SIS1100(e)/310x
Win Driver

Programmers Manual

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Revision Table:

Revision	Date	Modification
0.01	20.11.08	Generated from SIS3100 windriver manual
1.00	21.11.08	Initial release

1 Table of contents

2 Introduction/concept

The Windows driver for the SIS1100(e)/310x PCI (Express) to VME interface family is based on the PLX Technology Inc. API for the PLX9054 PCI to local bus and the PEX8311 PCI Express to local bus bridge chips. A DLL (sis1100w.dll) and high level language (i.e. C) example source code with projects for Microsoft Visual C++ and National Instruments CVI are provided as well as a ready to run executable (SIS3100Base) with graphical user interface on the base of CVI. The later allows the user to execute VME and SIS1100(e)/310x control cycles without writing a single line of code to get started.

The PLX API libraries and hence the SIS1100(e)/310x driver are designed for a single tasking environment. Many functions are not re-entrant and no locking mechanisms for hardware access and the use of internal variables are provided.

As we are aware, that no manual is perfect, we appreciate your feedback and will try to incorporate proposed changes and corrections as quickly as possible. The most recent version of this manual and the software can be downloaded from http://www.struck.de/win1100.htm.

Note: The driver is not tested with Windows NT

2.1 Acknowledgements

The SIS1100/3100 is a joined development between the ZEL department of the FZ Jülich and SIS GmbH. The SIS1100 is manufactured by SIS under license of the FZ Jülich.

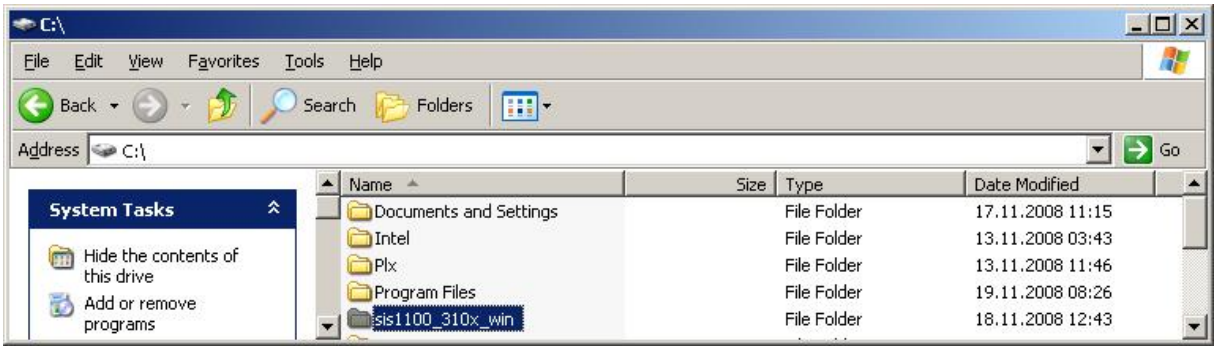
2.2 Copyright and Liablity

3 Getting started

We strongly encourage you to go through software/hardware installation in the order below.

3.1 Software Installation (Part 1)

Copy the sis1100_310x_win directory from the SIS1100310x driver win directory to your c: drive



3.2 Hardware Installation

Many users of the SIS1100/310x PCI (Express) to VME interface will not have to go through the complete documentation of the card combination unless they want to write custom driver software or have a closer look at the underlying protocol. We recommend to start with the following steps to get going:

- install the software (see 3.1) prior to hardware installation
- go to section installation of SIS1100 in this document
- go to section installation of SIS310x in this document
- go to section fibre installation and handling in this document
- install driver and dll
- modify one of the examples to match your first minimum application (like switch on/off a user LED on a VME slave, or check VME access on a VME display).
- start implementing a real application

3.2.1 Installation of SIS1100

Although the SIS1100 card (consisting of the SIS1100-CMC carrier card and the SIS1100-OPT Gigabit link CMC) has several jumpers, no modification of jumper settings prior to installation will be required.
The SIS1100e PCI express card has one jumper, which factory default setting is safe also.

Following steps are required to install the SIS1100:

- power down the computer prior to installation of the SIS1100
- open the computer housing
- install the SIS1100(e) in a PCI (Express) slot
- make sure that the card is properly seated
- secure the front panel bracket with a screw
- close the computer housing
- go to section installation of SIS3100

Note 1: Misalignment of contacts of the SIS1100 can result in serious damage of your computer. Please make sure, that the card is properly seated and secured with the front panel screw.

Note 2: The single lane SIS1100e can be installed in a PCI Express slot with higher lane count.

3.2.2 Installation of SIS310x

The SIS3100 and SIS3104 VME sequencers have a number of jumpers/switches to configure part of their functionality. For the standard single SIS310x/crate installation you should be fine with the factory default setting which includes:

- VME system controller /16 MHz clock enabled
- VME slave disabled
- Power on reset results in VME SYSRESET
- FPGA reset results in VME SYSRESET
- NIM Reset Input results in FPGA reset (where SIS3100 I/O option is installed)

Please refer to the chapter jumpers in the SIS310x hardware manuals if you would like to alter these settings.

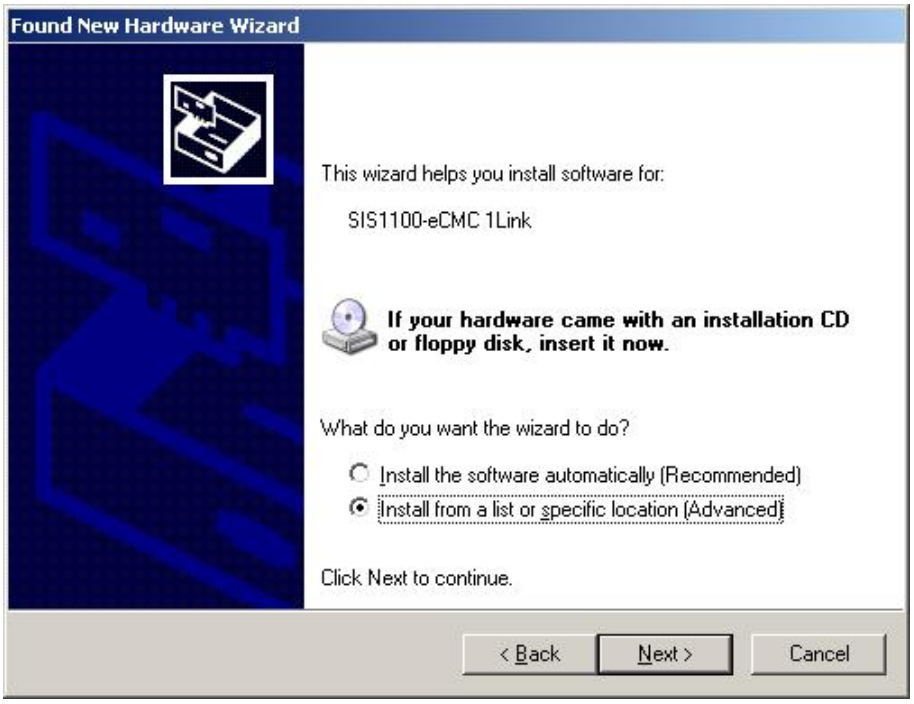
Following steps are required to install the SIS310x in the VME crate:

- power down the VME crate (unless you have a VME64x backplane)
- install the SIS310x in slot 1 of the crate
- make sure, that the card is properly seated
- go to section fibre installation and handling

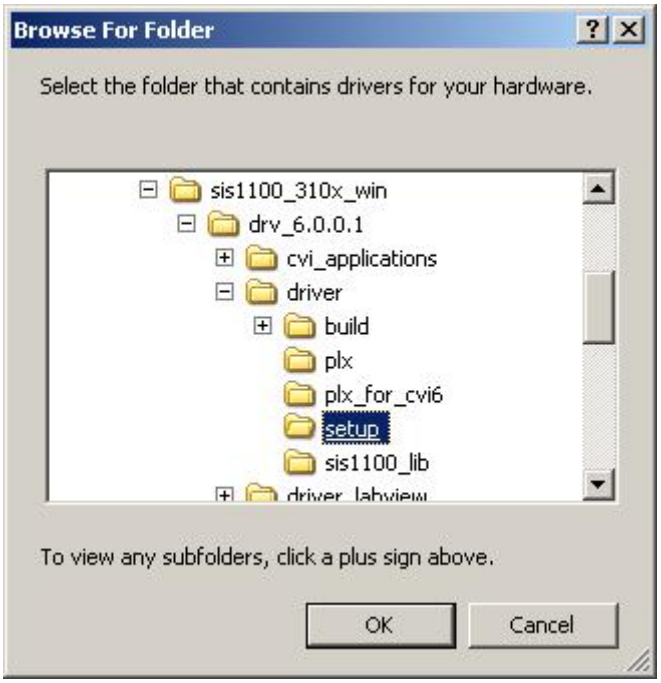
Note: In case you have problems with the VME extractor handles not “opening wide enough” you will have to get VME64x handles.

3.3 Win2K/XP/Vista Driver installation (Software Installation Part 2)

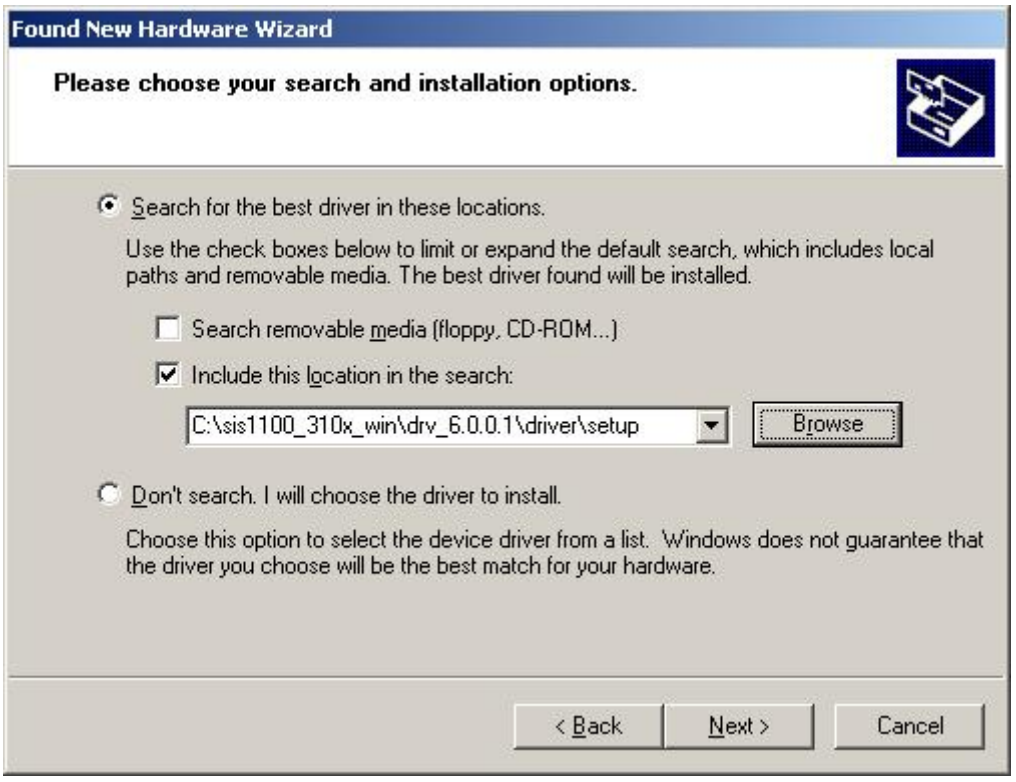
If the .inf file was copied to the proper location (in step 1 of the installation), the SIS1100 card will be reported as new hardware as shown in the screen dump below:



Select “Install from a list or specific location” and click Next.
Select the setup directory as shown below and click OK.



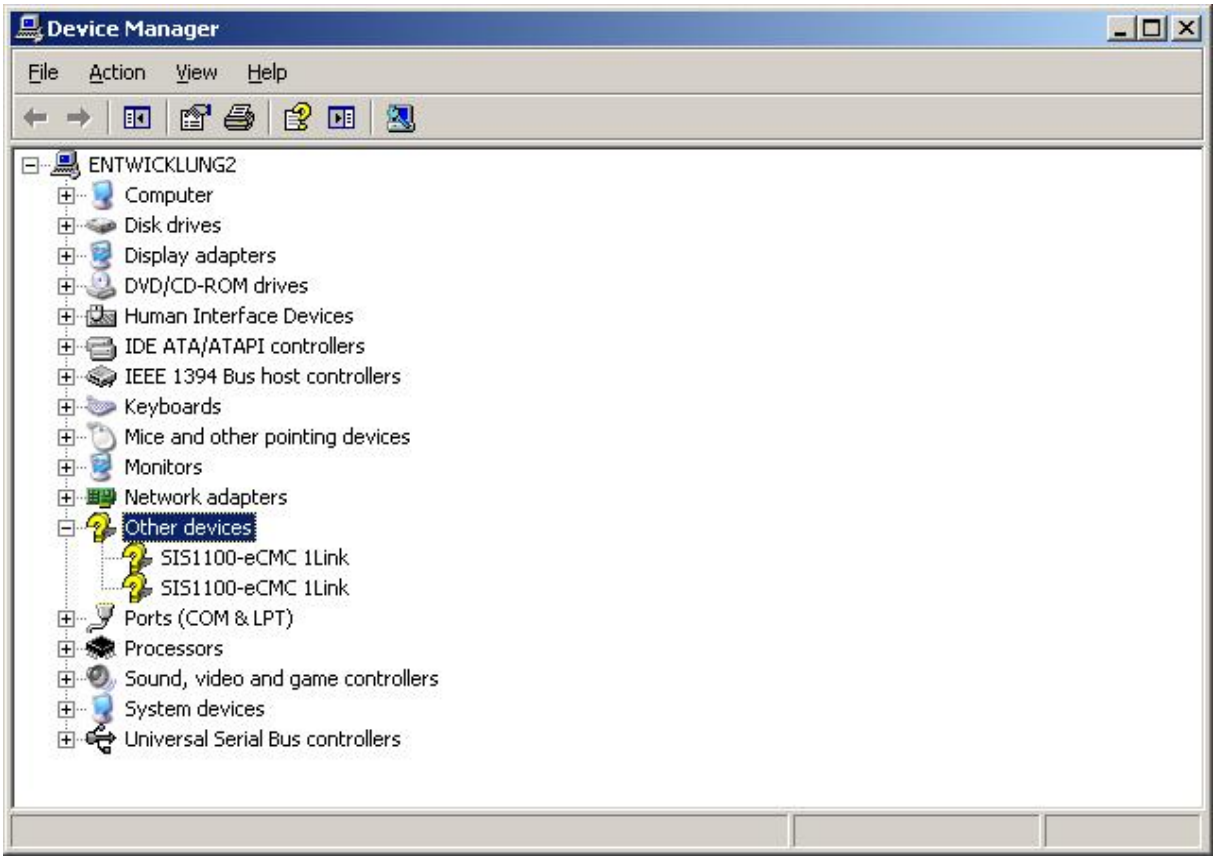
You should see:



You will want to click Continue Anyway in the Logo test popup.

At this point the installation should complete successful and the Hardware Wizard will report completion with the message below. Click Finish to close the Hardware Wizard.

In the device manager you will see SIS1100 cards (in this case 2 SIS1100 eCMC boards) as illustrated below.



3.4 Fibre Installation and Handling

3.4.1 Fibre cabling/installation

The connection between the SIS1100(e) card and the SIS310x board is made with two optical fibres. The length of the fibres is limited to 450 m (1300 feet) with the standard multimode lasers and fibres. Standard shipments come with a duplex fibre with LC connectors on both ends. . The fibres are mounted in the duplex housing/latch in a fashion, that sending and receiving fibre are crossed. Before installation of the duplex fibre the small white protection caps have to removed carefully from the four ends of the fibres. After removal of the black elastic protection plugs from the link media of the SIS1100 and SIS310x the twin LC connector assemblies can be connected to the link media. You will hear a clicking sound when the two latches of the connector come into place.
Proper optical connection can be verified by the green link LED (L) on the front panel of the SIS310x once the SIS1100 and 310x have been powered up. The green link upstream (LU) and link downstream (LD) LEDs can be used to track down a problem to one of the two fibres when the L LED remains off (SIS3100 only).
Push down the grey button on the twin LC connector assembly to release the two latches and to disconnect the fibre from the link medium.

Note: Please retain the protective caps of the fibres and the link media for later use (see below)

3.4.2 Protection against dust and mechanical stress

You should use the dust caps, that come with your SIS1100/310x shipment, to protect unused fibres and optical link media against dust. Dust or dirt can block the optical path or reduce transmission. The four small white caps should be plugged carefully onto the fibre ends of all fibres, the two black elastic plugs should be inserted into the optical link media of the SIS1100 and the SIS310x.
Fibres should be installed with a minimum bending radius of 10 cm (4 inches) and protected from accidental mechanical damage (step, office/lab chairs, ...).

4 Subroutines

Refer to the
sis1100310x\Driver\Win\sis1100_310x_win\drv_6.0.0.1\driver\sis1100_lib\sis1100w.h
for the calls and their parameters.

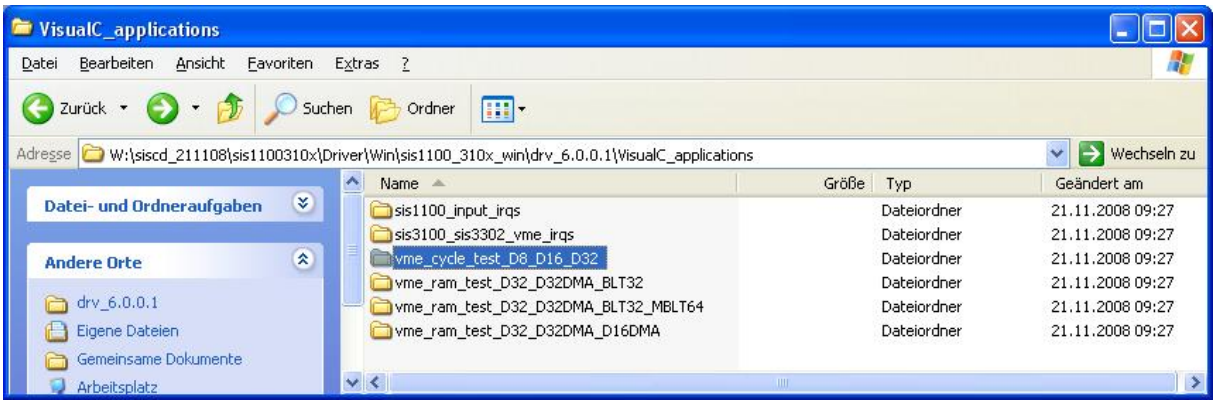
Temp note 21.11.08: variable names stripped in the header file, to be completed shortly. Refer to Visual C++ examples or the sis3100_base.c code for the time being.

4.1 Labview CVI

The sources for the SIS3100 base program can be found in the cvi_applications directory.

4.2 Visual C++ examples

A couple of Visual C++ example projects can be found on the DVD as shown below:



4.3 Labview

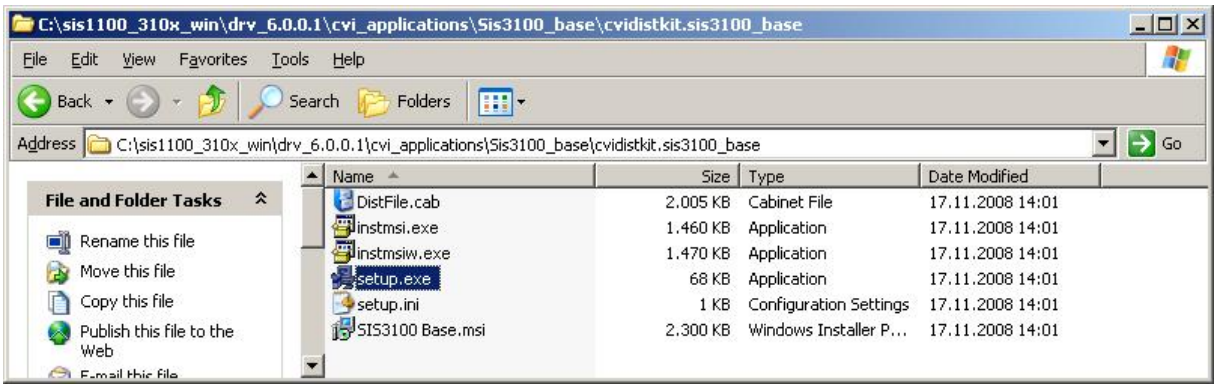
The Vis for the SIS1100(e)/SIS310x can be found in the directory:
sis1100310x\Driver\Win\sis1100_310x_win\drv_6.0.0.1\Labview_applications\vis
Refer to the sis3100-M-labview-0-vxxx documentation for details.

Note 1: The Labview code supports one interface only

Note 2: Labview uses another sis1100w.dll for the time being. It can be found in the vis directory and in the \Driver\Win\sis1100_310x_win\drv_6.0.0.1\driver_labview\setup directory

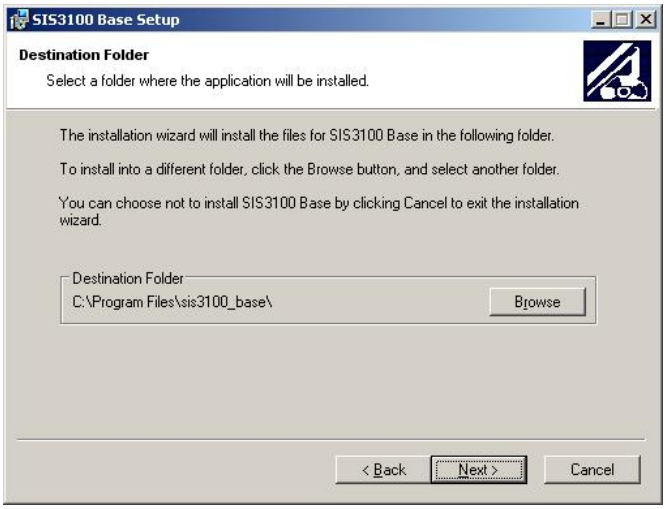
5 SIS3100Base VME executable.

Run the setup program in the directory cvidistkit_sis3100_base:

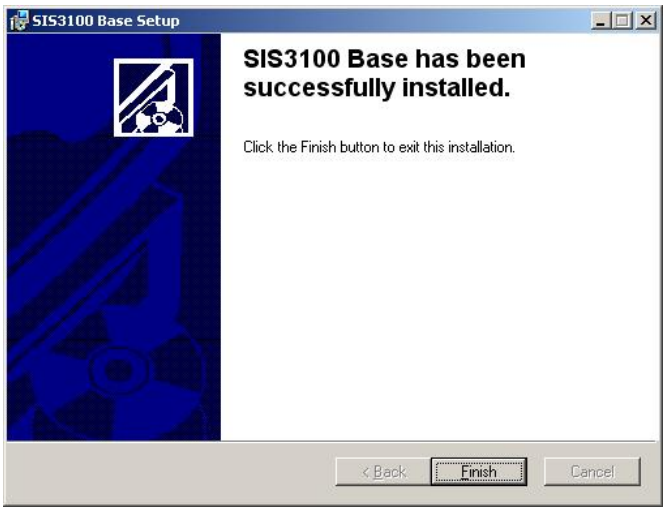


to install the National Instruments CVI runtime engine and the SIS3100Base executable on your computer. The installation wizard will come up.

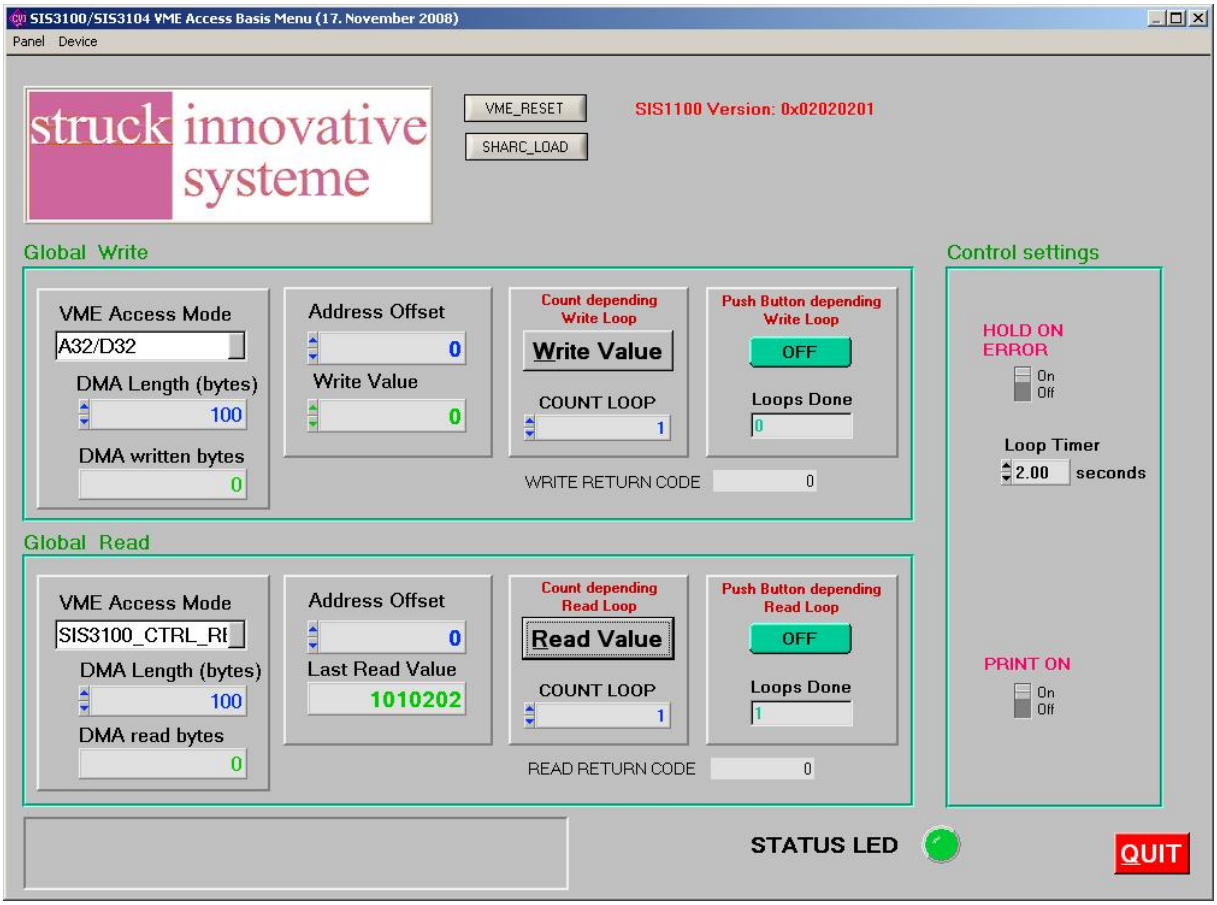
Select Next, select a destination folder and select Next again.



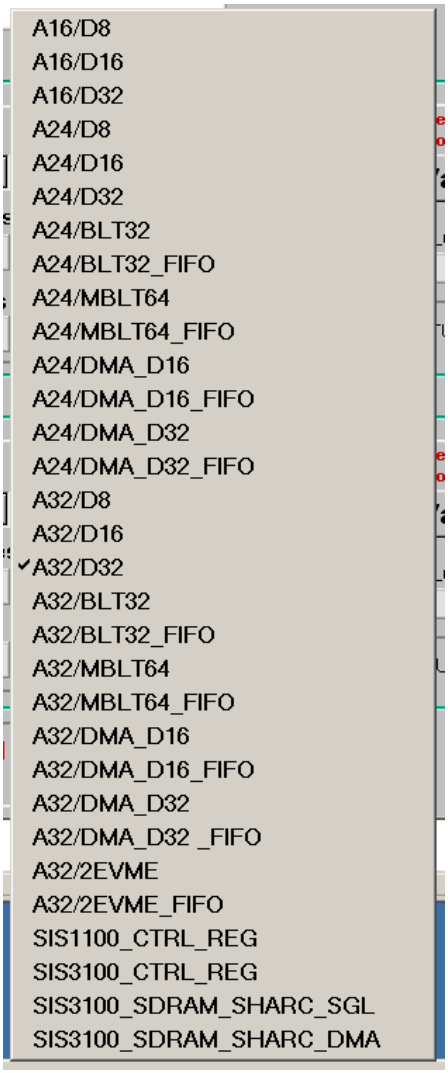
The installation should complete successfully



Start the program and you will see the Graphical User (GUI) interface below.



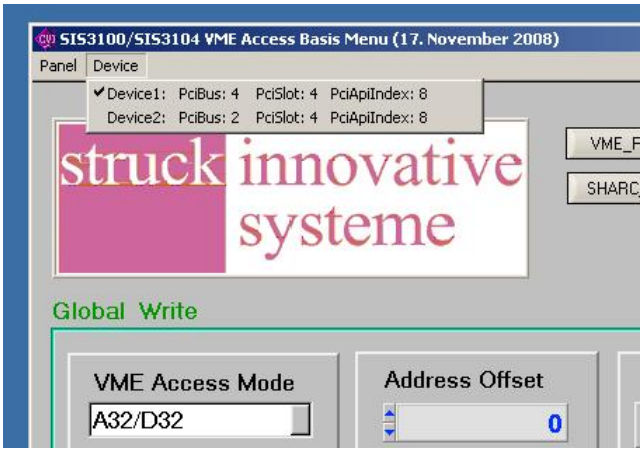
The Access Mode pulldown menus in the Global Write and Global Read section allow you to select a function. This pulldown is shown below for the Global Write case. A SIS3100_CTRL in the Global Read section with offset 0 will return the Identification register of the SIS310x card (1010202 in the example above).



SIS3100 Global Write Access Mode pulldown.

Note: The SIS3104 does not support SDRAM_SHARC cycles

The interface can be selected in the Device pulldown with several SIS1100 cards in the PC as shown below (with 2 cards in the PC).



6 Index