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Workshop ETS5 - 25 anos com KNX

KNX Technology Workshop

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Contribuir para o **enriquecimento do País, potenciando o crescimento de pessoas e organizações**.

Volkswagen Autoeuropa

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Tecnologia para a vida

AHK Deutsch-Portugiesische Industrie- und Handelskammer
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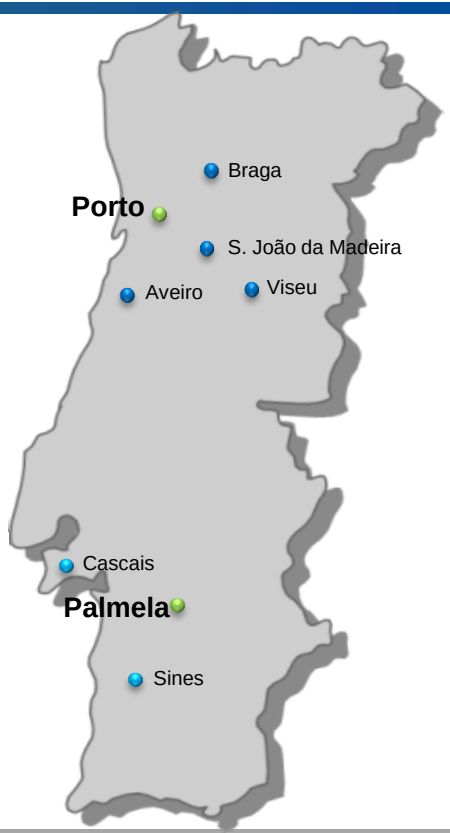
> 1100	60
Formandos	Colaboradores
> 200	8
Formadores externos	Localizações



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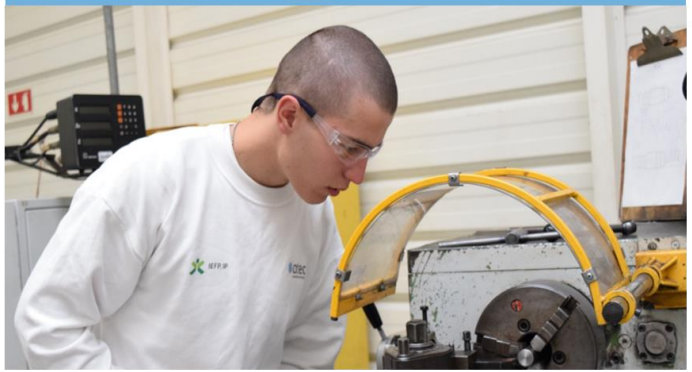
Formação profissional



Formação empresarial

Formação profissional

parceria com:

- Aprendizagem
- Especialização tecnológica
- Educação e formação de adultos

Formação empresarial

empresas e particulares

- Automação & tecnologias da informação
- Mecatrónica automóvel & mecânica industrial
- LEAN
- Comportamental & línguas
- Projetos internacionais

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Agenda

ETS 5 Profissional

- O porquê do ETS5?
  - *Desafios, Mudanças*
- Quais as novidades no ETS5?
  - *IT System Environment, User Interface, Business Logic, KNX System*
  - *ETS Apps, extend ETS functionality (excursus to ETS App Online Catalog+)*

ETS Segurança/ Core/ Tablet

- *Como criar segurança com o ETS ?*
- *Especificações do ETS Core/ Tablet?*
- *Conceito e Tecnologia*
- *User Interface*

Planeamento e datas

Novidades no ETS5

ETS4 was launched in 2010, since this…

- Formulation of new ETS requirements

  from the side of users & the KNX system, here especially the integration of KNX RF System Mode in ETS

- Introduction of an more and more “connected” world (I do not use wording “cloud” here)

  customer expectation to data availability everywhere and every time

- ETS user have less time to perform the same or an better (project) result for its customers

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What's new in ETS5 → Changes

Changes & improvements can be spilt up into three (3) sections.

- **IT System Environment**
  - *OS support; installation behavior, updates, compatibility, …*
- **User & Core Interface**
  - *Edit and naming behavior, views and filter, …*
- **KNX System**
  - *Download performance, diagnostic capabilities, RF system integration …*

In total we have to implement ~ 110.. 125 major & minor changes.

Ambiente e Sistema IT

Main Points

- Database “Removal”
- Installation & Setup & OS Support
- x32/x64 Mode (ETS + Apps)
- Next Generation Plug In Software
- Performance
  - *Database*
  - *Reports*
  - *New Dongle*
  - *Various*

Database Removal

Current ETS installation is not always ‘ideal’.

- Size of the setup to download
- OS preconditions for server installation
- Interference with existing/ installed PC (server) applications

Solution

- Remove the storage principle via a “database”
- Store data in plain XML project files (indexed files → access performance)

Installation & Setup & OS Support

ETS installation is restricted to the most recent OS versions.

- Win7 SP1 x32/x64, Win8 x32/x64, Server 2008 R2 SP1 x64, Server 2012 x64
- Reduction of Setup size : > 50% (530 MB → 65 MB)
- Falcon is integrated part of the ETS (no COM component anymore)
- Parallel installation of ETS3/4 to ETS5 possible
- RS232 support in ETS5 discontinued
- EibLib/IP support in ETS5 continued via an ETS App

  (remark: EibLib/IP was never an released and voted specification)

x32/x64 Mode (ETS + Apps)

While ETS4 is an 32- bit application, ETS5 is able to also run as a native x64- bit application.

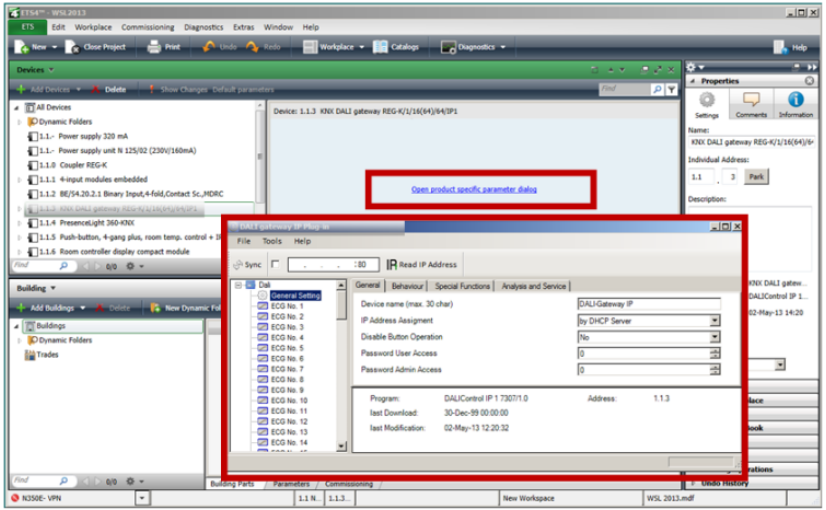
The used “mode” depends only on the activation of the *x32- compatibility module* (legacy Plug- Ins or ETS Apps).

- No need for different setups for 32/64 bit ETS5
- All ETS5 modules are natively 32- bit (as usual) and 64- bit capable
- In case of 64- bit, the possibility to have > 4 GB RAM for the ETS application itself
- *x32- compatibility module* is activated via an - in ETS5 integrated, free of charge - ETS App

Next Generation Plug In Software, #1

Since more than 10 years ETS supports Plug- ins; main reasons are:

- better (graphical) device configuration or specific download procedures
- additional device data storage & organization



Example: UI Plug- in

Next Generation Plug In Software, #2

Technical improvements introduced in IT make Plug- in development more difficult for KNX product manufacturers:

IT environment (e.g. PCs and operating system)

- Compatibility (Plug- in installation on introduction of new operating systems (OS))
- Data handling (updates & performance within the compatibility layer)

Customer acceptance (ETS user interface and usage)

- User interface style of Plug- In and ETS user interface diverge
- Multi instance capability (capability to run the “Plug- in” parameter dialog only once in ETS → parallel download)
- Drag, drop & touch mentality since introduction of *touch* capable tablets/ smartphones

→ constantly growing extra support of devices using a Plug- in

Next Generation Plug In Software, #3

What is our goal based on the (before mentioned) gained experience?

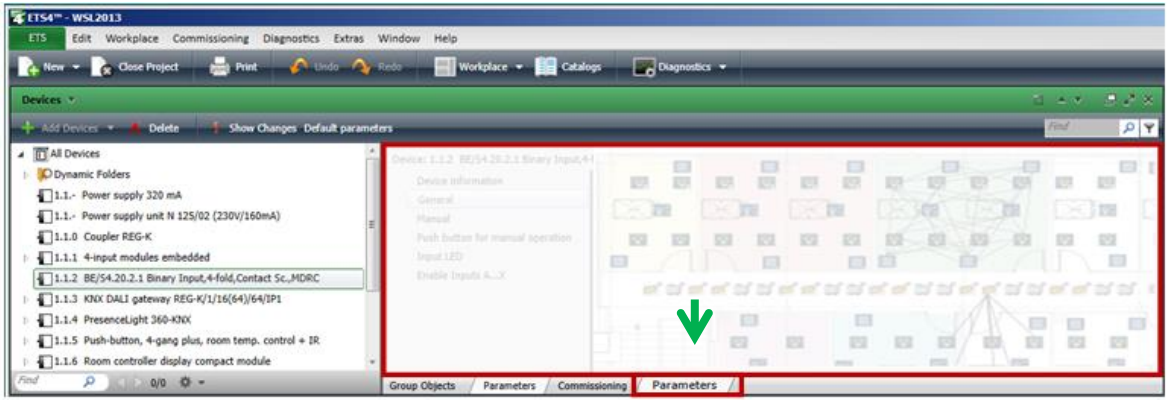
- continue to offer the ability to “program” special things in the ETS parameter dialog
- easy installation (at least easier than with current Plug- ins …)
- faster updates & well defined update process (via KNX/ ETS APP infrastructure)
- common design style and embedded integration in ETS (as in next example)

No “all or nothing” principle anymore!

Next Generation Plug In Software, #4

The new concept is:

- referred to as ‘Device Configuration Apps’ (DCA)
- derived from the already known ETS App concept, that solve the following is
  - *Online update capability of installed software*
  - *Embedded UI style, multi instance capability*



Performance #1 → database

By using the new “database free” technology and upgrading to .NET 4.5, a considerable performance improvement can be achieved in ETS5.

- Import/ export improvement by factor up to 10;
- An extra backup medium/ format is not necessary

  *(the project file is directly stored as backup, no SQL *.bak file as on ETS4)*

Project Hydro (~ 6000 devices)

ETS4 : Import 50 Seconds; Export 20 Seconds

ETS5 : Import 10 Seconds; Export 5 Seconds

Performance #2 → reports

By using the new “report” engine, a considerable performance improvement can be achieved in ETS5 on any kind of report.

- Generated reports speed up by factor up to 10;
- No extra report “modal window”, fully embedded in ETS UI
- *In report preview integrated collapse/ expand to display / hide device parameter and objects*

Project Hydro (~ 6000 devices)

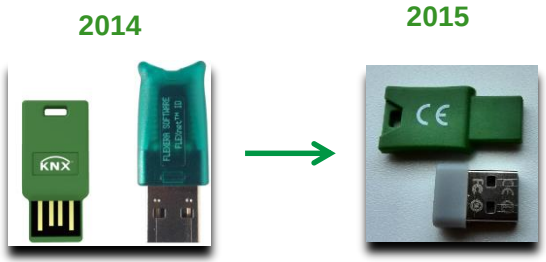
ETS4 : Topology, Details → 4628 pages, 15 minutes

ETS5 : Topology, Details → 1825 pages, > 15 seconds

Performance #3 → new dongle

By using an explicit for ETS5 new defined dongle we improve the stability of KNX tools in several major points.

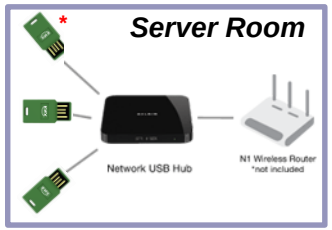
- Improved usability
  - Dongle with 4 GB extra build in memory → store ETS projects directly on it (works as an USB stick)
  - Smaller footprint (28.5 mm x 13 mm x 4.5 mm) compared to the current dongle (see picture below)
  - No extra windows dongle driver software needed (cause of many support cases because of compatibility to 32/64 bit OS)
- Improved security
  - Fully encrypted communication path between dongle and ETS, no possible “in between security leak” as with an unprotected dongle driver
  - Abandoning unsecure (crackable) HOST- ID license types
- Improved performance
  - Faster access to licenses stored on dongle, stored projects, KNX product databases; increased ETS speed (especially on ETS startup → license enumeration)



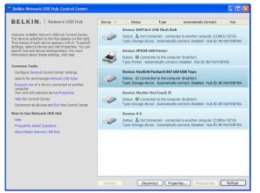
Performance #4 → new dongle (de facto local server license)

By using an network (Ethernet) / USB hub it is easy to achieve a simple network license system for ETS5 dongles (generally also on ETS4 dongles).

- Improved usability
  No hand out of dongles at the course start
- Improved security
  Dongle is safely stored in server/ storage room



* in this product example up to 15, by using 3 extra connected USB hubs



Product example only, no merchandising recommendation

Performance #5 → various

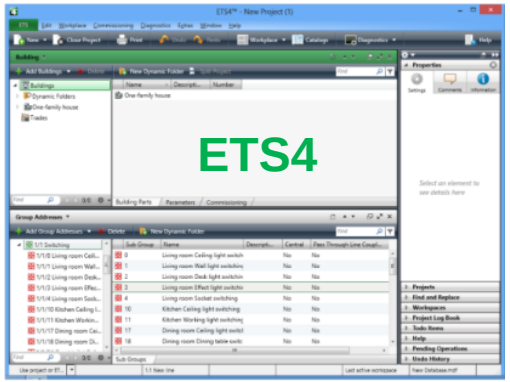
By improving some explicit time consuming tasks we increase the work performance with ETS5.

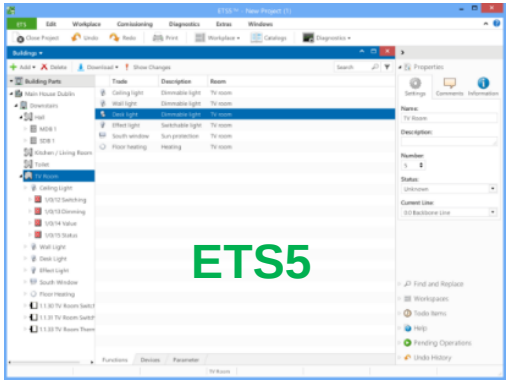
- Calculating possible Line Coupler changes (f*ilter tables*) in real-time, to prevent the download of all LC's in an installation (also the non affected ones as today in ETS 3/4)
- Import without closing database (as no use of database anymore…)
- Link GA's is showing only "compatible" GOs (and not the entire list as today in ETS3/4)

User Interface

Style Guide

- ETS5 style guide is linked to Win8 for increased workspace and maximum screen size





In view of that it would be the best … to have a look to the result, the ETS5

Business Logic

Main Points

- New ETS App SDK for DCA Apps → see (previous) DCA concept presentation part
- New ETS App SDK for Monitor Apps
- Standard DPT Decoder
- Falcon 5.0

New ETS App SDK for Monitor Apps

ETS5 supports an extra ETS App type to decode more/ additional telegram information.

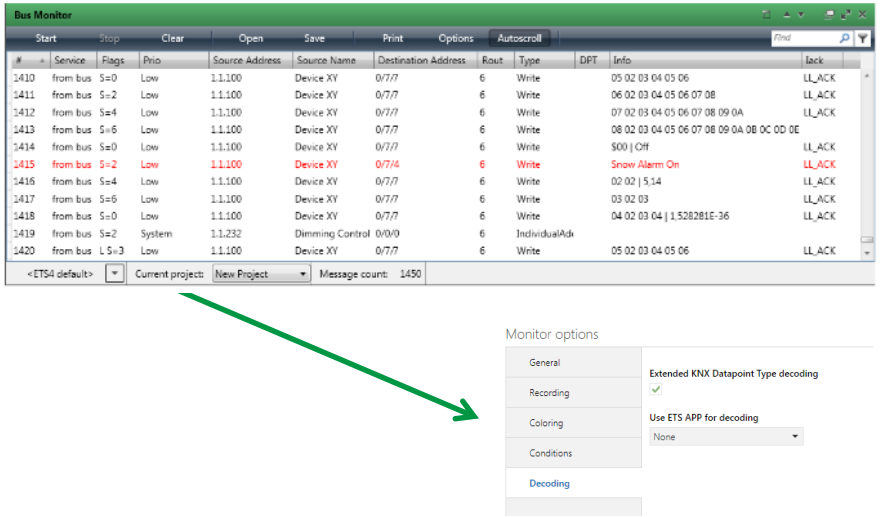
SDK (how- to)

```
public void InspectTelegram(ITelegram telegram)
{
  // If a telegram is sent to any of the monitored addresses, decode the raw data
  if (this.monitoredAddresses.Contains(telegram.DestinationAddress))
  {
    telegram.BackgroundBrush = Brushes.White;

    // Interpret raw data of telegram
    byte[] rawData = telegram.GetRawData();
    bool snowAlarmOn = rawData[0x11] == 1;

    if (snowAlarmOn)
    {
      telegram.Info = "Snow Alarm On";
      telegram.ForegroundBrush = Brushes.Red;
    }
  }
}
```

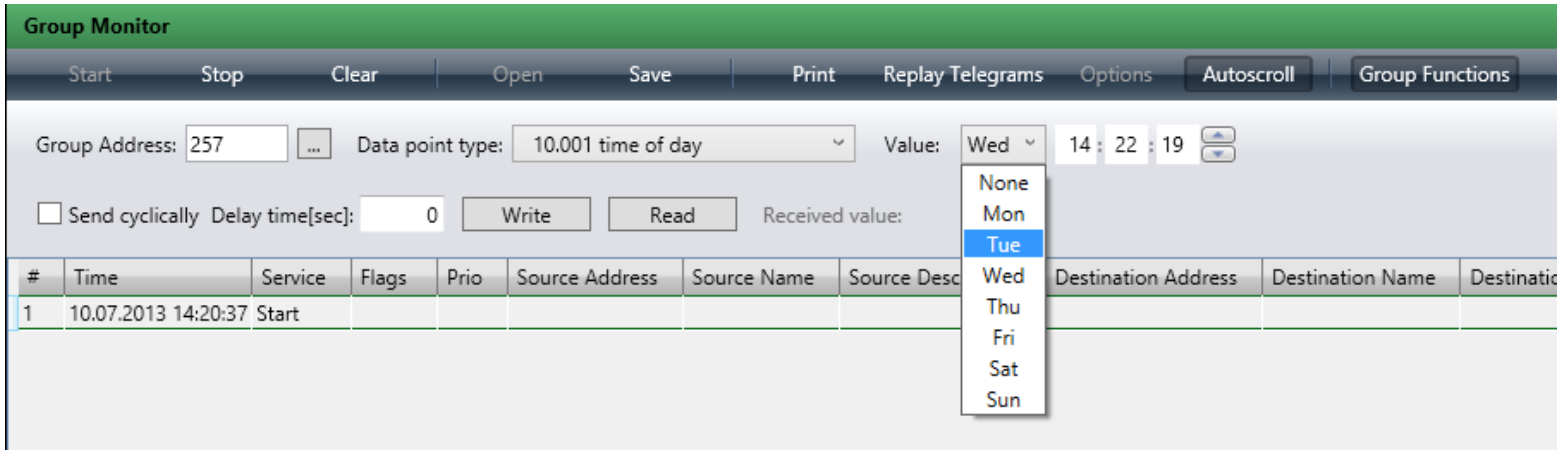
ETS5



Standard DPT Decoder

ETS5 supports standard decoding of DPT's via the GA monitor.

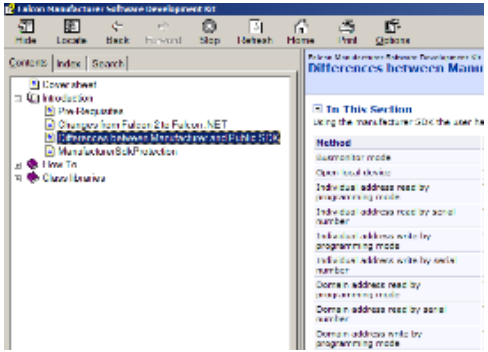
- Logical editing of complex data types.

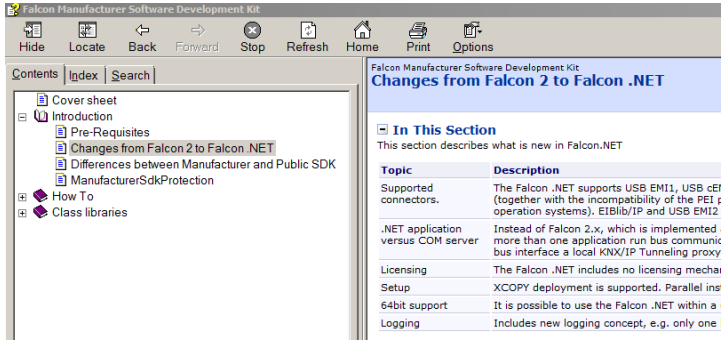


Falcon 5.0

Complete redesign of Falcon, with new .NET SDK

- No more support for RS232, EibLib/IP support via an ETS App
- 2 levels; Customer (restricted service usage, e.g. memory write) / Manufacturer
- Each manufacturer receives its own, company “personalized” free of charge falcon version
- KNX manufacturer is given access to the monitor interface (on current Falcon not public!)





KNX System

Main Points

- RF System Mode Support
- Long Frame Support

RF System Mode Support

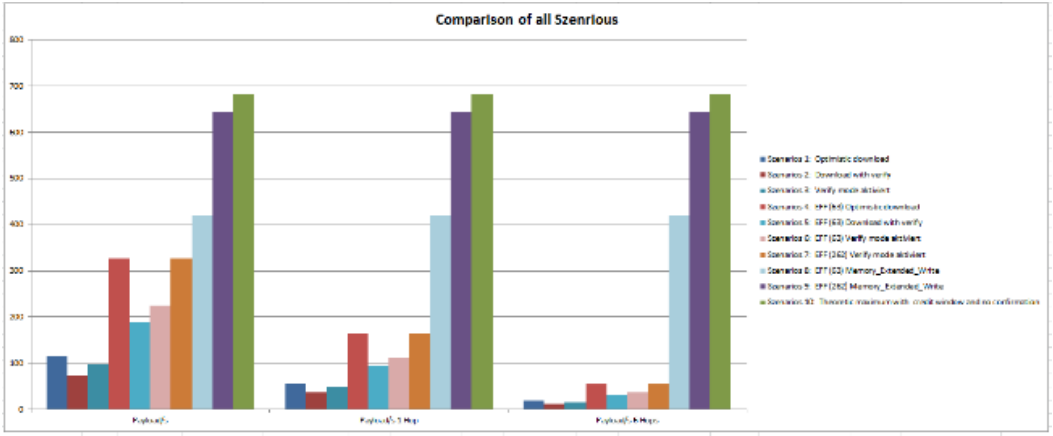
ETS5 supports natively integration of RF devices (like standard TP devices).

- Assignment of GAs & GOs (also between TP/ RF devices)
- Several TP(IP) to RF couplers in a installation possible
- Dedicated assigned Domain Address (DoA) per RF “Line”

Long Frame Support

ETS5 supports LF ➔ high speed impact on memory/ property R/W services.

- Scan algorithm to detect the possible “path” length according AN090.
- Scan result stored in ETS project data (couplers, devices/ last used length)



ETS Apps, extend ETS functionality

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Diversity of KNX Projects, problem?

Software tool, for ALL KNX installations for:

- Project planning
- Design
- Commissioning

→ Manufacturer & Product Independent !

- Specific projects require some functions = no need to be part of the basic ETS functionality
- Functions essential for experts, can be over-engineered and too complex for beginners.
- Market conditions require different project design in ETS

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The Solution! ETS Apps!

What is really an ETS App ?

- Extra software within ETS!
- Adds more functions to ETS!

+

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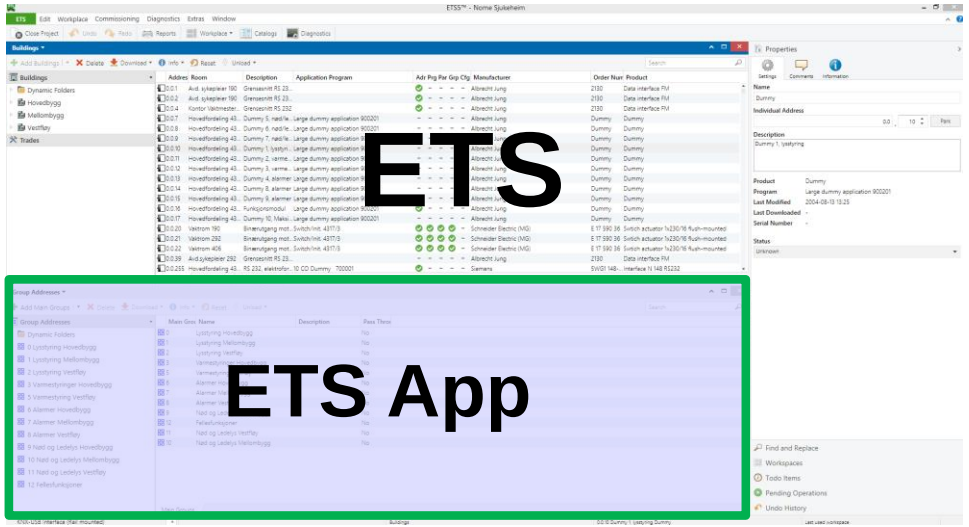

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Available ETS Apps (by KNX Association)

All details and available ETS Apps you can find under http://knx.org → Software → ETS Apps or under the "Download" section (Flyers)

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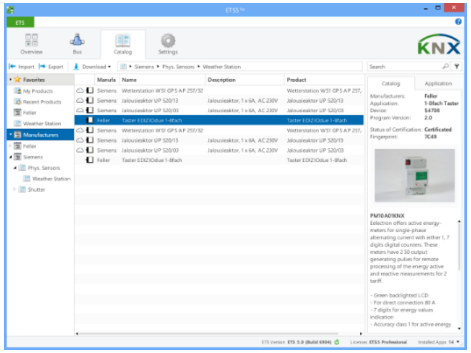
What's new in ETS5; Core Interface

Online Catalog +

OC+ is extended with more KNX product data information for ETS customer

- PDF file (e.g. application description), zip file (collector), picture, icon & comments
- ETS Online Example → Show It



→ Examples from ETS5

Notes

- Maintenance over KNX administration UI
- Same info in ETS catalog dashboard tab and *Product Finder* panel for online products

Various

Various Points

- Most significant Feature Requests (out of ~75)
  - *IP routing diagnostic function (discovery of KNXnet/IP devices)*
  - ***KNX interface; USB INF file support (online updateable interface XML description)***
  - *Separate monitor columns for IA, Name, Description*
  - *Adding up of bus current consumption per TP Line*
  - *Extended keyboard short cut definition*
  - *GA ex/import with **'Descriptions'***
  - *DPT assignment to a GA (not to several GOs only)*
  - *Dynamic folders; filter according GO properties*
  - ***Removal of line types X.0 as a separate element (like in ETS2) → most customers delete the "main line"***
  - *Buildings; location of "Cabinet" in a "Room" possible*
  - *Search with "*" and "?" + replacement for selection only*
  - *Internet access; proxy with authentication (often used in larger KNX member companies)*
  - *Extended parameter preview on multi selected devices (standard value versus individual value)*

ETS5 Catchphrases

Next ETS5 contains a lot of improvements, here again grouped according:

Infrastructure

- Database (removal)
- 64- bit capability
- Improved performance
- New dongle
- Next generation Plug- in software (DCA)

User Interface

- Improved ETS user interface (increased working area)
- Online catalog + (more information on KNX product databases of manufacturer)

KNX System

- New KNX RF System Mode integration
- Support of KNX long frames (enhanced download performance)

ETS Security/ Core / Tablet

ETS Security

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ETS Security

Retrospect

Following also the security “discussion” (e.g. summer 2014), KNX recommends to **start** the ETS Security development as fast as possible (done, already started).

- *It shall be the goal to*

  Allow KNX manufacturers to secure an KNX installation by

  - *Encrypt the entire communication running on IP networks*
  - *Encrypt individual “communication” channels (group objects) in devices requiring higher security levels for (part of their) communication*

Today’s Security at KNX

Position paper & flyer to create/ build safe KNX installations (without implemented KNX security protocol) you can find at http://knx.org/knx-en/downloads/ (section Marketing/ Flyer)

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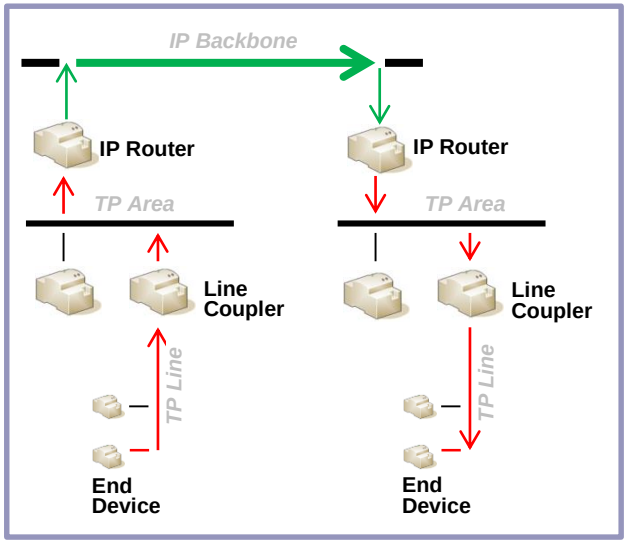
ETS Security

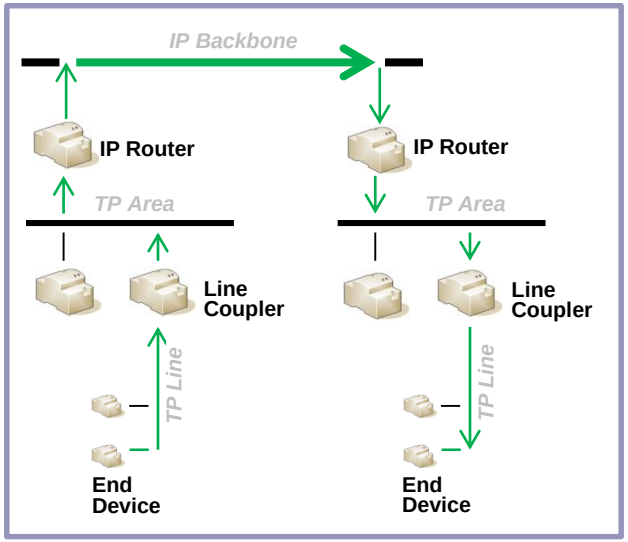
Technology Overview

KNXnet/IP Secure



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

Data Security



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

Unsecured communication

Secured communication

- **KNXnet/IP Secure** and **Data Security** can be combined in one installation.

ETS Professional

Functionality Excerpt

- Key management and distribution
- Establish secure link and download

ETS Core/ Tablet

Retrospect

In May 2014, KNX together with its members decided to start with three (3) new KNX projects (KNX 2020 Projects).

One of them was the *ETS Smart Home/ Light Commercial* project, with current working title: ‘ETS Core’.

- *It shall be the goal to*

Allow KNX manufacturers to also offer KNX kits for the smart home/light industry market

- *Supporting simplified configuration **for existing S - Mode devices** (without the need to modify any of the existing devices)*
- *Permitting a limited amount of modifications to parameters/links*
- *Later extendible with ETS Professional*

…

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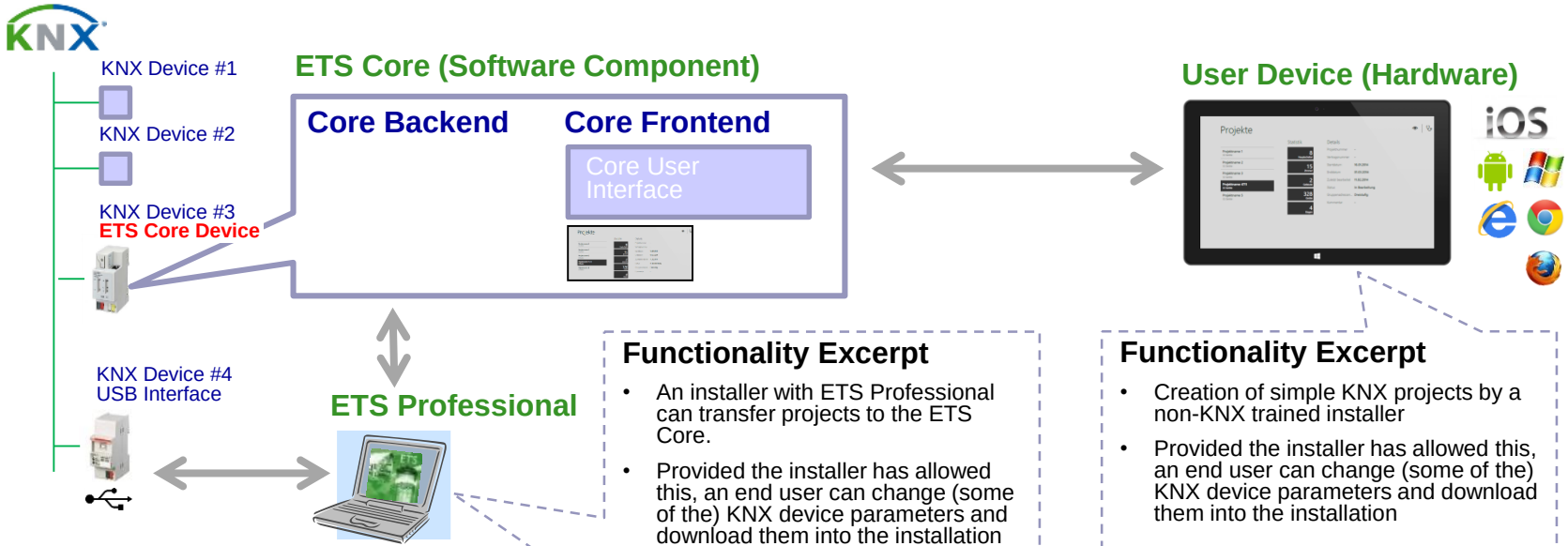
ETS Roadmap, ETS Core

Technology Overview



Functionality Excerpt

- An installer with ETS Professional can transfer projects to the ETS Core.
- Provided the installer has allowed this, an end user can change (some of the) KNX device parameters and download them into the installation
- Project synchronization between ETS Professional and ETS Core (archive reasons)

Functionality Excerpt

- Creation of simple KNX projects by a non-KNX trained installer
- Provided the installer has allowed this, an end user can change (some of the) KNX device parameters and download them into the installation

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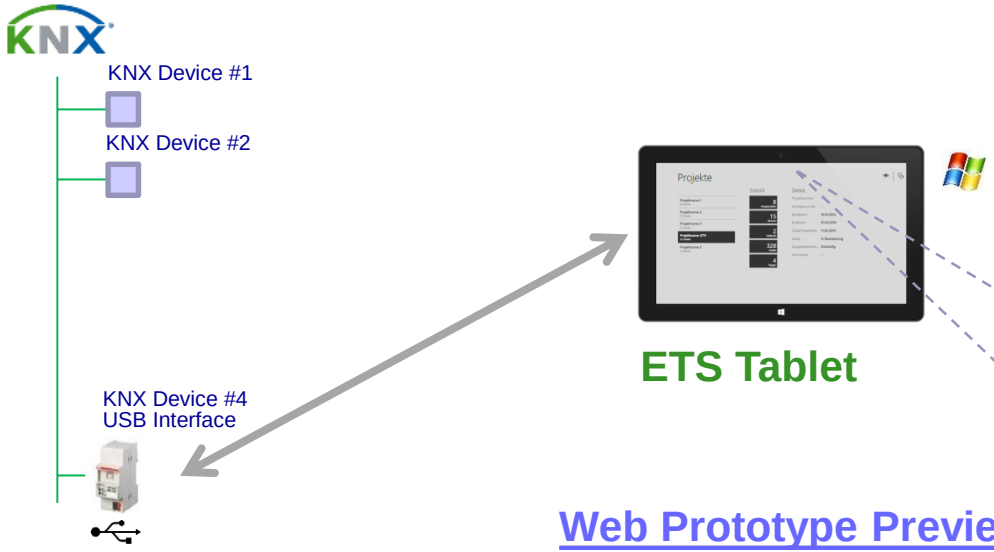
ETS Roadmap, ETS Tablet

Technology Overview



Functionality Excerpt

- Creation of simple KNX projects by a non-KNX trained installer
- Provided the installer has allowed this, an end user can change (some of the) KNX device parameters and download them into the installation
- Diagnostics of KNX projects

Total Schedule

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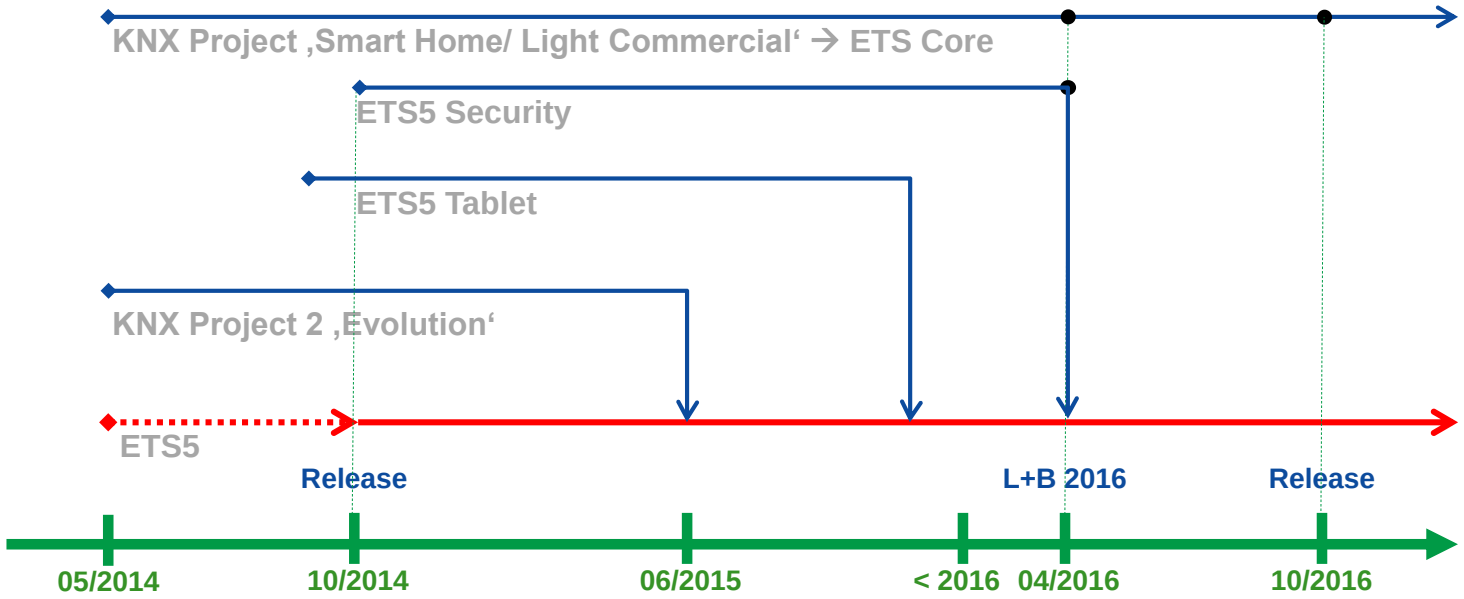
Total Projects Schedule



Your Questions?

Thanks for your attention!