

Agilent Technologies Acqiris U10xx Series Products

U106xA, U107xA, U1081A, U1082A,
U1084A

Startup Guide

Anticipate —Accelerate —Achieve



Agilent Technologies

Notices

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- <http://www.agilent.com/find/embedded>
- www.agilent.com/find/assist (worldwide contact information for repair and service)

Information on preventing damage to your Agilent equipment can be found at www.agilent.com/find/tips.

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This product has been designed and tested in accordance with accepted industry standards, and has been supplied in a safe condition. To review the Declaration of Conformity, go to <http://regulations.corporate.agilent.com/DoC/search.htm>.

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Safety Notices

The following safety precautions should be observed before using this product and any associated instrumentation.

This product is intended for use by qualified personnel who recognize shock hazards and are familiar with the safety precautions required to avoid possible injury. Read and follow all installation, operation, and maintenance information carefully before using the product.

WARNING

If this product is not used as specified, the protection provided by the equipment could be impaired. This product must be used in a normal condition (in which all means for protection are intact) only.

The types of product users are:

- **Responsible body** is the individual or group responsible for the use and maintenance of equipment, for ensuring that the equipment is operated within its specifications and operating limits, and for ensuring operators are adequately trained.
- **Operators** use the product for its intended function. They must be trained in electrical safety procedures and proper use of the instrument. They must be protected from electric shock and contact with hazardous live circuits.
- **Maintenance personnel** perform routine procedures on the product to keep it operating properly (for example, setting the line voltage or replacing consumable materials). Maintenance procedures are described in the user documentation. The procedures explicitly state if the operator may perform them. Otherwise, they should be performed only by service personnel.
- **Service personnel** are trained to work on live circuits, perform safe installations, and repair products. Only properly trained service personnel may perform installation and service procedures.

Agilent products are designed for use with electrical signals that are rated Measurement Category I and Measurement Category II, as described in the International Electrotechnical Commission (IEC) Standard IEC 60664. Most measurement, control, and data I/O signals are Measurement Category I and must not be directly connected to mains voltage or to voltage sources with high transient over-voltages. Measurement Category II connections require protection for high transient over-voltages often

associated with local AC mains connections. Assume all measurement, control, and data I/O connections are for connection to Category I sources unless otherwise marked or described in the user documentation.

Exercise extreme caution when a shock hazard is present. Lethal voltage may be present on cable connector jacks or test fixtures. The American National Standards Institute (ANSI) states that a shock hazard exists when voltage levels greater than 30V RMS, 42.4V peak, or 60VDC are present. A good safety practice is to expect that hazardous voltage is present in any unknown circuit before measuring.

Operators of this product must be protected from electric shock at all times. The responsible body must ensure that operators are prevented access and/or insulated from every connection point. In some cases, connections must be exposed to potential human contact. Product operators in these circumstances must be trained to protect themselves from the risk of electric shock. If the circuit is capable of operating at or above 1000V, no conductive part of the circuit may be exposed.

Do not connect switching cards directly to unlimited power circuits. They are intended to be used with impedance-limited sources. NEVER connect switching cards directly to AC mains. When connecting sources to switching cards, install protective devices to limit fault current and voltage to the card.

Before operating an instrument, ensure that the line cord is connected to a properly-grounded power receptacle. Inspect the connecting cables, test leads, and jumpers for possible wear, cracks, or breaks before each use.

When installing equipment where access to the main power cord is restricted, such as rack mounting, a separate main input power disconnect device must be provided in close proximity to the equipment and within easy reach of the operator.

For maximum safety, do not touch the product, test cables, or any other instruments while power is applied to the circuit under test. ALWAYS remove power

from the entire test system and discharge any capacitors before: connecting or disconnecting cables or jumpers, installing or removing switching cards, or making internal changes, such as installing or removing jumpers.

Do not touch any object that could provide a current path to the common side of the circuit under test or power line (earth) ground. Always make measurements with dry hands while standing on a dry, insulated surface capable of withstanding the voltage being measured.

The instrument and accessories must be used in accordance with its specifications and operating instructions, or the safety of the equipment may be impaired.

Do not exceed the maximum signal levels of the instruments and accessories, as defined in the specifications and operating information, and as shown on the instrument or test fixture panels, or switching card.

When fuses are used in a product, replace with the same type and rating for continued protection against fire hazard.

Chassis connections must only be used as shield connections for measuring circuits, NOT as safety earth ground connections.

If you are using a test fixture, keep the lid closed while power is applied to the device under test. Safe operation requires the use of a lid interlock.

Caution and Warning Notices

CAUTION

A CAUTION notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in damage to the product or loss of important data. Do not proceed beyond a CAUTION notice until the indicated conditions are fully understood and met.

WARNING

A WARNING notice denotes a hazard. It calls attention to an operating procedure, practice, or the like that, if not correctly performed or adhered to, could result in personal injury or death. Do not proceed

beyond a WARNING notice until the indicated conditions are fully understood and met.

Instrumentation and accessories shall not be connected to humans.

Before performing any maintenance, disconnect the line cord and all test cables.

To maintain protection from electric shock and fire, replacement components in mains circuits – including the power transformer, test leads, and input jacks – must be purchased from Agilent. Standard fuses with applicable national safety approvals may be used if the rating and type are the same. Other components that are not safety-related may be purchased from other suppliers as long as they are equivalent to the original component (note that selected parts should be purchased only through Agilent to maintain accuracy and functionality of the product). If you are unsure about the applicability of a replacement component, call an Agilent office for information.

Cleaning Precautions:

WARNING

To prevent electrical shock, disconnect the Agilent Technologies instrument from mains before cleaning. Use a dry cloth or one slightly dampened with water to clean the external case parts. Do not attempt to clean internally. To clean the connectors, use alcohol in a well-ventilated area. Allow all residual alcohol moisture to evaporate, and the fumes to dissipate prior to energizing the instrument.

Front and Rear Panel Symbols:



The CE mark is a registered trademark of the European Community.



N10149 The C-Tick mark is a registered trademark of the Australian Spectrum Management Agency.



This symbol indicates product compliance with the Canadian Interference-Causing Equipment Standard (ICES-001). It also identifies the product is an Industrial Scientific and Medical Group 1 Class A product (CISPR 11, Clause 4).



KCC-REM-ATI-
BLMODSF01

South Korean Class A EMC Declaration. this equipment is Class A suitable for professional use and is for use in elect-

tomagnetic environments outside of the home.

A 급 기기 (업무용 방송통신기자재)
이 기기는 업무용 (A 급) 전자파적합기
기로서 판 매자 또는 사용자는 이 점을
주
의하시기 바라 며 , 가정외의 지역에서
사용하는 것을 목적으로 합니다 .



This symbol indicates separate collection for electrical and electronic equipment, mandated under EU law as of August 13, 2005. All electric and electronic equipment are required to be separated from normal waste for disposal (Reference WEEE Directive, 2002/96/EC).



This symbol on an instrument means caution, risk of danger. You should refer to the operating instructions located in the user documentation in all cases where the symbol is marked on the instrument.



This symbol indicates the time period during which no hazardous or toxic substance elements are

expected to leak or deteriorate during normal use. Forty years is the expected useful life of the product.



This symbol indicates the instrument is sensitive to electrostatic discharge (ESD). ESD can damage the highly sensitive components in your instrument. ESD damage is most likely to occur as the module is being installed or when cables are connected or disconnected. Protect the circuits from ESD damage by wearing a grounding strap that provides a high resistance path to ground. Alternatively, ground yourself to discharge any built-up static charge by touching the outer shell of any grounded instrument chassis before touching the port connectors.

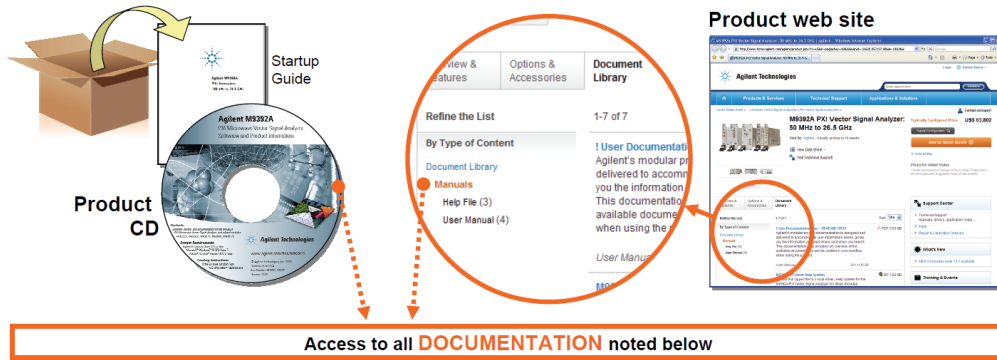


This symbol denotes a hot surface. The side cover of the module will be hot after use and should be allowed to cool for several minutes.

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Documentation Map



Startup Guide



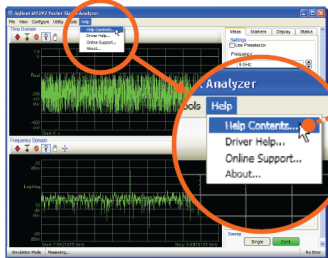
- Unpack product
- Verify shipment
- Install software
- Install hardware
- Verify operation
- Troubleshooting

Data Sheet

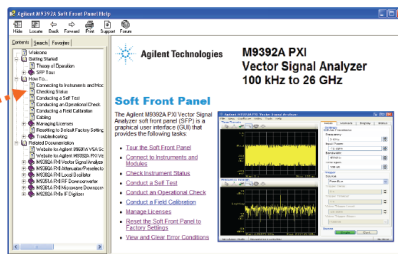


- Product description
- Technical specifications

Soft Front Panel (SFP) user interface

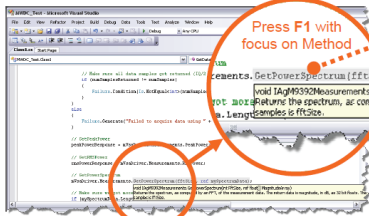


SFP help system

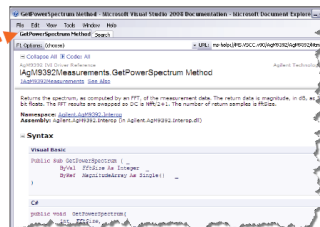


- Theory of operation
- Block diagram
- Configuration
- Self test
- Operational check
- Field calibration
- Troubleshooting

Visual Studio

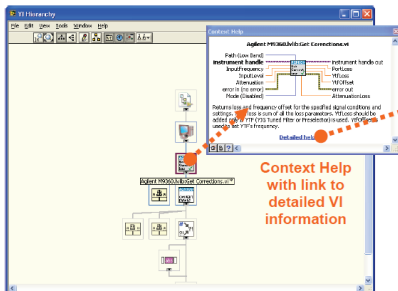


IVI Driver help system

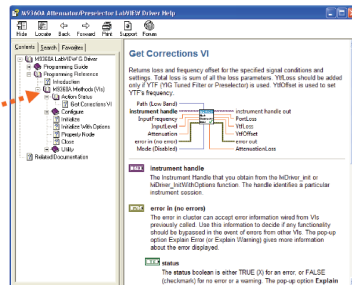


- IVI-COM and IVI-C driver programmer's reference
- Sample programs

LabVIEW



LabVIEW Driver help system



- LabVIEW driver programmer's reference
- Sample programs

Introduction

The scope of this Startup Guide is to detail the processes of receiving and installing the Acqiris U10xx Series Products and installing the required software. The Agilent MD1 High-Speed Digitizer Software is fully backward compatible with existing software applications based on Acqiris software previously delivered with the U10xxA series of digitizers.

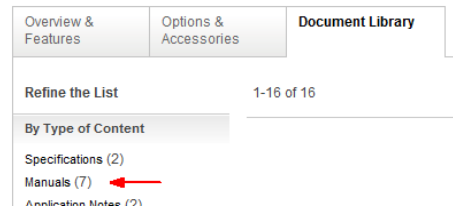
If you have any questions after reviewing this information, please contact your local Agilent representative or contact us through our website at www.agilent.com/find/assist

Related Documentation

This Startup Guide and the documentation listed below are on the CD and at www.agilent.com/find/embedded . Select **Technical Support >**

Manuals.

- Digitizer User Guide and Help system for the Soft Front Panel
- Help systems for the Agilent device drivers (IVI-C and IVI-COM, and LabVIEW G)
- Product specifications (Data Sheet)



Follow the Startup Sequence

This Start-Up Guide is intended to lead the user through the four steps of product installation as summarized in the diagram below. An optional fifth step shows how to perform an operational verification of the .

Step 1: Unpack and Inspect



Step 2: Verify Shipment



Step 3: Install Drivers and Software



Step 4: Install Modules

WARNING

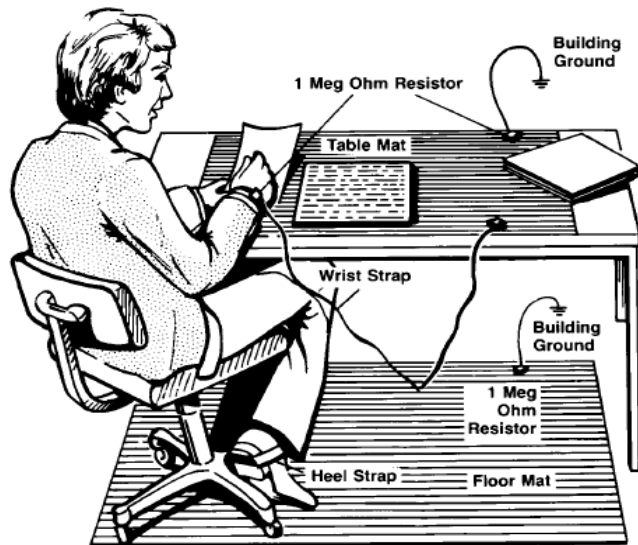
Closely follow the startup process flow in this document. Deviating from the sequence can cause unpredictable system behavior, damage your system, and may cause personal injury.

Step 1: Unpack and Inspect the Module

CAUTION

The module is shipped in materials which prevent damage from static. The module should only be removed from the packaging in an anti-static area ensuring that correct anti-static precautions are taken. Store all modules in anti-static envelopes when not in use.

ESD



Electrostatic discharge (ESD) can damage or destroy electronic components. Use a static-safe work station to perform all work on electronic assemblies. The figure (left) shows a static-safe work station using two types of ESD protection: conductive table-mat and wrist-strap combination, and conductive floor-mat and heel-strap combination. Both types, when used together, provide a significant level of ESD protection. Of the two, only the table-mat and wrist-strap combination provides adequate ESD protection when used alone. To ensure user safety, the static-safe accessories must provide at least 1 M Ω of isolation from ground.

WARNING

DO NOT use these techniques for a static-safe work station when working on circuitry with a voltage potential greater than 500 volts.

Inspect for Damage

After unpacking a module, inspect it for any shipping damage. Report any damage to the shipping agent immediately, as such damage is not covered by the warranty (see warranty information at beginning of this document).

CAUTION

To avoid damage when handling a module, do not touch exposed connector pins.

NOTE

See www.agilent.com/find/tips for information on preventing damage to your Agilent equipment.

Return a Module for Service

Should it become necessary to return a module for repair or service, follow the steps below:

1. Review the warranty information shipped with your product.
2. Contact Agilent to obtain a Return Material Authorization (RMA) and return address. For assistance finding Agilent contact information, go to www.agilent.com/find/assist (worldwide contact information for repair and service) or refer to the “Support” information on the product web page at
3. Write the following information on a tag and attach it to the malfunctioning equipment:
 - Name and address of owner. A P.O. box is not acceptable as a return address.
 - Product model number (for example,).
 - Product serial number. The serial number label is located on the top cover of the module. The serial number can also be read from the Soft Front Panel interface, but only after the hardware is installed.
 - Description of failure or service required.
4. Pack the module in its original ESD bag and packing carton. If the original carton is not available, use bubble wrap or packing peanuts and place the instrument in a sealed container and mark the container “FRAGILE”.
5. On the shipping label, write ATTENTION REPAIR DEPARTMENT and the RMA number.

NOTE

If any correspondence is required, refer to the product by serial number and model number.

Step 2: Install the Software

System Requirements

Item	Requirements		
Operating system	Windows XP SP3	Windows Vista® SP1 and SP2, Windows 7® (32 or 64-bit), All versions.	Linux kernel 2.6 or higher (32 or 64-bit), Debian 6.0, CentOS 5
Processor speed	600 MHz or higher required 800 MHz recommended	1 GHz 32-bit (x86), 1 GHz 64-bit (x64), no support for Itanium64	As per the minimum requirements of the chosen distribution.
Available memory	256 MB minimum, (1 GB or greater recommended)	1 GB minimum	As per the minimum requirements of the chosen distribution.
Available disk space ¹	1.5 GB available hard disk space, includes: <ul style="list-style-type: none"> 1 GB available for Microsoft .NET Framework 3.5 SP1 ² 100 MB for Agilent IO Libraries Suite 		100 MB
Video	Super VGA (800x600) 256 colors or more	Support for DirectX 9 graphics with 128 MB graphics memory recommended (Super VGA graphics is supported)	Does not require graphics (headless system). X Windows with 1280x1024 recommended for SFP
Browser	Microsoft Internet Explorer 6.0 or higher	Microsoft Internet Explorer 7.0 or higher	Distribution supplied browser.

¹ Note: Because of the installation procedure, less disk space may be required for operation than is required for installation. The amount of space listed above is required for installation.

² Note: .NET Framework Runtime Components are installed by default with Windows Vista. Therefore, you may not need this amount of available disk space.

Hardware Requirements

Since the Agilent Acqiris U10xx Series products include a number of different interface formats (PCI, PCIe and cPCI) please refer to the specific product manual or data sheet for hardware requirements. (see "[Introduction](#)" on page 7)

Installation Procedure

The MD1 software may be installed from either the Agilent MD1 High-Speed Digitizer Software and Product Information CD part number M9210-90007, or by downloading the appropriate Windows or Linux package from the Agilent Technologies website: www.agilent.com/find/embedded, and using the 'Technical Support' tab, select 'Drivers, Firmware & Software' then 'Driver'.

Installation Procedure (Windows)

NOTE Administrator privileges are required for installation of the software.

1. Prior to installing the MD1 software, please ensure that any previous version of the Acqiris software has been fully uninstalled from the PC.
2. Install the MD1 software from the CDROM or downloaded package.
 - a. If the CD does not automatically run when inserted, please click on the '*autorun.exe*' file in the root folder of the CD.

- b. The installation window will open.



- c. Select the option 'U1084A Installation', which will install the software required for your U10xxA series product, without the Agilent IO Libraries Suite which is not required for these products.

The MD1 Software Package provides a specific fundamental driver (*AgMD1Fundamental.dll*), which will be installed in the `C:\Program Files\IVI Foundation\IVI\Bin` folder. In addition, it also provides the driver contained in the previous Acqiris Software Package (*AqDrv4.dll*), allowing backward compatibility with existing software applications.

The Soft Front Panel (SFP), device driver and MD1 LabVIEW driver will be installed in the `C:\Program Files (x86)\Agilent\MD1` folder.

The Acqiris LabVIEW driver, Acqiris MATLAB MEX interface, C++ examples and documentation will be installed in the `C:\Program Files (x86)\Agilent\MD1\U10xx_Digitizers` folder.

Installation Procedure (Linux)

The MD1 Software Package provides a specific fundamental driver (*libAgMD1Fundamental.so*) and a specific IVI-C driver (*libAgMD1.so*), which following the procedure detailed below, will be installed in the `/usr/lib/` folder.

The package also includes the driver which was contained in the previous Acqiris Software Package (*libAqDrv4.so*), allowing backward compatibility with existing software applications.

- Please refer to the detailed installation instructions contained in the 'README' file, which is available from:
 - Within the '`/Linux`' folder of the AgMD1 CDROM (M9210-90007)
 - The driver page of the Agilent Technologies website.
 - Within the downloaded `.tar.gz` archive package.

Step 3: Install the Module

Please refer to the specific product manual for installation instructions. (see "[Introduction](#)" on page 7)

Step 4: Using the Applications

The following section provides information on using the installed Utilities, Demonstration applications and Drivers, both for Windows and Linux environments.

Running the MD1 SFP Application

MD1 SFP is an application which is intended to verify the functionality of the module and to serve as an easy to use and convenient program for capturing, displaying, and archiving captured data.

This program uses the AgMD1 and other associated drivers to control any supported digitizers. It is installed at the same time as those drivers.

Windows

There are currently two versions of the SFP application available under Windows. The SFP 1.x version is gradually being phased out by the introduction of the MD1 SFP (5.x). However at this point in time the SFP 5 application does not fully support all products, modes of operation or features that are supported by the SFP 1.x, and so the user must decide which SFP to use depending on their application.

MD1 SFP (5.x)

Supports all products which are covered by the MD1 driver:

- All Agilent U10xx (8, 10 & 12-bit Digitizers, Time to Digital Converters and Averagers).
- DGS, DGT, SAR/SSR, Peak TDC and AVG modes of operation.

To run the application: *Start > All Programs > Agilent > MD1 > MD1 SFP or MD1 SFP_64*

MD1 SFP 1.x

This application which was previously known as 'AcqirisLive' has one feature which the MD1SFP (5.x) does not; that it supports the acquisition from multiple modules simultaneously. Users who require this feature or prefer this application, may continue to utilize this version.

To run the application: *Start > All Programs > Agilent > MD1 > MD1 SFP 1.x*

Linux

To run the MD1 SFP 5 for Linux, enter the following command: `AgMD1SFP5`

If you receive an error regarding a missing dependency in `libQtXxx.so.4`:

AgMD1SFP5 requires the Qt4 GUI library version 4.5 or higher, to be present on your system. If it is not, please install it using the appropriate package manger for your distribution (apt-get, yum or YaST).

For more information the SFP_Help / User Guide may be accessed from the `Docs/` folder.

Running C/C++, LabVIEW or MATLAB Applications under Windows

Several example programs may be found in the folder:

```
C:\Program Files (x86)\Agilent\MD1\U10xx_Digitizers\C++\Windows\VS2008
```

Existing C/C++ software applications

If you have previously written applications with the Acqiris software, it will be necessary to make some changes to your project to use the new AgMD1Fundamental driver as follows:

1. In the project properties, set the include directory to:
`C:\Program Files (x86)\Agilent\MD1\U10xx_Digitizers\include` (default installation).
2. In the project properties, link to the new library:
`AgMD1Fundamental.lib` (in place of `AqDrv4.lib`)
or,
`AgMD1Fundamental_64.lib` (in place of `AqDrv4_64.lib`)
These libraries are located in:
`C:\Program Files (x86)\Agilent\MD1\U10xx_Digitizers\lib`
3. In your code, include the header file:
`AgMD1Fundamental.h` (in place of `AcqirisImport.h` and `AcqirisDIImport.h`)

You may now compile and run your existing code with the new AgMD1Fundamental driver.

New C/C++ software applications

Simply refer to the information in the Programmers Guide and Programmers Reference documents, and also in the example programs:

- Programmers Reference Manual, U1092-90002
- Programmers Guide, U1092-90003

These manuals will be installed to your computer with the driver package, and may be found from the Windows Start Menu: **Start > All Programs > Agilent > MD1 > Documentation**

LabVIEW applications

Use the Acqiris LabVIEW driver (uses `AqDrv4.dll`) which is provided in the folder:

```
C:\Program Files (x86)\Agilent\MD1\U10xx_Digitizers\LabVIEW
```

MATLAB applications

Use the MATLAB MEX interface which is provided in the folder:

```
C:\Program Files (x86)\Agilent\MD1\U10xx_Digitizers\MATLAB
```

Running C/C++ Applications under Linux

Several example programs may be found in the .tar.gz package file, under the folder:

`/MD1_Software_Linux_X.xx.xx.tar/LinuxMD1-X.xx.xx/U10xx/Examples/`

New C/C++ software applications

Please refer to the programming information contained in the README file, section 6.2.

An example program and makefile is located in: `/usr/share/doc/md1/examples`

Existing C/C++ software applications

If you have previously written applications with the Acqiris software, it will be necessary to make some changes to your project to use the new *AgMDIFundamental* driver as follows:

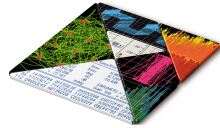
1. In the Makefile, link to the new library:
`-lAgMDIFundamental` (in place of `-lAqDrv4`)
2. In your code, include the header file:
`AgMDIFundamental.h` (in place of `AcqirisImport.h` and `AcqirisDIImport.h`)

You may now compile and run your existing code with the new *AgMDIFundamental* driver.



The Modular Tangram

The four-sided geometric symbol that appears in Agilent modular product literature is called a tangram. The goal of this seven-piece puzzle is to create shapes—from simple to complex. As with a tangram, the possibilities may seem infinite as you begin to create a new test system. With a set of clearly defined elements—hardware, software—Agilent can help you create the system you need, from simple to complex.



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PXI www.pxisa.org

PCI EXPRESS www.pcisig.com

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China	800 810 0189
Hong Kong	800 938 693
India	1 800 112 929
Japan	0120 (421) 345
Korea	080 769 0800
Malaysia	1 800 888 848
Singapore	1 800 375 8100
Taiwan	0800 047 866
Thailand	1 800 226 008

Europe & Middle East

Austria	43 (0) 1 360 277 1571
Belgium	32 (0) 2 404 93 40
Denmark	45 70 13 15 15
Finland	358 (0) 10 855 2100
France	0825 010 700 (0.125 €/minute)
Germany	49 (0) 7031 464 6333
Ireland	1890 924 204
Israel	972 3 9288 504 / 544
Italy	39 02 92 60 8484
Netherlands	31 (0) 20 547 2111
Spain	34 (91) 631 3300
Sweden	0200 88 22 55
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