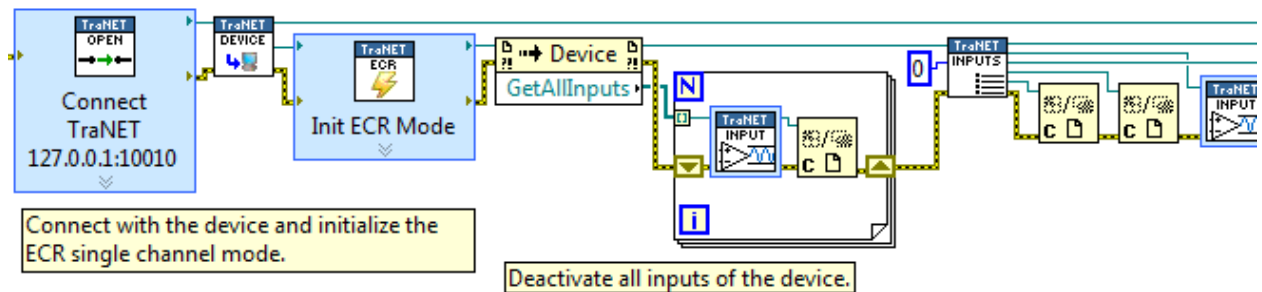


Elsys TraNET

LabVIEW Instrument Driver



User manual



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Introduction

This manual describes the use of Elsys' powerful hardware in LabVIEW with the Elsys TraNET LabVIEW Instrument Driver. This **LabVIEW Plug and Play (project-style) instrument driver** allows you to make use of all features and modes of the Elsys hardware.

The Elsys TraNET LabVIEW Instrument Driver can be used with **TraNET** devices as well as with **TPCX/TPCE modules**.

1 Installation

1.1 Requirements

- LabVIEW 2010 or newer
- Microsoft .NET Framework 3.5

Elsys hardware that is connected to a host computer requires the TpcServer to be installed on the host as well.

1.2 Automatic installation

By running the Elsys TraNET Instrument Driver Setup, the driver is installed into the LabVIEW instr.dir directory. In addition, this driver data file is stored as a zip-file in the program files directory including further documentation.

If the setup cannot find the location of the LabVIEW instr.dir automatically, a special page is shown, in which the location of the instr.dir can be selected by the user.

To check, if the driver was installed correctly, start LabVIEW and go to „Tools“ - „Instrumentation“ - „Find Instrument Drivers...“. The Elsys TraNET driver should be listed under „Installed Instrument Drivers“. If this is not the case, refer to the next chapter, how to install the driver manually.

1.3 Manual installation

If for any reason the driver was not installed automatically, the installation can also simply be made by hand.

The setup also installs the driver compressed as a zip-file. In the start menu go to “Elsys” - “LabVIEW Instrument Driver” - “Driver”. Unzip the zip file contained in this directory to the LabVIEW instr.dir directory. After that the driver should appear in the “Installed Instrument Drivers” list as described above.

For further information refer to the “Plug and Play Instrument Driver Installation Instructions” <http://www.ni.com/devzone/idnet/inetinst.htm>.

2 Driver Architecture

The Elsys TraNET LabVIEW Instrument Driver is **based on a .NET DLL**, the TransPCSystemLV.dll. This DLL was specially written for LabVIEW.

The VIs (Virtual Instruments) on the Elsys TraNET palette cover only the general and most often used features of the Elsys hardware. More specific features have to be accessed directly over the TransPCSystemLV dll. The documentation of this DLL can be found in the start menu at *“Elsys” - “LabView Instrument Driver” - “API documentation”*.

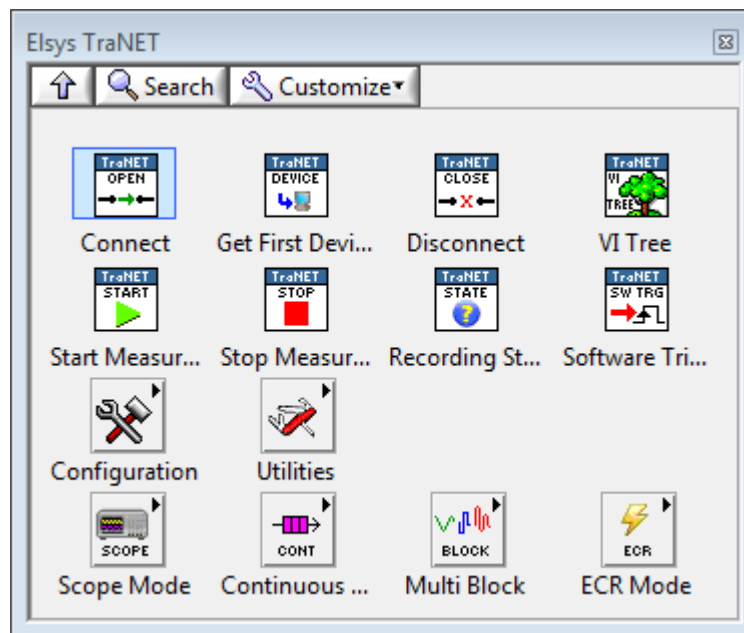
The TransPCSystemLV.dll itself is based on the TPCAccess.dll and TPCAccess64.dll (for LabVIEW 64bit), which are C++ DLLs. The TransPCSystemLV DLL is actually a wrapper, which makes all the features of the TPCAccess.dll available in LabVIEW in an easy to use and convenient manner. When distributing your LabVIEW application, make sure to **always include the TransPCSystemLV.dll together with the TPCAccess.dll and TPCAccess64.dll in the same directory!**



LabVIEW automatically detects the dependency on the TransPCSystemLV.dll, but the dependency on the TPCAccess.dll and TPCAccess64.dll has to be added manually.

3 Palette Set

The Elsys TraNET palette can be found in the Block Diagram Palette under “Instrument I/O” - “Instr Drivers” - “Elsys TraNET”.



The upper part of the palette holds the most important functions, as connecting to the device and starting measurements. The two sub palettes “Configuration” and “Utilities” hold functions to configure the input settings and to have an easier access to certain hardware features. Finally at the bottom each of the four different recording modes has a sub palette on his own. Each sub palette contains a VI to configure the corresponding mode and VIs to read out the data recorded by this mode.

3.1 Express VIs

To simplify the huge amount of configuration possibilities of the Elsys hardware, the Elsys TraNET LabVIEW Instrument driver makes use of Express VIs. **Express VIs are showed as icons surrounded by a blue field.**

Express VIs can be configured in the configuration dialog. **This configuration dialog is opened by double-clicking on the VI in the block diagram.** The settings made in this dialog are saved, and the hardware is configured according to them. If parameters have to be configured at runtime, they can be wired to the Express VIs as done with normal VIs. Those values wired to the VIs have precedence over the values set in the configuration dialog.

For further information about Express VIs refer to the LabVIEW Help <http://zone.ni.com/reference/en-XX/help/371361J-01/lvconcepts/expressVIs/>.

3.2 Palettes

3.2.1 Top Level



Connect – Opens the connection with a TraNET.



Get First Device – Returns the .NET Object of the first device in the TransPCSystem.



Disconnect – Closes the connection with a TransPCSystem.



Start Measurement – Starts a new measurement.



Stop Measurement – Stops the current measurement.



Recording State – Returns the current recording state of the TransPCSystem.



Software Trigger – Provokes a trigger event from the software.



VI Tree – Gives a schematic overview over all VIs contained in this driver.

3.2.2 Configuration



Amplifier Settings – Configures the amplifier settings such as input range, input offset, filter settings, and so on for the given input.



Trigger Settings – Configures the trigger mode, levels and flags for the given input.

3.2.3 Utilities



Get all 4 Inputs – Returns the first four input objects for a given board.



Get all 8 Inputs – Returns all eight input objects for a given board.



Get Waveform – Converts a RecordedBlock object into a LabVIEW waveform.



Get Marker – Returns two digital waveforms representing the marker bits of a RecordedBlock.



Reset – Resets the device configuration.



Autocalibrate – Performs an autocalibration on the given device.



Device Error – Returns detailed device status and error information.



Revision – Returns the server version running on the given device.

3.2.4 Scope Mode



Init Scope Mode – Configures a scope mode measurement for the given device.



Read Data – Reads the last recorded data of the given input.



Read Data 4 Inputs – Reads the last recorded data of the first four inputs of the given board.



Read Data 8 Inputs – Reads the last recorded data of all eight inputs of the given board.

3.2.5 Continuous Mode



Init Continuous Mode – Configures a continuous mode measurement for the given device.

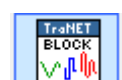


Update Waveform – Appends the newly recorded samples of an input to the already read out samples.



Read New Waveform – Reads the newly recorded samples since the last call of this function.

3.2.6 Multi Block Mode



Init Multit Block Mode – Configures a multi block mode measurement for the given device.



Read Block – Reads the specified block of the given input.



Count Blocks – Returns the number of recorded blocks of the given input.

3.2.7 ECR Mode



Init ECR Mode – Configures an ECR single or multi channel measurement with or without dual mode for the given device.



Associate Channels – Associates the given input with other inputs for the ECR single channel mode.

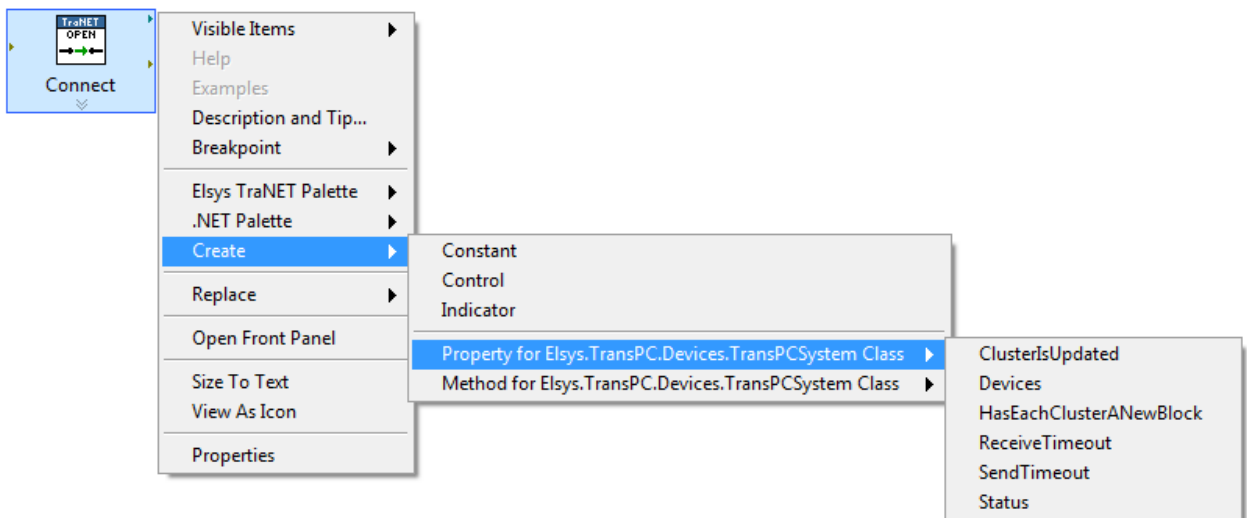


To read out data in the ECR mode, use the functions from the multi block and the continuous mode.

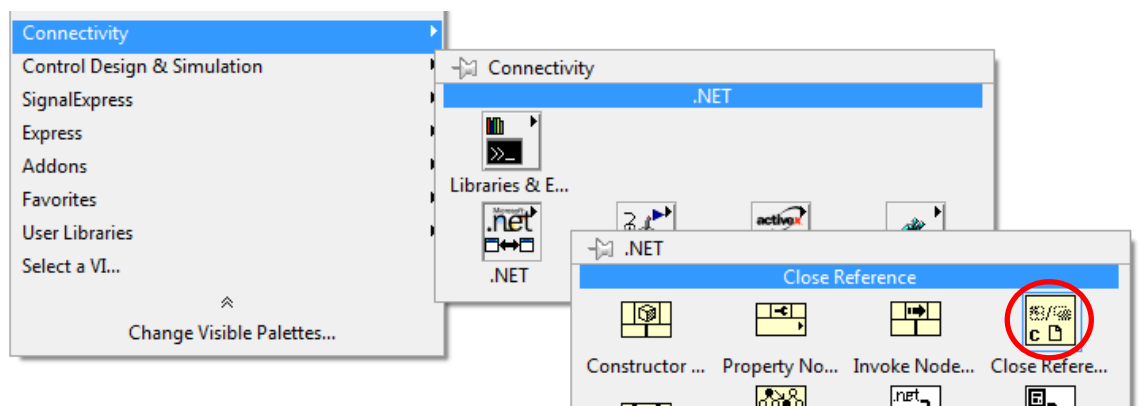
4 .NET and LabVIEW

As the underlying DLL for the Elsys TraNET LabVIEW Instrument Driver is a .NET DLL, all complex hardware parts, such as devices, boards, input, recorded blocks and so on are represented as .NET objects. These objects often offer much more functionality than covered by the VIs from the driver.

To use these functionalities, right-click on a .NET object input or output. Go to “Create” - “Property for ...” or “Method for ...”. The opening submenus list all possible methods and functions available in conjunction with the object. A description for every function and property can be found in the API documentation.



Make sure to always close all .NET objects with the “Close Reference” VI after the object is no longer needed. The “Close Reference” VI can be found in the “Connectivity” - “.NET” palette.

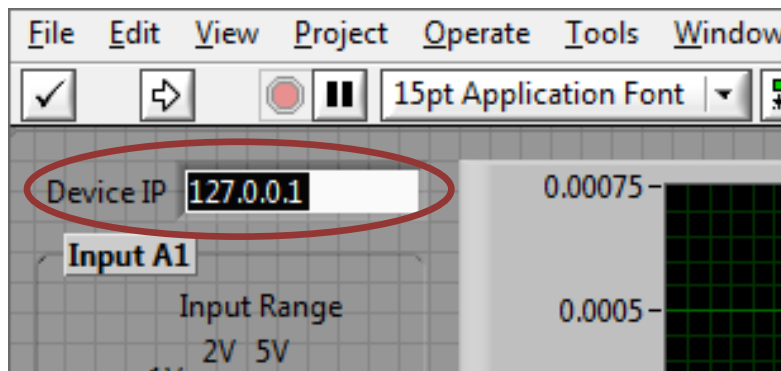


5 Examples

The Elsys TraNET LabVIEW Instrument Driver comes with several examples, showing how to make measurements with the different recording modes. All examples have comments added to the block diagram, explaining the details of the programming.

The examples can be found under *“instr.lib\Elsys TraNET\Examples”*. The *“TraNET Instrument Driver”* folder in the start menu holds an entry opening this folder.

By default the example connect to the local system TraNET on IP *“127.0.0.1”*. To run these examples with a TraNET with another IP address, change the *“Device IP”* accordingly on the Front Panel before running the VI.



Document information

Filename: LabVIEW Instrument Driver_1.0_130625_EN.docx
Version: 1.0
Status: Released

Last modification

Date: 25.06.2013
Author: Simon Geisseler