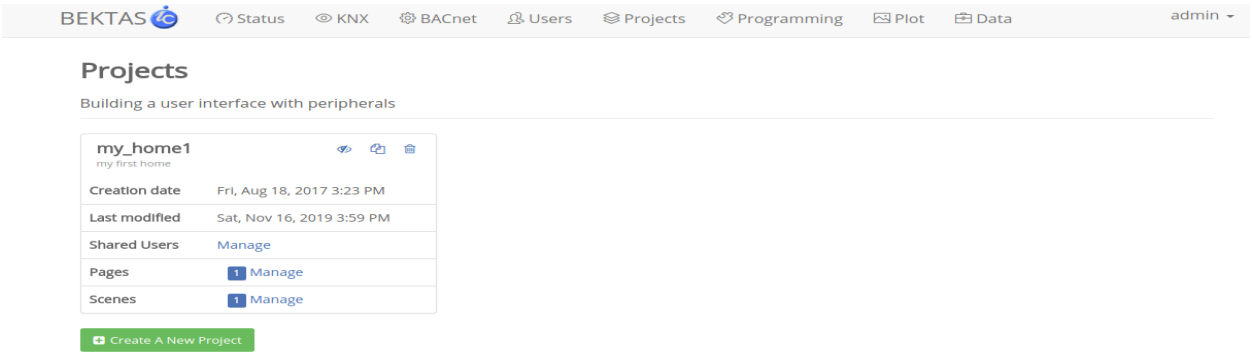
You are encouraged to create a new user and delete this default account for security purposes.

Users menu list : Username : admin Passwort : admin

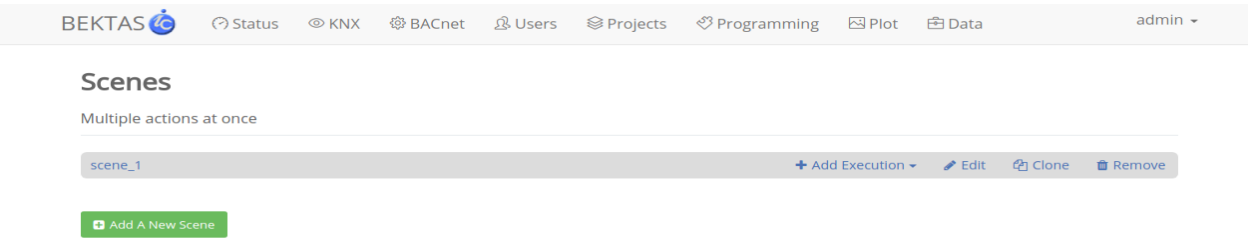
Projects menu list configurations. On a single server creating multiple configurations is possible. This helps creating different user interfaces and privileges to use peripherals within-the same system infrastructure.



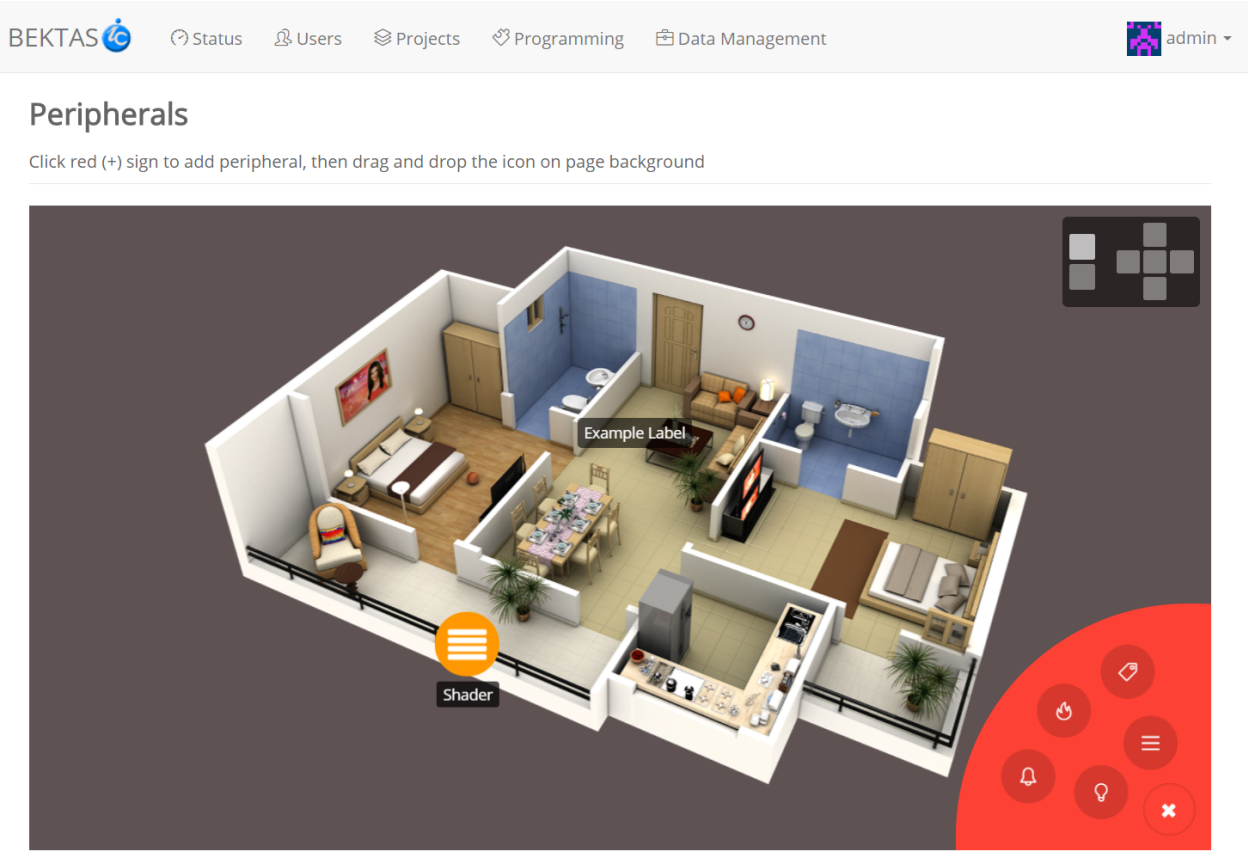
Every project can have multiple pages. Pages are containers for peripherals.



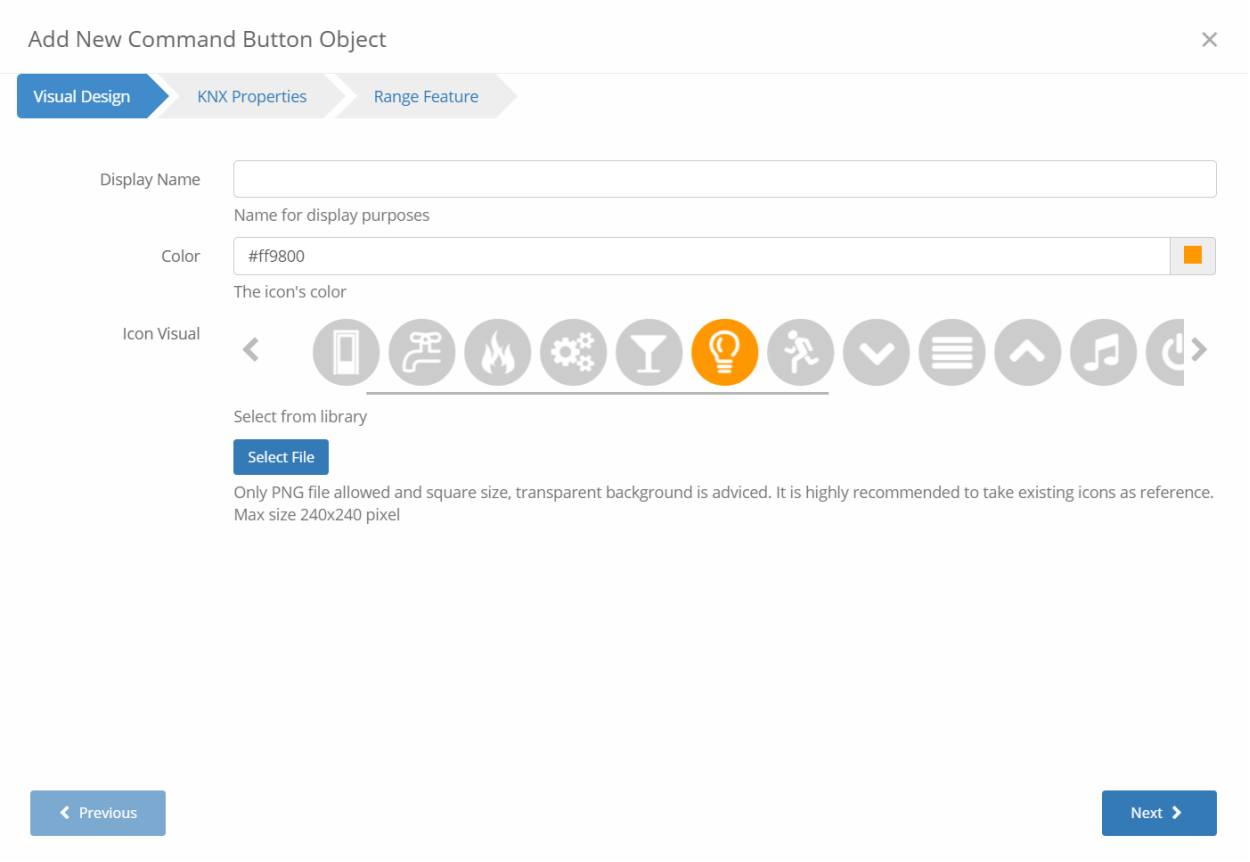
Every project can have own scenes. This scenes can be used by project's users. Programming section is very similar to Scenes. However scenes are triggered by user, programs are triggered automatically under certain conditions.



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

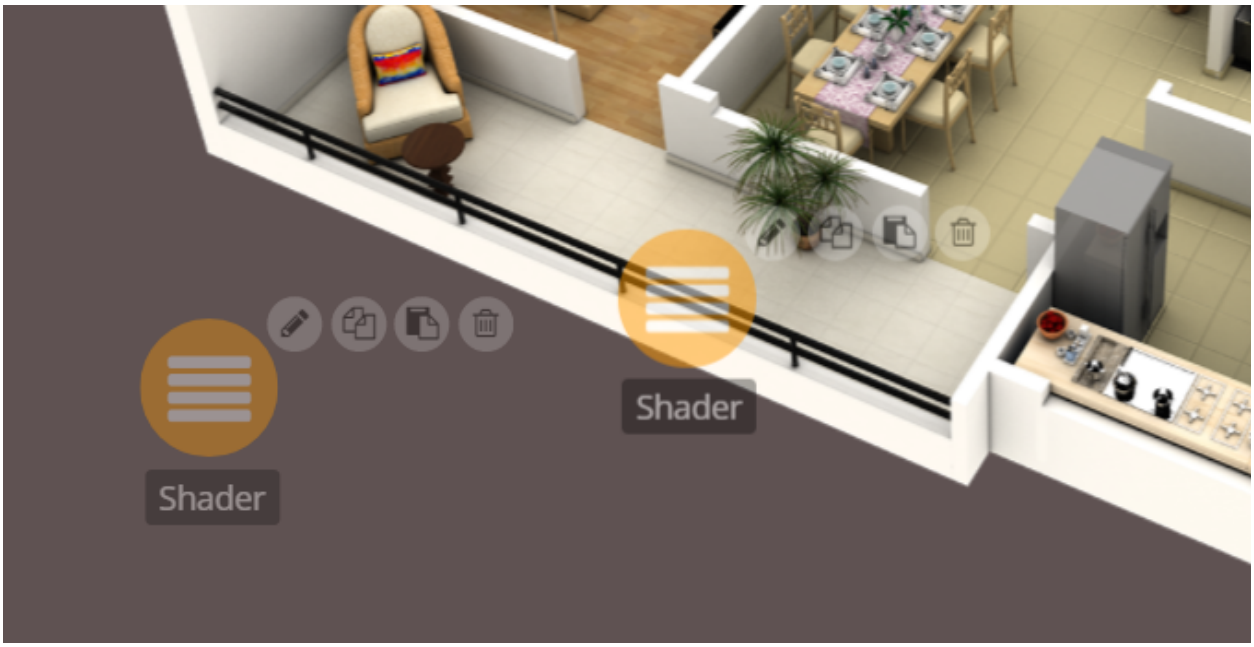


Peripherals definitions are guided by wizards. This wizards have several options categorized in a user friendly manner.



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.



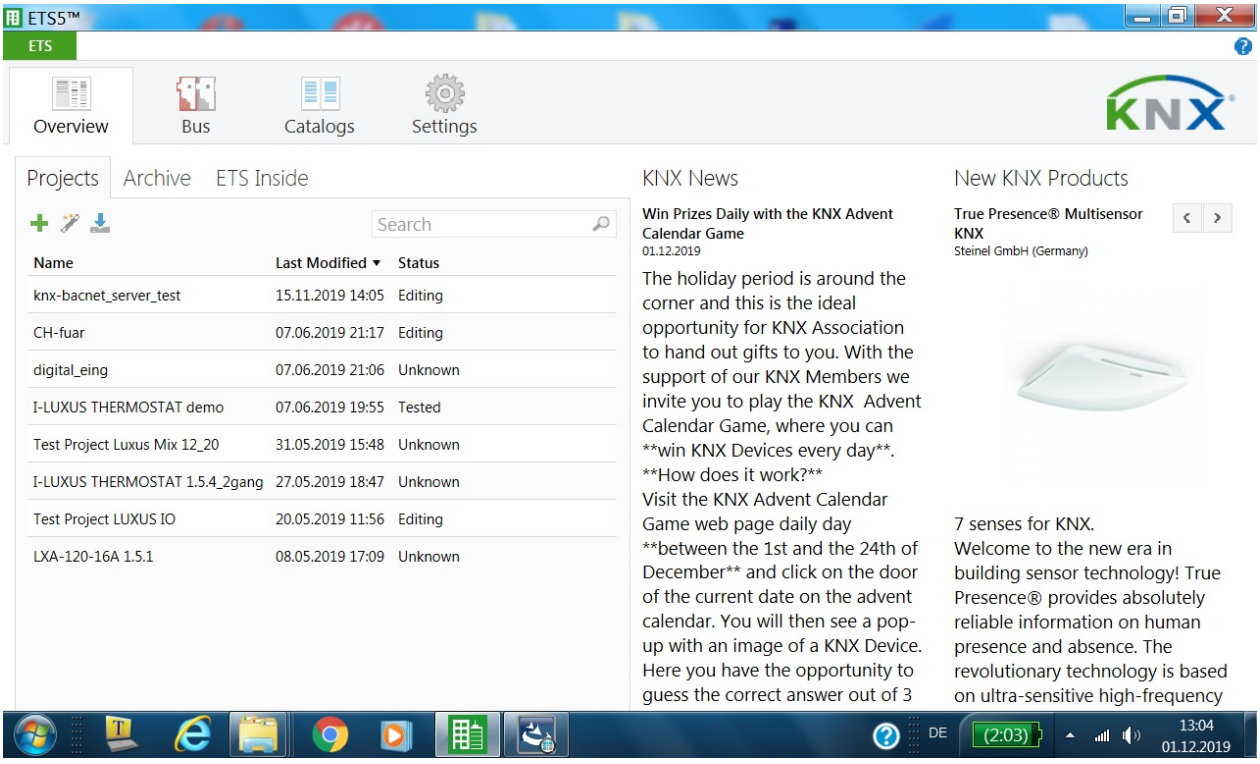
Programming section is independent from users. They are automatic actions. They can be triggered after a logical comparison.

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

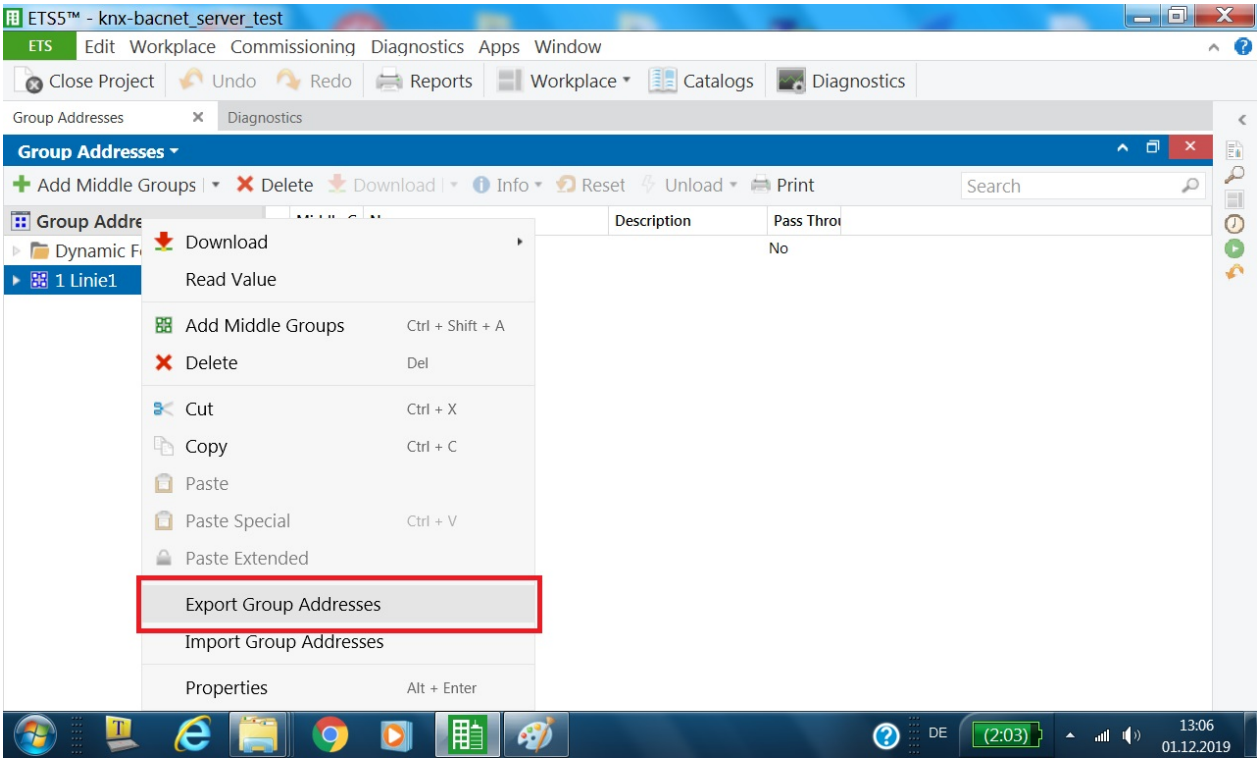
Importing / Exporting data enables administrator to clone the 13device or backup configuration.

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

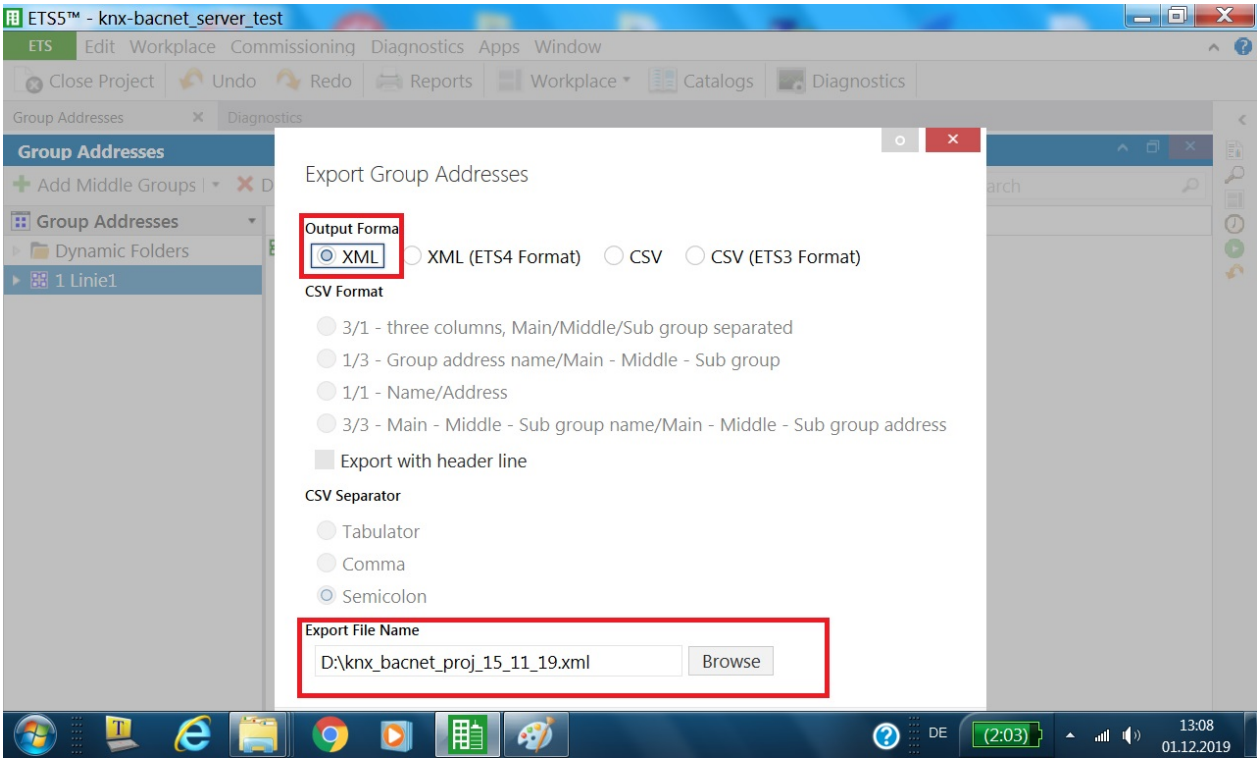
First Start ETS with Project



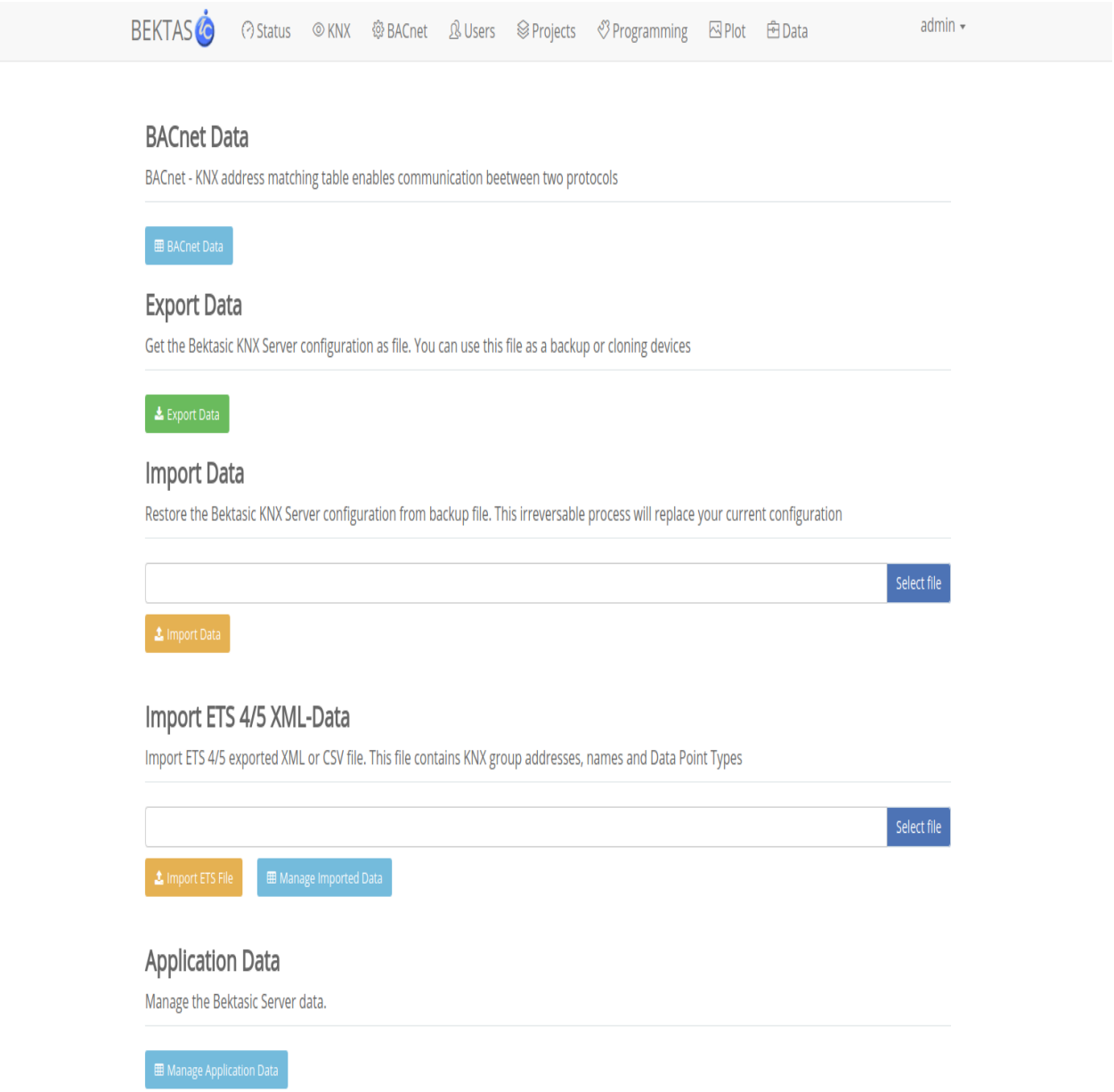
Then Go to Group Adresses and Export Group Adresses



Save it as xml File



Import it to KNX BACnet Server


BEKTAS
Status
KNX
BACnet
Users
Projects
Programming
Plot
Data
admin
BACnet Data
BACnet - KNX address matching table enables communication beetween two protocols
BACnet Data
Export Data
Get the Bektasic KNX Server configuration as file. You can use this file as a backup or cloning devices
Export Data
Import Data
Restore the Bektasic KNX Server configuration from backup file. This irreversable process will replace your current configuration
Select file
Import Data
Import ETS 4/5 XML-Data
Import ETS 4/5 exported XML or CSV file. This file contains KNX group addresses, names and Data Point Types
Select file
Import ETS File
Manage Imported Data
Application Data
Manage the Bektasic Server data.
Manage Application Data

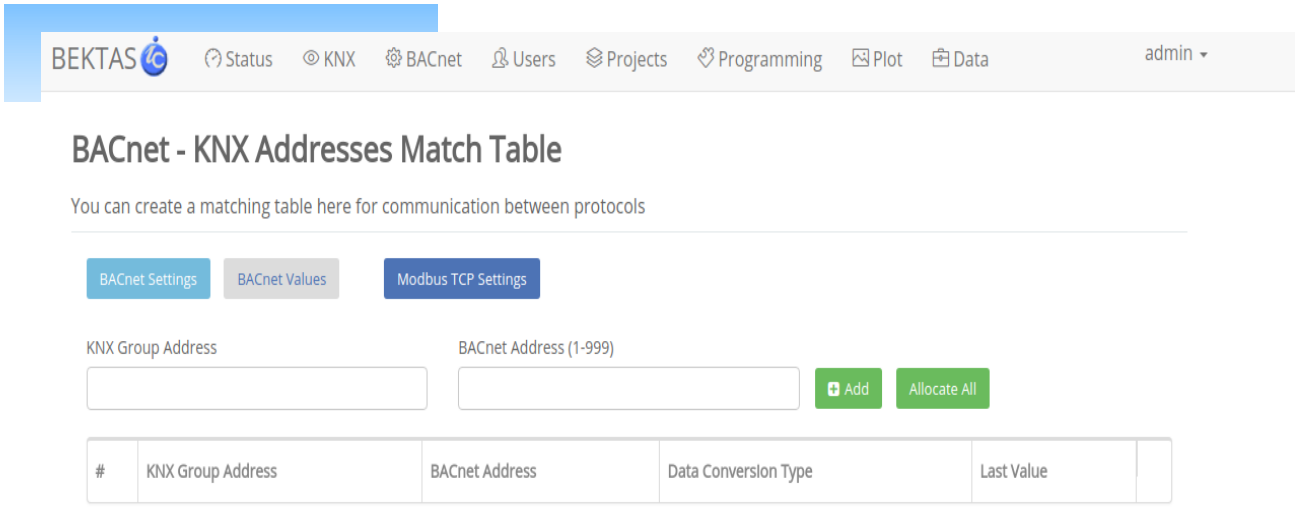
Format can be used marked in green.

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

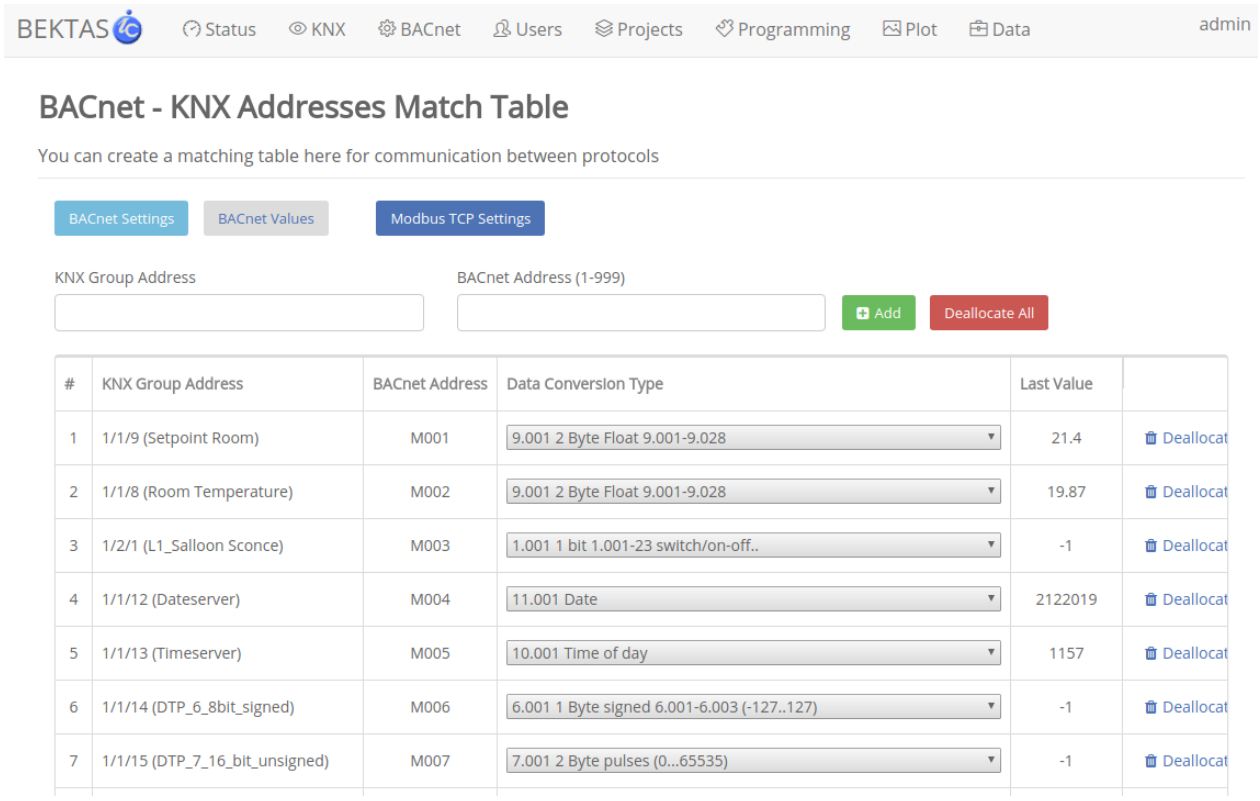
Example XML File

```
<?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="2.001 switch control" DPTs="DPST-2-1" />
    <GroupAddress Name="DP1" Address="1/0/5" Description="3.007 dimming control" DPTs="DPST-3-7" />
    <GroupAddress Name="DP1" Address="1/0/6" Description="5.001 perecntage 100%" DPTs="DPST-5-1" />
    <GroupAddress Name="DP1" Address="1/0/8" Description="6001 percentage" DPTs="DPST-6-1" />
    <GroupAddress Name="DP1" Address="1/0/10" Description="7.001 2 byte unsigned pulses" DPTs="DPST-7-1" /
>
    <GroupAddress Name="DP" Address="1/0/11" Description="7.002 2 byte time (ms)" 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.



This is Result after allocate all Datapoints. Data Conversion Type will be automatically chosen.



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