



KNX Product Certification

**Ensuring true multi-vendor
interoperability!!**

Joost Demarest – KNX Director

www.knx.org

KNX Product Certification – Essentials (1)



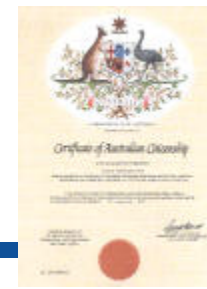
- Logo symbolizes that product has proven
 - Compliance to the **KNX** specifications
 - Ability to **interwork** with products of other vendors
 - Extra **labels** indicate supported configuration mode/medium
- KNX certification
 - is a private, **self-imposed** certification scheme amongst KNX members
 - KNX **not** officially **accredited** (still takes into account **EN 45011**)
 - KNX certificate only has value in KNX circles!
 - Can bow over more than 15 years of experience (as KNX certification scheme was based on EIB certification scheme started as far back as 1993!)
 - **Voluntary** certification for KNX members – if not certified
 - **no** possibility to bear the **logo**
 - (for KNX S-mode/EIB) not possible to have **ETS database entry**
- Due to **backward compatibility** and same testing basis, in most cases EIB devices can be branded with **double logo EIB + KNX**, KNX trademark however **obligatory**

KNX Product Certification – Essentials (2)



- Essential parts of the KNX Specifications for Certification
 - *Requirements*
 - Volume 3 : system (« stack ») and application (« interworking ») requirements
 - Volume 4 : Hardware requirements (identical to those for CE) – compliance to be checked against appropriate product standard + EN 50090-2-2 (minimum)
 - Volume 6 : allowed combinations (« profiles ») of system features
 - *Testing*
 - Volume 8 : conformance test specifications for all system/application features
 - *Procedure and paperwork*
 - Volume 5 : Certification Manual
 - *KonCert Expert Group* responsible for upkeep of Volume 5 + 8
- Currently no possibility as yet to certify software packages

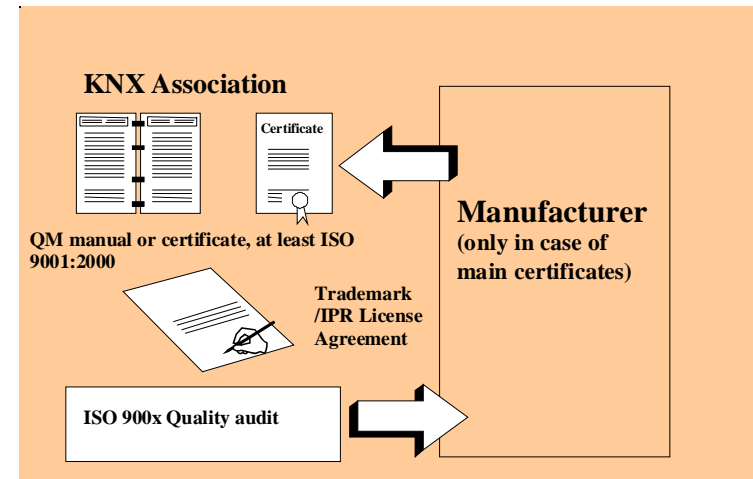
KNX Product Certification – Essentials (3)



- Certified parts do not have to again prove compliance
 - Re-use of System implementation, tested positively on a given **µC** platform, possible without re-testing
 - Re-use of certified application on **other hardware** possible without re-testing
 - Certified product sold by other manufacturer than original: only administrative procedure (« **derived** certificate »)
 - Correct functioning of new combinations : **manufacturer's responsibility**
- Association acts as Certification Administration Center (registration + certification) – Testing of KNX compliance is done at KNX approved test labs (accredited acc. ISO 17025 + aptitude tests), except when
 - **no accredited** KNX test lab exists for the product feature and/or
 - Test specifications for the product feature are not available (as **Approved** standard)
 - Testing of **hardware** compliance for CE resides under the responsibility of manufacturer

KNX Product Certification: Prerequisites

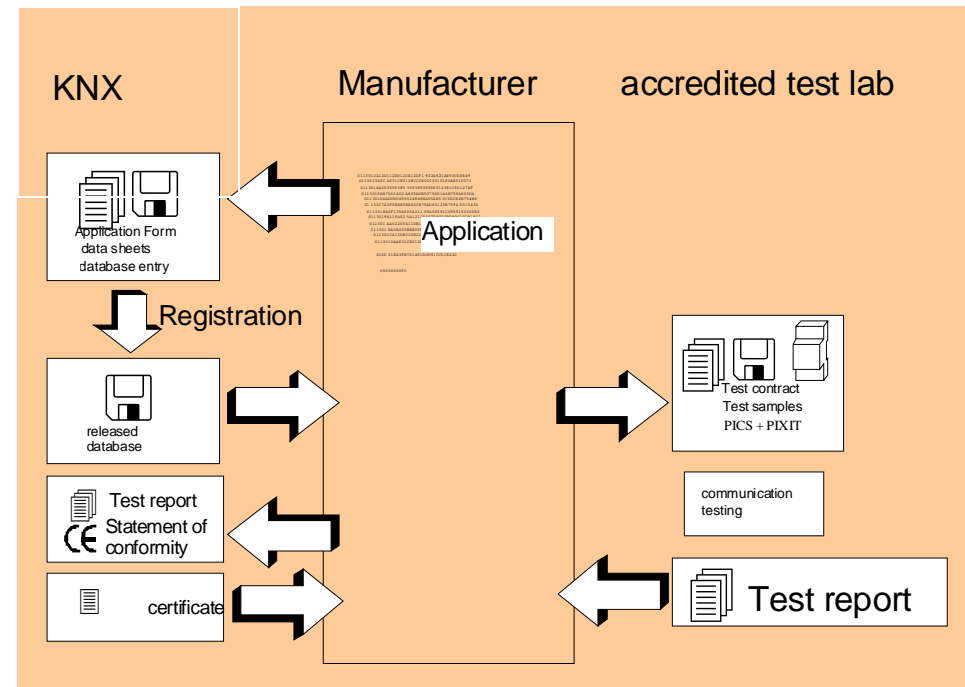
- **Membership**
 - If **KNX** member: possibility to certify according to KNX and EIB
- Signing of
 - the **Trademark License Agreement** (conditions for use of respective **logo**)
 - the **IPR License Agreement** (conditions for free use of KNX technology **patents** of fellow members in KNX certified products)
- compliance to minimum **ISO 9001:2000**
 - If not available: KNX **quality audit** at applicant



KNX Product Certification : Registration

Registration

- **Conditional use of logo** allowed for quick market entrance
- **Paperwork**
 - **General** application form
 - product **datasheet**
 - (for any application) **PIXIT** - overview of implemented (non)-standardised data types
 - (for non-certified system implementation) **PICS** describing conformance to allowed profile and listing supported services
- (for S-mode products) integrate product data in central **ETS** database – limited modification to « sealed » data possible
- If ETS application not registered, not usable in **ETS end user** version



KNX Product Certification: Testing, Certification & Surveillance

- **Testing**

- Maximum allowed time: **6 months**
- **Hardware** tests: manufacturer's responsibility
- **Software** tests: at accredited test lab of manufacturer's choice on basis of samples and documentation supplied by manufacturer



- **Certification**

- Submission of **CE** declaration + positive (application and/or system) (electronic) **test report** by manufacturer to KNX
- Issuing of paper (and electronic) **certificate** by KNX to manufacturer
- If product + software are left unchanged: **certificate never expires**

- **Surveillance**

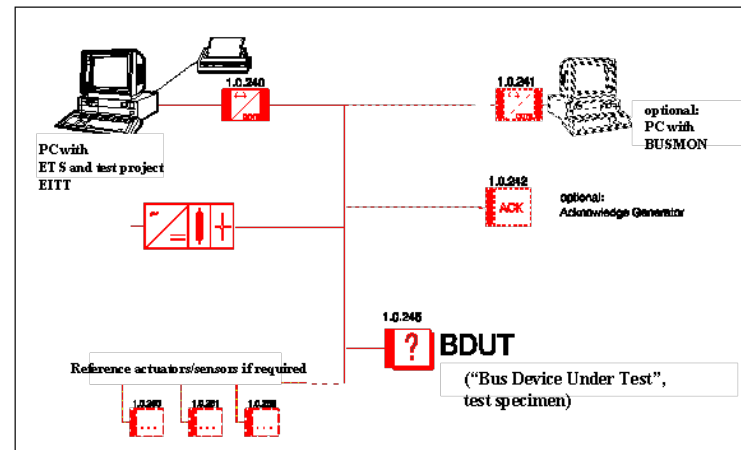
- **Retesting** of products drawn from the market at KNX accredited test labs
- **Checking of test reports** underlying submitted CE-declaration



KNX Product Certification is easy!

- If Certification is integrated into the development process, no extra effort
 - Hardware tests anyway legally (**CE**) required
 - Conformity tests can be largely prepared using uniform available test tools (**EITT**) also used by accredited Konnex Test labs
 - Necessary paperwork can form part of **internal** documentation system (e.g. PIXIT as part of company draft specifications)

- Conformance of system and application is always tested against a software tool sending out stimuli and evaluating responses (never in reference installations or plug fests)



KNX Product Certification - Hardware

- Tests according **EN 50090-2-2** (minimum) + appropriate **product standard**
- If facilities available, **manufacturer can test at his premises**. If not, at a test lab of his choice. Tests shall be documented
- Tests relate to
 - **Electrical Safety**: separation of bus and other circuits to avoid **electric shock** by the user
 - **Environmental** tests: **climatic, shock, protection class**
 - **Functional Safety**: reduction of **risk** that product causes hazardous situations in normal or foreseeable abnormal conditions
 - **EMC** (Electromagnetic Compatibility): device functions properly in **electromagnetic environment** and does not cause electromagnetic interference



KNX Product Certification - Hardware

- Tests relate to
 - **Physical External Interface:** (if available between bus access unit and application module) – compliance to *mechanical* and *electrical* requirements or appropriate labelling
 - **Bus connection:** use of *standardised* type or compliance to *minimum* requirements
 - **Power consumption:** stating the *maximum* bus power consumption
- Recommendations
 - **Life time:** minimum *10 years*, if desired substantiated by calculation of *fit* values
 - **Recycling:** use of materials that are easy to recycle

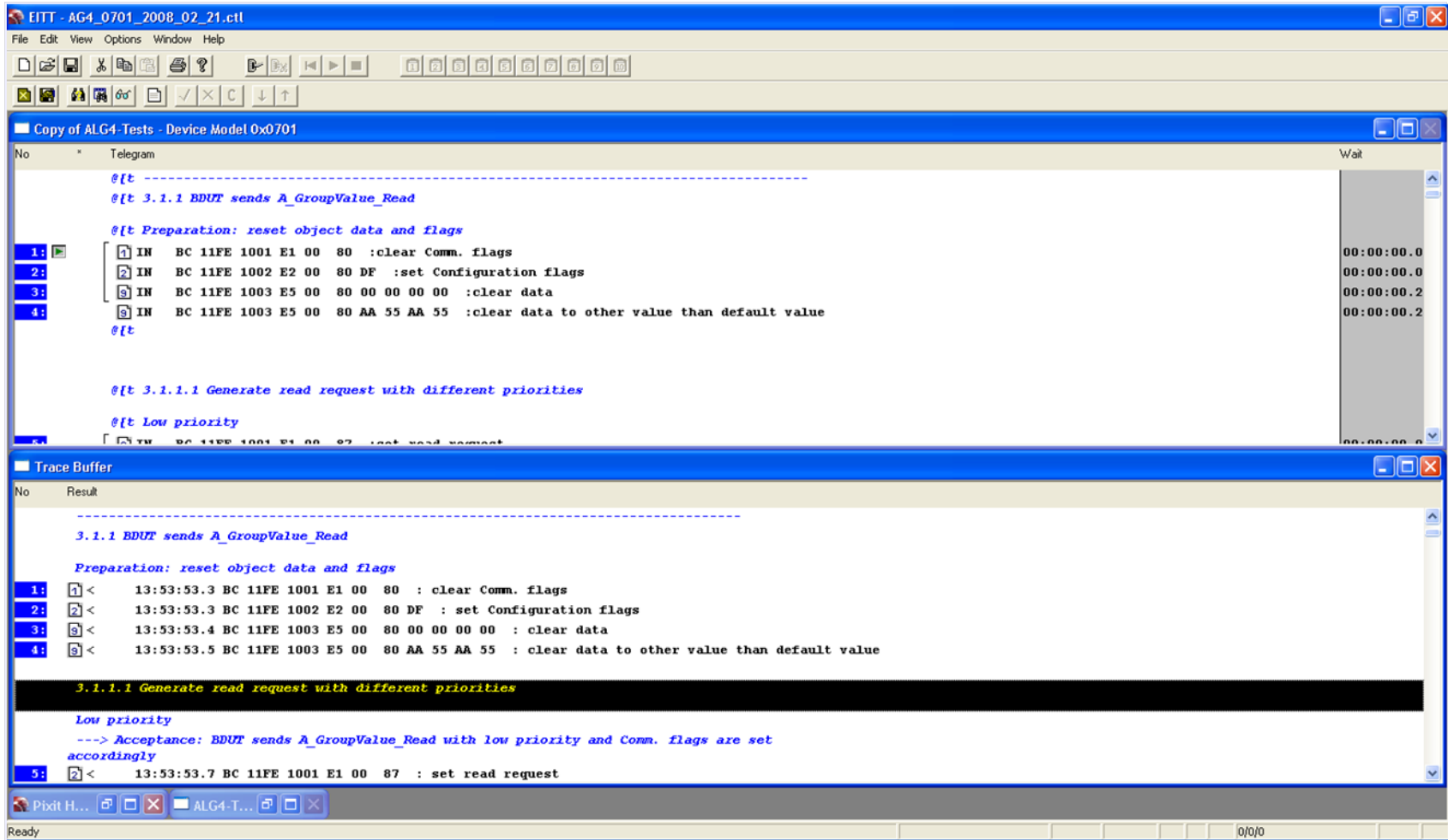


KNX Product Certification - Software

- Carried out by accredited test labs, predominantly with EITT Test Tool available from KNX
- Product contains already **certified system stack**
 - **Interworking and Functionality Tests**: it is checked whether
 - the product functions as declared by the manufacturer and
 - if declared data point types conform to specifications
 - Behaviour on **initialisation, reset, power failure**
 - Value of **routing counter** used in telegrams
 - **Telegram rate limitation** for cyclical functions
- Product contains **uncertified system stack**
 - When **closed device**: Physical, Link, Network, Transport, Application (Interface) Layer tests
 - When **BCU** (bus access unit with PEI): additional test of local services (data exchange on PEI)



KNX Product Certification – EITT snapshot



The screenshot displays the EITT software interface with two main windows open:

- Copy of ALG4-Tests - Device Model 0x0701:** This window shows a list of telegrams. The first telegram, labeled "3.1.1 BDUT sends A_GroupValue_Read", includes a preparation phase with four steps:
 - 1: IN BC 11FE 1001 E1 00 80 :clear Comm. flags
 - 2: IN BC 11FE 1002 E2 00 80 DF :set Configuration flags
 - 3: IN BC 11FE 1003 E5 00 80 00 00 00 00 :clear data
 - 4: IN BC 11FE 1003 E5 00 80 AA 55 AA 55 :clear data to other value than default value
- Trace Buffer:** This window shows the execution of the same telegram. It lists the received telegrams with their timestamps and descriptions:
 - 1: 13:53:53.3 BC 11FE 1001 E1 00 80 : clear Comm. flags
 - 2: 13:53:53.3 BC 11FE 1002 E2 00 80 DF : set Configuration flags
 - 3: 13:53:53.4 BC 11FE 1003 E5 00 80 00 00 00 00 : clear data
 - 4: 13:53:53.5 BC 11FE 1003 E5 00 80 AA 55 AA 55 : clear data to other value than default value
 - 5: 13:53:53.7 BC 11FE 1001 E1 00 87 : set read request



Thank you for your attention

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