Agilent Acqiris Instruments

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WARNING

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Foreword

Instrumentation firmware is thoroughly tested and thought to be functional but it is supplied “as is” with no warranty for specified performance. No responsibility is assumed for the use or the reliability of software, firmware or any equipment that is not supplied by Agilent or its affiliated companies.

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Introduction

Message to the User

Congratulations on having purchased an Agilent Technologies Acqiris data conversion product. Acqiris Digitizers, rs, Analyzers are high-speed data acquisition modules designed for capturing high frequency electronic signals. To get the most out of the products we recommend that you read the accompanying product User Manual, the Programmer's Guide and this Programmer’s Reference Manual carefully. We trust that the product you have purchased as well as the accompanying software will meet with your expectations and provide you with a high quality solution to your data conversion applications.

Using this Manual

This guide assumes you are familiar with the operation of a personal computer (PC) running a Windows 2000/XP/Vista/7 (32/64) or other supported operating system. In addition you ought to be familiar with the fundamentals of the programming environment that you will be using to control your Acqiris product. It also assumes you have a basic understanding of the principles of data acquisition using either, a waveform digitizer, a digital oscilloscope, or other similar instrument.

This Programmer’s Reference manual is divided into 2 sections.

Chapter 1	“Introduction", describes what can be found where in the documentation and how to use it.
Chapter 2	“Device Driver Function Reference", contains a full device driver function reference. This documents the traditional Application Program Interface (API) as it can be used in the following environments: LabVIEW, MATLAB MEX, Visual C++.

Conventions Used in This Manual

The following conventions are used in this manual:

NOTE

Denotes a note, which alerts you to important information.

Italic text denotes a warning, caution, or note.

Bold Italic text is used to emphasize an important point in the text or a note

mono text is used for sections of code, programming examples and operating system commands.

Certain features are common to several different modules. For increased readability we have defined the following families:

DC271-FAMILY	DC135/DC140/DC211/DC211A/DC241/DC241A/ DC271/DC271A/DC271AR/DP214/DP235/DP240
AP-FAMILY	AP240/AP235/AP100/AP101/AP200/AP201
12-bit-FAMILY	DC440/DC438/DC436/DP310/DP308/DP306
10-bit-FAMILY	DC122/DC152/DC222/DC252/DC282
U1071A-FAMILY	all U1071A variants, DP1400, U1091AD28

Warning Regarding Medical Use

The Agilent Acqiris cards are not designed with components and testing procedures that would ensure a level of reliability suitable for use in treatment and diagnosis of humans. Applications of these cards involving medical or clinical treatment can create a potential for accidental injury caused by product failure, or by errors on the part of the user. These cards are ***not*** intended to be a substitute for any form of established process or equipment used to monitor or safeguard human health and safety in medical treatment.

WARNING

The modules discussed in this manual have not been designed for making direct measurements on the human body. Users who connect an Agilent module to a human body do so at their own risk.

2
Device Driver Function Reference

All function calls require the argument instrumentID in order to identify the Acqiris Instrument to which the call is directed. The only exceptions are the initialization/termination functions:

Acqrs_calibrate **Acqrs_calibrateEx** **Acqrs_close**
Acqrs_closeAll **Acqrs_getNbrInstruments** **Acqrs_init**
Acqrs_InitWithOptions **Acqrs_setSimulationOptions**
AcqrsD1_multiInstrAutoDefine **AcqrsD1_multiInstrUndefineAll**

The functions **Acqrs_init**, **Acqrs_InitWithOptions**, **AcqrsD1_multiInstrDefine**, actually return instrument identifiers at initialization time, for subsequent use in the other function calls.

Status values and Error codes

All function calls return a status value of type **ViStatus** with information about the success or failure of the call. All Acqiris specific values can be found in the header file AcqirisErrorCodes.h and are shown in **Table 2-1**. The generic ones, defined by the VXIplug&play Systems Alliance, are listed in the header file **vpptype.h** (VXIplug&play instrument driver header file, which includes **visatype.h**: fundamental VISA data types and macro definitions). They are reproduced in **Table 2-2** for convenience. The header file **AgMD1FundamentalErrorCodes.h** shows the common error codes associated with each function.

Acqiris Error Codes	Hex value	Decimal value
ACQIRIS_ERROR_FILE_NOT_FOUND	BFFA4800	-1074116608
ACQIRIS_ERROR_PATH_NOT_FOUND	BFFA4801	-1074116607
ACQIRIS_ERROR_INVALID_HANDLE	BFFA4803	-1074116605
ACQIRIS_ERROR_NOT_SUPPORTED	BFFA4805	-1074116603
ACQIRIS_ERROR_INVALID_WINDOWS_PARAM	BFFA4806	-1074116602
ACQIRIS_ERROR_NO_DATA	BFFA4807	-1074116601
ACQIRIS_ERROR_NO_ACCESS	BFFA4808	-1074116600
ACQIRIS_ERROR_BUFFER_OVERFLOW	BFFA4809	-1074116599
ACQIRIS_ERROR_BUFFER_NOT_64BITS_ALIGNED	BFFA480A	-1074116598
ACQIRIS_ERROR_BUFFER_NOT_32BITS_ALIGNED	BFFA480B	-1074116597
ACQIRIS_ERROR_CAL_FILE_CORRUPTED	BFFA480C	-1074116596
ACQIRIS_ERROR_CAL_FILE_VERSION	BFFA480D	-1074116595
ACQIRIS_ERROR_CAL_FILE_SERIAL	BFFA480E	-1074116594
ACQIRIS_ERROR_ALREADY_OPEN	BFFA4840	-1074116544
ACQIRIS_ERROR_SETUP_NOT_AVAILABLE	BFFA4880	-1074116480
ACQIRIS_ERROR_IO_WRITE	BFFA48A0	-1074116448
ACQIRIS_ERROR_IO_READ	BFFA48A1	-1074116447
ACQIRIS_ERROR_IO_DEVICE_OFF	BFFA48A2	-1074116446
ACQIRIS_ERROR_IO_VME_CONFIG	BFFA48A3	-1074116445

Table 2-1

ACQIRIS_ERROR_IO_VME_ACCESS	BFFA48A4	-1074116444
ACQIRIS_ERROR_INTERNAL_DEVICENO_INVALID	BFFA48C0	-1074116416
ACQIRIS_ERROR_TOO_MANY_DEVICES	BFFA48C1	-1074116415
ACQIRIS_ERROR_EEPROM_DATA_INVALID	BFFA48C2	-1074116414
ACQIRIS_ERROR_INIT_STRING_INVALID	BFFA48C3	-1074116413
ACQIRIS_ERROR_INSTRUMENT_NOT_FOUND	BFFA48C4	-1074116412
ACQIRIS_ERROR_INSTRUMENT_RUNNING	BFFA48C5	-1074116411
ACQIRIS_ERROR_INSTRUMENT_STOPPED	BFFA48C6	-1074116410
ACQIRIS_ERROR_MODULES_NOT_ON_SAME_BUS	BFFA48C7	-1074116409
ACQIRIS_ERROR_NOT_ENOUGH_DEVICES	BFFA48C8	-1074116408
ACQIRIS_ERROR_NO_MASTER_DEVICE	BFFA48C9	-1074116407
ACQIRIS_ERROR_PARAM_STRING_INVALID	BFFA48CA	-1074116406
ACQIRIS_ERROR_COULD_NOT_CALIBRATE	BFFA48CB	-1074116405
ACQIRIS_ERROR_CANNOT_READ_THIS_CHANNEL	BFFA48CC	-1074116404
ACQIRIS_ERROR_PRETRIGGER_STILL_RUNNING	BFFA48CD	-1074116403
ACQIRIS_ERROR_CALIBRATION_FAILED	BFFA48CE	-1074116402
ACQIRIS_ERROR_MODULES_NOT_CONTIGUOUS	BFFA48CF	-1074116401
ACQIRIS_ERROR_INSTRUMENT_ACQ_LOCKED	BFFA48D0	-1074116400
ACQIRIS_ERROR_INSTRUMENT_ACQ_NOT_LOCKED	BFFA48D1	-1074116399
ACQIRIS_ERROR_EEPROM2_DATA_INVALID	BFFA48D2	-1074116398
ACQIRIS_ERROR_INSTRUMENT_IN_USE	BFFA48D3	-1074116397
ACQIRIS_ERROR_MEZZIO_IN_USE	BFFA48D4	-1074116396
ACQIRIS_ERROR_MEZZIO_ACQ_TIMEOUT	BFFA48D5	-1074116395
ACQIRIS_ERROR_DEVICE_ALREADY_OPEN	BFFA48D6	-1074116394
ACQIRIS_ERROR_EEPROM_CRC_FAILED	BFFA48D7	-1074116393
ACQIRIS_ERROR_INVALID_GEOMAP_FILE	BFFA48E0	-1074116384
ACQIRIS_ERROR_ACQ_TIMEOUT	BFFA4900	-1074116352
ACQIRIS_ERROR_OVERLOAD	BFFA4901	-1074116351
ACQIRIS_ERROR_PROC_TIMEOUT	BFFA4902	-1074116350
ACQIRIS_ERROR_LOAD_TIMEOUT	BFFA4903	-1074116349
ACQIRIS_ERROR_READ_TIMEOUT	BFFA4904	-1074116348
ACQIRIS_ERROR_INTERRUPTED	BFFA4905	-1074116347
ACQIRIS_ERROR_WAIT_TIMEOUT	BFFA4906	-1074116346
ACQIRIS_ERROR_CLOCK_SOURCE	BFFA4907	-1074116345
ACQIRIS_ERROR_OPERATION_CANCELLED	BFFA4908	-1074116344
ACQIRIS_ERROR_FIRMWARE_NOT_AUTHORIZED	BFFA4A00	-1074116096
ACQIRIS_ERROR_FPGA_1_LOAD	BFFA4A01	-1074116095
ACQIRIS_ERROR_FPGA_2_LOAD	BFFA4A02	-1074116094
ACQIRIS_ERROR_FPGA_3_LOAD	BFFA4A03	-1074116093
ACQIRIS_ERROR_FPGA_4_LOAD	BFFA4A04	-1074116092
ACQIRIS_ERROR_FPGA_5_LOAD	BFFA4A05	-1074116091
ACQIRIS_ERROR_FPGA_6_LOAD	BFFA4A06	-1074116090
ACQIRIS_ERROR_FPGA_7_LOAD	BFFA4A07	-1074116089
ACQIRIS_ERROR_FPGA_8_LOAD	BFFA4A08	-1074116088
ACQIRIS_ERROR_FIRMWARE_NOT_SUPPORTED	BFFA4A09	-1074116087
ACQIRIS_ERROR_FPGA_1_FLASHLOAD_NO_INIT	BFFA4A10	-1074116080
ACQIRIS_ERROR_FPGA_1_FLASHLOAD_NO_DONE	BFFA4A11	-1074116079
ACQIRIS_ERROR_FPGA_2_FLASHLOAD_NO_INIT	BFFA4A12	-1074116078
ACQIRIS_ERROR_FPGA_2_FLASHLOAD_NO_DONE	BFFA4A13	-1074116077
ACQIRIS_ERROR_SELFCHECK_MEMORY	BFFA4A20	-1074116064
ACQIRIS_ERROR_SELFCHECK_DAC	BFFA4A21	-1074116063

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ACQIRIS_ERROR_SELFCHECK_RAMP	BFFA4A22	-1074116062
ACQIRIS_ERROR_SELFCHECK_PCIE_LINK	BFFA4A23	-1074116061
ACQIRIS_ERROR_SELFCHECK_PCIE_DEVICE	BFFA4A24	-1074116060
ACQIRIS_ERROR_FLASH_ACCESS_TIMEOUT	BFFA4A30	-1074116048
ACQIRIS_ERROR_FLASH_FAILURE	BFFA4A31	-1074116047
ACQIRIS_ERROR_FLASH_READ	BFFA4A32	-1074116046
ACQIRIS_ERROR_FLASH_WRITE	BFFA4A33	-1074116045
ACQIRIS_ERROR_FLASH_EMPTY	BFFA4A34	-1074116044
ACQIRIS_ERROR_ATTR_NOT_FOUND	BFFA4B00	-1074115840
ACQIRIS_ERROR_ATTR_WRONG_TYPE	BFFA4B01	-1074115839
ACQIRIS_ERROR_ATTR_IS_READ_ONLY	BFFA4B02	-1074115838
ACQIRIS_ERROR_ATTR_IS_WRITE_ONLY	BFFA4B03	-1074115837
ACQIRIS_ERROR_ATTR_ALREADY_DEFINED	BFFA4B04	-1074115836
ACQIRIS_ERROR_ATTR_IS_LOCKED	BFFA4B05	-1074115835
ACQIRIS_ERROR_ATTR_INVALID_VALUE	BFFA4B06	-1074115834
ACQIRIS_ERROR_ATTR_CALLBACK_STATUS	BFFA4B07	-1074115833
ACQIRIS_ERROR_ATTR_CALLBACK_EXCEPTION	BFFA4B08	-1074115832
ACQIRIS_ERROR_KERNEL_VERSION	BFFA4C00	-1074115584
ACQIRIS_ERROR_UNKNOWN_ERROR	BFFA4C01	-1074115583
ACQIRIS_ERROR_OTHER_WINDOWS_ERROR	BFFA4C02	-1074115582
ACQIRIS_ERROR_VISA_DLL_NOT_FOUND	BFFA4C03	-1074115581
ACQIRIS_ERROR_OUT_OF_MEMORY	BFFA4C04	-1074115580
ACQIRIS_ERROR_UNSUPPORTED_DEVICE	BFFA4C05	-1074115579
ACQIRIS_ERROR_PARAMETER9	BFFA4D09	-1074115319
ACQIRIS_ERROR_PARAMETER10	BFFA4D0A	-1074115318
ACQIRIS_ERROR_PARAMETER11	BFFA4D0B	-1074115317
ACQIRIS_ERROR_PARAMETER12	BFFA4D0C	-1074115316
ACQIRIS_ERROR_PARAMETER13	BFFA4D0D	-1074115315
ACQIRIS_ERROR_PARAMETER14	BFFA4D0E	-1074115314
ACQIRIS_ERROR_PARAMETER15	BFFA4D0F	-1074115313
ACQIRIS_ERROR_NBR_SEG	BFFA4D10	-1074115312
ACQIRIS_ERROR_NBR_SAMPLE	BFFA4D11	-1074115311
ACQIRIS_ERROR_DATA_ARRAY	BFFA4D12	-1074115310
ACQIRIS_ERROR_SEG_DESC_ARRAY	BFFA4D13	-1074115309
ACQIRIS_ERROR_FIRST_SEG	BFFA4D14	-1074115308
ACQIRIS_ERROR_SEG_OFF	BFFA4D15	-1074115307
ACQIRIS_ERROR_FIRST_SAMPLE	BFFA4D16	-1074115306
ACQIRIS_ERROR_DATATYPE	BFFA4D17	-1074115305
ACQIRIS_ERROR_READMODE	BFFA4D18	-1074115304
ACQIRIS_ERROR_VM_FILE_EXTENSION	BFFA4D50	-1074115248
ACQIRIS_ERROR_VM_FILE_VERSION	BFFA4D51	-1074115247
ACQIRIS_ERROR_VM_FILE_READ	BFFA4D52	-1074115246
ACQIRIS_ERROR_VM_FILE_INVALID	BFFA4D53	-1074115245
ACQIRIS_ERROR_VM_VERIFICATION	BFFA4D54	-1074115244
ACQIRIS_ERROR_VM_CRC	BFFA4D55	-1074115243
ACQIRIS_ERROR_HW_FAILURE	BFFA4D80	-1074115200
ACQIRIS_ERROR_HW_FAILURE_CH1	BFFA4D81	-1074115199
ACQIRIS_ERROR_HW_FAILURE_CH2	BFFA4D82	-1074115198
ACQIRIS_ERROR_HW_FAILURE_CH3	BFFA4D83	-1074115197
ACQIRIS_ERROR_HW_FAILURE_CH4	BFFA4D84	-1074115196
ACQIRIS_ERROR_HW_FAILURE_CH5	BFFA4D85	-1074115195

Table 2-1

ACQIRIS_ERROR_HW_FAILURE_CH6	BFFA4D86	-1074115194
ACQIRIS_ERROR_HW_FAILURE_CH7	BFFA4D87	-1074115193
ACQIRIS_ERROR_HW_FAILURE_CH8	BFFA4D88	-1074115192
ACQIRIS_ERROR_HW_FAILURE_EXT1	BFFA4DA0	-1074115168
ACQIRIS_ERROR_MAC_T0_ADJUSTMENT	BFFA4DC0	-1074115136
ACQIRIS_ERROR_MAC_ADC_ADJUSTMENT	BFFA4DC1	-1074115135
ACQIRIS_ERROR_MAC_RESYNC_ADJUSTMENT	BFFA4DC2	-1074115134
ACQIRIS_WARN_SETUP_ADAPTED	3FFA4E00	1073368576
ACQIRIS_WARN_READPARA_NBRSEG_ADAPTED	3FFA4E10	1073368592
ACQIRIS_WARN_READPARA_NBRSAMP_ADAPTED	3FFA4E11	1073368593
ACQIRIS_WARN_NOT_CALIBRATED	3FFA4E12	1073368594
ACQIRIS_WARN_ACTUAL_DATASIZE_ADAPTED	3FFA4E13	1073368595
ACQIRIS_WARN_UNEXPECTED_TRIGGER	3FFA4E14	1073368596
ACQIRIS_WARN_READPARA_FLAGS_ADAPTED	3FFA4E15	1073368597
ACQIRIS_WARN_SIMOPTION_STRING_UNKNOWN	3FFA4E16	1073368598
ACQIRIS_WARN_INSTRUMENT_IN_USE	3FFA4E17	1073368597
ACQIRIS_WARN_HARDWARE_TIMEOUT	3FFA4E60	1073368672
ACQIRIS_WARN_RESET_IGNORED	3FFA4E61	1073368671
ACQIRIS_WARN_SELFCHECK_MEMORY	3FFA4F00	1073368832
ACQIRIS_WARN_CLOCK_SOURCE	3FFA4F01	1073368833
ACQIRIS_WARN_NUMERIC_OVERFLOW	3FFA4F20	1073368864

Table 2-1

Error code	Hex value	Decimal value
VI_SUCCESS	0	0
VI_ERROR_PARAMETER1	BFFC0001	-1074003967
VI_ERROR_PARAMETER2	BFFC0002	-1074003966
VI_ERROR_PARAMETER3	BFFC0003	-1074003965
VI_ERROR_PARAMETER4	BFFC0004	-1074003964
VI_ERROR_PARAMETER5	BFFC0005	-1074003963
VI_ERROR_PARAMETER6	BFFC0006	-1074003962
VI_ERROR_PARAMETER7	BFFC0007	-1074003961
VI_ERROR_PARAMETER8	BFFC0008	-1074003960
VI_ERROR_FAIL_ID_QUERY	BFFC0011	-1074003951
VI_ERROR_INV_RESPONSE	BFFC0012	-1074003950

Table 2-2

If important parameters supplied by the user (e.g. an **instrumentID**) are found to be invalid, most functions do not execute and return an error code of the type **VI_ERROR_PARAMETERi**, where i = 1, 2,... corresponds to the argument number.

If the user attempts (with a function **AcqrsD1_configXXXX**) to set a digitizer parameter to a value outside of its acceptable range, the function typically adapts the parameter to the closest allowed value and returns **ACQIRIS_WARN_SETUP_ADAPTED**. The digitizer parameters that are actually in use can be retrieved with the query functions **AcqrsD1_getXXXX**.

Data are always returned through pointers to user-allocated variables or arrays.

Some parameters are labeled "Currently ignored". It is recommended to supply the value "0" (ViInt32) or "0.0" (ViReal64) in order to be compatible with future products that may offer additional functionality.

API Function classification

The API has been split into two families:

- Acqrs Generic functions - AqBx - these can be used for all Acqiris Instruments
- AcqrsD1 Digitizer functions - AqDx - to be used for Digitizers and Analyzers

All of these functions are still contained in one library called **AgMD1Fundamental**. The LabView interface is also split into the two corresponding AqXX parts.

AgMD1Fundamental.h functions

	Function Name
Generic Initialization Functions	
Number of Physical Instruments	Acqrs_getNbrInstruments
Initialization	Acqrs_init
Initialization with Options	Acqrs_InitWithOptions
Simulation Options	Acqrs_setSimulationOptions
Generic Calibration Functions	
Calibrate Instrument	Acqrs_calibrate
Calibrate Instrument Extended	Acqrs_calibrateEx
Interrupt Calibration	Acqrs_calibrateCancel
Load calibration values from a file	Acqrs_calLoad
Query about the necessity of self calibration	Acqrs_calRequired
Save all calibration values in a file	Acqrs_calSave
Generic Query Functions	
Instrument Basic Data	Acqrs_getInstrumentData
Instrument Information	Acqrs_getInstrumentInfo
Number of Channels	Acqrs_getNbrChannels
Generic Utility Functions	
Version	Acqrs_getVersion
Error Message	Acqrs_errorMessage
Reset	Acqrs_reset
Set LED Color	Acqrs_setLEDColor
Close an instrument	Acqrs_close
Close all instruments	Acqrs_closeAll
Resume the control of an instrument that was suspended	Acqrs_resumeControl
Suspend control of an instrument	Acqrs_suspendControl
Prepare for entry or return from the system power down state	Acqrs_powerSystem

Digitizer Initialization Functions	*Function Name*
Number of Physical Instruments (deprec.)	AcqrsD1_getNbrPhysicalInstruments
MultiInstrument Auto Define	AcqrsD1_multiInstrAutoDefine
Initialization (deprec.)	AcqrsD1_init
Initialization with Options (deprec.)	AcqrsD1_InitWithOptions
Simulation Options (deprec.)	AcqrsD1_setSimulationOptions
Digitizer Calibration Functions	
Calibrate Instrument (deprec.)	AcqrsD1_calibrate
Calibrate Instrument Extended (deprec.)	AcqrsD1_calibrateEx
Digitizer Configuration Functions	
Configure Vertical Settings	AcqrsD1_configVertical
Configure Horizontal Settings	AcqrsD1_configHorizontal
Configure Channel Combination	AcqrsD1_configChannelCombination
Configure Trigger Class	AcqrsD1_configTrigClass
Configure Trigger Source	AcqrsD1_configTrigSource
Configure Trigger TV	AcqrsD1_configTrigTV
Configure Memory Settings	AcqrsD1_configMemory
Configure Memory Settings (extended)	AcqrsD1_configMemoryEx
Configure External Clock	AcqrsD1_configExtClock
Configure Digitizer Mode	AcqrsD1_configMode
Configure Multiplexer Input	AcqrsD1_configMultiInput
Configure Control IO	AcqrsD1_configControlIO
Configure Frequency Counter	AcqrsD1_configFCounter
Configure Averager Configuration Attribute	AcqrsD1_configAvgConfig
	AcqrsD1_configAvgConfigInt32
	AcqrsD1_configAvgConfigReal64
Configure (program) on-board FPGA (deprec.)	AcqrsD1_configLogicDevice
Configure Array of Setup Parameters	AcqrsD1_configSetupArray
Logical Device IO	AcqrsD1_logicDeviceIO
MultiInstrument Manual Define	AcqrsD1_multiInstrDefine
MultiInstrument Undefine	AcqrsD1_multiInstrUndefineAll
Setup Streaming in SC Analyzer	AcqrsD1_setAttributeString
Digitizer Acquisition Control Functions	
Start Acquisition	AcqrsD1_acquire
Start Acquisition (Extended)	AcqrsD1_acquireEx
Query Acquisition Status	AcqrsD1_acqDone
Software Trigger	AcqrsD1_forceTrig
Software Trigger (Extended)	AcqrsD1_forceTrigEx
Stop Acquisition	AcqrsD1_stopAcquisition
Wait for End of Acquisition	AcqrsD1_waitForEndOfAcquisition
Number of Acquired Segments	AcqrsD1_reportNbrAcquiredSegments
Digitizer Data Transfer Functions	
Universal Waveform Read	AcqrsD1_readData
ulate Data	AcqrsD1_ulateData
Averaged Data	AcqrsD1_averagedData
Read Frequency Counter	AcqrsD1_readFCounter

Digitizer Query Functions	*Function Name*
Query External Clock	AcqrsD1_getExtClock
Query Horizontal Settings	AcqrsD1_getHorizontal
Query Channel Combination	AcqrsD1_getChannelCombination
Query Memory Settings	AcqrsD1_getMemory
Query Memory Settings (extended)	AcqrsD1_getMemoryEx
Query Multiplexer Input	AcqrsD1_getMultiInput
Query Trigger Class	AcqrsD1_getTrigClass
Query Trigger Source	AcqrsD1_getTrigSource
Query Trigger TV	AcqrsD1_getTrigTV
Query Vertical Settings	AcqrsD1_getVertical
Query Digitizer Mode	AcqrsD1_getMode
Query Control IO	AcqrsD1_getControlIO
Query Frequency Counter	AcqrsD1_getFCounter
Query Averager Configuration	AcqrsD1_getAvgConfig
	AcqrsD1_getAvgConfigInt32
	AcqrsD1_getAvgConfigReal64
Instrument Basic Data (deprec.)	AcqrsD1_getInstrumentData
Instrument Information (deprec.)	AcqrsD1_getInstrumentInfo
Number of Channels	AcqrsD1_getNbrChannels
Query Array of Setup Parameters	AcqrsD1_getSetupArray
Digitizer Control Functions	
Query (on-board) Processing Status	AcqrsD1_procDone
Start (on-board) Processing	AcqrsD1_processData
Stop (on-board) Processing	AcqrsD1_stopProcessing
Wait for End of (on-board) Processing	AcqrsD1_waitForEndOfProcessing
Digitizer Utility Functions	
Best Nominal Samples	AcqrsD1_bestNominalSamples
Best Sampling Interval	AcqrsD1_bestSampInterval
Version	AcqrsD1_getVersion
Error Message	AcqrsD1_errorMessage
Extended Error Message	AcqrsD1_errorMessageEx
Reset (deprec.)	AcqrsD1_reset
Reset Digitizer Memory	AcqrsD1_resetDigitizerMemory
Restore Internal Registers	AcqrsD1_restoreInternalRegisters
Set LED Color	AcqrsD1_setLEDColor
Close all instruments (deprec.)	AcqrsD1_closeAll

API Function descriptions

This section describes each function in the Device Driver. The functions appear in alphabetical order.

Acqrs_calibrate

Purpose

Performs an auto-calibration of the instrument.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

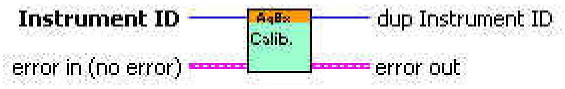
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

ViStatus status = Acqrs_calibrate(ViSession instrumentID);

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Calibrate Instrument.vi



MATLAB MEX Representation

[status]= Aq_calibrate(instrumentID)

Acqrs_calibrateCancel

Purpose

Interrupts a calibration of the instrument launched from a different thread.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

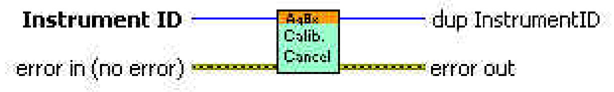
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

ViStatus status = Acqrs_calibrateCancel(ViSession instrumentID);

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Calibrate Cancel.vi



MATLAB MEX Representation

[status]= Aq_calibrateCancel(instrumentID)

Acqrs_calibrateEx

Purpose

Performs a (partial) auto-calibration of the instrument.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
calType	ViInt32	= 0 calibrate the entire instrument. = 1 calibrate only the current channel configuration. = 2 calibrate external clock timing. Requires operation in External Clock (Continuous). = 3 calibrate only at the current frequency (12-bit-FAMILY, only) = 4 fast calibration for current settings only
modifier	ViInt32	For calType = 0,1, or 2: Currently unused, set to “0” For calType = 3 or 4, 0 = calibrate for all channels n = calibrate for channel "n"
flags	ViInt32	Currently unused, set to “0”

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

Calling this function with **calType** = 0 is equivalent to calling **Acqrs_calibrate**.

Calibrating with **calType** = 1 reduces the calibration time in digitizers with many possible channel combinations, e.g. the DC271. However, the user must keep track of which channel combinations were calibrated, and request another such partial calibration when changing the channel configuration with the function **AcqrsD1_configChannelCombination**. This task can be facilitated by using **Acqrs_calRequired**.

Calibrating with **calType** = 2 can only be done if the external input frequency is appropriately high. See the discussion in the **Programmer's Guide** section 3.16.2, **External Clock (Continuous)**. If the calibration cannot be done an error code will be returned. It is not applicable for AP240 Signal Analyzer Platforms.

Calibrating with **calType** = 3 is for 12-bit digitizers only and is needed to support the HRes SR functionality. For best results it, or the longer full calibration, should be called after a change of sampling rate.

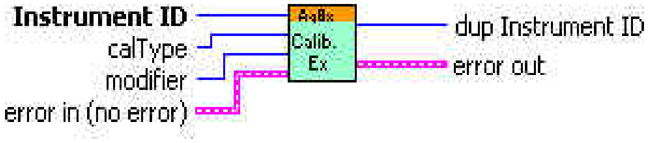
Calibrating with **calType** = 4 can be used for all but the 12-bit-FAMILY models. A new calibration should be done if the **AcqrsD1_ configChannelCombination** parameters or any of the following **AcqrsD1_configVertical** parameters are changed: fullScale, coupling (impedance), bandwidth, channel. This calibration will be much faster than the calType = 0 case for models with more than one impedance setting. It will use the new values that have been asked for.

Visual C++ Representation

```
ViStatus status = Acqrs_calibrate(ViSession instrumentID,
                  ViInt32 calType, ViInt32 modifier, ViInt32 flags);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) CalibrateEx Instrument.vi



MATLAB MEX Representation

```
[status]= Aq_calibrateEx(instrumentID, calType, modifier, flags)
```

Acqrs_calLoad

Purpose

Load calibration values from file. (For all but 12-bit-FAMILY modules).

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
filePathName	ViConstString	File path and file name
flags	ViInt32	Flags, may be: 0 = default filename. Calibration values will be loaded from the 'snXXXXX_calVal.bin' file in the working directory. 'filePathName' MUST be NULL or "" (empty String). 1 = specify path only. Calibration values will be loaded from the 'snXXXXX_calVal.bin' file in the specified directory. 'filePathName' MUST be non-NULL. 2 = specify filename. 'filePathName' represents the filename (with or without path) and MUST be non-NULL and non-empty.

Return Value

Name	Type	Description
status	ViStatus	Refer to Table 2-1 for error codes.

Discussion

Load calibration values from a binary file. The path or full filename can be specified, else default values will be used ('snXXXXX_calVal.bin' file in the working directory).

The function can return the following error codes:

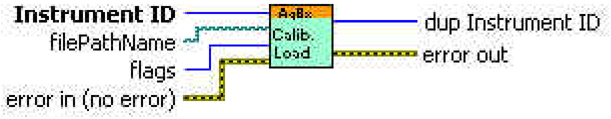
- **ACQIRIS_ERROR_FILE_CORRUPTED** if the file is corrupted
- **ACQIRIS_ERROR_FILE_VERSION** if the file has been generated with a driver version different than the used one (major and minor).
- **ACQIRIS_ERROR_FILE_SERIAL** if the file does not correspond to the instrument or an AS bus multi-instrument has changed.

Visual C++ Representation

```
ViStatus status = Acqrs_calLoad(ViSession instrumentID,
                    ViConstString filePathName, ViInt32 flags);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Calibration Load Instrument.vi



MATLAB MEX Representation

```
[status]= Aq_calLoad(instrumentID, filePathName, flags)
```

Acqrs_calRequired

Purpose

Check if a self calibration is needed. (For all but 12-bit-FAMILY modules).

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	Channel number [0,1... Nchan]

Output

Name	Type	Description
isRequiredP	ViBoolean	= VI_TRUE if a calibration on channel *chan* is needed VI_FALSE otherwise

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

Query about the necessity of self calibration.

The value *channel* = *0* can be used to do the query on all channels simultaneously.

A calibration is needed for channel, *channel* > *0*, if one or more of the 3 following condition is true:

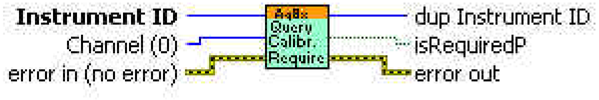
- The channel *channel* of the instrument has never been calibrated for the desired acquisition conditions.
- It has been calibrated more than 2 hours ago.
- The instrument temperature since the last calibration has changed by more than 5°C.

Visual C++ Representation

```
ViStatus status = Acqrs_calRequired(ViSession instrumentID, ViInt32 channel,
                    ViBoolean* isRequiredP);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Query Calibration Required.vi



MATLAB MEX Representation

```
[status isRequired] = Aq_calRequired(instrumentID, channel)
```

Acqrs_calSave

Purpose

Save all calibration values in a binary file. (For all but 12-bit-FAMILY modules).

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
filePathName	ViConstString	File path and file name
flags	ViInt32	Flags, may be: 0 = default filename. Calibration values will be loaded from the 'snXXXXX_calVal.bin' file in the working directory. 'filePathName' MUST be NULL or "" (empty String). 1 = specify path only. Calibration values will be loaded from the 'snXXXXX_calVal.bin' file in the specified directory. 'filePathName' MUST be non-NULL. 2 = specify filename. 'filePathName' represents the filename (with or without path) and MUST be non-NULL and non-empty.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

Write calibration values in a binary file. The path or full filename can be specified, else default values will be used ('snXXXXX_calVal.bin' file in the working directory).

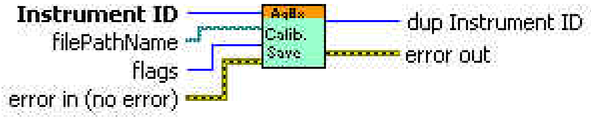
NOTE: If the file already exists, it will be overwritten.

Visual C++ Representation

```
ViStatus status = Acqrs_calSave(ViSession instrumentID,
                  ViConstString filePathName, ViInt32 flags);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Calibration Save.vi



MATLAB MEX Representation

```
[status]= Aq_calSave(instrumentID, filePathName, flags)
```

Acqrs_close

Purpose

Closes an instrument.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

Close the specified instrument. Once closed, this instrument is not available anymore and needs to be reenabled using Acqrs_InitWithOptions or Acqrs_init. 10-bit-FAMILY digitizers will have their power consumption lowered. Appropriate warm-up time may be needed when they are used again.

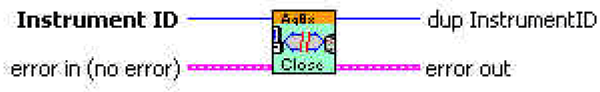
For freeing properly all resources, Acqrs_closeAll must still be called when the application closes, even if Acqrs_close was called for each instrument.

Visual C++ Representation

ViStatus status = Acqrs_close(ViSession instrumentID);

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Close.vi



MATLAB MEX Representation

[status]= Aq_close(instrumentID)

Acqrs_closeAll

Purpose

Closes all instruments in preparation for closing the application.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

This function should be the last call to the driver, before closing an application. Make sure to stop all instruments beforehand. 10-bit-FAMILY digitizers will have their power consumption lowered. Appropriate warm-up time may be needed when they are used again.

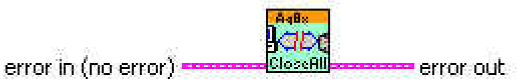
If this function is not called, closing the application might crash the computer in some situations, particularly in multi-threaded applications.

Visual C++ Representation

ViStatus status = Acqrs_closeAll(void);

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Close All Instruments.vi



MATLAB MEX Representation

[status]= Aq_closeAll()

Acqrs_configLogicDevice

Purpose

Configures (programs) on-board logic devices, such as user-programmable FPGA’s.

NOTE: With the exception of AC and SC Analyzers, this function now needs to be used only by VxWorks users to specify the filePath for FPGA .bit files. Otherwise it should no longer have to be used

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
deviceName	ViChar [ ]	Identifies which device to program For the AC210/AC240 and SC210/SC240 modules this string must be "Block1Dev1". Alternatively it can be "ASBUS::n::Block1Dev1" with n ranging from 0 to the number of modules -1. When clearing the FPGA’s, the string must be "Block1DevAll".
filePathName	ViChar [ ]	File path and file name
flags	ViInt32	flags, may be: 0 = program logic device with data in the file “filePathName” 1 = clear the logic device 2 = set path where FPGA .bit files can be found 3 = 0 + use normal search order with AgMD1Fundamental.ini file

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

With flags = 2 in VxWorks systems, the filePathName must point to a directory containing the FPGA configuration files with extension ‘.bit’

With flags = 0 or 3, the filePathName must point to an FPGA configuration file with extension ‘.bit’, e.g. “D:\Averagers\FPGA\AP100DefaultFPGA1.bit”.

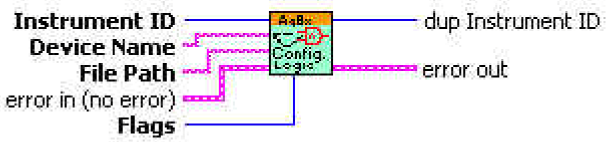
For more details on programming on-board logic devices, please refer to the **Programmer’s Guide** sections 3.2, **Device Initialization** and 3.3, **Device Configuration**.

Visual C++ Representation

```
ViStatus status = Acqrs_configLogicDevice(ViSession instrumentID,
                  ViChar deviceName[], ViChar filePathName[], ViInt32 flags);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Configure Logic Device.vi



MATLAB MEX Representation

```
[status]= Aq_configLogicDevice(instrumentID, deviceName, filePathName, flags)
```

Acqrs_errorMessage

Purpose

Translates an error code into a human readable form.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier can be VI_NULL
errorCode	ViStatus	Error code (returned by a function) to be translated
errorMessageSize	ViInt32	Size of the errorMessage character buffer in bytes (suggested size 512)

Output

Name	Type	Description
errorMessage	ViChar [ ]	Pointer to user-allocated string (suggested size 512) into which the error-message text is returned

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

This function should be called immediately after the return of the error status to ensure that the additional information remains available. For file errors, the returned message will contain the file name and the original 'ansi' error string. This is particularly useful for calls to the following functions:

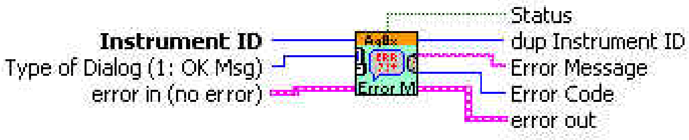
Acqrs_calibrate	**Acqrs_calibrateEx**
Acqrs_configLogicDevice	**Acqrs_configMode**
Acqrs_init	**Acqrs_InitWithOptions**

Visual C++ Representation

```
ViStatus status = Acqrs_errorMessage(ViSession instrumentID,
                  ViStatus errorCode, ViChar errorMessage[],ViInt32 errorMessageSize);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Error Message.vi



MATLAB MEX Representation

```
[status errorMessage]= Aq_errorMessage(instrumentID, errorCode)
```

Acqrs_getDevType

Purpose

Returns the deviceType which indicates which family of the API functions can be used.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
devTypeP	ViInt32*	Pointer to a device type (see AqDevType) with 1 = Digitizer (AcqrsD1) 2 = RC2xx Generator (AcqrsG2) 4 = TC Time-to-Digital Converter (AcqrsT3)

Return Value

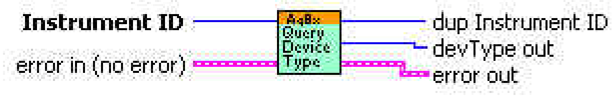
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

```
ViStatus status = Acqrs_getDevType(ViSession instrumentID,
                    ViInt32* devTypeP);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx)Query Device Type.vi



MATLAB MEX Representation

```
[status devType]= Aq_getDevType(instrumentID)
```

Acqrs_getDevTypeByIndex

Purpose

Returns the deviceType which indicates which family of API functions can be used.

Parameters

Input

Name	Type	Description
devIndex	ViInt32	Device Index (the integer part of the resource name as used in **Acqrs_initWithOptions**. See the **Programmer's Guide** section 3.2.1)

Output

Name	Type	Description
devTypeP	ViInt32*	Pointer to a device type (see AqDevType) with 1 = Digitizer (AcqrsD1) 2 = RC2xx Generator (AcqrsG2) 4 = TC Time-to-Digital Converter (AcqrsT3)

Return Value

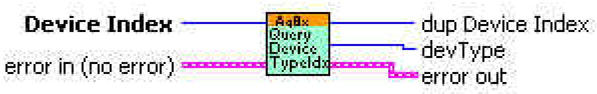
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

ViStatus status = Acqrs_getDevTypeByIndex(ViInt32 devIndex, ViInt32* devTypeP);

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx)Query Device Type By Index.vi



MATLAB MEX Representation

[status devType]= Aq_getDevType(devIndex)

Acqrs_getInstrumentData

Purpose

Returns some basic data about a specified instrument.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
name	ViChar [ ]	Pointer to user-allocated string, into which the model name is returned (length < 32 characters).
serialNbr	ViInt32	Serial number of the module.
busNbr	ViInt32	Bus number of the module location.
slotNbr	ViInt32	Slot number of the module location. (logical)

Return Value

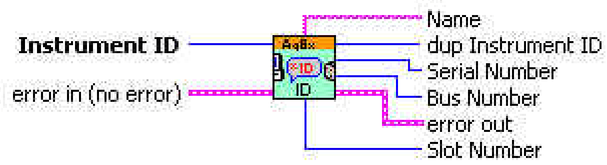
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

```
ViStatus status = Acqrs_getInstrumentData(ViSession instrumentID,
                    ViChar name[], ViInt32*serialNbr,
                    ViInt32* busNbr, ViInt32* slotNbr);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Query Instrument ID.vi



MATLAB MEX Representation

```
[status name serialNbr busNbr slotNbr]= Aq_getInstrumentData(instrumentID)
```

Acqrs_getInstrumentInfo

Purpose

Returns general information about a specified instrument.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
parameterString	ViString	Character string defining the requested parameter. See below for the list of accepted strings.

Output

Name	Type	Description
infoValue	ViAddr	Requested information value. ViAddr resolves to void* in C/C++. The user must allocate the appropriate variable type (as listed below) and supply its address as 'infoValue'.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Accepted Parameter Strings

Parameter String	Returned Type	Description
"ASBus_*m*_BusNb"	ViInt32	Bus number of the *m*'th module of a multi-instrument. *m* runs from 0 to (nbr of modules –1).
"ASBus_ *m*_IsMaster"	ViInt32	Returns 1 if the *m*'th module of a multi-instrument is the master, 0 otherwise. *m* runs from 0 to (nbr of modules –1).
"ASBus_ *m*_PosInCrate"	ViInt32	Physical slot number (position) in cPCI crate of the *m* 'th module of a multi-instrument. *m* runs from 0 to (nbr of modules –1).
"ASBus_ *m*_SerialNb"	ViInt32	Serial number of the *m*'th module of a multi-instrument. *m* runs from 0 to (nbr of modules –1).
"ASBus_ *m*_SlotNb"	ViInt32	Slot number of the *m*'th module of a multi-instrument. *m* runs from 0 to (nbr of modules –1).
"CrateNb"	ViInt32	Physical crate number (perhaps from AqGeo.map)
"DelayOffset"	ViReal64	Calibrated Delay Offset (only useful for recovery of battery backed-up acquisitions)
"DelayScale"	ViReal64	Calibrated Delay Scale (only useful for recovery of battery backed-up acquisitions)
"ExtCkRatio"	ViReal64	Ratio of sFmax over external clock inputFrequency
"HasTrigVeto"	ViInt32	Returns 1 if the functionality is available, 0 otherwise.
"IsPreTriggerRunning"	ViInt32	Returns 1 if the module has an acquisition started but is not yet ready to accept a trigger.
"LogDevDataLinks"	ViInt32	Number of available data links for a streaming analyzer
"LOGDEVHDRBLOCK*m*DEV*n*S *string*"	ViChar[ ]	Returns information about FPGA firmware loaded. See comments below.

"MainFirmwareFullVersion"	ViUInt32	get the full "firmware version" value of the loaded main Firmware
"MainFirmwareFunction"	ViUInt32	get the "firmware function" value, which identifies the capabilities of the loaded main Firmware
"MaxSamplesPerChannel"	ViInt32	Maximum number of samples per channel available in digitizer mode
"NbrADCBits"	ViInt32	Number of bits of data per sample from this modules ADCs
"NbrExternalTriggers"	ViInt32	Number of external trigger sources
"NbrInternalTriggers"	ViInt32	Number of internal trigger sources
"NbrModulesInInstrument"	ViInt32	Number of modules in this instrument. Individual modules (not connected through AS bus) return 1.
"Options"	ViChar[ ]	List of options, separated by ‘,’, installed in this instrument.
"OverloadStatus *chan*"	ViInt32	Returns 1 if *chan* is in overload, 0 otherwise. *chan* takes on the same values as 'channel' in **AcqrsD1_configTrigSource**.
"OverloadStatus ALL"	ViInt32	Returns 1 if any of the signal or external trigger inputs is in overload, 0 otherwise. Use the "OverloadStatus *chan* " string to determine which channel is in overload.
"PosInCrate"	ViInt32	Physical slot number (position) in cPCI crate
"SSRTimeStamp"	ViReal64	Current value of time stamp for Analyzers in SSR mode.
"TbNextSegmentPad"	ViInt32	Returns the additional array space (in samples) per segment needed for the image read of AcqrsD1_readData. It concerns the data available after the next call to AcqrsD1_acquire, as opposed to any current or past acquisition with different conditions.
"TbSegmentPad"	ViInt32	Returns the additional array space (in samples) per segment needed for the image read of AcqrsD1_readData. It concerns the current data available, as opposed to any future acquisition with different conditions.
"Temperature *m*"	ViInt32	Temperature in degrees Centigrade (^{o}C)
"TrigLevelRange *chan*"	ViReal64	Trigger Level Range on channel *chan*
“VersionUserDriver”	ViChar[ ]	String containing the full driver version.

Discussion

For the case "TrigLevelRange *chan*" the result is to be interpreted as ± (returned value), which is in % of the vertical Full Scale of the channel, or in mV for an external trigger source. The value of *chan* takes is the same as the values of 'channel' in **AcqrsD1_configTrigSource**.

For the case "Temperature *m*", *m* is the module number in a *MultiInstrument* and runs from 0 to (nbr of modules –1) following the channel order. It may be omitted on single digitizers or for the master of a *MultiInstrument*

For the case "Options" the available options are returned in a ‘,’ separated string. The options include the memory size if additional memory has been installed in the form "MnM" for digitizers where n is the number of megabytes available or "PnMB" for AP235/AP240 and "AnM" for AP100/AP101/AP200/AP201. Other possible options include "NoASBus", "BtBkup", "FreqCntr", "SSR", "Avg", and "StrtOnTrig". The infoValue should point to a string of at least 32 characters.

The case of "LOGDEVHDRBLOCK*m*DEV*n*S *string*" is one in which several possible values of *m, n,* and *string* are allowed. The single digit number *m* refers to the FPGA block in the module. For the moment this must always have the value 1. The single digit number *n* refers to the FPGA device in the block. It can have values in the range 1,2,3,4 depending on the module. Among the interesting values of *string* are the following case-sensitive strings: "name", "version", "versionTxt", "compDate", "model".

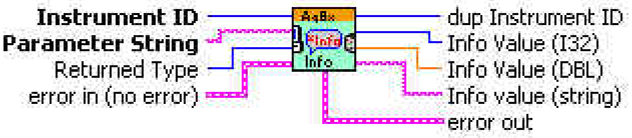
The case of "SSRTimeStamp" should only be used when data is readable. In other words, it should only be used between the moment at which the processing is done and the moment when **AcqrsD1_processData** is called to enable the subsequent bank switch. **.**

Visual C++ Representation

ViStatus status = Acqrs_getInstrumentInfo(ViSession instrumentID, ViString parameterString,
ViAddr infoValue);

LabVIEW Representation

Acqiris Bx.: (or Aq Bx) Query Instrument Information.vi



NOTE: The type of the returned value depends on the parameter requested. In LabVIEW, the correct returned type should be supplied as input to the VI, and the appropriate output wire connected. Any other wire will always return zero.

MATLAB MEX Representation

[status infoValue] = Aq_getInstrumentInfo(instrumentID, parameterString, dataTypeString)

Allowed values of dataTypeString are 'integer', 'double', or 'string'

Acqrs_getNbrChannels

Purpose

Returns the number of channels on the specified module.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
nbrChannels	ViInt32	Number of channels in the specified module

Return Value

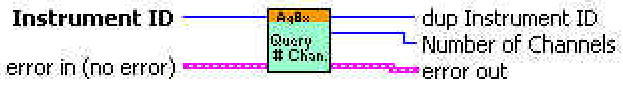
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

```
ViStatus status = Acqrs_getNbrChannels(ViSession instrumentID, ViInt32* nbrChannels);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Query Number of Channels.vi



MATLAB MEX Representation

```
[status nbrChannels] = Aq_getNbrChannels(instrumentID)
```

Acqrs_getNbrInstruments

Purpose

Returns the number of Acqiris instruments found on the computer.

Parameters

Output

Name	Type	Description
nbrInstruments	ViInt32	Number of Acqiris instruments found on the computer

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

In the case of multiple processes accessing the Agilent Acqiris instruments, this function will return the number of currently available instruments. If an instrument has already been initialized in another process, it will not be available unless it has been suspended via a call to **Acqrs_suspendControl**.

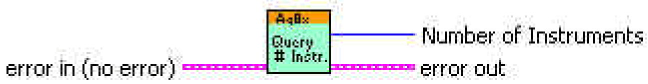
You should refer to to the **Programmer's Guide** section 3.2, **Device Initialization**, for a detailed explanation on the initialization procedure.

Visual C++ Representation

ViStatus status = Acqrs_getNbrInstruments(ViInt32* nbrInstruments);

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Query Number of Instruments.vi



MATLAB MEX Representation

[status nbrInstruments]= Aq_getNbrInstruments()

Acqrs_getVersion

Purpose

Returns version numbers associated with a specified instrument or current device driver.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
versionItem	ViInt32	1 for version of Kernel-Mode Driver 2 for version of EEPROM Common Section 3 for version of EEPROM Instrument Section 4 for version of CPLD firmware

Output

Name	Type	Description
version	ViInt32	version number of the requested item

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

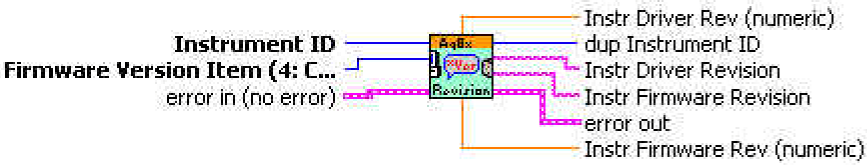
For drivers, the version number is composed of 2 parts. The upper 2 bytes represent the major version number, and the lower 2 bytes represent the minor version number.

Visual C++ Representation

```
ViStatus status = Acqrs_getVersion(ViSession instrumentID,
                        ViInt32 versionItem, ViInt32* version);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Revision Query.vi



MATLAB MEX Representation

```
[status version] = Aq_getVersion(instrumentID, versionItem)
```

Acqrs_init

Purpose

Initializes an instrument.

Parameters

Input

Name	Type	Description
resourceName	ViRsrc	ASCII string which identifies the module to be initialized. See discussion below.
IDQuery	ViBoolean	Currently ignored
resetDevice	ViBoolean	If set to 'TRUE', resets the module after initialization.

Output

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
Status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

You should refer to the **Programmer's Guide** section 3.2, **Device Initialization**, for a detailed explanation on the initialization procedure.

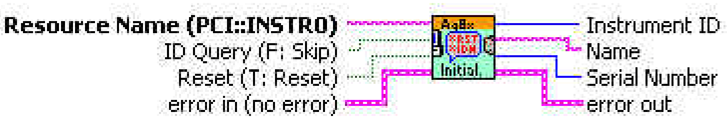
The function returns the error code ACQIRIS_ERROR_INIT_STRING_INVALID when the initialization string could not be interpreted.

Visual C++ Representation

ViStatus status = Acqrs_init(ViRsrc resourceName, ViBoolean IDQuery, ViBoolean resetDevice,
ViSession* instrumentID);

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Initialize.vi



MATLAB MEX Representation

[status instrumentID] = Aq_init(instrumentID, IDQuery, resetDevice)

Acqrs_InitWithOptions

Purpose

Initializes an instrument with options.

Parameters

Input

Name	Type	Description
resourceName	ViRsrc	ASCII string which identifies the instrument to be initialized. See below.
IDQuery	ViBoolean	Currently ignored
resetDevice	ViBoolean	If set to 'TRUE', resets the instrument after initialization.
optionsString	ViString	ASCII string that specifies options. Syntax: "optionName=bool" where bool is TRUE (1) or FALSE (0). Currently three options are supported: ”CAL”: do calibration at initialization (default 1) "DMA": use scatter-gather DMA for data transfers (default 1). "simulate": initialize a simulated device (default 0). NOTE: **optionsString** is case insensitive.

Output

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

You should refer to the **Programmer’s Guide** section 3.2, **Device Initialization** for a detailed explanation on the initialization procedure.

The function returns the error code ACQIRIS_ERROR_INIT_STRING_INVALID when the initialization string could not be interpreted.

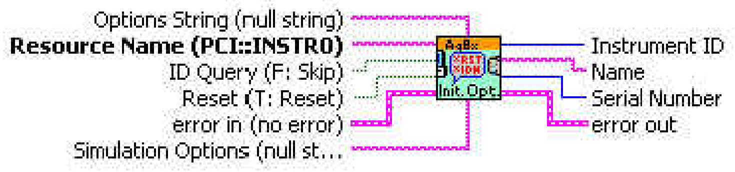
Multiple options can be given; Separate the option=value pairs with ‘,’ characters.

Visual C++ Representation

```
ViStatus status = Acqrs_InitWithOptions(ViRsrc resourceName, ViBoolean IDQuery,
                        ViBoolean resetDevice, ViString optionsString, ViSession* instrumentID);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Initialize with Options.vi



MATLAB MEX Representation

```
[status instrumentID]= Aq_initWithOptions(resourceName, IDQuery, resetDevice, optionsString)
```

Acqrs_logicDeviceIO

Purpose

Reads/writes a number of 32-bit data values from/to a user-defined register in on-board logic devices, such as user-programmable FPGAs. It is useful for AC/SC Analyzers and U1084A with the custom firmware option.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
deviceName	ViChar [ ]	Identifies which device to read from or write to. For the AC210/AC240 and SC210/SC240 modules this string must be "Block1Dev1". Alternatively it can be "ASBUS::n::Block1Dev1" with n ranging from 0 to the number of modules -1
registerID	ViInt32	Register Number: For AC210/AC240 and SC210/SC240 modules it can be in the range 0 to 127 For U1084A it can be in the range 0 to 1023.
nbrValues	ViInt32	Number of data values to read
dataArray	ViInt32 [ ]	User-supplied array of data values
readWrite	ViInt32	Direction 0 = read from device, 1 = write to device
flags	ViInt32	Currently unused, set to “0”

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

This function is only useful if the user programmed the on-board logic device (FPGA).

Typically, *nbrValues* is set to 1, but it may be larger if the logic device supports internal address auto-incrementation. The following example reads the (32-bit) contents of register 5 to *reg5Value*:

```
ViStatus status =Acqrs_logicDeviceIO(ID, "Block1Dev1", 5, 1, &reg5Value, 0, 0);
```

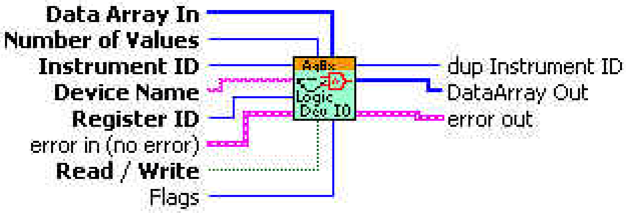
Note that *dataArray* must always be supplied as an address, even when writing a single value.

Visual C++ Representation

```
ViStatus status = Acqrs_logicDeviceIO(ViSession instrumentID,
                      ViChar deviceName[], ViInt32 registerID,
                      ViInt32 nbrValues,   ViInt32 dataArray[],
                      ViInt32 readWrite,   ViInt32 flags);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Logic Device IO.vi



MATLAB MEX Representation

Because of the separation of input and output arguments in MATLAB two functions are needed:

```
[status dataArray] = Aq_logicDeviceRead(instrumentID, deviceName, registerID, nbrValues,
                      modifier)

[status] = Aq_logicDeviceWrite(instrumentID, deviceName, registerID, nbrValues, dataArray,
                      modifier)
```

Acqrs_powerSystem

Purpose

Forces all instruments to prepare entry into or return from the system power down state.

Parameters

Input

Name	Type	Description
state	ViInt32	0 = 'AqPowerOff' of the AqPowerState enum 1 = 'AqPowerOn' of the AqPowerState enum
flags	ViInt32	Currently unused, set to “0”

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

Typically, this function is called by a 'Power Aware' application, when it catches a 'system power down' event, such as 'hibernate'.

If 'state == 0', it will suspend all other calling threads. If a thread is performing a long operation which cannot be completed within milliseconds, such as 'calibrate', it will be interrupted immediately and will get the status 'ACQIRIS_ERROR_OPERATION_INTERRUPTED'. Note that if an acquisition is still running while Acqrs_powerSystem(0, 0) is called, it might be incomplete or corrupted.

If 'state == 1', it will reenable the instruments at the same state as they were before Acqrs_powerSystem(0, 0). Threads which were suspended will be resumed. However, interrupted operations which returned an error 'ACQIRIS_ERROR_OPERATION_INTERRUPTED' have to be redone.

Visual C++ Representation

```
ViStatus status = Acqrs_powerSystem(ViInt32 state, ViInt32 flags);
```

LabVIEW Representation

There is no LabVIEW implementation of this function.

MATLAB MEX Representation

```
[status] = Aq_powerSystem(state, flags)
```

Acqrs_reset

Purpose

Resets an instrument.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

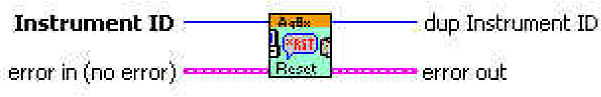
There is no known situation where this action is to be recommended.

Visual C++ Representation

ViStatus status = Acqrs_reset(ViSession instrumentID);

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Reset.vi



MATLAB MEX Representation

[status] = Aq_reset(instrumentID)

Acqrs_resetMemory

Purpose

Resets the instrument’s memory to a known default state.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

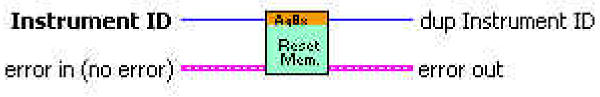
Each byte of the digitizer memory is overwritten sequentially with the values 0xaa, 0x55, 0x00 and 0xff. This functionality is mostly intended for use with battery backed-up memories.

Visual C++ Representation

ViStatus status = Acqrs_resetMemory(ViSession instrumentID);

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Reset Memory.vi



MATLAB MEX Representation

[status] = Aq_resetMemory(instrumentID)

Acqrs_resumeControl

Purpose

Resume the control of an instrument that was suspended (see **Acqrs_suspendControl**).

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

This function reacquires the driver lock of the instrument and allows calls to it from the current process. The error code ACQIRIS_ERROR_DEVICE_ALREADY_OPEN is returned when calling an instrument already locked by another process.

After successfully calling *Acqrs_resumeControl*, the module will be set to a default hardware state. It will have no valid data and the timestamp will be set to 0. When the next acquisition is started, the module will be configured with all of the unmodified settings from before the *Acqrs_suspendControl* was invoked.

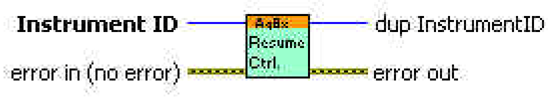
For modules on a VXI carrier, both modules must be accessed from the same process. The controlling process can be changed, but only for both modules together, i.e. both modules must be suspended, and access resumed in the same process.

Visual C++ Representation

ViStatus status = Acqrs_resumeControl(ViSession instrumentID);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Resume Control.vi



MATLAB MEX Representation

[status] = Aq_resumeControl(instrumentID

Acqrs_setAttributeString

Purpose

Sets an attribute with a string value (for use in SC Streaming Analyzers ONLY).

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	1...Nchan
name	ViConstString	ASCII string that specifies options “odlTxBitRate” is currently the only one used
value	ViConstString	For “odlTxBitRate” can have values like “2.5G”,”2.125G”, or “1.0625G”

Return Value

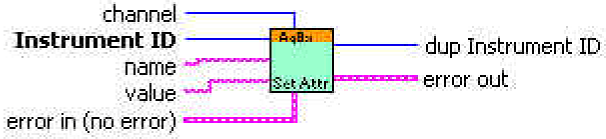
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

```
ViStatus status = Acqrs_setAttributeString(ViSession instrumentID,
                  ViInt32 channel, ViConstString name,
                  ViConstString value);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Set Attribute String.vi



MATLAB MEX Representation

```
[status] = Aq_setAttributeString (instrumentID, channel, name, value)
```

Acqrs_setLEDColor

Purpose

Sets the front panel LED to the desired color.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
color	ViInt32	0 = OFF (return to normal acquisition status indicator) 1 = Green 2 = Red 3 = Yellow

Return Value

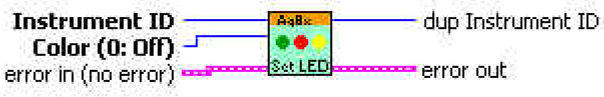
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

```
ViStatus status = Acqrs_setLEDColor(ViSession instrumentID,
                        ViInt32 color);
```

LabVIEW Representation

Acqiris Bx.lvlib: (or Aq Bx) Set LED Color.vi



MATLAB MEX Representation

```
[status ] = Aq_setLEDColor(instrumentID, color)
```

Acqrs_setSimulationOptions

Purpose

Sets one or several options which will be used by the function **Acqrs_InitWithOptions**, provided that the **optionsString** supplied with that function contains the string "simulate=TRUE".

Parameters

Input

Name	Type	Description
simOptionString	ViString	String listing the desired simulation options. See discussion below.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

See the **Programmer's Guide** section 3.2.10, **Simulated Devices,** for details on simulation. A string of the form "M8M" is used to set an 8 Mbyte simulated memory. The simulation options are reset to none by setting **simOptionString** to an empty string "".

Visual C++ Representation

ViStatus status = Acqrs_setSimulationOptions(ViString simOptionString);

LabVIEW Representation

Use Acqiris Bx.lvlib: (or Aq Bx) Initialize with Options.vi

MATLAB MEX Representation

[status] = Aq_setSimulationOptions(simOptionsString)

Acqrs_suspendControl

Purpose

Suspend control of an instrument to allow using it from another process.
NOTE: This is only available for Windows and Linux operating systems.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

This function releases the driver lock of the instrument and prevents all further calls from the current process. The error code ACQIRIS_ERROR_INVALID_HANDLE is returned when calling functions on a suspended instrument. Use **Acqrs_resumeControl** to reacquire the control of the instrument.

Once suspended, this instrument can be used from another process. However, if this is the first time this other process is used, all desired acquisition settings must be defined and a calibration will be needed.

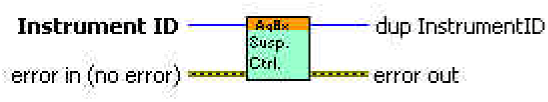
For modules on a VXI carrier, both modules must be accessed from the same process. The controlling process can be changed, but only for both modules together, i.e. both modules must be suspended, and access resumed in the same process.

Visual C++ Representation

ViStatus status = Acqrs_suspendControl(ViSession instrumentID);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Suspend Control.vi



MATLAB MEX Representation

[status] = Aq_suspendControl(instrumentID)

AcqrsD1_acqDone

Purpose

Checks if the acquisition has terminated.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
done	ViBoolean	done = VI_TRUE if the acquisition is terminated VI_FALSE otherwise

Return Value

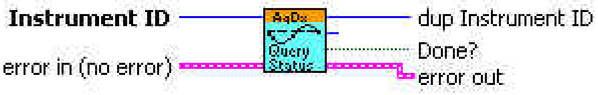
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

```
ViStatus status = AcqrsD1_acqDone(ViSession instrumentID,
                                  ViBoolean* done);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Acquisition Status.vi



MATLAB MEX Representation

```
[status done]= AqD1_acqDone(instrumentID)
```

Note: The older form Aq_acqDone is deprecated.

Please convert to the newer version.

AcqrsD1_acquire

Purpose

Starts an acquisition.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

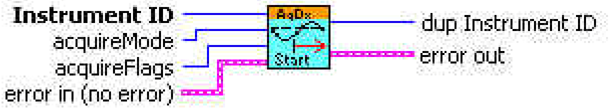
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

ViStatus status = AcqrsD1_acquire(ViSession instrumentID);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Start Acquisition.vi



MATLAB MEX Representation

[status]= AqD1_acquire(instrumentID)

Note: The older form Aq_acquire is deprecated.

Please convert to the newer version.

AcqrsD1_acquireEx

Purpose

Starts an acquisition.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
acquireMode	ViInt32	= 0, normal = 2, continue to accumulate (AP Averagers only)
acquireFlags	ViInt32	= 0, normal = 4, resets the time stamp counter (AP240 **Peak**^{TDC}, U1071A10-bit-Family and U1084A only)
acquireParams	ViInt32	Parameters, currently not used
reserved	ViInt32	Currently not used

Return Value

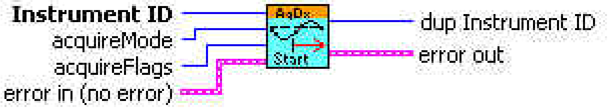
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

```
ViStatus status = AcqrsD1_acquireEx(ViSession instrumentID ,
                  ViInt32 acquireMode, ViInt32 acquireFlags, ViInt32 acquireParams,
                  ViInt32 reserved);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Start Acquisition.vi



MATLAB MEX Representation

```
[status]= AqD1_acquireEx(instrumentID, acquireMode, acquireFlags, acquireParams, reserved)
```

Note: The older form Aq_acquireEx is deprecated. Please convert to the newer version.

AcqrsD1_bestNominalSamples

Purpose

Helper function to simplify digitizer configuration. It returns the maximum nominal number of samples that fit into the available memory.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
nomSamples	ViInt32	Maximum number of data samples available

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

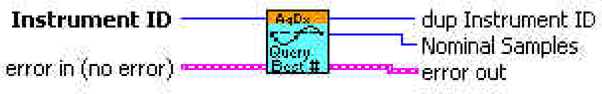
When using this method, make sure to use **AcqrsD1_configHorizontal** and **AcqrsD1_configMemory** beforehand to set the sampling rate and the number of segments to the desired values (**nbrSamples** in**AcqrsD1_configMemory** may be any number!). **AcqrsD1_bestNominalSamples** depends on these variables.

Visual C++ Representation

```
ViStatus status = AcqrsD1_bestNominalSamples(ViSession instrumentID,
                  ViInt32* nomSamples);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Best Nominal Samples.vi



MATLAB MEX Representation

```
[status nomSamples]= AqD1_bestNominalSamples(instrumentID)
```

Note: The older form Aq_bestNominalSamples is deprecated.

Please convert to the newer version.

AcqrsD1_bestSampInterval

Purpose

Helper function to simplify digitizer configuration. It returns the best possible sampling rate for an acquisition, which covers the **timeWindow** with no more than **maxSamples**. The calculation takes into account the requested state of the instrument, in particular the requested number of segments. In addition, this routine returns the "real" nominal number of samples that can be accommodated (it is computed as **timeWindow/samplingInterval**!).

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
maxSamples	ViInt32	Maximum number of samples to be used
timeWindow	ViReal64	Time window to be covered, in seconds

Output

Name	Type	Description
sampInterval	ViReal64	Recommended sampling interval in seconds
nomSamples	ViInt32	Recommended number of data samples

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

The function returns the value status = ACQIRIS_ERROR_SETUP_NOT_AVAILABLE when the available memory is too short, and the longest available sampling interval too short. The returned sampling interval is the longest one possible. It returns VI_SUCCESS when a good solution has been found.

NOTE: This function *does not* modify the state of the digitizer at all. It simply returns a recommendation that the user is free to override.

NOTE: When using this method, make sure to use **AcqrsD1_configMemory** beforehand to set the number of segments to the desired value (**nbrSamples** may be any number!). **AcqrsD1_bestSampInterval** depends on this variable.

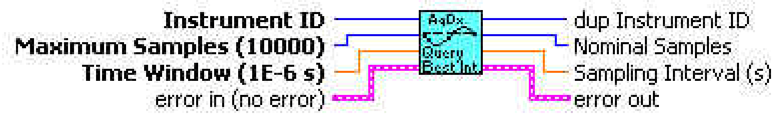
NOTE: The returned "recommended" values for the sampling interval **sampInterval** and the nominal number of samples **nomSamples** are expected to be used for configuring the instrument with calls to **AcqrsD1_configMemory** and **AcqrsD1_configHorizontal**. Make sure to use the same number of segments in this second call to **AcqrsD1_configMemory,** as in the first one.

Visual C++ Representation

```
ViStatus status = AcqrsD1_bestSampInterval(ViSession instrumentID, ViInt32 maxSamples,
                  ViReal64 timeWindow, ViReal64* sampInterval, ViInt32* nomSamples);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Best Sampling Interval.vi



MATLAB MEX Representation

```
[status sampInterval nomSamples]= AqD1_bestSampInterval(instrumentID, maxSamples,
                  timeWindow)
```

Note: The older form Aq_bestSampInterval is deprecated.

Please convert to the newer version.

AcqrsD1_configAvgConfig

Purpose

Configures a parameter for averager/analyzer operation.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channelNbr	ViInt32	Channel number. A value = 0 will be treated as =1 for compatibility.
parameterString	ViString	Character string defining the requested parameter. See below for the list of accepted strings.
value	ViAddr	Value to set. ViAddr resolves to void* in C/C++. The user must allocate the appropriate variable type (as listed below), set it to the requested value and supply its address as 'value'.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Accepted Parameter Strings

Parameter String	Data Type	Description
"DitherEnable"	ViInt32	For **U1084A Averagers** ONLY. 0 = No dithering 1 = Dithering enabled
"DitherRange"	ViInt32	For **Averagers** ONLY. Range of offset dithering, in ADC LSB's. May assume values v = 0, 1...15 for **AP** units and 31 for **U1084A** units. The offset is dithered over the range [-v, + v] in steps of ~1/8 LSB.
"FixedSamples"	ViInt32	For Threshold Gate type in **AP240/AP235 Analyzers** and **AP240/AP235 Peak**^{TDC} ONLY. Number of samples transmitted for each point over threshold. It must be a multiple of 4. 0 = No limit imposed.
"GateType"	ViInt32	For **AP240/AP235 Analyzers** and **AP240/AP235 Peak**^{TDC} ONLY. 0 = No Gates 1 = User Gates 2 = Threshold Gates For **Peak**^{TDC} a gate mode must be chosen.
"HistoTDCEnable"	ViInt32	For **AP240/AP235 Averagers** ONLY. 0 = not enabled 1 = enable the **simple TDC** mode for the channel
"InterpEnable"	ViInt32	For **U1084A Peak**^{TDC} ONLY. 0 = No interpolation 1 = Interpolation enabled

"InvertData"	ViInt32	0 = (no inversion) 1 = invert data, (1's complement).
"NbrMaxGates"	ViInt32	For Threshold Gate type in **AP240/AP235 Analyzers** and **AP240/AP235 Peak**^{TDC} ONLY. Maximum number of gates allowed for each segment. 0 = No limit imposed
"NbrSamples"	ViInt32	Number of data samples per waveform segment. May assume quantized values as explained below. For U1084A modules in Zero-Suppress mode, value must be a multiple of 2048 in dual-channel mode or 4096 in single-channel mode.
"NbrSegments"	ViInt32	Number of waveform segments to acquire. May assume values between 1 and 8192 in **AP** units and up to 131072 for **U1084A** units.
"NbrWaveforms"	ViInt32	For **Averagers** and **U1084A** (**Averager** or **Peak**^{TDC}) ONLY. Number of waveforms to average before going to next segment. May assume values between 1 and 65535 (64K – 1) in **AP** units and up to 16777216 for **U1084A** units.
"NbrRoundRobins"	ViInt32	For **AP240/AP235 Averagers** and **AP240/AP235 Peak**^{TDC} ONLY. Number of times to perform the full segment cycle during data accumulation.
"NoiseBaseEnable"	ViInt32	For **Averagers** and**U1084A** (**Averager** or **Peak**^{TDC}) ONLY. 0 = no base subtraction 1 = base subtraction enabled. It can only be enabled if the threshold is enabled, except for the **U1084A Peak**^{TDC} , which does not support threshold.
"NoiseBase"	ViReal64	For **Averagers** and **U1084A** (**Averager** or **Peak**^{TDC}) ONLY. Value in Volts of the value to be added in Noise Supressed Averaging.
"MarkerLatchMode"	ViInt32	For **AP240/AP235 Averagers** ONLY. Select on which trigger the Control IO markers are latched. 0= Old behavior on last trigger expect round robin (default) 1= Always on first trigger
"MaxSamplesPerSegment"	ViInt32	The maximum number of actual data samples to be stored per segment, after the zero-suppression is applied. Only samples which are actually retained are counted. Any data above this limit will be truncated.
"P1Control"	ViInt32	0 = not enabled For **AP240/AP235 Averagers** ONLY. 1 = addSub channel 1 2 = addSub channel 2 3 = addSub channel 1 + 2 4 = average trigger enable 5 = start veto enable 6 = average (out) For **AP240/AP235 SSR** ONLY. 1 = Timestamp reset enable

"P2Control"	ViInt32	0 = not enabled For **AP240/AP235 Averagers** ONLY. 1 = addSub channel 1 2 = addSub channel 2 3 = addSub channel 1 + 2 4 = average trigger enable 5 = start veto enable 6 = average (out) For **AP240/AP235 SSR** ONLY. 1 = Timestamp reset enable
"PostSamples"	ViInt32	For **AP240/AP235 SSR**, **U1084A** and **Peak^{TDC} Analyzers** in **Threshold Gate** or **Zero-Supress** mode. Used to guarantee a number of samples after the last one satisfying the threshold condition. The meaningful values are 0,4,8,12,16. Other values will be rounded up or adapted appropriately.
"PreSamples"	ViInt32	For **AP240/AP235 SSR**, **U1084A** and **Peak^{TDC} Analyzers** in **Threshold Gate** or **Zero-Supress** mode. Used to guarantee a number of samples before the first one satisfying the threshold condition. The meaningful values are 0,4,8,12,16. Other values will be rounded up or adapted appropriately.
"StartDelay"	ViInt32	Start delay in samples. For **AP** units, may assume values between 0 and 16777200(33554400) in steps of 16 (32) as explained below. The limit is StepSize*(1024*1024-1). For **U1084A** units, may assume values between 0 and 67108864(134217728) in steps of 16 (32) as explained below. The limit is StepSize*(4*1024*1024).
"StartDeltaNegPeak"	ViInt32	For **AP101/AP201 Analyzers** ONLY. Negative excursion needed before searching for negative peak.
"StartDeltaPosPeak"	ViInt32	For **AP101/AP201 Analyzers** ONLY. Positive excursion needed before searching for positive peak. May assume values between 1 and 0xff.
"StartDeltaPosPeakV"	ViReal64	For **Peak^{TDC} mode Analyzers** ONLY. Positive excursion needed before searching for positive peak. Must be positive.
"StartVetoEnable"	ViInt32	For **AP100/AP200 Averagers** ONLY 0 = for trigger enable functionality 1 = use high state of I/O signal to allow the average accumulation to start. Must be used in conjunction with **AcqrsD1_configControlIO**.

"StopDelay "	ViInt32	Stop delay in samples. For **AP** units, may assume values between 0 and 1048560 (2097120) in steps of of 16 (32) as explained below. The limit is StepSize*(64*1024-1). For **U1084A** units, may assume values between 0 and 67108864 (134217728) in steps of of 16 (32) as explained below. The limit is StepSize*(4*1024*1024)
“SyncOnTrigOutSync”	ViInt32	For **U1084A** units ONLY. 0 = No resynchronisation of the acquisition 1 = Resynchronisation of the acquisition to the resynchronized trigger output
"TdcHistogramDepth"	ViInt32	The depth of the histogram for **AP240/AP235 Peak**^{TDC} mode. 0 = 16-bit accumulation bins. 1 = 32-bit accumulation bins.
"TdcHistogramHorzRes"	ViInt32	The horizontal resolution of the histogram for interpolated peaks in the **Peak**^{TDC} mode. 0 = each bin corresponds to a sampling interval. n = each bin corresponds to ½**n of a sampling interval, n≤4
"TdcHistogramIncrement"	ViInt32	The desired increment to be applied for each entry; 1 = increment by 1, for **AP240/AP235 SimpleTDC Averager** and for all **Peak**^{TDC} **Analyzer** modes ONLY. 2 = increment by the ADCvalue – NoiseBase for an **AP240/AP235 SimpleTDC Averager** and by the ADCvalue for all **Peak**^{TDC} **Analyzer** modes
"TdcHistogramMode"	ViInt32	The type of histogram for **AP240/AP235 Peak**^{TDC} mode ONLY. 0 = no histogram. Data only is available for each acquisition. 1 = histogram.
"TdcHistogramVertRes"	ViInt32	The vertical resolution of the histogram for interpolated peaks when the **TDCHistogramIncrement** is 2 in the **Peak**^{TDC} mode. 0 = one LSB of the bin value corresponds to one LSB of the ADC. n = one LSB of the bin value corresponds to ½**n LSB of the ADC, n≤4
"TdcMinTOT"	ViInt32	For **AP240/AP235 SimpleTDC** mode ONLY. The desired minimum width of a peak in the waveform; It can take on a value (n) from 1 to 4. A peak is accepted if there are at least n consecutive data samples above the Threshold.
"TdcOverlaySegments"	ViInt32	This option controls the horizontal binning of data in the **AP240/AP235 Peak**^{TDC} histogram mode. 0 = each segment will be histogrammed independently. 1 = all segments will be histogrammed on a common time axis.

"TdcProcessType"	ViInt32	The desired processing for **AP240/AP235 Peak^{TDC}** mode peak finding. May assume 0 = No processing 1 = Standard peak finding (no interpolation) 2 = Interpolated peaks 3 = 8 sample peak regions for data readout 4 = 16 sample peak regions for data readout
"ThresholdEnable"	ViInt32	For **Averagers** ONLY. May assume 0 (no threshold) and 1 (threshold enabled).
"Threshold"	ViReal64	Value in Volts of the threshold for **Noise Supressed Averaging** or for **AP240/AP235 SSR** or **AP240/AP235 Peak^{TDC}** with **Threshold Gates**.
"TimestampClock"	ViInt32	For **AP240/AP235 Averagers** ONLY. Select the reference source for the Timestamp clock: 0 = PCI 33MHz clock (default) 1 = Internal 10MHz Reference clock
"TrigAlways"	ViInt32	May assume 0 (no trigger output) and 1 (trigger output on), in the case of no acquisition.
"TriggerTimeout"	ViInt32	For **AP101/AP201** ONLY. Trigger timeout in units of 30 ns in the range [0,2^{32} - 1]. A value of 0 means that no trigger will be generated and no *Prepare for Trigger* signal will be needed.
"TrigResync"	ViInt32	For **AP** units ONLY. May assume 0 (no resync), 1 (resync) and 2 (free run).
"ValidDeltaNegPeak"	ViInt32	For **AP101/AP201** ONLY. Positive excursion needed to validate a negative peak. May assume values between 1 and 0xff.
"ValidDeltaPosPeak"	ViInt32	For **AP101/AP201** ONLY. Negative excursion needed to validate a positive peak. May assume values between 1 and 0xff.
"ValidDeltaPosPeakV"	ViReal64	For **Peak^{TDC} Analyzers** ONLY. Negative excursion needed to validate a positive peak. Must be positive.

Discussion

The channelNbr is used to designate the channel number for those parameters whose values can be different for the two channels of an AP240/AP235 or a U1084A in dual-channel mode. These parameters are indicated in **bold** in the list above.

The applicability of each Parameter String as a function of module is indicated as needed. **Averagers** or **Peak^{TDC} Analyzers** refers to all AP and U1084A modules with that capability.

Set NbrWaveforms to 1 and NbrRoundRobins to n order to enable the round-robin segment acquisition mode with n triggers for each segment.

The granularity for "NbrSamples", is 16 for the AP100/AP101 and the AP240/AP235 in Dual-Channel mode, 32 for the AP200/AP201 and the AP240/AP235 in Single-Channel mode, 256 for the U1084A in Dual-Channel mode, and 512 for the U1084A in Single-Channel mode. The maximum values are limited as a function of the memory option for the AP units. The U1084A maximum is 262144 samples in Dual-Channel mode and 524288 samples in Single-Channel mode.

The granularity for "StartDelay" and "StopDelay" is 16 for the AP100/AP101 and the AP240/AP235 or U1084A in Dual-Channel mode and 32 for the AP200/AP201 and the AP240/AP235 or U1084A in Single-Channel mode.

If P1Control and/or P2Control are enabled for the Add/Subtract mode then the data will be added if the signal, or the OR of both signals, is in the high state. The same rule holds if they are used for trigger enable.

The P1Control/P2Control "average (out)" signal goes high after the first trigger is accepted for an average and drops back down when the last trigger's acquition is complete.

The "TrigResync" values 0 and 1 require a valid trigger, while 2 requires no trigger (useful for background acquisition).

Example

```
long channelNbr = 0, dither = 8;

AcqrsD1_configAvgConfig(ID, channelNbr, "DitherRange", &dither);
```

This function sets the dithering range to ± 8 LSB’s.

Note that this function takes the **address**, not the value of the parameter to be set.

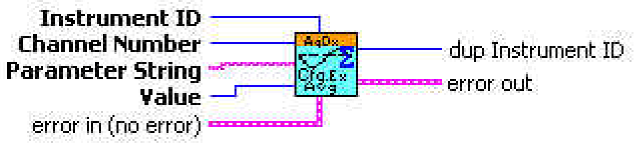
Visual C++ Representation

ViStatus status = AcqrsD1_configAvgConfig(ViSession instrumentID,
ViInt32 channelNbr, ViString parameterString, ViAddr value);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Extended Configure Averager.vi

This Vi is polymorphic, the value can be either I32 or DBL.



MATLAB MEX Representation

Note: Please see AqD1_configAvgConfigInt32 and AqD1_configAvgConfigReal64.

AcqrsD1_configAvgConfigInt32

Purpose

Configures a long parameter for averager/analyzer operation.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channelNbr	ViInt32	Channel number. A value = 0 will be treated as =1 for compatibility.
parameterString	ViString	Character string defining the requested parameter. See below for the list of accepted strings.
value	ViInt32	Value to set.

Return Value

Name	Type	Description
status	ViStatus	Refer to Table 2-1 for error codes.

Accepted Parameter Strings

Parameter String	Data Type	Description
"DitherEnable"	ViInt32	For **U1084A Averagers** ONLY. 0 = No dithering 1 = Dithering enabled
"DitherRange"	ViInt32	Range of offset dithering, in ADC LSB's. May assume values v = 0, 1...15 for **AP** units and 31 for **U1084A** units. The offset is dithered over the range [-v, + v] in steps of ~1/8 LSB. For **Averagers** ONLY.
"FixedSamples"	ViInt32	For Threshold Gate type in **AP240/AP235 Analyzers** and **AP240/AP235 Peak**^{TDC} ONLY. Number of samples transmitted for each point over threshold. It must be a multiple of 4. 0 = No limit imposed.
"GateType"	ViInt32	For **AP240/AP235 Analyzers** and **AP240/AP235 Peak**^{TDC} ONLY. 1 = User Gates 2 = Threshold Gates
"HistoTDCEnable"	ViInt32	For **AP240/AP235 Averagers** ONLY. 0 = not enabled 1 = enable the **simple TDC** mode for the channel
“InterpEnable”	ViInt32	For **U1084A Peak**^{TDC} ONLY. 0 = No interpolation 1 = Interpolation enabled
"InvertData"	ViInt32	0 = (no inversion) 1 = invert data, (1's complement).
"NbrMaxGates"	ViInt32	For Threshold Gate type in **AP240/AP235 Analyzers** and **AP240/AP235 Peak**^{TDC} ONLY. Maximum number of gates allowed for each segment. 0 = No limit imposed

"NbrSamples"	ViInt32	Number of data samples per waveform segment. May assume values between 16 or 32 and the available memory length, in multiples of 16 (32) as explained below. For U1084A modules in Zero-Suppress mode, value must be a multiple of 2048 in dual-channel mode or 4096 in single-channel mode.
"NbrSegments"	ViInt32	Number of waveform segments to acquire. May assume values between 1 and 8192.
"NbrWaveforms"	ViInt32	For **Averagers** and **U1084A** (**Averager** or **Peak^{TDC}**) ONLY. Number of waveforms to average before going to next segment. May assume values between 1 and 65535 (64K – 1) in **AP** units and up to 16777216 for **U1084A** units.
"NbrRoundRobins"	ViInt32	For **AP240/AP235 Averagers** and **AP240/AP235 Peak^{TDC}** ONLY. Number of times to perform the full segment cycle during data accumulation.
"NoiseBaseEnable"	ViInt32	For **Averagers** and **U1084A** (**Averager** or **Peak^{TDC}**) ONLY. 0 = no base subtraction 1 = base subtraction enabled. It can only be enabled if the threshold is enabled, except for the **U1084A Peak^{TDC}** , which does not support threshold.
“MarkerLatchMode”	ViInt32	For **AP240/AP235 Averagers** ONLY. Select on which trigger the Control IO markers are latched. 0= Old behavior on last trigger expect round robin (default) 1= Always on first trigger
“MaxSamplesPerSegment”	ViInt32	The maximum number of actual data samples to be stored per segment, after the zero-suppression is applied. Only samples which are actually retained are counted. Any data above this limit will be truncated.
"P1Control"	ViInt32	0 = not enabled For **AP240/AP235 Averagers** ONLY. 1 = addSub channel 1 2 = addSub channel 2 3 = addSub channel 1 + 2 4 = average trigger enable 5 = start veto enable 6 = average (out) For **AP240/AP235 SSR** ONLY. 1 = Timestamp reset enable
"P2Control"	ViInt32	0 = not enabled For **AP240/AP235 Averagers** ONLY. 1 = addSub channel 1 2 = addSub channel 2 3 = addSub channel 1 + 2 4 = average trigger enable 5 = start veto enable 6 = average (out) For **AP240/AP235 SSR** ONLY. 1 = Timestamp reset enable

"PostSamples"	ViInt32	For **AP240/AP235 SSR**, **U1084A** and **Peak**^{TDC} **Analyzers** in **Threshold Gate** or **Zero-Supress (SSR)** mode. Used to guarantee a number of samples after the last one satisfying the threshold condition. The meaningful values are 0,4,8,12,16. Other values will be rounded up or adapted appropriately.
"PreSamples"	ViInt32	For **AP240/AP235 SSR**, **U1084A** and **Peak**^{TDC} **Analyzers** in **Threshold Gate** or **Zero-Supress (SSR)** mode. Used to guarantee a number of samples before the first one satisfying the threshold condition. The meaningful values are 0,4,8,12,16. Other values will be rounded up or adapted appropriately.
"StartDelay"	ViInt32	Start delay in samples. For **AP** units, may assume values between 0 and 16777200(33554400) in steps of 16 (32) as explained below. The limit is StepSize*(1024*1024-1). For **U1084A** units, may assume values between 0 and 67108864(134217728) in steps of 16 (32) as explained below. The limit is StepSize*(4*1024*1024).
"StartDeltaNegPeak"	ViInt32	For **AP101/AP201 Analyzers** ONLY. Negative excursion needed before searching for negative peak.
"StartDeltaPosPeak"	ViInt32	For **AP101/AP201 Analyzers** ONLY. Positive excursion needed before searching for positive peak. May assume values between 1 and 0xff.
"StartVetoEnable"	ViInt32	For **AP100/AP200 Averagers** ONLY 0 = for trigger enable functionality 1 = use high state of I/O signal to allow the average accumulation to start. Must be used in conjunction with **AcqrsD1_configControlIO**.
"StopDelay "	ViInt32	Stop delay in samples. For **AP** units, may assume values between 0 and 1048560 (2097120) in steps of of 16 (32) as explained below. The limit is StepSize*(64*1024-1). For **U1084A** units, may assume values between 0 and 67108864 (134217728) in steps of of 16 (32) as explained below. The limit is StepSize*(4*1024*1024)
“SyncOnTrigOutSync”	ViInt32	For **U1084A** units ONLY. 0 = No resynchronisation of the acquisition 1 = Resynchronisation of the acquisition to the resynchronized trigger output
"TdcHistogramDepth"	ViInt32	The depth of the histogram for **Peak**^{TDC} mode. 0 = 16-bit accumulation bins. 1 = 32-bit accumulation bins.

"TdcHistogramHorzRes"	ViInt32	The horizontal resolution of the histogram for interpolated peaks in the **Peak**^{TDC} mode. 0 = each bin corresponds to a sampling interval. n = each bin corresponds to ½**n of a sampling interval, n≤4
"TdcHistogramIncrement"	ViInt32	The desired increment to be applied for each entry; 1 = increment by 1, for **SimpleTDC Averager** and **Peak**^{TDC} **Analyzer** modes ONLY. 2 = increment by the ADCvalue – NoiseBase for a **SimpleTDC Averager** and by the ADCvalue for the **Peak**^{TDC} **Analyzer**
"TdcHistogramMode"	ViInt32	The type of histogram for **Peak**^{TDC} mode ONLY. 0 = no histogram. Data only is available for each acquisition. 1 = histogram.
"TdcHistogramVertRes"	ViInt32	The vertical resolution of the histogram for interpolated peaks when the **TDCHistogramIncrement** is 2 in the **Peak**^{TDC} mode. 0 = one LSB of the bin value corresponds to one LSB of the ADC. n = one LSB of the bin value corresponds to ½**n LSB of the ADC, n≤4
"TdcMinTOT"	ViInt32	For **SimpleTDC** mode ONLY. The desired minimum width of a peak in the waveform; It can take on a value (n) from 1 to 4. A peak is accepted if there are at least n consecutive data samples above the Threshold.
"TdcOverlaySegments"	ViInt32	This option controls the horizontal binning of data in the **Peak**^{TDC} histogram mode. 0 = each segment will be histogrammed independently. 1 = all segments will be histogrammed on a common time axis.
"TdcProcessType"	ViInt32	The desired processing for **Peak**^{TDC} mode peak finding. May assume 0 = No processing 1 = Standard peak finding (no interpolation) 2 = Interpolated peaks 3 = 8 sample peak regions for data readout 4 = 16 sample peak regions for data readout
"ThresholdEnable"	ViInt32	For **Averagers** ONLY. May assume 0 (no threshold) and 1 (threshold enabled).
"TimestampClock"	ViInt32	For **Averagers** ONLY. Select the reference source for the Timestamp clock: 0 = PCI 33MHz clock (default) 1 = Internal 10MHz Reference clock
"TrigAlways"	ViInt32	May assume 0 (no trigger output) and 1 (trigger output on), in the case of no acquisition.

"TriggerTimeout"	ViInt32	For **AP101/AP201** ONLY. Trigger timeout in units of 30 ns in the range [0,2^{32} - 1]. A value of 0 means that no trigger will be generated and no *Prepare for Trigger* signal will be needed.
"TrigResync"	ViInt32	May assume 0 (no resync), 1 (resync) and 2 (free run)
"ValidDeltaNegPeak"	ViInt32	For **AP101/AP201** ONLY. Positive excursion needed to validate a negative peak. May assume values between 1 and 0xff.
"ValidDeltaPosPeak"	ViInt32	For **AP101/AP201** ONLY. Negative excursion needed to validate a positive peak. May assume values between 1 and 0xff.

Discussion

The "TrigResync" values 0 and 1 require a valid trigger, while 2 requires no trigger (useful for background acquisition).

Set NbrWaveforms to 1 and NbrRoundRobins to n order to enable the round-robin segment acquisition mode with n triggers for each segment.

The channelNbr is used to designate the channel number for those parameters whose values can be different for the two channels of an AP240/AP235 in dual-channel mode. These parameters are indicated in **bold** in the list above.

The granularity for "NbrSamples","StartDelay", and "StopDelay" is 16 for the AP100/AP101 and the AP240/AP235 in Dual-Channel mode and 32 for the AP200/AP201 and the AP240/AP235 in Single-Channel mode.

???

If P1Control and/or P2Control are enabled for the Add/Subtract mode then the data will be added if the signal, or the OR of both signals, is in the high state. The same rule holds if they are used for trigger enable.

The P1Control/P2Control "average (out)" signal goes high after the first trigger is accepted for an average and drops back down when the last trigger's acquition is complete.

Example

```
long channelNbr = 0, dither = 8;

AcqrsD1_configAvgConfigInt32(ID, channelNbr, "DitherRange", dither);
```

This function sets the dithering range to ± 8 LSB’s.

Note that this function takes value of the parameter to be set, not the the **address**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configAvgConfigInt32(ViSession instrumentID,
                        ViInt32 channelNbr, ViString parameterString,
                        ViInt32 value);
```

LabVIEW Representation

Please use the Acqiris Dx.lvlib: (or Aq Dx) Extended Configure Averager.vi described in **AcqrsD1_configAvgConfig**.

MATLAB MEX Representation

```
[status]= AqD1_configAvgConfigInt32(instrumentID, channel, parameterString, value)
```

AcqrsD1_configAvgConfigReal64

Purpose

Configures a double parameter for averager/analyzer operation.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channelNbr	ViInt32	Channel number. A value = 0 will be treated as =1 for compatibility.
parameterString	ViString	Character string defining the requested parameter. See below for the list of accepted strings.
value	ViReal64	Value to set.

Return Value

Name	Type	Description
status	ViStatus	Refer to Table 2-1 for error codes.

Accepted Parameter Strings

Parameter String	Data Type	Description
"NoiseBase"	ViReal64	For **Averagers** and **U1084A** (**Averager** or **Peak^{TDC}**) ONLY. Value in Volts of the value to be added in Noise Supressed Averaging.
"StartDeltaPosPeakV"	ViReal64	For **Peak^{TDC} mode Analyzers** ONLY. Positive excursion needed before searching for positive peak. Must be positive.
"Threshold"	ViReal64	Value in Volts of the threshold for **Noise Supressed Averaging** or for **SSR** or **Peak^{TDC}** with **Threshold Gates**.
"ValidDeltaPosPeakV"	ViReal64	For **Peak^{TDC} mode Analyzers** ONLY. Negative excursion needed to validate a positive peak. Must be positive.

Discussion

The channelNbr is used to designate the channel number for those parameters whose values can be different for the two channels of an AP240/AP235 in dual-channel mode. These parameters are indicated in **bold** in the list above.

Example

```
long channelNbr = 0;

double thresh = 0.8;

AcqrsD1_configAvgConfigReal64(ID, channelNbr, "DitherRange", thresh);
```

This function sets the NSA threshold to 0.8 V.

Note that this function takes the value of the parameter to be set, not the **address**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configAvgConfigReal64(ViSession instrumentID,
                        ViInt32 channelNbr, ViString parameterString,
                        ViReal64 value);
```

LabVIEW Representation

Please use the Acqiris Dx.lvlib: (or Aq Dx) Extended Configure Averager.vi described in **AcqrsD1_configAvgConfig**.

MATLAB MEX Representation

```
[status]= AqD1_configAvgConfigReal64(instrumentID, channel, parameterString, value)
```

AcqrsD1_configChannelCombination

Purpose

Configures how many converters are to be used for which channels. This routine is for use with some DC271-FAMILY instruments, the 10-bit-FAMILY, the U1071A-FAMILY, the AC/SC240, the U1084A, and the AP240/AP235 Signal Analyzer platforms.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
nbrConvertersPerChannel	ViInt32	= 1 all channels use 1 converter each (default) = 2 half of the channels use 2 converters each = 4 1/4 of the channels use 4 converters each
usedChannels	ViInt32	bit-field indicating which channels are used. See discussion below

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

The acceptable values for 'usedChannels' depend on 'nbrConvertersPerChannel' and on the number of available channels in the digitizer:

A) If 'nbrConvertersPerChannel' = 1, 'usedChannels' must reflect the fact that ALL channels are available for use. It accepts a single value for a given digitizer:

```
'usedChannels' = 0x00000001 if the digitizer has 1 channel
               = 0x00000003  if the digitizer has 2 channels
               = 0x0000000f   if the digitizer has 4 channels
```

B) If 'nbrConvertersPerChannel' = 2, 'usedChannels' must reflect the fact that only half of the channels may be used:

```
'usedChannels'= 0x00000001 use channel 1 on a 2-channel digitizer
              = 0x00000002  use channel 2 on a 2-channel digitizer
              = 0x00000003  use channels 1+2 on a 4-channel digitizer
              = 0x00000005  use channels 1+3 on a 4-channel digitizer
              = 0x00000009  use channels 1+4 on a 4-channel digitizer
              = 0x00000006  use channels 2+3 on a 4-channel digitizer
              = 0x0000000a  use channels 2+4 on a 4-channel digitizer
              = 0x0000000c  use channels 3+4 on a 4-channel digitizer
```

C) If 'nbrConvertersPerChannel' = 4, 'usedChannels' must reflect the fact that only 1 of the channels may be used:

```
'usedChannels'= 0x00000001 use channel 1 on a 4-channel digitizer
              = 0x00000002  use channel 2 on a 4-channel digitizer
              = 0x00000004  use channel 3 on a 4-channel digitizer
              = 0x00000008  use channel 4 on a 4-channel digitizer
```

NOTE: Digitizers which don't support channel combination, always use the default 'nbrConvertersPerChannel' = 1, and the single possible value of 'usedChannels'

NOTE: Changing the channel combination doesn't change the names of the channels; they are always the same.

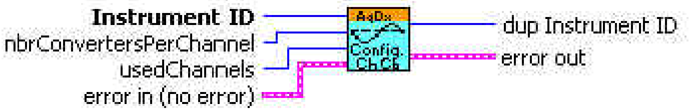
NOTE: If digitizers are combined with AS bus, the channel combination applies equally to all participating digitizers. The use of the word *channel* and the names shown apply to each module of the multi-instrument.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configChannelCombination(
                      ViSession instrumentID,
                      ViInt32 nbrConvertersPerChannel,
                      ViInt32 usedChannels);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Channel Combination.vi



MATLAB MEX Representation

```
[status]= AqD1_configChannelCombination(instrumentID, nbrConvertersPerChannel,
                      usedChannels)
```

Note: The older form Aq_configChannelCombination is deprecated.
Please convert to the newer version.

AcqrsD1_configControlIO

Purpose

Configures a ControlIO connector. (For DC271-FAMILY/AP-FAMILY/12-bit-FAMILY/U1071A-FAMILY/10-bit FAMILY/AC/SC and U1084A only)

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
connector	ViInt32	Connector Number 1 = Front Panel I/O A (MMCX or MCX connector) 2 = Front Panel I/O B (MMCX or MCX connector) 3 = Front Panel I/O C (MCX connector, if present) 9 = Front Panel Trigger Out (MMCX or MCX connector) 11 = PXI Bus 10 MHz (DC135/DC140/DC211/DC211A/DC241/DC241A/DC271/DC271A/DC271AR/DC122/DC152/DC222/DC252/DC282) 12 = PXI Bus Star Trigger (same models as above)
signal	ViInt32	The accepted values depend on the type of connector See the table below for details.
qualifier1	ViInt32	The accepted values depend on the type of connector See the table below for details.
qualifier2	ViReal64	If trigger veto functionality is available (AP101/AP201 only), accepts values between 30 ns and 1.0 sec. The trigger veto values given will be rounded off to steps of 33 ns. A value of 0.0 means that no holdoff is required and no *Prepare for Trigger* signal will be needed.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Accepted Values of *signal* vs. Connector Type

Connector Type	Possible Values of *signal* and *qualifierX*
Front Panel I/O	0 = Disable **Inputs:** 1 = Enable acquisition (for U1084A Averager & PeakTDC Only). 2 = Skip to Next Segment. Forces a jump to the next segment without waiting for a trigger, under the following conditions: a) The digitizer is running and acquiring data for a segment, the pre-trigger acquisition is complete. b) The state of the I/O input is high (the input is not memorize, if it rises or falls outside the above condition it will have no effect). After a skip has occurred, if the I/O remains high then any subsequent segments will be skipped when the above condition occurs. (U1084A and DP214 only) 6 = (Level) Enable trigger input (for Digitizers) If one of the two I/O connectors is set to this value then a high level must be present before an edge can be accepted. If both I/O connectors are set to this value, they both must be high before the trigger edge can be accepted. 6 = (Level) Enable trigger input or Start Veto. (Only for U1081A-001(AP100) and U1081A-003 (AP200) Averagers) See **AcqrsD1_configAvgConfig** for more information. 8 = *Prepare for Trigger* signal present on this connector. *qualifier2* gives the desired holdoff in time. (Only for U1081A-002 / U1081A-004 Analyzers) 9 = *Gate* signal for FC option totalize in gate functionality. (Only for U1061A) 15 = Start Veto (Only for U1084A Averager & PeakTDC). **Outputs:** 19 = (Clock) 10 MHz reference clock (only on I/O A for the U1084A Averager) 20 = (Pulse) Acquisition skips to next segment (in sequence acquisition mode) input (Not for AP240/AP235 Signal Analyzers nor U1084A Averager or PeakTDC). 21 = (Level) Acquisition is active 22 = (Level) Trigger is armed (ready) (Not available for the U1084A Averager or PeakTDC) 31 = Analyzer armed (for U1084A Averager & PeakTDC only). The values of *qualifier1* and *qualifier2* are not used
Front Panel Trigger Out	The value of *signal* is interpreted as a signal offset in mV. E.g. *signal* = -500 offsets the output signal by –500 mV. The accepted range of *signal* is [-2500,2500], i.e. ± 2.5 V with a resolution of ~20 mV. The value of *qualifier1* controls if the trigger output is resynchronized to the clock or maintains a precise timing relation to the trigger input. *qualifier1*= 0 (default): Non-resynchronized *qualifier1*= 1 : Resynchronized to sampling clock
PXI Bus 10 MHz	0 = Disable 1 = Enable Replaces the internal 10 MHz reference clock with the 10 MHz clock on the PXI rear panel connector.

PXI Bus Star Trigger	0 = Disable 1 = Use PXI Bus Star Trigger as Trigger Input 2 = Use PXI Bus Star Trigger for Trigger Output **Note:** When using this connector as Trigger Input, you also must set the trigger source in *sourcePattern* in the function **AcqrsD1_configTrigClass** to External Trigger2!

Discussion

ControlIO connectors are front panel IO connectors for special purpose control functions of the digitizer. Typical examples are user-controlled acquisition control (start/stop/skip) or control output signals such as 'acquisition ready' or 'trigger ready'.

The connector numbers are limited to the allowed values. To find out which connectors are supported by a given module, use the query function **AcqrsD1_getControlIO**.

The variable *signal* specifies the (programmable) use of the specified connector.

In order to set I/O A as a 'Enable Trigger' input and the I/O B as a 10 MHz reference output, use the function calls

```
AcqrsD1_configControlIO(instrID, 1,  6, 0, 0.0);

AcqrsD1_configControlIO(instrID, 2, 19, 0, 0.0);
```

In order to obtain a signal offset of +1.5 V on the Trigger Output, use the call

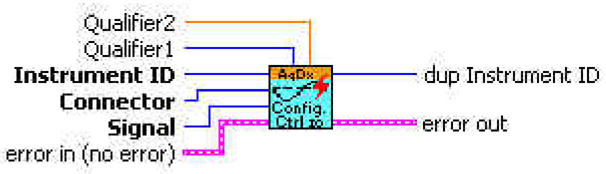
```
AcqrsD1_configControlIO(instrID, 9, 1500, 0, 0.0);
```

Visual C++ Representation

```
ViStatus status = AcqrsD1_configControlIO(ViSession instrumentID, ViInt32 connector,
                       ViInt32 signal, ViInt32 qualifier1, ViReal64 qualifier2);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Control IO Connectors.vi



MATLAB MEX Representation

```
[status]= AqD1_configControlIO(instrumentID, connector, signal, qualifier1, qualifier2)
```

Note: The older form Aq_configControlIO is deprecated.
Please convert to the newer version.

AcqrsD1_configExtClock

Purpose

Configures the external clock of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
clockType	ViInt32	= 0 Internal Clock (default at start-up) = 1 External Clock, continuously running = 2 External Reference (10 MHz) = 4 External Clock, with start/stop sequence
inputThreshold	ViReal64	Input threshold for external clock or reference in mV
delayNbrSamples	ViInt32	Number of samples to acquire after trigger (for digitizers using 'clockType' = 1 only!)
inputFrequency	ViReal64	The input frequency of the external clock, for clockType = 1 only
sampFrequency	ViReal64	The desired Sampling Frequency, for clockType = 1 only

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

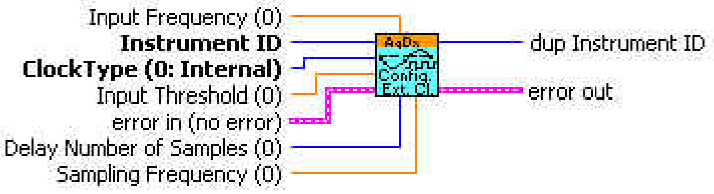
When **clockType** is set to 1 or 4, the parameters of the function **AcqrsD1_configHorizontal** are ignored! Please refer to your product User Manual, for the conditions on the clock signals, and to the **Programmer's Guide** section 3.16**, External Clock**, for the setup parameters and the theory of operation.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configExtClock(ViSession instrumentID, ViInt32 clockType,
                  ViReal64 inputThreshold, ViInt32 delayNbrSamples,
                  ViReal64 inputFrequency, ViReal64 sampFrequency);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure External Clock.vi



MATLAB MEX Representation

```
[status]= AqD1_configExtClock(instrumentID, clockType, inputThreshold, delayNbrSamples,
                  inputFrequency, sampFrequency)
```

Note: The older form Aq_configExtClock is deprecated.
Please convert to the newer version.

AcqrsD1_configFCounter

Purpose

Configures a frequency counter measurement

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
signalChannel	ViInt32	Signal input channel
type	ViInt32	Type of measurement = 0 Frequency (default) = 1 Period (1/frequency) = 2 Totalize by Time = 3 Totalize by Gate
targetValue	ViReal64	User-supplied estimate of the expected value, may be 0.0 if no estimate is available.
apertureTime	ViReal64	Time in sec, during which the measurement is executed, see discussion below.
reserved	ViReal64	Currently ignored
flags	ViInt32	Currently ignored

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

The Frequency mode (type = 0) measures the frequency of the signal applied to the selected ‘signalChannel’ during the aperture time. The default value of ‘apertureTime’ is 0.001 sec and can be set to any value between 0.001 and 1000.0 seconds. A longer aperture time may improve the measurement accuracy, if the (externally applied) reference clock has a high accuracy and/or if the signal slew rate is low.The ‘targetValue’ is a user-supplied estimated of the expected result, and helps in choosing the optimal measurement conditions. If the supplied value is < 1000.0, and > 0.0, then the instrument will not use the HF trigger mode to divide the input frequency. Otherwise, it divides it by 4 in order to obtain a larger frequency range.

The Period mode (type = 1) is similar to the frequency mode, but the function AcqrsD1_readFCounter returns the inverse of the measured frequency. If the ‘targetValue’ is < 0.001 (1 ms), then the instrument will not use the HF trigger mode, otherwise it does.

The Totalize by Time mode (type = 2) counts the number of pulses in the signal applied to the selected ‘signalChannel’ during the time defined by ‘apertureTime’. The ‘targetValue’ is ignored.

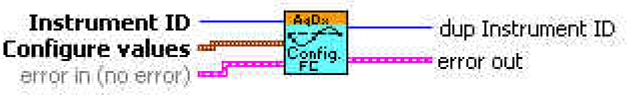
The Totalize by Gate mode (type = 3) counts the number of pulses in the signal applied to the selected ‘signalChannel’ during the time defined by signal at the I/O A or I/O B inputs on the front panel. The gate is open while the signal is high, and closed while the signal is low (if no signal is connected, counting will be enabled, since there is an internal pull-up resistor). The gate may be opened/closed several times during the measurement. The measurement must be terminated with the function **AcqrsD1_stopAcquisition**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configFCounter(ViSession instrumentID,
                  ViInt32 signalChannel, ViInt32 type, ViReal64 targetValue,
                  ViReal64 apertureTime,ViReal64 reserved, ViInt32 flags);
```

LabVIEW Representation

AqDx Configure FCounter.vi



MATLAB MEX Representation

```
[status]= AqD1_configFCounter(instrumentID, signalChannel, typeMes, targetValue,
                  apertureTime, reserved, flags)
```

Note: The older form Aq_configFCounter is deprecated.

Please convert to the newer version.

AcqrsD1_configHorizontal

Purpose

Configures the horizontal control parameters of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
sampInterval	ViReal64	Sampling interval in seconds
delayTime	ViReal64	Trigger delay time in seconds, with respect to the beginning of the record. A positive number corresponds to a trigger *before* the beginning of the record (post-trigger recording). A negative number corresponds to pre-trigger recording. It can't be less than -(sampInterval * nbrSamples), which corresponds to 100% pre-trigger.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

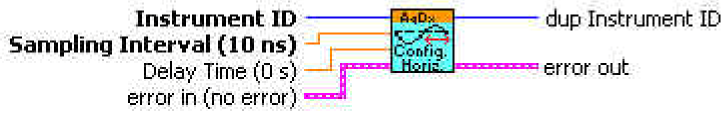
Refer to the **Programmer's Guide** section 3.12, **Trigger Delay and Horizontal Waveform Position**, for a detailed discussion of the value **delayTime**.

Visual C++ Representation

ViStatus status = AcqrsD1_configHorizontal(ViSession instrumentID, ViReal64 sampInterval,
ViReal64 delayTime);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Horizontal Settings.vi



MATLAB MEX Representation

[status]= AqD1_configHorizontal(instrumentID, sampInterval, delayTime)

Note: The older form Aq_configHorizontal is deprecated.

Please convert to the newer version.

AcqrsD1_configMemory

Purpose

Configures the memory control parameters of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
nbrSamples	ViInt32	Nominal number of samples to record (per segment!)
nbrSegments	ViInt32	Number of segments to acquire. 1 corresponds to the normal single-trace acquisition mode.

Return Value

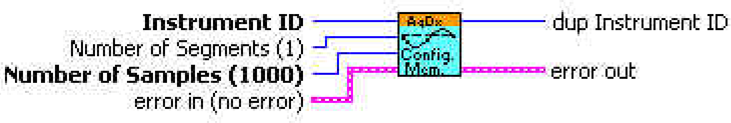
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configMemory(ViSession instrumentID,
                    ViInt32 nbrSamples, ViInt32 nbrSegments);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Memory Settings.vi



MATLAB MEX Representation

```
[status]= AqD1_configMemory(instrumentID, nbrSamples, nbrSegments)
```

Note: The older form Aq_configMemory is deprecated.
Please convert to the newer version.

AcqrsD1_configMemoryEx

Purpose

Extended configuration of the memory control parameters of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
nbrSamplesHi	ViUInt32	Must be set to 0 (reserved for future use)
nbrSamplesLo	ViUInt32	Nominal number of samples to record (per segment)
nbrSegments	ViInt32	Number of segments to acquire. 1 corresponds to the normal single-trace acquisition mode.
nbrBanks	ViInt32	Number of banks to be used for SAR mode
flags	ViInt32	= 0 default memory use = 1 force use of internal memory (digitizers with extended memory options only).

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

This routine is needed to access the new features of some of the digitizers.

The SAR mode should be activated by calling **AcqrsD1_configMode** with the appropriate flags value. The desired number of banks should be set here with the nbrBanks > 1. If the unit has external memory the flags parameter will also have to be set to 1.

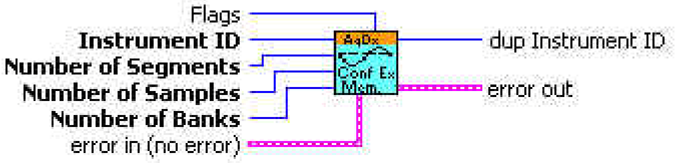
In an instrument equipped with external memory, flags = 1 will force the use of internal memory which give a lower dead time between segments of a sequence acquisition.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configMemoryEx(ViSession instrumentID,
                    ViUInt32 nbrSamplesHi, ViUInt32 nbrSamplesLo,
                    ViInt32 nbrSegments, ViInt32 nbrBanks,
                    ViInt32 flags);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Extended Memory Settings.vi



MATLAB MEX Representation

```
[status]= AqD1_configMemoryEx(instrumentID, nbrSamplesHi, nbrSamplesLo,
                    nbrSegments, nbrBanks, flags)
```

Note: The older form Aq_configMemoryEx is deprecated.
Please convert to the newer version.

AcqrsD1_configMode

Purpose

Configures the operational mode of Averagers and Analyzers and certain special Digitizer acquisition modes

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
mode	ViInt32	0 = normal data acquisition 1 = AC/SC stream data to DPU 2 = averaging mode (only in real-time averagers) 3 = buffered data acquisition (only in AP101/AP201 analyzers) 5 = **Peak**^{TDC} mode for Analyzers with this option. 6 = frequency counter mode 7 = SSR mode (AP235/240)/ Zero-Suppress (U1084) 12 = DDC mode (M9202A) 14 = Custom firmware
modifier	ViInt32	Currently not used, set to 0
flags	ViInt32	If 'mode' = 0, this variable can take these values: 0 = 'normal' (default value) 1 = 'Start on Trigger' mode 2 = 'Sequence Wrap' mode (all digitizers except U1071A-FAMILY and 10-bit-FAMILY) 10 = SAR mode For the U1084A Averager only, if 'mode' = 2, this variable can take the following values: 0 = 'normal' (default value) 10 = dual bank SAR mode For all other modules, this variable is not used if 'mode' = 2 (set to 0). For AP101/AP201 units, if 'mode' = 3, this variable can take these values: 0 = acquire into 1st memory bank 1 = acquire into 2nd memory bank If 'mode' = 7, this flag must take the following values: 0 = for all AP family modules 10 = for the U1084A module

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Note:

After switching operation modes an internal calibration should be performed to ensure that the instrument is operating within specification.

Discussion

Most digitizers only permit the default *mode* = 0. Real-time averagers support the normal data acquisition mode (0) and the averager mode (2). The analyzers (digitizers with buffered acquisition memory) (AP101/AP201 and AP235/AP240 with SSR) support both the normal data acquisition mode (0) *and* the buffered mode (3). AC/SC analyzers support both the normal data acquisition mode (0) *and* the stream data to DPU mode (1)

The normal data acquisition mode (0) supports the following submodes:

- flags = 0: normal digitizer mode
- flags = 1: ‘StartOnTrigger’ mode, whereby data recording only begins after the receipt of a valid trigger. For details, see **Programmer’s Guide** section 3.18, **Special Operating Modes**.
- flags = 2: ‘Sequence Wrap’ mode, whereby a multi-segment acquisition (with ‘nbrSegments’ > 2, when configured with the function **AcqrsD1_configMemory**), does not stop after ‘nbrSegments’, but *wraps around* to zero, indefinitely. Thus, such acquisitions must be stopped with the function **AcqrsD1_stopAcquisition** at the appropriate moment. For details, see **Programmer’s Guide** section 3.18, **Special Operating Modes**.
- flags = 10: SAR mode. This mode allows simultaneous data acquisition and readout and is available on some models only. **AcqrsD1_configMemoryEx** must be used to set the desired number of banks. When SAR mode is active any external memory present is not available.

The averaging mode (2) has the following differences from the default mode (0):

- The function **AcqrsD1_acquire()**: In mode 0, it starts a normal waveform acquisition, whereas in mode 2, it makes the instrument run as a real-time averager.
- The function **AcqrsD1_readData()** with **dataType = ReadReal64**: In mode 0, it returns the last acquired waveform, whereas in mode 2, it returns the averaged waveform (in Volts).

The buffered data acquisition mode (3) and the SSR mode (7) have the following differences from the default mode (0):

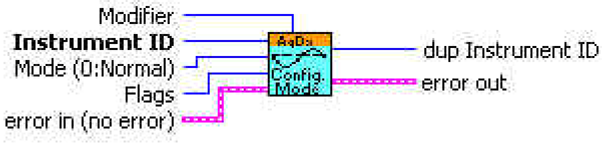
- The function **AcqrsD1_acquire()**: In mode 0, it starts a normal waveform acquisition, whereas in modes 3 or 7, it starts an acquisition into the next memory bank or a special memory bank, as defined by *flags*.
- The functions **AcqrsD1_readData()**: In mode 0, they return the last acquired waveform from the normal acquisition memory, whereas in mode 3, they return data from a memory bank (opposite to what is defined by *flags*).

Visual C++ Representation

```
ViStatus status = AcqrsD1_configMode(ViSession instrumentID,
                  ViInt32 mode, ViInt32 modifier, ViInt32 flags);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Operation Mode.vi



MATLAB MEX Representation

```
[status]= AqD1_configMode(instrumentID, mode, modifier, flags)
```

Note: The older form Aq_configMode is deprecated.

Please convert to the newer version.

AcqrsD1_configMultiInput

Purpose

Selects the active input when there are multiple inputs on a channel. It is useful for Averagers, Analyzers, and some digitizer models.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	1...Nchan
input	ViInt32	= 0 set to input connection A = 1 set to input connection B

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

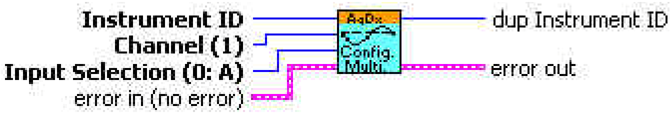
This function is only of use for instruments with an input-multiplexer (i.e. more than 1 input per digitizer, e.g. DP211). On the "normal" instruments with a single input per channel, this function may be ignored.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configMultiInput(ViSession instrumentID,
                  ViInt32 channel, ViInt32 input);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Multiplexer Input.vi



MATLAB MEX Representation

```
[status]= AqD1_configMultiInput(instrumentID, channel, input)
```

Note: The older form Aq_configMultiInput is deprecated.
Please convert to the newer version.

AcqrsD1_configSetupArray

Purpose

Sets the configuration for an array of configuration values. It is useful for Analyzers only.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	1...Nchan
setupType	ViInt32	Type of setup. 0 = GateParameters 2 = U1084A Thresholds
nbrSetupObj	ViInt32	Number of setup objects in the array
setupData	ViAddr	Pointer to an array containing the setup objects ViAddr resolves to void* in C/C++. The user must allocate the appropriate variable type and supply its address as ‘setupData’.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

GateParameters in AqGateParameters (If setupType = 0)

Name	Type	Description
GatePos	ViInt32	Start position of the gate (must be multiple of 4)
GateLength	ViInt32	Length of the gate (must be multiple of 4)

U1084AThresholds in AqThresholdGateParametersU1084A (If setupType = 2)

Name	Type	Description
threshold	ViReal64	Threshold value to use in Volts.
nextThreshSample	ViUInt32	The index of the sample in the segment, at which the Zero-Suppression system should switch to the next threshold in the array.
reseved	ViInt32	Reserved field, must be 0.

Discussion

The user has to take care to allocate sufficient memory for the setupData. nbrSetupObj should not be higher than what the allocated setupData holds.

The SSR option allows up to 4095 gate definitions. The AP101/AP201 analyzers are limited to 64 gate definitions. The U1084A analyser is limited to 128 gate definitions.

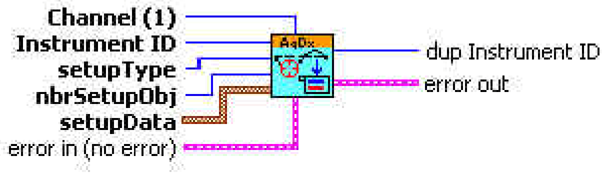
Note: The driver contains a set of 4095(64) default AqGateParameters, defined as { {0,256} {256, 256} {512, 256} {768, 256} ... }.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configSetupArray(ViSession instrumentID,
                        ViInt32 channel, ViInt32 setupType, ViInt32 nbrSetupObj,
                        ViAddr setupData);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Setup Array.vi



MATLAB MEX Representation

```
[status]= AqD1_configSetupArray(instrumentID, channel, setupType, nbrSetupObj, setupData)
```

Note: The older form Aq_configSetupArray is deprecated.

Please convert to the newer version.

AcqrsD1_configTrigClass

Purpose

Configures the trigger class control parameters of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
trigClass	ViInt32	= 0 edge trigger = 1 TV trigger (12-bit-FAMILY External only) = 3 OR (10-bit & U1071A-FAMILIES) = 4 NOR (10-bit & U1071A-FAMILIES) = 5 AND (10-bit & U1071A-FAMILIES) = 6 NAND (10-bit & U1071A-FAMILIES)
sourcePattern	ViInt32	= 0x000n0001 for Channel 1, = 0x000n0002 for Channel 2, = 0x000n0004 for Channel 3, = 0x000n0008 for Channel 4 etc. = 0x800n0000 for External Trigger 1, = 0x400n0000 for External Trigger 2 etc. where n is 0 for single instruments, or the module number for *MultiInstruments* (AS bus operation). See discussion below.
validatePattern	ViInt32	Currently unused, set to “0”
holdType	ViInt32	Currently unused, set to “0”
holdoffTime	ViReal64	Currently unused, set to “0.0”
reserved	ViReal64	Currently unused, set to “0.0”

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

The number of internal (i.e. channel) or external trigger sources of the instrument can be retrieved with the **Acqrs_getInstrumentInfo** function.

For more details on the trigger source pattern in AS bus-connected MultiInstruments, please refer to the **Programmer’s Guide** section 3.17.2, **Trigger Source Numbering with AS bus**.

For configuring the TV trigger see **AcqrsD1_configTrigTV**.

The U1071A-FAMILY OR, NOR, AND, and NAND patterns can be implemented as

sourcePattern = 0x800n0001for Channel 1 + External or
sourcePattern = 0x800n0002for Channel 2 + External.

The 10-bit family OR, NOR, AND, and NAND patterns can be implemented as

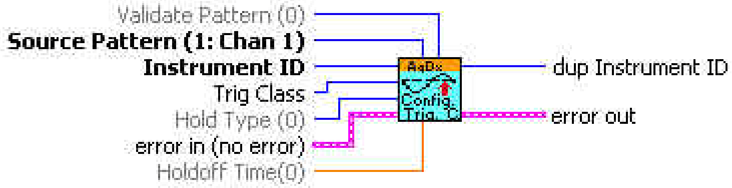
sourcePattern = *0x**8***00n000 ***f***where ***8*** can be either 8 or 0 and ***f*** can be any value between 0 and f consistent with the number of channels available in a single module.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configTrigClass(ViSession instrumentID,
                        ViInt32 trigClass, ViInt32 sourcePattern,
                        ViInt32 validatePattern, ViInt32 holdType,
                        ViReal64 holdoffTime, ViReal64 reserved);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Trigger Class.vi



MATLAB MEX Representation

```
[status]= AqD1_configTrigClass(instrumentID, trigClass, sourcePattern, validatePattern,
                        holdType, holdoffTime, reserved)
```

Note: The older form Aq_configTrigClass is deprecated.

Please convert to the newer version.

AcqrsD1_configTrigSource

Purpose

Configures the trigger source control parameters for the specified trigger source (channel or External).

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	= 1...(Number of IntTrigSources) for internal sources = -1..-(Number of ExtTrigSources) for external sources See discussion below.
trigCoupling	ViInt32	= 0 DC = 1 AC = 2 HF Reject (if available) = 3 DC, 50 Ω (ext. trigger only, if available) = 4 AC, 50 Ω (ext. trigger only, if available)
trigSlope	ViInt32	= 0 Positive = 1 Negative = 2 out of Window = 3 into Window = 4 HF divide = 5 Spike Stretcher
trigLevel1	ViReal64	Trigger threshold in % of the vertical Full Scale of the channel, or in mV if using an External trigger source. See discussion below.
trigLevel2	ViReal64	Trigger threshold 2 (as above) for use when Window trigger is selected

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

The number of internal (i.e. channel) or external trigger sources of the instrument can be retrieved with the function **Acqrs_getInstrumentInfo**. See the **Programmer's Guide** section **AS bus Operation** for additional details on that case.

The allowed range for the trigger threshold depends on the model and the channel chosen. See your product User Manual.

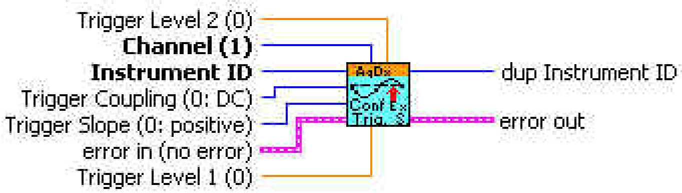
NOTE: Some of the possible states may be unavailable in some digitizers. In particular, the trigCoupling choices of 'DC, 50 Ω' and 'AC, 50 Ω' are only needed for modules that have both 50 Ω and 1 MΩ external input impedance possibilities.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configTrigSource(ViSession instrumentID,
                  ViInt32 channel, ViInt32 trigCoupling,
                  ViInt32 trigSlope, ViReal64 trigLevel1, ViReal64 trigLevel2);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Extended Trigger Source.vi



MATLAB MEX Representation

```
[status]= AqD1_configTrigSource(instrumentID, channel, trigCoupling, trigSlope,
                  trigLevel1, trigLevel2)
```

Note: The older form Aq_configTrigSource is deprecated.

Please convert to the newer version.

AcqrsD1_configTrigTV

Purpose

Configures the TV trigger parameters (12-bit-FAMILY only).

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	= -1..-(Number of ExtTrigSources) for external sources See discussion below.
standard	ViInt32	= 0 625/50/2:1 (PAL or SECAM) = 2 525/60/2:1 (NTSC)
field	ViInt32	= 1 Field 1 - odd = 2 Field 2 - even
line	ViInt32	= line number, depends on the parameters above: For 'standard' = 625/50/2:1 = 1 to 313 for 'field' = 1 = 314 to 625 for 'field' = 2 For 'standard' = 525/60/2:1 = 1 to 263 for 'field' = 1 = 1 to 262 for 'field' = 2

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

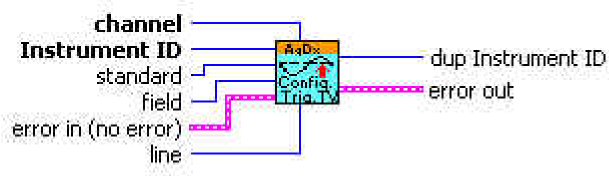
The number of internal (i.e. channel) or external trigger sources of the instrument can be retrieved with the **Acqrs_getInstrumentInfo** function.

Visual C++ Representation

ViStatus status = AcqrsD1_configTrigTV (ViSession instrumentID, ViInt32 channel,
ViInt32 standard, ViInt32 field, ViInt32 line);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Trigger TV.vi



MATLAB MEX Representation

[status]= AqD1_configTrigTV(instrumentID, channel, standard, field, line)

Note: The older form Aq_configMemoryEx is deprecated.

Please convert to the newer version.

AcqrsD1_configVertical

Purpose

Configures the vertical control parameters for a specified channel of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	1...Nchan, or –1,... for the External Input
fullScale	ViReal64	in Volts
offset	ViReal64	in Volts
coupling	ViInt32	= 0 Ground (Averagers ONLY) = 1 DC, 1 MΩ = 2 AC, 1 MΩ = 3 DC, 50 Ω = 4 AC, 50 Ω
bandwidth	ViInt32	= 0 no bandwidth limit (default) = 1 bandwidth limit at 25 MHz = 2 bandwidth limit at 700 MHz = 3 bandwidth limit at 200 MHz = 4 bandwidth limit at 20 MHz = 5 bandwidth limit at 35 MHz

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

For the DC440 and DP310 the coupling input is used to select the signal input: DC, 50 Ω for the Standard input and AC, 50 Ω for the Direct HF input.

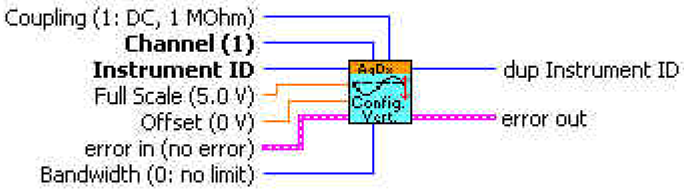
Some instruments have no bandwidth limiting capability. In this case, use **bandwidth** = 0. With **channel** = -1 this function can be used to set the Full Scale Range and the bandwidth limit of the external trigger for the DC271-FAMILY digitizers, the 10-bit-FAMILY, the AC/SC, and the AP240/AP235 signal analyzer platforms. For the case of a 10-bit-FAMILY or DC271-FAMILY MultiInstrument using AS bus, the external triggers of the additional modules are numbered –3, -5, ... following the principles given in the **Programmer's Guide** section 3.17.2, **Trigger Source Numbering with AS bus**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_configVertical(ViSession instrumentID,
                        ViInt32 channel,ViReal64 fullScale,
                        ViReal64 offset, ViInt32 coupling, ViInt32 bandwidth);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure Vertical Settings.vi



MATLAB MEX Representation

```
[status]= AqD1_configVertical(instrumentID, channel, fullScale, offset, coupling, bandwidth)
```

Note: The older form Aq_configVertical is deprecated.

Please convert to the newer version.

AcqrsD1_errorMessage

Purpose

Translates an error code into a human readable form. The new function **Acqrs_errorMessage** is to be preferred.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier can be VI_NULL
errorCode	ViStatus	Error code (returned by a function) to be translated

Output

Name	Type	Description
errorMessage	ViChar [ ]	Pointer to user-allocated string (suggested size 512) into which the error-message text is returned

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

There is no Matlab MEX implementation of this function.

Visual C++ Representation

```
ViStatus status = AcqrsD1_errorMessage(ViSession instrumentID, ViStatus errorCode,
                  ViChar errorMessage[]);
```

LabVIEW Representation

See **Acqrs_errorMessage**

AcqrsD1_errorMessageEx

Purpose

Translates an error code into a human readable form and returns associated information. The new function **Acqrs_errorMessage** is to be preferred.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier can be VI_NULL
errorCode	ViStatus	Error code (returned by a function) to be translated
errorMessageSize	ViInt32	Size of the errorMessage character buffer in bytes (suggested size 512)

Output

Name	Type	Description
errorMessage	ViChar [ ]	Pointer to user-allocated string (suggested size 512) into which the error-message text is returned

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

This function should be called immediately after the return of the error status to ensure that the additional information remains available. For file errors, the returned message will contain the file name and the original 'ansi' error string. This is particularly useful for calls to the following functions:

Acqrs_calibrate	Acqrs_calibrateEx
Acqrs_configLogicDevice	AcqrsD1_configMode
Acqrs_init	Acqrs_InitWithOptions

Visual C++ Representation

```
ViStatus status = AcqrsD1_errorMessageEx(ViSession instrumentID, ViStatus errorCode,
                  ViChar errorMessage[], ViInt32 errorMessageSize);
```

LabVIEW Representation

See **Acqrs_errorMessage**

MATLAB MEX Representation

```
[status errorMessage]= Aq_errorMessage(instrumentID, errorCode)
```

AcqrsD1_forceTrig

Purpose

Forces a *manual* trigger. It should not be used for rs or Analyzers.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

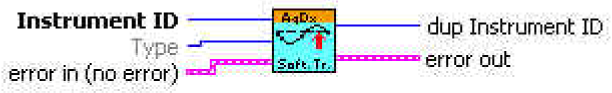
The function returns immediately after ordering the acquisition to stop. One must therefore wait until the acquisition has terminated before reading the data, by checking the status with the function **AcqrsD1_acqDone**. If the external clock is enabled, and there is no clock signal applied to the device, **AcqrsD1_acqDone** will never return **done** = VI_TRUE. Consider using a timeout and calling **AcqrsD1_stopAcquisition** if it occurs. In multisegment mode, the current segment is acquired, the acquisition is terminated and the data and timestamps of subsequent segments are invalid.

Visual C++ Representation

ViStatus status = AcqrsD1_forceTrig(ViSession instrumentID);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Software Trigger.vi



MATLAB MEX Representation

See **AcqrsD1_forceTrigEx**

AcqrsD1_forceTrigEx

Purpose

Forces a *manual* trigger. It should not be used for rs or Analyzers.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
forceTrigType	ViInt32	= 0 Sends a software trigger to end the full acquisition = 1 Sends a single software trigger and generates the TrigOut hardware signal
modifier	ViInt32	Currently not used
flags	ViInt32	Currently not used

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

The function returns immediately after ordering the acquisition to stop. One must therefore wait until the acquisition has terminated before reading the data, by checking the status with the function **AcqrsD1_acqDone**. If the external clock is enabled, and there is no clock signal applied to the device, **AcqrsD1_acqDone** will never return **done** = VI_TRUE. Consider using a timeout and calling **AcqrsD1_stopAcquisition** if it occurs.

For forceTrigType = 0, the 'trigOut' Control IO will NOT generate a trigger output. This mode is equivalent to **AcqrsD1_forceTrig**. In multisegment mode, the current segment is acquired, the acquisition is terminated and the data and timestamps of subsequent segments are invalid.

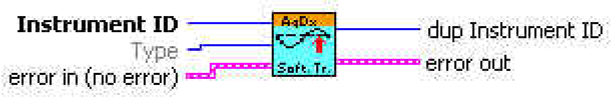
For forceTrigType = 1, 'trigOut' Control IO will generate a trigger output on each successful call. In multisegment mode, the acquisition advances to the next segment and then waits again for a trigger. If no valid triggers are provided to the device, the application must call AcqrsD1_forceTrigEx as many times as there are segments. Every acquired segment will be valid. This mode is only supported for single (i.e. non-AS bus-connected) digitizers (not rs or Analyzers).

Visual C++ Representation

```
ViStatus status = AcqrsD1_forceTrigEx(ViSession instrumentID ,
                          ViInt32 forceTrigType, ViInt32 modifier, ViInt32 flags);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Software Trigger.vi



MATLAB MEX Representation

```
[status]= AqD1_forceTrigEx(instrumentID, forceTrigType, modifier, flags)
```

Note: The older form Aq_forceTrigEx is deprecated.

Please convert to the newer version.

AcqrsD1_freeBank

Purpose

Free current bank during SAR acquisitions.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
reserved	ViInt32	Reserved

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

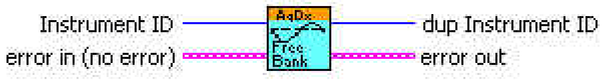
Calling this function indicates to the driver that the current SAR bank has been read and can be reused for a new acquisition. This call should be made after having read all desired data for the bank.

Visual C++ Representation

ViStatus status = AcqrsD1_freeBank(ViSession instrumentID, ViInt32 reserved);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Free Bank.vi



MATLAB MEX Representation

[status]= AqD1_freeBank(instrumentID, reserved)

AcqrsD1_getAvgConfig

Purpose

Returns an attribute from the analyzer/r configuration ***channelNbr***.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channelNbr	ViInt32	Channel number. A value = 0 will be treated as =1 for compatibility.
parameterString	ViString	Character string defining the requested parameter. See **AcqrsD1_configAvgConfig**for the list of accepted strings.

Output

Name	Type	Description
value	ViAddr	Requested information value. ViAddr resolves to void* in C/C++. The user must allocate the appropriate variable type (as listed under **AcqrsD1_configAvgConfig**) and supply its address as 'value'.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

See remarks under **AcqrsD1_configAvgConfig**.

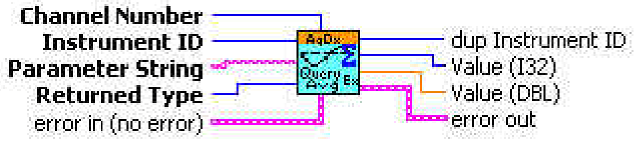
Visual C++ Representation

```
ViStatus status = AcqrsD1_getAvgConfig(ViSession instrumentID,
                  ViInt32 channelNbr, ViString parameterString, ViAddr value);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Extended r Settings.vi

This Vi returns the value as either I32 or DBL. Connect the desired type.



MATLAB MEX Representation

Please use the MEX representation associated with **AcqrsD1_configAvgConfigInt32** or **AcqrsD1_configAvgConfigReal64**.

Note: The older form Aq_getAvgConfig is deprecated.

Please convert to the newer version.

AcqrsD1_getAvgConfigInt32

Purpose

Returns a long attribute from the analyzer/r configuration ***channelNbr***.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channelNbr	ViInt32	Channel number. A value = 0 will be treated as =1 for compatibility.
parameterString	ViString	Character string defining the requested parameter. See **AcqrsD1_configAvgConfigInt32** for the list of accepted strings.

Output

Name	Type	Description
value	ViInt32 *addr	Requested information value.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

See remarks under **AcqrsD1_configAvgConfigInt32**.

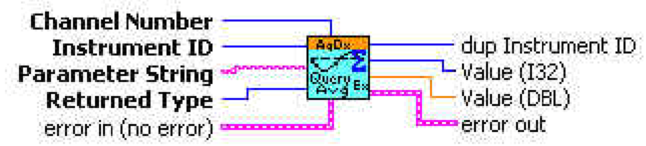
Visual C++ Representation

```
ViStatus status = AcqrsD1_getAvgConfigInt32(ViSession instrumentID,
                  ViInt32 channelNbr, ViString parameterString, ViInt32 *value);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Extended r Settings.vi

This Vi returns the value as either I32 or DBL. Connect the desired type.



MATLAB MEX Representation

```
[status value]= AqD1_getAvgConfigInt32(instrumentID, channel, parameterString)
```

AcqrsD1_getAvgConfigReal64

Purpose

Returns a double attribute from the analyzer/r configuration ***channelNbr***.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channelNbr	ViInt32	Channel number. A value = 0 will be treated as =1 for compatibility.
parameterString	ViString	Character string defining the requested parameter. See **AcqrsD1_configAvgConfigReal64**for the list of accepted strings.

Output

Name	Type	Description
value	ViReal64 *	Requested information value.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

See remarks under **AcqrsD1_configAvgConfigReal64**.

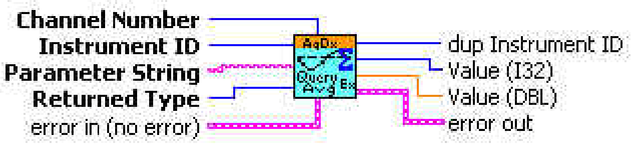
Visual C++ Representation

```
ViStatus status = AcqrsD1_getAvgConfigReal64(ViSession instrumentID,
                  ViInt32 channelNbr, ViString parameterString, ViReal64 *value);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Extended r Settings.vi

This Vi returns the value as either I32 or DBL. Connect the desired type.



MATLAB MEX Representation

```
[status value]= AqD1_getAvgConfigReal64(instrumentID, channel, parameterString)
```

AcqrsD1_getChannelCombination

Purpose

Returns the current channel combination parameters of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
nbrConvertersPerChannel	ViInt32	= 1 all channels use 1 converter each (default) = 2 half of the channels use 2 converters each = 4 1/4 of the channels use 4 converters each
usedChannels	ViInt32	bit-field indicating which channels are used. See discussion below

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

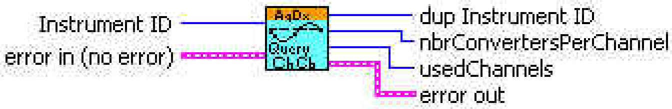
See remarks under **AcqrsD1_configChannelCombination**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getChannelCombination(
                    ViSession instrumentID,
                    ViInt32* nbrConvertersPerChannel,
                    ViInt32* usedChannels);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Channel Combination.vi



MATLAB MEX Representation

```
[status nbrConvertersPerChannel usedChannels]=AqD1_getChannelCombination(instrumentID)
```

Note: The older form Aq_getChannelCombination is deprecated.

Please convert to the newer version.

AcqrsD1_getControlIO

Purpose

Returns the configuration of a ControlIO connector. (For DC271-FAMILY/AP-FAMILY/12-bit-FAMILY/ U1071A-FAMILY/10-bit FAMILY/AC/SC and U1084A only)

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
connector	ViInt32	Connector Number 1 = Front Panel I/O A (MMCX or MCX connector) 2 = Front Panel I/O B (MMCX or MCX connector) 3 = Front Panel I/O C (MCX connector, if present) 9 = Front Panel Trigger Out (MMCX or MCX connector)

Output

Name	Type	Description
signal	ViInt32	Indicates the current use of the specified connector 0 = Disabled, 6 = Enable trigger etc. For a detailed list, see the description of **AcqrsD1_configControlIO**
qualifier1	ViInt32	The returned values depend on the type of connector, see the discussion in **AcqrsD1_configControlIO**
qualifier2	ViReal64	The returned values depend on the module, see the discussion in **AcqrsD1_configControlIO**

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

ControlIO connectors are front panel IO connectors for special purpose control functions of the digitizer. Typical examples are user-controlled acquisition control (trigger enable) or control output signals such as '10 MHz reference' or 'trigger ready'.

The connector numbers are limited to 0 and the supported values. To find out which connectors are supported by a given module, use this function with connector = 0:

```
AcqrsD1_getControlIO(instrID, 0, &ctrlIOPattern, NULL, NULL);
```

In this case, the returned value of *signal* is the bit-coded list of the *connectors* that are available in the digitizer. E.g. If the connectors 1 (I/O A), 2 (I/O B) and 9 (TrigOut) are present, the bits 1, 2 and 9 of *signal* are set, where bit 0 is the LSbit and 31 is the MSbit.

Thus, the low order 16 bits of *signal* (or *ctrlIOPattern* in the example above) would be equal to 0x206.

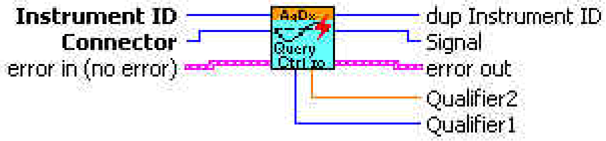
The DC271-FAMILY, 10-bit-FAMILY, AP-FAMILY, U1071A-FAMILY, 12-bit-FAMILY, and AC/SC cards support the connectors 1 (front panel I/O A MMCX coax), 2 (front panel I/O B MMCX coax) and 9 (front panel Trig Out MMCX coax).

Visual C++ Representation

```
ViStatus status = AcqrsD1_getControlIO(ViSession instrumentID,
                        ViInt32 connector, ViInt32* signal,
                        ViInt32* qualifier1, ViReal64* qualifier2);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Control IO Connectors.vi



MATLAB MEX Representation

```
[status signal qualifier1 qualifier2]= AqD1_getControlIO(instrumentID, connector)
```

Note: The older form Aq_getControlIO is deprecated.

Please convert to the newer version.

AcqrsD1_getExtClock

Purpose

Returns the current external clock control parameters of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
clockType	ViInt32	= 0 Internal Clock (default at start-up) = 1 External Clock, continuously running = 2 External Reference (10 MHz) = 4 External Clock, with start/stop sequence
inputThreshold	ViReal64	Input threshold for external clock or reference in mV
delayNbrSamples	ViInt32	Number of samples to acquire after trigger , for 'clockType' = 1 only!
inputFrequency	ViReal64	The presumed input frequency of the external clock, for clockType = 1 only
sampFrequency	ViReal64	The desired Sampling Frequency, for clockType = 1 only

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

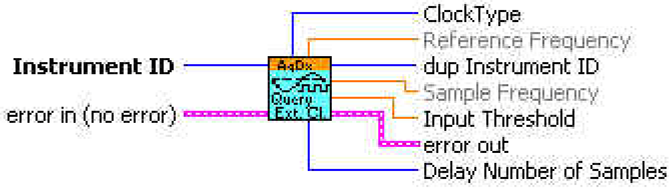
See remarks under **AcqrsD1_configExtClock**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getExtClock(ViSession instrumentID,
                  ViInt32* clockType, ViReal64* inputThreshold,
                  ViInt32* delayNbrSamples, ViReal64* inputFrequency,
                  ViReal64* sampFrequency);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query External Clock.vi



MATLAB MEX Representation

```
[status clockType inputThreshold delayNbrSamples inputFrequency sampFrequency]=
                  AqD1_getExtClock(instrumentID)
```

Note: The older form Aq_getExtClock is deprecated.

Please convert to the newer version.

AcqrsD1_getFCounter

Purpose

Returns the current frequency counter configuration

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
signalChannel	ViInt32	Signal input channel
type	ViInt32	Type of measurement = 0 Frequency (default) = 1 Period (1/frequency) = 2 Totalize by Time = 3 Totalize by Gate
targetValue	ViReal64	User-supplied estimate of the expected value
apertureTime	ViReal64	Time in sec, during which the measurement is executed
reserved	ViReal64	Currently ignored
flags	ViInt32	Currently ignored

Return Value

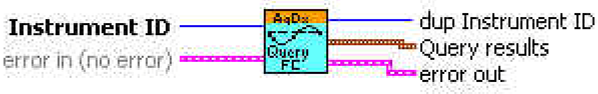
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getFCounter(ViSession instrumentID,
                        ViInt32* signalChannel, ViInt32* type, ViReal64* targetValue,
                        ViReal64* apertureTime, ViReal64* reserved, ViInt32* flags);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query FCounter.vi



MATLAB MEX Representation

```
[status signalChannel typeMes targetValue apertureTime reserved flags]=
                        AqD1_getFCounter(instrumentID)
```

Note: The older form Aq_getFCounter is deprecated.

Please convert to the newer version.

AcqrsD1_getHorizontal

Purpose

Returns the current horizontal control parameters of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
sampInterval	ViReal64	Sampling interval in seconds
delayTime	ViReal64	Trigger delay time in seconds

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

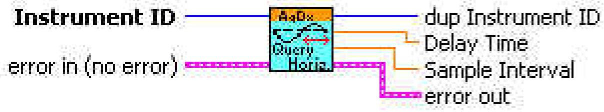
See remarks under **AcqrsD1_configHorizontal**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getHorizontal(ViSession instrumentID, ViReal64* sampInterval,
                    ViReal64* delayTime);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Horizontal Settings.vi



AcqrsD1_getMemory

Purpose

Returns the current memory control parameters of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
nbrSamples	ViInt32	Nominal number of samples to record (per segment!)
nbrSegments	ViInt32	Number of segments to acquire. 1 corresponds to the normal single-trace acquisition mode.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

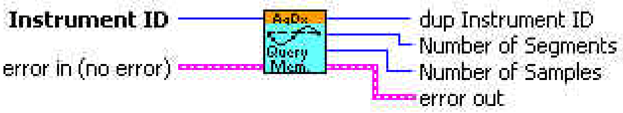
See remarks under **AcqrsD1_configMemory**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getMemory(ViSession instrumentID,
                         ViInt32* nbrSamples, ViInt32* nbrSegments);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Memory Settings.vi



MATLAB MEX Representation

```
[status nbrSamples nbrSegments] = AqD1_getMemory(instrumentID)
```

Note: The older form Aq_getMemory is deprecated.

Please convert to the newer version.

AcqrsD1_getMemoryEx

Purpose

Returns the current extended memory control parameters of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
nbrSamplesHi	ViUInt32	Will be set to 0 (reserved for future use)
nbrSamplesLo	ViUInt32	Nominal number of samples to record (per segment!)
nbrSegments	ViInt32	Number of segments to acquire. 1 corresponds to the normal single-trace acquisition mode.
nbrBanks	ViInt32	Number of banks to be used for 10-bit-FAMILY & U1071A-FAMILY SAR mode
flags	ViInt32	= 0 default memory use = 1 force use of internal memory (for 10-bit-FAMILY & U1071A-FAMILY digitizers with extended memory options only).

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

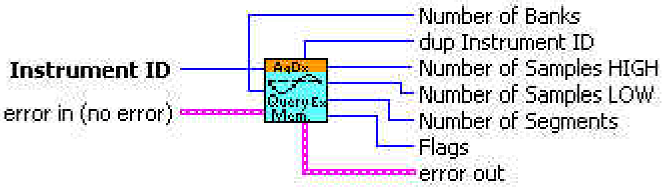
See remarks under **AcqrsD1_configMemoryEx**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getMemoryEx(ViSession instrumentID,
                  ViUInt32* nbrSamplesHi, ViUInt32* nbrSamplesLo,
                  ViInt32* nbrSegments, ViInt32* nbrBanks, ViInt32* flags);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Extended Memory Settings.vi



MATLAB MEX Representation

```
[status nbrSamplesHi nbrSamplesLo nbrSegments nbrBanks flags]=
                  AqD1_getMemoryEx(instrumentID)
```

Note: The older form Aq_getMemoryEx is deprecated.

Please convert to the newer version.

AcqrsD1_getMode

Purpose

Returns the current operational mode of the digitizer

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
mode	ViInt32	Operational mode
modifier	ViInt32	Modifier, currently not used
flags	ViInt32	Flags

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

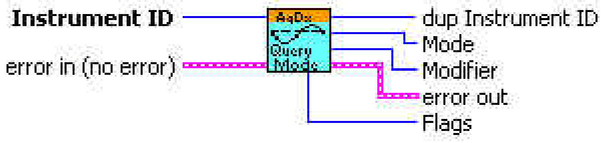
See remarks under **AcqrsD1_configMode.**

Visual C++ Representation

```
ViStatus status = AcqrsD1_getMode(ViSession instrumentID,
                  ViInt32* mode, ViInt32* modifier, ViInt32* flags);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Operation Mode.vi



MATLAB MEX Representation

```
[status mode modifiers flags] = AqD1_getMode(instrumentID)
```

Note: The older form Aq_getMode is deprecated.

Please convert to the newer version.

AcqrsD1_getMultiInput

Purpose

Returns the multiple input configuration on a channel.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	1...Nchan

Output

Name	Type	Description
input	ViInt32	= 0 input connection A = 1 input connection B

Return Value

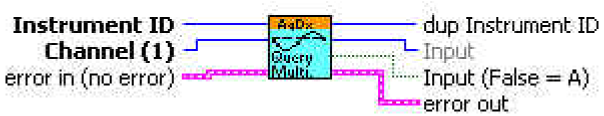
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

This function is only of use for instruments with an input-multiplexer (i.e. more than 1 input per digitizer, e.g. DP211). On the "normal" instruments with a single input per channel, this function may be ignored.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getMultiInput(ViSession instrumentID,
                   ViInt32 channel, ViInt32* input);
```



MATLAB MEX Representation

```
[status input] = AqD1_getMultiInput(instrumentID, channel)
```

Note: The older form Aq_getMultiInput is deprecated.

Please convert to the newer version.

AcqrsD1_getSetupArray

Purpose

Returns an array of configuration parameters. It is useful for Analyzers only.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	1...Nchan
setupType	ViInt32	Type of setup. 0 = GateParameters
nbrSetupObj	ViInt32	Maximum allowed number of setup objects in the output.

Output

Name	Type	Description
setupData	ViAddr	Pointer to an array for the setup objects ViAddr resolves to void* in C/C++. The user must allocate the appropriate array and supply its address as 'setupData'
nbrSetupObj-Returned	ViInt32	Number of setup objects returned

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

AqGateParameters

Name	Type	Description
GatePos	ViInt32	Start position of the gate
GateLength	ViInt32	Length of the gate

U1084AThresholds

Name	Type	Description
threshold	ViReal64	Threshold value to use in Volts.
nextThreshSample	ViUInt32	The index of the sample in the segment, at which the Zero-Suppression system should switch to the next threshold in the array.
reseved	ViInt32	Reserved field, must be 0.

Discussion

For the object definition refer to **AcqrsD1_configSetupArray**. If **AcqrsD1_getSetupArray** is called without having set the Parameters before, the default values will be returned.

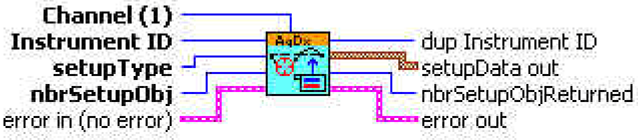
Note: The driver contains a set of 64 default AqGateParameters, defined as { {0,256} {256, 256} {512, 256} {768, 256} ... }.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getSetupArray(ViSession instrumentID, ViInt32 channel,
                  ViInt32 setupType, ViInt32 nbrSetupObj,
                  ViAddr setupData, ViInt32* nbrSetupObjReturned);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Setup Array.vi



MATLAB MEX Representation

```
[status setupData nbrSetupObjReturned] = AqD1_getSetupArray(instrumentID,
                  channel,setupType, nbrSetupObj)
```

Note: The older form Aq_getSetupArray is deprecated.

Please convert to the newer version.

AcqrsD1_getTrigClass

Purpose

Returns the current trigger class control parameters of the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
trigClass	ViInt32	= 0 edge trigger = 1 TV trigger (12-bit-FAMILY External only) = 3 OR (10-bit & U1071A-FAMILIES) = 4 NOR (10-bit & U1071A-FAMILIES) = 5 AND (10-bit & U1071A-FAMILIES) = 6 NAND (10-bit & U1071A-FAMILIES)
sourcePattern	ViInt32	= 0x000n0001 for Channel 1, = 0x000n0002 for Channel 2, = 0x000n0004 for Channel 3, = 0x000n0008 for Channel 4 etc. = 0x800n0000 for External Trigger 1, = 0x400n0000 for External Trigger 2 etc. where n is 0 for single instruments, or the module number for MultiInstruments (AS bus operation). See discussion below.
validatePattern	ViInt32	Currently returns "0"
holdType	ViInt32	Currently returns "0"
holdoffTime	ViReal64	Currently returns "0"
reserved	ViReal64	Currently returns "0"

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

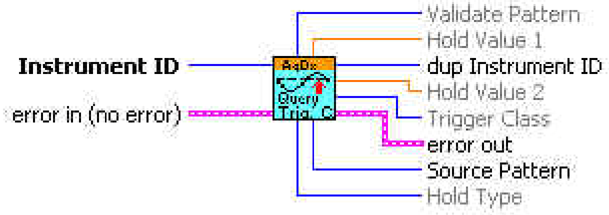
See remarks under **AcqrsD1_configTrigClass**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getTrigClass(ViSession instrumentID,
                        ViInt32* trigClass,
                        ViInt32* sourcePattern, ViInt32* validatePattern,
                        ViInt32* holdType, ViReal64* holdoffTime, ViReal64* reserved);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Trigger Class.vi



MATLAB MEX Representation

```
[status trigClass sourcePattern validatePattern holdType holdoffTime reserved] =
                        AqD1_getTrigClass(instrumentID)
```

Note: The older form Aq_getTrigClass is deprecated.

Please convert to the newer version.

AcqrsD1_getTrigSource

Purpose

Returns the current trigger source control parameters for a specified channel.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	= 1...(Number of IntTrigSources) for internal sources = -1..-(Number of ExtTrigSources) for external sources See discussion below.

Output

Name	Type	Description
trigCoupling	ViInt32	= 0 DC = 1 AC = 2 HF Reject = 3 DC, 50 W = 4 AC, 50 W
trigSlope	ViInt32	= 0 Positive = 1 Negative = 2 out of Window = 3 into Window = 4 HF divide = 5 Spike Stretcher
trigLevel1	ViReal64	Trigger threshold in % of the vertical Full Scale of the channel, or in mV if using an External trigger source. See discussion below.
trigLevel2	ViReal64	Trigger threshold 2 (as above) for use when Window trigger is selected

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

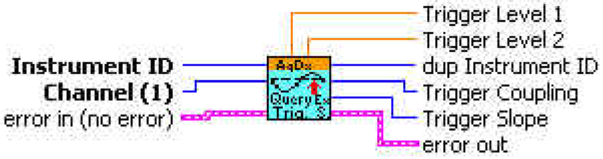
See remarks under **AcqrsD1_configTrigSource**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getTrigSource(ViSession instrumentID,
                  ViInt32 channel, ViInt32* trigCoupling,
                  ViInt32* trigSlope, ViReal64* trigLevel1, ViReal64* trigLevel2);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Extended Trigger Source.vi



MATLAB MEX Representation

```
[status trigCoupling trigSlope trigLevel1 trigLevel2] =
                  AqD1_getTrigSource(instrumentID, channel)
```

Note: The older form Aq_getTrigSource is deprecated.

Please convert to the newer version.

AcqrsD1_getTrigTV

Purpose

Returns the current TV trigger parameters (12-bit-FAMILY only).

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	= -1..-(Number of ExtTrigSources) for external sources See discussion below.

Output

Name	Type	Description
standard	ViInt32	= 0 625/50/2:1 (PAL or SECAM) = 2 525/60/2:1 (NTSC)
field	ViInt32	= 1 Field 1 - odd = 2 Field 2 - even
line	ViInt32	= line number, depends on the parameters above: For 'standard' = 625/50/2:1 = 1 to 313 for 'field' = 1 = 314 to 625 for 'field' = 2 For 'standard' = 525/60/2:1 = 1 to 263 for 'field' = 1 = 1 to 262 for 'field' = 2

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

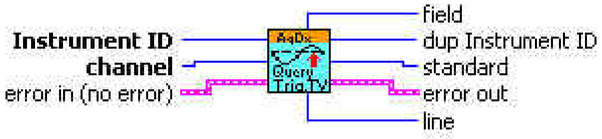
See discussion under **AcqrsD1_configTrigTV**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getTrigTV (ViSession instrumentID,
                        ViInt32 channel, ViInt32* standard,
                        ViInt32* field, ViInt32* line);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Trigger TV.vi



MATLAB MEX Representation

```
[status standard field line] = AqD1_getTrigTV(instrumentID, channel)
```

Note: The older form Aq_getTrigTV is deprecated.

Please convert to the newer version.

AcqrsD1_getVertical

Purpose

Returns the vertical control parameters for a specified channel in the digitizer.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	1...Nchan, or –1,... for the External Input

Output

Name	Type	Description
fullScale	ViReal64	in Volts
offset	ViReal64	in Volts
coupling	ViInt32	= 1 DC, 1 MW = 2 AC, 1 MW = 3 DC, 50 W = 4 AC, 50 W
bandwidth	ViInt32	= 0 no bandwidth limit (default) = 1 bandwidth limit at 25 MHz = 2 bandwidth limit at 700 MHz = 3 bandwidth limit at 200 MHz = 4 bandwidth limit at 20 MHz = 5 bandwidth limit at 35 MHz

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

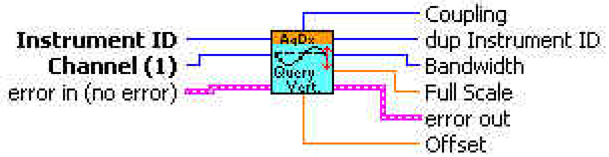
See remarks under **AcqrsD1_configVertical**.

Visual C++ Representation

```
ViStatus status = AcqrsD1_getVertical(ViSession instrumentID,
                        ViInt32 channel, ViReal64* fullScale,
                        ViReal64* offset, ViInt32* coupling, ViInt32* bandwidth);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Vertical Settings.vi



MATLAB MEX Representation

```
[status fullScale offset coupling bandwidth] = AqD1_getVertical(instrumentID, channel)
```

Note: The older form Aq_getVertical is deprecated.

Please convert to the newer version.

AcqrsD1_multiInstrAutoDefine

Purpose

Automatically initializes all digitizers and combines as many as possible to *MultiInstruments*. Digitizers are only combined if they are physically connected via AS bus.

Parameters

Input

Name	Type	Description
optionsString	ViString	ASCII string which specifies options. Currently no options are supported.

Output

Name	Type	Description
nbrInstruments	ViInt32	Number of user-accessible instruments. It also includes single instruments that don't participate on the AS bus.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

This call must be followed by **nbrInstruments** calls to the functions **Acqrs_init** or **Acqrs_InitWithOptions** to retrieve the **instrumentID** of the (multi)digitizers.

In the case of multiple processes accessing the Agilent Acqiris instruments, this function will return the number of currently available instruments. If an instrument has already been initialized in another process, it will not be available unless it has been suspended via a call to Acqrs_suspendControl.

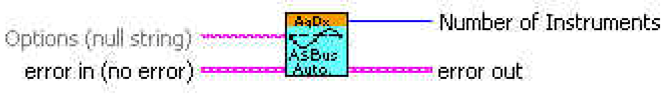
You should refer to to the **Programmer's Guide** section 3.2, **Device Initialization**, for a detailed explanation on the initialization procedure.

Visual C++ Representation

```
ViStatus status = AcqrsD1_multiInstrAutoDefine(ViString optionsString,
                  ViInt32* nbrInstruments);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) MultiInstrument Auto Define.vi



MATLAB MEX Representation

```
[status nbrInstruments] = AqD1_multiInstrAutoDefine(optionsString)
```

Note: The older form Aq_multiInstrAutoDefine is deprecated.

Please convert to the newer version.

AcqrsD1_multiInstrDefine

Purpose

This function defines the combination of a number of digitizers connected by AS bus into a single *MultiInstrument*. It is not applicable to AS bus 2 modules.

Parameters

Input

Name	Type	Description
instrumentList	ViSession [ ]	Array of 'instrumentID' of already initialized single digitizers
nbrInstruments	ViInt32	Number of digitizers in the 'instrumentList'
masterID	ViSession	'instrumentID' of master digitizer

Output

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

You should refer to to the **Programmer's Guide** section 3.2, **Device Initialization,** for a detailed explanation on the initialization procedure.

The function returns the error code ACQIRIS_ERROR_MODULES_NOT_ON_SAME_BUS if all modules in the **instrumentList** are not on the same bus.

It may also return the error codes ACQIRIS_ERROR_NOT_ENOUGH_DEVICES or ACQIRIS_ERROR_NO_MASTER_DEVICE, when **nbrInstruments** is < 2 or the **masterID** is not one of the values in the **instrumentList**.

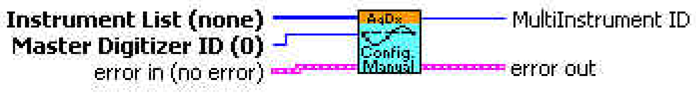
This function should only be used if the choices of the automatic initialization function **AcqrsD1_multiInstrAutoDefine** must be overridden. If the function executes successfully, the **instrumentID** presented in the **instrumentList** cannot be used anymore, since they represent individual digitizers that have become part of the new *MultiInstrument*, identified with newly returned **instrumentID**. Please refer to the **Programmer's Guide** section 3.2.8, **Manual Definition of MultiInstruments** for more information.

Visual C++ Representation

```
ViStatus status = AcqrsD1_multiInstrDefine(ViSession instrumentList[],
                  ViInt32 nbrInstruments, ViSession masterID, ViSession* instrumentID);
```

LabView Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure MultiInstrument Manual Define.vi



MATLAB MEX Representation

```
[status instrumentID] = AqD1_multiInstrDefine(instrumentList, nbrInstruments, masterID)
```

Note: The older form Aq_multiInstrDefine is deprecated.

Please convert to the newer version.

AcqrsD1_multiInstrUndefineAll

Purpose

Undefines all *MultiInstruments*.

Parameters

Input

Name	Type	Description
optionsString	ViString	ASCII string which specifies options. Currently no options are supported.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

You should refer to to the **Programmer's Guide** section 3.2, **Device Initialization**, for a detailed explanation on the initialization procedure.

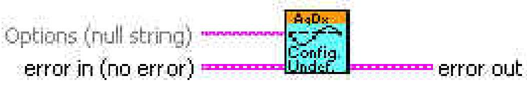
This function is almost never needed, except if you want to dynamically redefine *MultiInstruments* with the aid of the function **AcqrsD1_multiInstrDefine**. If the function executes successfully, the **instrumentID** of the previously defined *MultiInstruments* cannot be used anymore. You must either have remembered the **instrumentID** of the single instruments that made up the *MultiInstruments*, or you must reestablish all **instrumentIDs** of all digitizers by reinitializing with the code shown in the **Programmer's Guide** section 3.2.1, **Identification by Order Found**.

Visual C++ Representation

ViStatus status = AcqrsD1_multiInstrUndefineAll(ViString optionsString);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Configure MultiInstrument Undefine.vi



MATLAB MEX Representation

[status] = AqD1_multiInstrUndefineAll(optionsString)

Note: The older form Aq_multiInstrUndefineAll is deprecated.

Please convert to the newer version.

AcqrsD1_procDone

Purpose

Checks if the on-board data processing has terminated. This routine is for Analyzers only.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
done	ViBoolean	done = VI_TRUE if the processing is terminated VI_FALSE otherwise

Return Value

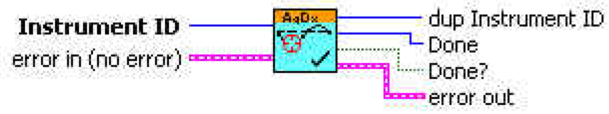
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

```
ViStatus status = AcqrsD1_procDone(ViSession instrumentID,
                        ViBoolean* done);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Process Done.vi



MATLAB MEX Representation

```
[status done] = AqD1_procDone(instrumentID)
```

Note: The older form Aq_procDone is deprecated.
Please convert to the newer version.

AcqrsD1_processData

Purpose

Starts on-board data processing on acquired data in the current bank as soon as the current acquisition terminates. It can also be used to allow the following acquisition to be started as soon as possible. This routine is for AP Analyzers only.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
processType	ViInt32	Type of processing 0 = no processing (or other Analyzers) and for **AP101/AP201 ONLY** 1 = gated peak detection, extrema mode 2 = gated peak detection, hysteresis mode 3 = interpolated peaks, extrema mode 4 = interpolated peaks, hysteresis mode And for **AP Peak**^{TDC} Analyzers 0 = respect the settings done with **AcqrsD1_configAvgConfig** 1 = gated peak detection with hystersis 2 = gated and interpolated peak detection with hysteresis 3 = gated peak detection with 8-point peak region 4 = gated peak detection with 16-point peak region
flags	ViInt32	Autoswitch functionality 0 = do (re-)processing in same bank 1 = start the next acquisition in the other bank 2 = switch banks but do not start next acquisition

Return Value

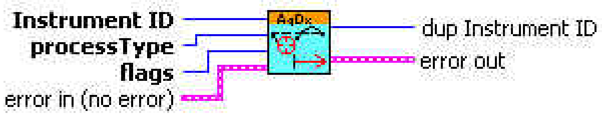
Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Visual C++ Representation

```
ViStatus status = AcqrsD1_processData(ViSession instrumentID,
                    ViInt32 processType, ViInt32 flags);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Process Data.vi



MATLAB MEX Representation

```
[status] = AqD1_processData(instrumentID, processType, flags)
```

Note: The older form Aq_processData is deprecated.

Please convert to the newer version.

AcqrsD1_readData

Purpose

Returns all waveform information. The sample data is returned in an array whose type is specified in the **AqReadParameters** structure.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
channel	ViInt32	1...Nchan
readPar	AqReadParameters	Requested parameters for the acquired waveform.

Output

Name	Type	Description
dataArray	ViAddr	User-allocated waveform destination array. The array size restrictions are given below. ViAddr resolves to void* in C/C++.
dataDesc	AqDataDescriptor	Waveform descriptor structure, containing waveform information that is common to all segments.
segDescArray	ViAddr	Segment descriptor structure array, containing data that is specific for each segment. The size of the array is defined by nbrSegments and the type by readMode.If readMode =4 there are no segment descriptors.

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Read Parameters in AqReadParameters

Name	Type	Description
dataType	ViInt32	Type representation of the waveform 0 = 8-bit ((ViInt8) = 1 byte 1 = 16-bit (ViInt16) = 2 bytes 2 = 32-bit (ViInt32/ViUInt32) = 4 bytes 3 = 64-bit (ViReal64) = 8 bytes

readMode	ViInt32	readout mode of the digitizer 0 = standard waveform (single segment only) 1 = image read for sequence waveform 2 = d waveform (from an r ONLY) 3 = gated waveform (from an AP101/AP201 ONLY) 4 = peaks (from an AP101/AP201 or AP **Peak**^{TDC}) 5 = short d waveform (from an AP r) 6 = shifted short d waveform (from an AP r) 7 = gated data from an SSR or AP **Peak**^{TDC} Analyzer 9 = **Peak**^{TDC} Histogram readout from an Analyzer 10 = **Peak**^{TDC} Peak region readout from an AP Analyzer 11 = raw sequence waveform read
firstSegment	ViInt32	Requested first segment number, may assume 0 to the (number of segments – 1).
nbrSegments	ViInt32	Requested number of segments, may assume 1 to the actual number of segments.
firstSampleInSeg	ViInt32	Requested position of first sample to read, typically 0. May assume 0 to the actual (number of samples – 1).
nbrSamplesInSeg	ViInt32	Requested number of samples, may assume 1 to the actual number of samples.
segmentOffset	ViInt32	ONLY used for readMode = 1 in DIGITIZERS and nowhere else: Requested offset, in number of samples, between adjacent segments in the destination buffer dataArray. Must be ³ nbrSamplesInSeg
dataArraySize	ViInt32	Number of bytes in the user-allocated dataArray. Used for verification / protection.
segDescArraySize	ViInt32	Number of bytes in the user-allocated segDescArray. Used for verification / protection.
flags	ViInt32	For AP Averagers: Bit 2 controls wether the accumulated data is reset after being read. Bit 2 = 0 : Data is reset after being read. Bit 2 = 1 : Data is not reset. AcqirisDataTypes.h contains AqReadDataFlags an enum which encodes the above values.
reserved	ViInt32	Reserved for future use, set to 0.
reserved2	ViReal64	Reserved for future use, set to 0.
reserved3	ViReal64	Reserved for future use, set to 0.

Segment Descriptor for Normal Waveforms (readMode = 0,1,3) in AqSegmentDescriptor

Name	Type	Description
horPos	ViReal64	Horizontal position of first data point.
timeStampLo timeStampHi	ViUInt32 ViUInt32	Low and high part of the 64-bit trigger timestamp. See discussion below.

Segment Descriptor for d Waveforms (readMode = 2,5,6) in AqSegmentDescriptorAvg

Name	Type	Description
horPos	ViReal64	Horizontal position of first data point.
timeStampLo timeStampHi	ViUInt32 ViUInt32	Low and high part of the 64-bit trigger timestamp. See discussion below.
actualTriggersInSeg	ViUInt32	Number of actual triggers acquired in this segment
avgOvfl	ViInt32	Acquisition overflow. See discussion below.
avgStatus	ViInt32	depth and status. See discussion below.
avgMax	ViInt32	Max value in the sequence. See discussion below.
flags	ViUInt32	The lowest four bits contain the hardware marker values. For AP Averagers, these are: Bit 0 (LSB) = P1, Bit 1 = P2 Bit 2 = I/O A Bit 3 = I/O B The marker is set at the last trigger, in the first round of the acquisition of the segment. For U1084A in Averager mode, these are: Bit 0 (LSB) = SSR bank, Bit 1 = I/O A Bit 2= I/O B, Bit 3 (MSB) = I/O C
reserved	ViInt32	Reserved for future use

Segment Descriptor for Raw Sequence Waveforms (readMode = 11) in AqSegmentDescriptorSeqRaw

Name	Type	Description
horPos	ViReal64	Horizontal position of first data point.
timeStampLo timeStampHi	ViUInt32 ViUInt32	Low and high part of the 64-bit trigger timestamp. See discussion below.
indexFirstPoint	ViUInt32	Pointer to first sample of this segment
actualSegmentSize	ViUInt32	Actual segment size, for the size of the circular buffer
reserved	ViInt32	Reserved for future use

Data Descriptor in AqDataDescriptor

Name	Type	Description
returnedSamplesPerSeg	ViInt32	Total number of data samples actually returned. DataArray[indexFirstPoint]... DataArray[indexFirstPoint+ returnedSamplesPerSeg-1]
indexFirstPoint	ViInt32	Offset of the first valid data point, that of the first sample, in the destination array. It should always be in the range [0...31]. It is not an offset in bytes but rather and index in units of samples that may occupy more than one byte.
sampTime	ViReal64	Sampling interval in seconds.
vGain	ViReal64	Vertical gain in Volts/LSB. See discussion below.
vOffset	ViReal64	Vertical offset in Volts. See discussion below.
returnedSegments	ViInt32	Number of segments
nbrAvgWforms	ViInt32	Number of d waveforms (nominal) in segment
actualTriggersInAcqLo actualTriggersInAcqHi	ViUInt32 ViUInt32	Low and high part of the 64-bit count of the number of triggers taken for the entire acquisition
actualDataSize	ViUInt32	Actual length in bytes used at dataArray. This value is only returned for SSR and **Peak**$^{\text{TDC}}$ Analyzers.
reserved2	ViInt32	Reserved for future use
reserved3	ViReal64	Reserved for future use

Discussion

All structures used in this function can be found in the header file **AcqirisDataTypes.h**. This file also contains **enum** definitions for the allowed values of the members of the **AqReadParameters** structure.

The type of the **dataArray** is determined from the **AqReadParameters** struct entry **dataType**.

Remember to set all values of the **AqReadParameters** structure, including the reserved values.

The following **dataType** and **readMode** combinations are supported:

	0 = standard	1 = image	2 = d	3 = gated	4 = peaks
0 = Int8	8,10	8,10	-	APX01	-
1 = Int16	10,12	10,12	-	-	-
2 = Int32	-	-	X	-	**AP Peak**$^{\text{TDC}}$
3 = Real64	X	X	X	-	APX01

	5 = short d	6 = shifted short d	7 = SSR	9 = Histogram	10 = peak region	11 = sequence raw
0 = Int8	-	-	X			8,10
1 = Int16	AP AVG	AP AVG	-	**Peak**^{TDC}		10,12
2 = Int32	-	-	-	**Peak**^{TDC}	**AP Peak**^{TDC}	
3 = Real64	AP AVG	AP AVG	-			

In this table

- ‘X’ means that the functionality is available depending on the option but independent of the model,
- '8' means that the functionality is available for 8-bit Digitizers and AP units in the digitizer mode,
- '10' means that it is available for the 10-bit Digitizers,
- '12' means that it is available for the 12-bit Digitizers.

It must be remembered that 12-bit digitizers generate 12 or 13-bit data which will be transferred as 2 bytes with the data shifted so that the MSB of the data becomes the MSB of the 16-bit word, thus preserving the sign information. The vGain value is therefore not the gain of the ADC in volts/LSB but rather the volts/LSB of the 16-bit word.

10-bit digitizers generate 12-bit data which can be transferred in either of 2 ways

2 bytes with the data shifted so that the MSB of the data becomes the MSB of the 16-bit word, thus preserving the sign information

1 byte with the 8-bit data of the most significant bits of the ADC value. Here the lowest two bits will be lost (truncated). The advantage is that the amount of data to be transferred has been cut by a factor of 2.

Real64 readout of 10-bit digitizers is based on 16-bit transfer of the data,

The value in Volts of any integer data point **data** in the returned **dataArray** for a digitizer can be computed with the formula:

$$V = \mathrm{vGain} * \mathrm{data} - \mathrm{vOffset}$$

Except in the case of AP Analyzers, the data points for dataType = 3 are in Volts and no conversion is needed. For AP Analyzers the data points are in units of the LSB of the ADC and must be converted using the formula above.

For **readMode = 0** and **dataType** $\leq$ **1, indexFirstPoint** must be used for the correct identification of the first data point in the **dataArray**. With the **U1084A**, **indexFirstPoint** must be used for **all** readModes and dataTypes.

In general, it is recommended to **always** take indexFirstPoint into account, as future products may use this field more often to compensate for stricter buffer alignment requirements.

The 3 "d" modes correspond to:

2 – 24-bit or 32-bit data read as such into either Int32 32-bit integers or converted into volts for Real64,

5 – 16-bit data read of the least significant 16 bits of the 24-bit sum. The result is presented in either an Int16 array or converted into volts for Real 64. The user is responsible for treating any potential overflows,

6 – 16-bit data read of the most significant 16 bits of the 24-bit sum. The result is presented in either an Int16 array or converted into volts for Real 64. The user is responsible for treating any potential overflows.

It should also be noted that the interpretation of r results was discussed in the **Programmer's Guide** section 3.10.5, **Reading an d Waveform from an r** and 3.10.6, **Reading a RT Add/Subtract d Waveform from an r.**

If **readMode** is set to gated, the **nbrSamplesInSeg** is set to the sum of the gate lengths.

The rules for the allocation of memory for the **dataArray** are as follows:

For digitizers (or other modules used as such)

with readMode = 0 and dataType = 0, the array size in bytes **must** be at least (nbrSamplesInSeg+32).

with readMode = 0 and dataType = 1, the array size in words

must be at least (nbrSamplesInSeg+32).

with readMode = 0 and dataType = 3, the array size in bytes must be at least

max(40,8*nbrSamplesInSeg) for 8-bit digitizers and max(88,8*nbrSamplesInSeg) for 10-bit and 12-bit digitizers.

with readMode = 1 or readMode = 11 the waveform destination array dataArray must not only allocate enough space to hold the requested data, but also some additional space. This function achieves a higher transfer speed by simply transferring an image of the digitizer memory to the CPU memory, and then reordering all circular segment buffers into linear arrays. Since allocating a temporary buffer for the memory image is time consuming, the user-allocated destination buffer is also used as a temporary storage for the memory image. The rule for the minimum storage space to allocate with waveformArray is discussed in the Programmer's Guide section 3.10.2, Reading Sequences of Waveforms.

For AP rs

with readMode = 0,1 cannot be used. If the AcqrsD1_configMode mode is set to 0 (normal data acquisition) please use the digitizer rules above

with readMode = 2, 5 or 6 are allowed and the size

must be at least nbrSamplesInSeg* nbrSegments * size_of_dataType

For U1084A rs

with readMode = 0,1 cannot be used. If the AcqrsD1_configMode mode is set to 0 (normal data acquisition) please use the digitizer rules above

only readMode = 2 is allowed and the buffer size in bytes **must** be at least (nbrSamplesInSeg * nbrSegments)* size_of_dataType + 16

For AP analyzers

readMode = 0,1 cannot be used. If the AcqrsD1_configMode mode is set to 0 (normal data acquisition) please use the digitizer rules above

readMode = 2 cannot be used

with readMode = 3 the array size must be at least the sum of all gate lengths.

with readMode = 4 in the APx01 analyzers the array size must be
4*sizeof(double) * number of gates

with readMode = 4 in the **Peak^{TDC}** analyzers the array size must be
8 * number of peaks

with readMode = 7 in the **Peak^{TDC}** or SSR analyzers the array size must be
nbrSegments * (16 + nbrSamplesInSeg) for the simple case of all the data in a single gate.

For other cases please see the **Programmer's Guide** section 3.10.7, **Reading SSR Analyzer Waveforms**, for a detailed explanation.

with readMode = 9 the array size must be at least
2**HistoRes*nbrSamplesInSeg*nbrSegments*size_of_dataType
if a segmented histogram is used and where
HistoRes is the value used in the call to **Acqrs_configAvgConfig** with "TdcHistogramHorzRes".

nbrSegments is either 1 or the number of segments if the value used in the call to **Acqrs_configAvgConfig** with "TdcHistogramMode" is 1

size_of_dataType = 2*(1+HistoDepth), where HistoDepth is the value used in the call to **Acqrs_configAvgConfig** with "TdcHistogramDepth"

for all other cases, its size, in bytes, **must** be at least
nbrSamplesInSeg* nbrSegments*size_of_dataType

For configuring gate parameters see the **User Manual: Family of Analyzers**

For U1084A Peak^{TDC} analyzers

readMode = 0 can be used to read the last trace which contributed to the histogram. The rules are the same as for digitizer mode. This feature is intended solely as a convenience for debugging and display purposes.

Use readMode = 9 to read the histogram. The data array size must be at least
2**HistoRes*nbrSamplesInSeg*nbrSegments*size_of_dataType + 16
if a segmented histogram is used, where HistoRes is the value used in the call to **Acqrs_configAvgConfig** with "TdcHistogramHorzRes".

The value of **returnedSamplesPerSeg** for **readMode** = 7 is not useable and therefore set to 0.

If used the segment descriptor array **segDesc**[] must always be allocated with a length that corresponds to the total number of segments requested with **nbrSegments** in **AqReadParameters**. The first requested segment is therefore deposited in **SegDesc[0]**. The segment descriptor array must also be allocated with the correct structure type that depends on the **readMode**. If not used a Null pointer can be passed to the function. There are no segment descriptors for readMode = 4, 7, 9, and 10.

The returned segment descriptor values **timeStampLo** and **timeStampHi** are respectively the low and high parts of the 64-bit trigger timestamp. For most models the units are picoseconds, with some exceptions. The timestamp is the trigger time with respect to an arbitrary time origin (this can be the start-time of the acquisition, or the time since power up, depending on the model being used), which is intended for the computation of time differences between segments of a Sequence acquisition. Please refer to the **Programmer's Guide** section 3.15, **Timestamps,** for a detailed explanation.

The returned segment descriptor value **horPos** is the horizontal position, for the segment, of the first (nominal) data point with respect to the origin of the nominal trigger delay in seconds. Since the first data point is BEFORE the origin, this number will be in the range [-**sampTime**, 0]. Refer to the **Programmer's Guide** section 3.12, **Trigger Delay and Horizontal Waveform Position**, for a detailed discussion of the value **delayTime**. For d Waveforms, the value of **horPos** will always be 0.

avgOvfl, avgStatus and **avgMax** will apply to Signal rs only. The features that they support have not yet been implemented.

The value of *segmentOffset* must be *nbrSamplesInSeg*. The waveforms are thus transferred sequentially into a single linear buffer, with 'holes' of length (*segmentOffset* – *nbrSamplesInSeg*) between them. Such 'holes' could be used for depositing additional segment-specific information before storing the entire sequence as a single array to disk. If you specify *firstSegment* > 0, you don't have to allocate any buffer space for waveforms that are not read, i.e. **waveformArray[0]** corresponds to the first sample of the segment *firstSegment*.

Example: In a DC270, if you specify *nbrSamplesInSeg* = *segmentOffset* = 1500. Then with *nbrSegments* = 80 and *nbrSamplesNom* = 1000, since the *currentSegmentPad* = 408, you would have to allocate at least 1408 * (80 + 1) = 114'048 bytes.

It is strongly recommended to allocate the waveform destination buffers permanently rather than dynamically, in order to avoid system overheads for buffer allocation/deallocation.

Visual C++ Representation

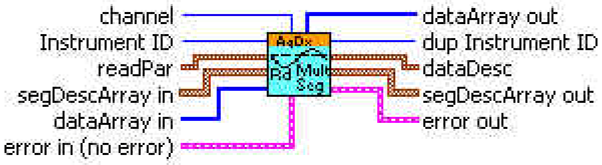
```
ViStatus status = AcqrsD1_readData(ViSession instrumentID,
                  ViInt32 channel, AqReadParameters* readPar,
                  ViAddr dataArray, AqDataDescriptor* descriptor, ViAddr segDesc);
```

LabVIEW Representations

Acqiris Dx.lvlib: (or Aq Dx) Read Multi-Segments.vi

This Vi is polymorphic, the sample data is returned in an array of type I8, I16 or DBL.

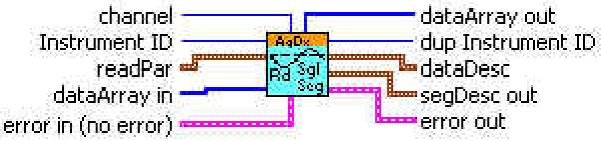
It is meant for the readout of multiple segments with readMode = 1.



Acqiris Dx.lvlib: (or Aq Dx) Read Single Segment.vi

This Vi is polymorphic, the sample data is returned in an array of type I8, I16.

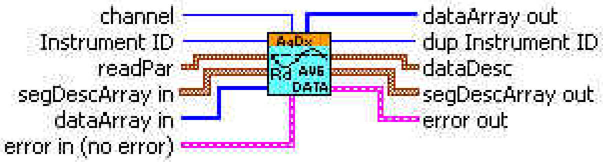
It is meant for the readout of a single segment with readMode = 0.



Acqiris Dx.lvlib: (or Aq Dx) Read r Data.vi

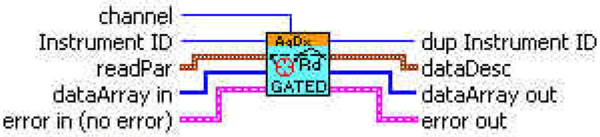
This Vi is polymorphic, the sample data is returned in an array of type I32 or DBL

It is meant for the readout of an r with readMode = 2.



Acqiris Dx.lvlib: (or Aq Dx) Read Gated Data.vi

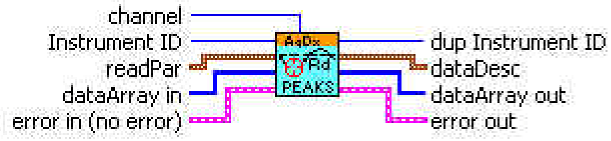
It is meant for the readout of an analyzer with readMode = 3.



Acqiris Dx.lvlib: (or Aq Dx) Read Peaks Data.vi

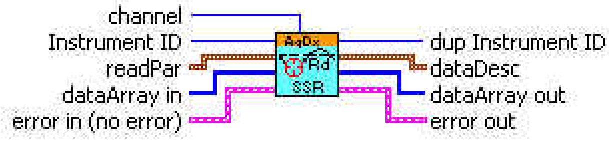
This Vi is polymorphic, the sample data is returned in an array of type I32 or DBL

It is meant for the readout of an analyzer with readMode = 4.



Acqiris Dx.lvlib: (or Aq Dx) Read SSR Data.vi

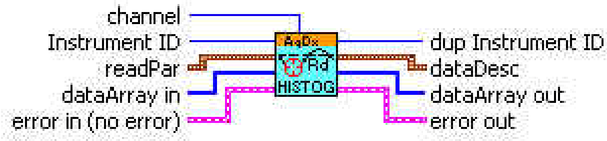
It is meant for the readout of an analyzer with readMode = 7.



Acqiris Dx.lvlib: (or Aq Dx) Read Histogram Data.vi

This Vi is polymorphic, the sample data is returned in an array of type I16 or I32

It is meant for the readout of an **Peak^{TDC}** analyzer with readMode = 9.



MATLAB MEX Representation

[status dataDesc segDescArray dataArray] = AqD1_readData(instrumentID, channel, readPar)

Note: The older form Aq_readData is deprecated.

Please convert to the newer version.

AcqrsD1_readFCounter

Purpose

Returns the result of a frequency counter measurement

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
result	ViReal64	Result of measurement

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

The result must be interpreted as a function of the effected measurement ‘type’:

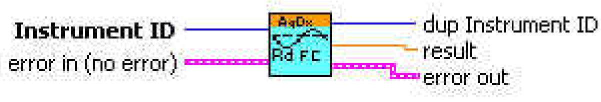
Measurement Type	Units
0 Frequency	Hz
1 Period	Sec
2 Totalize by Time	Counts
3 Totalize by Gate	Counts

Visual C++ Representation

ViStatus status = AcqrsD1_readFCounter(ViSession instrumentID, ViReal64* result);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Read FCounter.vi



MATLAB MEX Representation

[status result] = AqD1_readFCounter(instrumentID)

Note: The older form Aq_readFCounter is deprecated.

Please convert to the newer version.

AcqrsD1_reportNbrAcquiredSegments

Purpose

Returns the number of segments already acquired for a digitizer. For rs (but not AP100 or AP200) it will give the number of triggers already accepted for the current acquisition. In the case of analyzers it will return the value 1 at the end of the acquisition and is therefore not of much use.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Output

Name	Type	Description
nbrSegments	ViInt32	Number of segments already acquired

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

Can be called after an acquisition, in order to obtain the number of segments/triggers actually acquired (until **AcqrsD1_stopAcquisition** was called).

NOTE

For a digitizer, calling this function while an acquisition is active, in order to follow the progress of a Sequence acquisition, is dangerous and must be avoided.

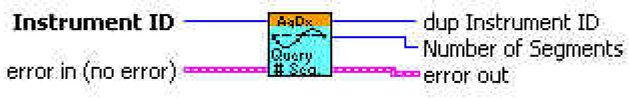
As needed the result should be interpreted as a ViUInt32.

Visual C++ Representation

ViStatus status = AcqrsD1_reportNbrAcquiredSegments(ViSession instrumentID,
ViInt32* nbrSegments);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Query Number of Acquired Segments.vi



MATLAB MEX Representation

[status nbrSegments] = Aqd1_reportNbrAcquiredSegments(instrumentID)

Note: The older form Aq_reportNbrAcquiredSegments is deprecated.

Please convert to the newer version.

AcqrsD1_resetDigitizerMemory

Purpose

Resets the digitizer memory to a known default state.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

Each byte of the digitizer memory is overwritten sequentially with the values 0xaa, 0x55, 0x00 and 0xff. This functionality is mostly intended for use with battery backed-up memories.

Visual C++ Representation

```
ViStatus status = AcqrsD1_resetDigitizerMemory(ViSession instrumentID);
```

LabVIEW Representation

Please refer to **Acqrs_resetMemory**.

MATLAB MEX Representation

```
[status] = AqD1_resetDigitizerMemory(instrumentID)
```

Note: The older form Aq_resetDigitizerMemory is deprecated.

Please convert to the newer version or Aq_resetMemory.

AcqrsD1_restoreInternalRegisters

Purpose

Restores some internal registers of an instrument.
Only needed after power-up of a digitizer with the battery back-up option.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
delayOffset	ViReal64	Global delay offset, should be retrieved with **Acqrs_getInstrumentInfo** (..., “DelayOffset”, ..) before power-off. If not known, use the value –20.0e-9
delayScale	ViReal64	Global delay scale, should be retrieved with **Acqrs_getInstrumentInfo** (..., “DelayScale”, ..) before power-off. If not known, use the value 5.0e-12

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

The normal startup sequence destroys the contents of the Acqiris digitizer memories. This function, together with a specific sequence of other function calls, prevents this from occurring in digitizers with battery backed-up memories.

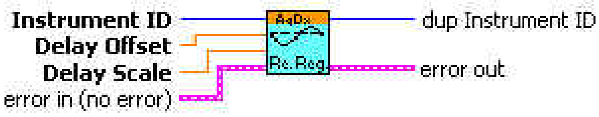
Please refer to the **Programmer’s Guide** section 3.19, **Readout of Battery Backed-up Memories**, for a detailed description of the required initialization sequence to read battery backed-up waveforms.

Visual C++ Representation

```
ViStatus status = AcqrsD1_restoreInternalRegisters(ViSession instrumentID,
                  ViReal64 delayOffset, ViReal64 delayScale);
```

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Restore Internal Registers.vi



MATLAB MEX Representation

```
[status] = AqD1_restoreInternalRegisters(instrumentID, delayOffset, delayScale)
```

Note: The older form Aq_restoreInternalRegisters is deprecated.

Please convert to the newer version.

AcqrsD1_stopAcquisition

Purpose

Stops the acquisition.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

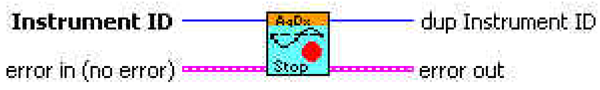
This function will stop the acquisition and not return until this has been accomplished. The data is not guaranteed to be valid. To obtain valid data after "manually" stopping the acquisition (e.g. timeout waiting for a trigger), one should use the function **AcqrsD1_forceTrig** to generate a "software" (or "manual") trigger, and then continue polling for the end of the acquisition with **AcqrsD1_acqDone**. This will ensure correct completion of the acquisition.

Visual C++ Representation

ViStatus status = AcqrsD1_stopAcquisition(ViSession instrumentID);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Stop Acquisition.vi



MATLAB MEX Representation

[status] = AqD1_stopAcquisition(instrumentID)

Note: The older form Aq_stopAcquisition is deprecated.

Please convert to the newer version.

AcqrsD1_stopProcessing

Purpose

Stops on-board data processing. This routine is for Analyzers only.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

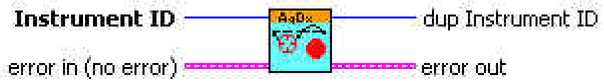
This function will stop the on-board data processing immediately. The output data is not guaranteed to be valid.

Visual C++ Representation

ViStatus status = AcqrsD1_stopProcessing(ViSession instrumentID);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Stop Processing.vi



MATLAB MEX Representation

[status] = AqD1_stopProcessing(instrumentID)

Note: The older form Aq_stopProcessing is deprecated.

Please convert to the newer version.

AcqrsD1_waitForEndOfAcquisition

Purpose

Waits for the end of acquisition.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
timeout	ViInt32	Timeout in milliseconds

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

This function will return only after the acquisition has terminated or when the requested timeout has elapsed, whichever comes first. For protection, the timeout is clipped to a maximum value of 10 seconds. If a larger timeout is needed, call this function repeatedly.

While waiting for the acquisition to terminate, the calling thread is put into 'idle', permitting other threads or processes to fully use the CPU.

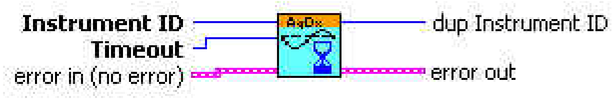
If a channel or trigger overload was detected, the returned status is always ACQIRIS_ERROR_OVERLOAD. Else, if the acquisition times out, the returned status is ACQIRIS_ERROR_ACQ_TIMEOUT, in which case you should use either **AcqrsD1_stopAcquisition** or **AcqrsD1_forceTrig** to stop the acquisition. Otherwise, the returned status is VI_SUCCESS.

Visual C++ Representation

ViStatus status = AcqrsD1_waitForEndOfAcquisition (ViSession instrumentID, ViInt32 timeout);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Wait For End Of Acquisition.vi



MATLAB MEX Representation

[status] = AqD1_waitForEndOfAcquisition(instrumentID, timeOut)

Note: The older form Aq_waitForEndOfAcquisition is deprecated.

Please convert to the newer version.

AcqrsD1_waitForEndOfProcessing

Purpose

Waits for the end of on-board data processing. . This routine is for Analyzers only.

Parameters

Input

Name	Type	Description
instrumentID	ViSession	Instrument identifier
timeout	ViInt32	Timeout in milliseconds

Return Value

Name	Type	Description
status	ViStatus	Refer to **Table 2-1** for error codes.

Discussion

This function will return only after the on-board processing has terminated or when the requested timeout has elapsed, whichever comes first. For protection, the timeout is clipped to a maximum value of 10 seconds. If a larger timeout is needed, call this function repeatedly.

While waiting for the processing to terminate, the calling thread is put into 'idle', permitting other threads or processes to fully use the CPU.

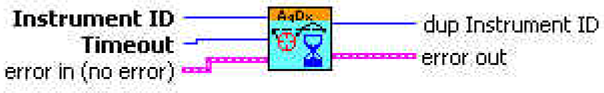
If the processing times out, the returned status is ACQIRIS_ERROR_PROC_TIMEOUT, in which case you should use **AcqrsD1_stopProcessing** to stop the processing. Otherwise, the returned status is VI_SUCCESS.

Visual C++ Representation

ViStatus status = AcqrsD1_waitForEndOfProcessing(ViSession instrumentID, ViInt32 timeout);

LabVIEW Representation

Acqiris Dx.lvlib: (or Aq Dx) Wait For End Of Processing.vi



MATLAB MEX Representation

[status] = AqD1_waitForEndOfProcessing(instrumentID, timeOut)

Note: The older form Aq_waitForEndOfProcessing is deprecated.

Please convert to the newer version.