Programmer

Tektronix

TG700
TV Signal Generator Platform

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This document applies to firmware version 5.5
and above.

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Preface

This manual provides programming information for the TG700 TV Signal Generator Platform and related modules.

Related Manuals

The following documents are also available for the TG700 and related modules:

- The *TG700 TV Signal Generator User Manual* (Tektronix part number 071-1970-XX) describes how to install the instrument and how to operate the mainframe and modules.

- The *TG700 TV Signal Generator Platform PC Tools Technical Reference* (Tektronix part number 077-0138-XX) describes how to use the PC tools that are available for the mainframe and related modules.

- The *TG700 TV Signal Generator Platform Specifications and Performance Verification Technical Reference* (Tektronix part number 077-0137-XX) describes the mechanical, electrical, and environmental specifications for the mainframe and related modules. This manual also provides performance verification procedures.

- The *TG700 TV Signal Generator Platform Programmer Manual* (Tektronix part number 077-0139-XX) provides programming information for the mainframe and related modules.

- The *TG700 TV Signal Generator Platform Service Manual* (Tektronix part number 077-0230-XX) describes how to service the TG700 mainframe to the module level (circuit boards, fuses). Specific service information for a module is located in a subsection of the Service manual specific to the module. The Service manual is optional and must be ordered separately.

- The *TG700 TV Signal Generator Platform Release Notes* (Tektronix part number 077-0229-XX) describes the new features, improvements, and limitations of the most recent available firmware for the TG700 TV Signal Generator Platform. This information is provided in both Japanese and English.

TG700 TV Signal Generator Platform Programmer Manual

Getting Started

Getting Started

To help you get started with programming the TG700, this section includes the following subsections:

- *Overview of the Manual*
  Summarizes each major section of this manual.

- *Connecting the Interface*
  Describes how to physically connect the analyzer to a controller.

Overview of the Manual

The information contained in each major section of this manual is described below.

Syntax and Commands   Section 2, *Syntax and Commands*, describes the structure and content of the messages your program sends to the analyzer. Figure 1‑1 shows command parts as described in the *Command Syntax* subsection.
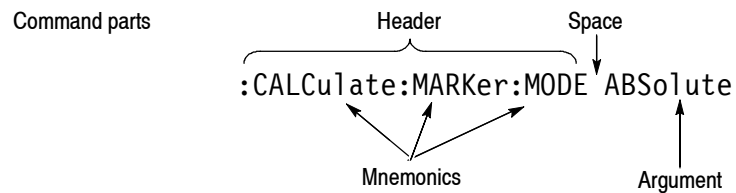
Figure 1‑1: Command parts

Section 2 also describes the effect of each command and provides examples of how you might use it.

Error Messages and Codes

The program may request information from the instrument. The instrument provides information in the form of status and error messages. Section 3, *Status and Events*, describes how to get status or event information from the program and details the event and error messages.

Connecting the Interface

The TG700 has a 10 BASE-T port on the rear panel that allows you to control the instrument remotely, using your PC to upload and download various files such as signal files or logo files. For details on connecting to this port, see the *TG700 TV Signal Generator Platform User Manual*, Tektronix part number 071-1970-XX.

10 BASE-T port
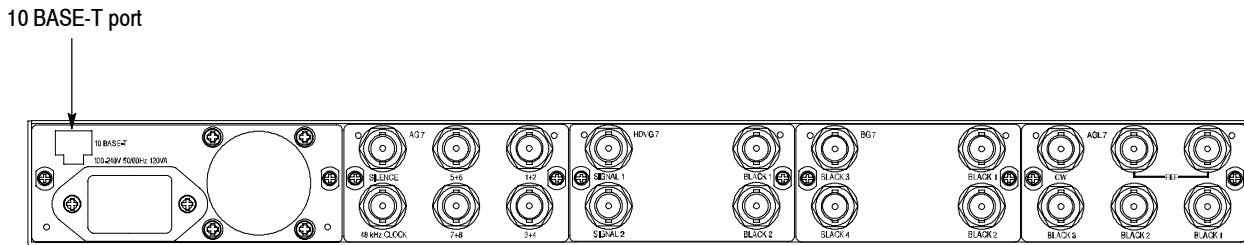
Figure 1‑2: 10 Base-T connector (rear panel)

Syntax and Commands

TG700 Syntax

This section contains information on the Standard Commands for Programmable Instruments (SCPI) and IEEE 488.2 Common Commands you can use to program your TG700. The information is organized in the following subsections:

- *Programming Model* – This subsection provides information on programming prerequisites

- *SCPI Commands and Queries* – This subsection describes the SCPI command organization and syntax

- *IEEE 488.2 Common Commands* – This subsection lists the commands and argument structures that are common to all SCPI commands

- *Constructed Mnemonics* – This subsection describes the usage of constructed mnemonics by the TG700.

- *Block Arguments* – This subsection describes the usage of block arguments by the TG700.

- *Special Characters* – This subsection lists the special character sets that are used by the remote control interface.

Programming Model

Specific conditions must exist before programming commands will affect the test signal generated by a module.

Selecting the Module

Select the module to be addressed before executing any commands. Many of the commands used by the TG700 are shared by several modules and will be accepted without a reported error.

Command Arguments

Many commands accept either string or numeric arguments. For example: a boolean argument can either be "1" or "ON".

Signal parameter commands that have a :STEP node can accept either a numeric value or a string argument that refers to the :STEP increment.

Select signal parameter commands accept either a numeric value or one of the following strings:

UP. Use this argument to increase the parameter value one increment as defined by the :STEP value.

DOWN. Use this argument to decrease the parameter value one increment as defined by the :STEP value.

MINimum. Use this argument to query the minimum value or set the parameter value to the minimum acceptable value.

MAXimum. Use this argument to query the maximum value or set the parameter value to the maximum acceptable value.

DEFault. Use this argument to query the default value or set the parameter value to the default value.

NOTE. *If the TG700 does not return a value in response to a MIN or MAX query, then the values are undefined and an error message is generated.*

Query Arguments If you send a query with no argument, the response is the current value. You can also use MINimum, MAXimum, and DEFault as arguments for queries whose command form can use these arguments (refer to the command syntax for the specific command). Instead of returning the current value, queries using these arguments return the following information:

MINimum. Returns the minimum acceptable value.

MAXimum. Returns the maximum acceptable value.

DEFault. Returns the default value.

Argument Example The following example demonstrates the effect of each of the arguments when used with a step value.

1. `:INSTrument:SELect "HDVG7:#"` selects the HDTV digital video generator module located in the slot number indicated by the "#" symbol.

2. `:OUTPut:CIRCle:STATe ON` displays a circle on the video display.

NOTE. :OUTPut:CIRCle:DIAMeter uses an argument that is the percent of picture height.

---

3. `:OUTPut:CIRCle:DIAMeter DEFault` sets the circle diameter to 90 percent of the screen height.

4. `:OUTPut:CIRCle:DIAMeter:STEP 10` sets the step increment to 10 percent.

5. `:OUTPut:CIRCle:DIAMeter DOWN` changes the circle diameter to 80 percent of the screen height.

6. `:OUTPut:CIRCle:DIAMeter 50` changes the circle diameter to 50 percent of the screen height.

7. `:OUTPut:CIRCle:DIAMeter MAXimum` changes the circle diameter to 100 percent of the screen height.

8. `:OUTPut:CIRCle:DIAMeter MINimum` changes the circle diameter to 0 percent of the screen height.

9. `:OUTPut:CIRCle:DIAMeter UP` changes the circle diameter to 10 percent of the screen height.

10. `:OUTPut:CIRCle:DIAMeter? MAXimum` queries the maximum circle diameter (not the current diameter). The query returns the value of 100 percent, which is the maximum circle diameter allowable.

SCPI Commands and Queries

SCPI is a standard created by a consortium that provides guidelines for remote programming of instruments. These guidelines provide a consistent programming environment for instrument control and data transfer. This environment uses defined programming messages, instrument responses, and data format across all SCPI instruments, regardless of manufacturer. The TG700 uses a command language based on the SCPI standard.

The SCPI language is based on a hierarchical or tree structure (see Figure 2-1) that represents a subsystem. The top level of the tree is the root node; it is followed by one or more lower-level nodes.
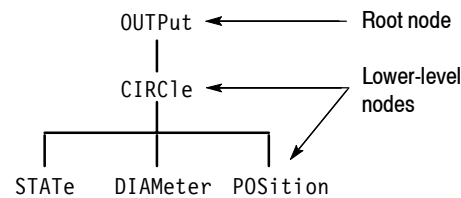
Figure 2-1: Example of SCPI subsystem hierarchy tree

You can create commands and queries from these subsystem hierarchy trees. Commands specify actions for the instrument to perform. Queries return measurement data and information about parameter settings.

Creating Commands

SCPI commands are created by stringing together the nodes of a subsystem hierarchy and separating each node by a colon.

In Figure 2-1, OUTPut is the root node and CIRCle, STATe, DIAMeter, and POSition are lower-level nodes. To create a SCPI command, start with the root node OUTPut and move down the tree structure adding nodes until you reach the end of a branch. Most commands and some queries have parameters; you must include a value for these parameters. If you specify a parameter value that is out of range, the parameter will be set to a default value.

For example, OUTPut:CIRCle:STATe ON is a valid SCPI command created from the hierarchy tree in Figure 2-1.

Creating Queries

To create a query, start at the root node of a tree structure, move down to the end of a branch, and add a question mark. OUTPut:CIRCle:STATe? is an example of a valid SCPI query using the hierarchy tree in Figure 2-1.

Parameter Types   Every parameter in the command and query descriptions is of a specified type. The parameters are enclosed in brackets, such as <pattern>. The parameter type is listed after the parameter and is enclosed in parentheses, for example, (discrete). Some parameter types are defined specifically for the TG700 command set and some are defined by ANSI/IEEE 488.2-1987 (see Table 2-1).

Table 2-1: Parameter types used in syntax descriptions

Parameter type	Description	Example
binary	Binary numbers	#B0110
arbitrary block[1]	A specified length of arbitrary data	#512234xxxxx . . . where 5 indicates that the following 5 digits (12234) specify the length of the data in bytes; xxxxx ... indicates the data
boolean	Boolean numbers or values	ON or 1 OFF or 0
discrete	A list of specific values	MIN, MAX, UP, DOWN
hexadecimal[2]	Hexadecimal numbers (0-9, A, B, C, D, E, F)	#HAA, #H1
NR1[2,3] numeric	Integers	0, 1, 15, -1
NR2[2] numeric	Decimal numbers	1.2, 3.141516, -6.5
NR3[2] numeric	Floating point numbers	3.1415E-9, -16.1E5
NRf[2] numeric	Flexible decimal number that may be type NR1, NR2 or NR3	See NR1, NR2, NR3 examples
string[4]	Alphanumeric characters (must be within quotation marks)	"Testing 1, 2, 3"

[1]   Defined in ANSI/IEEE 488.2 as "Definite Length Arbitrary Block Response Data."

[2]   An ANSI/IEEE 488.2-1992-defined parameter type.

[3]   Some commands and queries will accept a hexadecimal value even though the parameter type is defined as NR1.

[4]   Defined in ANSI/IEEE 488.2 as "String Response Data."

**Abbreviating Commands,
Queries, and Parameters**

You can abbreviate most SCPI commands, queries, and parameters to an accepted short form. This manual shows these short forms as a combination of upper and lower case letters. The upper case letters indicate the accepted short form of a command. As shown in Figure 2‑2, you can create a short form by using only the upper case letters. The accepted short form and the long form are equivalent and request the same action of the instrument.

Long form of a
command

OUTPut:EAUDio:CHANnel2:AMPLitude 10

Minimum information needed
for accepted short form

Accepted short form
of a command and
parameter

OUTP:EAUD:CHAN2:AMPL 10
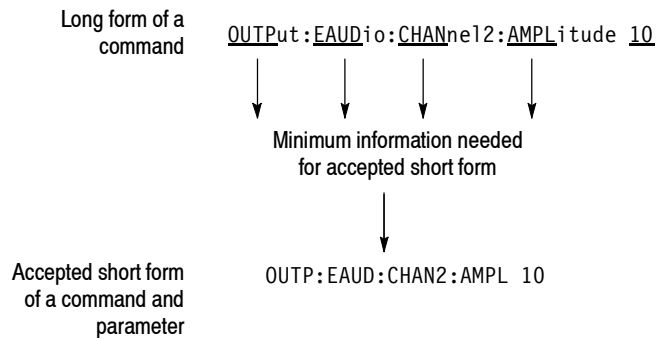
Figure 2‑2: Example of abbreviating a command

NOTE. The numeric suffix of a command or query may be included in either the long form or short form; the TG700 will default to "1" if no suffix is used. In Figure 2‑2, the "2" of "CHAN2" indicates that the command is directed to the second channel..

Chaining Commands and Queries

You can chain several commands or queries together into a single message. To create a chained message, first create a command or query, add a semicolon (;), and then add more commands or queries and semicolons until you are done. If the command following a semicolon is a root node, precede it with a colon (:). Figure 2--3 illustrates a chained message consisting of several commands and queries. The single chained message should end in a command or query, not a semicolon. Responses to any queries in your message are separated by semicolons.

```
:OUTP:CIRC:DIAM 75;:OUTP:EAUD:STAT ON;:OUTP:EAUD:GRRO:NBIT?;:OUTP:LOGO:POS:HOR?
```

First command   Second command   First query   Second query

The response from this chained message might be   24;--35

Response from first query   Response from second query
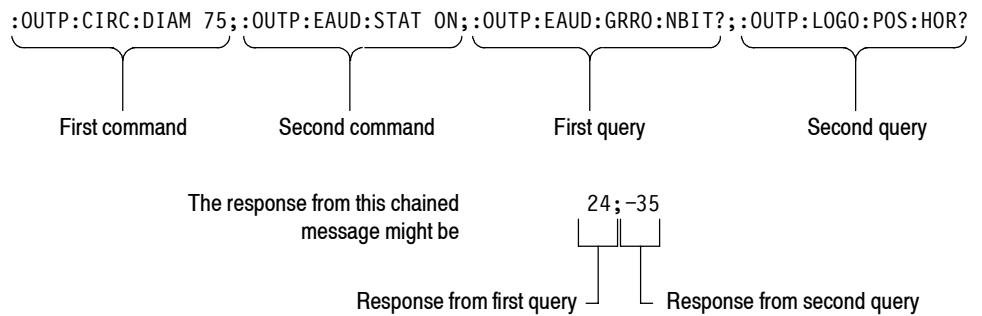
Figure 2--3: Example of chaining commands and queries

If a command has the same root and lower-level nodes as the previous command, you can omit these nodes. In Figure 2--4, the second command has the same root node (CIRC) as the first command, so these nodes can be omitted.

```
:OUTP:CIRC:DIAM 25;:OUTP:CIRC:POS:VERT 25;:OUTP:CIRC:STAT ON
```

Identical root and lower-level nodes

```
:OUTP:CIRC:DIMA 25;POS:VERT 25;STAT ON
```

First command   Additional commands (omitting the root nodes)
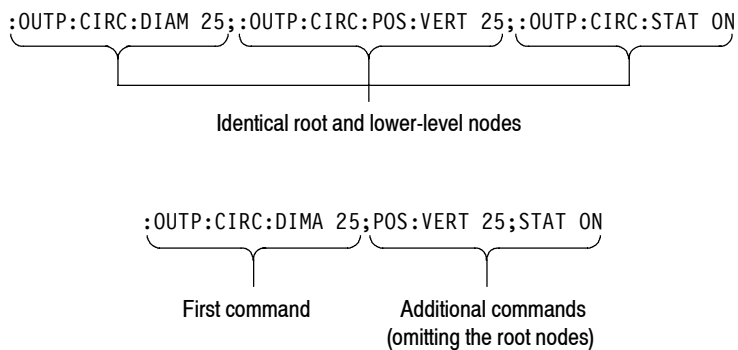
Figure 2--4: Example of omitting root and lower-level nodes in a chained message

General Rules   Here are three general rules for using SCPI commands, queries, and parameters:

■   You can use single (' ') or double (" ") quotation marks for quoted strings, but you cannot use both types of quotation marks for the same string.

correct: "This string uses quotation marks correctly."

correct: 'This string also uses quotation marks correctly.'

incorrect: "This string does not use quotation marks correctly.'

■   You can use upper case, lower case, or a mixture of both cases for all commands, queries, and parameters.

```
OUTPUT:TEXT:POSITION:HORIZONTAL 25
```

is the same as

```
output:text:position:horizontal 25
```

and

```
OUTPUT:text:position:HORIZONTAL 25
```

NOTE. *Literal strings (quoted) are case sensitive. For example: file names.*

■   No embedded spaces are allowed between or within nodes.

correct: `OUTPUT:TEXT:POSITION:HORIZONTAL 25`

incorrect: `OUTPUT: TEXT: POSITION: HOR IZONTAL 25`

IEEE 488.2 Common Commands

Description   ANSI/IEEE Standard 488.2 defines the codes, formats, protocols, and usage of common commands and queries used on the interface between the controller and the instruments. The TG700 complies with this standard.

Command and Query Structure   The syntax for an IEEE 488.2 common command is an asterisk (*) followed by a command and, optionally, a space and parameter value. The syntax for an IEEE 488.2 common query is an asterisk (*) followed by a query and a question mark. All of the common commands and queries are listed in the last part of the *Syntax and Commands* section. The following are examples of common commands:

■   `*ESE 16`

■   `*CLS`

The following are examples of common queries:

■   `*ESR?`

■   `*IDN?`

Backus-Naur Form Definition   This manual may describe commands and queries using the Backus-Naur Form (BNF) notation. Table 2-2 defines the standard BNF symbols:

Table 2-2: BNF symbols and meanings

Symbol	Meaning
< >	Defined element
::=	Is defined as
|	Exclusive OR
{ }	Group; one element is required
[ ]	Optional; can be omitted
. . .	Previous element(s) may be repeated
( )	Comment

Message Terminators   This manual uses <EOM> (End of message) to represent a message terminator.

Symbol	Meaning
<EOM>	Message terminator

The end-of-message terminator may be the ASCII code for line feed (LF) sent as the last data byte. The TG700 always terminates messages with LF. It allows white space before the terminator.

Constructed Mnemonics

Some header mnemonics specify one of a range of mnemonics. For example, an audio channel mnemonic can be either CHANnel1, CHANnel2, CHANnel3, or CHANnel4. You use these mnemonics in the command just as you do any other mnemonic. For example, there is a `:OUTP:EAUD:CHAN1:STAT?` query, and there is also an `:OUTP:EAUD:CHAN2:STAT?` query. In the command descriptions, this list of choices is abbreviated as CHANnel<n>. The value of <n> is the upper range of valid suffixes. If the numeric suffix is omitted, the TG700 uses the default value of "1".

Block Arguments

Several TG700 commands use a block argument form:

Symbol	Meaning
`<NZDig>`	A non-zero digit character, in the range 1–9
`<Dig>`	A digit character, in the range 0–9
`<DChar>`	A character with the hex equivalent of 00 through FF hexadecimal (0 through 255 decimal)

`<Block>`	A block of data bytes, defined as:
	
	`<Block> ::=`
	`{ #<NZDig><Dig>[<Dig>...][<DChar>...]`
	`
		#0[<DChar>...]<terminator> }`

<NZDig> specifies the number of <Dig> elements that follow. Taken together, the <Dig> elements form a decimal integer that specifies how many <DChar> elements follow.

Special Characters

The remote control interface handles characters differently than the front panel or SDP2000 software.

Standard symbol (ASCII)	Remote control sequence
/ (47)	's
\ (92)	'b
– (45)	'h
' (96)	"
: (58)	'c
Line return	^ (94)

Signal names created from SDP2000 software will be displayed as created. Signals created or displayed using the SCPI interface use the remote control sequence.

For example: "SinX/X" is displayed as "SinX/X" via the front panel or SDP2000 software; however, "SinX/X" is displayed as "SinX'sX" via when using SCPI.

Use the caret symbol "^" as a line return when naming buttons and signals.

TG700 Remote Commands

This section describes the remote command set used in the TG700. The commands for the TG700 are divided into the following eight groups:

■ Common commands

■ DISPLAY commands

■ INSTRUMENT commands

■ MASS MEMORY commands

■ PROGRAM commands

■ SENSE commands

■ STATUS commands

■ SYSTEM commands

The TG700 can be controlled remotely through the Ethernet interface on the rear panel. Refer to the *TG700 TV Signal Generator User Manual,* Tektronix part number 071-1970-XX, for detailed information about how to connect and set up for remote operation.

Common Commands

The Common commands have a "*" prefix and address all of the installed modules.

Command Tree

```
*CLS
*ESE(?)
*ESR?
*IDN?
*OPC(?)
*OPT?
*RST
*SRE(?)
*STB?
*TST?
*WAI
```

Command Description

`*CLS`

Clears SESR (Standard Event Status Register), the SBR (Status Byte Register), and Event Queue, which are used in the instrument status and event reporting system.

`*ESE`

Sets the bits of the ESER (Event Status Enable Register) used in the status and events reporting system.

`*ESE?`

Returns the contents of the ESER.

`*ESR?`

Returns the contents of SESR (Standard Event Status Register) used in the status and events reporting system.

`*IDN?`

Returns the ID information of the instrument.

`*OPC`

Causes bit 0 in the SESR (Standard Event Status Register) to be set , and the operation complete message to be issued, when all pending operations are finished.

`*OPC?`

Waits until all pending operations are finished and returns a "1 " ASCII character.

`*OPT?`

Lists all of the occupied slots in the TG700 and the nomenclature, slot, hardware version, and software version of the installed modules.

Each field is a slot. Each field is separated by commas. The information within a field is colon delimited, as in "<nomencla-ture>:<slot>:<hw>:<sw>".

`*RST`

Resets the instrument to the default state.

```
*SRE
```

        Sets the bits of the SRER (Service Request Enable Register).

```
*SRE?
```

        Returns the contents of SRER.

```
*STB?
```

        Returns the value of the SBR (Status Byte Register). Bit 6 of the SBR is read as a MSS (Master Status Summary) bit.

```
*TST?
```

        Self-test query. This query does not perform any tests; however, this query is accepted as a valid command to comply with IEEE 488.2 requirements.

```
*WAI
```

        Wait-to-continue command. This command is not necessary since the TG700 handles commands sequentially; however, this query is accepted as a valid command to comply with IEEE 488.2 requirements.

DISPLAY Commands

Use these commands to control the contrast and backlight settings of the LCD display.

Command Tree

```
:DISPlay
   :BACKlight                ON|OFF
   :CONTrast                 <numeric_value>
   [:WINDow][:TEXT][:DATA]   <message>
```

Command Description

```
:DISPlay:BACKlight ON|OFF
```

        Turns the LCD display backlight on or off. You can use 1 or 0 instead of ON or OFF.

```
:DISPlay:BACKlight?
```

        Returns the current status of the backlight.

:DISPlay:CONTrast <numeric_value>

> Controls the intensity of the front-panel LCD display. The value should be an integer number between 1 and 40.

:DISPlay:CONTrast?

> Returns the current contrast value.

INSTRUMENT Commands

Use these commands to list, identify, and query modules.

Command Tree

```
:INSTrument
  :CATalog?
     :FULL?
  [:SELect]  <module_name>
  :NSELect   <slot_number>
```

Command Description

:INSTrument:CATalog?

> Returns a comma delimited list of all slots that are occupied by modules.

:INSTrument:CATalog:FULL?

> Returns a comma delimited list of module names and slot numbers, in pairs. The string type of module and the numeric suffix indicates the slot. For example, "AGL7:1", 1, "HDVG7:2", 2 indicates a AGL7 in slot 1, and a HDVG7 in slot 2.

:INSTrument:[:SELect] <module_name>

> Selects a module by name.

:INSTrument:[:SELect]?

> Returns a module by name.

:INSTrument:NSELect <slot_number>

> Select a module by slot number.

```
:INSTrument:NSELect?
```

Returns a module by slot number.

MASS MEMORY Commands

All signal movement within the memory is accomplished by copying all appropriate files of the named signal(s) to the new location. The signal tree is traversable and the use of wildcards permits copying or storing individual signals or the entire module signal list.

Command Tree

```
:MMEMory
   :CATalog?              [<directory_path>]
   :CDIRectory            <directory_path>
   :COPY                  <source>,<destination>
   :DATA                  <file_name>,<block_data>
   :DELete                <file_name>
   :LOAD
      :DOWNload           <block_data>
      :PRESet             <preset_ID>|<preset_name>
      :SIGNal             <module_name>,<signal_name>
   :MDIRectory            <directory_path>
   :MOVe                  <from_filename>,<to_filename>
   :RDIRectory            <directory_path>
   :SIGNal
      :ACTive?            <signal_name>
   :STORe
      :PRESet             <preset_ID>|<preset_name>
   :PRESet
      :CATalog?           <preset_ID>
         :ALL?
      :DELete             <preset_ID>|<preset_name>
      :REName             <preset_ID>,<preset_name>
```

The argument <signal_name> is the full or partial path name to a signal found in a module. The argument <file_name> is the MS-DOS compatible naming convention. For example, the syntax for a complete path would be:

```
module_type/signal_set/button/test_signal
```

- module_type is the directory level for a given module type

- signal_set is the directory level for different sets of signals

- button is the directory level for different buttons

- test_signal is the directory level for different test signals

Command Description

:MMEMory:CATalog? [<directory_path>]

> Lists the current directory level. If at the top level, it returns a list of signal sets and the other files and directories for the module partition you are currently in. If in a Signal Set directory, it returns a list of buttons. If in a button directory, it returns a list of test signals.
>
> Query response – <used_bytes>, <available_bytes>, <file_name1>,, <file_size1>, <file_name2>,, <file_size2>

:MMEMory:CDIRectory [<directory_path>]

> Changes the current working directory.

:MMEMory:CDIRectory?

> Returns the current working directory path.

:MMEMory:COPY <source>,<destination>

> Copies a file within the TG700 file system. Wildcards are not supported.
>
> This command is provided to support sequence files and is not recommended for use with signal files.

:MMEMory:DATA <file_name>,<block_data>

> Loads data created by a PC to the flash memory of the TG700 with the specified file name. The file name should have an appropriate extension.

:MMEMory:DATA? <file_name>

> Lists the block data for the specified file name.

:MMEMory:DELete <file_name>

> Removes files from the flash memory of the TG700.

:MMEMory:LOAD:DOWNload <block_data>

> Adds DNL files to the TG700.

:MMEMory:LOAD:PREset <preset_ID>|<preset_name>

> Loads a saved preset. This command accepts the name of a previously saved preset. Current instrument settings are overwritten by this command. The preset_IDs are from 0 to 15; 0 represents the Power on Default, 1 to 13 represent ordinary presets, 14 represents the User Default, and 15 represents the Factory Default.

`:MMEMory:LOAD:SIGNal <module_name>,<signal_name>`
`:MMEMory:LOAD:SIGNal <slot_number>,<signal_name>`

Loads the named signal into the named module. The current signal in the module is overwritten.

`:MMEMory:MDIRectory <directory_name>`

Creates a directory by the given name.

`:MMEMory:MOVe <from_filename>,<to_filename>`

Changes the name of the specified file.

`:MMEMory:RDIRectory <directory_name>`

Removes the specified directory from the file system.

`:MMEMory:SIGNal:ACTive? <slot_number>|<module_name>`

Lists the current output signal in the specified module.

`:MMEMory:STORe:PRESet <preset_ID>|<preset_name>`

Saves all the instrument settings with the specified preset ID or preset name. The preset_IDs are from 0 to 15; 0 represents the Power on Default, 1 to 13 represent ordinary presets, 14 represents the User Default, and 15 represents the Factory Default.

`:MMEMory:PRESet:CATalog? <preset_ID>`

Lists the name of the specified preset saved in the TG700. The preset_IDs are from 0 to 15; 0 represents the Power on Default, 1 to 13 represent ordinary presets, 14 represents the User Default, and 15 represents the Factory Default.

`:MMEMory:PRESet:CATalog:ALL?`

Lists the names of all presets saved in the TG700.

`:MMEMory:PRESet:DELete <preset_ID>|<preset_name>`

Deletes the specified preset saved in the TG700. The preset_IDs are from 0 to 15; 0 represents the Power on Default, 1 to 13 represent ordinary presets, 14 represents the User Default, and 15 represents the Factory Default.

`:MMEMory:PRESet:REName <preset_ID>,<preset_name>`

Renames the specified preset saved in the TG700. The preset_IDs are from 0 to 15; 0 represents the Power on Default, 1 to 13 represent ordinary presets, 14 represents the User Default, and 15 represents the Factory Default.

PROGRAM Commands

Use these commands to access and run programs called "sequences".

Command Tree

```
:PROGram
  [:SELected]?
    :NAME                  <progname>
    :STATe                 RUN|PAUSe|STOP|CONTinue
    :WAIT?
  :EXPLicit
    :STATe                 <progname>,RUN|PAUSe|STOP|CONTinue
    :WAIT?
```

Command Description

:PROGram[:SELected]:NAME <program>

      Selects the default sequence file.

:PROGram[:SELected]:NAME?

      Returns the name of the default sequence file.

:PROGram[:SELected]:STATe RUN|PAUSe|STOP|CONTinue

      Controls execution of the default sequence. The choices are Run, PAUSe, STOP, and CONTinue.

:PROGram[:SELected]:STATe?

      Returns the condition of the execution of the default sequence.

:PROGram[:SELected]:WAIT

      Holds off further commands until the default sequence completes.

:PROGram[:SELected]:WAIT?

      If sequence has terminated or paused, this returns 1. If sequence is running, this returns 0.

:PROGram:EXPLicit:STATe <progname> RUN|PAUSe|STOP|CONTinue

      Controls execution of the specified sequence. The choices are RUN, PAUSe, STOP, and CONTinue.

:PROGram:EXPLicit:STATe? <progname>

      Returns the condition of the execution of the specified sequence.

```
:PROGram:EXPLicit:WAIT <progname>
```

Holds off further commands until the specified sequence completes.

```
:PROGram:EXPLicit:WAIT? <progname>
```

If sequence has terminated or paused, this returns 1. If sequence is running, this returns 0.

SENSE Commands

Use these queries to list which generator modules are using which frame reset signals.

Command Tree

```
:SENSe
  :ROSCillator
    :FRAMe[3]
      :CATalog?
      :FREQuency?
```

Command Description

```
:SENSe:ROSCillator:FRAMe<n>:CATalog?
```

Lists the modules using the frame reset signal <n>. The suffix identifies which of three frame reset signals to query.

```
:SENSe:ROSCillator:FRAMe<n>:FREQuency?
```

Lists the specific frame reset signal frequency.

STATUS Commands

Use these commands to address the instrument status and event queue.

Command Tree

```
:STATus
   :OPERation
      [:EVENt]?
      :CONDition?
      :ENABle              <numeric_value>
      :PTRansition         <numeric_value>
      :NTRansition         <numeric_value>
      :MAP                 <numeric_value>, <numeric_value>
      :INSTrument
         [:EVENt]?
         :CONDition?
         :ENABle           <numeric_value>
         :PTRansition      <numeric_value>
         :NTRansition      <numeric_value>
   :PRESet
   :QUEue
      [:NEXT]
      :ENABle
   :QUEStionable
      [:EVENt]?
      :CONDition?
      :ENABle              <numeric_value>
      :PTRansition         <numeric_value>
      :NTRansition         <numeric_value>
      :MAP                 <numeric_value>, <numeric_value>
      :INSTrument
         [:EVENt]?
         :CONDition?
         :ENABle           <numeric_value>
         :PTRansition      <numeric_value>
         :NTRansition      <numeric_value>
```

Command Description

PRESet. The OPERation node covers areas of instrument operational events. This node reports such items as signal settling, calibration, or running a sequence

QUEStionable. The QUEStionable node covers areas of questionable conditions that exist within the instrument. Questionable conditions might cause you to be unsure of the quality of the generated signals.

Subnodes. Each node has a set of subnodes that query the contents, or control the involvement, of each bit.

■ ENABle selects which bits are active in reporting the status.

■ EVENt is a destructive query only of the status.

■ CONDition is a nondesctructive query only of the status.

■ PTRansition allows a status to become true on a positive transition of the event.

■ NTRansition allows a status to become true on a negative transition of the event.

■ MAP reassigns event reporting at the top level of the status hierarchy.

■ INSTrument. Both main nodes have this sub node that summarizes the operational and questionable condition of the instrument. Each bit in these two registers represents a slot in the TG700. The summation of each register will feed into bit 13 of its respective parent register.

PRESet. All of the enable registers are set to TRUE so that they return to power-up conditions.

QUEue. QUEue:ENABle enables certain events or error conditions to be reported. Values that are not explicitly specified are not reported. STA-Tus:QUEue[:NEXT?] is the same as SYSTem:ERRor?.

Due to the repetitiveness of this subsystem, the details will be covered for the nodes EVENt, CONDition, ENABle, PTRansition, NTRanstion, and MAP. The syntax and examples do not include the full command. Refer to the Command Tree to derive what commands would be appropriate. The following text then describes each major branch within the STATus subsystem.

`[:EVENt]?`

> Performs a destructive reading of the specific event status register. The contents are cleared by reading or by *CLS.

`:CONDition?`

> Performs a nondestructive reading of the specified condition register. Contents are cleared as a result of *CLS.

`:ENABle <numeric_value>`

> Sets the register that enables the individual bits within the Event Register, which records event transition.

`:ENABle?`

> Returns the current Event Register settings.

`:PTRansition <numeric_value>`

> Sets the transistion register for enabling events to set bits true during a positive transition.

`:PTRansition?`

> Returns the transistion register for enabling events to set bits true during a positive transition.

`:NTRansition <numeric_value>`

> Sets the transition register for enabling events to set bits true during a negative transition.

`:NTRansition?`

> Returns the transition register for enabling events to set bits true during a negative transition.

`:STATus:OPERation:MAP <bit>,<event>`
`:STATus:QUEStionable:MAP <bit>,<event>`

> Reassigns events to bits in the OPERation or QUEStionable registers.

SYSTEM Commands

Use these commands to query the system related information and set the front-panel lock function.

Command Tree

```
:SYSTem
   :ERROR
      [:NEXT]?
   :HELP
      :SYNTax?
   :KLOCk
      :STATe  ON|OFF
   :VERSion?
```

Command Description

`:SYSTem:ERRor?`

> Lists the next event in the Error/Event queue. Queue is cleared at power up, upon *CLS, and upon reading the last item.

`:SYSTem:HELP:SYNTax?`

> Lists correct command syntax.

`:SYSTem:KLOCk:STATe ON|OFF`

> Locks or unlocks the front-panel buttons. You can use 1 or 0 instead of ON or OFF.

`:SYSTem:KLOCk:STATe?`

> Returns the current status of the front-panel buttons.

`:SYSTem:VERSion?`

> Lists the SCPI compliance version. Query only.

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AG7 Audio Generator Module Remote Commands

This section describes the command sets used for the AG7 Generator module remote operation. The commands for the module are divided into the following groups:

- OUTPUT commands

- SENSE commands

OUTPUT Commands

Use these commands to set the parameters for each audio channel, the audio data resolution, and the synchronization state relative to the frame reset signals.

Command Tree

```
:OUTPut
   :AUDio
      :CHANnel<n>
         :AMPLitude          <numeric_value>
         :FREQuency          <numeric_value>
         :CLICk              0|1|2|3|4
      :NBITs
      :SYNChronized          FREErun|FRAME_ONE|FRAME_TWO
```

Command Description

:OUTPut:AUDio:CHANnel<n>:AMPLitude <numeric_value>

>Sets the amplitude of a specific audio channel. The numeric value can range from –60 dBFS to 0 dBFS in 1 dBFS steps. The <n> in the command represents the channel number. You can use any channel number from 1 through 8.

:OUTPut:AUDio:CHANnel<n>:AMPLitude?

>Returns the amplitude of a specific audio channel. The <n> in the command represents the channel number. You can use any channel number from 1 through 8.

`:OUTPut:AUDio:CHANnel<n>:FREQuency <numeric_value>`

Sets the frequency of a specific audio channel. The unit is Hertz. The choices are 0, 50, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1500, 1600, 2000, 2400, 3000, 3200, 4000, 4800, 5000, 6000, 8000, 9600, 10000, 12000, 15000, 16000, and 20000. The <n> in the command represents the channel number. You can use any channel number from 1 through 8.

`:OUTPut:AUDio:CHANnel<n>:FREQuency?`

Returns the frequency of a specific audio channel. The <n> in the command represents the channel number. You can use any channel number from 1 through 8.

`:OUTPut:AUDio:CHANnel<n>:CLICk 0|1|2|3|4`

Sets the audio click of a specific audio channel. The choices are 1 sec to 4 sec, or 0. When 1 to 4 is selected, the audio click becomes valid. When audio click is valid, audio tone is turned off for 0.25 seconds around the time of the click. The <n> in the command represents the channel number. You can use any channel number from 1 through 8.

`:OUTPut:AUDio:CHANnel<n>:CLICk?`

Returns the audio click setting for the specified audio channel. The <n> in the command represents the channel number. You can use any channel number from 1 through 8.

`:OUTPut:AUDio:NBITs 20|24`

Sets the sample bits of the audio signal. The choices are 20 bits or 24 bits.

`:OUTPut:AUDio:NBITs?`

Returns the sample bits of the audio signal.

`:OUTPut:AUDio:SYNChronized FREErun|FRAME_ONE|FRAME_TWO`

Selects the frame reset signal to synchronize with the audio signal. The choices are FREErun (free run), FRAME_ONE (frame reset signal 1), and FRAME_TWO (frame reset signal 2). For FREErun, the audio signal is not synchronized with any of the frame reset signals.

`:OUTPut:AUDio:SYNChronized?`

Returns the frame reset signal synchronized with the audio signal.

SENSE Commands

Use these commands to adjust the timing offset of the audio outputs relative to the internal reference signal (frame reset signal).

Command Tree

```
:SENSe
  :CORRection
    :MDELay            <numeric_value>
      :STEP            <numeric_value>
```

Command Description

`:SENSe:CORRection:MDELay <numeric_value>`

Sets the timing offset of the audio outputs. The numeric values range from –160 ms to 160 ms in 1 μs steps. You can use UP, DOWN, or DEF instead of the numeric values.

`:SENSe:CORRection:MDELay?`

Returns the timing offset of the audio outputs.

`:SENSe:CORRection:MDELay:STEP <numeric_value>`

Sets the step increment used by the UP or DOWN commands. The unit is microseconds.

`:SENSe:CORRection:MDELay:STEP?`

Returns the step increment used by the UP or DOWN commands.

AGL7 Analog Genlock Module Remote Commands

This section describes the commands used for the AGL7 Genlock module remote operation. The commands for the module are divided into the following four groups:

- INPUT commands

- SOURCE commands

- OUTPUT commands

- SENSE commands

INPUT Commands

Use these commands to set the input standard and input connector for the genlock signal.

Command Tree

```
:INPut
   :REFerence
      :STANdard              NBURst|PBURst|N318M|NSYNc|PSYNc|HDSYnc
      :STATus?
      :HDSYnc?
   :SELect                   REFerence|CW
   :SOURce                   INTernal|EXTernal
   :CWAVE
      :FRAMe                 2.997|3.0|6.25|14.985|15.0|0
      :FREQuency?
   :LLOSs:ACTion             INTernal|STAy
```

Command Description

`:INPut:REFerence:STANdard NBURst|PBURst|N318M|NSYNc|PSYNc|HDSYnc`

Selects the input standard expected at the REF connector. The choices are NBURst (burst lock to NTSC black burst), PBURst (burst lock to PAL black burst), N318M (burst lock to NTSC black burst with 10 field ID), NSYNc (sync lock to NTSC black burst), PSYNc (sync lock to PAL black burst), and HDSYnc (lock to HDTV trilevel sync).

`:INPut:REFerence:STANdard?`

Returns the current input standard.

`:INPut:REFerence:STATus?`

Returns the current genlock status. The available responses are INTernal, ABSent, UNLocked, or LOCKed.

`:INPut:REFerence:HDSYnc?`

Returns the format of the HDTV trilevel sync signal currently inputted. The available responses are HD1080_60I, HD1080_59I, HD1080_50I, HD1080_24SF, HD1080_23SF, HD1080_30P, HD1080_29P, HD1080_25P, HD1080_24P, HD1080_23P, HD720_60P, HD720_59P or HD720_50P.

`:INPut:SELect REF|CW`

Sets the reference input for the genlock source. For REF, a black burst signal or HDTV trilevel signal applied to the REF connector is used. For CW, a CW signal applied to the CW connector is used for the genlock source.

`:INPut:SELect?`

Returns the reference input currently used.

`:INPut:SOURce INTernal|EXTernal`

Determines whether the internal signal or external signal is used as a reference signal.

`:INPut:SOURce?`

Returns the signal source (internal or external) used as a reference signal.

`:INPut:CWAVe:FRAMe 2.997|3.0|6.25|14.985|15.0|0`

Sets the frame reset signal frequency used when a CW signal is applied to the CW connector. The choices are 2.997 Hz, 3.0 Hz, 6.25 Hz, 14.985 Hz, and 15.0 Hz. For 0, the instrument is set to Keep Composite Timing.

`:INPut:CWAVe:FRAMe?`

Returns the current frequency of the frame reset signal for the CW input.

`:INPut:CWAVe:FREQuency?`

> Returns the frequency of the CW signal currently applied. The available responses are 1.0, 3.58, 4.43, 5.0, or 10.0.

`:INPut:LLOSs:ACTion INTernal|STAy`

> Sets the instrument action when a loss of genlock state occurs. For INTernal, the instrument automatically switches to the internal reference. For STAy, the instrument maintains the current state.

`:INPut:LLOSs:ACTion?`

> Returns the current instrument action when a loss of genlock state occurs. The available responses are INT or STA.

SOURCE Commands

Use these commands to set the timing offset of the genlock input signal relative to the internal reference signal (frame reset signal).

Refer to *Operating Basics* in the TG700 User Manual for detailed information about the setting range.

Command Tree

```
:SOURce
  :CORRection
    :MDELay
      :HORizontal          <numeric_value>
        :STEP              <numeric_value>
      :VERTical            <numeric_value>
        :STEP              <numeric_value>
```

Command Description

`:SOURce:CORRection:MDELay:HORizontal <numeric_value>`

> Sets the horizontal timing offset of the genlock input signal relative to the internal reference signal. The units are microseconds. You can use UP, DOWN, or DEF instead of a numeric value.

`:SOURce:CORRection:MDELay:HORizontal?`

> Returns the horizontal timing offset of the genlock input signal.

```
:SOURce:CORRection:MDELay:HORizontal:STEP <numeric_value>
```

> Sets the step increment used by the UP or DOWN command. The
> units are microseconds. You can use MIN, MAX, or DEF instead of
> a numeric value.

```
:SOURce:CORRection:MDELay:HORizontal:STEP?
```

> Returns the step increment used by the UP or DOWN command.

```
:SOURce:CORRection:MDELay:VERTical <numeric_value>
```

> Sets the vertical timing offset of the genlock input signal relative to
> the internal reference signal. The units are line numbers. You can
> use UP, DOWN, or DEF instead of a numeric value.

```
:SOURce:CORRection:MDELay:VERTical?
```

> Returns the vertical timing offset of the genlock input signal.

```
:SOURce:CORRection:MDELay:VERTical:STEP <numeric_value>
```

> Sets the step increment used by the UP or DOWN command. The
> units are line numbers. You can use MIN, MAX, or DEF instead of a
> numeric value.

```
:SOURce:CORRection:MDELay:VERTical:STEP?
```

> Returns the step increment used by the UP or DOWN command.

OUTPUT Commands

Use these commands to set the video standard and the type of signal for the
BLACK outputs.

Command Tree

```
:OUTPut1
  :STANdard            NTSC|PAL|NTSC_NSU
:OUTPut2
  :STANdard            NTSC|PAL|NTSC_NS|HDSYnc
:OUTPut3
  :STANdard            BB|HD1080_60I|HD1080_59I|HD1080_50I|
                       HD1080_24SF|HD1080_30P|HD1080_29P|
                       HD1080_25P|HD1080_24P|HD1080_23P|
                       HD720_60P|HD720_59P|HD720_50P
:OUTPUT<n>
  :SIGNal              BB|BB_FREF|BB_NO_FREE
```

Command Description

`:OUTPut1:STANdard NTSC|PAL|NTSC_NSU`

Sets the video standard for the BLACK 1 output. The choices are NTSC, PAL, and NTSC_NSU (NTSC no setup).

`:OUTPut1:STANdard?`

Returns the video standard for the BLACK 1 output.

`:OUTPut2:STANdard NTSC|PAL|NTSC_NSU|HDSYnc`

Sets the video standard for the BLACK 2 output. The choices are NTSC, PAL, NTSC_NSU (NTSC no setup), and HDSYnc (HDTV trilevel sync).

`:OUTPut2:STANdard?`

Returns the video standard for the BLACK 2 output.

`:OUTPut3:STANdard BB|HD1080_60I|HD1080_59I|HD1080_50I|`
`                   HD1080_24SF|HD1080_30P|HD1080_29P|`
`                   HD1080_25P|HD1080_24P|HD1080_23P|`
`                   HD720_60P|HD720_59P|HD720_50P`

Sets the video standard for the BLACK 3 output. The choices are BB (black burst) and HD1080_60I to HD720_50P.

`:OUTPut3:STANdard?`

Returns the video standard for the BLACK 3 output.

`:OUTPut<n>:SIGNal BB|BB_FREF|BB_NO_FREF`

Sets what kind of signal is available from a specific BLACK output. The <n> in the command represents the connector number. You can use connector number 1 and 2.

If the standard is NTSC or NTSC_NSU, the options are BB (black burst) or BB_FREF (black burst with field reference).

If the standard is PAL, the options are BB (black burst) or BB_NO_FREF (black burst no field reference).

`:OUTPut<n>:SIGNal?`

Returns the current output signal. The <n> in the command represents the connector number. You can use connector number 1 and 2.

SENSE Commands

Use these commands to set the timing offset of the BLACK outputs relative to the internal reference signal (frame reset signal).

Refer to *Operating Basics* in the TG700 User Manual for detailed information about the setting range.

Command Tree

```
:SENSe<n>
  :CORRection
    :MDELay
      :HORizontal        <numeric_value>
          :STEP          <numeric_value>
      :VERTical          <numeric_value>
          :STEP          <numeric_value>
```

Command Description

:SENSe<n>:CORRection:MDELay:HORizontal <numeric_value>

Sets the horizontal timing offset of a specific BLACK output. The units are microseconds. You can use UP, DOWN, or DEF instead of a numeric value. See page 2–2 for additional detail on UP, DOWN, and DEF. If the argument exceeds the horizontal time value, then the vertical offset is adjusted to accommodate the requested offset. The <n> in the command represents the connector number. You can use any connector number from 1 through 3.

:SENSe<n>:CORRection:MDELay:HORizontal?

Returns the horizontal timing offset of a specific BLACK output. The <n> in the command represents the connector number. You can use any connector number from 1 through 3.

:SENSe<n>:CORRection:MDELay:HORizontal:STEP <numeric_value>

Sets the step increment used by the UP or DOWN command. The units are microseconds. You can use MIN, MAX, or DEF instead of a numeric value. The <n> in the command represents the connector number. You can use any connector number from 1 through 3.

:SENSe<n>:CORRection:MDELay:HORizontal:STEP?

Returns the step increment used by the UP or DOWN command. The <n> in the command represents the connector number. You can use any connector number from 1 through 3.

`:SENSe<n>:CORRection:MDELay:VERTical <numeric_value>`

Sets the vertical timing offset of a specific BLACK output. The units are horizontal lines. You can use UP, DOWN, or DEF instead of a numeric value. The <n> in the command represents the connector number. You can use any connector number from 1 through 3.

`:SENSe<n>:CORRection:MDELay:VERTical?`

Returns the vertical timing offset of a specific BLACK output. The <n> in the command represents the connector number. You can use any connector number from 1 through 3.

`:SENSe<n>:CORRection:MDELay:VERTical:STEP <numeric_value>`

Sets the step increment used by the UP or DOWN commands. The units are horizontal lines. You can use MIN, MAX, or DEF instead of a numeric value. The <n> in the command represents the connector number. You can use any connector number from 1 through 3.

`:SENSe<n>:CORRection:MDELay:VERTical:STEP?`

Returns the step increment used by the UP or DOWN commands. The <n> in the command represents the connector number. You can use any connector number from 1 through 3.

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ATG7 Analog Test Generator Module Remote Commands

This section describes the command sets used for the ATG7 Generator module remote operation. The commands for the module are divided into the following three groups:

- MASS MEMORY commands (Refer to the *TG700 TV Signal Generator Platform User Manual*)

- OUTPUT commands

- SENSE commands

MASS MEMORY Commands

Two MASS MEMORY commands are listed here for your reference. You can use these to load and query the output test signal. Detailed information for using these commands are located in the *TG700 TV Signal Generator Platform User Manual*.

```
:MMEMory:LOAD:SIGNal <module_name>,<signal_name>
:MMEMory:LOAD:SIGNal <slot_number>,<signal_name>
```

Loads a signal into the specified module.

```
:MMEMory:SIGNal:ACTive? <slot_number>|<module_name>
```

Returns the current output signal of the specified module.

OUTPUT Commands

Use these commands to control the output parameters of the module. These include ID text overlay and APL features.

Command Tree

```
:OUTPut<n>
   :STANdard              NTSC|NTSC_NSU|PAL
   :SIGNal                BB|BB_FREF|BB_NO_FREF|SYNC|BLANKING|
                          SUBCARRIER|H_DRIVE|V_DRIVE|FREF|
                          PAL_PULSE (n=1,2)

                          BB|BB_NO_FREF|CB100_PER|CB75_PER|
                          CB_SMPTE|FF40PER|CB100_OR|CB75_OR|
                          OTHER_ONE|OTHER_TWO (n=4)
   :OVERlay
      :BLINk
         :STATe           ON|OFF
         :PERiod          <numeric_value>
   :TEXT
      :STATe              ON|OFF
      :DATA               <string>
      :POSition
         :HORizontal      <numeric_value>
         :VERTical        <numeric_value>
      :SAVe
   :APL
      :MODe               APL_OFF|APL_HIGH|APL_LOW|APL_BOUNCE
      :PERiod             <numeric_value>
```

Command Description

```
:OUTPut<n>:STANdard NTSC|NTSC_NSU|PAL
```

Sets the video standard for the BLACK 1, BLACK 2, or BARS output. The choices are NTSC, NTSC_NSU (NTSC no setup), or PAL. The <n> in the command represents the output connector type and you can specify 1, 2, or 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, and "4" represents the BARS connector.

```
:OUTPut<n>:STANdard?
```

> Returns the video standard for the BLACK 1, BLACK 2, or BARS output. The <n> in the command represents the output connector and you can specify 1, 2, or 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, and "4" represents the BARS connector.

```
:OUTPut<n>:SIGNal BB|BB_FREF|BB_NO_FREF|SYNC|BLANKING|
                  SUBCARRIER|H_DRIVE|V_DRIVE|FREF|
                  PAL_PULSE (n=1,2)
                  BB|BB_NO_FREF|CB100_PER|CB75_PER|CB_SMPTE|
                  FF40PER|CB100_OR|CB75_OR|OTHER_ONE|
                  OTHER_TWO (n=4)
```

> Sets the signal available from the BLACK 1, BLACK 2, or BARS output. The <n> in the command represents the output connector and you can specify 1, 2, or 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, and "4" represents the BARS connector.

> If "1" or "2" is specified for the connector type, the choices are BB (black burst), BB_FREF (black burst with field reference), BB_NO_FREF (black burst no field reference), SYNC (composite sync), BLANKING (composite blanking), SUBCARRIER (subcarrier), H_DRIVE (H drive), V_DRIVE (V drive), FREF (Color Frame ID), or PAL PULSE (PAL pulse).

> If "4" is specified for the connector type, the choices are BB (black burst), BB_FREF (black burst with field reference), BB_NO_FREF (black burst no field reference), CB100PER (100% color (or colour) bars), CB75PER (75% color (or colour) bars), CB_100_OR (100% colour bars over red), CB_75_OR (75% colour bars over red), CB_SMPTE (SMPTE color bars), FF40PER (40% flat field), OTHER_ONE (Other 1), or OTHER_TWO (Other 2).

```
:OUTPut<n>:SIGNal?
```

> Returns the current output signal for the BLACK 1, BLACK 2, or BARS output. The <n> in the command represents the output connector and you can specify 1, 2, or 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, and "4" represents the BARS connector.

```
:OUTPut<n>:OVERlay:BLINk:STATe ON|OFF
```

> Turns the text blinking mode on or off. You can also use 1 or 0 instead of ON or OFF. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

:OUTPut<n>:OVERlay:BLINk:STATe?

Returns the current state of the text blinking mode. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

:OUTPut<n>:OVERlay:BLINk:PERiod <numeric_value>

Sets the blinking interval of the text blinking mode. You can set the value as 0.5 seconds or 1.0 seconds. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

:OUTPut<n>:OVERlay:BLINk:PERiod?

Returns the blinking interval of the text blinking mode. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

:OUTPut<n>:TEXT:STATe ON|OFF

Turns the text overlay on the video signal on or off. You can also use 1 or 0 instead of ON or OFF. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

:OUTPut<n>:TEXT:STATe?

Returns the current text overlay state. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

:OUTPut<n>:TEXT:DATA <string>

Sets the current string for the text overlay mode. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector. The text string may contain up to 18 characters.

:OUTPut<n>:TEXT:DATA?

Returns the current string for the text overlay mode. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

`:OUTPut<n>:TEXT:POSition:HORizontal <numeric_value>`

Sets the text horizontal position in the video signal. The unit is percent of active picture width. You can set the position from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of the numeric value. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

`:OUTPut<n>:TEXT:POSition:HORizontal?`

Returns the current text horizontal position in the video signal. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

`:OUTPut<n>:TEXT:POSition:VERTical <numeric_value>`

Sets the text vertical position in the video signal. The unit is percent of active picture height. You can set the position from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of the numeric value. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

`:OUTPut<n>:TEXT:POSition:VERTical?`

Returns the current text vertical position in the video signal. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

`:OUTPut<n>:TEXT:SAVe`

Saves the current text and its display position to the signal file. There are no arguments. The <n> in the command represents the output connector and you can specify 3 or 4. "3" represents the SIGNAL connector and "4" represents the BARS connector.

`:OUTPut<n>:APL:MODe APL_OFF|APL_HIGH|APL_LOW|APL_BOUNCE|BOUNCE`

Sets the output mode of the APL signal. Refer to *Operating Basics* in the TG700 User Manual for detailed information about each mode. You can only specify "3" (SIGNAL connector) for the <n>.

`:OUTPut<n>:APL:MODe?`

Returns the current output mode of the APL signal. You can specify only "3" (SIGNAL connector) for the <n>.

:OUTPut<n>:APL:PERiod <numeric_value>

> Sets the time interval between two signals when they are output in the bounce modes. You can set the value from 0.5 seconds to 2.0 seconds in 0.5 seconds steps. You can specify only "3" (SIGNAL connector) for the <n>.

:OUTPut<n>:APL:PERiod?

> Returns the time interval between two signals when they are output in the bounce modes. You can specify only "3" (SIGNAL connector) for the <n>.

SENSE Commands

Use these commands to adjust the timing offset of each output relative to the internal reference signal (frame reset signal).

Refer to *Operating Basics* in the TG700 User Manual for detailed information about the timing offset range.

Command Tree

```
:SENSe<n>
   :CORRection
     :MDELay
        :HORizontal          <numeric_value>
            :STEP            <numeric_value>
        :VERTical            <numeric_value>
           :STEP             <numeric_value>
```

Command Description

:SENSe<n>:CORRection:MDELay:HORizontal <numeric_value>

> Sets the horizontal timing offset for the specified output. The timing resolution is clock-cycles. The unit is microseconds. You can use UP, DOWN, or DEF instead of the numeric values. See page 2-2 for additional detail on UP, DOWN, and DEF. If the argument exceeds the horizontal time value, then the vertical offset is adjusted to accommodate the requested offset. The <n> in the command represents the output connector and you can specify from 1 through 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, "3" represents the SIGNAL connector, and "4" represents the BARS connector.

`:SENSe<n>:CORRection:MDELay:HORizontal?`

> Returns the horizontal timing offset of the specified output. The <n> in the command represents the output connector and you can specify from 1 through 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, "3" represents the SIGNAL connector, and "4" represents the BARS connector.

`:SENSe<n>:CORRection:MDELay:HORizontal:STEP <numeric_value>`

> Sets the step increment used by the UP or DOWN commands. The unit is microseconds. You can use UP, DOWN, or DEF instead of the numeric values. The <n> in the command represents the output connector and you can specify from 1 through 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, "3" represents the SIGNAL connector, and "4" represents the BARS connector.

`:SENSe<n>:CORRection:MDELay:HORizontal:STEP?`

> Returns the step increment used by the UP or DOWN commands. The <n> in the command represents the output connector and you can specify from 1 through 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, "3" represents the SIGNAL connector, and "4" represents the BARS connector.

`:SENSe<n>:CORRection:MDELay:VERTical <numeric_value>`

> Sets the vertical timing offset of the specified output. The argument can be a floating point value that is translated into integer lines with a horizontal offset. You can use UP, DOWN, or DEF instead of a numeric value. The <n> in the command represents the output connector and you can specify from 1 through 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, "3" represents the SIGNAL connector, and "4" represents the BARS connector.

`:SENSe<n>:CORRection:MDELay:VERTical?`

> Returns the vertical timing offset of the specified output. The <n> in the command represents the output connector and you can specify from 1 through 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, "3" represents the SIGNAL connector, and "4" represents the BARS connector.

:SENSe<n>:CORRection:MDELay:VERTical:STEP <numeric_value>

Sets the step increment used by the UP or DOWN commands. You can use MIN, MAX, or DEF instead of the numeric values. The <n> in the command represents the output connector and you can specify from 1 through 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, "3" represents the SIGNAL connector, and "4" represents the BARS connector.

:SENSe<n>:CORRection:MDELay:VERTical:STEP?

Returns the step increment used by the UP or DOWN commands. The <n> in the command represents the output connector and you can specify from 1 through 4. "1" represents the BLACK 1 connector, "2" represents the BLACK 2 connector, "3" represents the SIGNAL connector, and "4" represents the BARS connector.

AVG7 Analog Video Generator Module Remote Commands

This section describes the remote commands used to control the AVG7 Generator module remotely. The commands to the module are divided into the following three groups:

- MASS MEMORY commands (Refer to the *TG700 TV Signal Generator Platform User Manual*)

- OUTPUT commands

- SENSE commands

MASS MEMORY Commands

Two MASS MEMORY commands are listed here for your reference. You can use these to load and query the output test signal. Detailed information for using these commands are located in the *TG700 TV Signal Generator Platform User Manual*.

```
:MMEMory:LOAD:SIGNal <module_name>,<signal_name>
:MMEMory:LOAD:SIGNal <slot_number>,<signal_name>
```

Loads a signal into the specified module.

```
:MMEMory:SIGNal:ACTive? <slot_number>|<module_name>
```

Returns the current output signal of the specified module.

OUTPUT Commands

Use these commands to control the output parameters of the module. These include output status and circle/text/logo overlay.

Command Tree

```
:OUTPut<n>
  :STATe                ON|OFF
  :CIRCle
    :STATe              ON|OFF
    :DIAMeter           <numeric_value>
    :POSition
      :HORizontal       <numeric_value>
      :VERTical         <numeric_value>
  :LOGO
    :STATe              ON|OFF
    :POSition
      :HORizontal       <numeric_value>
      :VERTical         <numeric_value>
    :SELect             <logo_name>
    :SAVe
  :TEXT
    :STATe              ON|OFF
    :DATA               <string>
    :POSition
      :HORizontal       <numeric_value>
      :VERTical         <numeric_value>
    :SAVe
  :OVERlay
    :BLINk
      :STATe            ON|OFF
      :PERiod           <numeric_value>
  :APL
    :MODe               APL_OFF|APL_HIGH|APL_LOW|APL_BOUNCE
    :PERiod             <numeric_value>
  :MOVe
    :HORizontal         <numeric_value>
    :VERTical           <numeric_value>
    :PERiod             <numeric_value>
    :RANDom[:STATe]     ON|OFF
  :VIDeo
    :CONFig             YC|COMPOSITE
    :SCH                <numeric_value>
    :SYNC
      :STATe            ON|OFF
```

Command Description

:OUTPut<n>:STATe ON|OFF

> Turns the signal output of the specified channel on or off. The <n> in the command represents the output channel and you can specify 1, 2, or 3. You can use 1 or 0 instead of ON or OFF.

:OUTPut<n>:STATe?

> Returns the current output state of the specified channel. The <n> in the command represents the output channel and you can specify 1, 2, or 3.

:OUTPut1:CIRCle:STATe ON|OFF

> Turns the circle overlay on the video signal on or off. You can use 1 or 0 instead of ON or OFF.

:OUTPut1:CIRCle:STATe?

> Returns the current circle overlay state.

:OUTPut1:CIRCle:DIAMeter <numeric_value>

> Sets the diameter of the displayed circle. The unit is the percent of active picture height. You can set the diameter from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

:OUTPut1:CIRCle:DIAMeter?

> Returns the diameter of the displayed circle.

:OUTPut1:CIRCle:POSition:HORizontal <numeric_value>

> Sets the horizontal position of the circle as it appears on the active signal. The unit is the percent of active picture width. You can set the position from –50% to +50% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

:OUTPut1:CIRCle:POSition:HORizontal?

> Returns the current horizontal position of the circle as it appears on the active signal.

:OUTPut1:CIRCle:POSition:VERTical <numeric_value>

> Sets the vertical position of the circle as it appears on the active signal. The unit is the percent of active picture height. You can set the position from –50% to +50% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:CIRCle:POSition:VERTical?`

>   Returns the current vertical position of the circle as it appears on the active signal.

`:OUTPut1:LOGO:STATe ON|OFF`

>   Turns the logo overlay on the video signal on or off. You can use 1 or 0 instead of ON or OFF.

`:OUTPut1:LOGO:STATe?`

>   Returns the current logo overlay state.

`:OUTPut1:LOGO:POSition:HORizontal <numeric_value>`

>   Sets the horizontal position of the logo as it appears on the active signal. The unit is the percent of active picture width. You can set the position from –100% to 0% in 0.1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:LOGO:POSition:HORizontal?`

>   Returns the current horizontal position of the logo.

`:OUTPut1:LOGO:POSition:VERTical <numeric_value>`

>   Sets the vertical position of the logo as it appears on the active signal. The unit is the percent of active picture height. You can set the position from –100% to 0% in 0.1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:LOGO:POSition:VERTical?`

>   Returns the current vertical position of the logo.

`:OUTPut1:LOGO:SELect <logo_name>`

>   Selects the logo used for the logo overlay.

`:OUTPut1:LOGO:SELect?`

>   Returns the current logo used for the logo overlay.

`:OUTPut1:LOGO:SAVe`

>   Saves the current display position of the logo to the logo file. There are no arguments.

`:OUTPut1:TEXT:STATe ON|OFF`

>   Turns the text overlay on the video signal on or off. You can use 1 or 0 instead of ON or OFF.

`:OUTPut1:TEXT:STATe?`

> Returns the current text overlay state.

`:OUTPut1:TEXT:DATA <string>`

> Sets the current string for the text mode.

`:OUTPut1:TEXT:DATA?`

> Returns the current string for the text mode.

`:OUTPut1:TEXT:POSition:HORizontal <numeric_value>`

> Sets the text horizontal position in the video signal. The unit is the percent of active picture width. You can set the position from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of the numeric value.

`:OUTPut1:TEXT:POSition:HORizontal?`

> Returns the current text horizontal position in the video signal.

`:OUTPut1:TEXT:POSition:VERTical <numeric_value>`

> Sets the text vertical position in the video signal. The unit is the percent of active picture height. You can set the position from 0.0% to 100.0% in 1% steps. You can also use MIN, MAX, or DEF instead of the numeric value.

`:OUTPut1:TEXT:POSition:VERTical?`

> Returns the current text vertical position in the video signal.

`:OUTPut1:TEXT:SAVe`

> Saves the current text and its display position to the signal file. There are no arguments.

`:OUTPut1:OVERlay:BLINk:STATe ON|OFF`

> Turns on or off the blinking mode for the logo, text, and circle overlay. You can also use 1 or 0 instead of ON or OFF

`:OUTPut1:OVERlay:BLINk:STATe?`

> Returns the current state of the blinking mode for the logo, text, and circle overlay.

`:OUTPut1:OVERlay:BLINk:PERiod <numeric_value>`

> Sets the blinking interval of the blinking mode for the logo, text, and circle overlay. You can set the value as 0.5 seconds or 1.0 seconds.

`:OUTPut1:OVERlay:BLINk:PERiod?`

> Returns the blinking interval of the blinking mode for the logo, text, and circle overlay.

`:OUTPut1:APL:MODe APL_OFF|APL_HIGH|APL_LOW|APL_BOUNCE|BOUNCE`

> Sets the output mode of the APL signal. Refer to the *APL Submenu* section in the TG700 User Manual for detailed information about the each mode.

`:OUTPut1:APL:MODe?`

> Returns the current output mode of the APL signal.

`:OUTPut1:APL:PERiod <numeric_value>`

> Sets the time interval between two signals when they are output in the bounce modes. You can set the value from 0.5 seconds to 2.0 seconds in 0.5 seconds steps.

`:OUTPut1:APL:PERiod?`

> Returns the time interval between two signals when they are output in the bounce modes.

`:OUTPut1:MOVe:HORizontal <numeric_value>`

> Sets the amount of horizontal scrolling in the moving picture mode. You can set the value from –252 to +252 in 4 samples steps.

`:OUTPut1:MOVe:HORizontal?`

> Returns the amount of horizontal scrolling in the moving picture mode.

`:OUTPut1:MOVe:VERTical <numeric_value>`

> Sets the amount of vertical scrolling in the moving picture mode. You can set the value from –252 to +252 in 1 line steps.

`:OUTPut1:MOVe:VERTical?`

> Returns the amount of vertical scrolling in the moving picture mode.

`:OUTPut1:MOVe:PERiod <numeric_value>`

> Sets the time interval between occurrences of the scrolling. You can set the value from 1 to 16 in 1 field steps.

`:OUTPut1:MOVe:PERiod?`

> Returns the time interval between occurrences of the scrolling.

`:OUTPut1:MOVe:RANDom:STATe ON|OFF`

> Turns the random scrolling mode on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:MOVe:RANDom:STATe?`

> Returns the current state of the random scrolling mode.

`:OUTPut1:VIDeo:CONFig YC|COMPOSITE`

> Sets the output channel configuration when a composite signal is being output. For YC, a Y signal, C signal, and composite signal will be assigned to CH1, CH2, and CH3 respectively. For COMPOSITE, a composite signal will be assigned to all the three channels.

`:OUTPut1:VIDeo:CONFig?`

> Returns the current setting of the output channel configuration when a composite signal is being output.

`:OUTPut1:VIDeo:SCH <numeric_value>`

> Sets the SCH phase for a composite signal. You can set the value from −180 degrees to +180 degrees in 1 degree steps.

`:OUTPut1:VIDeo:SCH?`

> Returns the current SCHphase setting.

`:OUTPut1:VIDeo:SYNC:STATe ON|OFF`

> Sets whether or not a sync signal is multiplexed with the B and R signals when a GBR signal is being output. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:VIDeo:SYNC:STATe?`

> Returns whether or not a sync signal is multiplexed with the B and R signals when a GBR signal is being output.

SENSE Commands

Use these commands to set the timing offset of the output signals relative to the internal reference signal (frame reset signal).

Refer to *Operating Basics* in the TG700 User Manual for detailed information about the setting range.

Command Tree

```
:SENSe<n>
  :CORRection
    :MDELay
      :HORizontal        <numeric_value>
          :STEP          <numeric_value>
      :VERTical          <numeric_value>
          :STEP          <numeric_value>
```

Command Description

:SENSe1:CORRection:MDELay:HORizontal <numeric_value>

> Sets the horizontal timing offset of the output signals. The timing resolution is clock-cycles. The units are microseconds. You can use UP, DOWN, or DEF instead of the numeric value. If the argument exceeds the horizontal time value, then the vertical offset is adjusted to accommodate the requested delay.

:SENSe1:CORRection:MDELay:HORizontal?

> Returns the current horizontal timing offset of the output signals.

:SENSe1:CORRection:MDELay:HORizontal:STEP <numeric_value>

> Sets the step increment used by the UP or DOWN commands. The units are microseconds. You can use MIN, MAX, or DEF instead of a numeric value.

:SENSe1:CORRection:MDELay:HORizontal:STEP?

> Returns the current step increment.

:SENSe1:CORRection:MDELay:VERTical <numeric_value>

> Sets the vertical timing offset of the output signals. The argument can be a floating point value that is translated into integer lines with a horizontal offset. You can use UP, DOWN, or DEF instead of a numeric value.

:SENSe1:CORRection:MDELay:VERTical?

> Returns the current vertical timing offset of the output signals.

:SENSe1:CORRection:MDELay:VERTical:STEP <numeric_value>

> Sets the step increment used by the UP or DOWN commands. You can use MIN, MAX, or DEF instead of a numeric value.

:SENSe1:CORRection:MDELay:VERTical:STEP?

> Returns the current step increment.

AWVG7 Analog Wideband Video Generator Module Remote Commands

This section describes the remote commands used to control the AWVG7 Generator module remotely. The commands to the module are divided into the following three groups:

- MASS MEMORY commands (Refer to the *TG700 TV Signal Generator Platform User Manual*)

- OUTPUT commands

- SENSE commands

MASS MEMORY Commands

Two MASS MEMORY commands are listed here for your reference. You can use these to load and query the output test signal. Detailed information for using these commands are located in the *TG700 TV Signal Generator Platform User Manual*.

```
:MMEMory:LOAD:SIGNal <module_name>,<signal_name>
:MMEMory:LOAD:SIGNal <slot_number>,<signal_name>
```

Loads a signal into the specified module.

```
:MMEMory:SIGNal:ACTive? <slot_number>|<module_name>
```

Returns the current output signal of the specified module.

OUTPUT Commands

Use these commands to control the output parameters of the module. These include output status and circle/text/logo overlay.

Command Tree

```
:OUTPut<n>
  :STATe                ON|OFF
  :CIRCle
    :STATe              ON|OFF
    :DIAMeter           <numeric_value>
    :POSition
      :HORizontal       <numeric_value>
      :VERTical         <numeric_value>
  :LOGO
    :STATe              ON|OFF
    :POSition
      :HORizontal       <numeric_value>
      :VERTical         <numeric_value>
    :SELect             <logo_name>
    :SAVe
  :TEXT
    :STATe              ON|OFF
    :DATA               <string>
    :POSition
      :HORizontal       <numeric_value>
      :VERTical         <numeric_value>
    :SAVe
  :OVERlay
    :BLINk
      :STATe            ON|OFF
      :PERiod           <numeric_value>
  :MOVe
    :HORizontal         <numeric_value>
    :VERTical           <numeric_value>
    :PERiod             <numeric_value>
    :RANDom[:STATe]     ON|OFF
  :VIDeo
    :SYNC
      :STATe            ON|OFF
```

Command Description

`:OUTPut<n>:STATe ON|OFF`

Turns the signal output of the specified channel on or off. The <n> in the command represents the output channel and you can specify 1, 2, or 3. You can use 1 or 0 instead of ON or OFF.

`:OUTPut<n>:STATe?`

Returns the current output state of the specified channel. The <n> in the command represents the output channel and you can specify 1, 2, or 3.

`:OUTPut1:CIRCle:STATe ON|OFF`

Turns the circle overlay on the video signal on or off. You can use 1 or 0 instead of ON or OFF.

`:OUTPut1:CIRCle:STATe?`

Returns the current circle overlay state.

`:OUTPut1:CIRCle:DIAMeter <numeric_value>`

Sets the diameter of the displayed circle. The unit is the percent of active picture height. You can set the diameter from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:CIRCle:DIAMeter?`

Returns the diameter of the displayed circle.

`:OUTPut1:CIRCle:POSition:HORizontal <numeric_value>`

Sets the horizontal position of the circle as it appears on the active signal. The unit is the percent of active picture width. You can set the position from –50% to +50% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:CIRCle:POSition:HORizontal?`

Returns the current horizontal position of the circle as it appears on the active signal.

`:OUTPut1:CIRCle:POSition:VERTical <numeric_value>`

Sets the vertical position of the circle as it appears on the active signal. The unit is the percent of active picture height. You can set the position from –50% to +50% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:CIRCle:POSition:VERTical?`

>   Returns the current vertical position of the circle as it appears on the active signal.

`:OUTPut1:LOGO:STATe ON|OFF`

>   Turns the logo overlay on the video signal on or off. You can use 1 or 0 instead of ON or OFF.

`:OUTPut1:LOGO:STATe?`

>   Returns the current logo overlay state.

`:OUTPut1:LOGO:POSition:HORizontal <numeric_value>`

>   Sets the horizontal position of the logo as it appears on the active signal. The unit is the percent of active picture width. You can set the position from –100% to 0% in 0.1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:LOGO:POSition:HORizontal?`

>   Returns the current horizontal position of the logo.

`:OUTPut1:LOGO:POSition:VERTical <numeric_value>`

>   Sets the vertical position of the logo as it appears on the active signal. The unit is the percent of active picture height. You can set the position from –100% to 0% in 0.1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:LOGO:POSition:VERTical?`

>   Returns the current vertical position of the logo.

`:OUTPut1:LOGO:SELect <logo_name>`

>   Selects the logo used for the logo overlay.

`:OUTPut1:LOGO:SELect?`

>   Returns the current logo used for the logo overlay.

`:OUTPut1:LOGO:SAVe`

>   Saves the current display position of the logo to the logo file. There are no arguments.

`:OUTPut1:TEXT:STATe ON|OFF`

>   Turns the text overlay on the video signal on or off. You can use 1 or 0 instead of ON or OFF.

:OUTPut1:TEXT:STATe?

> Returns the current text overlay state.

:OUTPut1:TEXT:DATA <string>

> Sets the current string for the text mode.

:OUTPut1:TEXT:DATA?

> Returns the current string for the text mode.

:OUTPut1:TEXT:POSition:HORizontal <numeric_value>

> Sets the text horizontal position in the video signal. The unit is the percent of active picture width. You can set the position from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of the numeric value.

:OUTPut1:TEXT:POSition:HORizontal?

> Returns the current text horizontal position in the video signal.

:OUTPut1:TEXT:POSition:VERTical <numeric_value>

> Sets the text vertical position in the video signal. The unit is the percent of active picture height. You can set the position from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of the numeric value.

:OUTPut1:TEXT:POSition:VERTical?

> Returns the current text vertical position in the video signal.

:OUTPut1:TEXT:SAVe

> Saves the current text and its display position to the signal file. There are no arguments.

:OUTPut1:OVERlay:BLINk:STATe ON|OFF

> Turns on or off the blinking mode for the logo, text, and circle overlay. You can also use 1 or 0 instead of ON or OFF.

:OUTPut1:OVERlay:BLINk:STATe?

> Returns the current state of the blinking mode for the logo, text, and circle overlay.

:OUTPut1:OVERlay:BLINk:PERiod <numeric_value>

> Sets the blinking interval of the blinking mode for the logo, text, and circle overlay. You can set the value as 0.5 seconds or 1.0 seconds.

`:OUTPut1:OVERlay:BLINk:PERiod?`

Returns the blinking interval of the blinking mode for the logo, text, and circle overlay.

`:OUTPut1:MOVe:HORizontal <numeric_value>`

Sets the amount of horizontal scrolling in the moving picture mode. You can set the value from –252 to +252 in 4 samples steps.

`:OUTPut1:MOVe:HORizontal?`

Returns the amount of horizontal scrolling in the moving picture mode.

`:OUTPut1:MOVe:VERTical <numeric_value>`

Sets the amount of vertical scrolling in the moving picture mode. You can set the value from –252 to +252 in 1 line steps.

`:OUTPut1:MOVe:VERTical?`

Returns the amount of vertical scrolling in the moving picture mode.

`:OUTPut1:MOVe:PERiod <numeric_value>`

Sets the time interval between occurrences of the scrolling. You can set the value from 1 to 16 in 1 field steps.

`:OUTPut1:MOVe:PERiod?`

Returns the time interval between occurrences of the scrolling.

`:OUTPut1:MOVe:RANDom:STATe ON|OFF`

Turns the random scrolling mode on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:MOVe:RANDom:STATe?`

Returns the current state of the random scrolling mode.

`:OUTPut1:VIDeo:SYNC:STATe ON|OFF`

Sets whether or not a sync signal is multiplexed with the B and R signals when a GBR signal is being output. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:VIDeo:SYNC:STATe?`

Returns whether or not a sync signal is multiplexed with the B and R signals when a GBR signal is being output.

SENSE Commands

Use these commands to set the timing offset of the output signals relative to the internal reference signal (frame reset signal).

Refer to *Operating Basics* in the TG700 User Manual for detailed information about the setting range.

Command Tree

```
:SENSe<n>
  :CORRection
    :MDELay
      :HORizontal          <numeric_value>
        :STEP              <numeric_value>
      :VERTical            <numeric_value>
        :STEP              <numeric_value>
```

Command Description

`:SENSe1:CORRection:MDELay:HORizontal <numeric_value>`

> Sets the horizontal timing offset of the output signals. The timing resolution is clock-cycles. The units are microseconds. You can use UP, DOWN, or DEF instead of the numeric value. See page 2-2 for additional detail on UP, DOWN, and DEF. If the argument exceeds the horizontal time value, then the vertical offset is adjusted to accommodate the requested delay.

`:SENSe1:CORRection:MDELay:HORizontal?`

> Returns the current horizontal timing offset of the output signals.

`:SENSe1:CORRection:MDELay:HORizontal:STEP <numeric_value>`

> Sets the step increment used by the UP or DOWN commands. The units are microseconds. You can use MIN, MAX, or DEF instead of a numeric value.

`:SENSe1:CORRection:MDELay:HORizontal:STEP?`

> Returns the current step increment.

`:SENSe1:CORRection:MDELay:VERTical <numeric_value>`

> Sets the vertical timing offset of the output signals. The argument can be a floating point value that is translated into integer lines with a horizontal offset. You can use UP, DOWN, or DEF instead of a numeric value.

:SENSe1:CORRection:MDELay:VERTical?

Returns the current vertical timing offset of the output signals.

:SENSe1:CORRection:MDELay:VERTical:STEP <numeric_value>

Sets the step increment used by the UP or DOWN commands. You can use MIN, MAX, or DEF instead of a numeric value.

:SENSe1:CORRection:MDELay:VERTical:STEP?

Returns the current step increment.

BG7 Black Generator Module Remote Commands

This section describes the command sets used for the BG7 Generator module remote operation. The commands for the module are divided into the following groups:

■ OUTPUT commands

■ SENSE commands

OUTPUT Commands

Use these commands to set the video standard and the kind of signal for the BLACK outputs.

NOTE. *Use of the OUTPUT4:TIMEcode commands requires hardware version 1.2 or later and software version 5.1 or later.*

Command Tree

```
:OUTPut
   :CONFigure?
:OUTPut<n>
   :STANdard              NTSC|NTSC_NSU|PAL|HD1080_60I|
                          HD1080_59I|HD1080_50I|HD1080_24SF|
                          HD1080_23SF|HD1080_30P|HD1080_29P|
                          HD1080_25P|HD1080_24P|HD1080_23P|
                          HD720_60P|HD720_59P|HD720_50P
:OUTPUT4
   :TIMECode
      :STATus?
      :SOURce              DISable|TOD|COUNter
      :SOURce?
      :OFFSet              <NR1>,<NR1>,<NR1>,<NR1>
      :OFFSet?
      :VITc[1/2]
         :STATe            <BOOLEAN>
         :STATe?
         :LINe             <NR1>
         :LINe?
   :DROPf
      :STATe               <BOOLEAN>
```

```
                    :STATe?
    :SIGNal                      BB|BB_FREF|BB_10FID|CB100PER|
                                 CB75PER|CB_SMPTE|FF40PER|OTHER_ONE|
                                 OTHER_TWO|BB_NO_FREF|CB100_OR|CB75_OR
```

Command Description

```
:OUTPut:CONFigure?
```

Returns the availability of color bars signal output option (Option
CB). "1" indicates that the option is available and "0" indicates the
option is not available.

```
:OUTPut<n>:STANdard NTSC|NTSC_NSU|PAL|HD1080_60I|HD1080_59I|
                    HD1080_50I|HD1080_24SF|HD1080_23SF|
                    HD1080_30P|HD1080_29P|HD1080_25P|
                    HD1080_24P|HD1080_23P|HD720_60P|HD720_59P|
                    HD720_50P
```

Sets the video standard for a specific BLACK output. The choices
are NTSC, PAL, NTSC_NSU (NTSC no setup), and HD1080_60I to
HD720_50P. The <n> in the command represents the connector
number. You can use any connector number from 1 through 4.

```
:OUTPut<n>:STANdard?
```

Returns the video standard for a specific BLACK output. The <n> in
the command represents the connector number. You can use any
connector number from 1 through 4.

```
:OUTPut<n>:SIGNal BB|BB_FREF|BB_10FID|CB100PER|CB75PER|
                  CB_SMPTE|FF40PER|OTHER_ONE|OTHER_TWO|
                  BB_NO_FREF|CB100_OR|CB75_OR
```

Sets what kind of signal is available from a specific BLACK output.
The <n> in the command represents the connector number. You can
use any connector number from 1 through 4.

If the standard is NTSC or NTSC_NSU, the options are:

BB (black burst) or BB_FREF (black burst with field reference).

With Option CB you can also select:

BB_10FID (black burst with 10 field ID), CB100PER (100%
color bars), CB75PER (75% color bars), CB_SMPTE (SMPTE
color bars), FF40PER (40% flat field), OTHER_ONE (Other 1),
or OTHER_TWO (Other 2).

If the standard is PAL, the options are:

BB (black burst) or BB_NO_FREF (black burst no field reference).

With Option CB you can also select:

CB100PER (100% colour bars), CB75PER (75% colour bars) CB_100_OR (100% colour bars over red), CB_75_OR (75% colour bars over red), FF40PER (40% flat field), OTHER_ONE (Other 1), or OTHER_TWO (Other 2).

`:OUTPut<n>:SIGNal?`

Returns the current output signal. The <n> in the command represents the connector number. You can use any connector number from 1 through 4.

`:OUTPut4:TIMECode:STATus?`

Returns the current time code settings.

`:OUTPut4:TIMECode:SOURce DISable|TOD|COUNter`

Sets time code source. Disable shuts off the time code output. TOD sets the time of day clock as the source. Counter sets the time code source to the program counter. See the GPS7 Synchronization and Timecode Module Remote Commands chapter, starting on page 2-92 for more information on the TOD setting.

`:OUTPut4:TIMECode:SOURce?`

Returns the current time code source setting.

`:OUTPut4:TIMECode:OFFSet <NR1>,<NR1>,<NR1>,<NR1>`

Sets the time code offset in hours, minutes, seconds, and frames (HH:MM:SS:FF).

`:OUTPut4:TIMECode:VITc[1/2]:STATe 0 | 1 (BOOLEAN)`

Enables or disables the insertion of a VITC. You can enable two time codes. Setting the state to 1 enables the time code. Setting the state to 0 disables the time code.

`:OUTPut4:TIMECode:LINe <NR1>`

Sets the line number on which the VITC is located. For NTSC output, the line number range is 10-20. For PAL output, the line number range is 6-22. For HD output, the line number range is 7-40.

:OUTPut4:TIMECode:LINe?

>   Returns the line number on which the VITC is located.

:OUTPut4:TIMECode:DROPf:STATe 0 | 1   (BOOLEAN)

>   Enables or disables the use of Drop Frame time code.

:OUTPut4:TIMECode:DROPf:STATe?

>   Returns the Drop Frame time code state. A setting of 0 means drop
>   frame time code is not used. A setting of 1 means drop frame time
>   code is used.

SENSE Commands

Use these commands to adjust the timing offset of the BLACK outputs relative
to the internal reference signal (frame reset signal).

Refer to *Operating Basics* in the TG700 User Manual for detailed information
about the timing offset range.

Command Tree

```
:SENSe<n>
   :CORRection
     :MDELay
       :HORizontal        <numeric_value>
          :STEP           <numeric_value>
       :VERTical          <numeric_value>
          :STEP           <numeric_value>
```

Command Description

:SENSe<n>:CORRection:MDELay:HORizontal <numeric_value>

>   Sets the horizontal timing offset of a specific BLACK output. The
>   timing resolution is clock-cycles. The unit is microseconds. You can
>   use UP, DOWN, or DEF instead of the numeric values. See page 2–2
>   for additional detail on UP, DOWN, and DEF. If the argument
>   exceeds the horizontal time value, then the vertical offset is adjusted
>   to accommodate the requested offset. The <n> in the command
>   represents the connector number. You can use any connector number
>   from 1 through 4.

`:SENSe<n>:CORRection:MDELay:HORizontal?`

> Returns the horizontal timing offset of a specific BLACK output. The <n> in the command represents the connector number. You can use any connector number from 1 through 4.

`:SENSe<n>:CORRection:MDELay:HORizontal:STEP <numeric_value>`

> Sets the step increment used by the UP or DOWN commands. The unit is microseconds. You can use UP, DOWN, or DEF instead of the numeric values. The <n> in the command represents the connector number. You can use any connector number from 1 through 4.

`:SENSe<n>:CORRection:MDELay:HORizontal:STEP?`

> Returns the step increment used by the UP or DOWN commands. The <n> in the command represents the connector number. You can use any connector number from 1 through 4.

`:SENSe<n>:CORRection:MDELay:VERTical <numeric_value>`

> Sets the vertical timing offset of a specific BLACK output. The argument can be a floating point value that is translated into integer lines with a horizontal offset. You can use UP, DOWN, or DEF instead of a numeric value. The <n> in the command represents the connector number. You can use any connector number from 1 through 4.

`:SENSe<n>:CORRection:MDELay:VERTical?`

> Returns the vertical timing offset of a specific BLACK output. The <n> in the command represents the connector number. You can use any connector number from 1 through 4.

`:SENSe<n>:CORRection:MDELay:VERTical:STEP <numeric_value>`

> Sets the step increment used by the UP or DOWN commands. You can use MIN, MAX, or DEF instead of the numeric values. The <n> in the command represents the connector number. You can use any connector number from 1 through 4.

`:SENSe<n>:CORRection:MDELay:VERTical:STEP?`

> Returns the step increment used by the UP or DOWN commands. The <n> in the command represents the connector number. You can use any connector number from 1 through 4.

DVG7 Digital Video Generator Module Remote Commands

This section describes the remote commands used to control the DVG7 Generator module remotely. The commands to the module are divided into the following three groups:

■ MASS MEMORY commands (Refer to the *TG700 TV Signal Generator Platform User Manual*)

■ OUTPUT commands

■ SENSE commands

MASS MEMORY Commands

Two MASS MEMORY commands are listed here for your reference. You can use these to load and query the output test signal. Detailed information for using these commands are located in the *TG700 TV Signal Generator Platform User Manual*.

```
:MMEMory:LOAD:SIGNal <module_name>,<signal_name>
:MMEMory:LOAD:SIGNal <slot_number>,<signal_name>
```

Loads a signal into the specified module.

```
:MMEMory:SIGNal:ACTive? <slot_number>|<module_name>
```

Returns the current output signal of the specified module.

OUTPUT Commands

Use these commands to control the output parameters of the module. These include embedded audio and circle/text/logo overlay.

Command Tree

```
:OUTPut<n>
  :CIRCle
    :STATe              ON|OFF
    :DIAMeter           <numeric_value>
    :POSition
      :HORizontal       <numeric_value>
      :VERTical         <numeric_value>
  :EAUDio
    :CHANnel<n>
      :AMPLitude        <numeric_value>
      :FREQuency        <numeric_value>
      :CLICk            OFF|1|2|3|4
    :GROup<n>
        :STATe          ON|OFF
        :PREemphasis    OFF|CD|CCITt
        :NBITs          20|24
        :SAMPLIng       FRAMe|NOFRame|ASYNc
  :LOGO
    :STATe              ON|OFF
    :POSition
      :HORizontal       <numeric_value>
      :VERTical         <numeric_value>
    :SELect             <logo_name>
    :SAVe
  :MOVe
    :HORizontal         <numeric_value>
    :VERTical           <numeric_value>
    :PERiod             <numeric_value>
    :RANDom[:STATe]     ON|OFF
  :OVERlay
    :BLINk
      :STATe            ON|OFF
      :PERiod           <numeric_value>
  :TEXT
    :STATe              ON|OFF
    :DATA               <string>
    :POSition
      :HORizontal       <numeric_value>
      :VERTical         <numeric_value>
    :SAVe
```

```
:VIDeo
  :Y
     :STATe             ON|OFF
  :PB
     :STATe             ON|OFF
  :PR
     :STATe             ON|OFF
  :NBITs                8|10
  :EDH
     :STATe             ON|OFF
  :AVTiming
     :STATe             ON|OFF
:STANdard                D2_NTSC|D1_NTSC|D1_PAL
:SIGNal                  BLACk|GRAY|FF50P|WHITe
```

Command Description

:OUTPut1:CIRCle:STATe ON|OFF

> Turns the circle overlay on the video signal on or off. You can use 1 or 0 instead of ON or OFF.

:OUTPut1:CIRCle:STATe?

> Returns the current circle overlay state.

:OUTPut1:CIRCle:DIAMeter <numeric_value>

> Sets the diameter of the displayed circle. The unit is percent of active picture height. You can set the diameter from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

:OUTPut1:CIRCle:DIAMeter?

> Returns the diameter of the displayed circle.

:OUTPut1:CIRCle:POSition:HORizontal <numeric_value>

> Sets the horizontal position of the circle as it appears on the active signal. The unit is percent of active picture width. You can set the position from −50% to +50% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

:OUTPut1:CIRCle:POSition:HORizontal?

> Returns the current horizontal position of the circle as it appears on the active signal.

`:OUTPut1:CIRCle:POSition:VERTical <numeric_value>`

> Sets the vertical position of the circle as it appears on the active signal. The unit is percent of active picture height. You can set the position from –50% to +50% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:CIRCle:POSition:VERTical?`

> Returns the current vertical position of the circle as it appears on the active signal.

`:OUTPut<n>:EAUDio:CHANnel<m>:AMPLitude <numeric_value>`

> Sets the amplitude of a specific embedded audio channel for the selected outputs. You can set the amplitude from –60 dBFS to 0 dBFS in 1 dBFS steps. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:CHANnel<m>:AMPLitude?`

> Returns the current amplitude of a specific embedded audio channel for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:CHANnel<m>:FREQuency <numeric_value>`

> Sets the frequency of a specific embedded audio channel for the selected outputs. The frequency choices are –1, 0, 50, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1500, 1600, 2000, 2400, 3000, 3200, 4000, 4800, 5000, 6000, 8000, 9600, 10000, 12000, 15000, 16000, or 20000. For –1, the output of the audio data is disabled. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:CHANnel<m>:FREQuency?`

> Returns the current frequency of a specific embedded audio channel for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:CHANnel<m>:CLICk 0|1|2|3|4`

> Sets the audio click of a specific audio channel for the selected outputs. You can select 0, 1 (second), 2 (seconds), 3 (seconds) or 4 (seconds). When 1, 2, 3 or 4 is selected, the audio click becomes valid. Audio Tone is turned off for 0.25 seconds around the time of the click. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:CHANnel<m>:CLICk?`

> Returns the current audio click settings of a specific audio channel for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:GROup<m>:STATe ON|OFF`

> Turns on or off the output of a specific audio group for the selected outputs. You can also use 1 or 0 instead of ON or OFF. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:STATe?`

> Returns the current output state of a specific audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:PREemphasis OFF|CD|CCITt`

Turns the preemphasis bits in the audio signal of a specific embedded audio group for the selected outputs on or off. The signal itself does not have preemphasis, but you can set the bits in order to check other equipment. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:PREemphasis?`

Returns the current preemphasis bits settings of a specific embedded audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:NBITs 20|24`

Sets the sample bits of a specific embedded audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:NBITs?`

Returns the current sample bits of a specific embedded audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:SAMPLIng FRAMe|NOFRame|ASYNc`

Sets the sampling alignment status bits in the audio signal of a specific embedded audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:SAMPLIng?`

> Returns the current sampling alignment status bits settings of a specific embedded audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut1:LOGO:STATe ON|OFF`

> Turns the logo overlay display on the video signal on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:LOGO:STATe?`

> Returns the current logo overlay state.

`:OUTPut1:LOGO:POSition:HORizontal <numeric_value>`

> Sets the horizontal position of the logo as it appears on the active signal. The unit is percent of active picture width. You can set the position from -100% to 0% in 0.1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:LOGO:POSition:HORizontal?`

> Returns the current horizontal position of the logo.

`:OUTPut1:LOGO:POSition:VERTical <numeric_value>`

> Sets the vertical position of the logo as it appears on the active signal. The unit is percent of active picture height. You can set the position from -100% to 0% in 0.1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:LOGO:POSition:VERTical?`

> Returns the current vertical position of the logo.

`:OUTPut1:LOGO:SELect <logo_name>`

> Selects the logo used for the logo overlay.

`:OUTPut1:LOGO:SELect?`

> Returns the current logo used for the logo overlay.

`:OUTPut1:LOGO:SAVe`

> Saves the current display position of the logo to the logo file. There are no arguments.

`:OUTPut1:MOVe:HORizontal <numeric_value>`

> Sets the amount of horizontal scrolling in the moving picture mode. You can set the value from –252 to +252 in 4 samples steps.

`:OUTPut1:MOVe:HORizontal?`

> Returns the amount of horizontal scrolling in the moving picture mode.

`:OUTPut1:MOVe:VERTical <numeric_value>`

> Sets the amount of vertical scrolling in the moving picture mode. You can set the value from –252 to +252 in 1 line steps.

`:OUTPut1:MOVe:VERTical?`

> Returns the amount of vertical scrolling in the moving picture mode.

`:OUTPut1:MOVe:PERiod <numeric_value>`

> Sets the time interval between occurrences of the scrolling. You can set the value from 1 to 16 in 1 field steps.

`:OUTPut1:MOVe:PERiod?`

> Returns the time interval between occurrences of the scrolling.

`:OUTPut1:MOVe:RANDom:STATe ON|OFF`

> Turns the random scrolling mode on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:MOVe:RANDom:STATe?`

> Returns the current state of the random scrolling mode.

`:OUTPut1:OVERlay:BLINk:STATe ON|OFF`

> Turns on or off the blinking mode for the logo, text, and circle overlay. You can also use 1 or 0 instead of ON or OFF

`:OUTPut1:OVERlay:BLINk:STATe?`

> Returns the current state of the blinking mode for the logo, text, and circle overlay.

`:OUTPut1:OVERlay:BLINk:PERiod <numeric_value>`

> Sets the blinking interval of the blinking mode for the logo, text, and circle overlay. You can set the value as 0.5 seconds or 1.0 seconds.

`:OUTPut1:OVERlay:BLINk:PERiod?`

> Returns the blinking interval of the blinking mode for the logo, text, and circle overlay.

`:OUTPut1:TEXT:STATe ON|OFF`

> Turns the text overlay display on the video signal on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:TEXT:STATe?`

> Returns the current text overlay state.

`:OUTPut1:TEXT:DATA <string>`

> Sets the current string for the text mode.

`:OUTPut1:TEXT:DATA?`

> Returns the current string for the text mode.

`:OUTPut1:TEXT:POSition:HORizontal <numeric_value>`

> Sets the text horizontal position in the video signal. The unit is percent of active picture width. You can set the position from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of the numeric value.

`:OUTPut1:TEXT:POSition:HORizontal?`

> Returns the current text horizontal position in the video signal.

`:OUTPut1:TEXT:POSition:VERTical <numeric_value>`

> Sets the text vertical position in the video signal. The unit is percent of active picture height. You can set the position from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of the numeric value.

`:OUTPut1:TEXT:POSition:VERTical?`

> Returns the current text vertical position in the video signal.

`:OUTPut1:TEXT:SAVe`

> Saves the current text and its display position to the signal file. There are no arguments.

`:OUTPut1:VIDeo:Y:STATe ON|OFF`

> Turns the Y component of the serial digital video signals on or off. You can also use 1 or 0 instead of ON or OFF.

:OUTPut1:VIDeo:Y:STATe?

> Returns the current output state of the Y component of the serial digital video signals.

:OUTPut1:VIDeo:PB:STATe ON|OFF

> Turns the P_B component of the serial digital video signals on or off. You can also use 1 or 0 instead of ON or OFF.

:OUTPut1:VIDeo:PB:STATe?

> Returns the current output state of the P_B component of the serial digital video signals.

:OUTPut1:VIDeo:PR:STATe ON|OFF

> Turns the P_R component of the serial digital video signals on or off. You can also use 1 or 0 instead of ON or OFF.

:OUTPut1:VIDeo:PR:STATe?

> Returns the current output state of the P_R component of the serial digital video signals.

:OUTPut<n>:VIDeo:NBITs 8|10

> Sets the video resolution for the selected output. The options are 8 bits or 10 bits. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors.

:OUTPut<n>:VIDeo:NBITs?

> Returns the current video resolution for the selected outputs. The options are 8 bits or 10 bits. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors.

:OUTPut<n>:VIDeo:EDH:STATe ON|OFF

> Turns Error Detection and Handling insertion for the selected outputs on or off. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors.

:OUTPut1:VIDeo:EDH:STATe?

> Returns the current Error Detection and Handling insertion status.

`:OUTPut<n>:VIDeo:EDH:STATe?`

> Returns the current Error Detection and Handling insertion status for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors.

`:OUTPut1:VIDeo:AVTiming:STATe ON|OFF`

> Turns the output mode for an audio/video timing measurement on or off. Refer to *Operating Basics* in the TG700 User Manual for detailed information about the mode. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:VIDeo:AVTiming:STATe?`

> Returns the current output mode setting for an audio/video timing measurement.

`:OUTPut2:STANdard D2_NTSC|D1_NTSC|D1_PAL`

> Sets the video standard for the serial digital black signals output from the BLACK connectors. The choices are D2_NTSC (525–143 format), D1_NTSC (525–270 format), or D1_PAL (625–270 format). This command is only available if Option BK is installed.

`:OUTPut<n>:STANdard?`

> Returns the video standard for the selected output. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors.

`:OUTPut2:SIGNal BLACk|GRAY|FF50P|WHITe`

> Sets the type of the serial digital black signals output from the BLACK connectors. The options are BLACK (serial digital black signal) , GRAY (40% flat field signal), FF50P (50% flat field signal), or WHITe (100% flat field signal). This command is only available if Option BK is installed.

`:OUTPut2:SIGNal?`

> Returns the current serial digital black signals output from the BLACK connectors. This command is only available if Option BK is installed.

`:OUTPut:CONFigure?`

> Returns the availability of serial digital black signal output option (Option BK). "1" indicates that the option is available and "0" indicates that the option is not available.

SENSE Commands

Use these commands to set the timing offset of the SIGNAL outputs and the BLACK outputs (Option BK only) relative to the internal reference signal (frame reset signal).

Refer to *Operating Basics* in the TG700 User Manual for detailed information about the setting range.

Command Tree

```
:SENSe<n>
  :CORRection
    :MDELay
      :HORizontal        <numeric_value>
        :STEP            <numeric_value>
      :VERTical          <numeric_value>
        :STEP            <numeric_value>
```

Command Description

:SENSe<n>:CORRection:MDELay:HORizontal <numeric_value>

Sets the horizontal timing offset of the selected outputs. The timing resolution is clock-cycles. The units are microseconds. You can use UP, DOWN, or DEF instead of the numeric value. See page 2-2 for additional detail on UP, DOWN, and DEF. If the argument exceeds the horizontal time value, then the vertical offset is adjusted to accommodate the requested delay. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

:SENSe<n>:CORRection:MDELay:HORizontal?

Returns the current horizontal timing offset of the selected outputs. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

:SENSe<n>:CORRection:MDELay:HORizontal:STEP <numeric_value>

Sets the step increment used by the UP or DOWN commands. The units are microseconds. You can use MIN, MAX, or DEF instead of a numeric value. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

`:SENSe<n>:CORRection:MDELay:HORizontal:STEP?`

> Returns the current step increment. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

`:SENSe<n>:CORRection:MDELay:VERTical <numeric_value>`

> Sets the vertical timing offset of the selected outputs. The argument can be a floating point value that is translated into integer lines with a horizontal offset. You can use UP, DOWN, or DEF instead of a numeric value. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

`:SENSe<n>:CORRection:MDELay:VERTical?`

> Returns the current vertical timing offset of the selected outputs. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

`:SENSe<n>:CORRection:MDELay:VERTical:STEP <numeric_value>`

> Sets the step increment used by the UP or DOWN commands. You can use MIN, MAX, or DEF instead of a numeric value. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

`:SENSe<n>:CORRection:MDELay:VERTical:STEP?`

> Returns the current step increment. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

GPS7 GPS Synchronization and Timecode Module Remote Commands

This section describes the remote commands used to control the GPS7 module remotely. The commands to the module are divided into the following groups:

■ INPUT commands

■ SOURCE commands

■ OUTPUT commands

■ SENSE commands

■ CONFIGURE commands

***NOTE**. Commands which control generator lock (Genlock) features are not supported by GPS7 modules that do not have a REF IN connector.*

INPUT Commands

Use these commands to control the input parameters of the module.

Command Tree

```
:INPut
   :STAtus:
      :REF?                GPS | INTERNAL | NTSC Burst | SMPTE318M |
                           PAL Burst | 1080 60i | 1080 59i |
                           1080 50i | 1080 23sF | 1080 24sF |
                           1080 30p | 1080 29p | 1080 25p |
                           1080 24p | 1080 23p | 720 60p | 720 59p

      :FOM?                No Signal | Bad Signal | Locked
      :TOD?                YYYY-MM-DD HH:MM:SS
      :UTC?                YYYY-MM-DD HH:MM:SS
      :PCOUnter?           YYYY-MM-DD HH:MM:SS
      :SIG?                <numeric_value>
      :SAT?                <NR1>/<NR1>
      :ANTenna?            POWER OFF | OPEN | SHORT | NOMINAL
```

```
                         :DIAG
                            :STATus?          <string>
                            :GLOCK?           <string>
                          :GENlock?           INTernal | ABSent | UNLocked | LOCKed |
                                              NLOCK
                            :STATus?          <string>
                        :SOURce               GPS | INTernal | NBURst | N318M |
                                              PBURst | HDSYnc
                        :SOURce?
                        :LLOSs
                           :ACTion            INTernal | STAy
                           :ACTion?
                           :RECovery          JAM | FAST | STAY
                           :RECovery?
                        :SWARning
                           :THREshold         <NR1> 0, 1, 2, ..,10
                           :THREshold?
                        :ANTenna
                           :POWer             OFF | DC3V | DC5V

                           :POWer?
                           :POSition          FIXed | MOBile
                           :POSition?
                        :GPS
                           :ACQuire
```

Command Description

`:INPut:STAtus:REF?`

> Returns the time reference in use. If GPS is the selected reference and cannot be detected, No Signal is returned.

`:INPut:STAtus:FOM?`

> Returns the Figure of Merit (quality of GPS signal) value. See the *GPS7 GPS Synchronization and Timecode Module* chapter of the *TG700 TV Signal Generator Platform User Manual* for additional information.

`:INPut:STAtus:TOD?`

> Returns the local time of day in the GPS7 module. This time includes any time zone offset correction that has been entered by the user and any applied leap second correction.

`:INPut:STAtus:UTC?`

> Returns the UTC (Coordinated Universal Time) in the GPS7 module. This time does not include any local time zone offset.

`:INPut:STAtus:PCOUnter?`

> Returns the program time.

`:INPut:STAtus:SIG?`

> Returns the GPS signal strength.

`:INPut:STAtus:SAT?`

> Returns two numbers characterizing the GPS satellite status. The numbers are returned in the form "XX/XX". The first number represents the number of satellites from which the receiver is getting good "fix" information; the second number is the number of satellites that are in view (which may be larger than the first number because the receiver may not be getting good fix information from all the satellites).

`:INPut:STAtus:ANTenna?`

> Returns the antenna connection status. Connection status can be Power Off, Open, Short, or Nominal.

`:INPut:STAtus:DIAG:STATus?`

> Returns a string containing all GPS DIAG menu display items, separated by a semicolon. The full list of returned values is:
>
> Temperature
> Oscillator Phase and DAC values
> Oscillator lock state
> Power supply readings
> +5V, +8V, –5V,
> Phase detect ramp value (these values are used for factory diagnostic analysis)
> – Up: A and B
> – Down: A and B

`:INPut:STAtus:DIAG:GLOCK?`

> Returns a string containing all Genlock DIAG menu display items, separated by a semicolon. The full list of returned values is:

- Stuck Bits – Status is indicated by "H" for high, "L" for low, and "–" for OK.

- Shorted Bits – Status is indicated by "S" for shorted (always in pairs) and "–" for OK.

- Genlock Signal Amplitude min/max

`:INPut:STAtus:GENlock?`

NOTE. *This query is not supported by GPS7 modules that do not have a REF IN connector.*

> Returns genlock reference status. The possible responses are INTernal, ABSent, UNLocked, LOCKed, or NLOCK (near loss of lock).

`:INPut:STAtus:GENlock:STATus?`

NOTE. *This query is not supported by GPS7 modules that do not have a REF IN connector.*

> Returns a string containing amplitude and VITC information for the genlock source. The VITC information is returned as Absent or as a line number. A returned line number indicates the line on which the VITC information was found.

`:INPut:SOURce GPS | INTernal|NBURst | N318M | PBURst | HDSYnc`

NOTE. *The arguments NBURst, N318M, PBURst, and HDSYnc are not supported by GPS7 modules that do not have a REF IN connector.*

> Sets the video reference source.

`:INPut:SOURce?`

> Returns the video reference source setting.

`:INPut:LLOSs:ACTion`

> Sets the Loss of Lock action setting. The action can be set to switch to internal or stay at current frequency when loss of lock occurs.

`:INPut:LLOSs:ACTion?`

> Returns the Loss Lock action setting.

`:INPut:LLOSs:RECovery`

> Sets the Holdover Recovery action setting. The action can be set to Jam Phase, Fast Slew, or Stay Legal. When a loss of lock occurs, this setting specifies the method used to synchronize the time when lock is achieved. Recovery methods are Jam Phase, Fast Slew, and Stay Legal (SMPTE specified).

`:INPut:LLOSs:RECovery?`

> Returns the Holdover Recovery action setting.

`:INPut:SWARning:THREshold`

> Sets the Figure of Merit (quality of GPS signal) value that triggers warning indicators. Threshold can be set to integer values, from 1 to 11.

`:INPut:SWARning:THREshold?`

> Returns the Figure of Merit value that triggers warning indicators.

`:ANTenna:POWer`

> Sets the power level supplied to the antenna.

`:ANTenna:POWer?`

> Returns the antenna power setting.

`:ANTenna:POSition FIXED | MOBILE`

> Sets the GPS module configuration that optimizes the system for either fixed position or mobile (remote van) operation.

`:ANTenna:POSition?`

> Returns the antenna position setting.

`:GPS:ACQuire`

> Forces manual position acquisition. This is a set only command.

SOURCE Commands

Use these commands to control the source parameters of the module.

Command Tree

```
:SOURce
  :CORRection
    :MDELay
      :HORizontal         <NRf>
          :STEP           <NRf> | MIN | MAX | DEF
      :VERTical           <NR1>
          :STEP           <NR1>
  :TIMESet
    :OFFSet               HH:MM,HH:MM
    :OFFSet?              HH:MM,HH:MM
    :TOD
      :SOURce             GPS | INTernal | VITc
      :SOURce?            GPS | INTernal | VITc
      :TIME               HH:MM:SS
      :TIME?              HH:MM:SS
      :DATE               YYYY-MM-DD
      :DATE?              YYYY-MM-DD
      :MODE               FOLLow | ONCE | NOW
      :MODE?
    :AUTO
      :STATe              0 | 1
      :STATe?             0 | 1
      :OFFSet             HH:MM, HH:MM
      :OFFSet?            HH:MM, HH:MM
      :DATE               YYYY-MM-DD
      :DATE?              YYYY-MM-DD
      :TIME               HH:MM:SS
      :TIME?              HH:MM:SS
  :PCOUnter
    :INITialize           Set only
    :TIME
      :INITial            HH:MM:SS
      :INITial?           HH:MM:SS
  :JAMSync
    :STATe                0 | 1
    :STATe?               0 | 1
    :EXECute              Set only
    :TIME                 HH:MM:SS
    :TIME?                HH:MM:SS
```

```
:LEAPsec
    :SOURce             LOCal | UTC
    :SOURce?
    :EXECute            Set only
    :TIME               <numeric_value>,<numeric_value>,
                        <numeric_value>
    :TIME?
:ALARm
    :STATe              0 | 1
    :STATe?
    :TIME               <numeric_value>,<numeric_value>,
                        <numeric_value>
    :TIME?
:LLOSs
    :GPO
        :MDELay         <Nr1>,<Nr1>,<Nr1> (HH:MM:SS)
        :MDELay?
    :BLAck
        :MDELay         <Nr1>,<Nr1>,<Nr1> (HH:MM:SS)
        :MDELay?
:NLLOSs
    :GPO
        :MDELay         <Nr1>,<Nr1>,<Nr1> (HH:MM:SS)
        :MDELay?
:NOGL
    :GPO
        :MDELay         <Nr1>,<Nr1>,<Nr1> (HH:MM:SS)
        :MDELay?
:SWARning
    :GPO
        MDELay          <numeric_value>,<numeric_value>,
                        <numeric_value>
        MDELay?
GPIo
    :INPut              RESET_COUNT | REACQ_SAT | JAM
    :INPut?
    :OUTPut[1/2]        NONE | SIG_WARN | LOCK_LOSS |
                        ALARM_TIME | NEAR_LLOS | NO_GENLOCK
    :OUTPut[1/2]?
    :STATus?            String (OUTPUT2,OUTPUT1,INPUT)> :==
                        "0,0,0", ."1,1,1"
```

Command Description

```
:SOURce:CORRection:MDELay:HORizontal <NR1>
```

Sets the horizontal timing offset of the selected source. The timing resolution is clock-cycles. The units are microseconds. See Table 2-3 for the delay ranges.

Table 2-3: GPS7 Source horizontal offset ranges

Standard / Frame rate	Range (sample clock cycles)
NTSC	$\pm$ 3432 (54 MHz clock)
PAL	$\pm$ 3456 (54 MHz clock)
1080 60i	$\pm$ 2200 (74.25 MHz clock)
1080 59.94i	$\pm$ 2200 (74.18 MHz clock)
1080 50i	$\pm$ 2640 (74.25 MHz clock)
1080 24 sF	$\pm$ 2750 (74.25 MHz clock)
1080 23.98 sF	$\pm$ 2750 (74.18 MHz clock)
1080 30p	$\pm$ 2200 (74.25 MHz clock)
1080 29.97p	$\pm$ 2200 (74.18 MHz clock)
1080 25p	$\pm$ 2640 (74.25 MHz clock)
1080 24p	$\pm$ 2750 (74.25 MHz clock)
1080 23.98p	$\pm$ 2750 (74.18 MHz clock)
720 60p	$\pm$ 1650 (74.25 MHz clock)
720 59.94p	$\pm$ 1650 (74.18 MHz clock)

```
:SOURce:CORRection:MDELay:HORizontal?
```

Returns the current horizontal timing offset of the selected source.

```
:SOURce:CORRection:MDELay:HORizontal:STEP
```

Sets the horizontal timing offset up/down step increment in units of microseconds. You can use "MIN", "MAX", or "DEF" instead of numeric values.

```
:SOURce:CORRection:MDELay:VERTical
```

Sets the vertical timing offset of the genlock signal relative to the internal reference signal, in units of lines. Range: NTSC - $\pm$525, PAL - $\pm$625, HD - $\pm$562, or $\pm$375 (720p).

`:SOURce:CORRection:MDELay:VERTical:STEP`

> Sets the vertical timing offset up/down step increment in units of lines. You can also use "MIN", "MAX" or "DEF" instead of numeric values.

`SOURce:TIMESet:OFFSet <numeric_value>,<numeric_value> (HH:MM)`

> Sets the global time offset (from system TOD). This command can be used to adjust time for a time zone.

`SOURce:TIMESet:OFFSet?`

> Returns the global time offset.

`SOURce:TIMESet:TOD:SOURce INTernal | GPS | VITc`

NOTE. *The argument VITc is not supported by GPS7 modules that do not have a REF IN connector.*

> Sets the source for the mainframe time of day.

`SOURce:TIMESet:TOD:SOURce?`

> Returns the source setting for the mainframe time of day.

`SOURce:TIMESet:TOD:TIME <numeric_value>,<numeric_value>,<numeric_value> (HH:MM:SS)`

> Sets the global mainframe time of day. This setting has no effect if the TOD source is set to GPS.

`SOURce:TIMESet:TOD:TIME?`

> Returns the global mainframe time of day.

`SOURce:TIMESet:TOD:DATE <numeric_value>,<numeric_value>,<numeric_value> (YYYY:MM:DD)`

> Sets the global mainframe date.

`SOURce:TIMESet:TOD:DATE?`

> Returns the global mainframe date.

```
SOURce:TIMESet:TOD:MODE FOLLow | ONCE | NOW
```

NOTE. This command is not supported by GPS7 modules that do not have a REF IN connector.

Sets the timecode synchronization method for VITC. Select FOLLow to continually synchronize the timecode. Select ONCE to synchronize the timecode only once when lock is achieved. Select NOW to synchronize the timecode when the EXECute command is set.

```
SOURce:TIMESet:TOD:MODE:EXECute
```

NOTE. This command is not supported by GPS7 modules that do not have a REF IN connector.

Initiates an immediate timecode synchronization.

```
SOURce:TIMESet:AUTO:STATe 0 | 1
```

Sets the automatic time offset function. Setting this value to 1 enables the automatic offset function.

```
SOURce:TIMESet:AUTO:STATe?
```

Returns the setting of the automatic time offset function. A returned value of 1 means the function is enabled. A returned value of 0 means the function is disabled.

```
SOURce:TIMESet:AUTO:OFFSet <numeric_value>,<numeric_value>
(HH:MM)
```

Sets the offset value to use for the scheduled automatic offset.

```
SOURce:TIMESet:AUTO:OFFSet?
```

Returns the offset value to use for the scheduled automatic offset.

```
SOURce:TIMESet:AUTO:DATE <numeric_value>,<numeric_value>,<numer-
ic_value> (YYYY:MM:DD)
```

Sets the date when an automatic offset will occur.

```
SOURce:TIMESet:AUTO:DATE?
```

Returns the date when an automatic offset is scheduled to occur.

`SOURce:TIMESet:AUTO:TIME <numeric_value>,<numeric_value>,<numeric_value> (HH:MM:SS)`

> Sets the time of day when an automatic offset should occur.

`SOURce:TIMESet:AUTO:TIME?`

> Returns the time of day when an automatic offset should occur.

`SOURce:TIMESet:PCOUnter:INITialize`

> Sets the global program counter. Any module output (GPS7, BG7, or HDVG7) that can put timecode on the video signal can be configured to use the Program Time counter as its source. This is a set only command.

`SOURce:TIMESet:PCOUnter:TIME:INITial <numeric_value>,<numeric_value>,<numeric_value> (HH:MM:SS)`

> Sets the time for the program counter.

`SOURce:TIMESet:PCOUnter:TIME:INITial?`

> Returns the program counter initial time setting.

`SOURce:TIMESet:JAMSync:STATe 0 | 1`

> Sets the timecode jam sync state. A setting of 1 enables automatic jam sync at the specified time.

`SOURce:TIMESet:JAMSync:STATe?`

> Returns the timecode auto jam sync state. A returned value of 1 means auto jam sync is enabled. A returned value of 0 means auto jam sync is disabled.

`SOURce:TIMESet:JAMSync:EXECute`

> Immediately initiates a jam sync. This is a set-only command.

`SOURce:TIMESet:JAMSync:TIME <numeric_value>,<numeric_value>,<numeric_value> (HH:MM:SS)`

> Sets the time when an automated jam sync should occur.

`SOURce:TIMESet:JAMSync:TIME?`

> Returns the time when an automatic jam sync is set to occur.

`SOURce:TIMESet:LEAPsec:SOURce LOCal | UTC`

>Sets the time source for leap second adjustment. If UTC is selected, a leap second will be applied at 00:00:00 UTC. If the source is set to local, you can specify the time to apply the leap second adjustment.

`SOURce:TIMESet:LEAPsec:SOURce?`

>Returns the time source for the leap second adjustment.

`SOURce:TIMESet:LEAPsec:TIME <numeric_value>,<numeric_value>,<numeric_value> (HH:MM:SS)`

>Sets the local time when a leap second will be added. The source must be set to LOCal for this setting to apply.

`SOURce:TIMESet:LEAPsec:TIME?`

>Returns the time setting when a leap second will be applied.

`SOURce:TIMESet:ALARm:STATe 0 | 1`

>Enables and disables the alarm timer. The alarm timer is used to the GPI ground closure. This feature can be used to drive a tally light or similar indicator at a specific time in a program.

`SOURce:TIMESet:ALARm:STATe?`

>Returns the enabled/disabled state of the alarm timer.

`SOURce:TIMESet:ALARm:TIME <numeric_value>,<numeric_value>,<numeric_value> (HH:MM:SS)`

>Sets the time at which the alarm timer triggers a GPI ground closure.

`SOURce:TIMESet:ALARm:TIME?`

>Returns the time at which the alarm timer is set to trigger a GPI ground closure.

`SOURce:TIMESet:LLOSs:GPO:MDELay <numeric_value>,<numeric_value>,<numeric_value> (HH:MM:SS)`

>Sets a delay time for the GPI alarm to report a loss of lock condition.

`SOURce:TIMESet:LLOSs:GPO:MDELay?`

>Returns the delay time for the GPI alarm to report a loss of lock condition.

SOURce:TIMESet:LLOSs:BLAck:MDELay <numeric_value>,<numeric_value>,<numeric_value> (HH:MM:SS)

>Sets a delay time for the black2 output to be blanked on loss of lock.

SOURce:TIMESet:LLOSs:BLAck:MDELay?

>Returns the delay time setting for blanking the black2 output on loss of lock.

SOURce:TIMESet:NLLOSs:GPO:MDELay <numeric_value>,<numeric_value>,<numeric_value> (HH:MM:SS)

NOTE. This command is not supported by GPS7 modules that do not have a REF IN connector.

>Sets a delay time for the GPI alarm to report a near loss of lock condition (Genlock only).

SOURce:TIMESet:NLLOSs:GPO:MDELay?

>Returns the delay time for the GPI alarm to report a near loss of lock condition (Genlock only).

SOURce:TIMESet:NOGL:GPO:MDELay <numeric_value>,<numeric_value>,<numeric_value> (HH:MM:SS)

NOTE. This command is not supported by GPS7 modules that do not have a REF IN connector.

>Sets a delay time for the GPI alarm to report no genlock input.

SOURce:TIMESet:NOGL:GPO:MDELay?

>Returns the delay time for the GPI alarm to report no genlock input.

SOURce:TIMESet:SWARning:GPO:MDELay <numeric_value>,<numeric_value>,<numeric_value> (HH:MM:SS)

>Set the delay between when a signal warning is detected, and when it is reported on the GPI output.

SOURce:TIMESet:SWARning:GPO:MDELay?

>Returns the delay time between when a signal warning is detected, and when it is reported on the GPI output.

SOURce:GPIo:INPut RESET_COUNT | REACQ_SAT | JAM

> Sets the action to take when the input pin on the GPI (General Purpose Interface) connector is asserted. The choices are: RESET_COUNT – reset the program time counter back to initial time; REACQ_SAT – trigger the reacquire satellite position; and JAM – trigger a jam sync.

SOURce:GPIo:INPut?

> Returns the GPI action to be taken when the input pin on the GPI connector is asserted.

SOURce:GPIo:OUTPut[1/2] NONE | SIG_WARN | LOCK_LOSS | ALARM_TIME | NEAR_LLOS | NO_GENLOCK

NOTE. *The arguments NEAR_LLOS and NO_GENLOCK are not supported by GPS7 modules that do not have a REF IN connector.*

> Sets the condition that causes the output pin to go high. The choices available are: NONE – no action will trigger the output pin to go high; SIG_WARN – output goes high when the signal warning alarm is triggered; LOCK_LOSS – output goes high when the loss of lock alarm is triggered. A loss of lock alarm is triggered when the GPS signal falls below the user defined threshold after the waiting time has been exceeded; ALARM_TIME – A time of day or counter alarm is triggered for one second when the specified time is reached on the specified counter; NEAR_LLOS – output goes high when the near loss of lock alarm is triggered (Genlock only). A loss of lock alarm is triggered when the signal falls below the threshold after the waiting time has been exceeded; NO_GENLOCK – output goes high when no Genlock signal is detected. A no genlock alarm is triggered when no genlock signal is detected for the specified waiting time.

SOURce:GPIo:OUTPut[1/2]?

> Returns the action that causes the GPI connector output pin to go high.

SOURce:GPIo:STATus?

> Returns the module GPI status. This is a query-only command. The command returns a string. The returned string is in this form: <OUTPUT2, OUTPUT1, INPUT>. The values for each string element are 0 or 1. For example, a returned string might be "0,0,0" or "1,1,1". A value of 0 means OFF. A value of 1 means ON (inverted hardware status).

OUTPUT Commands

Use these commands control the output parameters of the module.

Command Tree

```
:OUTPut1
  :STATe                0 | 1
  :STATe?
:OUTPut<1/2/3>
  :STANdard             NTSC | PAL | NTSC_NSU |
                        HD1080_60I|HD1080_59I|HD1080_50I|
                        HD1080_24SF|HD1080_23SF|HD1080_30P|
                        HD1080_29P|HD1080_25P|HD1080_24P|
                        HD1080_23P| HD720_60P|HD720_59P|
                        HD720_50P| CW_10MHZ
  :STANdard?
  :SIGNal               BB | BB_FREF | BB_NO_REF
  :TIMECode
    :SOURce             DISable, TOD, COUNter
    :SOURce?
    :OFFset             <NR1>,<NR1>,<NR1> (HH:MM:SS)
    :OFFset?

    :VITc[1/2]
      :STATe            0 | 1
      :STATe?
      :LINe             <NR1> (NTSC: 10-20, PAL: 6-22,
                        HD: 7-40)
      :LINe?
  :DROPf
    :STATe              0 | 1
    :STATe?
:OUTPut3
  :LLOSs
      :STATe            0 | 1
      :STATe?
:OUTPut<4>
  :LTC[1/2/3/4]
    :SOURce             DISable | TOD | PCOUnter
    :SOURce?
    :OFFSet             <NR1>,<NR1>,<NR1>,<NR1> (HH:MM:SS:FF)
    :OFFSet?
    :TYPE               N23_FPS|N24_FPS|N25_FPS|N30_FPS|D30_FPS
    :TYPE?
    :LEVel              <NRf> (0.5 .. 5.0 in 0.5V increments)
    :LEVel?
```

```
              :MDELay              <NRf> ms
              :MDELay?                          :CAL
                :OUTput            POS_V | NEG_V | OFF
              :LOOP                0 | 1
              :LOOP?
```

Command Description

```
OUTPut1:STATe 0|1
```

NOTE. *This command is not supported by GPS7 modules that do not have a REF IN connector.*

Sets the Black1 output. Select 1 to enable the Black1 output. Select 0 to disable the Black1 output.

```
OUTPut1:STATe?
```

Returns the Black1 output state.

```
OUTPut[1/2/3]:STANdard NTSC|PAL|NTSC_NSU|HD1080_60I|HD1080_59I|
HD1080_50I| HD1080_24SF|HD1080_23SF|HD1080_30P|HD1080_29P|
HD1080_25P|HD1080_24P|HD1080_23P|HD720_60P|HD720_59P|
HD720P_50P|CW_10MHZ
```

Sets the video standard for the serial digital black signals output from the BLACK connectors. This command is only available if Option BK is installed.

```
OUTPut[1/2/3]:STANdard?
```

Returns the video standard for the serial digital black signals output from the BLACK connectors. This command is only available if Option BK is installed.

```
:OUTPut[1/2/3]:SIGNal BB | BB_FREF | BB_NO_REF
```

Sets the Black Output signal. The selections are BB: Black burst; BB_FREF: Black burst with field reference; and BB_NO_REF: Black burst with no field reference.

If the output standard (OUTPut<1/2/3>:STANDard) is set for HD rates or CW_10MHZ (Black 3 only), the command returns an ERROR.

If the output standard is set to PAL, then the BB and BB_FREF settings output a black burst signal with field reference. The

BB_NO_REF setting outputs a black burst signal with no field reference.

If the output standard is set to NTSC or NTSC_NSU, then the BB_FREF setting outputs a black burst signal with field reference. The BB and BB_NO_REF settings output a black burst signal with no field reference.

`:OUTPut[1/2/3]:TIMECode:SOURce DISable|TOD|COUNter`

Sets timecode source. Disable shuts off the timecode output. TOD sets the time of day clock as the source. Counter sets the timecode source to the program counter.

`:OUTPut[1/2/3]:TIMECode:SOURce?`

Returns the current timecode source setting.

`:OUTPut[1/2/3]:TIMECode:OFFSet <NR1>,<NR1>,<NR1>,<NR1>`

Sets the timecode offset in hours, minutes, seconds, and frames (HH:MM:SS:FF).

`:OUTPut[1/2/3]:TIMECode:VITc[1/2]:STATe 0 | 1`

Enables or disables the insertion of a VITC. You can enable two timecodes. Setting the state to 1 enables the timecode. Setting the state to 0 disables the timecode.

`:OUTPut[1/2/3]:TIMECode:VITc[1/2]:STATe?`

Returns the VITC insertion state.

`:OUTPut[1/2/3]:TIMECode:LINe`

Sets the line number on which the VITC is located. For NTSC output, the line number range is 10–20. For PAL output, the line number range is 6–22. For HD output, the line number range is 7–40.

`:OUTPut[1/2/3]:TIMECode:LINe?`

Returns the line number on which the VITC is located.

`:OUTPut[1/2/3]:DROPf 0 | 1`

Enables or disables the use of Drop Frame timecode.

`:OUTPut[1/2/3]:DROPf 0 | 1`

Returns the Drop Frame timecode state. A setting of 0 means drop frame timecode is not used. A setting of 1 means drop frame timecode is used.

`:OUTPut[2]:LLOSs:STATe 0 | 1`

Sets the Black 2 signal to go to 0 V DC if a Loss of Lock condition occurs. Using 1 enables the function. Using 0 means the Black 2 signal will not change due to Loss of Lock.

`:OUTPut[2]:LLOSs:STATe?`

Returns the setting for Black 2 to go to 0 V DC on Loss of Lock.

`:OUTPut4:LTC[1/2/3/4]:SOURce DISable | TOD | PCOUnter`

Sets linear timecode output source. DISable shuts off the timecode output. TOD sets the time of day clock as the source. PCOUnter sets the timecode source to the program counter.

`:OUTPut4:LTC[1/2/3/4]:SOURce?`

Returns the current linear timecode source setting.

`:OUTPut4:LTC[1/2/3/4]:OFFSet <NR1>,<NR1>,<NR1>,<NR1>`

Sets the linear timecode offset in hours, minutes, seconds, and frames (HH:MM:SS:FF).

`:OUTPut4:LTC[1/2/3/4]:OFFSet?`

Returns the linear timecode offset in hours, minutes, seconds, and frames (HH:MM:SS:FF).

`:OUTPut4:LTC[1/2/3/4]:TYPE N23_FPS|N24_FPS|N25_FPS|N30_FPS|`
`                        D30_FPS`

Sets the linear timecode type.

`:OUTPut4:LTC[1/2/3/4]:TYPE?`

Returns the type of linear timecode output.

`:OUTPut4:LTC[1/2/3/4]:LEVel <numeric_value>`

Sets the voltage level of the linear timecode signal. The value specified must be in floating point format. The range is from 0.5 to 5.0 volts, in 0.5 volt increments.

`:OUTPut4:LTC[1/2/3/4]:LEVel?`

Returns the voltage level of the linear timecode signal.

`:OUTPut4:LTC[1/2/3/4]:MDELay <Numeric_value>`

Sets the delay for the linear timecode. The value specified must be in floating point format. Units are milliseconds.

```
:OUTPut4:LTC[1/2/3/4]:MDELay?
```

> Returns the delay setting for the linear timecode. Units are milliseconds.

SENSE Commands

Use these commands to adjust the timing offset of the BLACK outputs relative to the internal reference signal (frame reset signal).

Command Tree

```
:SENSe<n>              1|2|3
  :CORRection
    :MDELay

      :HORizontal      <numeric_value> floating point
        :STEP          <numeric_value>
        :STEP?
        :FINe          <numeric value>
        :FINe?
      :VERTical        <numeric_value>
        :STEP          <numeric_value>
```

Command Description

```
:SENSe<n>:CORRection:MDELay:HORizontal <numeric_value>
```

> Sets the horizontal timing offset of the selected outputs. The timing resolution is clock-cycles. The units are microseconds. If the argument exceeds the horizontal time value, then the vertical offset is adjusted to accommodate the requested delay. The <n> in the command represents the output connector. "1" represents the BLACK1 connector, "2" represents the BLACK2 connector, and "3" represents the BLACK3 connector. See Table 2-4 for the delay ranges.

Table 2-4: GPS7 Output horizontal offset ranges

Standard / Frame rate	Range (sample clock cycles)
NTSC	± 3432 (54 MHz clock)
PAL	± 3456 (54 MHz clock)
1080 60i	± 2200 (74.25 MHz clock)

Table 2-4: GPS7 Output horizontal offset ranges (Cont.)

Standard / Frame rate	Range (sample clock cycles)
1080 59.94i	$\pm$ 2200 (74.18 MHz clock)
1080 50i	$\pm$ 2640 (74.25 MHz clock)
1080 24sF	$\pm$ 2750 (74.25 MHz clock)
1080 23.98sF	$\pm$ 2750 (74.18 MHz clock)
1080 30p	$\pm$ 2200 (74.25 MHz clock)
1080 29.97p	$\pm$ 2200 (74.18 MHz clock)
1080 25p	$\pm$ 2640 (74.25 MHz clock)
1080 24p	$\pm$ 2750 (74.25 MHz clock)
1080 23.98p	$\pm$ 2750 (74.18 MHz clock)
720 60p	$\pm$ 1650 (74.25 MHz clock)
720 59.94p	$\pm$ 1650 (74.18 MHz clock)
720 50p	$\pm$ 1980 (74.25 MHz clock)

:SENSe<n>:CORRection:MDELay:HORizontal?

Returns the current horizontal timing offset of the selected outputs. The <n> in the command represents the output connector. "1" represents the BLACK1 connector, "2" represents the BLACK2 connector, and "3" represents the BLACK3 connector.

:SENSe<n>:CORRection:MDELay:HORizontal:STEP <numeric_value>

Increments the horizontal timing offset in steps. The step increment is not user definable, but varies depending on the standard specified (OUTput<n>:STANdard). For NTSC/PAL, the increment is 1/54 MHz. For HD frame rates, the increment is 1/74.18 MHz or 1/74.25 MHz, depending on the frame rate (see Table 2--4). You can specify the number of steps using a floating point numeric value. You can also use the UP or DOWN commands. You can use MIN, MAX, or DEF instead of a numeric value. The <n> in the command represents the output connector. "1" represents the BLACK1 connector, "2" represents the BLACK2 connector, and "3" represents the BLACK3 connector.

:SENSe<n>:CORRection:MDELay:HORizontal:STEP?

Returns the current step increment. The <n> in the command represents the output connector. "1" represents the BLACK1 connector, "2" represents the BLACK2 connector, and "3" represents the BLACK3 connector.

`:SENSe<n>:CORRection:MDELay:HORizontal:FINe <numeric_value>`

Increments the horizontal timing offset in fine steps. For NTSC and PAL, the valid range for the argument is –10.00 to +10.00 in steps of 0.10. For HD, the valid range for the argument is –7.00 to +7.00 in steps of 0.10.

`:SENSe<n>:CORRection:MDELay:HORizontal:FINe?`

Returns the horizontal timing offset in fine steps.

`:SENSe<n>:CORRection:MDELay:VERTical <numeric_value>`

Sets the vertical timing offset of the selected outputs. The argument must be an integer value. The range of value for the argument is shown in Table 2–5. You can use UP, DOWN, or DEF instead of a numeric value. See page 2–2 for additional detail on UP, DOWN, and DEF. The <n> in the command represents the output connector. "1" represents the BLACK1 connector, "2" represents the BLACK2 connector, and "3" represents the BLACK3 connector.

Table 2‑5: GPS7 Vertical timing offset ranges

Standard / frame rate	Range
NTSC	± 525
PAL	± 1250

HD
    1080
    720
	
	± 562
	± 375

`:SENSe<n>:CORRection:MDELay:VERTical?`

Returns the current vertical timing offset of the selected outputs. The <n> in the command represents the output connector. "1" represents the BLACK1 connector, "2" represents the BLACK2 connector, and "3" represents the BLACK3 connector.

`:SENSe<n>:CORRection:MDELay:VERTical:STEP <numeric_value>`

Sets the step increment used by the UP or DOWN commands. You can use MIN, MAX, or DEF instead of a numeric value. See page 2–2 for additional detail on MIN, MAX, and DEF. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

HD3G7 3 Gb/s SDI Video Generator Module Remote Commands

This section describes the commands used to remotely control the HD3G7 3 Gb/s SDI Video Generator module. The commands are divided into the following groups:

- OUTPUT commands
  (Refer to the HD3G7 section of the TG700 User Manual, Tektronix part number 071-1970-XX, for restrictions on which standards are supported for each output mode.)

- SENSE commands

- DIAGNOSTIC commands

OUTPUT Commands

Use these commands control the output parameters of the module.

NOTE. *The OUTPUT1 commands affect both of the BNC module connectors in the same way. Output 1 is always identical to Output 2.*

Command Tree

```
:OUTPut1
   :ALPHa              COPY_YG | FF_0P | FF_10P  | FF_20P |
                       FF_30P | FF_40P | FF_50P | FF_60P |
                       FF_70P | FF_80P | FF_90P FF_100P
   :ANC
      :OUTMode         <DIS|CONT|SING>
      :OUTMode?
      :PARIty          MAN|AUTO
      :PARIty?
      :LINe            <NR1>,<NR1>
      :LINe?
      :SAMple          <NR1:sample>
      :SAMple?
      :DID             <HEX>
      :DID?
      :SDID            <HEX>
```

```
                      :SDID?
                      :DBN                <HEX>
                      :DBN?

                      :DC                 <NR1> {0-254}
                      :DC?
                      :UDW
                         :INDex           <NR1> {0-254}
                         :INDex?
                         :SET             <NR1:INDEX>,<NR2:UDW>
                         :SET?
                         :CLEAr
                      :CS
                         :MANual          <HEX>
                         :MANual?
                         :AUTO
                            :STATe        0|1
                            :STATe?
                         :AUTO?
                      :VCH                <LUMA|CHRO>
                      :VCH?
                      :LOCation           <LINKA|LINKB>
                      :LOCation?
                      :FIELd
                      :FIELd?
                      :DATa?
                   :BLACk                 <0|1>
                   :BLACk?
                   :CONVert
                      :STATe?
                   :DHD                   <SIG_SIG|SIG_BLK>
                   :DHD?
                   :EAUDio
                      :AGROup             1|2|3|4
                         :STATe                       0|1
                         :STATe?
                         :SAMPLing        <FRAM|NOFR|ASYNC>
                         :SAMPLing?
                         :CHANnel         1|2|3|4
                            :AMPLitude    <numeric_value>
                            :AMPLitude?
                            :FREQuency    <numeric_value>
                            :FREQuency?
                            :CLICk        0|1|2|3|4
                            :CLICk?
                            :MODE         ACTive|INACtive|MUTE
                            :MODE?
```

```
              :BGROup           1|2|3|4
                 :STATe                          0|1
                 :STATe?
                 :SAMPLing         <FRAM|NOFR|ASYNC>
                 :SAMPLing?
                 :CHANnel          1|2|3|4
                    :AMPLitude     <numeric_value>
                    :AMPLitude?
                    :FREQuency     <numeric_value>
                    :FREQuency?
                    :CLICk         0|1|2|3|4
                    :CLICk?
                    :MODE          ACTive|INACtive|MUTE
                    :MODE?
           DATA?
         :SYNThesizer
           :CINEma
              :PROJector        <NR1> {1-32}
              :PROJector?
           :STATe            GEN|CONV
           :STATe?
           :SIGNal           COLBAR_100P|COLBAR_75P|COLBAR_SMPTE|
                             FF_0P|FF_10P|FF_20P|FF_30P|FF_40P|
                             FF_50P|FF_60P|FF_70P|FF_80P|FF_90P|
                             FF_100P|LIN_5STEP|LIN_RAMP|
                             MON_RED|MON_75RED|MON_GREEN|
                             MON_75GREEN|MON_BLUE|MON_75BLUE|
                             MON_CONV|PULSE_2T30|SDI_EQU|SDI_PLL|
                             SDI_MTX
           :SIGNal?
           :SIGNal:LIST?
           :SIGNal:COUNt?
           :SIGNal:BUILd?
           :SIGNal:LOAD      <signal name>
           :SIGNal:LOAD?
         :MODe             MODE_3GA|MODE_3GB|MODE_3GB_2K|
                           MODE_3GA_2K|MD_720_3GA|MD_2X1080_HD|
                           MD_2X720_HD|MD_1080_HD|MD_720_HD|
         :MODe?
         :STANdard         HD1080_60P|HD1080_59P|HD1080_50P|
                           HD1080_60I|HD1080_59I|HD1080_50I|
                           HD1080_30P|HD1080_29P|HD1080_25P|
                           HD1080_24P|HD_1080_23|HD1080_30SF|
                           HD1080_29SF|HD1080_25SF|HD1080_24SF|
                           HD1080_23SF|
                           HD720_60P|HD720_5994P|HD720_50P|
                           HD720_30P|HD720_2997P|HD720_25P|
```

```
                                        HD720_24P|HD720_2398P|
                                        TK1080_23P|TK1080_23SF|TK1080_24P|
                                        TK1080_24SF|TK1080_25P|TK1080_25SF|
                                        TK1080_29P|TK1080_29SF|TK1080_30P|
                                        TK1080_30SF
          :STANdard?
          :SAMPling
            :SELect                     GBR444_12B|GBR444_10B|GBR444A_10B|
                                        YCB444_12B|YCB444_10B|YCB444A_10B|
                                        YCB422_12B|YCB422_10B|YCB422A_12B|
                                        XYZ444_2K
          :SAMPling?

          :VIDeo
            :Y
              :STATe                    ON|OFF
              :STATe?
            :PB
              :STATe                    ON|OFF
              :STATe?
            :PR
              :STATe                    ON|OFF
              :STATe?
            :AVTiming
              :State                    ON|OFF
              :State?
            :EFILter                    ON|OFF
            :EFILter?
              :State                    ON|OFF
              :State?
          :MOVe
            :HORizontal                 <numeric_value>
            :HORizontal?
            :VerTical                   <numeric_value>
            :VERTical?
            :PERiod                     <numeric_value>
              :RANDom
                :STATe                  ON|OFF
                :STATe?
            :PERiod?
          :TIMECode
            :SOURce                     <TOD|PCOUnter> (if GPS7 is present)
                                        <PCOUnter> (if no GPS7 is present)
            :SOURce?
            :OFFSet                     <NR1>,<NR1>,<NR1>,<NR1> (HH:MM:SS:FF)
            ;OFFSet?
            :DROP
```

```
        :STATe          <0|1>
        :STATe?
    :LTC
        :STATe          <0|1>
        :STATe?
    :AVITc
        :STATe          <0|1>
        :STATe?
    :INITial        <NR1>,<NR1>,<NR1>,<NR1> (HH:MM:SS:FF)
    ;INITial?
    :SET
    :DATa?
:TRIGger            SYS_CLOCK|FRM_PULSE|LINE_PULSE
:TRIGger?

:VPID
    :STATe          0|1
    :STATe?
:ZONE
    :FREQuency
    :FREQuency?
    :AMPLitude
    :AMPLitude?
    :K
    :K?
    :KX
    :KX?
    :KXSQ
    :KXSQ?
    :KXT
    :KXT?
    :KXY
    :KXY?
    :KY
    :KY?
    :KYSQ
    :KYSQ?
    :KYT
    :KYT?
    :KT
    :KT?
    :KTSQ
    :KTSQ?
    :WAVE
    :WAVE?
    :SAVE
    :TRESet
```

```
              :STATe           0|1
              :STATe?
          :VIDeo
            :Y
              :STATe           0|1
              :STATe?
            :PB
              :STATe           0|1
              :STATe?
            :PR
              :STATe           0|1
              :STATe?
        :DATa?
```

Command Description

```
:OUTPut1:ALPHa COPY_YG|FF_0P|FF_10P|FF_20P|FF_30P|FF_40P|
               FF_50P|FF_60P|FF_70P|FF_80P|FF_90P|FF_100P|
```

Sets the alpha channel signal. The choices are COPY_YG (fills the alpha channel with Y or G data from the input signal), FF_0P (0% Flat Field), FF_10P (10% Flat field), FF_20P (20% Flat field), FF_30P (30% Flat field), FF_40P (40% Flat field), FF_50P (50% Flat field), FF_60P (60% Flat field), FF_70P (70% Flat field), FF_80P (80% Flat field), FF_90P (90% Flat field), and FF_100P (100% Flat field).

```
:OUTPut1:ALPHa?
```

Returns the current alpha channel signal.

```
:OUTPut1:ANC:OUTMode <DIS|CONT|SING>
```

Sets the ancillary payload output mode. The choices are DIS (disable), CONT (continuous), and SING (single packet).

```
:OUTPut1:ANC:OUTMode?
```

Returns the ancillary payload output mode setting.

```
:OUTPut1:ANC:PARIty <MAN|AUTO>
```

Sets the ancillary payload parity. The choices are AUTO (automatic) and MAN (manual).

```
:OUTPut1:ANC:PARIty?
```

Returns the ancillary payload parity setting.

```
:OUTPut1:ANC:LINe <NR1>,<NR1>
```

Sets the line on which the ancillary payload starts. Two values are required; the first value is for the Field 1 line number and the second value is for the Field 2 line number. If only a single value is sent, an error will be returned.

`:OUTPut1:ANC:LINe?`

Returns the line on which the ancillary payload starts.

`:OUTPut1:ANC:SAMPle <NR1>`

Sets the ancillary payload sample start location. The default value is 1928.

`:OUTPut1:ANC:SAMPle?`

Returns the ancillary payload sample start setting.

`:OUTPut1:ANC:DID <HEX>`

Sets the ancillary payload Data Identifier. The data identifier range is from 1 to 255 (FF hex). The Data Identifier should be followed by either a Secondary Data Identifier (SDID) or a Data Block Number (DBN) followed by a Data Count (DC). The Data Count value is followed by User Data Words (UDW), which are followed by a checksum value.

You can send both 8-bit and 10-bit words. A query returns an 8-bit or 10-bit word depending on the ANC:PARITY setting in the instrument. If the you send 10-bit word when the Parity is Auto(8-bit), the instrument masks the value. The DID value should be in Hex(preceded by #H as shown in below)

```
:OUTP1:ANC:DID #HFE
:OUTP1:ANC:DID #H2FF
```

`:OUTPut1:ANC:DID?`

Returns the ancillary payload Data Identifier.

`:OUTPut1:ANC:SDID <HEX>`

Sets the ancillary payload Secondary Data Identifier. The Secondary Data Identifier is valid only if the DID is less than 80 hex.

You can send both 8-bit and 10-bit words. A query returns an 8-bit or 10-bit word depending on the ANC:PARITY setting in the instrument. If you send a 10-bit word when the Parity is

Auto (8-bit), the instrument masks the value. The SDID value should be in Hex (preceded by #H, as shown in below).

```
:OUTP1:ANC:SDID #HFE
:OUTP1:ANC:SDID #H2FF
```

:OUTPut1:ANC:SDID?

Returns the ancillary payload Secondary Data Identifier.

:OUTPut1:ANC:DBN <HEX>

Sets the ancillary payload Data Block Number.

You can send both 8-bit and 10-bit words. A query returns an 8-bit or 10-bit word depending on the ANC:PARITY setting in the instrument. If you send a 10-bit word when the Parity is Auto (8-bit), the instrument masks the value. The DBN value should be in Hex (preceded by #H, as shown in below).

```
:OUTP1:ANC:DBN #HFE
:OUTP1:ANC:DBN #H2FF
```

:OUTPut1:ANC:DBN?

Returns the ancillary payload Data Block Number.

:OUTPut1:ANC:DC <NR1> {0-254}

Sets the ancillary payload Data Count. The DC value determines how many payload data (UDW) can be set.

:OUTPut1:ANC:DC?

Returns the ancillary payload Data Count. The data count indicates how many user data words should follow.

:OUTPut1:ANC:UDW:INDex <NR1> {0-254}

Sets the User Data Word (UDW) location.

:OUTPut1:ANC:UDW:INDex?

Returns the UDW location where the :SET command puts its value and returns its value.

:OUTPut1:ANC:UDW:SET <NR1:INDEX>,<NR2:UDW>

Sets the location for and value of a User Data Word. The SET command takes two arguments – first one is the index and second one is the UDW value. The index argument (NR1) specifies the location where the UDW value (NR2) will be set. The UDW value should be in Hex (preceded by #H, as shown in below).

When Parity is set to 8-bit (Auto):

`:OUTP1:ANC:UDW #HFE ()`

When parity is set to 10 bits (Manual):

`:OUTP1:ANC:UDW #H2FF`

`:OUTPut1:ANC:UDW:SET?`

Returns the value of the UDW value from the location that was earlier set by the OUTP1:ANC:UDW:INDex command.

`:OUTPut1:ANC:UDW:CLEAr`

Clears the ancillary payload User Data Words values (setting them to 0x00).

`:OUTPut1:ANC:CS:MANual    <HEX>`

Sets the ancillary payload checksum manually to the value specified. The available range is 0x000 – 0x3FF in 10-bit edit mode.

`:OUTPut1:ANC:CS:MANual?`

Returns the value specified for the ancillary payload checksum.

`:OUTPut1:ANC:CS:AUTO:STATe 0|1`

Enables or disables the automatic checksum calculation for the ancillary payload user data words.

`:OUTPut1:ANC:CS:AUTO:STATe?`

Returns the state of the automatic checksum calculation (enabled or disabled).

`:OUTPut1:ANC:CS:AUTO?`

Returns the automatically calculated checksum for the ancillary payload user data words.

`:OUTPut1:ANC:VCH <LUMA|CHRO>`

Sets the video channel for the ancillary payload to either Luma or Chroma. Luma is the default value.

`:OUTPut1:ANC:VCH?`

Returns the video channel for the ancillary payload.

`:OUTPut1:ANC:LOCation <LINKA|LINKB>`

Sets the location for the ancillary payload.

`:OUTPut1:ANC:LOCation?`

Returns the location for the ancillary payload.

`:OUTPut1:ANC:FIELd <0|1|2>`

This command is applicable for interlaced and segmented frame formats. This command sets the ancillary payload either on Field 1 or Field 2 or both on Field 1 & 2. The meaning of the arguments is : 0 = Field 1, 1= Field 2, and 2= Both Field1 & 2.

The Line numbers where Field1 and Field2 payload data is inserted can be set using the two arguments (ln1, ln2) in the OUTP1:ANC:LINe command.

`:OUTPut1:ANC:FIELd?`

Returns the field on which the ancillary payload is set.

`:OUTPut1:ANC:DATa?`

Returns the ancillary data settings as a single block of data. Data is returned as a sequence of integers, with parameters separated by commas. Data is returned in the following order(line breaks are inserted here for ease of reading):

<Line1>,<Line2>,<Sample>,<Video Channel>,<Link Loc>,<Parity>,<Output Mode>,<DID>,<SDID>,<CS>,<Auto CS Selection>,<Field Selection>

`:OUTPut1:BLACk <0|1>`

Sets the secondary output. If not set, the secondary output uses the same test pattern as the primary output.

`:OUTPut1:BLACk?`

Returns the secondary output setting

`:OUTPut1:CONVert:STATe?`

Returns the standard and sampling structure information for the current conversion.

`:OUTPut1:DHD <SIG_SIG|SIG_BLK>`

Sets the 2xHD stream content. SIG_SIG sets the stream content to Test Signal/Test Signal. SIG_BLK sets the stream content to Test Signal/Black.

`:OUTPut1:DHD?`

Returns the 2xHD stream content setting.

`:OUTPut1:EAUDio:AGROup[n]:STATe 0|1`

Enables or disables embedded audio for Link A group n, where n=1-4.

`:OUTPut1:EAUDio:AGROup[n]:STATe?`

Returns the status of embedded audio for Link A group 1-4.

`:OUTPut1:EAUDio:AGROup[n]:SAMPLing <FRAM|NOFR|ASYN>`

Sets the sampling alignment status bits in the audio signal of a specific embedded audio group for the selected outputs. The choices are FRAM (Frame), NOFR (Frame without Frame Number), and ASYNC (Asynchronous). The [n] in the command represents the group number.

`:OUTPut1:EAUDio:AGROup[n]:SAMPLing?`

Returns the sampling alignment status bits in the audio signal of a specific embedded audio group for the selected outputs.

`:OUTPut1:EAUDio:AGROup[n]:CHANnel[x]:AMPLitude <numeric_value>`

Sets the amplitude of a specific audio channel. The numeric value can range from -60 dBFS to 0 dBFS in 1 dBFS steps. The [n] in the command represents the group number. The [x] in the command represents the channel number. You can use any channel number from 1 through 4.

`:OUTPut1:EAUDio:AGROup[n]:CHANnel[x]:AMPLitude?`

Returns the amplitude of a specific audio channel. The [n] in the command represents the group number. The [x] in the command represents the channel number.

`:OUTPut1:EAUDio:AGROup[n]:CHANnel[x]:FREQuency <numeric_value>`

Sets the frequency of a specific audio channel. The unit is Hertz. The choices are 10.0 – 20000.0 in steps of 0.5, default = 1000. The <n> in the command represents the channel number. You can use any channel number from 1 through 8.

`:OUTPut1:EAUDio:AGROup[n]:CHANnel[x]:FREQuency?`

Returns the frequency of a specific audio channel.

`:OUTPut1:EAUDio:AGROup[n]:CHANnel[x]:CLICk 0|1|2|3|4`

Sets the audio click of a specific audio channel. The choices are 1 second to 4 seconds, or off (0). When 1 to 4 is selected, the audio click becomes valid. When audio click is valid, audio tone is turned

off for 0.25 seconds around the time of the click. The <x> in the command represents the channel number. You can use any channel number from 1 through 4.

`:OUTPut1:EAUDio:AGROup[n]:CHANnel[x]:CLICk?`

Returns the audio click status of the specified audio channel.

`:OUTPut1:EAUDio:AGROup[n]:CHANnel[x]:MODE ACTive|INACtive|MUTE`

Sets the mode of a specific audio channel. The choices are ACT (active), INAC (inactive), and MUTE (muted).

`:OUTPut1:EAUDio:AGROup[n]:CHANnel[x]:MODE?`

Returns the mode of a specific audio channel.

`:OUTPut1:EAUDio:AGROup[n]:CHANnel[x]:ORIGin <string>`

Sets the channel origin ID of up to four ASCII characters.

`:OUTPut1:EAUDio:AGROup[n]:CHANnel[x]:ORIGin?`

Returns the channel origin ID.

`:OUTPut1:EAUDio:BGROup[n]:STATe 0|1`

Enables or disables embedded audio for Link B group n, where n=1-4.

`:OUTPut1:EAUDio:BGROup[n]:STATe?`

Returns the status of embedded audio for Link B group 1-4.

`:OUTPut1:EAUDio:BGROup[n]:SAMPLing <FRAM|NOFR|ASYN>`

Sets the sampling alignment status bits in the audio signal of a specific embedded audio group for the selected outputs. The choices are FRAM (Frame), NOFR (Frame without Frame Number), and ASYNC (Asynchronous). The [n] in the command represents the group number.

`:OUTPut1:EAUDio:BGROup[n]:SAMPLing?`

Returns the sampling alignment status bits in the audio signal of a specific embedded audio group for the selected outputs.

`:OUTPut1:EAUDio:BGROup[n]:CHANnel[x]:AMPLitude <numeric_value>`

Sets the amplitude of a specific audio channel. The numeric value can range from -60 dBFS to 0 dBFS in 1 dBFS steps. The [n] in the command represents the group number. The [x] in the command

represents the channel number. You can use any channel number from 1 through 4.

`:OUTPut1:EAUDio:BGROup[n]:CHANnel[x]:AMPLitude?`

Returns the amplitude of a specific audio channel. The [n] in the command represents the group number. The [x] in the command represents the channel number.

`:OUTPut1:EAUDio:BGROup[n]:CHANnel[x]:FREQuency <numeric_value>`

Sets the frequency of a specific audio channel. The unit is Hertz. The choices are 10.0 – 20000.0 in steps of 0.5, default = 1000. The <n> in the command represents the channel number. You can use any channel number from 1 through 4.

`:OUTPut1:EAUDio:BGROup[n]:CHANnel[x]:FREQuency?`

Returns the frequency of a specific audio channel.

`:OUTPut1:EAUDio:BGROup[n]:CHANnel[x]:CLICk 0|1|2|3|4`

Sets the audio click of a specific audio channel. The choices are 1 second to 4 seconds, or off (0). When 1 to 4 is selected, the audio click becomes valid. When audio click is valid, audio tone is turned off for 0.25 seconds around the time of the click. The <x> in the command represents the channel number. You can use any channel number from 1 through 4.

`:OUTPut1:EAUDio:BGROup[n]:CHANnel[x]:CLICk?`

Returns the audio click status of the specified audio channel.

`:OUTPut1:EAUDio:BGROup[n]:CHANnel[x]:MODE ACTive|INACtive|MUTE`

Sets the mode of a specific audio channel. The choices are ACT (active), INAC (inactive), and MUTE (muted).

`:OUTPut1:EAUDio:BGROup[n]:CHANnel[x]:MODE?`

Returns the mode of a specific audio channel.

`:OUTPut1:EAUDio:BGROup[n]:CHANnel[x]:ORIGin <string>`

Sets the channel origin ID of up to four ASCII characters.

`:OUTPut1:EAUDio:BGROup[n]:CHANnel[x]:ORIGin?`

Returns the channel origin ID.

:OUTPut1:EAUDio:DATA?

> Returns the enhanced audio group settings as a single block of data. Data is returned in the following format (line breaks are inserted here for ease of reading):

> Gr[0]Status, Gr[0]Sampling,
> Ch[0]Frq, Ch[0]Amp, Ch[0]Click, Ch[0]State, Ch[0]Origin,
> Ch[1]Frq, Ch[1]Amp, Ch[1]Click, Ch[1]State, Ch[1]Origin,
> Ch[2]Frq, Ch[2]Amp, Ch[2]Click, Ch[2]State, Ch[2]Origin,
> Ch[3]Frq, Ch[3]Amp, Ch[3]Click, Ch[3]State, Ch[3]Origin:
> Gr[1]Status, Gr[1]Sampling,
> Ch[0]Frq, Ch[0]Amp, Ch[0]Click, Ch[0]State, Ch[0]Origin,
> Ch[1]Frq, Ch[1]Amp, Ch[1]Click, Ch[1]State, Ch[1]Origin,
> Ch[2]Frq, Ch[2]Amp, Ch[2]Click, Ch[2]State, Ch[2]Origin,
> Ch[3]Frq, Ch[3]Amp, Ch[3]Click, Ch[3]State, Ch[3]Origin:
> Gr[2]Status, Gr[2]Sampling,
> Ch[0]Frq, Ch[0]Amp, Ch[0]Click, Ch[0]State, Ch[0]Origin,
> Ch[1]Frq, Ch[1]Amp, Ch[1]Click, Ch[1]State, Ch[1]Origin,
> Ch[2]Frq, Ch[2]Amp, Ch[2]Click, Ch[2]State, Ch[2]Origin,
> Ch[3]Frq, Ch[3]Amp, Ch[3]Click, Ch[3]State, Ch[3]Origin:
> Gr[3]Status, Gr[3]Sampling,
> Ch[0]Frq, Ch[0]Amp, Ch[0]Click, Ch[0]State, Ch[0]Origin,
> Ch[1]Frq, Ch[1]Amp, Ch[1]Click, Ch[1]State, Ch[1]Origin,
> Ch[2]Frq, Ch[2]Amp, Ch[2]Click, Ch[2]State, Ch[2]Origin,
> Ch[3]Frq, Ch[3]Amp, Ch[3]Click, Ch[3]State, Ch[3]Origin:

> Each setting is separated by "," (comma). Groups are separated by ":" (colon).

:OUTPut1:MODe:MODE_3GA|MODE_3GA_2K|MODE_3GB|MODE_3GB_2K|
        MD_720_3GA|MD_2X1080_HD|MD_2X720_HD|
        MD_1080_HD|MD_720_HD

> Sets the output mode. The options are as follows

MODE_3GA	3GA 1080 lines
MODE_3GA_2K	3GA 2K
MODE_3GB	3GB 1080 lines
MODE_3GB_2K	3GB 2K
MD_720_3GA	3GA 720 lines
MD_2X1080_HD	2xHD 1080 lines
MD_2X720_HD	2xHD 720 lines
MD_1080_HD	HD 1080 lines
MD_720_HD	HD 720 lines

:OUTPut1:MODe?

> Returns the current output mode.

`:OUTPut1:MOVe:HORizontal <numeric_value>`

Sets the amount of horizontal scrolling in the moving picture mode. You can set the value from –252 to +252 samples.

`:OUTPut1:MOVe:HORizontal?`

Returns the amount of horizontal scrolling in the moving picture mode.

`:OUTPut1:MOVe:VERTical <numeric_value>`

Sets the amount of vertical scrolling in the moving picture mode. You can set the value from –252 to +252 samples.

`:OUTPut1:MOVe:VERTical?`

Returns the amount of vertical scrolling in the moving picture mode.

`:OUTPut1:MOVe:PERiod <numeric_value>`

Sets the time interval between occurrences of the scrolling. You can set the value from 1 to 16 frames.

`:OUTPut1:MOVe:PERiod?`

Returns the time interval between occurrences of the scrolling.

`:OUTPut1:MOVe:RANDom[:STATe] ON|OFF`

Turns the random scrolling mode on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:MOVe:RANDom[:STATe]?`

Returns the current state of the random scrolling mode.

`:OUTPut1:SAMPling: GBR444_12B|GBR444_10B|GBR444A_10B|`
`        YCB444_12B|YCB444_10B|YCB444A_10B|YCB422_12B|`
`        YCB422_10B|YCB422A_12B|GBR444_2K|XYZ444_2K`

Sets the sampling structure for the output test signal. Arguments can be set based on what Format/Output Mode is set at that point. The options are as follows:

GBR444_12B	1080 4:4:4 GBR 12 bits
GBR444_10B	1080 4:4:4 GBR 10 bits
GBR444A_10B	1080 4:4:4 GBR+A 10 bits
YCB444_12B	1080 4:4:4 YCbCr 12 bits
YCB444_10B	1080 4:4:4 YCbCr 10 bits
YCB444A_10B	1080 4:4:4 YCbCr+A 10 bits
YCB422_12B	1080 4:2:2 YCbCr 12 bits

YCB422_10B   1080 4:2:2 YCbCr 10 bits
YCB422A_12B   1080 4:2:2 YCbCr+A 12 bits
GBR444_2K   2K 4:4:4 GBR 12 bits
XYZ444_2K   2K 4:4:4 XYZ 12 bits

The GBR444_2K and XYZ444_2K options are only available when
any 2K format is selected by the :OUTPut1:STANdard command.

:OUTPut1:SAMPling?

Returns the sampling structure for the output test signal.

:OUTPut1:STANdard HD1080_60P|HD1080_59P|HD1080_50P|
        HD1080_60I|HD1080_59I|HD1080_50I|HD1080_30P
        HD1080_29P|HD1080_25P|HD1080_24P|HD1080_23P
        HD1080_30SF|HD1080_29SF|HD1080_25SF|
        HD1080_24SF|HD1080_23SF|HD720_60P|
        HD720_59P|HD720_50P|HD720_30P|
        HD720_29P|HD720_25P|HD720_24P|
        HD720_23P|HD1080_24SF|HD1080_23SF|
        HD720_60P|HD720_5994P|HD720_50P|
        HD720_30P|HD720_2997P|HD720_25P|
        HD720_24P|HD720_2398P|
        TK1080_23P|TK1080_23SF|TK1080_24P|
        TK1080_24SF|TK1080_25P|TK1080_25SF|
        TK1080_29P|TK1080_29SF|TK1080_30P|
        TK1080_30SF

Sets the video standard of the output signal. Arguments can be set
based on what Output Mode is set at that point. TK1080_XX
arguments represent 2K video formats.

:OUTPut1:STANdard?

Returns the current video standard of the output signal.

:OUTPut1:SYNThesizer:CINEma:PROJector   <NR1> {1-54}

Sets the projector test pattern. The choices are as follows:

0 = 100% Color Bars
1 = SMPTE EG432-1 Color Accuracy
2= Step Black-White
3= Step Black-Dark Gray
6= Black Flat Field
7= White Flat Field
8= Black-to-White 1
9= Black-to-White 2
10= Black-to-White 3
11= Black-to-White 4

12= Black-to-White 5
13= Black-to-White 6
14= Black-to-White 7
15= Black-to-White 8
16= Black-to-White 9
17= Black-to-White 10
18= Black-to-Gray 1
19= Black-to-Gray 2
20= Black-to-Gray 3
21= Black-to-Gray 4
22= Black-to-Gray 5
23= Black-to-Gray 6
24= Black-to-Gray 7
25= Black-to-Gray 8
26= Black-to-Gray 9
27= Black-to-Gray 10
28= Circle Zoneplate
29= Diagonal Zoneplate
30= Horizontal Sine Zoneplate
31= Horizontal Sweep Zoneplate
32= Vertical Sine Zoneplate
33= V Sweep Zoneplate
34= Custom-1 Zoneplate
35= Custom-2 Zoneplate
36= Red-1 Field
37= Red-2 Field
38= Green-1 Field
39= Green-2 Field
40= Blue-1 Field
41= Blue-2 Field
42= Blue-2 Field
43= Cyan-2 Field
44= Magneta-1 Field
45= Magenta-2 Field
46= Yellow-1 Field
47= Yellow-2 Field
48= Convergence
49= Checkerboard
50= Production Aperture
51= Window
52= Equalizer Test
53= PLL Test
54= SDI Matrix

:OUTPut1:SYNThesizer:CINEma:PROJector?

Returns the projector test pattern setting.

```
:OUTPut1:SYNThesizer:STATe GEN|CONV
```

Sets the synthesizer to generator or convergence mode.

```
:OUTPut1:SYNThesizer:STATe?
```

Returns the current synthesizer mode.

```
:OUTPut1:SYNThesizer:SIGNal
```

NOTE. The SIGNal and SIGNal? commands do not give full access to the test patterns available to this module. Use the SIGNAL:COUNT, SIGNAL:LOAD, and SIGNAL:LIST commands.

```
COLBAR_100P|COLBAR_75P|COLBAR_SMPTE|FF_0P|
FF_10P|FF_20P|FF_30P|FF_40P|FF_50P|
FF_60P|FF70_P|FF_80P|FF_90P|FF_100P|
LIN_5STEP|LIN_10STEP|LIN_RAMP|LIN_SHALLOW_RAMP|
LIN_GRAD_RAMP|LIN_VRAMP|
MON_RED|MON_75RED|MON_GREEN|MON_75GREEN|MON_BLUE|
MON_75BLUE|MON_CONV|
PULSE_2T30|PULSE_2T60|
SDI_EQU|SDI_PLL|SDI_MTX|
ZP_CIRCLE|ZP_DIAG|ZP_HSINE|ZP_HSWEEP|ZP_VSINE|
ZP_VSWEEP|ZP_1_CUSTOM|ZP_2_CUSTOM
```

Sets the HD test signal. Before sending this command, you need to set the :OUTPut<n>:SYNThesizer:STATe command to GEN. The options are as follows:

COLBAR_100P	100% Color Bars
COLBAR_75P	75% Color Bars
COLBAR_SMPTE	SMPTE RP219 Color Bars
FF_0P	0% Flat Field
FF_10P	10% Flat Field
FF_20P	20% Flat Field
FF_30P	30% Flat Field
FF_40P	40% Flat Field
FF_50P	50% Flat Field
FF_60P	60% Flat Field
FF_70P	70% Flat Field
FF_80P	80% Flat Field
FF_90P	90% Flat Field
FF_100P	100% Flat Field
LIN_5STEP	5 Step Staircase
LIN_10STEP	10 Step Staircase
LIN_RAMP	Ramp
LIN_SHALLOW_RAMP	Shallow Ramp

LIN_GRAD_RAMP	Gradient Ramp
LIN_VRAMP	Valid Ramp
MON_RED	100% Red Field
MON_75RED	75% Red Field
MON_GREEN	100% Green Field
MON_75GREEN	75% Green Field
MON_BLUE	100% Blue Field
MON_75BLUE	75% Blue Field
MON_CONV	Convergence
PULSE_2T30	2T30 Pulse and Bar
PULSE_2T60	2T60 Pulse and Bar
SDI_EQU	Equalizer Test
SDI_PLL	PLL Test
SDI_MTX	SDI Matrix
ZP_CIRCLE	Circle Zone Plate
ZP_DIAG	Diagonal Sine Zone Plate
ZP_HSINE	Diagonal Sine Zone Plate
ZP_HSWEEP	Horizontal Sine Zone Plate
ZP_VSINE	Vertical Sine Zone Plate
ZP_VSWEEP	Vertical Sweep Zone Plate
ZP_1_CUSTOM	Custom1 Zone Plate
ZP_2_CUSTOM	Custom2 Zone Plate

`:OUTPut1:SYNThesizer:SIGNal?`

Returns the current HD test signal.

`:OUTPut1:SYNThesizer:SIGNal:LIST?`

Returns all available signals by name. The information of each signal is separated by colon ":".

`:OUTPut1:SYNThesizer:SIGNal:COUNt?`

Returns how many parametric signals are present in the instrument.

`:OUTPut1:SYNThesizer:SIGNal:LOAD`

Loads a parametric signal with specified signal name. A list of all available signals is found by using the SIGNAL:LIST? query.

`:OUTPut1:SYNThesizer:SIGNal:LOAD?`

Returns the current parametric signal.

`:OUTPut1:TIMECode:SOURce TOD|PCOUnter`

Sets time code source. TOD sets the time of day clock as the source (available only if a GPS7 module is installed in the TG700). PCounter sets the time code source to the program counter (always available).

:OUTPut1:TIMECode:SOURce?

> Returns the timecode source setting.

:OUTPut1:TIMECode:OFFSet <NR1>,<NR1>,<NR1>,<NR1> (HH:MM:SS:FF)

> Sets the time code offset in hours, minutes, seconds, and frames (HH:MM:SS:FF).

:OUTPut1:TIMECode:OFFSet?

> Returns the time code offset in hours, minutes, seconds, and frames (HH:MM:SS:FF). This setting is valid only if a GPS7 module is present.

:OUTPut1:TIMECode:DROP:STATe <0|1>

> Enables or disables the use of Drop Frame timecode (for non−integer frame rate only). A setting of 0 means drop frame timecode is not used. A setting of 1 means drop frame timecode is used.

:OUTPut1:TIMECode:DROP:STATe?

> Returns the Drop Frame timecode state.

:OUTPut1:TIMECode:LTC:STATe <0|1>

> Enables or disables the use of Linear timecode. A setting of 0 means Linear timecode is not used. A setting of 1 means Linear timecode is used.

:OUTPut1:TIMECode:LTC:STATe?

> Returns the Linear timecode state.

:OUTPut1:TIMECode:AVITc:STATe <0|1>

> Enables or disables the insertion of a VITC. You can enable two timecodes. Setting the state to 1 enables the timecode. Setting the state to 0 disables the timecode.

:OUTPut1:TIMECode:AVITc:STATe?

> Returns the VITC insertion state.

:OUTPut1:TIMECode:INITial <NR1>,<NR1>,<NR1> (HH:MM:SS)

> Sets the initial time in hours, minutes, seconds (HH:MM:SS). This setting is valid only if *no* GPS7 module is present.

:OUTPut1:TIMECode:INTial?

> Returns the initial time setting.

`:OUTPut1:TIMECode:SET`

>Applies the initial time setting. This setting is valid only if *no* GPS7 module is present.

`:OUTPut1:TIMECode:DATa?`

>Returns the timecode data settings as a single block of data. Data is returned as a sequence of integers, with parameters separated by commas. Data is returned in the following format :

>\<Source\>,\< LTC state\>,\<VITC State\>, \<Drop State\>,\<HH\>, \<MM\>,\<SS\>(Init Time)

`:OUTPut1:TRIgger SYS_CLOCK|FRM_PULSE|LINE_PULSE`

>Specifies the signal available at the TRIGGER output connector. The available choices are a sample clock (~148 MHz), a frame pulse (once per video frame), or a line pulse (once per video line). FRM_PULSE is a field-rate square wave when an interlace or segmented frame format is selected, otherwise it is a frame-rate pulse.

`:OUTPut1:TRIgger?`

>Returns the current signal type at the TRIGGER output connector.

`:OUTPut1:VIDeo:Y:STATe ON|OFF`

>Turns the Y component of the digital video signal to on or off. You can use 1 or 0 instead of ON or OFF.

`:OUTPut1:VIDeo:Y:STATe?`

>Returns the current signal output state of the Y component of the digital video.

`:OUTPut1:VIDeo:PB:STATe <ON|OFF>`

>Turns the P_B component of the digital video signal to on or off. You can use 1 or 0 instead of ON or OFF.

`:OUTPut1:VIDeo:PB:STATe?`

>Returns the current signal output state of the P_B component of the digital video.

`:OUTPut1:VIDeo:PR:STATe <ON|OFF>`

>Turns the P_R component of the digital video signal to on or off. You can use 1 or 0 instead of ON or OFF.

`:OUTPut1:VIDeo:PR:STATe?`

>Returns the current signal output state of the P_R component of the digital video.

`:OUTPut1:VIDeo:AVTiming <0|1>`

>Turns the output mode for an audio/video timing measurement on or off. Refer to *Operating Basics* in the TG700 User Manual for detailed information about the mode. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:VIDeo:AVTiming?`

>Returns the current output mode setting for an audio/video timing measurement.

`:OUTPut1:VIDeo:EFILter:STAT <0|1>`

>When set to 0, all edge filtering is disabled. Test signals with quick, large data transitions will exhibit ringing.

`:OUTPut1:VIDeo:EFILter:STAT?`

>Enabled = 1; Disabled = 0

`:OUTPut1:VPID:STATe 0|1`

>Sets the VPID (Video Payload IDentifier) state. 0 disables VPID. 1 enables VPID.

`:OUTPut1:VPID:STATe?`

>Returns the VPID state.

`:OUTPut1:ZONE:FREQuency <NR1>`

>Sets the zone plate frequency.

`:OUTPut1:ZONE:FREQuency?`

>Returns the zone plate frequency.

`:OUTPut1:ZONE:AMPLitude`

>Sets the value of the zone plate amplitude.

`:OUTPut1:ZONE:AMPLitude?`

>Returns the value of the zone plate amplitude.

`:OUTPut1:ZONE:K <NR1>`

>Sets the value of the K parameter (phase).

`:OUTPut1:ZONE:K?`

> Returns the value of the K parameter.

`:OUTPut1:ZONE:KX`

> Sets the value of the KX parameter (horizontal frequency).

`:OUTPut1:ZONE:KX?`

> Returns the value of the KX parameter.

`:OUTPut1:ZONE:KXSQ`

> Sets the value of the KXSQ parameter (horizontal sweep).

`:OUTPut1:ZONE:KXSQ?`

> Returns the value of the KXSQ parameter.

`:OUTPut1:ZONE:KXT`

> Sets the value of the KXT parameter (temporal channel horizontal frequency).

`:OUTPut1:ZONE:KXT?`

> Returns the value of the KXT parameter.

`:OUTPut1:ZONE:KXY`

> Sets the value of the KXY parameter (vertical channel horizontal frequency).

`:OUTPut1:ZONE:KXY?`

> Returns the value of the KXY parameter.

`:OUTPut1:ZONE:KY`

> Sets the value of the KY parameter (vertical channel frequency).

`:OUTPut1:ZONE:KY?`

> Returns the value of the KY parameter.

`:OUTPut1:ZONE:KYSQ`

> Sets the value of the KYSQ parameter (vertical sweep).

`:OUTPut1:ZONE:KYSQ?`

> Returns the value of the KYSQ parameter.

`:OUTPut1:ZONE:KYT`

Sets the value of the KYT parameter (vertical channel vertical frequency).

`:OUTPut1:ZONE:KYT?`

Returns the value of the KYT parameter.

`:OUTPut1:ZONE:KT`

Sets the value of the KT parameter (temporal channel frequency).

`:OUTPut1:ZONE:KT?`

Returns the value of the KT parameter.

`:OUTPut1:ZONE:KTSQ`

Sets the value of the KTSQ parameter (temporal sweep).

`:OUTPut1:ZONE:KTSQ?`

Returns the value of the KTSQ parameter.

`:OUTPut1:ZONE:WAVE <SINE|SQUARe|TRIAngle>`

Sets the waveform shape.

`:OUTPut1:ZONE:WAVE?`

Returns the selected waveform shape.

`:OUTPut1:ZONE:SAVE`

Saves the current settings as User Custom 1 or User Custom 2.

`:OUTPut1:ZONE:TRESet:STATe 0|1`

Sets the Temporal dimension to stay constant or vary.

`:OUTPut1:ZONE:TRESet:STATe?`

Returns the Temporal parameter state.

`:OUTPut1:ZONE:VIDEO:Y:STATe 0|1`

Enables or disables the Y/G/X color signal depending on the selected sampling structure (see the `:OUTPut1:SAMPling:SELect` command).

`:OUTPut1:ZONE:VIDEO:Y:STATe?`

Returns the state of the Y/G/X color signal.

`:OUTPut1:ZONE:VIDEO:PB:STATe 0|1`

> Enables or disables the Cb/B/Y color signal depending on the selected sampling structure (see the `:OUTPut1:SAMPling:SELect` command).

`:OUTPut1:ZONE:VIDEO:PB:STATe?`

> Returns the state of the Cb/B/Y color signal.

`:OUTPut1:ZONE:VIDEO:PR:STATe 0|1`

> Enables or disables the Cr/R/Z color signal depending on the selected sampling structure (see the `:OUTPut1:SAMPling:SELect` command).

`:OUTPut1:ZONE:VIDEO:PR:STATe?`

> Returns the state of the Cr/R/Z color signal.

`:OUTPut1:ZONE:DATa?`

> Returns the Zoneplate data settings as a single block of data. Data is returned as a sequence of integers, with parameters separated by commas. Data is returned in the following format:
>
> <Amp>,<Freq>,<kx>,<kx2>,<kxy>,<ky>,<ky2>,<k>,<kxt>,<kyt>, <kt>,<kt2>,<Y>,<Pb>,<Pr>,<Waveform Shape>,<TReset>

SENSE Commands

Use these commands to set the timing of the HD3G7 module relative to the internal reference signal (frame reset signal).

Command Tree

```
:SENSe1
  :CORRection
    :MDELay
      :HORizontal        <NR1>
      :Horizontal?
      :VERTical          <NR1>
      :Relative          <ANALog|SERial>
```

Command Description

`:SENSe1:CORRection:MDELay:HORizontal <NR1>`

Sets the horizontal timing offset of the selected outputs. The timing resolution is clock-cycles. The units are microseconds. See Table 2-6 for the delay ranges.

Table 2-6: HD3G7 Horizontal offset ranges

Standard / Frame rate	Range μs (± 1 video line)	Resolution
1080 60p	± 14.814	.0067 us (148.5 MHz clock)
1080 59.94p	± 14.829	.0067 us (148.36 MHz clock)
1080 50p	± 17.778	.0067 us (148.5 MHz clock)
1080 60i	± 29.629	.0135 us (74.25 MHz clock)
1080 59.94i	± 29.659	.0135 us (74.18 MHz clock)
1080 50i	± 35.556	.0135 us (75.25 MHz clock)
1080 30p / sF	± 29.629	.0135 us (75.25 MHz clock)
1080 29.97p / sF	± 29.659	.0135 us (74.18 MHz clock)
1080 25p / sF	± 35.542	.0135 us (75.25 MHz clock)
1080 24p / sF	± 37.037	.0135 us (75.25 MHz clock)
1080 23.98p / sF	± 37.074	.0135 us (74.18 MHz clock)
720 60p	± 22.222	.0135 us (75.25 MHz clock)
720 59.94p	± 22.244	.0135 us (74.18 MHz clock)
720 50p	± 26.667	.0135 us (75.25 MHz clock)

Table 2- 6: HD3G7 Horizontal offset ranges (Cont.)

Standard / Frame rate	Range µs (± 1 video line)	Resolution
720 30p	± 44.444	.0135 us (75.25 MHz clock)
720 29.97p	± 44.489 us	.0135 us (74.18 MHz clock)
720 25p	± 53.333 us	.0135 us (75.25 MHz clock)
720 24p	± 55.555 us	.0135 us (75.25 MHz clock)
720 23.98p	± 55.611 us	.0135 us (74.18 MHz clock)

:SENSe1:CORRection:MDELay:HORizontal?

    Returns the current horizontal timing offset of the selected outputs.

:SENSe1:CORRection:MDELay:VERTical <NR1>

    Sets the vertical timing offset of the selected outputs. The units are lines. The range is ± 562.

:SENSe1:CORRection:MDELay:RELative <ANALog|SERial>

    ANALog includes correction for the delay through a standard D to A converter; SERial omits this correction.

DIAGNOSTIC Commands

Use these commands to perform diagnostics on the module. The command readouts also appear on the front panel of the instrument.

Command Tree

```
:DIAGnostic
   :TEMPerature?
   :FPGA?
   :LOCK?
   :YCRC?
   :CCRC?
   :CLEAr
   :POWer?
   :DDS?
   :DATa?
```

Command Description

:DIAGnostic:TEMPerature?

Returns the current temperature of the circuit board or FPGA in degrees Celsius.

:DIAGnostic:FPGA?

Returns the current FPGA version.

:DIAGnostic:LOCK?

Returns the status of the JIT, FLEX0, and FLEX1 circuits where 0 indicates locked and 1 indicates unlocked.

:DIAGnostic:YCRC?

Returns the number of input Y CRC errors since clear.

:DIAGnostic:CCRC?

Returns the number of input C CRC errors since clear.

:DIAGnostic:CLEAr

Trigger only. If the value is set to 1, the command clears the CRC counts and resets them to zero.

:DIAGnostic:POWer?

Returns a string with eight supply voltage values.

`:DIAGnostic:DDS?`

> Returns the phase lock status of the DDS0 and DDS1 circuits.

`:DIAG:DATa?`

> Returns the Diagnostics data settings as a single block of data. Data is returned as a series of strings, with parameters separated by commas. Data is returned in the following format:

> <Temp>,<FPGA>,<Lock>,<DDS>,<YCRC>,<CCRC>,<Power>

HDLG7 HD Dual Link Video Generator Module Remote Commands

This section describes the remote commands used to control the HDLG7 module remotely. The commands to the module are divided into the following two groups:

■ OUTPUT commands

■ SENSE commands

OUTPUT Commands

Use these commands control the output parameters of the module.

Command Tree

```
:OUTPut1
   :ALPHa                  COPY_YG|FF_0P|FF_10P|FF_20P|FF_30P|
                           FF_40P|FF_50P|FF_60P|FF_70P|FF_80P|
                           FF_90P|FF_100P
   :CONVert
      :BLACkwhite          ON|OFF
      :LINK
         :AUDio            0|1|2
      :STATe?
   :MOVe
      :HORizontal          <numeric_value>
      :VERTical            <numeric_value>
      :PERiod              <numeric_value>
      :RANDom[:STATe]      ON|OFF
   :SAMPling
      :SELect              GBR444_12B|GBR444_10B|GBR444A_10B|
                           YCB444_12B|YCB444_10B|YCB444A_10B|
                           YCB422_12B|YCB422_10B|YCB422A_12B|
                           GBR444_2K|XYZ444_2K
      :STANdard            HD1080_60P|HD1080_59P|HD1080_50P|
                           HD1080_60I|HD1080_59I|HD1080_50I|
                           HD1080_30P|HD1080_29P|HD1080_25P|
                           HD1080_24P|HD1080_23P|HD1080_24SF|
                           HD1080_23SF|TK1556_14SF|TK1556_15SF|
                           TK1556_17SF|TK1556_18SF|TK1080_23SF|
                           TK1080_24SF|TK1080_25SF|TK1080_29SF|
```

```
                                     TK1080_30SF|TK1080_23P|TK1080_24P|
                                     TK1080_25P|TK1080_29P|TK1080_30P
                 :SYNThesize
                   :CINEma
                     :COLOr          RGB|PROJ
                     :GRAD
                        :HORizontal  <16, 17, 18, ... , 1912, 1913>
                        :VERTical    <16, 17, 18, ... , 2880>
                     :PROJector      <0, 1, 2, ... , 46, 47>
                        :CATalog?
                 :STATe              ON|OFF
                 :SIGNal             COLBAR_100P|COLBAR_75P|COLBAR_SMPTE|
                                     FF_0P|FF_10P|FF_20P|FF_30P|FF_40P|
                                     FF_50P|FF_60P|FF_70P|FF_80P|FF_90P|
                                     FF_100P|LIN_5STEP|LIN_RAMP|LIN_VRAMP|
                                     MON_RED|MON_75RED|MON_GREEN|
                                     MON_75GREEN|MON_BLUE|MON_75BLUE|
                                     MON_CONV|PULSE_2T30|SDI_EQU|SDI_PLL|
                                     SDI_MTX
```

Command Description

```
:OUTPut1:ALPHa COPY_YG|FF_0P|FF_10P|FF_20P|FF_30P|FF_40P|
               FF_50P|FF_60P|FF_70P|FF_80P|FF_90P|FF_100P|
```

Sets the alpha channel signal. The choices are COPY_YG (fills the alpha channel with Y or G data from the input signal), FF_0P (0% Flat Field), FF_10P (10% Flat field), FF_20P (20% Flat field), FF_30P (30% Flat field), FF_40P (40% Flat field), FF_50P (50% Flat field), FF_60P (60% Flat field), FF_70P (70% Flat field), FF_80P (80% Flat field), FF_90P (90% Flat field), and FF_100P (100% Flat field).

```
:OUTPut1:ALPHa?
```

Returns the current alpha channel signal.

```
:OUTPut1:CONVert:BLACkwhite ON|OFF
```

Turns the black and white mode on or off. When the current color space is GBR, G data is copied to B and R field for getting a black and white display. When the color space is YCbCr, the command has no effect.

```
:OUTPut1:CONVert:BLACkwhite?
```

Returns the current black and white mode status.

`:OUTPut1:CONVert:LINK:AUDio 0|1|2`

> Sets which link to place embedded audio on the input signal. The choices are 0 (Link A only), 1 (Link B only), and 2 (Link A and Link B).

`:OUTPut1:CONVert:LINK:AUDio?`

> Returns the link to place embedded audio on the input signal.

`:OUTPut1:CONVert:STATe?`

> Returns the video standard and sampling structure information from the second line of the status display.

`:OUTPut1:MOVe:HORizontal <numeric_value>`

> Sets the amount of horizontal scrolling in the moving picture mode. You can set the value from –252 to +252 in 4 samples steps.

`:OUTPut1:MOVe:HORizontal?`

> Returns the amount of horizontal scrolling in the moving picture mode.

`:OUTPut1:MOVe:VERTical <numeric_value>`

> Sets the amount of vertical scrolling in the moving picture mode. You can set the value from –252 to +252 in 1 line steps.

`:OUTPut1:MOVe:VERTical?`

> Returns the amount of vertical scrolling in the moving picture mode.

`:OUTPut1:MOVe:PERiod <numeric_value>`

> Sets the time interval between occurrences of the scrolling. You can set the value from 1 to 16 in 1 field steps.

`:OUTPut1:MOVe:PERiod?`

> Returns the time interval between occurrences of the scrolling.

`:OUTPut1:MOVe:RANDom[:STATe] ON|OFF`

> Turns the random scrolling mode on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:MOVe:RANDom[:STATe]?`

> Returns the current state of the random scrolling mode.

```
:OUTPut1:SAMPling:SELect GBR444_12B|GBR444_10B|GBR444A_10B|
                         YCB444_12B|YCB444_10B|YCB444A_10B|
                         YCB422_12B|YCB422_10B|YCB422A_12B|
                         GBR444_2K|XYZ444_2K
```

Sets the sampling structure for the output test signal. The options are as follows:

GBR444_12B	1080 4:4:4 GBR 12 bits
GBR444_10B	1080 4:4:4 GBR 10 bits
GBR444A_10B	1080 4:4:4 GBR+A 10 bits
YCB444_12B	1080 4:4:4 YCbCr 12 bits
YCB444_10B	1080 4:4:4 YCbCr 10 bits
YCB444A_10B	1080 4:4:4 YCbCr+A 10 bits
YCB422_12B	1080 4:2:2 YCbCr 12 bits
YCB422_10B	1080 4:2:2 YCbCr 10 bits
YCB422A_12B	1080 4:2:2 YCbCr+A 12 bits
GBR444_2K	2K 4:4:4 GBR 12 bits
XYZ444_2K	2K 4:4:4 XYZ 12 bits

The GBR444_2K and XYZ444_2K options are only available when any 2K format is selected by the :OUTPut1:STANdard command.

```
:OUTPut1:SAMPling:SELect?
```

Returns the current sampling structure.

```
:OUTPut1:STANdard HD1080_60P|HD1080_59P|HD1080_50P|HD1080_60I|
                  HD1080_59I|HD1080_50I|HD1080_30P|HD1080_29P|
                  HD1080_25P|HD1080_24P|HD1080_23P|HD1080_24SF|
                  HD1080_23SF|TK1556_14SF|TK1556_15SF|
                  TK1556_17SF|TK1556_18SF|TK1080_23SF|
                  TK1080_24SF|TK1080_25SF|TK1080_29SF|
                  TK1080_30SF|TK1080_23P|TK1080_24P|TK1080_25P|
                  TK1080_29P|TK1080_30P
```

Sets the video standard of the output signal. TK1556_xx and TK1080_xx arguments represent 2K video formats.

```
:OUTPut1:STANdard?
```

Returns the current video standard.

```
:OUTPut1:SYNThesize:CINEma:COLOr RGB|PROJ
```

Sets the 2K test signal color space. The choices are RGB (Rec.709 Test pattern) and PROJ (Projector Test Pattern).

`:OUTPut1:SYNThsize:CINEma:COLOr?`

> Returns the current 2K test signal color space.

`:OUTPut1:SYNThsize:CINEma:GRAD:HORizontal <16, 17, 18, ... ,1913>`

> Sets the start offset of the Horizontal Gradient projector test pattern. You can set the value from 16 to 1913 in 1 level steps.

`:OUTPut1:SYNThsize:CINEma:GRAD:HORizontal?`

> Returns the current start offset of the Horizontal Gradient projector test pattern.

`:OUTPut1:SYNThsize:CINEma:GRAD:VERTical <16, 17, 18, ... , 2880>`

> Sets the start offset of the Vertical Gradient projector test pattern. For the 2048 x 1080 format, you can set the value from 16 to 2880 in 1 level steps. For the 2048 x 1556 format, you can set the value from 16 to 2405 in 1 level steps.

`:OUTPut1:SYNThsize:CINEma:GRAD:VERTical?`

> Returns current start offset of the Vertical Gradient projector test pattern.

`:OUTPut1:SYNThesize:CINEma:PROJector <0, 1, 2, ..., 46, 47>`

Sets the projector test pattern. Before sending this command, set the
:OUTPut1:SYNThesize:STATe command to ON and
:OUTPut1:SYNThesize:CINEma:COLOr to PROJ.
The possible settings are:

0: Color Bar Patch-1	24: Black to Gray Step-7
1: Color Bar Patch-2	25: Black to Gray Step-8
2: Step Black-White	26: Black to Gray Step-9
3: Step Black-Dark Gray	27: Black to Gray Step-10
4: Horizontal Gradient	28: Red-1 Field
5: Vertical Gradient	29: Red-2 Field
6: Black Flat Field	30: Green-1 Field
7: White Flat Field	31: Green-2 Field
8: Black to White Step-1	32: Blue-1 Field
9: Black to White Step-2	33: Blue-2 Field
10: Black to White Step-3	34: Cyan-1 Field
11: Black to White Step-4	35: Cyan-2 Field
12: Black to White Step-5	36: Magenta-1 Field
13: Black to White Step-6	37: Magenta-2 Field
14: Black to White Step-7	38: Yellow-1 Field
15: Black to White Step-8	39: Yellow-2 Field
16: Black to White Step-9	40: GRID
17: Black to White Step-10	41: Checkboard
18: Black to Gray Step-1	42: Aspect Ratio
19: Black to Gray Step-2	43: Window
20: Black to Gray Step-3	44: Equalizer Test
21: Black to Gray Step-4	45: PLL Test
22: Black to Gray Step-5	46: SDI Matrix
23: Black to Gray Step-6	47: Black (response only)

`:OUTPut1:SYNThesize:CINEma:PROJector?`

Returns the current projector test pattern number. If an HD test
signal is selected, 47 (Black) is returned.

`:OUTPut1:SYNThesize:CINEma:PROJector:CATalog?`

Lists all the projector test patterns.

`:OUTPut1:SYNThesize:STATe ON|OFF`

Turns the generator mode on or off.

`:OUTPut1:SYNThesize:STATe?`

Returns the current generator mode status.

```
:OUTPut1:SYNThesize:SIGNal COLBAR_100P|COLBAR_75P|COLBAR_SMPTE|
                           FF_0P|FF_10P|FF_20P|FF_30P|FF_40P|
                           FF_50P|FF_60P|FF70_P|FF_80P|FF_90P|
                           FF_100P|LIN_5STEP|LIN_RAMP|LIN_VRAMP|
                           MON_RED|MON_75RED|MON_GREEN|
                           MON_75GREEN|MON_BLUE|MON_75BLUE|
                           MON_CONV|PULSE_2T30|SDI_EQU|SDI_PLL|
                           SDI_MTX
```

Sets the HD test signal. Before sending this command, you need to set the :OUTPut1:SYNThesize:STATe command to ON. The options are as follows:

COLBAR_100P	100% Color Bars
COLBAR_75P	75% Color Bars
COLBAR_SMPTE	SMPTE RP219 Color Bars
FF_0P	0% Flat Field
FF_10P	10% Flat Field
FF_20P	20% Flat Field
FF_30P	30% Flat Field
FF_40P	40% Flat Field
FF_50P	50% Flat Field
FF_60P	60% Flat Field
FF_70P	70% Flat Field
FF_80P	80% Flat Field
FF_90P	90% Flat Field
FF_100P	100% Flat Field
LIN_5STEP	5 Step Staircase
LIN_RAMP	Ramp
LIN_VRAMP	Valid Ramp
MON_RED	100% Red Field
MON_75RED	75% Red Field
MON_GREEN	100% Green Field
MON_75GREEN	75% Green Field
MON_BLUE	100% Blue Field
MON_75BLUE	75% Blue Field
MON_CONV	Convergence
PULSE_2T30	2T30 Pulse and Bar
SDI_EQU	Equalizer Test
SDI_PLL	PLL Test
SDI_MTX	SDI Matrix

```
:OUTPut1:SYNThesize:SIGNal?
```

Returns the current HD test signal.

SENSE Commands

Use these commands to set the timing offset of the LINK B outputs relative to the LINK A outputs.

Refer to *Operating Basics* in the TG700 User Manual for detailed information about the setting range.

Command Tree

```
:SENSe1
  :CORRection
    :MDELay
      :HORizontal        <numeric_value>
```

Command Description

:SENSe1:CORRection:MDELay:HORizontal <numeric_value>

> Sets the horizontal timing offset of the LINK B outputs. The timing resolution is clock-cycles. The units are microseconds.

:SENSe1:CORRection:MDELay:HORizontal?

> Returns the current horizontal timing offset of the LINK B outputs.

Command Examples

This section shows some examples of using remote commands to generate dual link signals and to set the timing offset of the LINK B outputs.

Generating Dual Link Signals from Converted Input

To output dual link signals from a converted input where the source test signal is 1080 59.94i standard, 100% Color Bars from the HDVG7 module in slot 4. The HDLG7 module is in slot 3, the sampling structure is "GBR 4:4:4 10 bits," and alpha channel data of 10% Flat Field is inserted:

```
INST:SEL "HDVG7:4"
INST: NSEL 4;:MMEM:LOAD:SIGN 4,"/1080 59.94i/COLOR
BAR/100%^Color Bars"
INST:SEL "HDLG7:3"
OUTP1:SYNT:STAT OFF
OUTP1:SAMP:SEL GBR444A_10B
OUTP1:ALPH FF_10P
```

Generating Synthesized Dual Link Signals

To generate dual link signals where the HDLG7 module is in slot 3, the video standard is 1080 59.94i, the test signal is 100% Color Bars, the sampling structure is "1080 YCbCr 4:4:4 10 bits," and no alpha channel data is inserted:

```
INST:SEL "HDLG7:3"
OUTP1:SYNT:STAT ON
OUTP1:STAN HD1080_59I
OUTP1:SYNT:SIGN COLBAR_100P
OUTP1:SAMP:SEL YCB444_10B
```

Generating Synthesized Projector Test Patterns

To generate projector test patterns where the video standard is 2K 1080 24p and the test pattern is Black to Gray Step-8:

```
OUTP1:STAN TK1080_24P
OUTP1:SYNT:CINE:COLO PROJ
OUTP1:SYNT:CINE:PROJ 25
```

You can list all the projector test patterns and their numbers by using the :OUTP1: SYNT:CINE:PROJ:CAT? command.

Setting Timing Offset of Link B Relative to Link A

To set the timing offset of the LINK B outputs to 0.0269 μs from the LINK A outputs:

```
SENS1:CORR:MDEL:HOR 0.0269
```

HDVG7 HDTV Digital Video Generator Module Remote Commands

This section describes the remote commands used to control the HDVG7 Generator module remotely. The commands to the module are divided into the following three groups:

- MASS MEMORY commands (Refer to the *TG700 TV Signal Generator Platform User Manual*)

- OUTPUT commands

- SENSE commands

MASS MEMORY Commands

Two MASS MEMORY commands are listed here for your reference. You can use these to load and query the output test signal. Detailed information for using these commands are located in the *TG700 TV Signal Generator Platform User Manual*.

```
:MMEMory:LOAD:SIGNal <module_name>,<signal_name>
:MMEMory:LOAD:SIGNal <slot_number>,<signal_name>
```

> Loads a signal into the specified module.

```
:MMEMory:SIGNal:ACTive? <slot_number>|<module_name>
```

> Returns the current output signal of the specified module.

OUTPUT Commands

Use these commands control the output parameters of the module. These include embedded audio and circle/text/logo overlay.

Command Tree

```
:OUTPut<n>
  :CIRCle
    :STATe            ON|OFF
    :DIAMeter         <numeric_value>
    :POSition
      :HORizontal     <numeric_value>
      :VERTical       <numeric_value>
```

```
:EAUDio
  :CHANnel<n>
    :AMPLitude        <numeric_value>
    :FREQuency        <numeric_value>
    :CLICk            OFF|1|2|3|4
  :GROup<n>
        :STATe        ON|OFF
        :PREemphasis  OFF|CD|CCITt
        :NBITs        20|24
        :SAMPLIng     FRAMe|NOFRame|ASYNc
:LOGO
  :STATe              ON|OFF
  :POSition
    :HORizontal       <numeric_value>
    :VERTical         <numeric_value>
  :SELect             <logo_name>
  :SAVe
:MOVe
  :HORizontal         <numeric_value>
  :VERTical           <numeric_value>
  :PERiod             <numeric_value>
  :RANDom[:STATe]     ON|OFF
:OVERlay
  :BLINk
    :STATe            ON|OFF
    :PERiod           <numeric_value>
:TEXT
  :STATe              ON|OFF
  :DATA               <string>
  :POSition
    :HORizontal       <numeric_value>
    :VERTical         <numeric_value>
  :SAVe
:VIDeo
  :Y
    :STATe            ON|OFF
  :PB
    :STATe            ON|OFF
  :PR
    :STATe            ON|OFF
  :AVTiming
    :STATe            ON|OFF
:STANdard             HD1080_60I|HD1080_59I|HD1080_50I|
                      HD1080_24SF|HD1080_23SF|HD1080_30P|
                      HD1080_29P|HD1080_25P|HD1080_24P|
                      HD1080_23P|HD1035_60I|HD1035_59I|
                      HD720_60P|HD720_59P|HD720_50P|
```

```
                                    HD720_30P|HD720_29P|HD720_25P|
                                    HD720_24P|HD720_23P
            :SIGNal                 BLACk|GRAY|FF50P|WHITe
```

Command Description

`:OUTPut1:CIRCle:STATe ON|OFF`

> Turns the circle overlay on the video signal on or off. You can use 1 or 0 instead of ON or OFF.

`:OUTPut1:CIRCle:STATe?`

> Returns the current circle overlay state.

`:OUTPut1:CIRCle:DIAMeter <numeric_value>`

> Sets the diameter of the displayed circle. The unit is percent of active picture height. You can set the diameter from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:CIRCle:DIAMeter?`

> Returns the diameter of the displayed circle.

`:OUTPut1:CIRCle:POSition:HORizontal <numeric_value>`

> Sets the horizontal position of the circle as it appears on the active signal. The unit is percent of active picture width. You can set the position from –50% to +50% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:CIRCle:POSition:HORizontal?`

> Returns the current horizontal position of the circle as it appears on the active signal.

`:OUTPut1:CIRCle:POSition:VERTical <numeric_value>`

> Sets the vertical position of the circle as it appears on the active signal. The unit is percent of active picture height. You can set the position from –50% to +50% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:CIRCle:POSition:VERTical?`

> Returns the current vertical position of the circle as it appears on the active signal.

`:OUTPut<n>:EAUDio:CHANnel<m>:AMPLitude <numeric_value>`

Sets the amplitude of a specific embedded audio channel for the selected outputs. You can set the amplitude from –60 dBFS to 0 dBFS in 1 dBFS steps. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:CHANnel<m>:AMPLitude?`

Returns the current amplitude of a specific embedded audio channel for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:CHANnel<m>:FREQuency <numeric_value>`

Sets the frequency of a specific embedded audio channel for the selected outputs. The frequency choices are –1, 0, 50, 100, 150, 200, 250, 300, 400, 500, 600, 750, 800, 1000, 1200, 1500, 1600, 2000, 2400, 3000, 3200, 4000, 4800, 5000, 6000, 8000, 9600, 10000, 12000, 15000, 16000, or 20000. For –1, the output of the audio data is disabled. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:CHANnel<m>:FREQuency?`

Returns the current frequency of a specific embedded audio channel for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:CHANnel<m>:CLICk 0|1|2|3|4`

Sets the audio click of a specific audio channel for the selected outputs. You can select 0, 1 (second), 2 (seconds), 3 (seconds) or 4 (seconds). When 1, 2, 3 or 4 is selected, the audio click becomes valid. Audio Tone is turned off for 0.25 seconds around the time of the click. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents

the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:CHANnel<m>:CLICk?`

Returns the current audio click settings of a specific audio channel for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the channel number and you can use any channel number from 1 through 16.

`:OUTPut<n>:EAUDio:GROup<m>:STATe ON|OFF`

Turns the output of a specific audio group for the selected outputs on or off. You can also use 1 or 0 instead of ON or OFF. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:STATe?`

Returns the current output state of a specific audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:PREemphasis OFF|CD|CCITt`

Turns the preemphasis bits on or off in the audio signal of a specific embedded audio group for the selected outputs. The signal itself does not have preemphasis, but you can set the bits in order to check other equipment. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:PREemphasis?`

Returns the current preemphasis bits settings of a specific embedded audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:NBITs 20|24`

> Sets the sample bits of a specific embedded audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:NBITs?`

> Returns the current sample bits of a specific embedded audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:SAMPLIng FRAMe|NOFRame|ASYNc`

> Sets the sampling alignment status bits in the audio signal of a specific embedded audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut<n>:EAUDio:GROup<m>:SAMPLIng?`

> Returns the current sampling alignment status bits settings of a specific embedded audio group for the selected outputs. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors. The <m> in the command represents the group number and you can use any channel number from 1 through 4.

`:OUTPut1:LOGO:STATe ON|OFF`

> Turns the logo overlay display on the video signal on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:LOGO:STATe?`

> Returns the current logo overlay state.

`:OUTPut1:LOGO:POSition:HORizontal <numeric_value>`

> Sets the horizontal position of the logo as it appears on the active signal. The unit is percent of active picture width. You can set the position from –100% to 0% in 0.1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:LOGO:POSition:HORizontal?`

Returns the current horizontal position of the logo.

`:OUTPut1:LOGO:POSition:VERTical <numeric_value>`

Sets the vertical position of the logo as it appears on the active signal. The unit is percent of active picture height. You can set the position from -100% to 0% in 0.1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:LOGO:POSition:VERTical?`

Returns the current vertical position of the logo.

`:OUTPut1:LOGO:SELect <logo_name>`

Selects the logo used for the logo overlay.

`:OUTPut1:LOGO:SELect?`

Returns the current logo used for the logo overlay.

`:OUTPut1:LOGO:SAVe`

Saves the current display position of the logo to the logo file. There are no arguments.

`:OUTPut1:MOVe:HORizontal <numeric_value>`

Sets the amount of horizontal scrolling in the moving picture mode. You can set the value from -252 to +252 in 4 samples steps.

`:OUTPut1:MOVe:HORizontal?`

Returns the amount of horizontal scrolling in the moving picture mode.

`:OUTPut1:MOVe:VERTical <numeric_value>`

Sets the amount of vertical scrolling in the moving picture mode. You can set the value from -252 to +252 in 1 line steps.

`:OUTPut1:MOVe:VERTical?`

Returns the amount of vertical scrolling in the moving picture mode.

`:OUTPut1:MOVe:PERiod <numeric_value>`

Sets the time interval between occurrences of the scrolling. You can set the value from 1 to 16 in 1 field steps.

`:OUTPut1:MOVe:PERiod?`

> Returns the time interval between occurrences of the scrolling.

`:OUTPut1:MOVe:RANDom[:STATe] ON|OFF`

> Turns the random scrolling mode on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:MOVe:RANDom[:STATe]?`

> Returns the current state of the random scrolling mode.

`:OUTPut1:OVERlay:BLINk:STATe ON|OFF`

> Turns on or off the blinking mode for the logo, text, and circle overlay. You can also use 1 or 0 instead of ON or OFF

`:OUTPut1:OVERlay:BLINk:STATe?`

> Returns the current state of the blinking mode for the logo, text, and circle overlay.

`:OUTPut1:OVERlay:BLINk:PERiod <numeric_value>`

> Sets the blinking interval of the blinking mode for the logo, text, and circle overlay. You can set the value as 0.5 seconds or 1.0 seconds.

`:OUTPut1:OVERlay:BLINk:PERiod?`

> Returns the blinking interval of the blinking mode for the logo, text, and circle overlay.

`:OUTPut1:TEXT:STATe ON|OFF`

> Turns the text overlay display on the video signal on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:TEXT:STATe?`

> Returns the current text overlay state.

`:OUTPut1:TEXT:DATA <string>`

> Sets the current string for the text mode.

`:OUTPut1:TEXT:DATA?`

> Returns the current string for the text mode.

`:OUTPut1:TEXT:POSition:HORizontal <numeric_value>`

> Sets the text horizontal position in the video signal. The unit is percent of active picture width. You can set the position from 0% to

100% in 1% steps. You can also use MIN, MAX, or DEF instead of the numeric value.

`:OUTPut1:TEXT:POSition:HORizontal?`

Returns the current text horizontal position in the video signal.

`:OUTPut1:TEXT:POSition:VERTical <numeric_value>`

Sets the text vertical position in the video signal. The unit is percent of active picture height. You can set the position from 0% to 100% in 1% steps. You can also use MIN, MAX, or DEF instead of a numeric value.

`:OUTPut1:TEXT:POSition:VERTical?`

Returns the current text vertical position in the video signal.

`:OUTPut1:TEXT:SAVe`

Saves the current text and its display position to the signal file. There are no arguments.

`:OUTPut1:VIDeo:Y:STATe ON|OFF`

Turns the Y component of the serial digital video signals on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:VIDeo:Y:STATe?`

Returns the current Y component output state of the serial digital video signals.

`:OUTPut1:VIDeo:PB:STATe ON|OFF`

Turns the P_B component of the serial digital video signals on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:VIDeo:PB:STATe?`

Returns the current P_B component output state of the serial digital video signals.

`:OUTPut1:VIDeo:PR:STATe ON|OFF`

Turns the P_R component of the serial digital video signals on or off. You can also use 1 or 0 instead of ON or OFF.

`:OUTPut1:VIDeo:PR:STATe?`

Returns the current output state of the P_R component of the serial digital video signals.

:OUTPut1:VIDeo:AVTiming:STATe ON|OFF

> Turns the output mode for an audio/video timing measurement on or off. Refer to *Operating Basics* in the TG700 User Manual for detailed information about the mode. You can also use 1 or 0 instead of ON or OFF.

:OUTPut1:VIDeo:AVTiming:STATe?

> Returns the current output mode setting for an audio/video timing measurement.

:OUTPut2:STANdard HD1080_60I|HD1080_59I|HD1080_50I|HD1080_24SF|
> HD1080_23SF|HD1080_30P|HD1080_29P|HD1080_25P|
> HD1080_24P|HD1080_23P|HD1035_60I|HD1035_59I|
> HD720_60P|HD720_59P|HD720P_50P|HD720_30P|
> HD720_29P|HD720_25P|HD720_24P|HD720_23P

> Sets the video standard for the serial digital black signals output from the BLACK connectors. The choices are HD 1080_60I to HD720_23P. This command is only available if Option BK is installed.

:OUTPut<n>:STANdard?

> Returns the video standard for the selected output. The <n> in the command represents the output connector type. "1" represents the SIGNAL connectors and "2" represents the optional BLACK connectors.

:OUTPut2:SIGNal BLACk|GRAY|FF50P|WHITe

> Sets the type of the serial digital black signals output from the BLACK connectors. The options are BLACK (serial digital black signal), GRAY (40% flat field signal), FF50P (50% flat field signal), or WHITe (100% flat field signal). This command is only available if Option BK is installed.

:OUTPut2:SIGNal?

> Returns the current serial digital black signals output from the BLACK connectors. This command is only available if Option BK is installed.

:OUTPut4:TIMECode:SOURce DISable|TOD|COUNter

> Sets time code source. Disable shuts off the time code output. TOD sets the time of day clock as the source. Counter sets the time code source to the program counter.

:OUTPut4:TIMECode:SOURce?

Returns the current time code source setting.

`:OUTPut4:TIMECode:OFFSet <NR1>,<NR1>,<NR1>,<NR1>`

Sets the time code offset in hours, minutes, seconds, and frames (HH:MM:SS:FF).

`:OUTPut4:TIMECode:LINe <NR1>`

Sets the line number on which the VITC is located. For NTSC output, the line number range is 10–20. For PAL output, the line number range is 6–22. For HD output, the line number range is 7–40.

`:OUTPut4:TIMECode:ATC:STATe 0 | 1  (BOOLEAN)`

Enables or disables the use of ancillary time code.

`:OUTPut4:TIMECode:ATC:STATe?`

Returns the ancillary time code state. A setting of 0 means ancillary time code is not used. A setting of 1 means ancillary time code is used.

`:OUTPut:CONFigure?`

Returns the availability of serial digital black signal output option (Option BK). "1" indicates that the option is available and "0" indicates that the option is not available.

SENSE Commands

Use these commands to set the timing offset of the SIGNAL outputs and the BLACK outputs (Option BK only) relative to the internal reference signal (frame reset signal).

Refer to *Operating Basics* in the TG700 User Manual for detailed information about the setting range.

Command Tree

```
:SENSe<n>
  :CORRection
    :MDELay
      :HORizontal        <numeric_value>
         :STEP           <numeric_value>
      :VERTical          <numeric_value>
         :STEP           <numeric_value>
```

Command Description

`:SENSe<n>:CORRection:MDELay:HORizontal <numeric_value>`

Sets the horizontal timing offset of the selected outputs. The timing resolution is clock-cycles. The units are microseconds. You can use UP, DOWN, or DEF instead of the numeric value. See page 2-2 for additional detail on UP, DOWN, and DEF. If the argument exceeds the horizontal time value, then the vertical offset is adjusted to accommodate the requested delay. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

`:SENSe<n>:CORRection:MDELay:HORizontal?`

Returns the current horizontal timing offset of the selected outputs. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

`:SENSe<n>:CORRection:MDELay:HORizontal:STEP <numeric_value>`

Sets the step increment used by the UP or DOWN commands. The units are microseconds. You can use MIN, MAX, or DEF instead of a numeric value. See page 2-2 for additional detail on MIN, MAX, and DEF. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

`:SENSe<n>:CORRection:MDELay:HORizontal:STEP?`

Returns the current step increment. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

`:SENSe<n>:CORRection:MDELay:VERTical <numeric_value>`

Sets the vertical timing offset of the selected outputs. The argument can be a floating point value that is translated into integer lines with a horizontal offset. You can use UP, DOWN, or DEF instead of a numeric value. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

`:SENSe<n>:CORRection:MDELay:VERTical?`

Returns the current vertical timing offset of the selected outputs. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

:SENSe<n>:CORRection:MDELay:VERTical:STEP <numeric_value>

Sets the step increment used by the UP or DOWN commands. You can use MIN, MAX, or DEF instead of a numeric value. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

:SENSe<n>:CORRection:MDELay:VERTical:STEP?

Returns the current step increment. The <n> in the command represents the type of output connector. "1" represents the SIGNAL connectors and "2" represents the BLACK connectors.

Error Messages and Codes

Error Messages and Codes

Error codes with a negative value are SCPI standard error codes; errors with a positive value are unique to the TG700.

Command Errors

Command errors are returned when there is a syntax error in the command.

Table 3-1: Command errors

Error code	Error message
–100	command error
–101	invalid character
–102	syntax error
–103	invalid separator
–104	data type error
–105	GET not allowed
–108	parameter not allowed
–109	missing parameter
–110	command header error
–111	header separator error
–112	program mnemonic too long
–113	undefined header
–114	header suffix out of range
–120	numeric data error
–121	character
–123	exponent too large
–124	too many digits
–128	numeric data not allowed
–130	suffix error
–131	invalid suffix
–134	suffix too long
–138	suffix not allowed
–140	character data error

Table 3‑1: Command errors (Cont.)

Error code	Error message
–141	invalid character data
–144	character data too long
–148	character data not allowed
–150	string data error
–151	invalid string data
–158	string data not allowed
–160	block data error
–161	invalid block data
–168	block data not allowed
–170	command expression error
–171	invalid expression
–178	expression data not allowed
–180	macro error
–181	invalid outside macro definition
–183	invalid inside macro definition
–184	macro parameter error

Execution Errors

These error codes are returned when an error is detected while a command is being executed.

Table 3‑2: Execution errors

Error code	Error message
–200	execution error
–201	invalid while in local
–202	settings lost due to RTL
–210	trigger error
–211	trigger ignored
–212	arm ignored
–213	init ignored
–214	trigger deadlock

Table 3‑2: Execution errors (Cont.)

Error code	Error message
-215	arm deadlock
-220	parameter error
-221	settings conflict
-222	data out of range
-223	too much data
-224	illegal parameter value
-225	out of memory
-226	lists not same length
-230	data corrupt or stale
-231	data questionable
-240	hardware error
-241	hardware missing
-250	mass storage error
-251	missing mass storage
-252	missing media
-253	corrupt media
-254	media full
-255	directory full
-256	FileName not found
-257	FileName error
-258	media protected
-260	execution expression error
-261	math error in expression
-270	execution macro error
-271	macro syntax error
-272	macro execution error
-273	illegal macro label
-274	execution macro parameter error
-275	macro definition too long
-276	macro recursion error
-277	macro redefinition not allowed
-278	macro header not found
-280	program error

Table 3-2: Execution errors (Cont.)

Error code	Error message
-281	cannot create program
-282	illegal program name
-283	illegal variable name
-284	program currently running
-285	program syntax error
-286	program runtime error

Device Specific Errors

These error codes are returned when an internal instrument error is detected. This type of error may indicate a hardware problem.

Table 3-3: Device specific errors

Error code	Error message
-300	device specific error
-310	system error
-311	memory error
-312	PUD memory lost
-313	calibration memory lost
-314	save/recall memory lost
-315	configuration memory lost
-330	self test failed
-350	queue overflow

Query Errors

These error codes are returned in response to an unanswered query.

Table 3‑4: Query errors

Error code	Error message
–400	query error
–410	query interrupted
–420	query unterminated
–430	query deadlocked
–440	query unterminated after indefinite period

Device Errors

These error codes are unique to the TG700 and the installed modules.

Table 3‑5: Device errors

Error code	Error message
242	module not found
243	module not a generator
249	directory not found
251	standard not compatible with input
252	no signal found on input
253	unable to release clock
254	unable to lock clock
263	signal file not found
264	current signal not saved to file
265	signal file failed to load

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