Tektronix®

SourceXpress®
Waveform Creation Application

Programmer Manual

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www.tek.com

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Supports product software version 6.1.x and above.

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Getting Started

Introduction

The SourceXpress® programmatic interface works seamlessly with the programmatic interface of both the AWG70000 series and AWG5200 series instruments. Using a single VISA or socket session, it is possible to communicate with both SourceXpress and AWG series instruments.

This programmer manual provides the commands for remotely control the SourceXpress software. The commands listed are unique to the SourceXpress application.

For the list of commands to control the features of an AWG70000 series instrument (through SourceXpress), refer to the *AWG70000 series Arbitrary Waveform Generators Programmer Manual*.

For the list of commands to control the features of an AWG5200 series instrument (through SourceXpress), refer to the *AWG5200 series Arbitrary Waveform Generators Programmer Manual*.

The AWG series programmer manuals also provides general information about Remote Control, GPIB Parameters, LAN Parameters, Connecting to an Instrument using GPIB, and setting up GPIB communication.

Documentation

In addition to this SourceXpress Programmer Guide, the following documentation is included with the SourceXpress application:

- SourceXpress Help. The help provides in-depth operation and user interface help.
- SourceXpress User Manual (PDF). This is adapted from the SourceXpress help system and is available on the Tektronix website (www.tek.com/manual/downloads), Tektronix part number 077-1144-xx.

For programming information about the AWG series instruments, refer to the following documentation:

- *AWG70000A Series Arbitrary Waveform Generators Programmer Manual*. This document provides programming information and commands for remotely operating an AWG70000A series instrument. This manual is available on the Tektronix website (www.tek.com/manual/downloads), Tektronix part number 077-0782-xx.

  AWG5200 Series Arbitrary Waveform Generators Programmer Manual. This document provides programming information and commands for remotely operating an AWG5200 series instrument. This manual is available on the Tektronix website (www.tek.com/manual/downloads), Tektronix part number 077-1337-xx.

Related documentation

The following related documentation is available on the Tektronix website (www.tek.com/manual/downloads), Tektronix part number 077-0140-xx.

- TekVISA Programmer Manual. The manual describes TekVISA, the Tektronix implementation of the VISA Application Programming Interface (API). TekVISA is industry-compliant software for writing interoperable instrument drivers in a variety of Application Development Environments (ADEs).

TekVISA remote communication

TekVISA is required to communicate with instruments via a LAN and to interface with SourceXpress via its programmatic interface.

TekVISA is the Tektronix implementation of VISA (Virtual Instrument Software Architecture), an industry-standard communication protocol. VISA provides a common standard for software developers so that software from multiple vendors, such as instrument drivers, can run on the same platform. TekVISA is industry-compliant software, available with selected Tektronix instruments.

You can use this software to write (or draw) interoperable instrument drivers in a variety of Application Development Environments (ADEs). It implements a subset of Version 2.2 of the VISA specification for controlling GPIB and serial (RS-232) instrument interfaces locally or remotely via an Ethernet LAN connection.

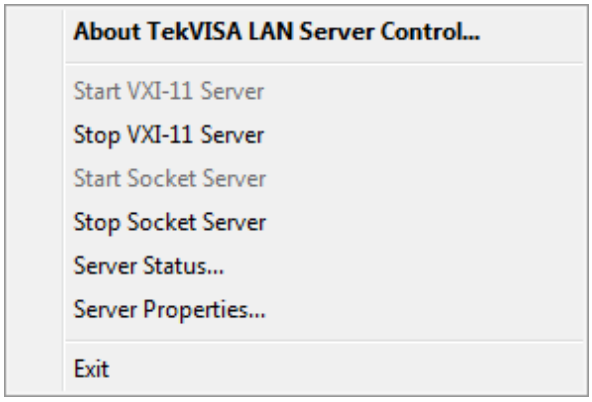
TekVISA is available for download from the Tektronix website (www.Tek.com/product-support).

NOTE. *TekVISA must be the only VISA type software installed on the PC (where SourceXpress is installed). If another VISA program is installed, you must uninstall that software before installing TekVISA.*

If TekVISA is installed in conjunction with another VISA program, you will have to uninstall both programs and re-install TekVISA.

When TekVISA is installed on your PC, the tray icons will include the following:

Right click the tray icon to set properties, check status, or start the VXI-11 or socket servers.



Syntax and Commands

Command Syntax

For information on Syntax Overview, Command and Query Structure, Clearing the Instrument, Command Entry, Parameter Types, SCPI Commands and Queries, refer to the connected instrument's programmer manual.

Command Groups

Connectivity group commands

Use these commands to perform connection operations on generators or generator gangs.

Table 2-1: Connectivity group commands and their descriptions

Command	Description
CONNectivity:ACTive	Sets or returns the active generator using the connected generator's name.
CONNectivity:CONNect	Connects SourceXpress to a remote generator using the generator's hostname, making the remote generator available for use by SourceXpress.
CONNectivity:DISConnect	Disconnects the named generator from SourceXpress.
CONNectivity:GANG:CREAte	Creates a gang generator consisting of the specified instruments (members).
CONNectivity:REMove	Removes the named generator from SourceXpress.
CONNectivity:STATus?	Returns the connection status of the named generator.

Synchronization group commands

Use these commands to perform synchronization operations on a generator gang.

Table 2-2: Synchronization group commands and their descriptions

Command	Description
SYNChronize:ADJust:[STARt]	Performs a system sample rate calibration on the active gang of a synchronized system.
SYNChronize:ENABle	Sets or returns the synchronization state (enabled or disabled) of the active generator gang.
SYNChronize:DESKew:ABORt	Cancels a system deskew calibration on the active generator gang.
SYNChronize:DESKew:[STARt]	Performs a system deskew calibration on the active generator gang.
SYNChronize:DESKew:STATe?	Returns the state of the system deskew condition of the active generator gang.

Waveform plug-in group commands

Use these commands to activate or query available plug-ins.

Table 2-3: Waveform plug-in group commands and their descriptions

Command	Description
WPLugin:ACTive	Sets or returns the active waveform creation plug-in.
WPLugin:PLUGins?	Returns all the available waveform creation plug-ins.

Command Descriptions

CONNectivity:ACTive

This command sets or returns the active generator using the connected generator name. The active generator is the target of instrument operations. Only a single generator can be active at once.

The set version of this command must use the actual generator name as listed in the Generator List (in the SourceXpress application).

Conditions The generator must be connected before it can become active.

Group Connectivity

Syntax

```
CONNectivity:ACTive <generator_name>
CONNectivity:ACTive?
```

Arguments <generator_name>::=<string>

Returns <generator_name>::= the name of the active generator.

Examples `CONNECTIVITY:ACTIVE "MyGenerator"` makes the generator named "MyGenerator" the active generator.

`CONNECTIVITY:ACTIVE?` might return `"MyGenerator"`, indicating that the generator named MyGenerator is the active generator.

CONNectivity:CONNect (No Query Form)

This command connects SourceXpress to a remote generator using the generator's hostname, making the remote generator available for use by SourceXpress. You can also assign a unique generator name of the connected generator. If a name is not specified, then the hostname is used as the name for the connected generator. The generator name is the name that appears in the Generator List.

Group Connectivity

Syntax `CONNectivity:CONNect <hostname>[,<generator_name>]`

Arguments <hostname>::=<string> The hostname may consist of either the computer name of the instrument or the IP address of the instrument.
The computer name can be found by viewing the Windows Computer Properties of the instrument.
<generator_name>::=<string>

Examples `CONNECTIVITY:CONNECT "192.153.22.101","MyGenerator"` connects to the instrument with the named IP address and names the instrument "MyGenerator".

CONNectivity:DISConnect (No Query Form)

This command disconnects the named generator from SourceXpress.

Conditions You must use the name of the generator as listed in the Generator List in SourceXpress.

Group Connectivity

Syntax `CONNectivity:DISConnect <generator_name>`

Arguments <generator_name>::=<string>

Examples `CONNECTIVITY:DISCONNECT "MyGenerator"` disconnects the remote generator named "MyGenerator".

CONNectivity:GANG:CREAte (No Query Form)

This command creates a gang generator consisting of the specified instruments (members). A gang generator can consist of 2 to 4 generators. The gang is placed in the Generator List.

Conditions

Only AWG70000 series generators can be used in a generator gang.

All members (instruments) within a gang must have the same number of channels.

All members must be available in the Generator List.

If creating a gang of real instruments, all members must be connected to the same AWGSYNC01 synchronization hub.

Group

Connectivity

Syntax

```
CONNectivity:GANG:CREAte
<gang_name>,<member1>,<member2>[,<member3>[,<member4>]]
```

Arguments

<gang name>::=<string> User defined name for the gang.
<member1>::=<string> Required. Instrument identifier as appears in Generator List.
<member2>::=<string> Required. Instrument identifier as appears in Generator List.
<member3>::=<string> Optional. Instrument identifier as appears in Generator List.
<member4>::=<string> Optional. Instrument identifier as appears in Generator List.

Examples

`CONNectivity:GANG:CREAte "MyGang", "awg70001_1", "awg70001_2", "awg70001_3"` creates a gang named “MyGang” consisting of the three named instruments.

CONNectivity:REMove (No Query Form)

This command removes the named generator from SourceXpress. If the named generator is the active generator, it is disconnected and removed without warning.

If the generator is in a gang, the gang and all its members are removed.

Conditions You must use the name of the generator as listed in the Generator List in SourceXpress.

Group Connectivity

Syntax `CONNectivity:REMove <generator_name>`

Arguments <generator_name>::=<string>

Examples `CONNECTIVITY:REMOVE "MyGenerator"` removes the remote generator named "MyGenerator".

CONNectivity:STATus? (Query Only)

This command returns the connection status of the named generator.

Conditions You must use the name of the generator as listed in the Generator List in SourceXpress.

Group Connectivity

Syntax `CONNectivity:STATus? <generator_name>`

Arguments <generator_name>::=<string>

Returns A single <Boolean> value, 0 or 1.
0 indicates the named generator is not connected.
1 indicates the named generator is connected.

Examples `CONNECTIVITY:STATUS? "MyGenerator"` might return `1`, indicating that this generator is connected and available.

SYNChronize:ADJust:[STARt] (No Query Form)

This command performs a system sample rate calibration on the active gang of a synchronized system.

This command may take up to 3 minutes to complete.

Conditions The active generator must be a generator gang and synchronization is enabled.

This is an overlapping command.
Overlapping commands run concurrently with other commands, allowing additional commands to start before the overlapping command has finished.

Group Synchronization

Syntax

```
SYNChronize:ADJust:[STARt]
```

Examples `SYNCHRONIZE:ADJUST:START` starts the calibration on the active generator gang of a synchronized system.

SYNChronize:ENABle

This command sets or returns the synchronization state (enabled or disabled) of the active generator gang. All instruments in the gang are affected.

Conditions

The active generator must be a generator gang.

If the active generator is not a gang, refer to the AWG70000A programming manual for the proper synchronization command for an individual generators.

This is an overlapping command.
Overlapping commands run concurrently with other commands, allowing additional commands to start before the overlapping command has finished.

Group

Synchronization

Syntax

```
SYNChronize:ENABle {OFF|ON|0|1}
SYNChronize:ENABle?
```

Arguments

OFF or 0 disables synchronization.
ON or 1 enables synchronization.

OFF or 0 is the default value.

Returns

A single <Boolean> value.

Examples

```
SYNCHRONIZE:ENABLE 1
*OPC?
```

enables synchronization in the generators within the active gang. The overlapping command is followed with an Operation Complete query.
The overlapping command is followed with an Operation Complete query.

`SYNCHRONIZE:ENABLE?` might return `0`, indicating that synchronization is not enabled on the instruments in the active generator gang.

SYNChronize:DESKew:ABORt (No Query Form)

This command cancels a system deskew calibration on the active generator gang. The command might take up to 10 minutes to cancel.

Conditions The active generator must be a generator gang and synchronization is enabled.

This is an overlapping command.
Overlapping commands run concurrently with other commands, allowing additional commands to start before the overlapping command has finished.

Group Synchronization

Syntax

```
SYNChronize:DESKew:ABORt
```

Examples

```
SYNCHRONIZE:DESKEW:ABORT
*OPC?
```

returns when deskew calibration is cancelled. The overlapping command is followed with an Operation Complete query.

SYNChronize:DESKew:[STARt] (No Query Form)

This command performs a system deskew calibration on the active generator gang. The command might take up to 30 minutes to complete.

Conditions The active generator must be a generator gang and synchronization is enabled.

This is an overlapping command.
Overlapping commands run concurrently with other commands, allowing additional commands to start before the overlapping command has finished.

Group Synchronization

Syntax

```
SYNChronize:DESKew:[STARt]
```

Examples

```
SYNCHRONIZE:DESKEW:START
*OPC?
```

returns when the deskew calibration is complete. The overlapping command is followed with an Operation Complete query.

SYNChronize:DESKew:STATe? (Query Only)

This command returns the state of the system deskew condition of the active generator gang.

Conditions The active generator must be a generator gang.

The command is only valid on a generator gang and synchronization is enabled.

Group Synchronization

Syntax `SYNChronize:DESKew:STATe?`

Returns 1, the deskew calibration is running.
0, the deskew calibration is stopped, cancelled, complete, or when synchronization is disabled.

Examples `SYNCHRONIZE:DESKEW:STATE?` returns `0` when the deskew calibration is cancelled or complete.

WPLugin:ACTive

This command sets or returns the active waveform creation plug-in.

Conditions This is an overlapping command.
Overlapping commands run concurrently with other commands, allowing additional commands to start before the overlapping command has finished.

Group Waveform plug-in

Syntax `WPLugin:ACTive <plugin_name>`

Arguments <plugin_name>::=<string>

Returns A single string representing the active waveform creation plug-in.

Examples `WPLUGIN:ACTIVE "Multitone"` sets Multitone plug-in as the active plug-in.

`WPLUGIN:ACTIVE?` might return "Multitone", indicating the Multitone plug-in is currently active.

WPLugin:PLUGins? (Query Only)

This command returns all the available waveform creation plug-ins installed.

Group Waveform plug-in

Syntax `WPLugin:PLUGins?`

Returns <string>::= <plugin_name>,<plugin_name>,....

Plugin_name is the waveform module name(s).

Examples `WPLUGIN:PLUGINS?` might return `"Basic Waveform,Multitone"` indicating that the Basic Waveform and Multitone plug-ins are installed.

Error messages

Error messages and codes

The following error codes are unique to the SourceXpress application.

Table 3-1: Device errors

Error code	Error message
2100	Unable to connect. Connection requires instrument firmware version {0} or greater.
2101	Unable to connect. Connection requires SourceXpress software version {0} or greater.
2102	Failed to connect. Failed to connect to generator.
2103	Generator not found. Generator not found in the Connected Generator list.
2104	Set to active failure. Failed to set a generator to be the active generator.
2105	Connection lost. Lost connection to the active generator.
2106	Name in use. Name already in use by another virtual generator.
2107	Invalid name. Unable to find virtual generator with the specified name.
2108	Disconnect failed. Cannot disconnect from the default virtual generator.
2109	Remove failed. Cannot remove the default virtual generator.

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