

Benefits of Drivers

Purpose: Describe benefits of drivers in general and IVI drivers specifically.

Topics:

- Drivers and SCPI
- Structure of IVI specifications
- Specific IVI driver benefits

Comparing Drivers and SCPI

- Programming with SCPI

```
viPrintf(vi, "MEAS:VOLT? %f, %f", range, resolution);  
viScanf(vi, &reading);
```

- Program deals with strings sent to/from the instrument
- Syntax errors caught by instrument when program is run
- Checking for errors requires another sequence to read error
- Simple model that requires no driver install

- Programming with IVI-C

```
Ag34410_MeasureDCVolt(vi, range, resolution, &reading);
```

- Program variables sent directly – no chance for SCPI syntax errors
- Syntax errors caught by compiler or editor
- No performance impact due to string manipulation
- Uses debug tools and techniques the programmers knows

What are IVI Drivers – Really??

- Architecture specifications
- Instrument class specifications
- A library of shared software components

4.1 Scope	4.2 DMM	4.3 FGen	4.4 DCPwr	4.5 ACPwr	4.6 Switch	4.7 PwrMeter	4.8 SpecAn	4.10RFSigGen	4.12 Counter	4.13DownCnv	4.14 UpConv	4.15Digitizer
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13 specs @ ~220 pages

<p>Architecture Specifications 3.1,3.2,3.3,3.4,3.5,3.6,3.9,3.10,3.12,3.17,3.18</p>
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~1140 pages of specs

The IVI Architectures

IVI Provides: C, COM, and .NET

- C dll for environments that use DLLs
- COM Components for COM and .NET ADEs
- .NET Assemblies for .NET ADEs

Architectures make use of same class definition

Architectures have specific rules for installation, style, etc.

Details in next section



IVI Shared Components

IVI Provides several common components to enable multi-vendor systems (more information in the final section)

- C Shared Components
- Floating Point Services
- IVI-COM Session Factory
- Configuration Server
- COM Type Libraries
- .NET PIAs
- .NET Shared Components



What is IVI Compliant -Really??

IVI Compliant

- Common behavior model
- Support for IVI Features
 - Simulation, IO, doc,
- Standard install
- Common API for common tasks
 - ~40 common functions
 - Simulation, Caching, Open, Close, Initialize, SW Trigger, Status check, Version
- Consistent API
 - Common organization, data types, naming

Class Compliant

- Instrument Class API
- Custom API still available
 - Especially for capabilities beyond the class
- Simplifies exchanging instruments

Why IVI? – Simpler to use

Uniform way of doing common tasks

- Instantiation, initialization, shutdown
- Controlling driver features – state caching, error query, simulation, etc.
- Configuration and installation
 - Fixed locations for binaries, source, headers, documentation, examples
 - Proper registry entries always made
 - Common protocol to open/close (standard I/O address is a big benefit)
 - Consistent solution for managing driver versions
- Standard mechanism for handling multi-channel devices
 - aka repeated capabilities in IVI parlance
- Standard error reporting

Why? – Common Features

Key Capabilities that simplify program development

- Syntactic Interchangeability
- Simulation
- Fine grained control through properties
- Usable in many ADEs
- Documentation of SCPI commands used by function
- DirectIO (drivers provide access to SCPI)
- Attributes for all parameters (fine grained control)
- Buildable source for message based instruments (SCPI)
- Tested using a IVI-defined process

Why IVI? – One Driver for any ADE

- IVI Drivers (C/COM/.NET) provide a first class experience in *nearly any ADE*
 - Visual Basic 6
 - Visual C++
 - Visual C# and Visual Basic.NET
 - VBA (Excel, Word, PowerPoint)
 - LabVIEW
 - LabWindows/CVI
 - MATLAB
 - Agilent VEE





IVI Registration Page

- IVI maintains a registration database
- IVI requires that drivers claiming compliance be registered
- For users:
 - List of drivers, supported instruments
 - Mechanism to address defects

Register New Drivers

Driver Registry

This page lists the drivers registered with the IVI Foundation. Information in this list is updated automatically; for concerns or corrections, contact the IVI Foundation.

[RSS](#) [Register New Drivers](#)

Manufacturer	Instrument Class	Supported Models	Driver Vendor	Driver Type
Acery Technologies	Custom	LM1413A	Acery Technologies	IVI-COM
Acery Technologies	Custom	LM4445Y	Acery Technologies	IVI-COM
Advantest	IviDmm	R6552, R6552T, R6552T-R	National Instruments	IVI-C
Agilent Technologies	IviDmm	34401A, 34410A, 34411A, E1412A, L4411A	National Instruments	IVI-C
Agilent Technologies	IviDmm	34420A	National Instruments	IVI-C
Agilent Technologies	IviDmm	3458A	National Instruments	IVI-C
Agilent Technologies	IviDmm	E1410A	National Instruments	IVI-C
Agilent Technologies	IviDmm	E1411B	National Instruments	IVI-C
Agilent Technologies	IviFgen	3325B	National Instruments	IVI-C
Agilent Technologies	IviFgen	33120A, 33210A, 33220A, 33250A, E1441A	National Instruments	IVI-C
		E4420B, E4420B, E4421B, E4421B, E4423B, E4423B, E4424B, E4424B, E4425B, E4426B,		