



**Driver Manual**  
**cifX Device Driver**  
**INtime**  
**V3.1/V4.x**

**Hilscher Gesellschaft für Systemautomation mbH**  
**[www.hilscher.com](http://www.hilscher.com)**

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# 1 Introduction

## 1.1 About this Document

TenAsys INtime is a real-time kernel which extends any standard Windows environment on a PC architecture with industrial-grade, fully deterministic, hard real-time capabilities.

This manual describes the Hilscher cifX driver for INtime.

The driver offers access to the Hilscher netX based hardware (e.g. CIFX50) with the same functional API as the cifX device driver for Windows. It is also possible to use the cifX INtime driver from normal Windows environment or from inside the INtime real-time kernel.

## 1.2 List of Revisions

Rev	Date	Name	Chapter	Revision
1	2008-06-12	MT	All	Created
2	2011-12-15	SS		INtime V4.x support

Table 1: List of Revisions

## 1.3 Terms, Abbreviations and Definitions

Term	Description
cifX	<b>C</b> ommunication <b>I</b> nterface based on netX
comX	<b>C</b> ommunication <b>M</b> odule based on netX
PCI	<b>P</b> eripheral <b>C</b> omponent <b>I</b> nterconnect
DLL	<b>D</b> ynamic <b>L</b> ink <b>L</b> ibrary
API	<b>A</b> pplication <b>P</b> rogramming <b>I</b> nterface
DPM	<b>D</b> ual- <b>P</b> ort <b>M</b> emory Physical interface to all communication board (DPM is also used for PROFIBUS- <b>DP</b> Master).

Table 2: Terms, Abbreviations and Definitions

## 1.4 References to Documents

This manual is based on the following documents and specifications:

- [1] Hilscher Gesellschaft für Systemautomation mbH: Driver Manual cifX Device Driver - Windows 2000/XP/Vista/7 V1.1.x.x. Revision 20, english, 2011
- [2] Hilscher Gesellschaft für Systemautomation mbH: Operating Instruction Manual CIFX Device Driver - Installation and Operation V1.0.x.x. Revision 6, english 2010
- [3] Hilscher Gesellschaft für Systemautomation mbH: Dual-Port Memory Interface Manual - netX based products. Revision 11, english, 2011

Table 3: References to Documents

## 1.5 Overview

The cifX INtime driver runs inside the Real-Time extension in a separate address space. A special version of the cifX Application Interface DLL (cifX32DLL.dll) is provided with the INtime driver to allow Windows applications, like SYCON.net, the accesses to the INtime driver from the Windows User Space.

### 1.5.1 Accessing the cifX INtime Driver from Windows (none real-time)

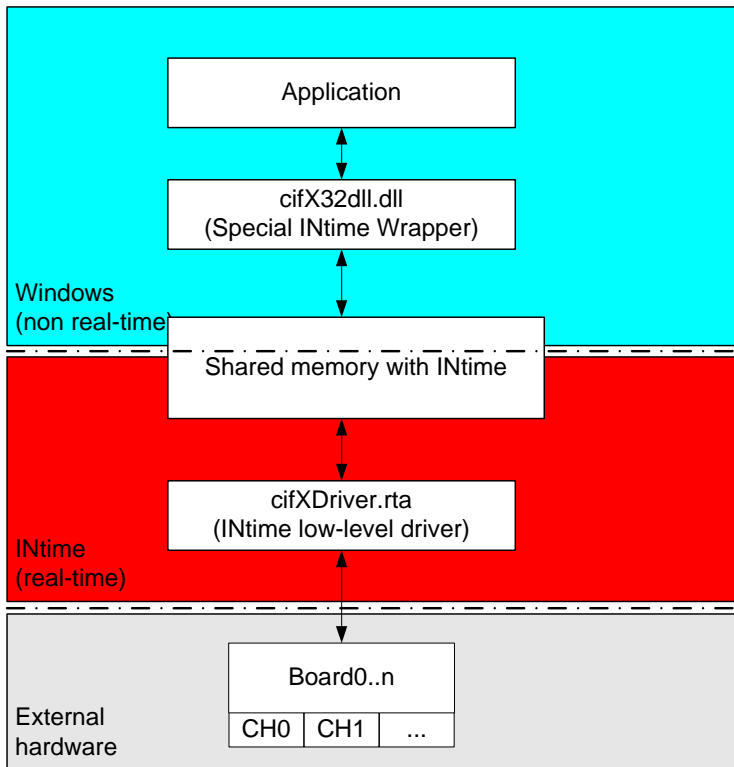


Figure 1: INtime cifX Driver Architecture (Non real-time Usage)

## 1.5.2 Accessing the cifX INtime Driver from INtime (real-time)

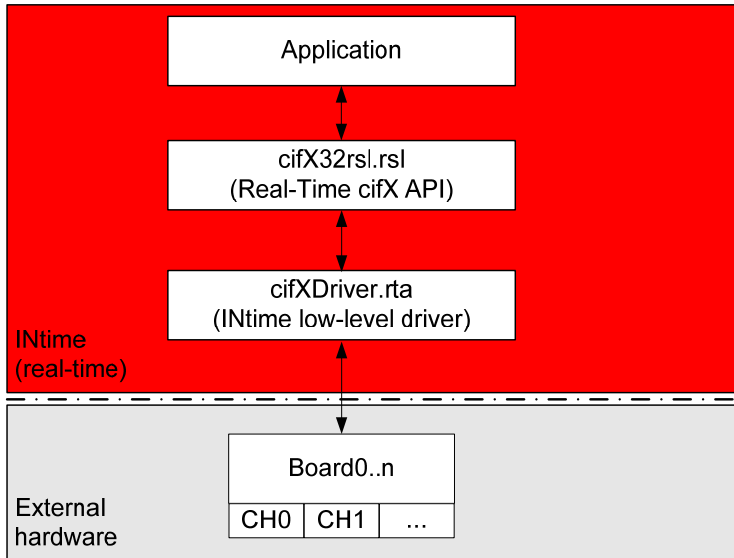


Figure 2: INtime cifX Driver Architecture (Real-time Usage)

## 1.6 Requirement

- Operating System: Windows 2000, Windows XP, Windows Vista or Windows 7 (32 or 64-bit)
- INtime Version 3.1/4.x
- **SYCON.net for netX installation from CD CIFX version 06/2011 or higher. SYCON.net installation comes on CD with cifX device.**

## 1.7 Supported Hardware

- cifX board (PCI / PCIe)
- netPLC
- NXSB-PCA / NXSB100 / NXHX board
- NX-PCA-PCI / NXHX
- netJACK 100

## 1.8 Features

- Based on the cifX Toolkit source (V1.1.0.0)
- Interrupt support for cifX boards
- DMA data transfer for I/O data (cifX boards)
- Support for loadable modules
- Interrupt notification for applications
- Unlimited number of cifX boards supported

## 1.9 Limitations

- Simultaneous access (from real-time AND non real-time mode) is not possible
- Downloaded SYCON.net Configurations are only saved for "local" INtime systems. For "remote" access to INtime, the firmware and configuration must be copied manually to the target system.
- CD for INtime Driver does not contain a SYCON.net for netX installation. SYCON.net installation comes on CD with cifX device.
- No Windows-7 or 64bit support for INtime V3.1
- Configuration/Firmware download via SYCON.net will fail with the current release of SYCON.net! The issue is fixed by applying the patch delivered with this driver CD (refer to section *Patch the SYCON.net Installation* on page 28 for further information)
- Your INtime installation may need to be patched. The patch installer can be found on the driver CD (see section *Patch the INtime Installation* on page 11)

## 1.10 CD Contents

Folder	Content
API	Application programming interface files
Includes	Hilscher cifX API header files
Libaries	INtime API files
INtime3	Libraries for use in INtime V3.1 real-time applications
INtime4	Libraries for use in INtime V4.x real-time applications
Documentation	Documentation of the cifX Windows and cifX INtime driver
Driver	INTime V3.1/V4.x driver binaries and DLLs
Examples	Example projects and source code
Installation	Driver installation directories
INtime	INtime V3.1/V4.x driver installation
Windows	Windows 2000/XP/Vista/7 driver installation
Hotfix	Patch files to fix known issues with SYCON.net and INtime
INtime	Hotfix for INtime
SYCON.net	Hotfix for SYCON.net

Table 4: CD Contents

## **1.11 Legal Notes**

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### 1.11.5 Registered Trademarks

Please notice: INtime is a registered trademark of TenAsys Corporation.

Windows and Windows XP are registered trademarks of Microsoft Corporation.

## 2 Installation

The INtime driver comes with an installer program. It is also possible to proceed the installation manually by copying the driver software to the host system. This chapter describes both, the installer program and the manual installation procedure.

---

**Note:** Depending on the INtime installation, the installation directories may change!

---

### Recommended Installation Order:

1. Install cifX Windows driver
2. Configure device (firmware/configuration)
3. Install the INtime driver

---

**Note:** It is recommended to previously install the cifX Driver, so that the default registry settings are available. If this is not done, refer to section *Driver Registry Settings* on page 15 on how to create all necessary driver registry keys manually.

---

### 2.1 Installation of the cifX Windows Driver (recommended)

The cifX Driver installation is available on the INtime CD in the folder "*Driver\Windows*". A detailed description of the installation process is given in the Installation and Operation Guide for the cifX Device Driver for Windows [2].

When Windows asks for a driver, for your newly inserted cifX card, select the path to the cifX driver folder on your CD. Windows automatically installs all needed tools and sets up the registry.

After the installation succeeded the card can be configured using the cifX Setup tool.



Figure 3: cifX Setup Wizard for Windows

## 2.2 Installation of the cifX INtime Driver (mandatory)

The INtime cifX driver comes with an automatic setup application and is available on the INtime CD in the folder "Driver\INtime". Instructions to use the setup are given in the section below (section 2.2.2). It is highly recommended to use this setup application to install the INtime cifX driver properly! However it is also possible to install the INtime cifX driver manually. Please refer to section 2.2.3 for further instructions.

### 2.2.1 Patch the INtime Installation

Your INtime 4 installation may need to be patched. Navigate to the directory "Hotfix\INtime" on the cifX INtime driver CD and execute the installer *INtime\_CIFX\_Patch.exe*. The installer will check your INtime installation and applies the patch if required. After patching your INtime installation you can proceed with the install procedure of the cifX INtime driver.

### 2.2.2 Automatic Setup

To install the INtime cifX driver execute the setup wizard (*cifX INtime Driver Setup.exe*) found on the INtime CD in the folder "Installation\INtime". The setup wizard detects your installed INtime version automatically and installs the proper cifX driver (including 64-bit installer on a 64-bit operating systems with installed INtime V4.x).



Figure 4: cifX INtime Driver Setup Wizard

During the installation the user can choose the setup type that best suits his needs. While the typical and complete setup install all feature of the driver, the custom setup allows the user to set the destination directory and choose which of the following features shall be installed:

- **cifX SDK:** Installs libraries and headers files required to develop application for cifX devices.
- **Windows Application Access:** In order to enable the usage of Hilscher standard applications like Sycon.NET, cifXTest or cifXSetup under the INtime environment the cifX API library will be replaced by a special INtime wrapper library.

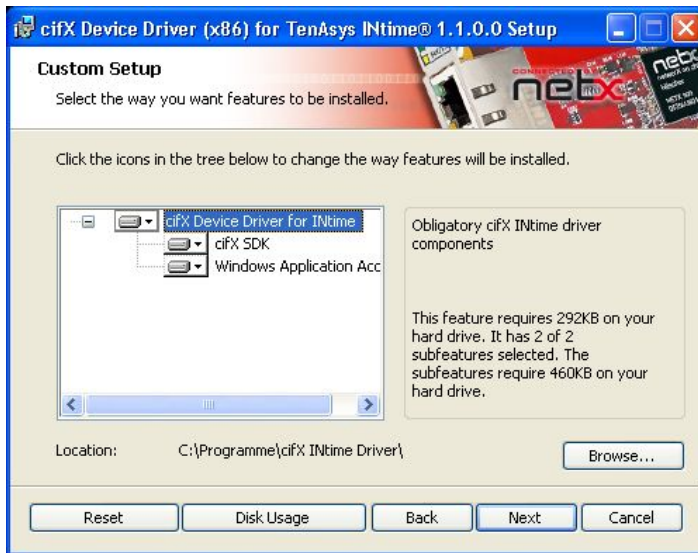


Figure 5: Custom Setup

**Note:** Make sure no Windows application is accessing the hardware, because the setup tries to rename the original cifX32DLL.dll from the cifX Windows driver (located in the ".\Windows\system32" directory) and copies the INtime version of the cifX32DLL.dll into the directory.

### Verifying the cifX32 DLL Version

During the installation of the cifX INtime driver, the cifX32DLL from the original cifX Windows driver installation (located under ".\Windows\System32", respectively ".\Windows\SysWOW64" on 64-bit OS) will be replaced by an INtime wrapper version. The INtime version of the DLL allows Windows application to access the cifX hardware via the INtime driver. The cifX32DLL.dll version can be verified by using the file property dialog from Windows.

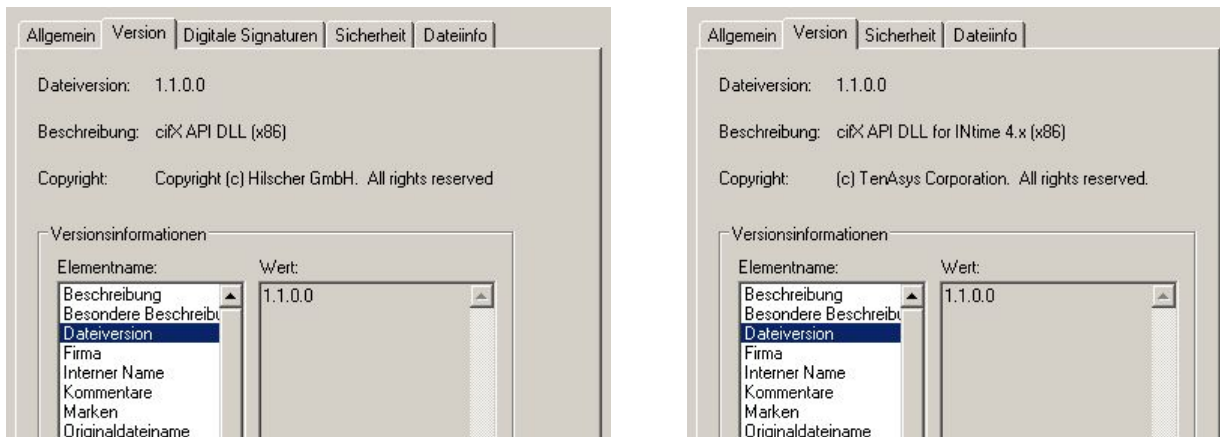


Figure 6: Verifying the cifX32DLL Version

## 2.2.3 Manual Installation

The manual installation is done by copying the files from the CD to your INtime installation. The following table shows a recommendation where the files should be placed.

File from CD (Source)	Local Folder (Destination)	Description
<b>Driver Installation</b>		
Driver\INtime3\cifxdrv.rta Driver\INtime4\cifxdrv.rta	<INTIME>\bin	Low-Level Driver
Driver\INtime3\cifx32rsl.rsl Driver\INtime4\cifx32rsl.rsl	<INTIME>\bin	API for real-time projects
Driver\INtime3\cifx32dll.dll Driver\INtime4\cifx32dll.dll	On 32-bit operating system: <WINDOWS>\System32  On 64-bit operating system: <WINDOWS>\SysWOW64	<b>ATTENTION:</b> This will replace the "normal", Windows cifX Device Driver DLL. All Windows application will only be able to access the Real-Time driver. If you only want a single application to use the Real-Time driver, copy the INtime cifX32DLL.dll into the applications directory.
Driver\INtime4\x64\cifx32dll.dll	On 64-bit operating system: <WINDOWS>\ System32	<b>ATTENTION:</b> INtime V3.1 does not support 64-bit operating systems.
<b>API / Programming Installation</b>		
API\Includes\*.h	<INTIME>\rt\include\cifX	These are the header files for interfacing with the cifx32rsl / cifX32dll. Make sure to let your project point to this include folder.
API\libs\INtime3\*.lib API\libs\INtime4\*.lib	<INTIME>\rt\lib\cifX	These are the libraries for interfacing with cifx32rsl / cifX32dll. Make sure to let your project point to this additional library folder.

Table 5: INtime Driver Installation (File copying)

## 2.3 Pass a PC card cifX to INtime

To be able to use the card under INtime, you need to move the card from non real-time to real-time management. This is done via the *INtime Device Manager*. After this step has been executed, the card will not be longer accessible from the *Windows Device Manager* or the cifX driver for Windows.

**Note:** Make sure, no Windows application is accessing the cifX hardware when passing it to INtime.

- Open the INtime Device Manager

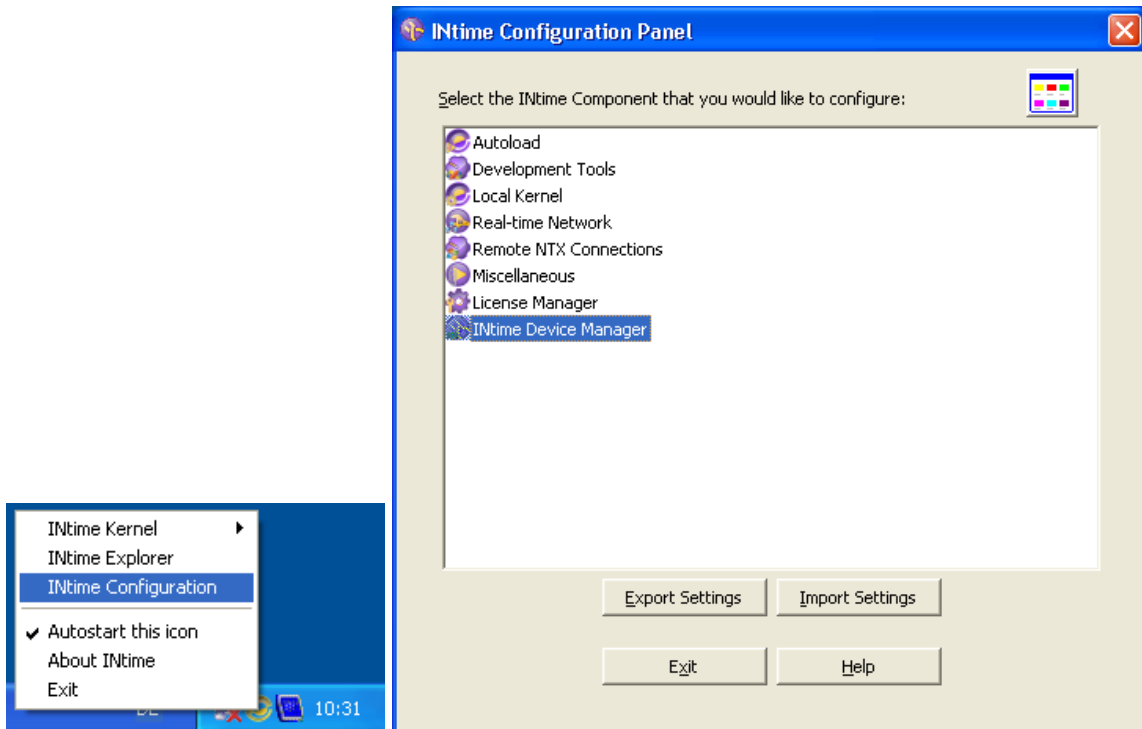


Figure 7: Open INtime Device Manager

- Right-Click on the cifX card and select **"Pass to INtime (non interrupt or MSI)"** or **"Pass to INtime (with legacy IRQ)"** and save the configuration. If interrupt support is required select the latter (Please make sure that the interrupt channel of your cifX device is not shared with another windows device, otherwise system stability is compromised)

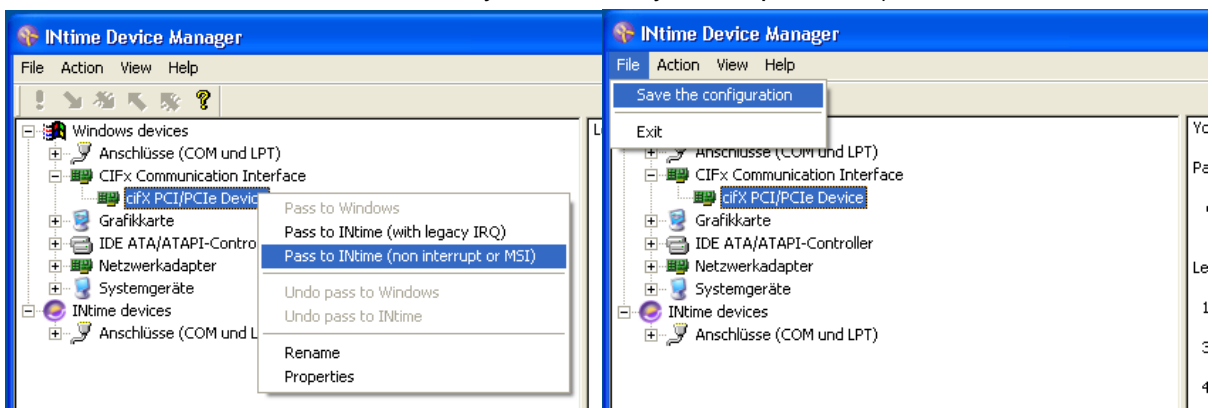


Figure 8: Pass cifX Card to INtime

- Your final configuration should look like this

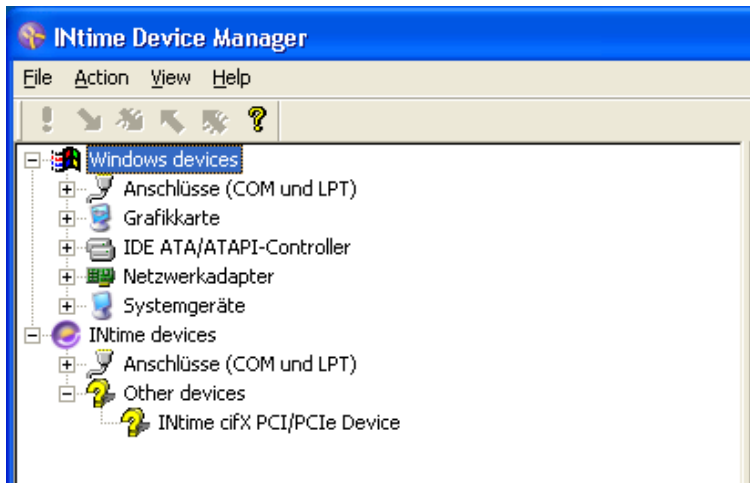


Figure 9: Final cifX INtime Configuration

## 2.4 Driver Registry Settings

The basic driver registry settings are done by the cifX Windows Driver installation. If you skip the driver installation, this chapter describes the necessary registry settings and also the keys needed to download a firmware / configuration on a specific cifX card.

Global Driver Settings		
Value	Type	Description
<b>[HKLM\System\CurrentControlSet\Services\CIFxDrv]</b>		
InstallDir	REG_SZ	Driver base directory. This is the path the second stage loader (NXCIF50-RTE.bin) and firmware / configuration files (in separate subfolders) are expected
<b>[HKLM\System\CurrentControlSet\Services\CIFxDrv\Parameters]</b>		
TraceLevel	REG_DWORD	Adjust the amount of debug outputs of the driver. Each bit represents a level. Bit 0: Enable debug Bit 1: Enable informational data Bit 2: Enable warnings Bit 3: Enable errors
PollingInterval	REG_DWORD	Time in ms to check card for COS bit change
<b>[HKLM\SYSTEM\CurrentControlSet\Services\CIFxDrv\Parameters\NX-PCA-PCI]</b>		
DPM_8_Bit	REG_DWORD	NXPCA-PCI Timings parameter for 8 bit mode.
DPM_16_Bit	REG_DWORD	NXPCA-PCI Timings parameter for 16 bit mode.
DPM_32_Bit	REG_DWORD	NXPCA-PCI Timings parameter for 32 bit mode.

Table 6: INtime-Driver - Global Driver Settings

Device Specific Settings		
Value	Type	Description
[HKLM\System\CurrentControlSet\Services\CIFxDrv\DeviceConfig\<DevNr>\<SerialNr>]: or [HKLM\System\CurrentControlSet\Services\CIFxDrv\DeviceConfig\Slot\<SlotNr>]:		
Alias	REG_SZ	Alias name of device
InterruptEnable	REG_DWORD	Device interrupt handling enable/disable 0 = disable ( <b>default</b> ) 1 = enabled
DMAEnable	REG_DWORD	Direct memory access enable/disable 0 = disable ( <b>default</b> ) 1 = enable
OSFile	REG_SZ	To use loadable modules, a rcX base firmware is required. This entry specifies the path to the rcX base firmware file relative to: <InstallationDir>\<Device Number>_<Serial Number> <InstallationDir>\Slot_<Slot Nr.>
[HKLM\System\CurrentControlSet\Services\CIFxDrv\DeviceConfig\<DevNr>\<SN>\Channel<0..6>]: or [HKLM\System\CurrentControlSet\Services\CIFxDrv\DeviceConfig\Slot\<SlotNr>\Channel<0..6>]:		
ModuleCount	REG_DWORD	Number of configured modules
Module0	REG_SZ	Each module gets an own entry with an index as suffix. This specifies the complete path to the file.
ConfigCount	REG_DWORD	Number of configured fieldbus databases
Config0	REG_SZ	Each database gets an own entry with an index as suffix. This specifies the complete path to the file.
WarmstartFile	REG_SZ	File name to warmstart parameter file

Table 7: INtime-Driver - Device Specific Settings

**Note:** All filenames are used as short file names (no path information). The file storage is explained in the following section *Firmware and Configuration File Storage* on page 18.

**Note:** An example registry file "cifX.reg" can be found in the Driver\INtime CD directory.

**Sample driver configuration:**

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv]
"InstallDir"="D:\Programme\CifX Device Driver"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\Parameters]
"TraceLevel"=dword:000000ff
"PollingInterval"=dword:000001f4
```

**Sample device configuration:**

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217]
"InterruptEnable"=dword:00000001
"DMAEnable"=dword:00000001
"Alias"=""
"OSFile"="cifXrcX.nxf"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel0]
"ModuleCount"=dword:00000001
"Module0"="cifXdps.nxf"
"ConfigCount"=dword:00000001
"Config0"="config.nxd"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel1]
"ModuleCount"=dword:00000000
"ConfigCount"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel2]
"ModuleCount"=dword:00000000
"ConfigCount"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel3]
"ModuleCount"=dword:00000000
"ConfigCount"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel4]
"ModuleCount"=dword:00000000
"ConfigCount"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel5]
"ModuleCount"=dword:00000000
"ConfigCount"=dword:00000000
```

## 2.5 Firmware and Configuration File Storage

cifX cards are not using any flash memory to store a firmware or configuration on the card. Every time the card is powered-up, the firmware and configuration must be downloaded to the hardware.

---

**Note:** Firmware and configurations are not stored on the hardware and must be downloaded each time the card is powered-up.

---

It is the task of the driver to initialize the card and therefore the driver has to know which files must be loaded to the hardware.

To allow device specific configuration every file that needs to be downloaded must be stored in an own folder. These folders are created inside the cifX driver installation directory (see Registry Settings, "*InstallDir*", usually *.\Program Files*).

This chapter describes where these files are stored.

- Use the *Slotnumber* (hardware rotary switch)

The *Slotnumber* serves to distinguish cifX cards from each other clearly, especially if more cifX cards are installed in one PC. The *Slotnumber* must be set at the cifX card using the Rotary Switch *Slotnumber*. While *Slotnumber 0* means, that the cifX card is identified via its device and serial number, values from 1 to 9 corresponds to the *Slotnumber 1 to 9*. The firmware and configuration file must reside in the subdirectory *Slot\_<1..9>*.

- Use the device and serial number (default)

If the cifX device is not equipped with a rotary switch or the *Slotnumber* should not be used, the device is identified by its device and serial number. The firmware and configuration file must reside in the subdirectory */<Device Number>\_<Serial Number>/*.

---

**Note:** When using cifX Setup Utility to configure the card, the file storage will automatically be handled by the application. The cifX Setup Utility comes with the cifX Windows driver installation and can be found in the driver installation directory or in the system control panel.

---

The following table describes the different subdirectory levels:

Subdirectory	Description
<INSTALLDIR>	Installation directory of the cifX device driver for Windows®, containing the second stage PCI boot loader and the cifX driver tools <b>Note:</b> This directory must contain the second stage PCI bootloader (e.g. NETX100-BSL.bin)
<Device Nr.>_<Serial Nr.> Slot_<1..9>	Device and serial number of the device or slot number if the device provides a rotary switch. If the slot number is 0 the device and serial number is always used to identify the device. <b>Note:</b> This directory must contain the rcX base firmware, if loadable modules are used.
Channel<#>	Channel specific files (loadable modules, monolithic firmware files, fieldbus database files) <b>Note:</b> Currently only channel 0 is supported

Table 8: Firmware and Configuration File Storage

Sample file structure for a cifX device with device number 1250100 and serial number 20217:

```
+ <INSTALLDIR>
|
|--+ 1250100_20217
|   |--+ Channel0
|       |-- cifXdps.nxf
|       |-- config.nxd
|   |--+ Channel1
|   |--+ Channel2
|   |--+ Channel3
|   |--+ Channel4
|   |--+ Channel5
```

Sample file structure for a cifX device identified by Slot number 2 and loadable module support:

```
+ <InstallDir>
|
|-- NETX100-BSL.BIN (second stage PCI bootloader)
|
|--+ Slot_2
|   |--+ Channel0
|       |-- nx100dpm.nxo (loadable module)
|       |-- config.nxd (fieldbus database)
|   |--+ Channel1
|   |--+ Channel2
|   |--+ Channel3
|   |--+ Channel4
|   |--+ Channel5
|
|-- cifXrcX.nxf (rcX base firmware)
```

## 2.6 Driver Start-Up

The driver behaves like any other real time INtime application. It can be started via the INtime Explorer or placed in the "autostart" of the kernel. There are different command line parameters available, which are described here.

Option	Type	Description
conf	String	Name of the registry file to load The referenced file is an export of the cifX Windows driver's registry key.
log	String	Filename of the log file to write debug information
stage2	String	File containing the cifX Second stage loader (Normally defined in registry)
poll	DWORD	Time in milliseconds [ms] to poll the card for change of state information
trace	DWORD	Trace level for debug outputs
inst	DWORD	Bit mask of board instances to activate. Each bit represents a board.
ntrans	DWORD	Number of transaction buffers to reserve
ncbs	DWORD	Number of control buffers to reserve
prio	DWORD	Priority of the cifx service thread (default=128)

Table 9: INtime-Driver - Command Line Options

### Example Startup:

```
cifxdrv.rta log=C:\cifxdrv.log poll=500 trace=255
```

## 2.6.1 Configure the Driver for Automatic Start-Up

Usually the driver should start with the INtime kernel. This chapter describes how to add the driver to the kernel start-up procedure.

- Open INtime *Autoload* application

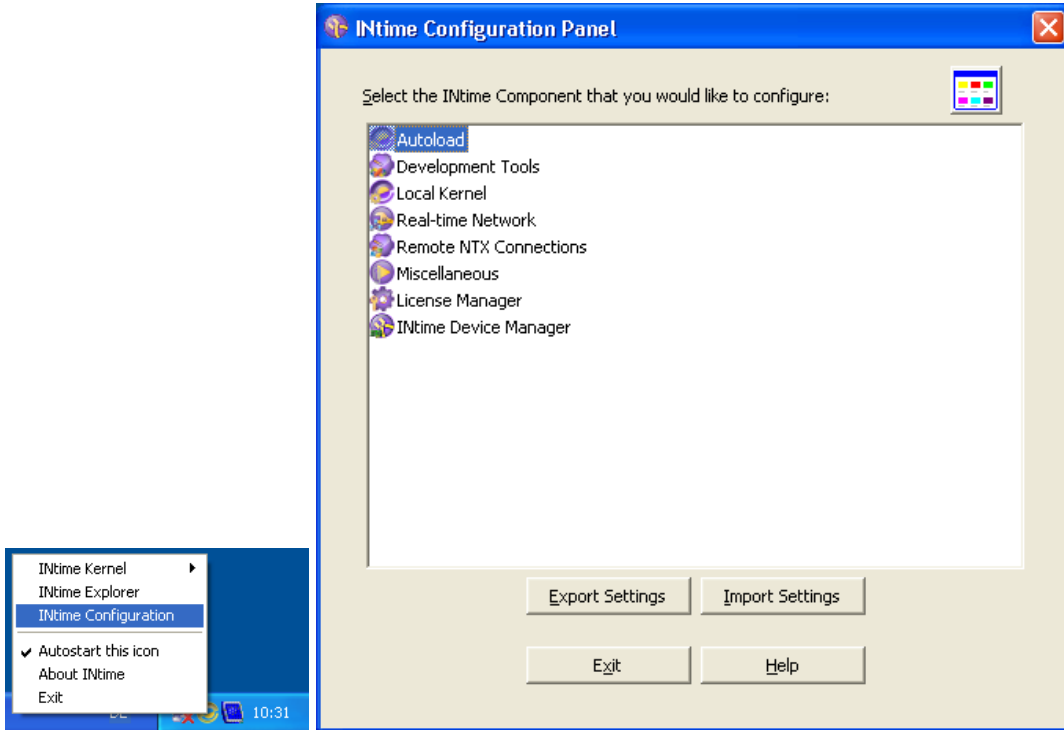


Figure 10: INtime Autoload Configuration (Start)

- Click "Add" to define a startup entry for the cifX Driver

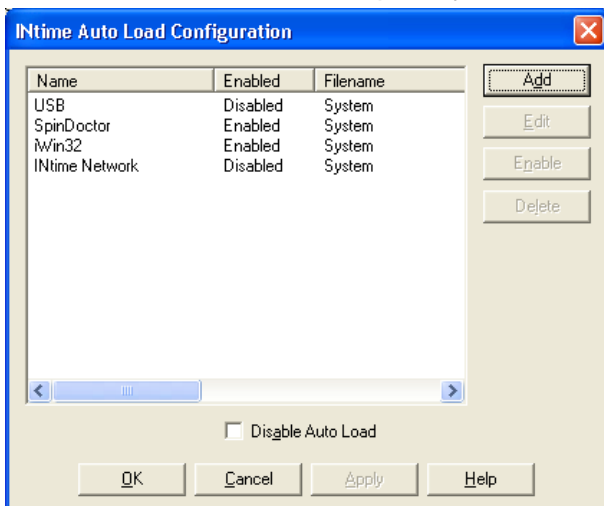


Figure 11: INtime Autoload Configuration (List)

- Fill in all needed information and your startup parameters (see section *Driver Start-Up* on page 20 for a description of the startup options)

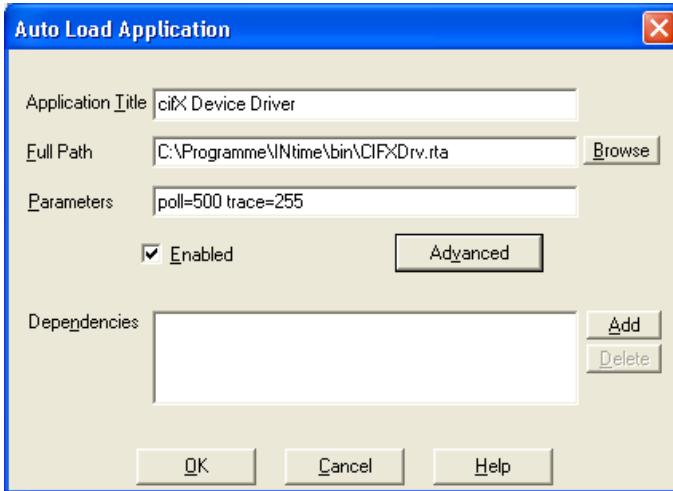


Figure 12: INtime Autoload Configuration (Add cifX Entry)

- Make sure your entry is enabled

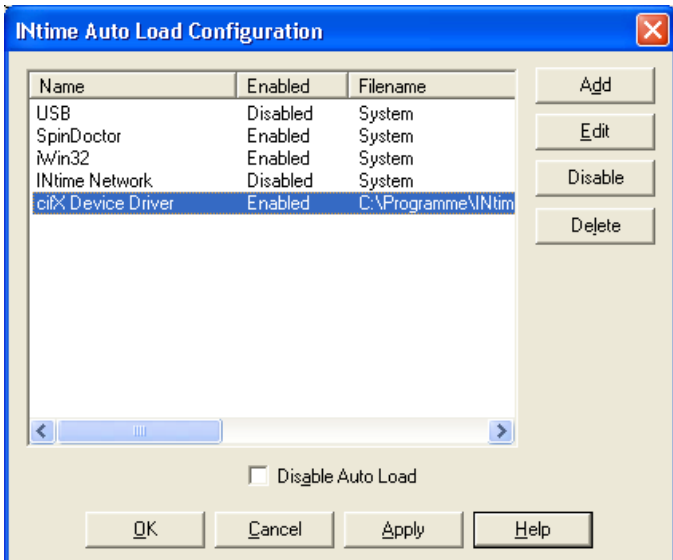


Figure 13: INtime Auto Load Configuration (List with cifX Entry)

## 2.6.2 Configuration with a Local Registry File

To allow configuration without access to the registry it is possible to pass a file, containing the registry contents for the driver and let the driver read the configuration from there. See "conf" start-up parameter.

You can either write an own registry file or export the settings from an existing cifX Windows driver installation.

To export the registry, process the following steps:

- Start registry editor "regedit.exe"
- Select the key "HKLM\SYSTEM\CurrentControlSet\Services\CIFxDrv"
- Export the registry by selecting "Export" from the file menu

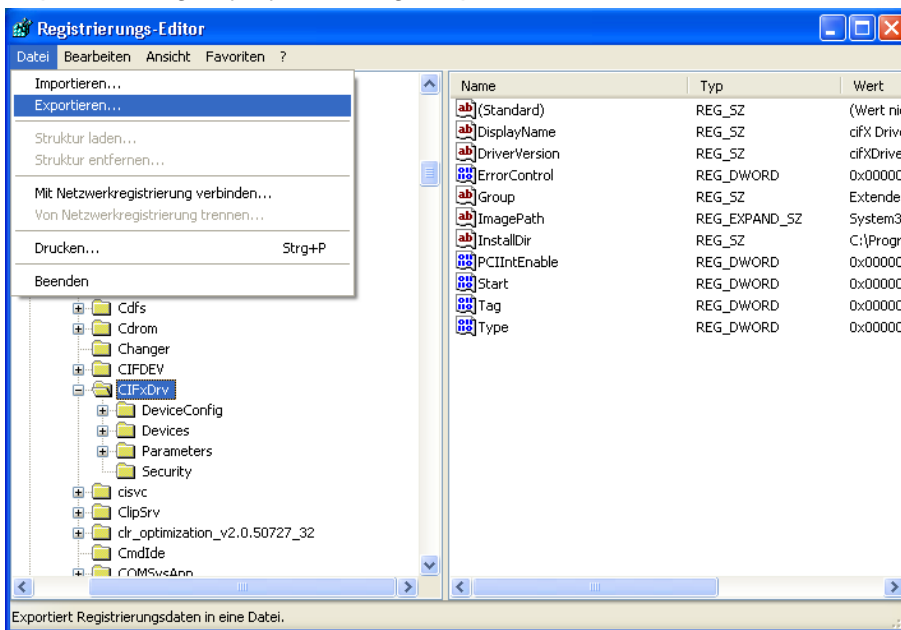


Figure 14: Export cifX Windows Registry Entries

## Sample export file

```
Windows Registry Editor Version 5.00
```

```
[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv]
"InstallDir"="C:\Programme\cifX Device Driver"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100]

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217]
"Alias"="ECS"
"InterruptEnable"=dword:00000000
"DMAEnable"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel0]
"ModuleCount"=dword:00000001
"Module0"="ecscifx.nxf"
"ConfigCount"=dword:00000001
"Config0"="config.nxd"

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel1]
"ModuleCount"=dword:00000000
"ConfigCount"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel2]
"ModuleCount"=dword:00000000
"ConfigCount"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel3]
"ModuleCount"=dword:00000000
"ConfigCount"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel4]
"ModuleCount"=dword:00000000
"ConfigCount"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\DeviceConfig\1250100\20217\Channel5]
"ModuleCount"=dword:00000000
"ConfigCount"=dword:00000000

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\Parameters]
"TraceLevel"=dword:0000000f

[HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\CIFxDrv\Parameters\NX-PCA-PCI]
"DPM_8_Bit"=dword:5431f962
"DPM_16_Bit"=dword:4073f8e2
"DPM_32_Bit"=dword:40824122
```

## 2.7 Assign a Firmware / Configuration File

Firmware and configuration files must be downloaded on every start-up (power-up) of a cifX card, as they do not have flash memory on board, to store it. This must be done by the driver, during the start-up phase.

The settings are stored per device as described in section *Driver Registry Settings* on page 15. These settings can be created and changed with the cifX Setup utility, coming with the Windows cifX device driver, or manually by editing the registry.

### 2.7.1 Using the cifX Setup Utility

The application is installed into the cifX driver installation directory (usually ".\Program files\cifX Device Driver") and will also be inserted into the Windows control panel.

- Start the cifX Setup utility

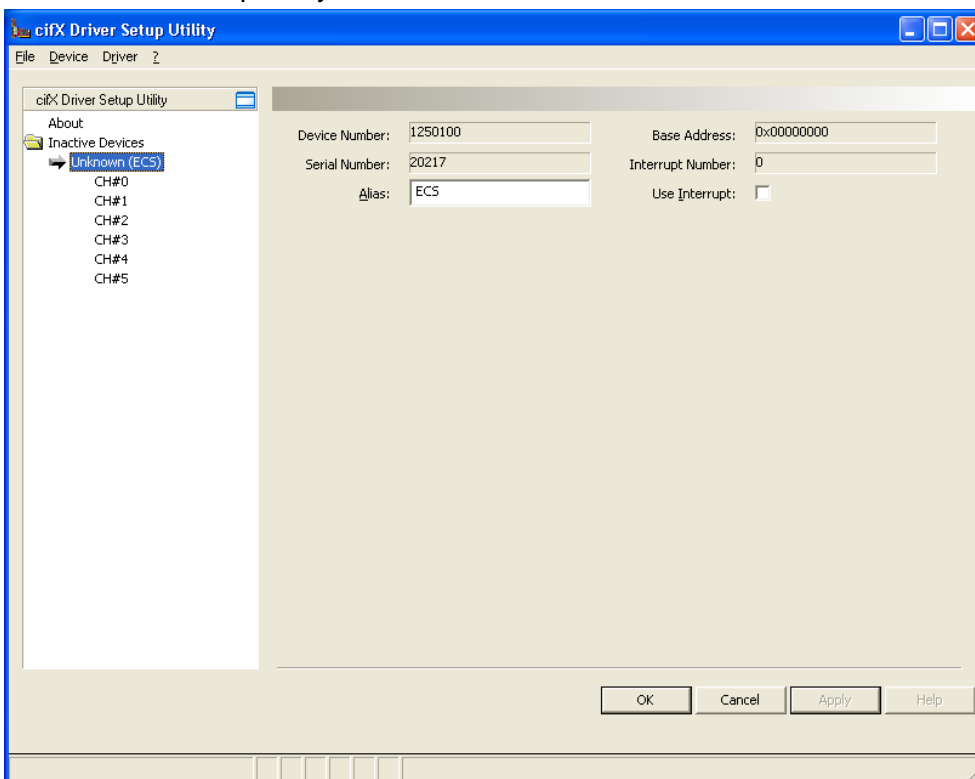


Figure 15: cifX Setup Utility

- Configure the device by setting all needed parameters in the device tree and define the files which should be loaded to the card

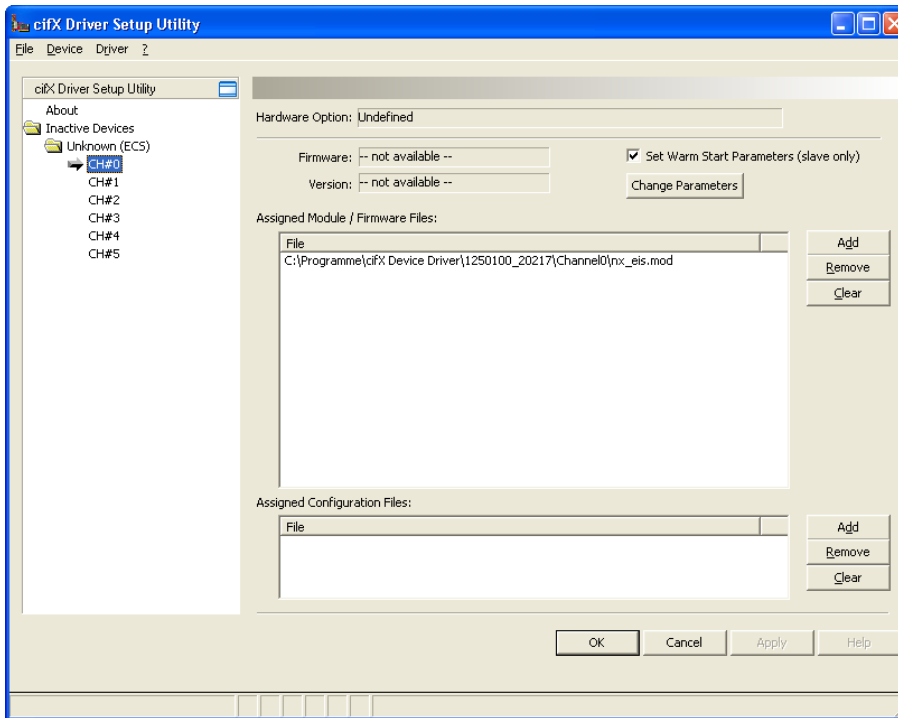


Figure 16: cifX Setup Utility - Firmware/Configuration Dialog

---

**Note:** To configure devices with the cifX Setup utility, they must have been once under the control of the Windows device driver. If a new card is inserted and directly passed to INtime, without installing the Windows cifX Device driver first, this card will not appear in the device list.

---



---

**NOTE:** If there is no driver running (cifX Windows / cifX INtime), the tool will only show "Inactive Devices".

---

## 2.7.2 Manually via Registry

The cifX Setup utility is a front end for the registry changes. All devices can also be set up by changing the registry manually and copying the files into to device storage.

---

**Note:** If the configuration is changed manually, the driver must be reloaded before the changes became active.

---

Refer to section *Driver Registry Settings* on page 15 for setting up the registry manually.

### 3 Using SYCON.net to Configure the Fieldbus System

The Hilscher Fieldbus hardware will be configured by a Windows application called SYCON.net. SYCON.net is based on the FDT/DTM concept and generates the configuration files for the hardware. It is also able to update the firmware for a specific card.

---

**Note:** Please refer to the SYCON.net user manual on how to create a fieldbus configuration for a cifX hardware.

---

---

**Note:** Because of the separation between the Windows and INtime environment, SYCON.net is not able to directly download and store a firmware / configuration by default. Therefore the cifX32DLL.dll from the Windows cifX driver (located in the .\Windows\System32 directory) must be replaced with the INtime version of this DLL.

---

Please use the following steps to create a configuration:

- Install SYCON.net
- Open SYCON.net and create a configuration
- Store the SYCON.net configuration project and export the configuration from SYCON.net into a database file.

Use either the cifX Setup Utility to place the firmware and configuration files into the cards file storage or copy the files manually into the cards file storage.

Now start/restart the cifXINtime driver. This will load the firmware and configuration into the cifX card.

Open SYCON.net and open the configuration project. Now you should be able to connect to the hardware and run the SYCON.net diagnostics.

OR

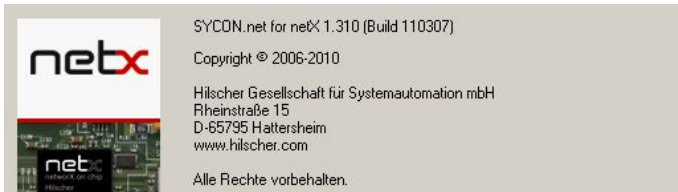
- If available, connect SYCON.net to a cifX card and download the configuration. This will automatically store the files in the cards file storage and restarts the device.

### 3.1 Patch the SYCON.net Installation

Due to compatibility issues with SYCON.net and the cifX INtime driver a firmware or configuration download will cause a fatal crash of the SYCON.net application (see screenshot below)!

An unhandled win32 exception occurred in ODMV3.exe [3548].

This issue can be fixed by applying a special patch to the SYCON.net application. Check your SYCON.net application to find out if the patch is necessary. SYCON.net 1.350 and higher don't need to be patched.

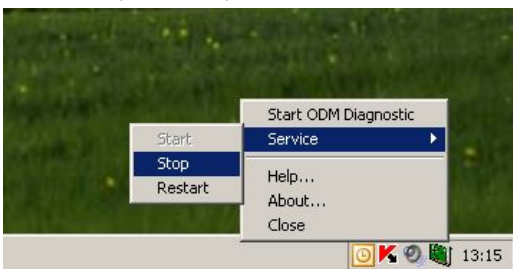


For older versions a step by step instruction to apply the patch is given below:

1. Navigate to the folder "<Common Files Path>\Hilscher\ODMV3" (e.g. *C:\Program Files\Common Files\Hilscher\ODMV3*, This path only exists if SYCON.net is installed on your local machine). The file *ODMCifXDriver.dll* located in that folder may have to be replaced by a newer version.
2. In order to check the version of the *ODMCifXDriver.dll*, open the file properties and change to the tab version. If the version is equal or higher than 1.101.1.9801 your SYCON.net installation is up to date - you don't need to apply the patch. Otherwise proceed with next step.



3. Make sure that the ODMV3 service is not running. Right click on the ODMV3 tray icon found in the tray bar of your windows machine and select Service->Stop.



4. Navigate to the folder "Hotfix\SYCON.net" on the cifX INtime driver CD
5. Replace your local version of *ODMCifXDriver.dll* with the one you find on the CD
6. The ODMV3 service will be restarted on next access via SYCON.net. Firmware and configuration downloads will now work properly!

## 4 Programming with the cifX INtime Driver

The cifX INtime driver offers the same interface than the cifX Windows driver and therefore the cifX Device Driver manual [3] can be used. This manual describes the driver functions (API), error codes and shows some program examples.

The installation CD also includes an "Example" directory with INtime specific examples.

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## 5.3 Contacts

### Headquarters

#### Germany

Hilscher Gesellschaft für  
Systemautomation mbH  
Rheinstrasse 15  
65795 Hattersheim  
Phone: +49 (0) 6190 9907-0  
Fax: +49 (0) 6190 9907-50  
E-Mail: [info@hilscher.com](mailto:info@hilscher.com)

#### Support

Phone: +49 (0) 6190 9907-99  
E-Mail: [de.support@hilscher.com](mailto:de.support@hilscher.com)

### Subsidiaries

#### China

Hilscher Systemautomation (Shanghai) Co. Ltd.  
200010 Shanghai  
Phone: +86 (0) 21-6355-5161  
E-Mail: [info@hilscher.cn](mailto:info@hilscher.cn)

#### Support

Phone: +86 (0) 21-6355-5161  
E-Mail: [cn.support@hilscher.com](mailto:cn.support@hilscher.com)

#### France

Hilscher France S.a.r.l.  
69500 Bron  
Phone: +33 (0) 4 72 37 98 40  
E-Mail: [info@hilscher.fr](mailto:info@hilscher.fr)

#### Support

Phone: +33 (0) 4 72 37 98 40  
E-Mail: [fr.support@hilscher.com](mailto:fr.support@hilscher.com)

#### India

Hilscher India Pvt. Ltd.  
New Delhi - 110 025  
Phone: +91 11 40515640  
E-Mail: [info@hilscher.in](mailto:info@hilscher.in)

#### Italy

Hilscher Italia srl  
20090 Vimodrone (MI)  
Phone: +39 02 25007068  
E-Mail: [info@hilscher.it](mailto:info@hilscher.it)

#### Support

Phone: +39 02 25007068  
E-Mail: [it.support@hilscher.com](mailto:it.support@hilscher.com)

#### Japan

Hilscher Japan KK  
Tokyo, 160-0022  
Phone: +81 (0) 3-5362-0521  
E-Mail: [info@hilscher.jp](mailto:info@hilscher.jp)

#### Support

Phone: +81 (0) 3-5362-0521  
E-Mail: [jp.support@hilscher.com](mailto:jp.support@hilscher.com)

#### Korea

Hilscher Korea Inc.  
Suwon, 443-734  
Phone: +82 (0) 31-695-5515  
E-Mail: [info@hilscher.kr](mailto:info@hilscher.kr)

#### Switzerland

Hilscher Swiss GmbH  
4500 Solothurn  
Phone: +41 (0) 32 623 6633  
E-Mail: [info@hilscher.ch](mailto:info@hilscher.ch)

#### Support

Phone: +49 (0) 6190 9907-99  
E-Mail: [ch.support@hilscher.com](mailto:ch.support@hilscher.com)

#### USA

Hilscher North America, Inc.  
Lisle, IL 60532  
Phone: +1 630-505-5301  
E-Mail: [info@hilscher.us](mailto:info@hilscher.us)

#### Support

Phone: +1 630-505-5301  
E-Mail: [us.support@hilscher.com](mailto:us.support@hilscher.com)