XLON®
HAPI

```
int main()
{
    ...
    CreateNv()
    ...
    OpenNetInterface()
    ...
    SetNv()
    ...
    WaitForNvUpdate()
    ...
    CloseNetInterface()
    ...
    return 0;
}
```


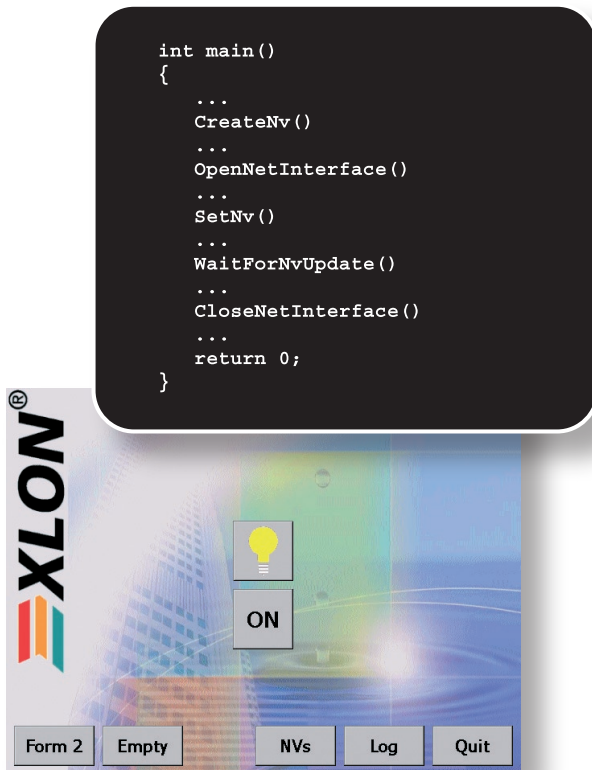## Features and Benefits

- Easy programming of powerful Visualization-, Control- and Web-Applications for LON
- No deeper knowledge of programming PC based LON applications required
- Compatible with XLON®PC, XLON®PC xsl, XLON® LonTalk Adapters and 3rd party LonTalk Adapters
- Supports all Microsoft Desktop, Embedded and Server Operating Systems
- All common programming languages and environments supported, e.g. C, C++, C#, VisualBasic, Java, J#, Delphi, LabView, Python, ASP.NET etc.
- Dynamic loadable library (DLL)
- Up to 4096 Network Variables
- LonMark® SNVT Master List fully supported
- Self-Installation of the application node possible
- Sending and receiving of any Explicit Messages supported
- All service types defined by LonTalk protocol can be used
- All addressing modes defined by LonTalk protocol can be used
- Network Management and -Diagnosis supported
- Application download to other nodes from APB and NXE files
- File transfer to other nodes via LON-FTP

Description

The XLON®HAPI is a software library which comes in form of a DLL, which simplifies and accelerates building LON based Visualization-, Control- and Web-Applications. The user needs no deeper knowledge about creating PC based LON Applications (Host-Application programming).

If exclusively network variables are used for communicating over LON, the effort is strongly reduced once more. Solely the contents of network variables must be processed. This means in practice, that output variables can be set and changes in input variables are signalled. Of course all Standard Network Variable Types (SNVTs) of the cur-

rent LonMark® SNVT Master List are supported respectively continuously added. Up to 4096 NVs can be defined, self documentation strings for the node and for the NVs can be provided.

As well XLON®HAPI is first choice for applications demanding more complex techniques like Explicit Messages, Network Management or Network Diagnosis. Even Application- and FTP-Downloads to other nodes in the network can be carried out. Advanced users can utilize all service types known in the LonTalk protocol, like Unacknowledged, Unacknowledged Repeated, Acknowledged, Request/Response, etc. In the same way, all addressing modes known in the LonTalk protocol are supported, like Subnet/Node-, Neuron-, Group-, Broadcast- und Local-Addressing. ⇒

XLON® HAPI

The accompanying flow chart illustrates the schematic structure of a Visualization Application similar to the one illustrated besides, with which Network Variables (NVs) can be visualized and set. This already very powerful Sample Application, which utilizes only a small part of the possibilities of the XLON HAPI, can be subdivided in 3 main parts:

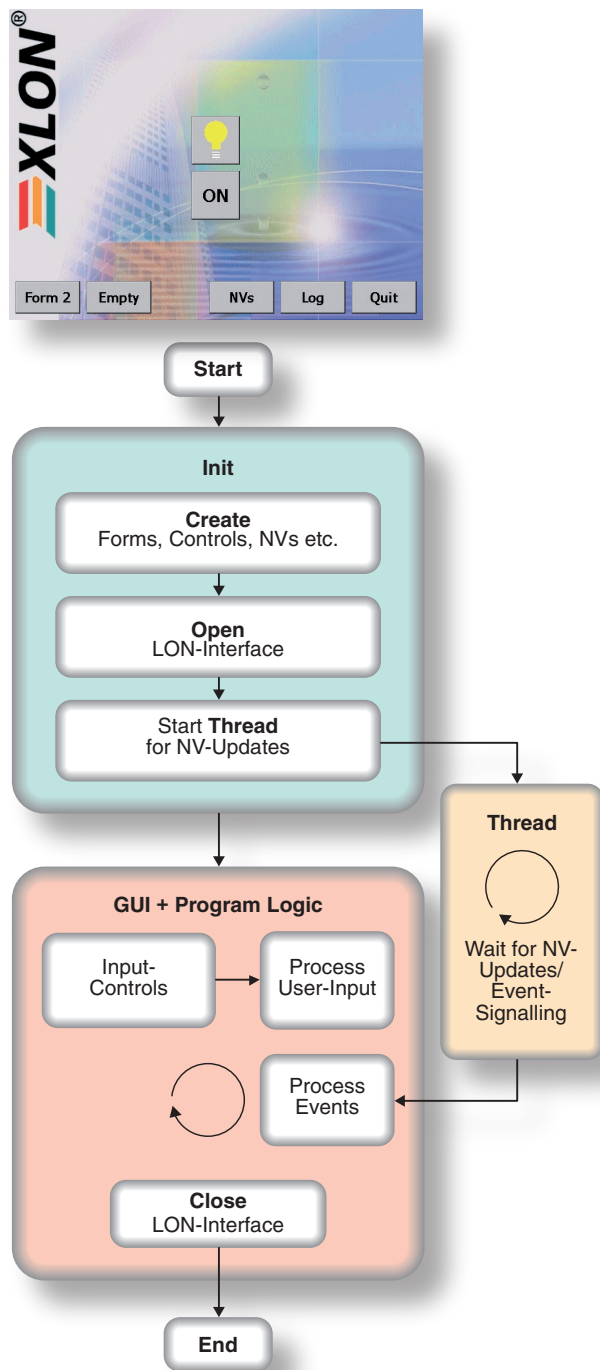## ≡ Initializing and Opening the LON-Interface

When the program starts, all NVs have to be created and initialized. This will be achieved through the function „CreateNv()". After this has been done, the network interface can be opened by function „OpenNetInterface()". Before leaving the application, the network interface should be closed by function „CloseNetInterface()".

≡ Network Variable Updates

In order to receive updates from existing NVs, it is meaningful to simply start a separate thread. Within the thread-loop it is waited for NV updates, which is realized by calling function „WaitForNvUpdate()". If there is an update recognized, it will be signalled by an Event to all other objects interested in this update.

≡ Graphical User Interface (GUI) und Program Logic

NVs are set by function „SetNv()", which is used within the GUI code as a reaction to user input. This function is used as well to set NVs on behalf of the program logic or as a reaction to updates of other NVs.

Start

Init
- **Create** Forms, Controls, NVs etc.
- **Open** LON-Interface
- Start **Thread** for NV-Updates

Thread
Wait for NV-Updates/ Event-Signalling

GUI + Program Logic
- Input-Controls → Process User-Input
- Process Events
- **Close** LON-Interface

End

Specification

LON Network Interface	≡XLON®PC, ≡XLON®PC XSI, ≡XLON®PCI, ≡XLON®USB, ≡XLON®PC/104, ≡XLON®DONGLE, 3rd party LonTalk Adapter
OS Requirements	Windows CE 4.2, Windows CE 5.0, Windows ME, Windows 2000, Windows XP, Windows Server 2003, Windows Vista
Programming Environments	Visual Studio 6.0, Visual Studio 2002/2003 .NET, Visual Studio 2005, Microsoft embedded Visual C++ 4.0, 3rd party IDEs like Borland Delphi or Borland C++ Builder and many Tools and Techniques for building Webapplications

Documentation

The Programming Guide is bilingual (English/German) and is included in the extent of delivery. Sample Applications for Visual Studio 2003 / 2005 are included in the extent of delivery as well.