

kDrive

cross-platform component library for KNX

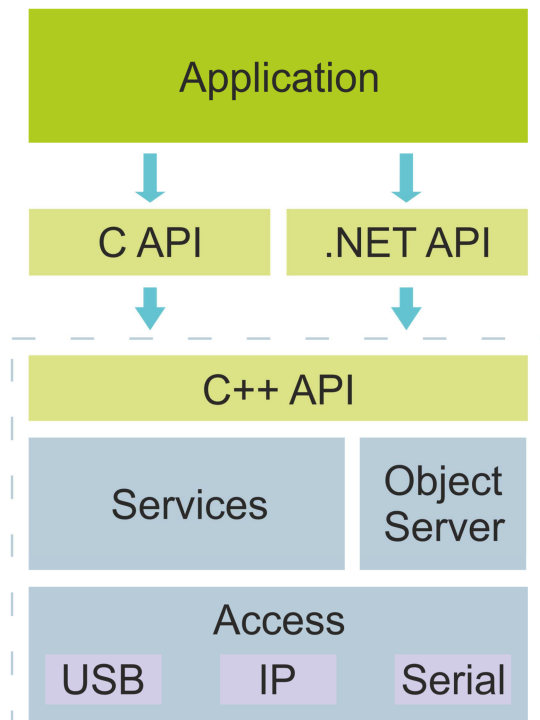
overview and architecture

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kDrive: cross-platform component library for KNX

kDrive by Weinzierl Engineering is a powerful software development kit (SDK) for KNX communication via KNX standard interfaces on the telegram level. It is implemented as a cross-platform software component library with a high grade of flexibility.



kDrive defines a complete ecosystem for the rapid development of KNX applications on platforms with POSIX (Portable Operating System Interface) operating systems, such as Linux, Windows / WinCE, iOS, and Android. Application programming interfaces (APIs) are available in C++, C and .NET.

The kDrive SDK can be configured for a range of requirements, in either a binary or source distribution - see our license system for details.

This document gives an overview about kDrive architecture. For further information see our kDrive user guide available at www.weinzierl.de

Application area

The purpose of kDrive is to enable the development of KNX software on different operating systems, like Windows or Linux. It can be the basis for visualization tools as well as for individual management clients. A common use case is the implementation of test tools for production.

The kDrive library can be used for all media in KNX as well as for different configuration modes.

The following components are currently available:

- Telegram access
- Services
- Object server

The telegram access component

The kDrive access component implements KNX bus access via interface devices. It contains the drivers for all supported KNX interfaces and enables the telegram communication with a KNX installation. The access part is required for all applications using the kDrive library.

Supported KNX Interfaces and Protocols

- KNX Serial Interface, EMI2 via FT1.2
- KNX TinySerial Interface
- KNX USB Interface, EMI1 and cEMI
- KNX IP Interface / KNXnet/IP Tunnelling cEMI
- KNX IP Router / KNXnet/IP Routing cEMI

The devices communicate via different flavors of the External Messaging Interface (EMI) as specified in the KNX Standard. The library internally handles the various protocols and offers a single common interface using the Common EMI (cEMI) telegram format.

Telegram formatters

For an easy assembly of KNX telegrams the access component contains a sophisticated set of KNX telegram formatters. They can be used to encode and decode KNX telegrams.

The service component

Each KNX device which can be managed via the bus is called a KNX management server. It offers management services like memory read or property value write to be configured. A management tool like ETS or a KNX easy mode controller therefore is called a management client.

The service library contains a complete set of KNX management client services, including services for System mode (used by ETS) and Easy modes with support for connection-oriented and connection-less services. The kDrive Services library implements KNX management services for example:

Device Services (point to point)

- Property Value Read
- Property Value Write
- Property Description Read
- Function Property Command
- Function Property State Read
- User Memory Read
- User Memory Write
- ...

System Services (broadcast)

- Individual Address Prog Mode Read
- Individual Address Prog Mode Write
- Network Parameter Write
- Domain Address Serial Number Read
- Domain Address Serial Number Write
- Domain Address Selective Read
- ...

These services build the management part of the KNX Application Layer.

The object server component

The object server implements runtime part of the KNX Application Layer which is based on so-called group objects. The Object Server is a data repository for KNX Datapoint Values and provides specific support for KNX runtime group telegrams. The Object Server can be configured by API or by file.

The object server can be used as communication base for visualization or control tools such that visualization tools do not need to directly handle KNX telegrams. Via the object server the software can talk directly to data points. Additionally, existing visualization tools can be adapted to KNX technology with low effort.

Currently the Object Server is only available as part of the commercial kDrive packages.

Datapoint Formatters

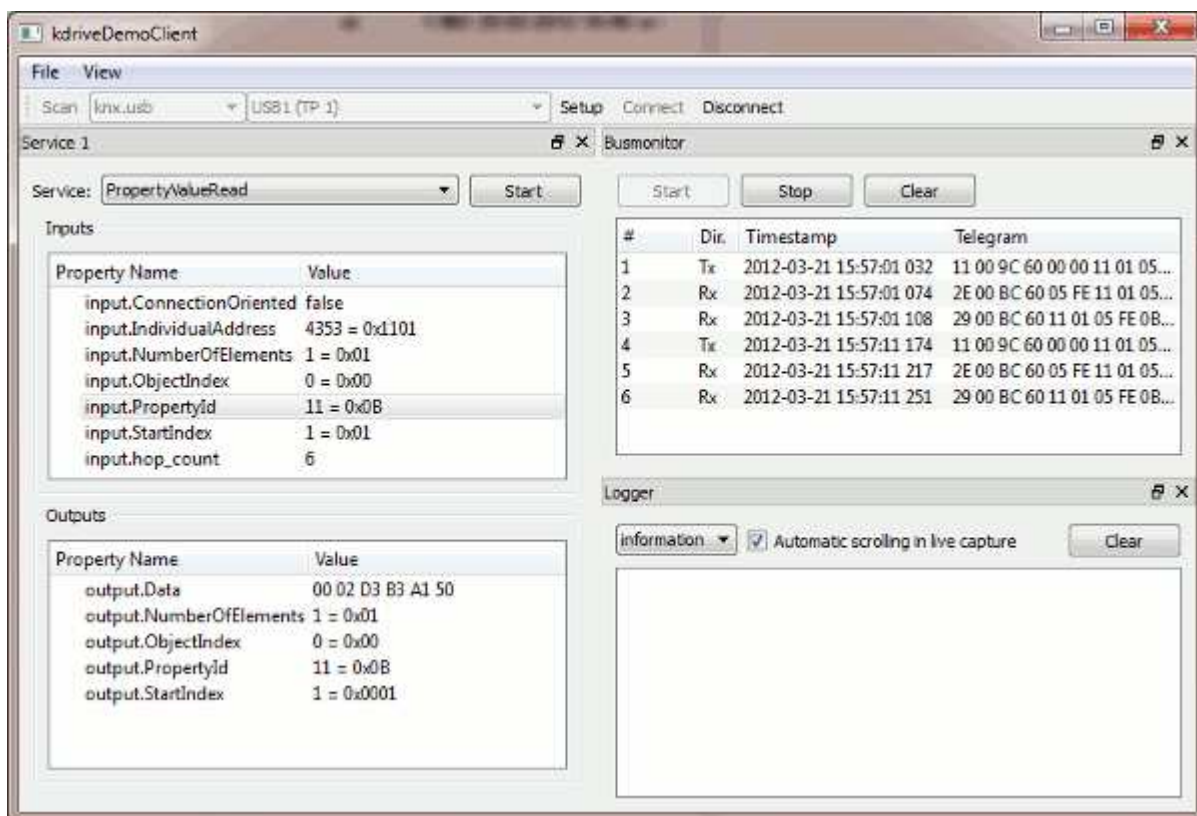
The KNX Datapoint formatters simplify encoding and decoding of KNX Datapoint types like the KNX specific 2 Byte Float (KNX DPT 9.xxx).

KDrive DemoClient

kDrive DemoClient is a Qt application based on the kDrive C++ components.

It implements the following functionality:

- Access Ports: USB, IP, FT1.2, TinySerial
- KNX Telegram Bus Monitor
- Management Client Services
- Object Server



The kDrive demo client is included in kDriveExpress as compiled program. In kDriveSource also the sources of the program are included.

Platforms and technology

kDrive is implemented as **cross-platform C++ software component library**.

It can be used on platforms with POSIX (like) operating systems. By default kDrive is available for Windows and Linux. Commercial packages are available for additional operating systems like embedded Linux, iOS and android as well.

Platform independency is achieved via standard libraries, such as the Boost C++ library.

Implementation


The primary kDrive Application Programming Interface (API) is the C++ class interface offered by each of the kDrive components. In addition however, different API technologies are supported. The kDriveExpress library is a C interface to (a subset of) the kDrive C++ components. It exposes the kDrive Access and kDrive Services libraries. In kDriveExpress there is also a .NET DLL available with a similar API for developing applications with C# and VB.NET. Samples are also provided.

Versions and licenses

The kDrive SDK is available in either a binary or source distribution.

<p>SDK kDriveExpress</p> <p><i>Free License</i></p> <p>Available modules:</p> <ul style="list-style-type: none"> • Access • Limited Examples for Services 	<p>.NET API</p> <p>C-API</p> <ul style="list-style-type: none"> • limited to Weinzierl Interfaces • No source code
<p>SDK kDriveExpress</p> <p><i>Commercial license</i></p> <p>Available modules:</p> <ul style="list-style-type: none"> • Access • Services • ObjectServer 	<p>.NET API</p> <p>C-API</p> <ul style="list-style-type: none"> • No source code
<p>SDK kDriveSource</p> <p><i>Commercial License</i></p> <p>Available modules:</p> <ul style="list-style-type: none"> • Access • Services • ObjectServer 	<p>.NET API</p> <p>C-API</p> <p>C++ API</p> <ul style="list-style-type: none"> • Source code included (C++)

Available platforms

	Windows	WinCE	Linux	ARM Linux	iOS	Android
SDK kDriveExpress Free license	 only 32bit	-	 only Ubuntu 32 bit	-	-	-
SDK kDriveExpress Commercial license		-			-	-
SDK kDriveSource Commercial license					 On request	 On request

Please contact us for more information regarding component license and pricing.

For evaluation purpose a free version of kDrive is available on our web page at www.weinzierl.de This version is limited to KNX Interfaces from Weinzierl Engineering. It includes the Telegram Access part of the library and some services like Property Value Read. The free version is available for a limited number of platforms.

Further technical information can be found in our kDrive user guide.