Programmer Manual

Tektronix

MTS400 Series
MPEG Test System

071-1725-01

This document applies to firmware version 1.0
and above.

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Preface

This manual describes how to use the SCPI remote control commands for the MTS400 Series system MPEG Player application.

***NOTE**. SCPI remote control commands for the MTX100B MPEG Player and Recorder are described in the MTX100B User Manual, Tektronix part number 071-1927-xx.*

The manual is organized into the following sections:

- **Getting Started**
  Provides instructions for connecting the MTS400 Series System to a single PC or a network and setting the network parameters for the 100/10 BASE-T port, as well as network interface specifications for the instrument.
- **Syntax and Commands**
  Information on the Standard Commands for Programmable Instruments (SCPI) and IEEE 488.2 Common Commands.
- **Error Messages and Codes**
  Lists the error messages and codes.
- **Appendix A: Default Settings**
  Lists the default settings of the remote commands.
- **Index**

Related Documentation

Table i lists the other documentation available for the MTS400 Series System. Additional documentation, such as Read Me files, may be included on the installation disks.

Table i: Related documentation

Title	Part number	Description
MTS400 Series Getting Started Manual (English)	071-1505-xx	Describes the features of the product and provides instructions for installing the instrument, reinstalling the software, and troubleshooting network problems.
MTS400 Series Getting Started Manual (Japanese)	071-1727-xx	Provides a Japanese language version of the Getting Started manual described above.
MTS400 Series User Manual	071-1507-xx	Provides in-depth operating information for the various software applications included in the product.
MTS400 Series Technical Reference Manual	071-1724-xx	Provides the MTS400 Series specifications and a performance verification procedure. Available only as a PDF file on the *MTS400 Series Customer Documentation CD-ROM*.
MTS400 Series Release Notes	071-1726-xx	Provides information about software problems and behaviors.
MTS4EA Compressed Video Elementary Stream Analyzer User Manual	071-1641-xx	Provides operating information for the optional MTS4EA Compressed Video ES Analyzer application.

The following URLs access the Web sites for the standards organizations listed (the URLs listed were valid at the time of writing):

- MPEG-2 standards (International Organization for Standards)
  http://www.iso.ch/
- DVB standards (European Technical Standards Institute)
  http://www.etsi.org/
- ATSC standards (Advanced Television Systems Committee)
  http://www.atsc.org/

Getting Started

This manual contains information on the Standard Commands for Programmable Instruments (SCPI) and IEEE 488.2 Common Commands you can use to program your MTS400 Series Player application. This manual also describes the optional commands that control the optional interface cards.

Connecting to a Network

The MTS400 Series System has a 100/10 BASE-T port on the rear panel that allows you to upload and download stream files.

This section provides instructions for connecting the MTS400 Series System to a single PC or a network and setting the network parameters for the 100/10 BASE-T port.

Connecting the MTS400 Series System to Your PC(s)

The MTS400 Series System uses the rear-panel 100/10 BASE-T port to communicate with a PC. Use one of the following two methods to connect the instrument to your PC(s).

- If you are connecting the instrument directly to a single PC, use a crossover Ethernet cable to connect between the 100/10 BASE-T port on the MTS400 Series System and the Ethernet port on the PC. If you need to construct your own crossover cable, Figure 1–1 shows the pin connections to change on a straight cable to produce a crossover cable.
- If you are connecting the instrument to your local Ethernet network, use a straight Ethernet cable to connect between the 100/10 BASE-T port on the MTS400 Series System and the Ethernet hub port of your local network. By connecting to an Ethernet network, you can access the instrument using any PC on the network.

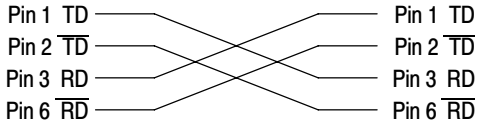

Figure 1–1: Pin connections for a crossover Ethernet cable

Setting Ethernet Network Parameters

You can set the network parameters for the MTS400 Series System using the Control Panel of Windows XP.

***NOTE**. The following procedure assumes that you are familiar with the basics of using the Windows XP operating system. If necessary, review the Windows XP documentation.*

Perform the following procedure to set the network parameters for the MTS400 Series System.

1. Connect the keyboard and mouse provided with the instrument to the appropriate connectors on the instrument.
2. Select **Minimize** or **Exit** from the **File** menu to close the Play (or Record) screen. The Windows XP desktop appears.
3. Select **Settings** → **Control Panel** from the Start menu. The **Control Panel** window appears.
4. Double-click the **Network Connections** icon in the window. The **Network Connections** window appears as shown in Figure 1–2.

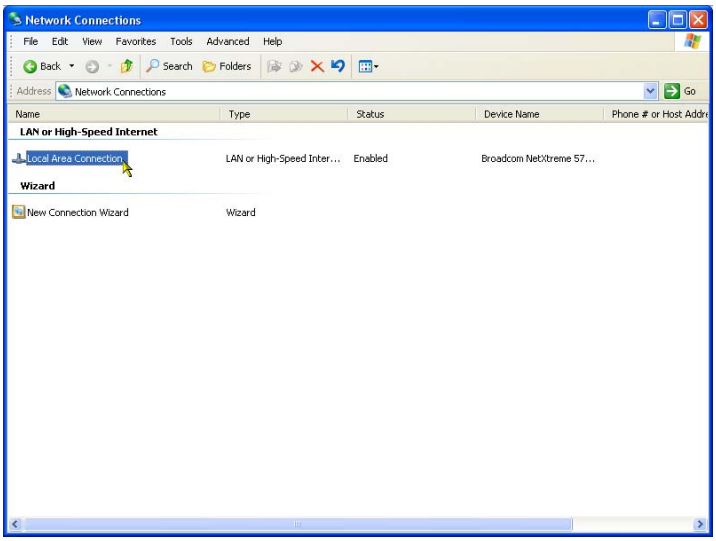

Figure 1–2: Network and Dial-up Connections window

5. Double−click the **Local Area Connection** icon. The **Local Area Connection Status** dialog box appears as shown in Figure 1−3.

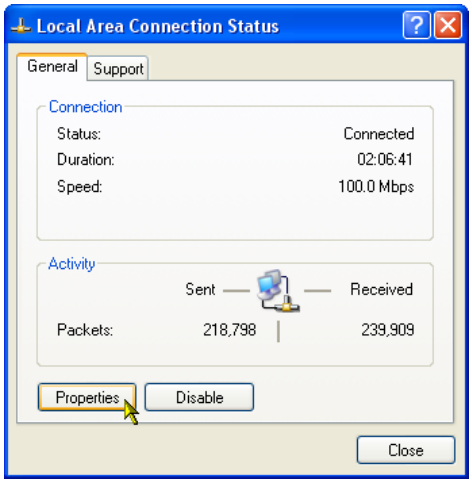

Figure 1−3: Local Area Connection Status dialog box

6. Click the **Properties** button. The **Local Area Connection Properties** dialog box appears as shown in Figure 1−4.

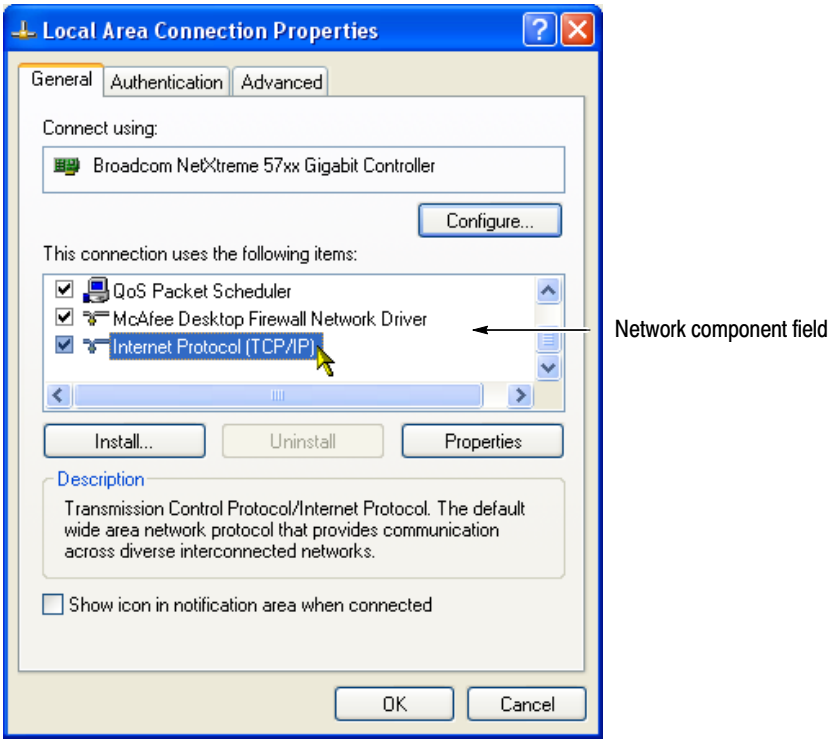

Figure 1–4: Local Area Connection Properties dialog box

7. In the network component field, click **Internet Protocol (TCP/IP)**.
8. Click the **Properties** button. The **Internet Protocol (TCP/IP) Properties** dialog box appears as shown in Figure 1–5.

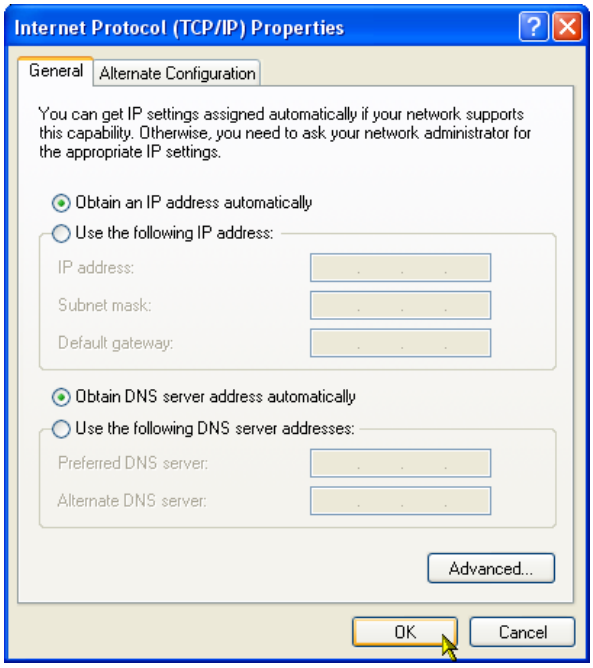

Figure 1–5: Internet Protocol (TCP/IP) Properties dialog box

The settings in the dialog box depend on whether a DHCP (Dynamic Host Configuration Protocol) server is in the network connected to the MTS400.

When the DHCP Server is in the Network.

9. In the dialog box, select the **Obtain an IP address automatically** and **Obtain DNS server address automatically** check boxes.

10. Click the **OK** button.

The MTS400 accesses the DHCP server and obtains the addresses automatically when connected to the network.

Refer to the user documentation supplied with your server OS for detailed information about DHCP server functions.

***NOTE**. Under some network environments, the MTS400 may not be able to obtain the IP address automatically from a DHCP server. In this case, you need to enter the appropriate address value in each submenu item.*

When the DHCP Server is not in the Network. When the DHCP server is not in the network, perform the following procedure to set the network parameters.

1. If you connect the MTS400 directory to a single PC:
   a. In the dialog box, select the **Use the following IP address** check box.
   b. Set the **IP address** parameter to be the same IP address as the PC's address except for the last number. The last number must be different than the last number in the PC's IP address.
   c. Set the **Subnet mask** parameter to be the same net mask (subnet mask) used by the PC. Do not enter a number if the PC does not have a net mask.
   d. You do not need to enter a **Default gateway** if you are directly connected to a single PC.
2. If you connect the MTS400 to your local Ethernet network:
   a. In the dialog box, select the **Use the following IP address** check box.
   b. Ask your local network administrator and set the appropriate addresses.

CAUTION. *To prevent communication conflicts on your Ethernet network, ask your local network administrator for the correct numbers to enter in the dialog box if you connect the MTS400 to your local Ethernet network.*

3. Verify the Ethernet connection by using a ping command from the PC.

Network Interface Specifications

The MTS400 Series System supports remote control using the Ethernet interface. This section describes the network interface specifications for the instrument.

The TCP/IP is used as the network protocol. The commands can be sent from the application program through the socket interface of the TCP/IP. Also, the query can be received through the interface.

Keep the following in mind while controlling the instrument remotely with the Ethernet interface.

- The LF (linefeed) or CR (carriage return) code is needed at the end of a message as a terminator. Use the Communication dialog box or the :SYSTem:COMMunicate:SOCKet:RXTERM command to set which terminator is used.

- The IEEE 488.1 standard (for instance Device Clear, Service Request, etc.) is not supported.
- The Message Exchange Control Protocol in the IEEE 488.2 is not supported. However, the common commands such as *ESE and the event handling features are supported.
- The Indefinite format (the block start at #0) in the <ARBITRARY BLOCK PROGRAM DATA> of the IEEE 488.2 is not supported.

Checking Remote Command Operation

To check remote command operation of the MTS400 Series System, perform the following procedure:

1. Connect the instrument to your PC using an Ethernet cable (refer to *Connecting to a Network* on page 1–1).
2. Click Windows **Start** button and select **Run** from the start menu.
3. In the dialog box, type **telnet** and then click **OK**.

   The TELNET window appears.
4. Select **Preferences** from the **Terminal** pull-down menu.
5. In the **Preferences** dialog box, check the **Local Echo** check box and then click **OK**.
6. Select **Remote System** from the **Connect** pull-down menu.

   The **Connect** dialog box appears.
7. In the **Host Name** field, enter the IP address of the MTS400 Series System.
8. In the **Port** field, enter the port number set by the Communication dialog box or the :SYSTem:COMMunicate:SOCKet:PORT command (the default value is 49152).
9. Click **Connection**.
10. Type ***IDN?** in the command line and press the Enter key.
11. Check that the ID information of the MTS400 Series System appears on the PC.

Syntax and Commands

This section contains information on the Standard Commands for Programmable Instruments (SCPI) and IEEE 488.2 Common Commands you can use to program your MTS400 Series Player application. The information is organized in the following subsections: Syntax, Functional Command Groups, and Remote Commands.

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 MTS400 Series Player application 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.

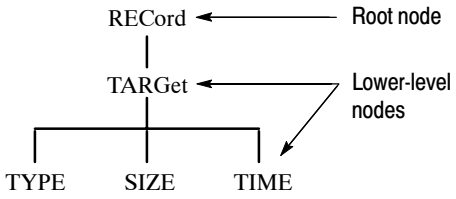

Figure 2–1: Example of SCPI subsystem hierarchy tree

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, RECord is the root node and TARGet, TYPE, SIZE, and TIME are lower-level nodes. To create a SCPI command, start with the root node RECord 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, RECord:TARGet:TYPE DISK 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. RECord:TARGet:TYPE? 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 MTS400 Series Player application 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.

Table 2–1: Parameter types used in syntax descriptions (Cont.)

Parameter type	Description	Example
[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.

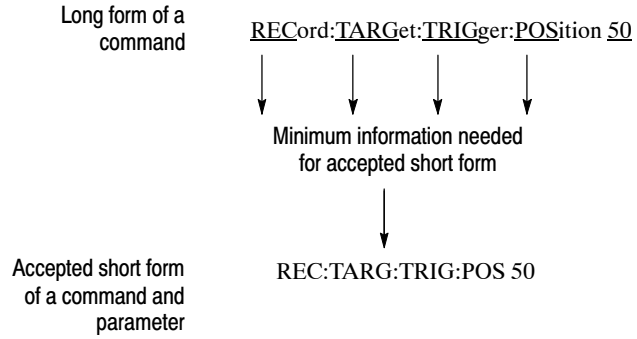

Figure 2–2: Example of abbreviating a command

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.

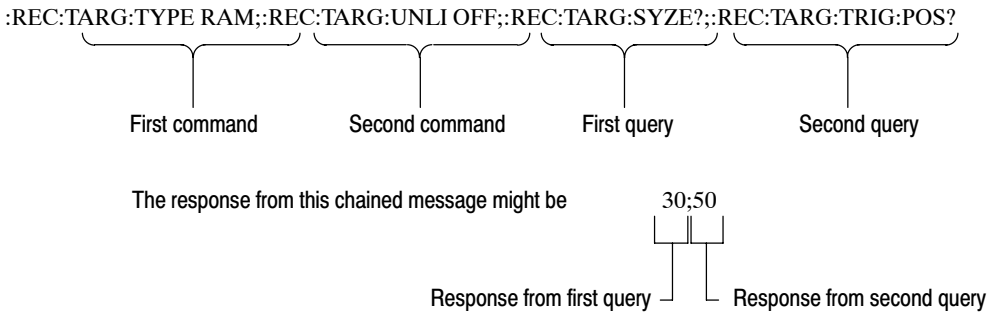

Figure 2–3: Example of chaining commands and queries

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 (REC) and lower level node (TARG) as the first command, so these nodes can be omitted.

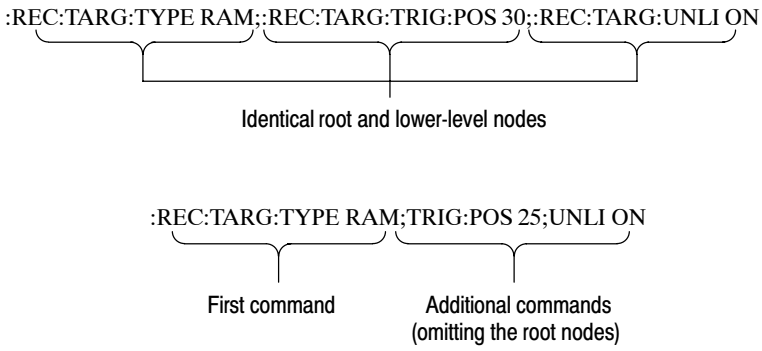

Figure 2–4: Example of omitting root and lower-level nodes in a chained message

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.

  RECORD:TARGET:TRIGGER:POSITION 50

  is the same as

  record::position target:trigger50

  and

  RECORD:target:trigger:POSITION 50

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

- No embedded spaces are allowed between or within nodes.

  correct: RECORD:TARGET:TRIGGER:POSITION 50

  incorrect: RECORD: TARGET: TRIGGER: POSI TION 50

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 MTS400 Series Player application 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

Functional Command Groups

The commands are divided into the following six groups:

- Common commands
- DISPLAY commands
- MASS MEMORY commands
- PLAY commands
- RECORD commands
- SYSTEM commands

The Player application can be controlled remotely through the 100/10 BASE-T port on the rear panel. Refer to *Connecting to a Network* on page 1–1 for detailed information about how to connect and set up for remote operation.

Common Commands

The Common commands have a "*" prefix and address of all the instruments that support IEEE 488.2.

Command Tree

*CLS
*ESE(?)
*ESR?
*IDN?
*LRN?
*OPC(?)
*OPT?
*RST
*SRE(?)
*STB?
*TRG
*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. The ID information contains manufacturer, model, firmware version, hardware version, and FPGA code version.

*LRN?

Returns the current instrument settings.

*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. This command is only available just after the :PLAY:STARt or :RECord:STARt command is executed.

*OPC?

Waits until all pending operations are finished and returns a “1 ” ASCII character. This query is only available just after the :PLAY:STARt or :RECord:STARt command is executed.

*OPT?

Lists the installed interface option.

*RST

Resets the instrument to the factory default state. This command has the same effect when the :SYSTem:PRESet and *CLS commands are executed successively.

*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.

*TRG

Generates a trigger event.

*TST?

Performs the self test and returns its result. The MTS400 Series System always returns 1.

*WAI

Wait-to-continue command. This command is not necessary since the MTS400 Series System handles commands sequentially.

DISPLAY Commands

Use these commands to select a display format of the base value in the hierarchy display.

Command Tree

```
:DISPlay
   :VIEW
      :FORMat              HEXadecimal|DECimal|OCTal
```

Command Description

:DISPlay:VIEW:FORMat HEXadecimal|DECimal|OCTal

Sets the base value used to describe the component information in the hierarchy display. The choices are HEXadecimal, DECimal, or OCTal. The default value is HEXadecimal.

:DISPlay:VIEW:FORMat?

Returns the current display format of the base value in the hierarchy display.

MASS MEMORY Commands

Use these commands to perform file related operations such as changing and moving a directory, and loading and saving a preset.

Command Tree

```
:MMEMory
   :CATalog?            [<directory_path>]
   :CDIRectory
      [:DATA]           <directory_path>
      :STATe            <directory_path>
   :LOAD
      :STATe            <preset_name>
   :MDIRectory          <directory_path>
   :STORe
      :STATe            <preset_name>
```

Command Description

:MMEMory:CATalog? [<directory_path>]

Lists the files in the specified directory. The query response is as follows:
<used _bytes>, <available_bytes>, "<file_name>, <directory_flag>, <file_size>, <date>,<time>"...

:MMEMory:CDIRectory[:DATA] [<directory_path>]

Changes the current directory for data files. The default value is E:.

:MMEMory:CDIRectory[:DATA]?

Returns the current directory for data files.

:MMEMory:CDIRectory:STATe <directory_path>

Changes the current directory for setting files.

:MMEMory:CDIRectory:STATe?

Returns the current directory for setting files.

:MMEMory:LOAD:STATe <preset_name>

Loads the specified preset. This command accepts the name of a previously saved preset. Current instrument settings are overwritten by this command.

:MMEMory:MDIRectory <directory_path>

Creates a subdirectory. The command is invalid if a directory with the specified name already exists.

:MMEMory:STORe:STATe <preset_name>

Saves the instrument settings with the specified preset name.

PLAY Commands

Use these commands to set parameters related to the stream output. These include packet size, output clock rate, data output source, and PCR jitter insertion.

Command Tree

```
:PLAY
   :AUTOplay                ON|OFF
   :CLOCk
      :DEFault
         :RATE                          <numeric_value>
         :RATE
            :RATIo          <numeric_value>,<numeric_value>
      :ESRAtefixed          ON|OFF
      :ISDBT
         :CONVert           ON|OFF
      :RATE                             <numeric_value>
      :RATE
         :RATIo             <numeric_value>,<numeric_value>
      :SOURce               INTernal|EXT10M|EXT27M|EXTIfft|
                            EXTParallel|EXTSerial
   :LOAD
      :FILE                 <file_name>
   :LOOP                                ON|OFF
      :ISDBT
         :FRAMe             ON|OFF
   :PACKet                  188|204|208|NONTs
   :PCR
      :INITial  <numeric_value>,<numeric_value>
      :INACCuracy           NONE|SINe|SQUare|TRIangle|PULSe|SAW|
                            RANDom|OFFSet[,,numeric_value>,
                            <numeric_value>[,<numeric_value>
                            [,<numeric_value>[,<numeric_value>]]]
   :S192F
      :PARTialts            ON|OFF
   :SOURce                  RAM|DISK
   :SPIOutput               ON|OFF
   :SSPOsition
      :INITial
         :ENABle            ON|OFF
         [:POSition]        <numeric_value>
         :TIME                          <string>
      [:POSition]           <numeric_value>,<numeric_value>
      :TIME                             <string>,<string>
   :STANdard?
```

```
:STARt
:STOP
:SYNC
   :PSYNc              TSPAcket|SF|NONTs
      :INTErval        NONE|<numeric_value>
   :DVALid
      :WIDth           NONE|<numeric_value>
:TIMEpacket
   :DEFine             <numeric_value>,<numeric_value>,
                       <numeric_value>,<numeric_value>,
                       <numeric_value>,<numeric_value>
   :MODE                          ORIGinal|OS|USER
:UPDAte                ON|OFF
   :ITEM
      :CC              ON|OFF
      :NPT             ON|OFF
      :PCR             ON|OFF
         :METHod       HARDware|SOFTware
      :REEDsolomon     ON|OFF
      :TIMEpacket      ON|OFF
```

Command Description

:PLAY:AUTOplay ON|OFF

Sets whether or not the selected stream is automatically output using the last power-down settings when you turn the instrument on. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:PLAY:AUTOplay?

Return the current auto play mode status.

:PLAY:CLOCk:DEFault:RATE <numeric_value>

Sets the default clock rate that is automatically set when the selected stream file is downloaded. Since the clock rate is calculated based on the PCRs in the file, the value may be different from the original clock rate. If this happen, you can set the appropriate value by this command. You can set the rate from 0.001 MHz to 250.0 MHz. If you change the value, the :PLAY:CLOCk:RATE command setting will set to the same value. The default value is 56.61.

:PLAY:CLOCk:DEFault:RATE?

Returns the default clock rate that is automatically set when the selected stream file was downloaded.

:PLAY:CLOCk:DEFault:RATE:RATIo <numeric_value>,<numeric_value>

Sets the default clock rate that is automatically set when the selected stream file is downloaded using a fraction. Since the clock rate is calculated based on the PCRs in the file, the value may be different from the original clock rate. If this happen, you can set the appropriate value by this command. The first argument represents a numerator and the second represents a denominator. You can set both values from 0 to 2000000000. If you change the value, the :PLAY:CLOCk:RATE:RATIo command setting will set to the same value. The default values are 629 for the numerator and 300 for the denominator.

:PLAY:CLOCk:DEFault:RATE:RATIo?

Returns the default clock rate that is automatically set when the selected stream file is downloaded using a fraction.

:PLAY:CLOCk:ESRAtefixed ON|OFF

Sets whether or not elementary stream rate is fixed. When you set it to ON, the elementary stream rate becomes constant regardless of the clock rate setting. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:PLAY:CLOCk:ISDBT:CONVert ON|OFF

Sets whether or not the clock rate is automatically set when the data file for ISDB–TSB is loaded. When you set it to ON, the clock rate is automatically set to (2048/1701) x 27 MHz and the elementary stream rate becomes constant regardless of the :PLAY:CLOCk:ESRAtefixed command setting. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:CLOCk:ISDBT:CONVert?

Returns whether or not the clock rate is automatically set when the data file for ISDB–TSB is loaded.

:PLAY:CLOCk:ESRAtefixed?

Returns the current elementary stream rate status.

:PLAY:CLOCk:RATE <numeric_value>

Sets the clock rate for the stream output. You can set the rate from 0.001 MHz to 250.0 MHz. The default value is 56.61.

:PLAY:CLOCk:RATE?

Returns the current clock rate for the stream output.

:PLAY:CLOCk:RATE:RATIo <numeric_value>,<numeric_value>

Sets the clock rate for the stream output using a fraction. The first argument represents a numerator and the second represents a denominator. You can set both values from 0 to 2000000000. The default values are 629 for the numerator and 300 for the denominator.

:PLAY:CLOCk:RATE:RATIo?

Returns the current clock rate for the stream output using a fraction.

:PLAY:CLOCk:SOURce INTernal|EXT10M|EXT27M|EXTIfft|EXTParallel|EXTSerial

Sets which clock to use as the reference for the stream output. The choices are:

INTernal: uses the internal clock.
EXT10M: uses a 10 MHz signal on the CLK/REF IN connector.
EXT27M: uses a 27 MHz signal on the CLK/REF IN connector.
EXTIfft: uses an IFFT sample clock signal (8.126984 MHz) on the CLK/REF IN connector.
EXTParallel: uses a clock signal on the CLK/REF IN connector as a parallel clock.
EXTSerial: uses a clock signal on the CLK/REF IN connector as a serial clock.

:PLAY:CLOCk:SOURce?

Returns the current reference clock for the stream output.

:PLAY:LOAD:FILE <file_name>

Loads the specified stream file.

:PLAY:LOAD:FILE?

Returns the name of the file currently loaded.

:PLAY:LOOP ON|OFF

Sets whether or not the selected stream is output using looping method. When you set it to ON, the stream is continuously output. The default value is ON.

:PLAY:LOOP?

Returns the current output loop mode status.

:PLAY:LOOP:ISDBT:FRAMe ON|OFF

Sets whether to output an ISDB-T transport stream in OFDM frames when looped. When you set it to OFF, an ISDB-T transport stream is looped in packets. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:LOOP:ISDBT:FRAMe?

Returns whether to output an ISDB-T transport stream in OFDM frames when looped.

:PLAY:PACKet 188|204|208|NONTs

Sets the packet size for the selected stream file. The choices are 188, 204, 208, or NONTs (Non TS). The default value is 188.

:PLAY:PACKet?

Returns the current packet size setting for the selected stream file.

:PLAY:PCR:INITial <numeric_value>,<numeric_value>

Sets the initial value of the program_clock_reference_base and program_clock_reference_extension parameters. You can set the program_clock_reference_base value from 0 to 8589934591 and set the program_clock_reference_extension value from 0 to 299. The default values are both 0.

:PLAY:PCR:INITial?

Returns the current initial value of the program_clock_reference_base and program_clock_reference_extension parameters.

:PLAY:PCR:INACcuracy NONE|SINe|SQUare|TRIangle|PULSe|SAW|
RANDom|OFFSet[,<PID>,<amplitude>
[<period>[,<pulse_width>]]];

Sets the PCR jitter insertion. Use the first argument to set the waveform type used to add jitter. When NONE is selected, the jitter insertion is disabled. Use the second to fifth arguments to set the PID of the PCRs, the amplitude of the waveform, the period of the waveform, and pulse width of the waveform. The pulse width is available only when the waveform is set to PULSe. The ranges of each argument are as follows:

PID: 0 to 8191
Amplitude: 0 to 135000000
Period: 5 to 3000
Pulse width: 1 to (period −1)

:PLAY:PCR:INACcurracy?

Returns the current PCR jitter insertion settings.

:PLAY:S192F:PARTialts ON|OFF

Sets whether to output a stream file consisting of a 192−byte packet as a partial transport stream. When you set it to OFF, the stream is output in Non TS format. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:S192F:PARTialts?

Returns whether to output a stream file consisting of a 192−byte packet as a partial transport stream.

:PLAY:SOURce RAM|DISK

Sets the source for stream output. The choices are RAM (system RAM) or DISK (hard disk). The default value is DISK.

:PLAY:SOURce?

Returns the current source setting for stream output.

:PLAY:SPIOutput ON|OFF

Sets whether the signal output from the SPI IN/OUT connector is enabled or not. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:SPIOutput?

Returns the current output status of the SPI IN/OUT connector.

:PLAY:SSPOsition:INITial:ENABle ON|OFF

Sets whether to enable to set the initial start position of the selected stream to be looped. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:PLAY:SSPOsition:INITial:ENABle?

Returns the current state of the initial start position setting.

:PLAY:SSPOsition:INITial[:POSition] <numeric_value>

Sets the initial start position of the selected stream to be looped by the number of packets (the number of super frames for M-TMCC file, or the number of bytes for a Non-TS file). The setting range depends on the :PLAY:SSPOsition[:POSition] command settings. The default value is 0.

:PLAY:SSPOsition:INITial[:POSition]?

Returns the current initial start position of the selected stream by the number of packets.

:PLAY:SSPOsition:INITial:TIME <string>

Sets the initial start position of the selected stream to be looped by time (hh:mm:ss). The setting range depends on the :PLAY:SSPOsition:TIME command settings. The default value is 00:00:00.

:PLAY:SSPOsition:INITial:TIME?

Returns the current initial start position of the selected stream by time.

:PLAY:SSPOsition[:POSition] <numeric_value>,<numeric_value>

Sets the loop start and stop positions of the selected stream to be looped by the number of packets (the number of super frames for M-TMCC file, or the number of bytes for a Non-TS file). Specify the start position in the first argument and specify the stop position in the second argument. You can set the positions from 0 to (available maximum value of the selected stream file). The default values are both 0.

:PLAY:SSPOsition[:POSition]?

Returns the current loop start and stop position settings of the selected stream by the number of packets.

:PLAY:SSPOsition:TIME <string>,<string>

Sets the loop start and stop positions of the selected stream to be looped by time (hh:mm:ss). Specify the start time in the first argument and specify the stop time in the second argument. You can set the time from 0 to (available maximum value of the selected stream file). The default values are both 00:00:00.

:PLAY:SSPOsition:TIME?

Returns the current loop start and stop position settings of the selected stream by time (hh:mm:ss).

:PLAY:STANdard?

Returns the standard of the loaded stream file. The available responses are MPEG, ARIB, ATSC, DVB, NONTs, MTMCc, STMCc, or ISDBT. The MTMCc, STMCc, and ISDBT standards are checked only when the :SYSTem:STANdard command is set to ARIB.

:PLAY:STARt

Starts outputing the selected stream. There are no arguments.

:PLAY:STOP

Stops outputing the selected stream. There are no arguments.

:PLAY:SYNC TSPAcket|SF|NONTs

Sets the format of the PSYNC signal output from the SPI IN/OUT connector. For TSPAcket, a single pulse signal is output at the start point of each packet. For SF, a single pulse is output at the start point of the SF appearing every 204x48x8 bytes. For NONTs, you can set the output period and data width of the PSYNC signal using the :PLAY:SYNC:PSYNc:INTerval command and :PLAY:SYNC:PSYNc:WIDTh commands. SF is available only when MTMCc is returned by the :PLAY:STANdard? query. The default value is TSPAcket.

:PLAY:SYNC?

Returns the current format setting of the PSYNC signal.

:PLAY:SYNC:DVALid:WIDTh NONE|<numeric_value>

Sets the status and data width of the DVALID signal when NONTs is selected in the :PLAY:SYNC command. When you select NONE, the DVALID signal is disabled. You can set the width from 16 bytes to 255 bytes. This value cannot be set more than the value set by the :PLAY:SYNC:PSYNC:INTerval command. The default value is 188.

:PLAY:SYNC:DVALid:WIDTh?

Returns the current status and data width of the DVALID signal.

:PLAY:SYNC:PSYNc:INTerval NONE|<numeric_value>

Sets the status and output period of the PSYNC signal when NONTs is selected in the :PLAY:SYNC command. When you select NONE, the PSYNC signal is disabled. You can set the interval from 16 bytes to 255 bytes. This value needs to be set equal to or greater than the value in the :PLAY:SYNC:DVALid:WIDTh command. The default value is 188.

:PLAY:SYNC:PSYNc:INTerval?

Returns the current status and output period of the PSYNC signal.

:PLAY:TIMEpacket:DEFine <numeric_value>,<numeric_value>,
<numeric_value>,<numeric_value>,
<numeric_value>,<numeric_value>

Sets the initial values of the TDT, TOT, or STT when selected USER in the :PLAY:TIMEpacket:MODE command. The arguments are <year>, <month>, <date>, <hour>, <minute>, and <second>. You can set the values from 1900,3,1,0,0,0 to 2038,4,22,23,59,59 for the TDT and TOT and from 1980,1,6,0,0,0 to 2116,2,12,6,28,15 for the STT. The default values are the current date and time.

:PLAY:TIMEpacket:DEFine?

Returns the current data and time settings of the TDT, TOT, or STT.

:PLAY:TIMEpacket:MODE ORIGinal|OS|USER

Selects the reference time used to set the initial value of the TDT, TOT, or STT when the :PLAY:UPDAte command is set to ON. The choices are ORIGinal, SYSTem, or USER. For ORIGinal, the original (default) value defined in the selected stream is used. For OS, the clock/calendar of the operating system is used. For USER, you can set any value in the :PLAY:TIMEpacket:DEFine command. The default value is ORIGinal.

:PLAY:TIMEpacket:MODE?

Returns the current reference time selection used to set the initial value of the TDT, TOT, or STT.

:PLAY:UPDAte ON|OFF

Sets whether to update parameters in a stream when looped. You can select which parameters are updated using the :PLAY:UPDAte:ITEM commands. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:UPDAte?

Returns the current update mode status.

:PLAY:UPDAte:ITEM:CC ON|OFF

Sets whether to update continuity_counter values when the :PLAY:UPDAte command is set to ON. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:UPDAte:ITEM:CC?

Returns whether to update continuity_counter values when the :PLAY:UPDAte command is set to ON.

:PLAY:UPDAte:ITEM:NPT ON|OFF

Sets whether to update NPT values when the :PLAY:UPDAte command is set to ON. You can use 1 or 0 instead of ON or OFF. This command is only available when the :PLAY:UPDAte:PCR command is set to ON and the :PLAY:UPDAte:ITEM:PCR:METHod command is set to SOFTware. The default value is OFF.

:PLAY:UPDAte:ITEM:NPT?

Returns whether to update NPT values when the :PLAY:UPDAte command is set to ON.

:PLAY:UPDAte:ITEM:PCR ON|OFF

Sets whether to update PCR/PTS/DTS values when the :PLAY:UPDAte command is set to ON. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:UPDAte:ITEM:PCR?

Returns whether to update PCR/PTS/DTS values when the :PLAY:UPDAte command is set to ON.

:PLAY:UPDAte:ITEM:PCR:METHod HARDware|SOFTware

Sets the method to update PCR/PTS/DTS values. The choices are HARDware or SOFTware. The default value is HARDware.

:PLAY:UPDAte:ITEM:PCR:METHod?

Returns the update method for PCR/PTS/DTS values.

:PLAY:UPDAte:ITEM:REEDsolomon ON|OFF

Sets whether to update Reed-Solomon symbols in an ISDB-T transport stream when the :PLAY:UPDAte command is set to ON. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:UPDAte:ITEM:REEDsolomon?

Returns whether to update Reed-Solomon symbols in an ISDB-T transport stream when the :PLAY:UPDAte command is set to ON.

:PLAY:UPDAte:ITEM:TIMEpacket ON|OFF

Sets whether to update TDT/TOT/STT values when the :PLAY:UPDAte command is set to ON. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:UPDAte:ITEM:TIMEpacket?

Returns whether to update TDT/TOT/STT values when the :PLAY:UPDAte command is set to ON.

RECORD Commands

Use these commands to set parameters related to the data record. These include input interface, record size, and trigger position.

Command Tree

```
:RECord
   :ACQuire
      :STARt
      :STOP
   :CLOCk
      :RATE?
   :EXTernal                RISE|FALL|OFF
   :PACKet?
   :SOURce                  SPI|ASI|UNIVersal|BNCserial|DHEI|
                            I1394I|S310M|STANdard|OPTion
   :STANdard?
   :STARt
   :STOP
   :STORe
      :FILE                 <file_name>
      :MODE                          NEWfile|OVERwrite
   :TARGet
      :IGNOredvalid         ON|OFF
      :SIZE                 <numeric_value>
      :TIME                          <string>
      :TRIGger
         :CONTinuous        ON|OFF
            :LIMit          <numeric_value>
         :POSition          <numeric_value>
      :TYPE                          RAM|DISK
      :UNLImit              ON|OFF
```

Command Description

:RECord:ACQuire:STARt

Starts input stream acquisition. When two or more record commands are sent to the instrument successively, the instrument stops stream acquisition and then starts stream acquisition for each command. Therefore, when many commands are sent to the instrument, it takes a long time to complete all settings. If you send the :RECord:ACQuire:STOP command before sending record commands and send the :RECord:ACQuire:STARt command after sending record commands, you can shorten the setting time.

:RECord:ACQuire:STOP

Stops input stream acquisition. Refer to the :RECord:ACQuire:STARt command description on how to use this command.

:RECord:CLOCk:RATE?

Returns the clock rate of the input stream in MHz.

:RECord:EXTernal RISE|FALL|OFF

Sets whether to start input stream record using a trigger signal applied to the TRIG IN connector. The choices are RISE, FALL, or OFF. When you set it to RISE, the input stream record is started at the rising edge of the applied trigger signal. When you set it to FALL, the input stream record is started at the falling edge of the applied trigger signal. The default value is OFF.

:RECord:EXTernal?

Returns whether to start input stream record using a trigger signal applied to the TRIG IN connector.

:RECord:PACKet?

Returns the packet size of the input stream. The available responses are 188, 204, 208, or NONTs. When the :RECord:I1394I:PARTialts command is set to ON, the response is 192.

:RECord:SOURce SPI|ASI|UNIVersal|BNCserial|DHEI|I1394I|S310M|
STANdard|OPTion

Sets the interface used to capture a stream data. The choices are SPI, ASI, UNIVersal, BNCserial, DHEI, I1394I (IEEE1394), S310M (SMPTE310M), STANdard (same as SPI), or OPTion (optional interface currently installed). The default value is SPI.

:RECord:SOURce?

Returns the current interface used to capture a stream data.

:RECord:STORe:FILE <file_name>

Specifies the file name used when the input stream is saved.

:RECord:STANdard?

Returns the current standard used to display the input stream. The available responses are MPEG, ARIB, ATSC, DVB, NONTs, MTMCc, STMCc, or ISDBT. The MTMCc, STMCc, and ISDBT standard are checked only when the :SYSTem:STANdard command is set to ARIB. When the RECord:I1394I PARTialts command is set to ON, the response is P_TS.

:RECord:STARt

Starts recording the input stream.

:RECord:STOP

Stops recording the input stream.

:RECord:STORe:FILE?

Returns the current file name used when the input stream is saved.

:RECord:STORe:MODE NEWfile|OVERwrite

Sets the save mode when the input stream is saved. The choices are NEWfile or OVERwrite. For NEWfile, a new file is created whenever you save a stream file. The file name is the following: The name specified by the :RECord:STORe:FILE command + # (1, 2, 3, 4...). For OVERwrite, the existing file is overwritten by the new file with the name specified in the :RECord:STORe:FILE command. The default value is OVERwrite.

:RECord:STORe:MODE?

Returns the current save mode setting when the input stream is saved.

:RECord:TARGet:TRIGger:IGNOredvalid ON|OFF

Sets whether the instrument ignores the DVALID signal from the selected interface when a stream data is acquired. When you set it to ON, the instrument ignores the DVALID signal, and the stream data is acquired according to the internal clock signal. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:RECord:TARGet:TRIGger:IGNOredvalid?

Returns whether the instrument ignores the DVALID signal from the selected interface when a stream data is acquired.

:RECord:TARGet:SIZE <numeric_value>

Sets the file size to record the input stream in MB. You can set the file size from 1 to free space of the system RAM or hard disk. This setting changes the :RECord:TARGet:TIME command setting. The default value is 50 MB.

:RECord:TARGet:SIZE?

Returns the current file size setting to record the input stream.

:RECord:TARGet:TIME <string>

Sets the recording time (hh:mm:ss) to record the input stream. The minimum value of the setting range depends on the clock rate of the input stream. The maximum value of the setting range depends on the free space of the RAM or hard disk, or the clock rate of the input stream. This setting changes the :RECord:TARGet:SIZE command setting. The default value is 00:00:00.

:RECord:TARGet:TIME?

Returns the current recording time (hh:mm:ss) to record the input stream.

:RECord:TARGet:TRIGger:CONTinuous ON|OFF

Turns Continuous Recording on or off. When you set it to ON, you can record multiple stream files continuously on the hard disk. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:RECord:TARGet:TRIGger:CONTinuous?

Returns the current Continuous Recording state.

:RECord:TARGet:TRIGger:CONTinuous:LIMit <numeric_value>

Sets the number of files to stop Continuous Recording. You can set the value from 2 to 32767. The default value is 32767.

:RECord:TARGet:TRIGger:CONTinuous:LIMit?

Returns the number of files to stop Continuous Recording.

:RECord:TARGet:TRIGger:POSition <numeric_value>

Sets the trigger position used to record the input stream. You can set the trigger position from 0% to 100%. The default value is 0%.

:RECord:TARGet:TRIGger:POSition?

Returns the current trigger position setting.

:RECord:TARGet:TYPE RAM|DISK

Sets the record target used to record the input stream. The choices are RAM or DISK (hard disk). The default value is DISK.

:RECord:TARGet:TYPE?

Returns the current record target used to record the input stream.

:RECord:TARGet:TRIGger:UNLImit ON|OFF

Sets whether to record the input stream to the full free space in the hard disk or RAM. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:RECord:TARGet:TRIGger:UNLImit?

Returns whether to record the input stream to the full free space in the hard disk or RAM.

SYSTEM Commands

Use these commands to set or query the system related functions.

Command Tree

```
:SYSTem
   :COMMunicate
      :SOCKet
         :PORT                    <numeric_value>
         :RXTERM          CR|LF
         :TXTERM          CR|LF|CRLF|LFCR
   :ERRor[:NEXT]?
   :KLOCk[:STATe]         ON|OFF
   :MODE                          PLAY|RECord
   :OPTions?
   :PRESet
   :STANdard              MPEG|ARIB|ATSC|DVB
   :STATus?
```

Command Description

:SYSTem:COMMunicate:SOCKet:PORT <numeric_value>

Sets the port number needed to remotely control the instrument over an Ethernet network. You can set the value from 1024 to 65535. When you change the value, the current network connection is disconnected.

:SYSTem:COMMunicate:SOCKet:PORT?

Returns the current port number setting.

:SYSTem:COMMunicate:SOCKet:RXTERM CR|LF

Sets the terminator used when the instrument receives commands from a controller. The choices are CR (carriage return) or LF (linefeed). The default value is LF.

:SYSTem:COMMunicate:SOCKet:RXTERM?

Returns the terminator used when the instrument receives commands from a controller.

:SYSTem:COMMunicate:SOCKet:TXTERM CR|LF|CRLF|LFCR

Sets the terminator used when the instrument sends information to a controller. The choices are CR (carriage return) , LF (linefeed), CRLF, or LFCR. The default value is CRLF.

:SYSTem:COMMunicate:SOCKet:TXTERM?

Returns the terminator used when the instrument sends information to a controller.

:SYSTem:ERRor[:NEXT]?

Returns an error message from the error/event queue. The response format is as follows:

<error_code>,"<error_message>"

Refer to *Error Messages and Codes* on page 3–1 for detailed information.

:SYSTem:KLOCk[:STATe] ON|OFF

Locks or unlocks the front-panel buttons and mouse operation. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:SYSTem:KLOCk[:STATe]?

Returns the current status of lock function.

:SYSTem:MODE PLAY|RECord

Sets the operation mode of the instrument. The choices are PLAY or RECord. The default value is PLAY.

:SYSTem:MODE?

Returns the current operation mode of the instrument.

:SYSTem:OPTions?

Returns the option number, hardware version, and code version of the installed interface card.

:SYSTem:PRESet

Resets the instrument to the factory default settings.

:SYSTem:STANdard MPEG|ARIB|ATSC|DVB

Sets the standard used to display the input stream. The choices are MPEG, ARIB, ATSC, or DVB. The default value is ARIB.

:SYSTem:STANdard?

Returns the current standard used to display the input stream.

:SYSTem:STATus?

Returns the current operation status of the instrument. The available responses are:

0: the instrument stops any operations
1: the instrument is outputing a data
2: the instrument is acquiring a data
3: the instrument is recording a data

Optional Commands

This subsection describes the commands used to control the optional interface cards. These commands are available only when the appropriate interface card is installed into the MTS400 Series System.

Option 07 SMPTE310M/ASI Interface

:PLAY:OP07AS:PORT:TYPE <arg>

<arg> = ASI or S310M

Selects which signal to output from the OUTPUT connecter. The choices are ASI or S310M (SMPTE310M). The default value is ASI.

:PLAY:OP07AS:PORT:TYPE?

Returns the current output signal selection.

:PLAY:S310M <arg>

<arg> = M8VSB

Selects the SMPTE310M mode for output. The only choice is M8VSB.

:PLAY:S310M?

Returns the current SMPTE310M mode for output.

:PLAY:ASI:FORMAT <arg>

<arg> = BYTE or BURST or PACKET

Sets the output format of the ASI signal. The choices are BYTE, BURST or PACKET. The default value is PACKET.

:PLAY:ASI:FORMAT?

Returns the current output format setting of the ASI signal.

:PLAY:OP07AS:PORT: THROughout <arg>

<arg> = ON or OFF

Selects play loop throughout. The default Value is OFF

:PLAY:OP07AS:PORT: THROughout?

Returns the current loop throughout status.

:RECORD:OP07AS:INPUTPORT <arg>

<arg> = BNC or SPI

Selects the recording input port. The default value is BNC.

:RECORD:OP07AS:INPUTPORT?

Returns the current recording input port.

:RECORD:OP07AS:PORT:TYPE <arg>

<arg> = ASI or S310M

Selects the input signal expected from the INPUT connecter. The choices are ASI or S310M (SMPTE310M). The default value is ASI.

:RECORD:OP07AS:PORT:TYPE?

Returns the current input signal selection.

:RECORD:S310M <arg>

<arg> = M8VSB

Selects the SMPTE310M mode for input. The only choice is M8VSB.

:RECORD:S310M?

Returns the current SMPTE310M mode for input.

Commands

This section describes the remote commands used in the MTS400 Series Player application. This section also contains the optional commands that are used to control the optional interface cards.

DISPLAY Commands

Use these commands to select a display format of the base value in the hierarchy display.

Command Tree

```
:DISPlay
   :VIEW
      :FORMat              HEXadecimal|DECimal|OCTal
```

Command Description

:DISPlay:VIEW:FORMat HEXadecimal|DECimal|OCTal

Sets the base value used to describe the component information in the hierarchy display. The choices are HEXadecimal, DECimal, or OCTal. The default value is HEXadecimal.

:DISPlay:VIEW:FORMat?

Returns the current display format of the base value in the hierarchy display.

MASS MEMORY Commands

Use these commands to perform file related operations such as changing and moving a directory, and loading and saving a preset.

Command Tree

```
:MMEMory
   :CATalog?            [<directory_path>]
   :CDIRectory
      [:DATA]           <directory_path>
      :STATe            <directory_path>
   :LOAD
      :STATe            <preset_name>
```

:MDIRectory	<directory_path>
:STORe	
:STATe	<preset_name>

Command Description

:MMEMory:CATalog? [<directory_path>]

Lists the files in the specified directory. The query response is as follows:
<used _bytes>, <available_bytes>, "<file_name>, <directory_flag>, <file_size>, <date>,<time>"...

:MMEMory:CDIRectory[:DATA] [<directory_path>]

Changes the current directory for data files. The default value is E:.

:MMEMory:CDIRectory[:DATA]?

Returns the current directory for data files.

:MMEMory:CDIRectory:STATe <directory_path>

Changes the current directory for setting files.

:MMEMory:CDIRectory:STATe?

Returns the current directory for setting files.

:MMEMory:LOAD:STATe <preset_name>

Loads the specified preset. This command accepts the name of a previously saved preset. Current instrument settings are overwritten by this command.

:MMEMory:MDIRectory <directory_path>

Creates a subdirectory. The command is invalid if a directory with the specified name already exists.

:MMEMory:STORe:STATe <preset_name>

Saves the instrument settings with the specified preset name.

PLAY Commands

Use these commands to set parameters related to the stream output. These include packet size, output clock rate, data output source, and PCR jitter insertion.

Command Tree

```
:PLAY
   :AUTOplay                ON|OFF
   :CLOCk
      :DEFault
         :RATE                          <numeric_value>
         :RATE
            :RATIo          <numeric_value>,<numeric_value>
      :ESRAtefixed          ON|OFF
      :ISDBT
         :CONVert           ON|OFF
      :RATE                             <numeric_value>
      :RATE
         :RATIo             <numeric_value>,<numeric_value>
      :SOURce               INTernal|EXT10M|EXT27M|EXTIfft|
                            EXTParalleI|EXTSerial
   :LOAD
      :FILE                 <file_name>
   :LOOP                                ON|OFF
      :ISDBT
         :FRAMe             ON|OFF
   :PACKet                  188|204|208|NONTs
   :PCR
      :INITial  <numeric_value>,<numeric_value>
      :INACcuracy           NONE|SINe|SQUare|TRIangle|PULSe|SAW|
                            RANDom|OFFSet[,,numeric_value>,
                            <numeric_value>[,<numeric_value>
                            [,<numeric_value>[,<numeric_value>]]]
   :S192F
      :PARTialts            ON|OFF
   :SOURce                  RAM|DISK
   :SPIOutput               ON|OFF
   :SSPOsition
      :INITial
         :ENABle            ON|OFF
         [:POSition]        <numeric_value>
         :TIME                          <string>
      [:POSition]           <numeric_value>,<numeric_value>
      :TIME                             <string>,<string>
   :STANdard?
```

```
:STARt
:STOP
:SYNC
   :PSYNc              TSPAcket|SF|NONTs
      :INTErval        NONE|<numeric_value>
   :DVALid
      :WIDth           NONE|<numeric_value>
:TIMEpacket
   :DEFine             <numeric_value>,<numeric_value>,
                       <numeric_value>,<numeric_value>,
                       <numeric_value>,<numeric_value>
   :MODE                                ORIGinal|OS|USER
:UPDAte                ON|OFF
   :ITEM
      :CC              ON|OFF
      :NPT             ON|OFF
      :PCR             ON|OFF
         :METHod       HARDware|SOFTware
      :REEDsolomon     ON|OFF
      :TIMEpacket      ON|OFF
```

Command Description

:PLAY:AUTOplay ON|OFF

Sets whether or not the selected stream is automatically output using the last power-down settings when you turn the instrument on. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:PLAY:AUTOplay?

Return the current auto play mode status.

:PLAY:CLOCk:DEFault:RATE <numeric_value>

Sets the default clock rate that is automatically set when the selected stream file is downloaded. Since the clock rate is calculated based on the PCRs in the file, the value may be different from the original clock rate. If this happen, you can set the appropriate value by this command. You can set the rate from 0.001 MHz to 250.0 MHz. If you change the value, the :PLAY:CLOCk:RATE command setting will set to the same value. The default value is 56.61.

:PLAY:CLOCk:DEFault:RATE?

Returns the default clock rate that is automatically set when the selected stream file was downloaded.

:PLAY:CLOCk:DEFault:RATE:RATIo <numeric_value>,<numeric_value>

Sets the default clock rate that is automatically set when the selected stream file is downloaded using a fraction. Since the clock rate is calculated based on the PCRs in the file, the value may be different from the original clock rate. If this happen, you can set the appropriate value by this command. The first argument represents a numerator and the second represents a denominator. You can set both values from 0 to 2000000000. If you change the value, the :PLAY:CLOCk:RATE:RATIo command setting will set to the same value. The default values are 629 for the numerator and 300 for the denominator.

:PLAY:CLOCk:DEFault:RATE:RATIo?

Returns the default clock rate that is automatically set when the selected stream file is downloaded using a fraction.

:PLAY:CLOCk:ESRAtefixed ON|OFF

Sets whether or not elementary stream rate is fixed. When you set it to ON, the elementary stream rate becomes constant regardless of the clock rate setting. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:PLAY:CLOCk:ISDBT:CONVert ON|OFF

Sets whether or not the clock rate is automatically set when the data file for ISDB−Tsb is loaded. When you set it to ON, the clock rate is automatically set to (2048/1701) x 27 MHz and the elementary stream rate becomes constant regardless of the :PLAY:CLOCk:ESRAtefixed command setting. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:CLOCk:ISDBT:CONVert?

Returns whether or not the clock rate is automatically set when the data file for ISDB−Tsb is loaded.

:PLAY:CLOCk:ESRAtefixed?

Returns the current elementary stream rate status.

:PLAY:CLOCk:RATE <numeric_value>

Sets the clock rate for the stream output. You can set the rate from 0.001 MHz to 250.0 MHz. The default value is 56.61.

:PLAY:CLOCk:RATE?

Returns the current clock rate for the stream output.

:PLAY:CLOCk:RATE:RATIo <numeric_value>,<numeric_value>

Sets the clock rate for the stream output using a fraction. The first argument represents a numerator and the second represents a denominator. You can set both values from 0 to 2000000000. The default values are 629 for the numerator and 300 for the denominator.

:PLAY:CLOCk:RATE:RATIo?

Returns the current clock rate for the stream output using a fraction.

:PLAY:CLOCk:SOURce INTernal|EXT10M|EXT27M|EXTIfft|EXTParallel|EXTSerial

Sets which clock to use as the reference for the stream output. The choices are:

INTernal: uses the internal clock.
EXT10M: uses a 10 MHz signal on the CLK/REF IN connector.
EXT27M: uses a 27 MHz signal on the CLK/REF IN connector.
EXTIfft: uses an IFFT sample clock signal (8.126984 MHz) on the CLK/REF IN connector.
EXTParallel: uses a clock signal on the CLK/REF IN connector as a parallel clock.
EXTSerial: uses a clock signal on the CLK/REF IN connector as a serial clock.

:PLAY:CLOCk:SOURce?

Returns the current reference clock for the stream output.

:PLAY:LOAD:FILE <file_name>

Loads the specified stream file.

:PLAY:LOAD:FILE?

Returns the name of the file currently loaded.

:PLAY:LOOP ON|OFF

Sets whether or not the selected stream is output using looping method. When you set it to ON, the stream is continuously output. The default value is ON.

:PLAY:LOOP?

Returns the current output loop mode status.

:PLAY:LOOP:ISDBT:FRAMe ON|OFF

Sets whether to output an ISDB-T transport stream in OFDM frames when looped. When you set it to OFF, an ISDB-T transport stream is looped in packets. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:LOOP:ISDBT:FRAMe?

Returns whether to output an ISDB-T transport stream in OFDM frames when looped.

:PLAY:PACKet 188|204|208|NONTs

Sets the packet size for the selected stream file. The choices are 188, 204, 208, or NONTs (Non TS). The default value is 188.

:PLAY:PACKet?

Returns the current packet size setting for the selected stream file.

:PLAY:PCR:INITial <numeric_value>,<numeric_value>

Sets the initial value of the program_clock_reference_base and program_clock_reference_extension parameters. You can set the program_clock_reference_base value from 0 to 8589934591 and set the program_clock_reference_extension value from 0 to 299. The default values are both 0.

:PLAY:PCR:INITial?

Returns the current initial value of the program_clock_reference_base and program_clock_reference_extension parameters.

:PLAY:PCR:INACcuracy NONE|SINe|SQUare|TRIangle|PULSe|SAW|
RANDom|OFFSet[,<PID>,<amplitude>
[<period>[,<pulse_width>]]];

Sets the PCR jitter insertion. Use the first argument to set the waveform type used to add jitter. When NONE is selected, the jitter insertion is disabled. Use the second to fifth arguments to set the PID of the PCRs, the amplitude of the waveform, the period of the waveform, and pulse width of the waveform. The pulse width is available only when the waveform is set to PULSe. The ranges of each argument are as follows:

PID: 0 to 8191
Amplitude: 0 to 135000000
Period: 5 to 3000
Pulse width: 1 to (period −1)

:PLAY:PCR:INACCurracy?

Returns the current PCR jitter insertion settings.

:PLAY:S192F:PARTialts ON|OFF

Sets whether to output a stream file consisting of a 192−byte packet as a partial transport stream. When you set it to OFF, the stream is output in Non TS format. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:S192F:PARTialts?

Returns whether to output a stream file consisting of a 192−byte packet as a partial transport stream.

:PLAY:SOURce RAM|DISK

Sets the source for stream output. The choices are RAM (system RAM) or DISK (hard disk). The default value is DISK.

:PLAY:SOURce?

Returns the current source setting for stream output.

:PLAY:SPIOutput ON|OFF

Sets whether the signal output from the SPI IN/OUT connector is enabled or not. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:SPIOutput?

Returns the current output status of the SPI IN/OUT connector.

:PLAY:SSPOsition:INITial:ENABle ON|OFF

Sets whether to enable to set the initial start position of the selected stream to be looped. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:PLAY:SSPOsition:INITial:ENABle?

Returns the current state of the initial start position setting.

:PLAY:SSPOsition:INITial[:POSition] <numeric_value>

Sets the initial start position of the selected stream to be looped by the number of packets (the number of super frames for M-TMCC file, or the number of bytes for a Non-TS file). The setting range depends on the :PLAY:SSPOsition[:POSition] command settings. The default value is 0.

:PLAY:SSPOsition:INITial[:POSition]?

Returns the current initial start position of the selected stream by the number of packets.

:PLAY:SSPOsition:INITial:TIME <string>

Sets the initial start position of the selected stream to be looped by time (hh:mm:ss). The setting range depends on the :PLAY:SSPOsition:TIME command settings. The default value is 00:00:00.

:PLAY:SSPOsition:INITial:TIME?

Returns the current initial start position of the selected stream by time.

:PLAY:SSPOsition[:POSition] <numeric_value>,<numeric_value>

Sets the loop start and stop positions of the selected stream to be looped by the number of packets (the number of super frames for M-TMCC file, or the number of bytes for a Non-TS file). Specify the start position in the first argument and specify the stop position in the second argument. You can set the positions from 0 to (available maximum value of the selected stream file). The default values are both 0.

:PLAY:SSPOsition[:POSition]?

Returns the current loop start and stop position settings of the selected stream by the number of packets.

:PLAY:SSPOsition:TIME <string>,<string>

Sets the loop start and stop positions of the selected stream to be looped by time (hh:mm:ss). Specify the start time in the first argument and specify the stop time in the second argument. You can set the time from 0 to (available maximum value of the selected stream file). The default values are both 00:00:00.

:PLAY:SSPOsition:TIME?

Returns the current loop start and stop position settings of the selected stream by time (hh:mm:ss).

:PLAY:STANdard?

Returns the standard of the loaded stream file. The available responses are MPEG, ARIB, ATSC, DVB, NONTs, MTMCc, STMCc, or ISDBT. The MTMCc, STMCc, and ISDBT standards are checked only when the :SYSTem:STANdard command is set to ARIB.

:PLAY:STARt

Starts outputing the selected stream. There are no arguments.

:PLAY:STOP

Stops outputing the selected stream. There are no arguments.

:PLAY:SYNC TSPAcket|SF|NONTs

Sets the format of the PSYNC signal output from the SPI IN/OUT connector. For TSPAcket, a single pulse signal is output at the start point of each packet. For SF, a single pulse is output at the start point of the SF appearing every 204x48x8 bytes. For NONTs, you can set the output period and data width of the PSYNC signal using the :PLAY:SYNC:PSYNc:INTerval command and :PLAY:SYNC:PSYNc:WIDTh commands. SF is available only when MTMCc is returned by the :PLAY:STANdard? query. The default value is TSPAcket.

:PLAY:SYNC?

Returns the current format setting of the PSYNC signal.

:PLAY:SYNC:DVALid:WIDTh NONE|<numeric_value>

Sets the status and data width of the DVALID signal when NONTs is selected in the :PLAY:SYNC command. When you select NONE, the DVALID signal is disabled. You can set the width from 16 bytes to 255 bytes. This value cannot be set more than the value set by the :PLAY:SYNC:PSYNC:INTerval command. The default value is 188.

:PLAY:SYNC:DVALid:WIDTh?

Returns the current status and data width of the DVALID signal.

:PLAY:SYNC:PSYNc:INTerval NONE|<numeric_value>

Sets the status and output period of the PSYNC signal when NONTs is selected in the :PLAY:SYNC command. When you select NONE, the PSYNC signal is disabled. You can set the interval from 16 bytes to 255 bytes. This value needs to be set equal to or greater than the value in the :PLAY:SYNC:DVALid:WIDTh command. The default value is 188.

:PLAY:SYNC:PSYNc:INTerval?

Returns the current status and output period of the PSYNC signal.

:PLAY:TIMEpacket:DEFine <numeric_value>,<numeric_value>,
<numeric_value>,<numeric_value>,
<numeric_value>,<numeric_value>

Sets the initial values of the TDT, TOT, or STT when selected USER in the :PLAY:TIMEpacket:MODE command. The arguments are <year>, <month>, <date>, <hour>, <minute>, and <second>. You can set the values from 1900,3,1,0,0,0 to 2038,4,22,23,59,59 for the TDT and TOT and from 1980,1,6,0,0,0 to 2116,2,12,6,28,15 for the STT. The default values are the current date and time.

:PLAY:TIMEpacket:DEFine?

Returns the current data and time settings of the TDT, TOT, or STT.

:PLAY:TIMEpacket:MODE ORIGinal|OS|USER

Selects the reference time used to set the initial value of the TDT, TOT, or STT when the :PLAY:UPDAte command is set to ON. The choices are ORIGinal, SYSTem, or USER. For ORIGinal, the original (default) value defined in the selected stream is used. For OS, the clock/calendar of the operating system is used. For USER, you can set any value in the :PLAY:TIMEpacket:DEFine command. The default value is ORIGinal.

:PLAY:TIMEpacket:MODE?

Returns the current reference time selection used to set the initial value of the TDT, TOT, or STT.

:PLAY:UPDAte ON|OFF

Sets whether to update parameters in a stream when looped. You can select which parameters are updated using the :PLAY:UPDAte:ITEM commands. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:UPDAte?

Returns the current update mode status.

:PLAY:UPDAte:ITEM:CC ON|OFF

Sets whether to update continuity_counter values when the :PLAY:UPDAte command is set to ON. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:UPDAte:ITEM:CC?

Returns whether to update continuity_counter values when the :PLAY:UPDAte command is set to ON.

:PLAY:UPDAte:ITEM:NPT ON|OFF

Sets whether to update NPT values when the :PLAY:UPDAte command is set to ON. You can use 1 or 0 instead of ON or OFF. This command is only available when the :PLAY:UPDAte:PCR command is set to ON and the :PLAY:UPDAte:ITEM:PCR:METHod command is set to SOFTware. The default value is OFF.

:PLAY:UPDAte:ITEM:NPT?

Returns whether to update NPT values when the :PLAY:UPDAte command is set to ON.

:PLAY:UPDAte:ITEM:PCR ON|OFF

Sets whether to update PCR/PTS/DTS values when the :PLAY:UPDAte command is set to ON. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:UPDAte:ITEM:PCR?

Returns whether to update PCR/PTS/DTS values when the :PLAY:UPDAte command is set to ON.

:PLAY:UPDAte:ITEM:PCR:METHod HARDware|SOFTware

Sets the method to update PCR/PTS/DTS values. The choices are HARDware or SOFTware. The default value is HARDware.

:PLAY:UPDAte:ITEM:PCR:METHod?

Returns the update method for PCR/PTS/DTS values.

:PLAY:UPDAte:ITEM:REEDsolomon ON|OFF

Sets whether to update Reed-Solomon symbols in an ISDB-T transport stream when the :PLAY:UPDAte command is set to ON. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:UPDAte:ITEM:REEDsolomon?

Returns whether to update Reed-Solomon symbols in an ISDB-T transport stream when the :PLAY:UPDAte command is set to ON.

:PLAY:UPDAte:ITEM:TIMEpacket ON|OFF

Sets whether to update TDT/TOT/STT values when the :PLAY:UPDAte command is set to ON. You can use 1 or 0 instead of ON or OFF. The default value is ON.

:PLAY:UPDAte:ITEM:TIMEpacket?

Returns whether to update TDT/TOT/STT values when the :PLAY:UPDAte command is set to ON.

RECORD Commands

Use these commands to set parameters related to the data record. These include input interface, record size, and trigger position.

Command Tree

```
:RECord
   :ACQuire
      :STARt
      :STOP
   :CLOCk
      :RATE?
   :EXTernal                RISE|FALL|OFF
   :PACKet?
   :SOURce                  SPI|ASI|UNIVersal|BNCserial|DHEI|
                            I1394I|S310M|STANdard|OPTion
   :STANdard?
   :STARt
   :STOP
   :STORe
      :FILE                 <file_name>
      :MODE                          NEWfile|OVERwrite
   :TARGet
      :IGNOredvalid         ON|OFF
      :SIZE                 <numeric_value>
      :TIME                          <string>
      :TRIGger
         :CONTinuous        ON|OFF
            :LIMit          <numeric_value>
         :POSition          <numeric_value>
      :TYPE                          RAM|DISK
      :UNLImit              ON|OFF
```

Command Description

:RECord:ACQuire:STARt

Starts input stream acquisition. When two or more record commands are sent to the instrument successively, the instrument stops stream acquisition and then starts stream acquisition for each command. Therefore, when many commands are sent to the instrument, it takes a long time to complete all settings. If you send the :RECord:ACQuire:STOP command before sending record commands and send the :RECord:ACQuire:STARt command after sending record commands, you can shorten the setting time.

:RECord:ACQuire:STOP

Stops input stream acquisition. Refer to the :RECord:ACQuire:STARt command description on how to use this command.

:RECord:CLOCk:RATE?

Returns the clock rate of the input stream in MHz.

:RECord:EXTernal RISE|FALL|OFF

Sets whether to start input stream record using a trigger signal applied to the TRIG IN connector. The choices are RISE, FALL, or OFF. When you set it to RISE, the input stream record is started at the rising edge of the applied trigger signal. When you set it to FALL, the input stream record is started at the falling edge of the applied trigger signal. The default value is OFF.

:RECord:EXTernal?

Returns whether to start input stream record using a trigger signal applied to the TRIG IN connector.

:RECord:PACKet?

Returns the packet size of the input stream. The available responses are 188, 204, 208, or NONTs. When the :RECord:I1394I:PARTialts command is set to ON, the response is 192.

:RECord:SOURce SPI|ASI|UNIVersal|BNCserial|DHEI|I1394I|S310M|
STANdard|OPTion

Sets the interface used to capture a stream data. The choices are SPI, ASI, UNIVersal, BNCserial, DHEI, I1394I (IEEE1394), S310M (SMPTE310M), STANdard (same as SPI), or OPTion (optional interface currently installed). The default value is SPI.

:RECord:SOURce?

Returns the current interface used to capture a stream data.

:RECord:STORe:FILE <file_name>

Specifies the file name used when the input stream is saved.

:RECord:STANdard?

Returns the current standard used to display the input stream. The available responses are MPEG, ARIB, ATSC, DVB, NONTs, MTMCc, STMCc, or ISDBT. The MTMCc, STMCc, and ISDBT standard are checked only when the :SYSTem:STANdard command is set to ARIB. When the RECord:I1394I PARTialts command is set to ON, the response is P_TS.

:RECord:STARt

Starts recording the input stream.

:RECord:STOP

Stops recording the input stream.

:RECord:STORe:FILE?

Returns the current file name used when the input stream is saved.

:RECord:STORe:MODE NEWfile|OVERwrite

Sets the save mode when the input stream is saved. The choices are NEWfile or OVERwrite. For NEWfile, a new file is created whenever you save a stream file. The file name is the following: The name specified by the :RECord:STORe:FILE command + # (1, 2, 3, 4...). For OVERwrite, the existing file is overwritten by the new file with the name specified in the :RECord:STORe:FILE command. The default value is OVERwrite.

:RECord:STORe:MODE?

Returns the current save mode setting when the input stream is saved.

:RECord:TARGet:TRIGger:IGNOredvalid ON|OFF

Sets whether the instrument ignores the DVALID signal from the selected interface when a stream data is acquired. When you set it to ON, the instrument ignores the DVALID signal, and the stream data is acquired according to the internal clock signal. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:RECord:TARGet:TRIGger:IGNOredvalid?

Returns whether the instrument ignores the DVALID signal from the selected interface when a stream data is acquired.

:RECord:TARGet:SIZE <numeric_value>

Sets the file size to record the input stream in MB. You can set the file size from 1 to free space of the system RAM or hard disk. This setting changes the :RECord:TARGet:TIME command setting. The default value is 50 MB.

:RECord:TARGet:SIZE?

Returns the current file size setting to record the input stream.

:RECord:TARGet:TIME <string>

Sets the recording time (hh:mm:ss) to record the input stream. The minimum value of the setting range depends on the clock rate of the input stream. The maximum value of the setting range depends on the free space of the RAM or hard disk, or the clock rate of the input stream. This setting changes the :RECord:TARGet:SIZE command setting. The default value is 00:00:00.

:RECord:TARGet:TIME?

Returns the current recording time (hh:mm:ss) to record the input stream.

:RECord:TARGet:TRIGger:CONTinuous ON|OFF

Turns Continuous Recording on or off. When you set it to ON, you can record multiple stream files continuously on the hard disk. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:RECord:TARGet:TRIGger:CONTinuous?

Returns the current Continuous Recording state.

:RECord:TARGet:TRIGger:CONTinuous:LIMit <numeric_value>

Sets the number of files to stop Continuous Recording. You can set the value from 2 to 32767. The default value is 32767.

:RECord:TARGet:TRIGger:CONTinuous:LIMit?

Returns the number of files to stop Continuous Recording.

:RECord:TARGet:TRIGger:POSition <numeric_value>

Sets the trigger position used to record the input stream. You can set the trigger position from 0% to 100%. The default value is 0%.

:RECord:TARGet:TRIGger:POSition?

Returns the current trigger position setting.

:RECord:TARGet:TYPE RAM|DISK

Sets the record target used to record the input stream. The choices are RAM or DISK (hard disk). The default value is DISK.

:RECord:TARGet:TYPE?

Returns the current record target used to record the input stream.

:RECord:TARGet:TRIGger:UNLImit ON|OFF

Sets whether to record the input stream to the full free space in the hard disk or RAM. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:RECord:TARGet:TRIGger:UNLImit?

Returns whether to record the input stream to the full free space in the hard disk or RAM.

SYSTEM Commands

Use these commands to set or query the system related functions.

Command Tree

```
:SYSTem
   :COMMunicate
      :SOCKet
         :PORT                    <numeric_value>
         :RXTERM        CR|LF
         :TXTERM        CR|LF|CRLF|LFCR
   :ERRor[:NEXT]?
   :KLOCk[:STATe]       ON|OFF
   :MODE                          PLAY|RECord
   :OPTions?
   :PRESet
   :STANdard            MPEG|ARIB|ATSC|DVB
   :STATus?
```

Command Description

:SYSTem:COMMunicate:SOCKet:PORT <numeric_value>

Sets the port number needed to remotely control the instrument over an Ethernet network. You can set the value from 1024 to 65535. When you change the value, the current network connection is disconnected.

:SYSTem:COMMunicate:SOCKet:PORT?

Returns the current port number setting.

:SYSTem:COMMunicate:SOCKet:RXTERM CR|LF

Sets the terminator used when the instrument receives commands from a controller. The choices are CR (carriage return) or LF (linefeed). The default value is LF.

:SYSTem:COMMunicate:SOCKet:RXTERM?

Returns the terminator used when the instrument receives commands from a controller.

:SYSTem:COMMunicate:SOCKet:TXTERM CR|LF|CRLF|LFCR

Sets the terminator used when the instrument sends information to a controller. The choices are CR (carriage return), LF (linefeed), CRLF, or LFCR. The default value is CRLF.

:SYSTem:COMMunicate:SOCKet:TXTERM?

Returns the terminator used when the instrument sends information to a controller.

:SYSTem:ERRor[:NEXT]?

Returns an error message from the error/event queue. The response format is as follows:

<error_code>,"<error_message>"

Refer to *Error Messages and Codes* on page 3–1 for detailed information.

:SYSTem:KLOCk[:STATe] ON|OFF

Locks or unlocks the front-panel buttons and mouse operation. You can use 1 or 0 instead of ON or OFF. The default value is OFF.

:SYSTem:KLOCk[:STATe]?

Returns the current status of lock function.

:SYSTem:MODE PLAY|RECord

Sets the operation mode of the instrument. The choices are PLAY or RECord. The default value is PLAY.

:SYSTem:MODE?

Returns the current operation mode of the instrument.

:SYSTem:OPTions?

Returns the option number, hardware version, and code version of the installed interface card.

:SYSTem:PRESet

Resets the instrument to the factory default settings.

:SYSTem:STANdard MPEG|ARIB|ATSC|DVB

Sets the standard used to display the input stream. The choices are MPEG, ARIB, ATSC, or DVB. The default value is ARIB.

:SYSTem:STANdard?

Returns the current standard used to display the input stream.

:SYSTem:STATus?

Returns the current operation status of the instrument. The available responses are:

0: the instrument stops any operations
1: the instrument is outputing a data
2: the instrument is acquiring a data
3: the instrument is recording a data

Optional Commands

This subsection describes the commands used to control the optional interface cards. These commands are available only when the appropriate interface card is installed into the MTS400 Series System.

Option 07 SMPTE310M/ASI Interface

:PLAY:OP07AS:PORT:TYPE <arg>

<arg> = ASI or S310M

Selects which signal to output from the OUTPUT connecter. The choices are ASI or S310M (SMPTE310M). The default value is ASI.

:PLAY:OP07AS:PORT:TYPE?

Returns the current output signal selection.

:PLAY:S310M <arg>

<arg> = M8VSB

Selects the SMPTE310M mode for output. The only choice is M8VSB.

:PLAY:S310M?

Returns the current SMPTE310M mode for output.

:PLAY:ASI:FORMAT <arg>

<arg> = BYTE or BURST or PACKET

Sets the output format of the ASI signal. The choices are BYTE, BURST or PACKET. The default value is PACKET.

:PLAY:ASI:FORMAT?

Returns the current output format setting of the ASI signal.

:PLAY:OP07AS:PORT: THROughout <arg>

<arg> = ON or OFF

Selects play loop throughout. The default Value is OFF

:PLAY:OP07AS:PORT: THROughout?

Returns the current loop throughout status.

:RECORD:OP07AS:INPUTPORT <arg>

<arg> = BNC or SPI

Selects the recording input port. The default value is BNC.

:RECORD:OP07AS:INPUTPORT?

Returns the current recording input port.

:RECORD:OP07AS:PORT:TYPE <arg>

<arg> = ASI or S310M

Selects the input signal expected from the INPUT connecter. The choices are ASI or S310M (SMPTE310M). The default value is ASI.

:RECORD:OP07AS:PORT:TYPE?

Returns the current input signal selection.

:RECORD:S310M <arg>

<arg> = M8VSB

Selects the SMPTE310M mode for input. The only choice is M8VSB.

:RECORD:S310M?

Returns the current SMPTE310M mode for input.

Error Messages and Codes

This section lists the error messages and codes.

Error messages and codes can be obtained by using the query :SYSTem:ERRor[:NEXT]?. These are returned in the following format:

<error_code>,"<error_message>"

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	invalid character in numeric
-123	exponent too large
-124	too many digits
-128	numeric data not allowed
-130	suffix error
-131	invalid suffix
-134	suffix too long

Table 3–1: Command errors (Cont.)

Error code	Error message
–138	suffix not allowed
–140	character data error
–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
–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

Table 3–2: Execution errors (Cont.)

Error code	Error message
–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
–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

Appendix A: Default Settings

Table A–1 lists the default settings of the remote commands.

These default settings can be set by using the *RST command, except for the:SYSTem:COMMunicate:SOCKet command settings.

Table A–1: Default settings

Header	Default Settings
DISPLAY commands	
:DISPlay:VIEW:FORMat	HEXadecimal
PLAY commands	
:PLAY:AUTOplay	OFF (0)
:PLAY:CLOCk:DEFault:RATE	5.6610E+001
:PLAY:CLOCk:DEFault:RATE:RATIo	629,300
:PLAY:CLOCk:ESRAtefixed	OFF (0)
:PLAY:CLOCk:ISDBT:CONVert	ON (1)
:PLAY:CLOCk:RATE	5.6610E+001
:PLAY:CLOCk:RATE:RATIo	0, 0
:PLAY:CLOCk:SOURce	INTernal
:PLAY:LOOP	ON (1)
:PLAY:LOOP:ISDBT:FRAMe	ON (1)
:PLAY:PACKet	188
:PLAY:PCR:INACcuracy	NONE
:PLAY:PCR:INITial	0, 0
:PLAY:S192F:PARTialts	ON (1)
:PLAY:SOURce	DISK
:PLAY:SPIOutput	ON (1)
:PLAY:SSPOsition:INITial:ENABle	ON (1)
:PLAY:SSPOsition:INITial[:POSition]	0
:PLAY:SSPOsition:INITial:TIME	”00:00:00”
:PLAY:SSPOsition[:POSition]	0, 0
:PLAY:SSPOsition:TIME	”00:00:00”,”00:00:00”
:PLAY:SYNC	TSPAcket
:PLAY:SYNC:DVALid:WIDTh	NONE

Table A–1: Default settings (Cont.)

Header	Default Settings
:PLAY:SYNC:PSYNc:INTerval	NONE
:PLAY:TIMEpacket:DEFine	Current data and time
:PLAY:TIMEpacket:MODE	ORIGinal
:PLAY:UPDAte	ON (1)
:PLAY:ITEM:CC	ON (1)
:PLAY:ITEM:NPT	OFF (0)
:PLAY:ITEM:PCR	ON (1)
:PLAY:ITEM:PCR:METHod	HARDware
:PLAY:ITEM:REEDsolomon	ON (1)
:PLAY:ITEM:TIMEpacket	ON (1)
RECORD commands	
:RECord:EXTernal	OFF (0)
:RECord:SOURce	SPI
:RECord:STORe:MODE	OVERwrite
:RECord:TARGet:IGNOredvalid	OFF (0)
:RECord:TARGet:SIZE	50 [MB]
:RECord:TARGet:TIME	”00:00:00”
:RECord:TARGet:TRIGger:CONTinuous	OFF (0)
:RECord:TARGet:TRIGger:CONTinuous:LIMit	32767
:RECord:TARGet:TRIGger:POSition	0 [%]
:RECord:TARGet:TYPE	DISK
:RECord:TARGet:UNLImit	OFF (0)
SYSTEM commands	
:SYSTem:COMMunicate:SOCKet:PORT	49152
:SYSTem:COMMunicate:SOCKet:RXTERM	LF
:SYSTem:COMMunicate:SOCKet:TXTERM	CRLF
:SYSTem:KLOCk[:STATe]	OFF (0)
:SYSTem:MODE	PLAY
:SYSTem:STANdard	ARIB
Optional commands	
Option 07 SMPTE310M/ASI Interface	
:PLAY:OP07AS:PORT:TYPE	ASI
:PLAY:S310M	M8VSB

Table A–1: Default settings (Cont.)

Header	Default Settings
:PLAY:ASI:FORMAT	PACKET
:PLAY:OP07AS:PORT: THROughout	OFF
:RECORD:OP07AS:INPUTPOR T	BNC
:RECORD:OP07AS:POR T:TYPE	ASI
:RECORD:S310M	M8VSB

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