XDK LoRa-Extension
Quick Start Guide

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XDK LoRa-Extension Version	1.0
Notes	Data in this document is subject to change without notice. Product photos and pictures are for illustration purpose only and may differ from the real product´s appearance.

Before you start

The XDK LoRa-Extension is a wireless and secure communication solution that can exchange data up to a range of 40 km. Public or private LPWANs can be joined or created. For more information, see our XDK LoRa-Extension 2-pager.

Warning: Risk of Interference and unlawful use:

Before activation of the XDK LoRa-Extension, check the country variant of your XDK-LoRa-Extension. E.g. the Version with country code „EU“ is certified for operation in the EU.

Outside the certified country, the use of the XDK LoRa-Extension might be in conflict with legal requirements and frequency band allocations. That may cause harmful interference and risk of legal prosecution. The user must inform himself and ensure that legal requirements are fulfilled before activating the XDK LoRa-Extension.

In advance, install the workbench, version 3.5.0 or higher on a PC (see xdk.io/learning – workbench installation).

Structure of the quick start guide:

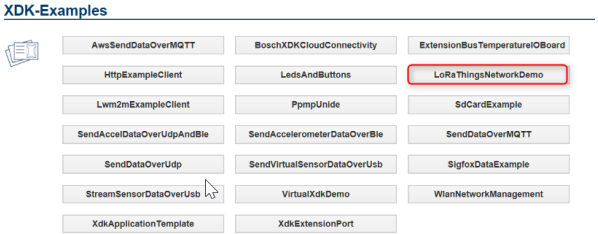
A. Connecting the XDK LoRa-Extension to the XDK
B. Flashing of the LoRaThingsNetworkDemo Firmware
C. The things network (TTN)
D. Integration into Cayenne
E. Links
F. Specifications
G. Regulatory Notices
H. Document History and Modification

A. Connecting the XDK LoRa-Extension to the XDK

First check for bent pins! Plug and unplug the XDK LoRa-Extension straight to the XDK. It is possible to screw a monitoring plate underneath both devices for a better fixation. The downloading file for the 3D-printer is available on XDK.io/extensions

B. Flashing of the LoRaThingsNetworkDemo Firmware

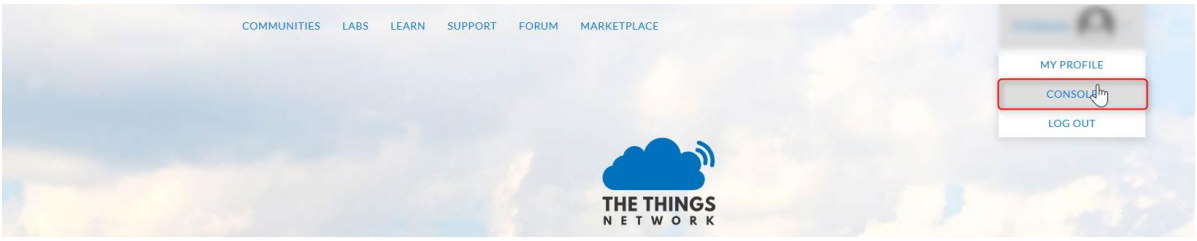
Use the workbench, version 3.5.0 or higher, to flash the LoRaThingsNetworkDemo firmware (see highlighted below) on the XDK



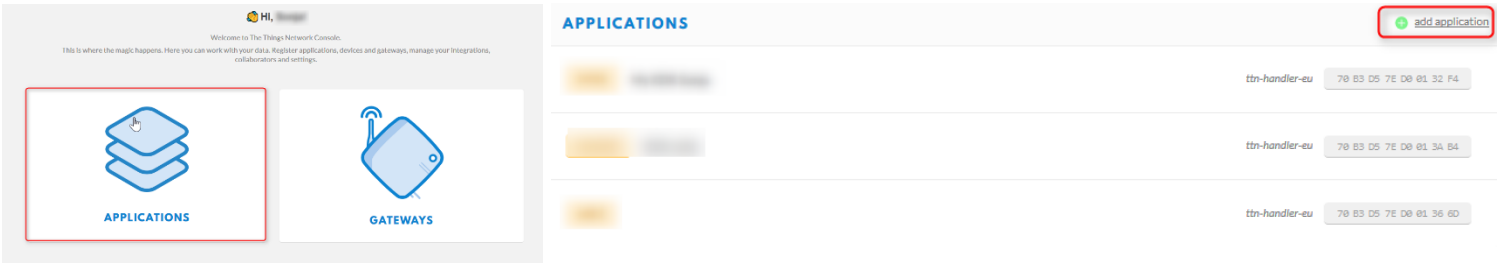
Flashing: Select LoRaThingsNetworkDemo then press Flash!

C. The things network (TTN)

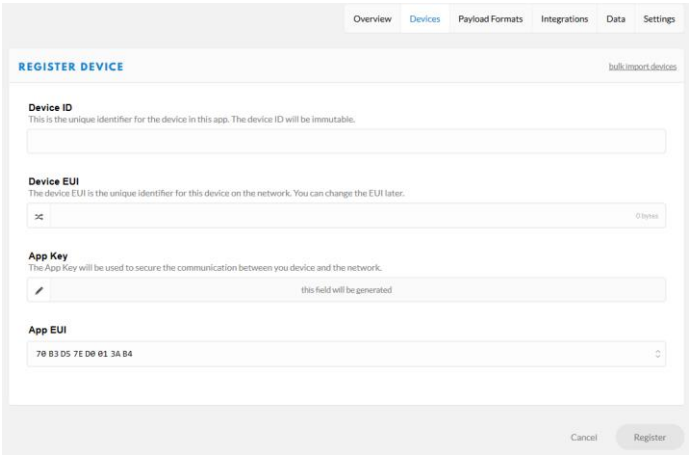
1. Register at TTN with username, email and password then activate your account via mail (see link below)
2. Log in and press console



3. Press Applications, then add an application and enter details



4. Register a device
   - Device EUI: Boot the application and copy the Hardware Device EUI from the console in the workbench to the field in the TTN



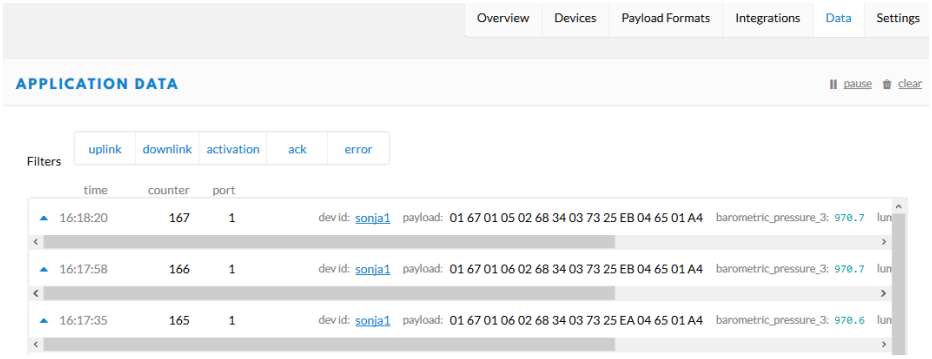
   - App EUI: Define the *App_LoRa_App_EUI* in the header file *AppController.h* with the given App EUI by copying the code
   - App Key: Define the *App_LoRa_App_Key* in the header file *AppController.h* with the generated App Key

```
/**
 * APP_LORA_APP_EUI is unique to the Application Server and each Application Server will have its own AppEUI
 */
#define APP_LORA_APP_EUI      0x0123456789ABCDEF
/**
 * APP_LORA_APP_KEY is the data encryption key used to "encode" the messages between the end nodes and the Application Server
 */
#define APP_LORA_APP_KEY \
    0xAA, 0x55, 0xAA, 0xAA, 0x55, 0xAA, 0xAA, 0x55, 0xAA, 0xAA, 0x55, 0xAA, 0xAA, 0x55, 0xAA, 0x55

```

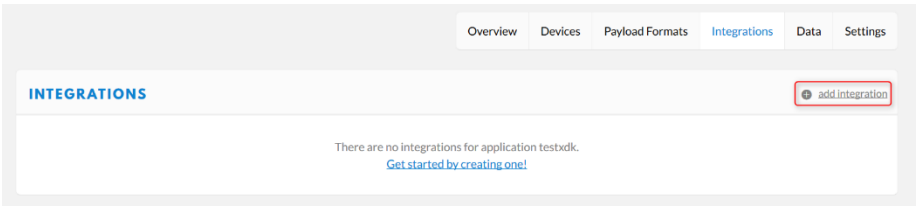
→ You can switch the parameters by pressing “<>” (makes copying easier)

5. Save and flash the new firmware on the device
6. You can see the data of your application in the overview/data

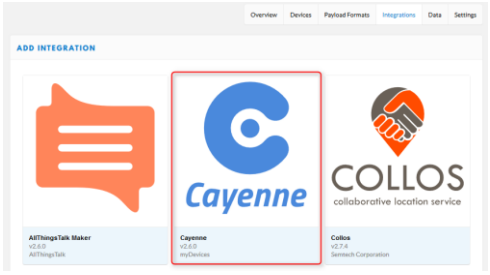


D. Integration into Cayenne

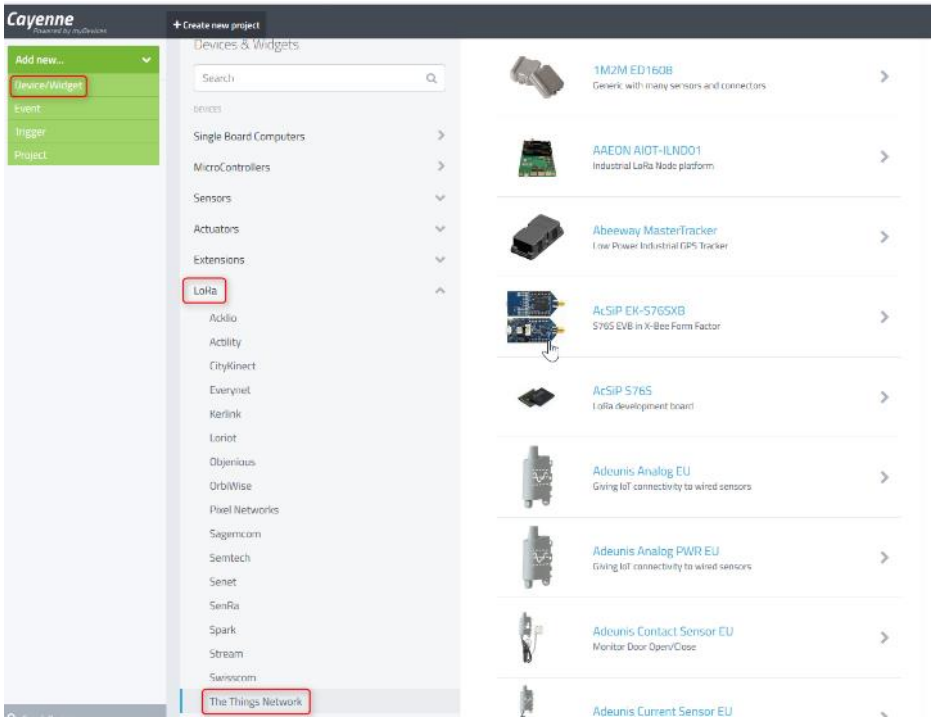
1. Add Integration



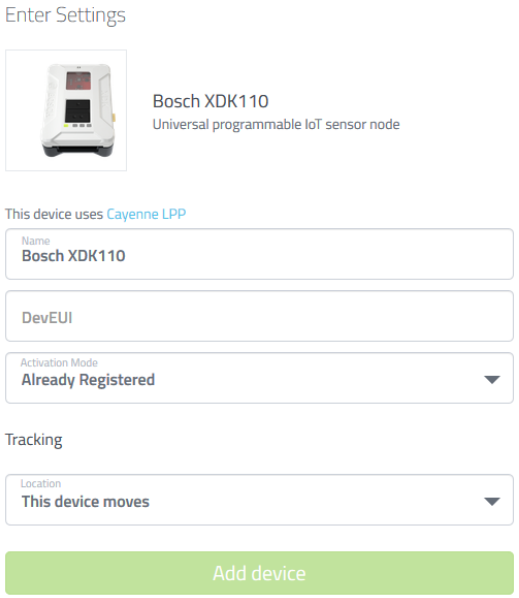
2. Choose Cayenne
   - Access key: Choose default key



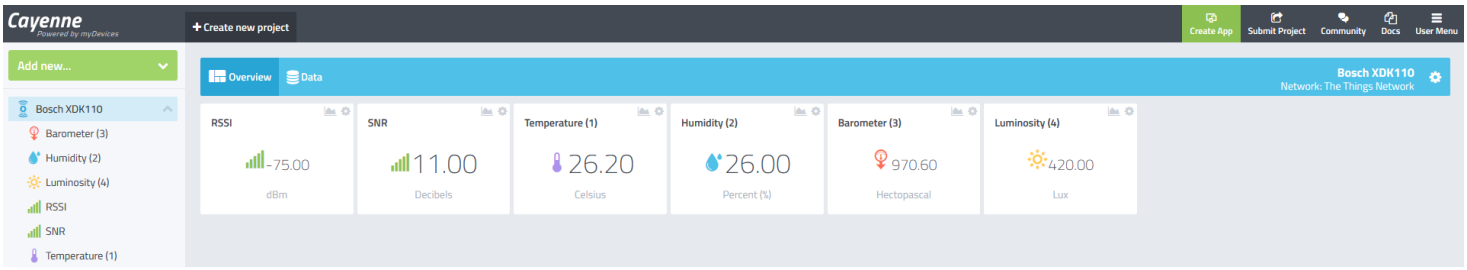
3. Sign up at Cayenne with name, email and password then activate your account via mail (see link below)
4. Add new Device/Widget, select LoRa ,then The Things Network and then search for the Bosch XDK110



5. Enter settings and provide your DevEUI



6. Now you can see details of your project in the overview/data



E. Links

https://xdk.bosch-connectivity.com/extensions
https://lora-alliance.org/
https://xdk.bosch-connectivity.com/software-downloads
https://www.thethingsnetwork.org/
http://xdk.bosch-connectivity.com/
https://cayenne.mydevices.com

F. Specifications

- Radio power: max. 13 dBm EIRP
- Channel Plan: LoRa EU863-870
- Frequency bands: 868.0-868.6 MHz, 864.0-864.6 MHz, 869.40 – 869.65 MHz
- Supply voltage: 2.5 V DC via XDK Extension port
- Physical interface and pin designation: See the XDK110 User Guide page 44

G. Regulatory Notices

EU Declaration of conformity

Hereby, Bosch Connected Devices and Solutions GmbH declares that the radio equipment type “XDK110 LoRa-Extension “ is in compliance with Directive 2014/53/EU (Radio Equipment Directive).

The full text of the EU declaration of conformity is available at the following internet address: xdk.io/Conformity

SW Versions, which are relevant for conformity:

BCDS is providing a simplified API for LoRa device communication, called “BCDS_LoraSimplified”. The user shall apply “BCDS_LoraSimplified” as programming interface to ensure that module operates in full compliance with the requirements of ETSI EN 300220-1, -2. The interface is provided by BCDS as a shared library “LoraDrivers” as “libLoRaDrivers_efm32.a” version v.0.3.4 (or later versions) as part of the XDK Workbench 3.5.0 release (or later versions).

A second API “BCDS_LoraDevice API” is delivered in the shared library, which provides access on device hardware level for experienced software engineers.

Warning: Risk of voiding CE Conformity

The user is informed that the modification of parameters on duty cycle and definition of frequency channels using “BCDS_LoraDevice API” leads to the loss of conformity with ETSI EN 300220-1, -2 and void the CE declaration of conformity of the XDK LoRa Ext EU. The user is fully liable for all legal consequences and damages from interference arising from modification of these parameters through BCDS_LoraDevice API.

Disposal according to the WEEE Directive 2012/19/EU

The XDK device and extension modules shall be sorted for environmental-friendly recycling.
Do not dispose of the device into household or industrial waste!
According to the European Guideline 2012/19/EU, electric and electronic devices that are no longer usable must be collected separately and disposed of in an environmentally correct manner.

H. Document History and Modification

Rev. No.	Chapter	Description of modification/Changes	Editor	Date
1.0		Version 1.2 initial release	SB	2019-02-06
		Addung legal notices		
1.4	F	Specifications	SB	2019-04-01