Smart home and building solutions.
Global. Secure. Connected.

ETS6 Professional

New features & functionality

Smart, Secure, Open

Futurasmus 20 Years, 2021.05.06
Vassilios Lourdas, Tools Team Leader

ETS6 Professional

ETS6 Professional – Smart, Secure, Open

KNX Association presents the new ETS6 Professional!

Smart!	**User Experience & User Interface**
Secure!	**New KNX network capabilities**
Open!	**KNX IoT**

Smart, Secure, Open

What is behind the slogans?

Explanation > Implementation > **Advantages & Benefits**

Secure

ETS6 Professional – Smart, Secure, Open

Explanation > Implementation > Advantages & Benefits

An KNX installation is a live organization, it evolves and changes together with its inhabitants' habits and needs. Extending it however might be a cumbersome task when new devices require topological changes because they are of different media type (e.g. RF) or KNX Data Secure support.

Secure

Support of the KNX Segment Coupler and KNX Security Proxy Coupler features and scale the installation to the maximum!

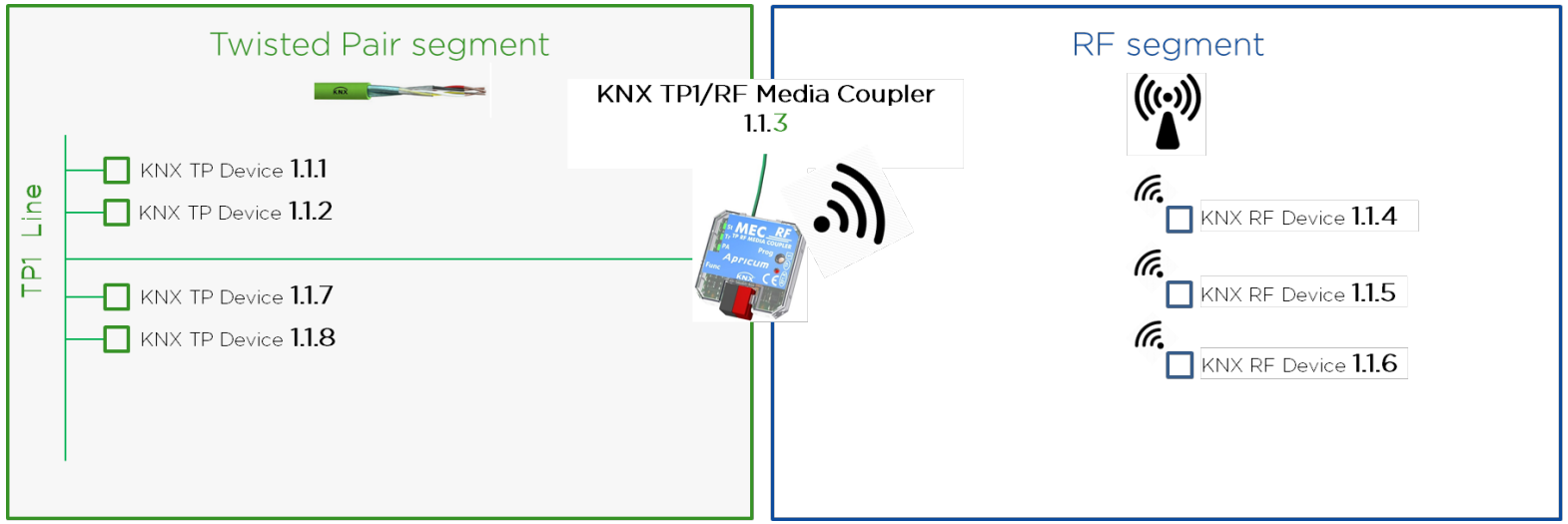
ETS6 Professional – Smart, Secure, Open

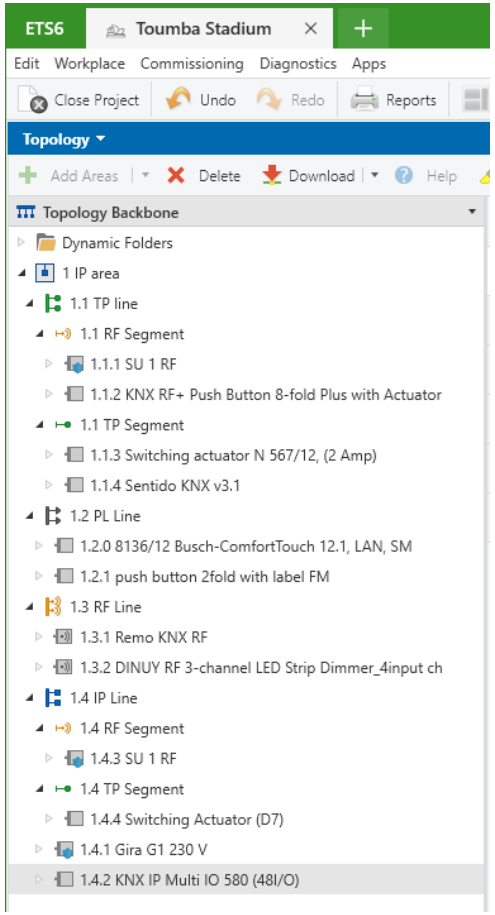
Explanation > **Implementation** > Advantages & Benefits

ETS6 Professional supports KNX Segment Couplers

which are devices that allow...

- ... extending an existing KNX TP1 Line with RF devices
- ... extending an existing KNX TP1 Line with TP1 devices with filtering
- ... connecting lots of small TP1 islands to KNXnet/IP with filtering





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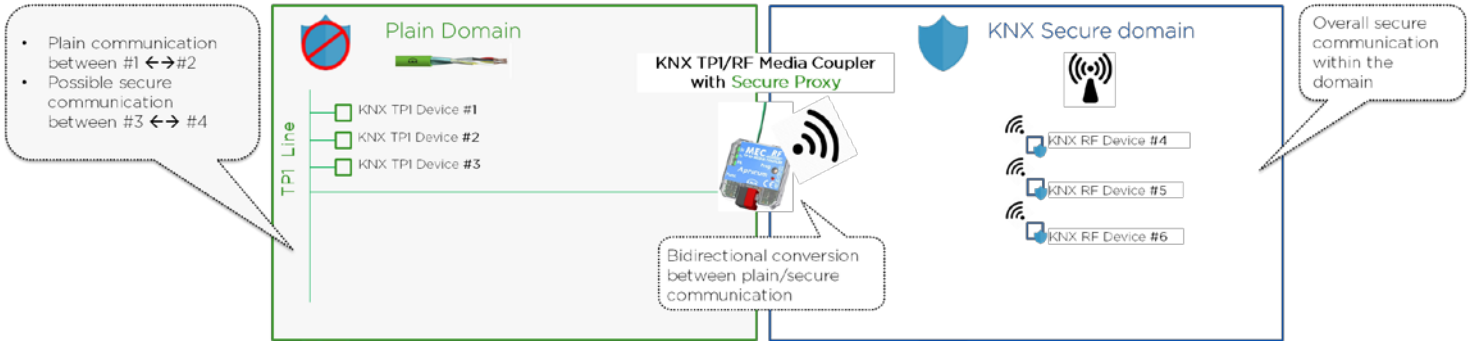
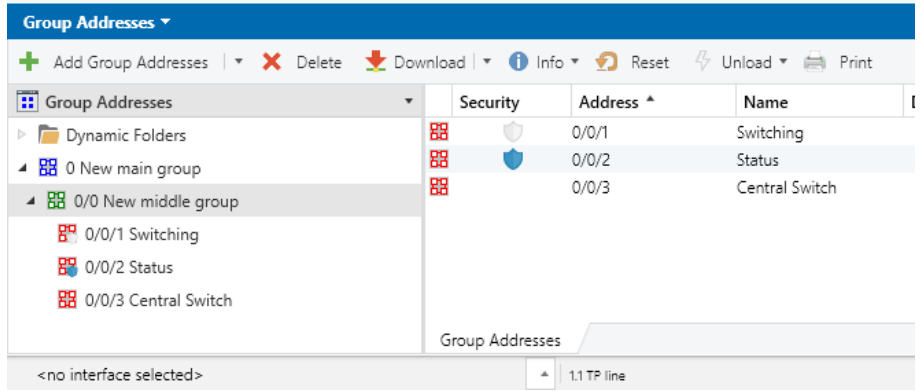
Explanation > **Implementation** > Advantages & Benefits

ETS6 Professional supports KNX Secure Proxy

which is a device that allows…

- … securing the KNX communication in open Subnetworks (KNX Data Security)
- … securing the configuration of devices in the installation (KNX Data Security, KNX IP Secure Device Management)
- … securing run-time communication of certain applications (KNX Data Security)





ETS6 Professional – Smart, Secure, Open

ETS6 Professional supports new generation of KNX RF devices (KNX RF Multi S-Mode)

- Based on device runtime capabilities from an ETS6 product entry
- Easy to configure since nothing is to be done by the installer
- Secure, as KNX Data Security is mandatory
- Configuration of frequencies for each link (Ready, Multi Fast, Multi Slow), is automatically done by ETS6
- Activation of Fast ACK is done by default
- Configuration of ACK slot number is automatically done by ETS6

ETS6 Professional – Smart, Secure, Open

Explanation > Implementation > Advantages & Benefits

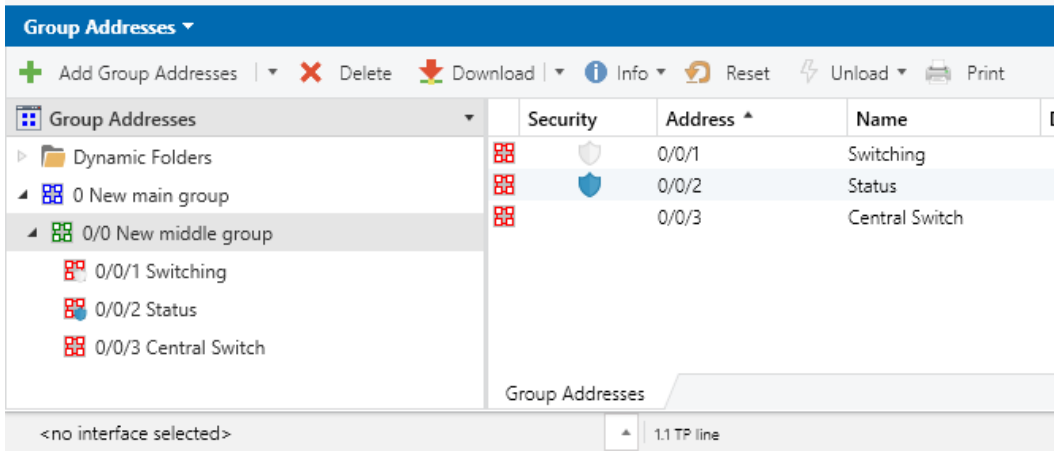
Secure

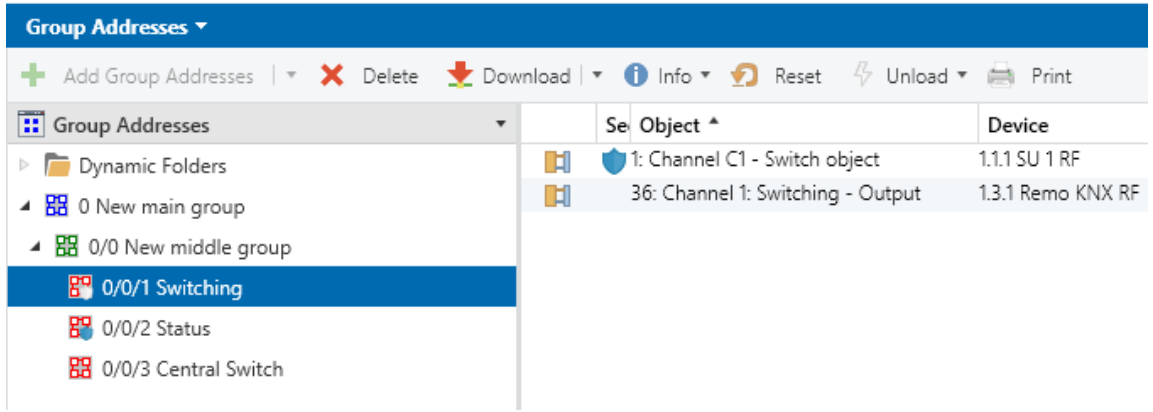
Scale the project topology and structure (almost) freely

Create a line segment adding devices from different medium type (e.g. RF) and keep the addressing scheme!

Use KNX Secure devices together with plain KNX devices now possible

A function can be used plain or securely depending on the input.





ETS6 Professional – Smart, Secure, Open

Smart

ETS6 Professional – Smart, Secure, Open

Explanation > Implementation > Advantages & Benefits

People nowadays use internet browsers more and more to accomplish daily tasks. ETS6 Professional approaches them seamlessly introducing a ‘browser-alike’ User Experience with flexible tab and window handling.

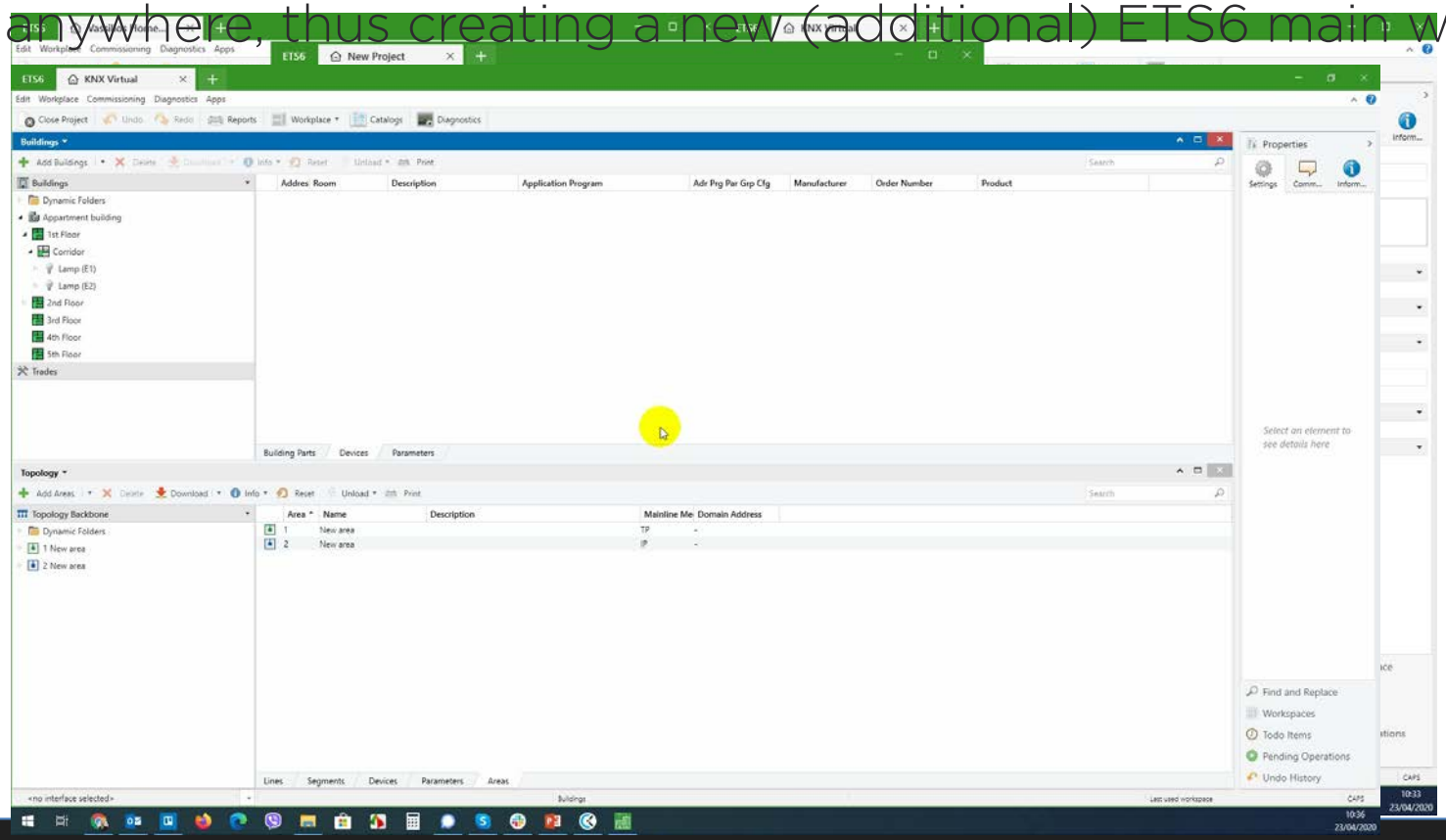
Smart

Interaction with ETS in a familiar way!

ETS6 Professional – Smart, Secure, Open

Explanation > **Implementation** > Advantages & Benefits

In ETS6 Professional a tab can be dragged out of the current main window and dropped anywhere, thus creating a new (additional) ETS6 main window



ETS6 Professional – Smart, Secure, Open

Explanation > **Implementation** > Advantages & Benefits

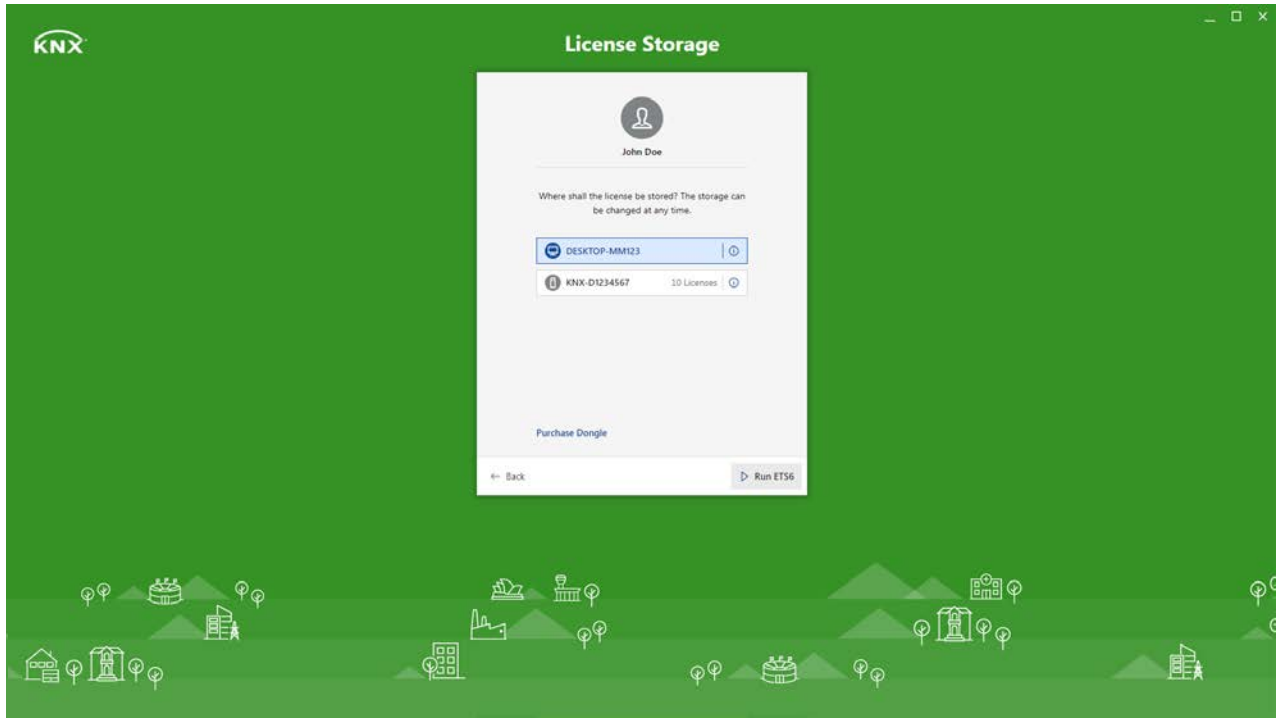
ETS6 Professional supports cloud licensing **additionally** to dongle-based licensing!

Re-use the KNX dongle if you already have one!

ETS6 Professional – Smart, Secure, Open

Explanation > **Implementation** > Advantages & Benefits

ETS6 Professional implements an intuitive licensing workflow to help you enable its features quickly.

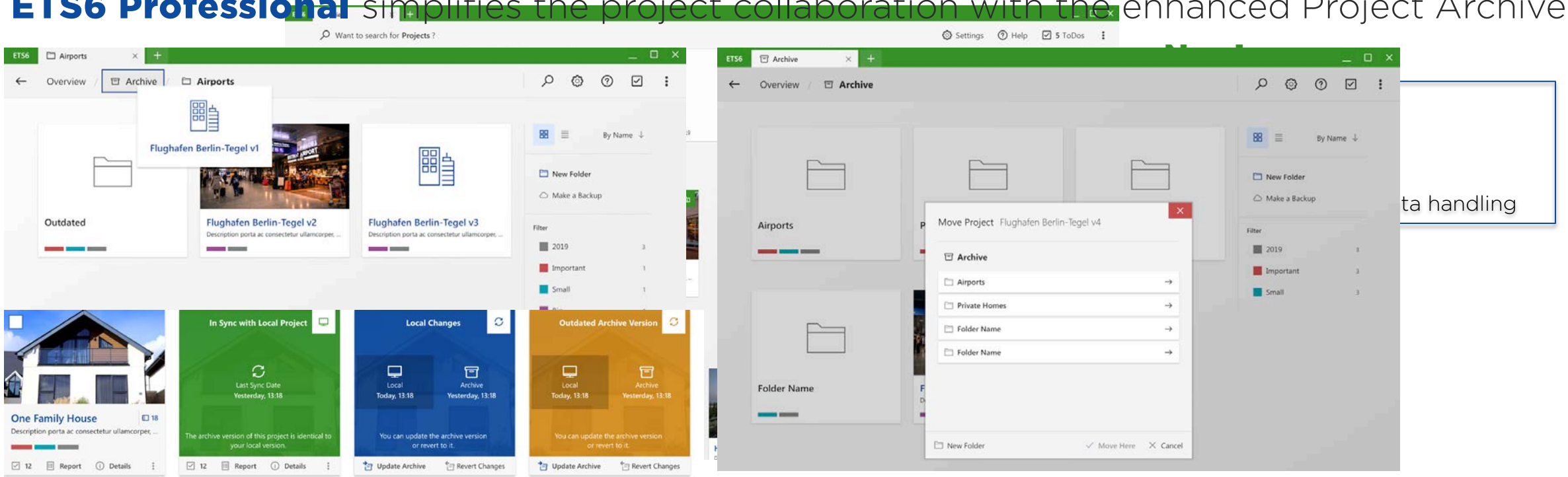


ETS6 Professional – Smart, Secure, Open

Explanation > Implementation > Advantages & Benefits

ETS6 Professional starts with an adaptive dashboard, where the projects can be quickly clustered and sorted.

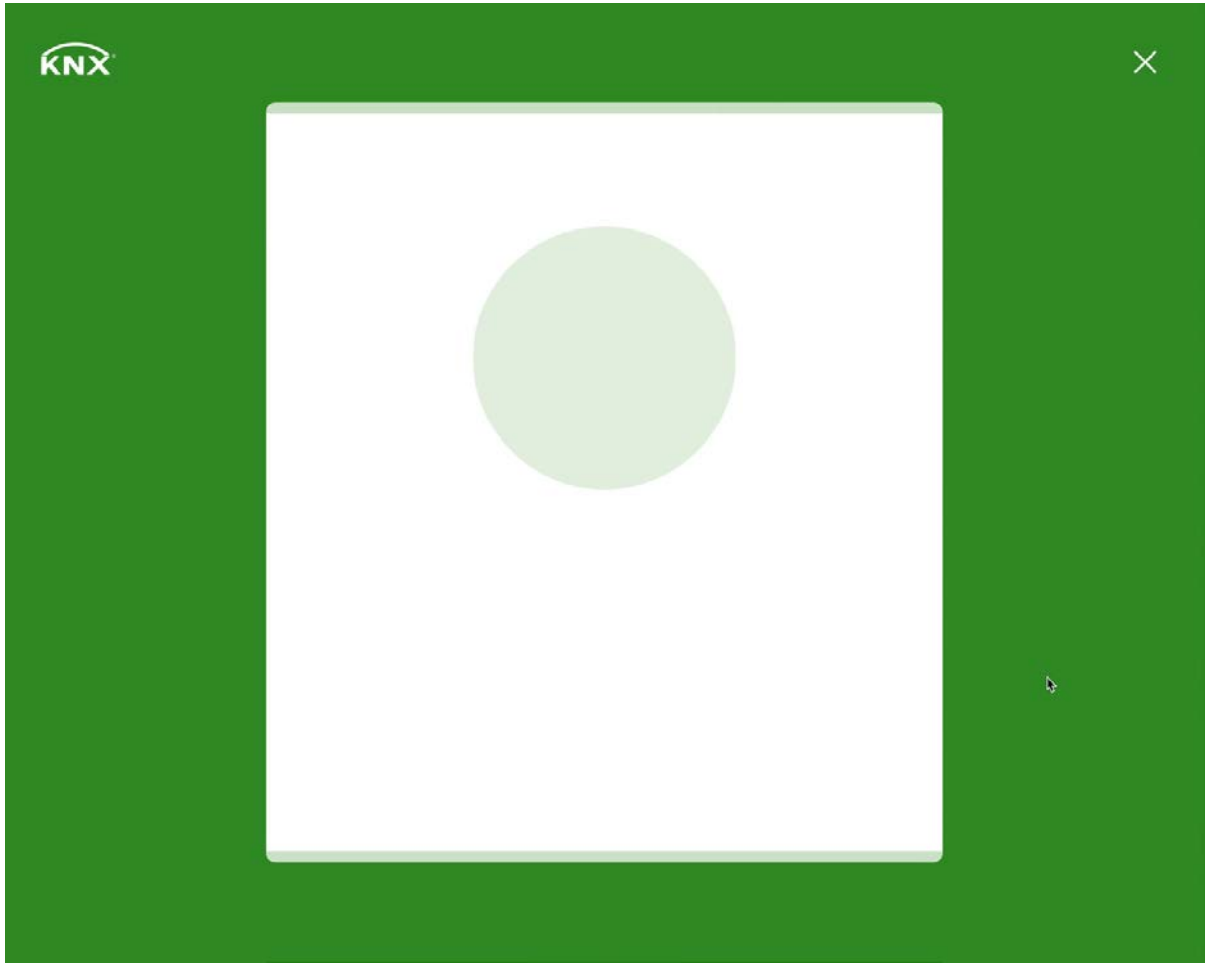
ETS6 Professional simplifies the project collaboration with the enhanced Project Archive!



ta handling

ETS6 Professional – Smart, Secure, Open

- Never miss an important update again!
- Release notes always available before each update.
- Keeping ETS up-to-date ensures continuous improvements and stability of your ETS.



ETS6 Professional – Smart, Secure, Open

Explanation > Implementation > Advantages & Benefits

Smart

Eases the project handling

Faster access to the project data allow you to find your project quickly and start working!

Flexibility when working on projects, like a web browser

Tabs and windows can be dragged & dropped to allow software adaptions when needed.

Simplified licensing workflow & new cloud license

Guidance through the licensing steps and use ETS6 Professional without any hardware dependencies

Never miss again critical updates

Update notifications become prominent including feature & bug fix information prior to the installation.

ETS6 Professional – Smart, Secure, Open

Open

ETS6 Professional – Smart, Secure, Open

Explanation > Implementation > Advantages & Benefits

ETS is implementing a graphical user interface, in which the interface objects mimic their real-world counterparts in how they appear and/or how a user can interact with them.

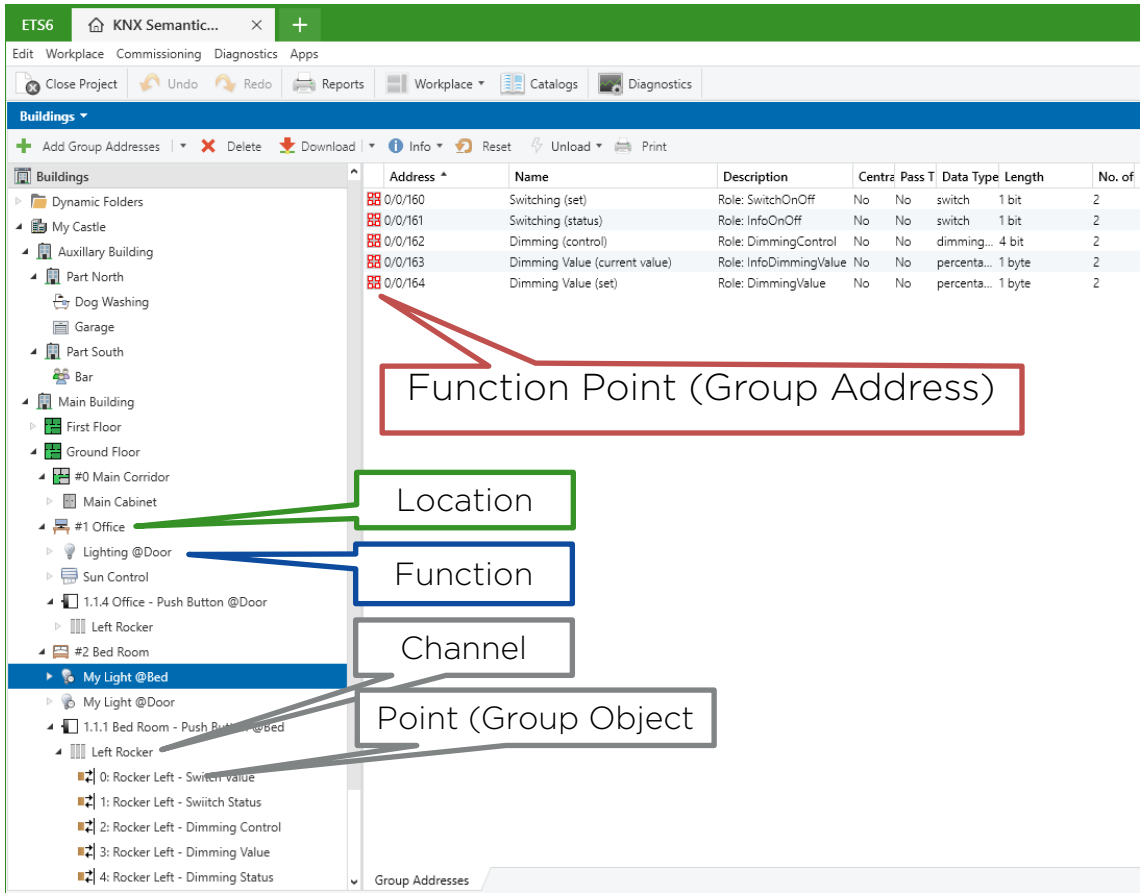
Open

KNX IoT represents KNX in the outside world implementing semantic project information and tagging

ETS6 Professional – Smart, Secure, Open

Explanation > **Implementation** > Advantages & Benefits

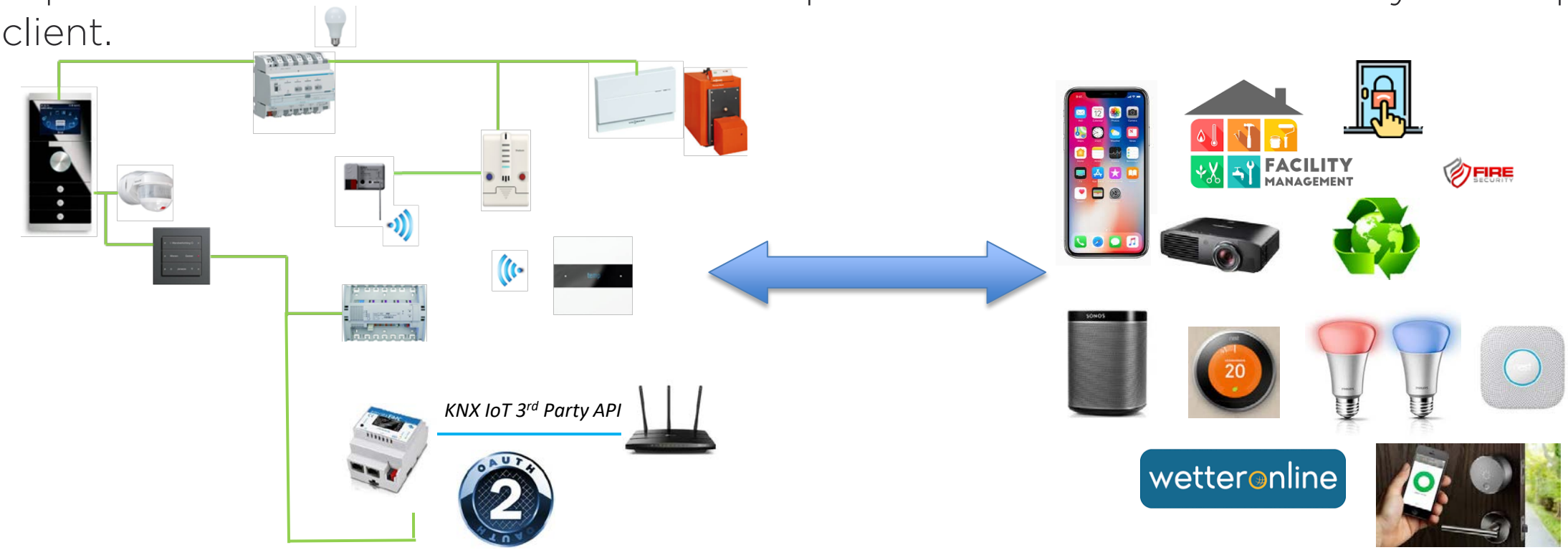
ETS6 Professional adds in the background semantic information to Locations, Functions, Function points, Channels, Group Objects.



ETS6 Professional – Smart, Secure, Open

Explanation > **Implementation** > Advantages & Benefits

ETS6 Professional export to the KNX IoT 3rd Party API, contains all semantical data to be exposed on the API to address the IoT endpoints that can be addressed by a third party client.



ETS6 Professional – Smart, Secure, Open

Explanation > Implementation > Advantages & Benefits

Open

One single KNX standardized solution for all KNX manufacturers

3rd Party Adapters to KNX can focus on one single interface to access a KNX installation

Integration with other systems that are not directly KNX compatible

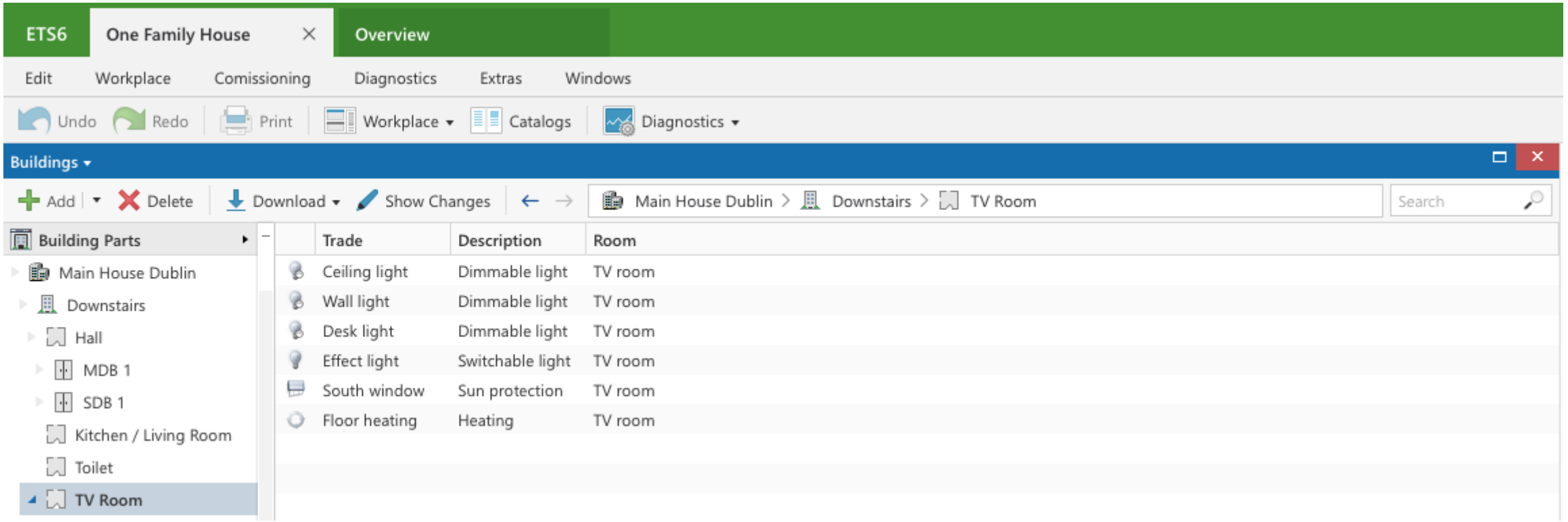
Seamlessly integrate other systems to the KNX project without any hassle.

ETS6 Professional – Smart, Secure, Open

More?

ETS6 Professional – Smart, Secure, Open

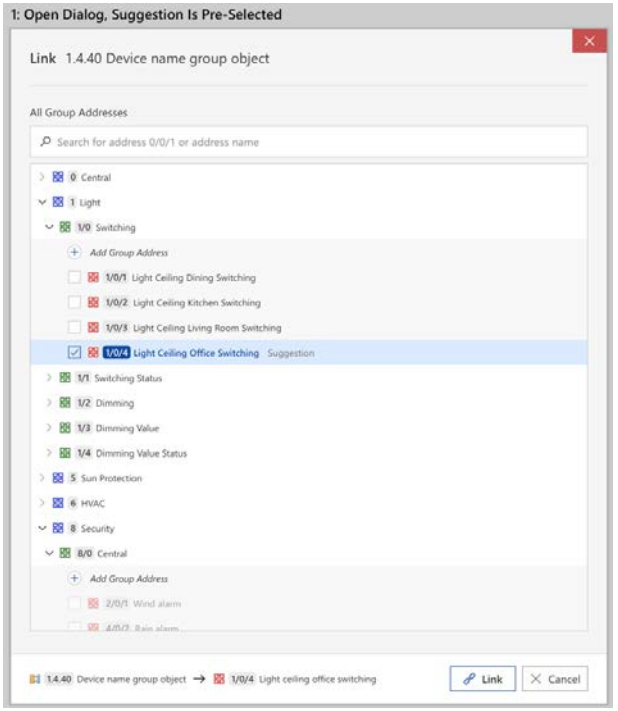
ETS6 Professional provides browsing style navigation history per panel



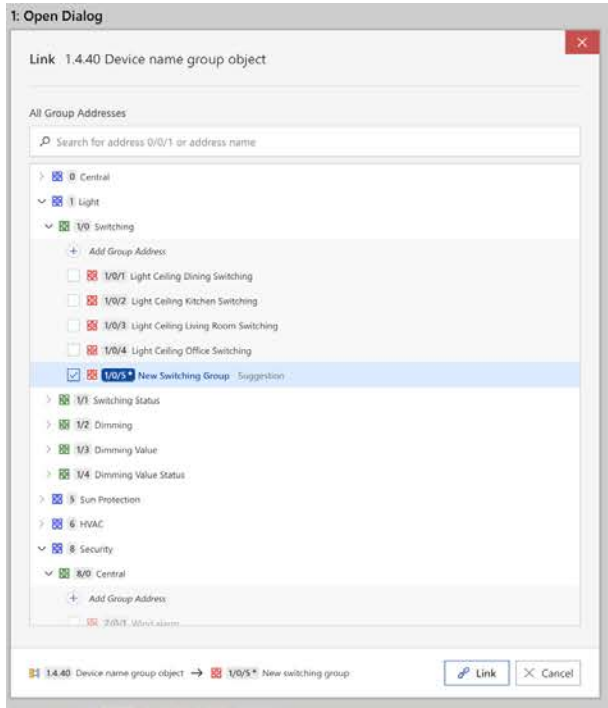
ETS6 Professional – Smart, Secure, Open

ETS6 Professional implements an optimized ‘Link with’ dialog to link Group Addresses faster!

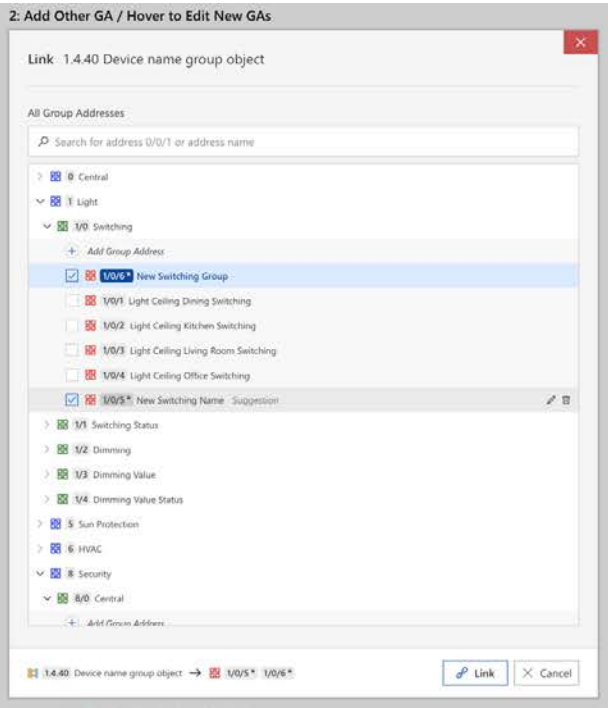
1: Open Dialog, Suggestion Is Pre-Selected



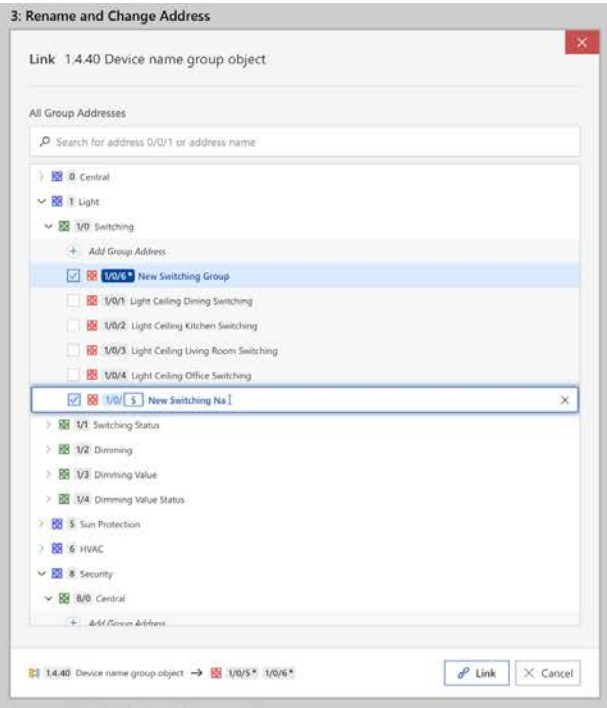
1: Open Dialog



2: Add Other GA / Hover to Edit New GAs



3: Rename and Change Address

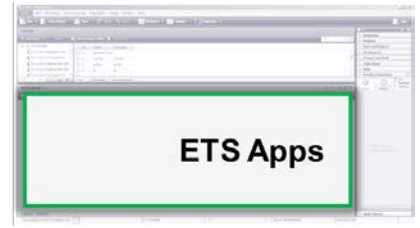


ETS6 Professional – Smart, Secure, Open

ETS6 Professional maintains 30 years of backwards compatibility!

- **Maintain compatibility with existing KNX (and EIB) devices!**
  - All KNX (and EIB) certified can still be configured with ETS6 Professional!

- **Maintain compatibility with existing plug-ins, DCAs & ETS Apps**
  - Existing x86 plug-ins will continue to work with ETS6 Professional.
  - Existing DCAs & ETS5 Apps will continue to work in ETS6 Professional*.

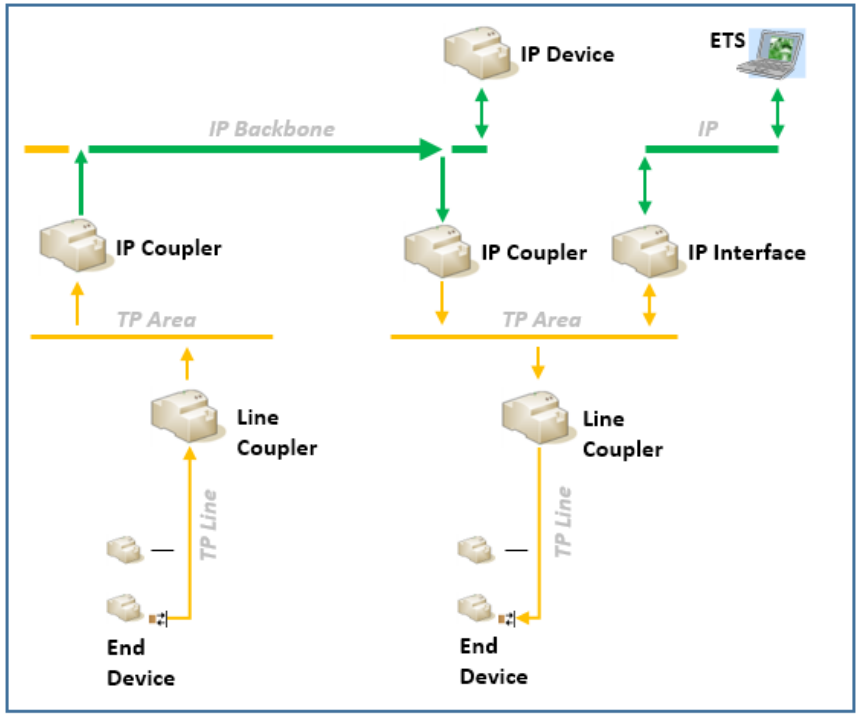


** prerequisite to have been built against ETS5 SDK v5.7*

Using KNX Secure in ETS6

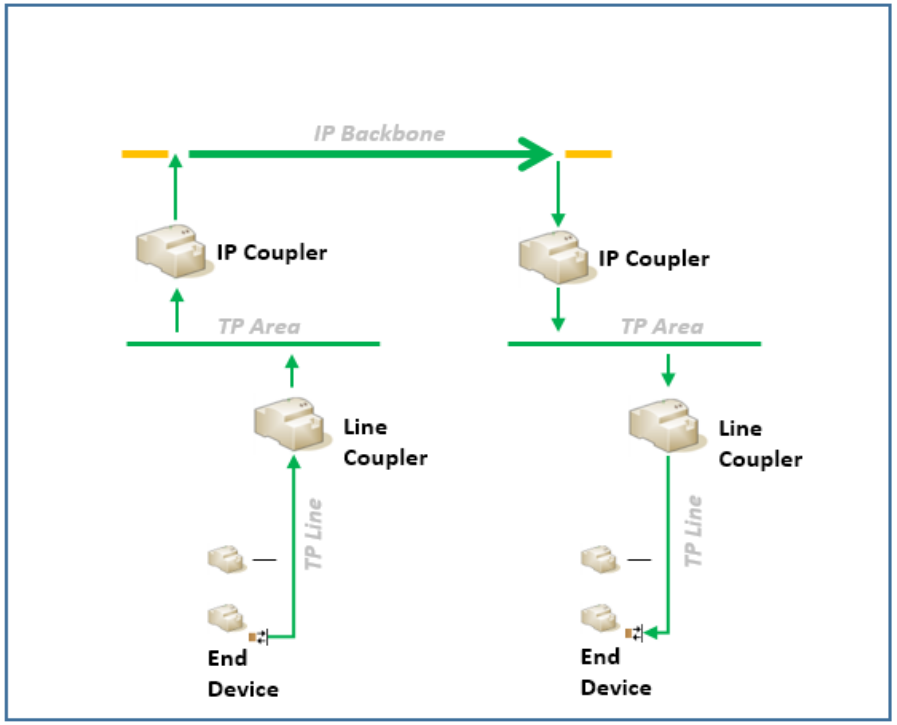
Using KNX Secure in ETS6 – Introduction - KNX Secure Overview

KNX IP Secure



All KNX telegrams between the two (or more) IP Couplers are encrypted

KNX Data Secure



The group communication of a particular sender (one or more group objects) to another group object(s) is encrypted

Plain communication
Secured communication

Using KNX Secure in ETS6 – KNX Secure Facts

KNX Secure Application Scope

KNX Secure covers the following main application scenarios in a KNX installation.

- Secure Communication on IP
- Secure Communication between end devices across media
- Secure Communication during configuration

KNX Secure Attack Vectors

The following threat scenarios or possible attacks on the KNX system are effectively thwarted by KNX Security:

- Telegram Repetition
- Telegram Manipulation
- Telegram Visibility

Using KNX Secure in ETS6 – KNX Secure Facts

KNX Secure used algorithms

KNX Secure uses AES128 CCM for encryption/authentication and elliptic curve Diffie-Hellman for a secure key exchange

- *Advanced Encryption Standard* (AES) is a standard encryption algorithm (ISO/IEC 18033-3)
  - *Block size: 128 bit*
    Key size: 128 bit, 192 bit or 256 bit
  - Consists of:
    - Substituting bytes
    - Shifting rows
    - Mixing columns
    - Add round key

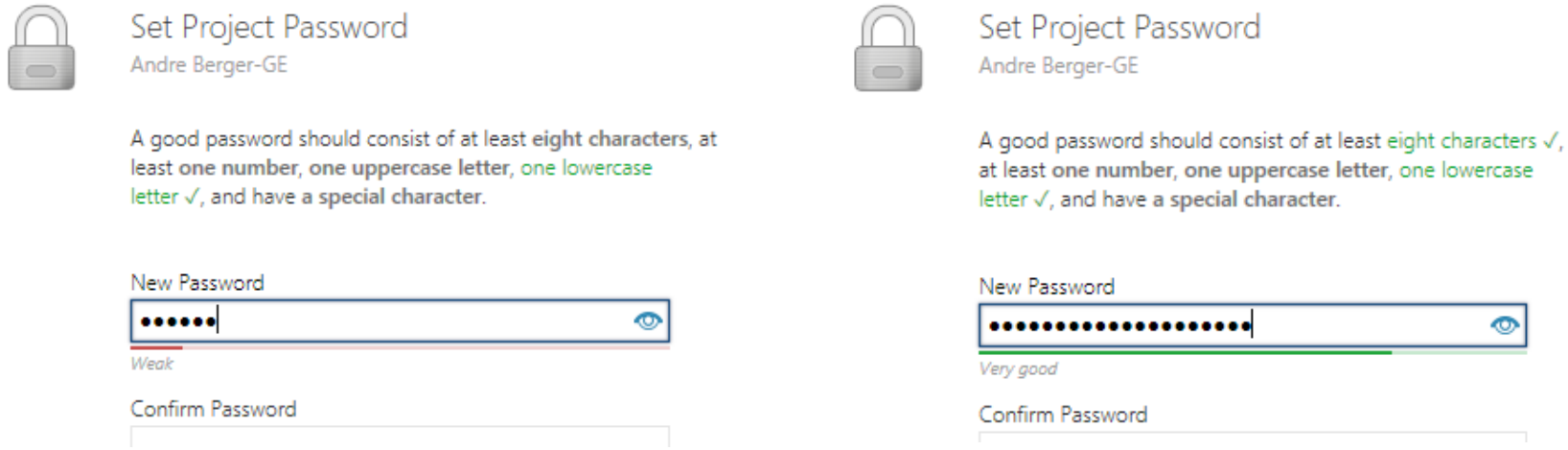
*Several animations exist on the Internet (*https://www.youtube.com/watch?v=mlzxpkdX), *usage in KNX (KNX IP Secure)*

- Elliptic curve Diffie- Hellman key exchange is a worldwide standardized and widely used algorithm to share a common secret key on an unsecure communication channel

Using KNX Secure in ETS6 – KNX Secure Facts

Security of ETS KNX Projects with KNX Secure #1

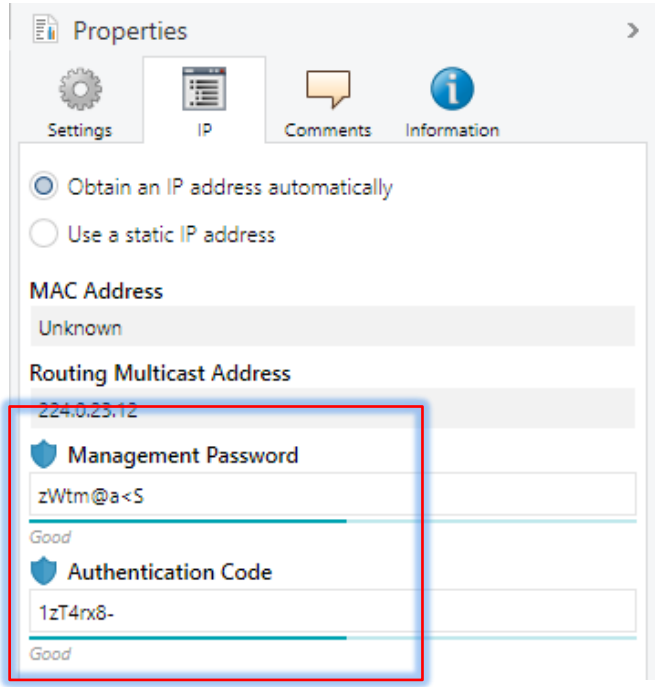
- Every ETS project using KNX Secure requires increased “security level” for the project data itself (not allowed to view passwords used in project) → ETS projects therefore need to be password protected
- ETS displays the required password strength.



Using KNX Secure in ETS6 – KNX Secure Facts

Security of ETS KNX Projects with KNX Secure #2

- Every KNX Secure device used in a secure way in an ETS project also has individual passwords. Also here ETS displays the password strength in a proper way.



Using KNX Secure in ETS6 – KNX Secure Facts

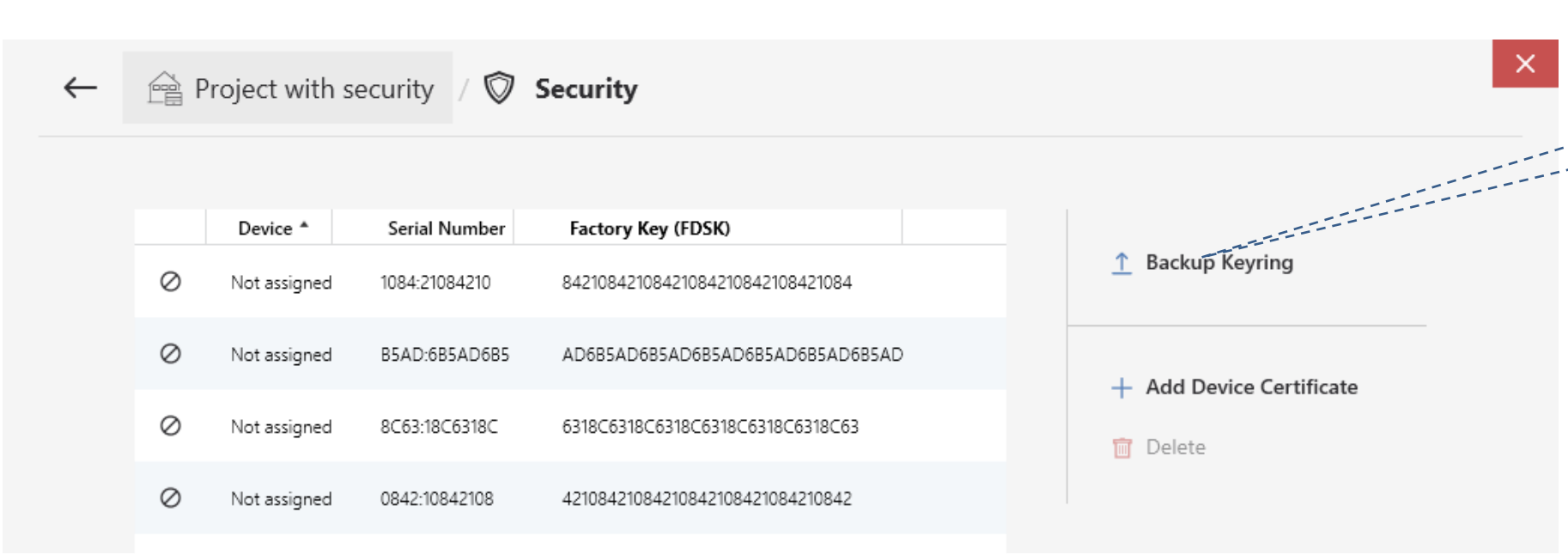
Keys in an ETS KNX Project with KNX Secure #1

- When using KNX Secure features of devices, an individual device and/ or the IP backbone key for the “secure” communication need to be maintained. These keys are stored and maintained by ETS in a safe way, even when projects are exported.

Using KNX Secure in ETS6 – KNX Secure Facts

Keys in an ETS KNX Project with KNX Secure #2

- Monitoring a KNX (Secure) installation → for a valid use case (e.g. external visualization or diagnostics) it is necessary to get hold of the keys used in the ETS project in a (secured) way → keyring exported file

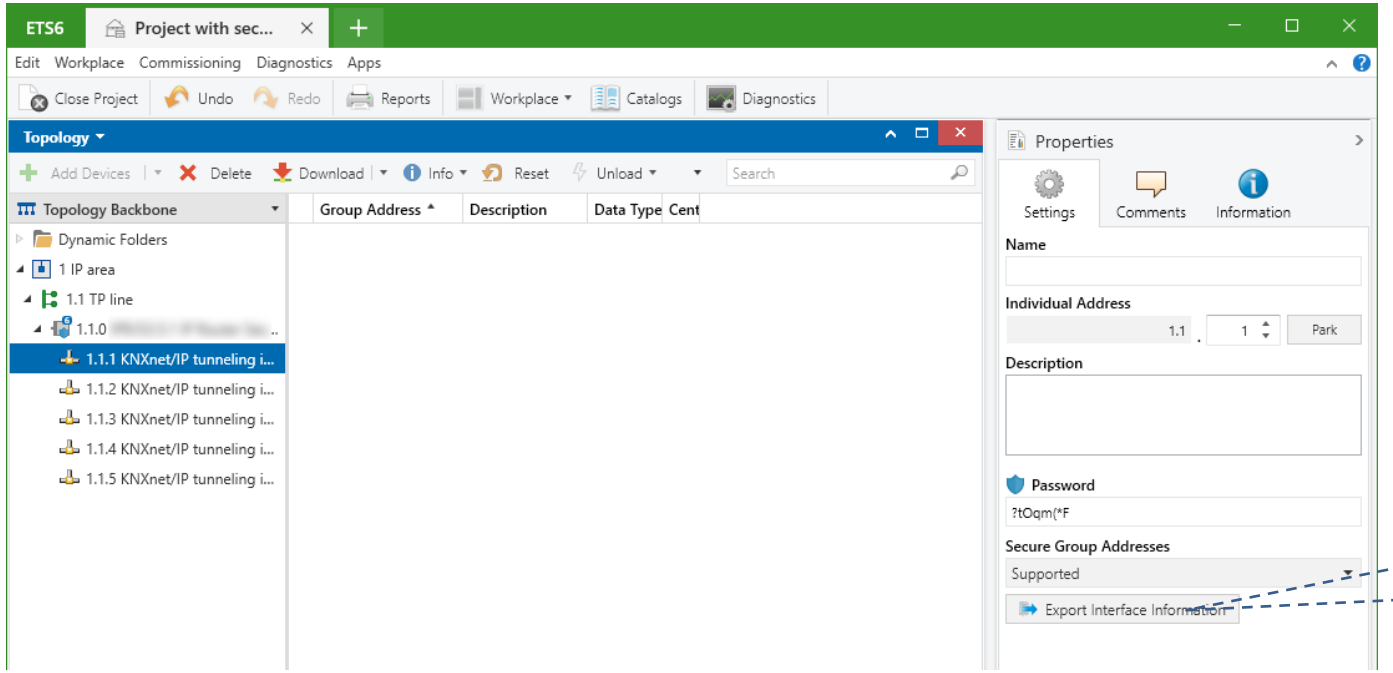


Keyring export function of entire installation (XML file)

Using KNX Secure in ETS6 – KNX Secure Facts

Keys in an ETS KNX Project with KNX Secure #3

- Monitoring a KNX (Secure) installation → for a valid use case (e.g. external visualization) it is necessary to get hold of the keys used in the ETS project in a (secured) way → keyring exported file



Individual keyring export for this tunnelling interface only

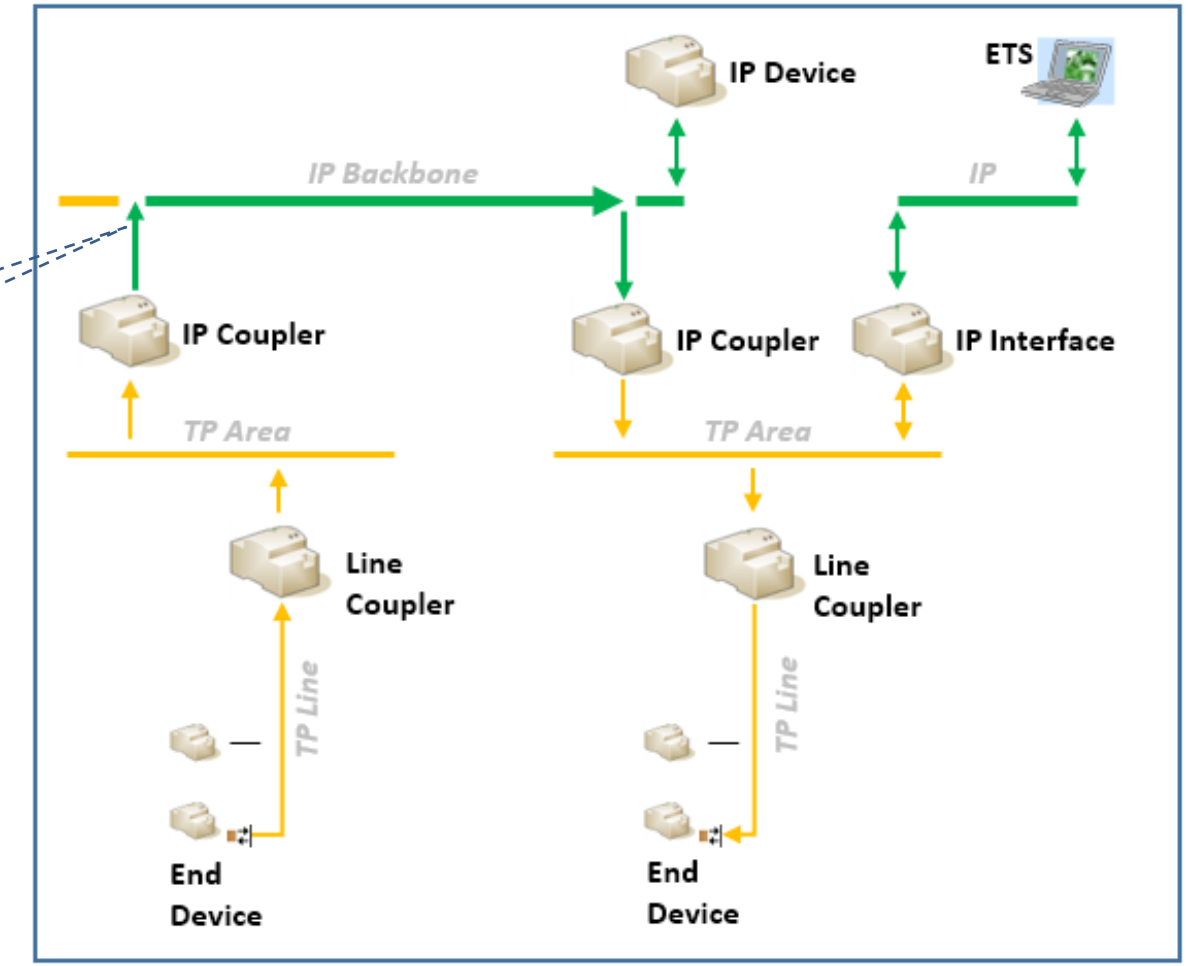
KNX Secure Types

Using KNX Secure in ETS6 – KNX Secure Types

KNX IP Secure, Technology

KNX IP Secure encrypts the entire KNXnet/IP frame.

All KNX telegrams between the two (or more) IP Couplers are **SECURED**



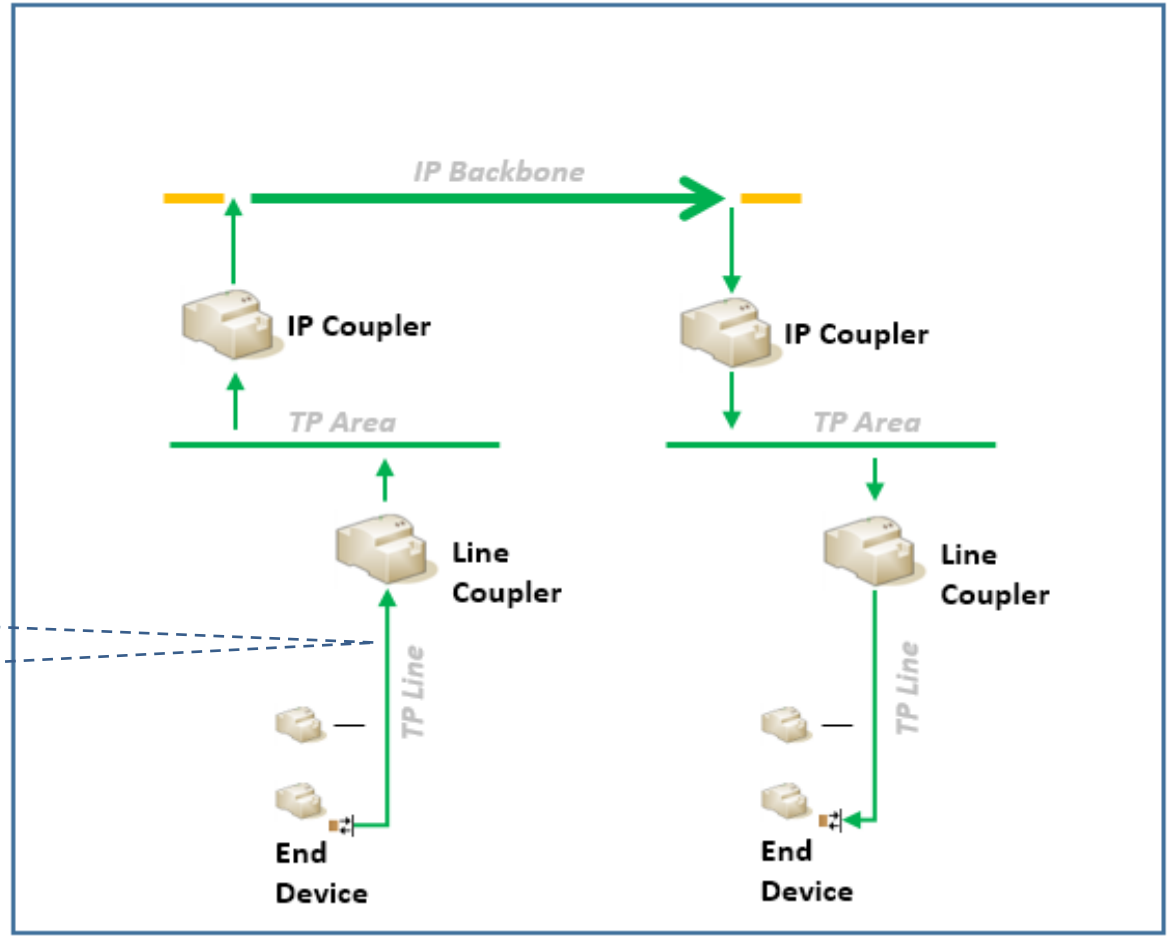
Plain communication
Secured communication

Using KNX Secure in ETS6 – KNX Secure Types

KNX Data Secure, Technology

KNX Data Secure encrypts only the APCI and the payload.

The group communication of a particular sender (one or more group objects) to another group object(s) is **SECURED**



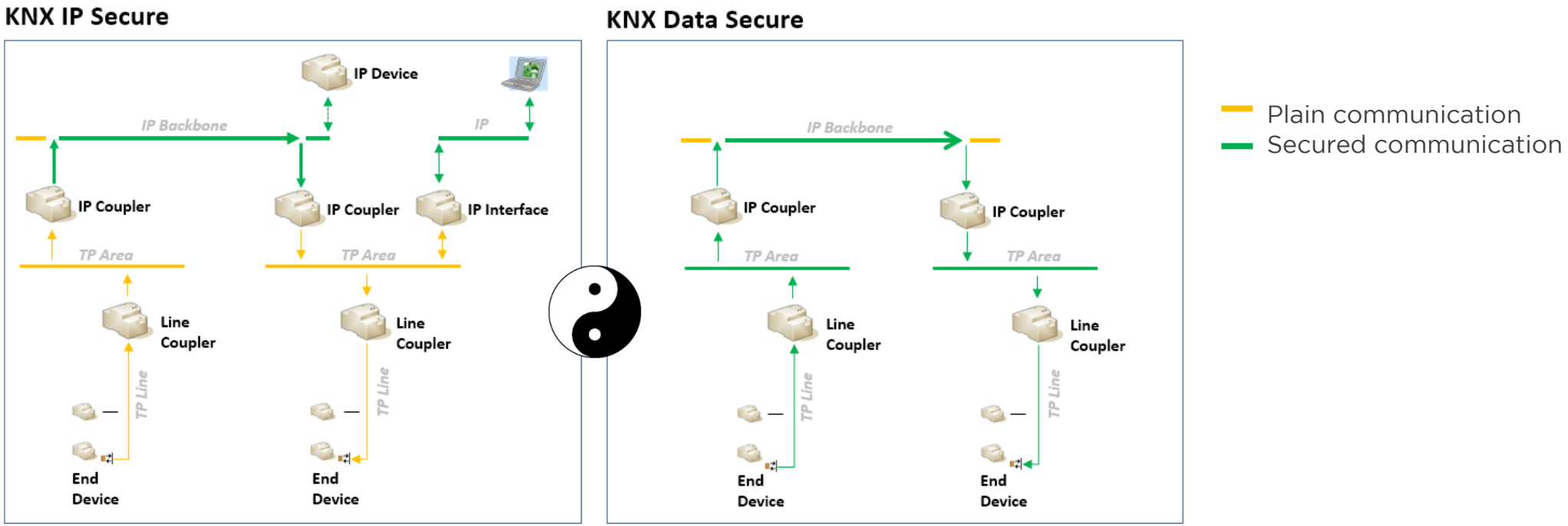
Plain communication
Secured communication

Using KNX Secure in ETS6 – KNX Secure Types

KNX Secure, Combined

KNX IP Secure and KNX Data Secure can be combined in an ETS project/installation.

ETS handles the key management/distribution, establishes ‘secure links’ and downloads these links in KNX Secure devices independent of the KNX Secure types.



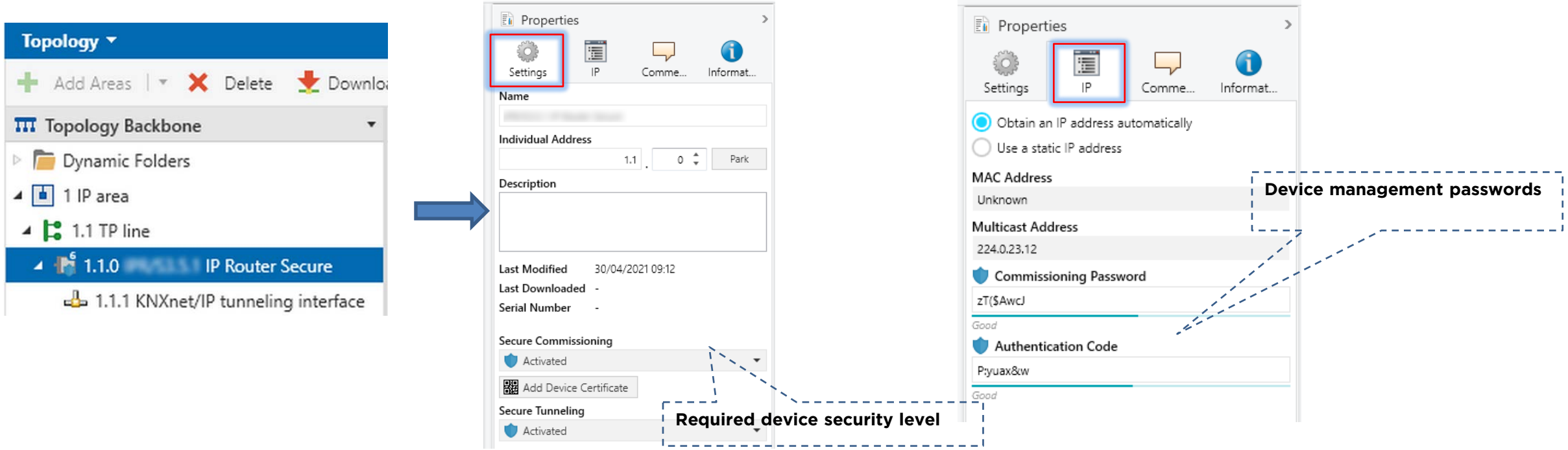
KNX Secure in ETS6

Using KNX Secure in ETS6

KNX IP Secure, IP Devices

The KNX secure level of IP **devices** (e.g., on the backbone) is part of the **device** properties.

- Possible levels are ***Activated/ Deactivated***. There are dependencies between this level and the backbone (e.g. the need to set the Level to ***Activated*** for such devices when backbone is secure)

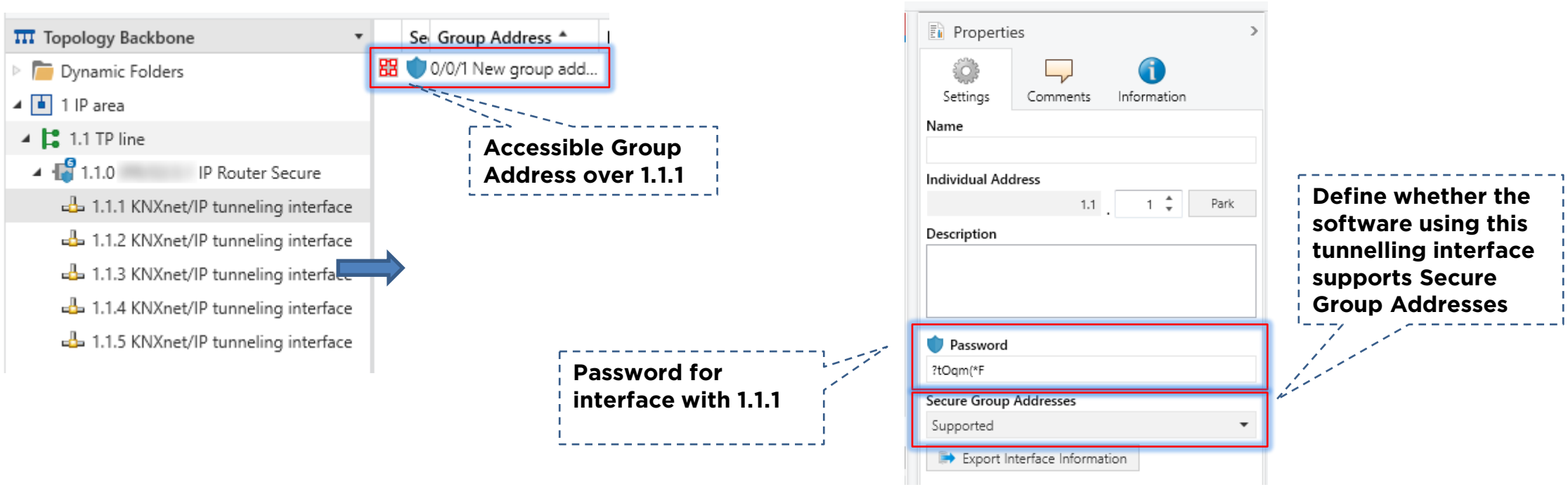


Using KNX Secure in ETS6

KNX IP Secure, IP interfaces

The KNX secure level of IP **interfaces** is (also) part of the **device** properties.

- For external (visualization) access via (additional) tunneling interfaces, an interface password and a group address explicitly assigned to the interface is needed

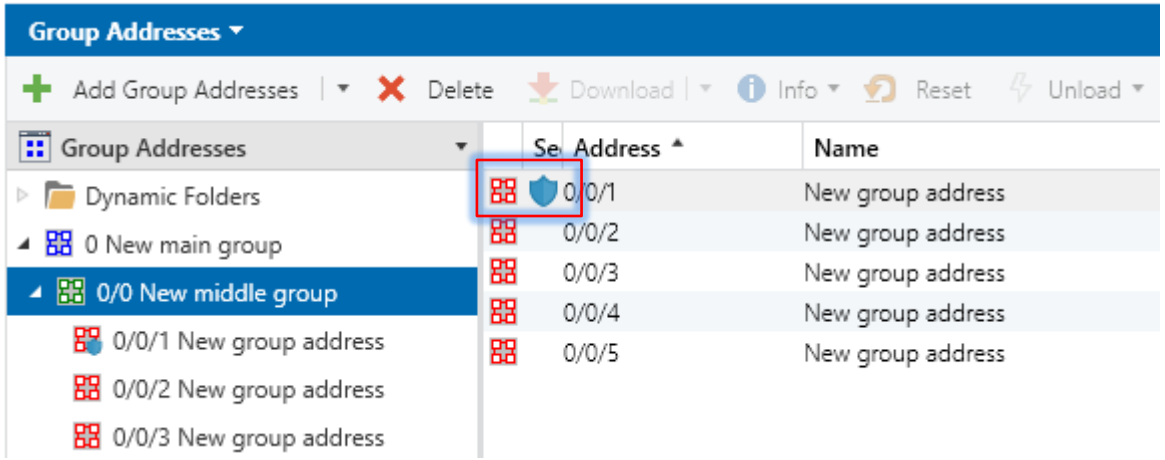


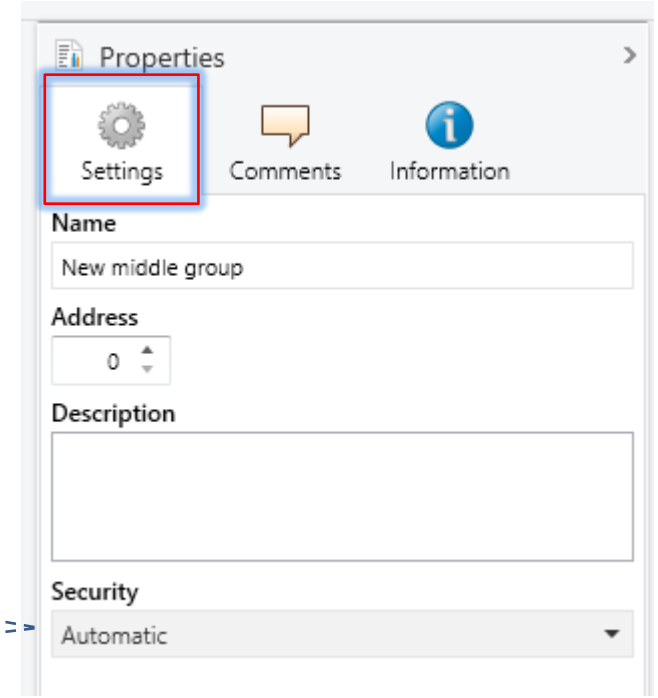
Using KNX Secure in ETS6

KNX Data Secure, Group Addresses

The KNX secure level of a group address is part of the **group address** properties.

- Possible levels are **On/Off/Automatic**. There are dependencies between this level and the group addresses assigned to the group objects (e.g. the need to download such devices also secure when the group address is secure)





Required device security level

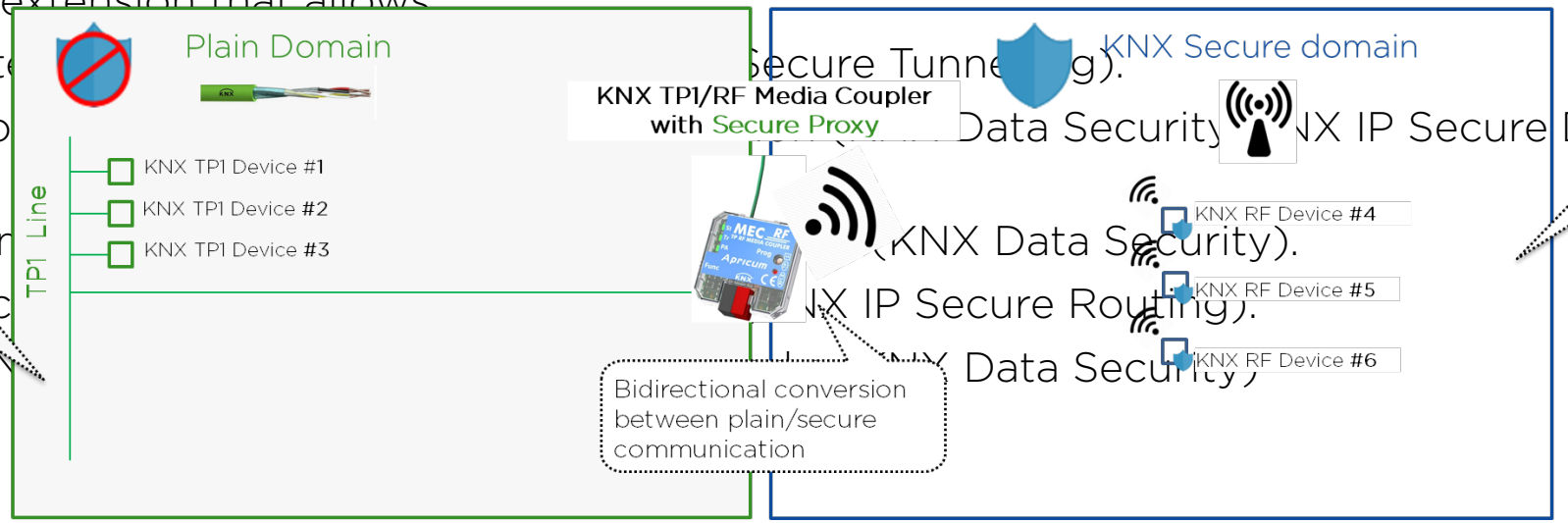
KNX Secure Proxy in ETS6

Using KNX Secure in ETS6 - KNX Secure Facts

ETS6 Professional supports KNX Secure Proxy

which is a coupler extension that allows

- Plain communication between #1 ↔#2
- Possible secure communication between #3 ↔ #4

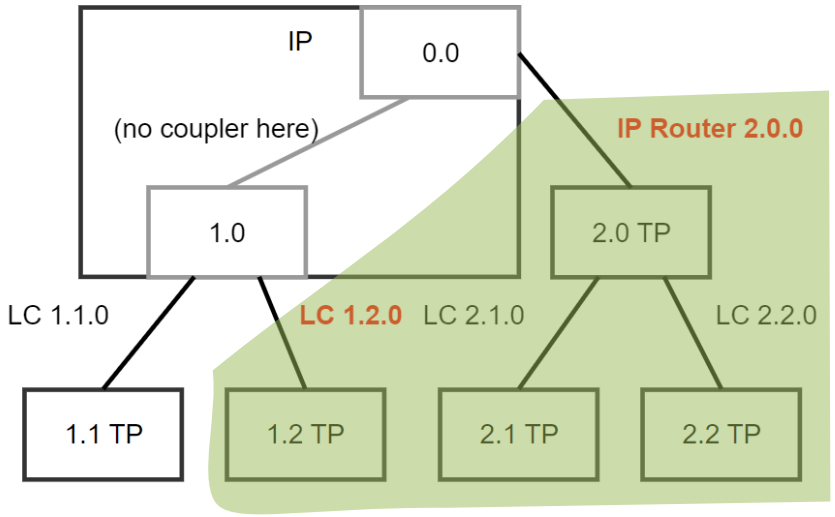


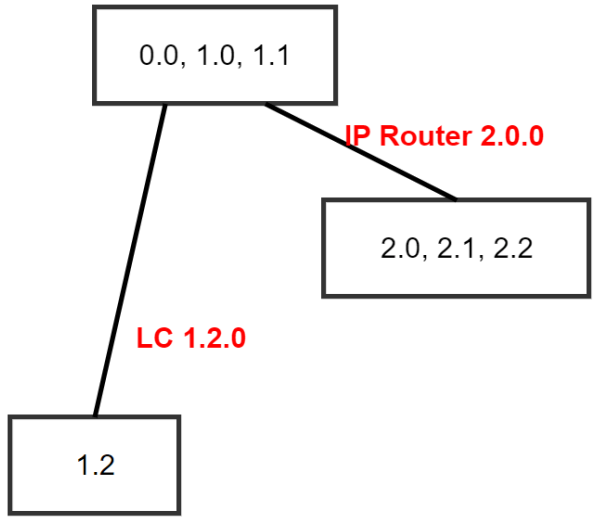
4. Securing KN[illegible] c[illegible]
5. Securing the KN[illegible]

Secure Tunne[illegible]g).
Data Security[illegible]X IP Secure [illegible]
(KNX Data Security).
[illegible]X IP Secure Routing).
[illegible] Data Security)

Using KNX Secure in ETS6 - KNX Secure Facts

- **ETS6** can cope with **multiple security domains** *(ETS5 only with one)*, in which the security rules are the same as in ETS5
- **ETS6** can cope with the security domain borders





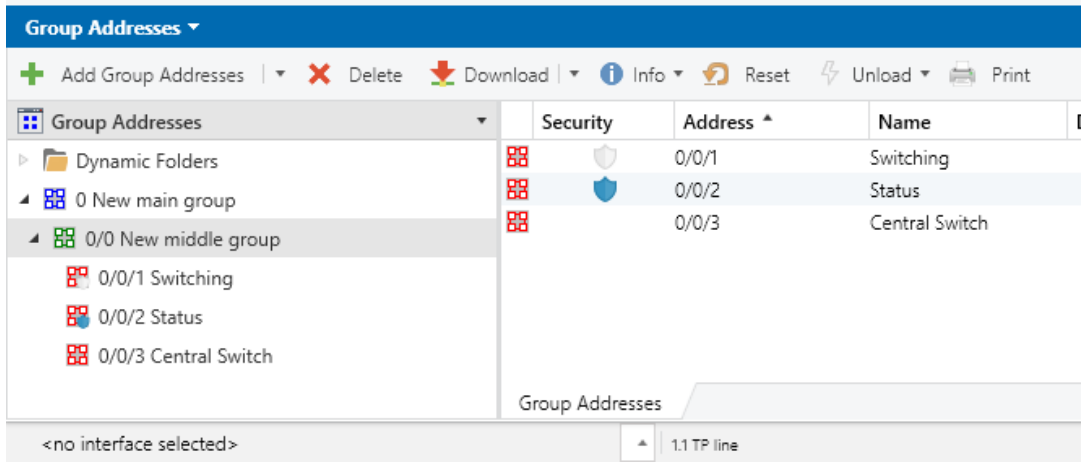
Using KNX Secure in ETS6 - KNX Secure Facts

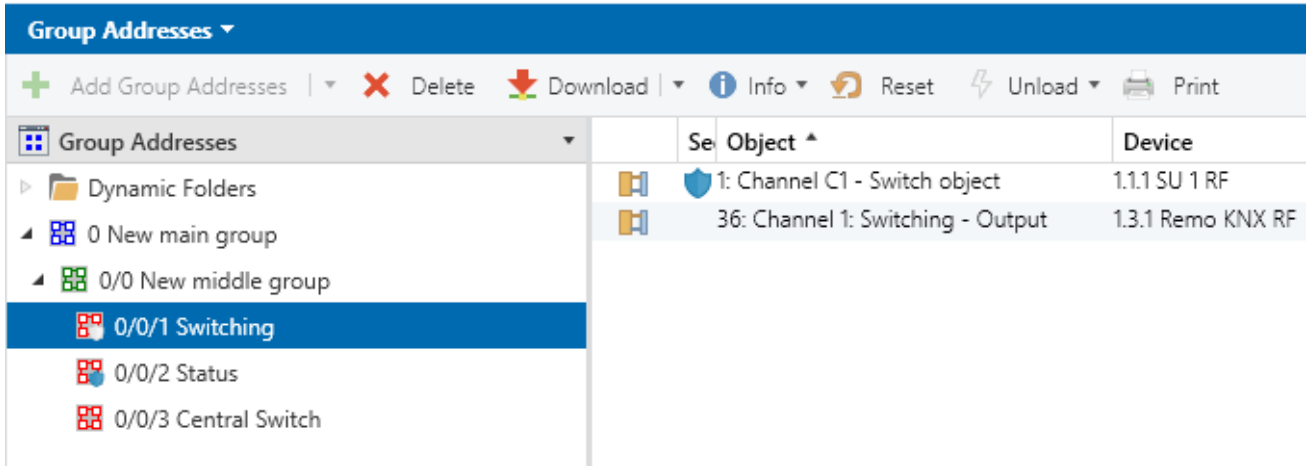
Group communication security axioms

Axiom 1: Within a security domain communication using a specific group address is either all secure or all plain.

Axiom 2: There is a single key per group address within an installation.

Axiom 3: ETS supports only A+C, not A. (A = Authentication, C = Confidentiality)





Thank you!

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