

TAS7x00Series Terahertz Spectroscopic Imaging System Remote API Reference Manual (Automatic Control Measuring Option)

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TAS7x00Series Terahertz Spectroscopic Imaging System Remote API Reference Manual (Automatic Control

Measuring Option)

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Preface

Purpose of This Manual

This manual describes how to install the automatic control measurement option and use Remote APIs.

The notation "TAS7500" in this manual represents the TAS7500 and TAS7400 unless otherwise noted.

Prerequisites and Target Users

This manual is written for those who have the following knowledge:

- The outline of the TAS7500 Series Terahertz Spectroscopy & Imaging System configuration
- Programming languages such as Excel VBA and LabVIEW

Target users

• System developers who operate the TAS7500 Series Terahertz Spectroscopy & Imaging System to obtain measurement results.

Sample Programs Used in This Manual

These sample programs are provided by Advantest to users free of charge as reference for creating software used on Advantest products. Users are allowed to copy or modify these sample programs to create new software. However, Advantest is not responsible for functionality issues with the software created by the user, problems with the created software, and damages due to such functionality issues or problems. By using these sample programs, users shall be deemed to have agreed to the above conditions.

Related Manuals

TAS7x00Series Terahertz Spectroscopic Imaging System Math Library Reference Manual(Automatic Control Measuring Option)

This manual describes how to install and use the arithmetic libraries.

TAS7x00 Series Terahertz Optical Sampling System Instruction Manual This manual describes the product configuration, functions, tasks to be performed before starting measurement, and notes on use of the TAS7x00 Series Terahertz Optical Sampling System.

Typographic Convention

Conventions for Command Line and Program Examples

Command line and program examples are printed in a different font than the main body text so they can easily be distinguished. Similarly, different styles are used for user input and screen output.

 Table C-1
 Conventions for Command Line and Program Examples

Typeface or Symbol	Description	Example
لـ	Shows the [Return] having been pressed on a command line.	cd₊┘
abcd123	Command, directory, and file names, as well as screen output and program examples, are shown.	Set api=CreateObject("ATTAS.Remote.API")
abcd123	When this typeface appears in a command line expression, it indicates the user must type in exactly the same.	dir↓
[]	When this symbol appears in a syntax expression, the specifica- tion enclosed in [] can be omit- ted.	<pre>GetSample(resultKind [, timeout])</pre>

Indicators for Operating the GUI

The name of the option selection area of Graphical User Interface (GUI) screen is enclosed in the [] symbol. Also, operations for selecting commands within menus are indicated by an arrow symbol (\rightarrow) .

Table C-2 Indicators for Operating the GUI

Typeface or Symbol	Description	Example
[]	Shows the name of the option selection area on the GUI screen.	[File] menu [OK] button
[]→[]	Shows commands in a menu.	[File]→[Exit]

Indicators for Keyboard Operation

Keyboard keys are enclosed in the [] symbol. When multiple keys are depressed simultaneously, the plus sign (+) is used as an indicator; multiple keys pressed in sequence are indicated by a comma.

Typeface or Symbol	Description	Example
[]	Shows keyboard keys.	[Return] key
[Ctrl]	Shows the [Control] key.	[Ctrl] key
+	Shows a second key pressed while a first one is held down when keys are connected by the plus (+) sign.	[Ctrl]+[d]
,	Shows each key sequentially when keys are delimited by com- mas.	[Ctrl]+[x], [y]

 Table C-3
 Indicators for Keyboard Operation

Reference Source Notations

Reference sources are indicated by a change in typeface. Also, depending on the type of reference source, quotation marks or * may be used.

 Table C-4
 Reference Source Notations

Typeface or symbol	Explanation	Example
"Reference Source Notations" on page Co nvention–2 Refer to Table C-4.	Indicates a chapter title, section title, or figure/table number. In the case of an online manual, clicking the string describing the reference source will cause the manual to jump to that page.	 → Refer to "Reference Source Notations" on page Convention-2 for information on nota- tion methods for reference sources. Table C-4 indicates the notation method for the reference source.
TAS7x00Series Tera- hertz Spectroscopic Imaging System Math Library Reference Manual(Automatic Control Measuring Option)	Indicates the title of the manual to which to refer. Clicking a manual title in an on-line manual will cause the document to jump to the "Related Manuals" on page Preface-1.	→ Refer to TAS7x00Series Terahertz Spectro- scopic Imaging System Math Library Refer- ence Manual(Automatic Control Measuring Option) for information on arithmetic libraries.

Unit Indicators

Outside of the program examples and grammar discussed in this manual, SI unit symbols are used to indicate units.

1.1 Functions of This Option

1. Overview

The automatic control measurement option is an API (Application Programming Interface) used to control the TAS7500 system from an external application.

1. 1 Functions of This Option

The major functions of this option are as follows:

- Starting/stopping measurement
- Obtaining measurement results (time data and frequency data)
- Correction of the TAS7500 system

1. Overview

1. 2 Requirements for Using This Option

The requirements for using this option are as follows:

• OS

Microsoft Windows 7 Professional [32 bit] Microsoft Windows 7 Professional [64 bit]

- Language Excel VBA LabVIEW version 8.2 or later Visual Basic .NET Visual C# .NET
- Required software Microsoft .NET Framework 4.0 or later
- TAS7500 system version R4.00 or later
- TAS7400 system version R5.03 or later

1. 3 Restrictions

The restrictions for this option are as follows:

- Number of systems that can be connected Only one TAS7500 system can be connected to the PC used for remote control. In addition, only one Remote API can be started from the PC used for remote control.
- Supported TAS7500 system This option only supports the TAS7500 Series Terahertz Optical Sampling System.

2. 1 Installation

2. Installation and Uninstall

This chapter describes how to install and uninstall the automatic control measurement option.

2. 1 Installation

This section describes how to install this option on the PC used to remotely control the TAS7500 system.

- 1) Insert the TAS7x00 System Software installation media (1/3) into the DVD-ROM drive.
- 2) When setup.bat in the TASRemoteAPI folder is double-clicked, the User Account Control dialog box is displayed. Click the **[Allow]** button.
- 3) The following InstallShield Wizard window is then displayed:

H Advantest TASRemoteAPI (x64) - InstallShield Wizard		
2	Welcome to the InstallShield Wizard for Advantest TASRemoteAPI (x64)	
	The InstallShield(R) Wizard will install Advantest TASRemoteAPI (x64) on your computer. To continue, click Next.	
2	WARNING: This program is protected by copyright law and international treaties.	
	< Back Next > Cancel	

2. Installation and Uninstall

2–2

4) Click the [Install] button to start installing the software.



5) A window showing the installation progress is then displayed.

Installing The prog	Advantest TASRemoteAPI (x64) ram features you selected are being installed.
i de la companya de l	Please wait while the InstallShield Wizard installs Advantest TASRemoteAPI (x64). This may take several minutes. Status:
stallShield -	< Back Next > Cancel

2. 1 Installation

6) When the installation is complete, click the **[Finish]** button.



2. Installation and Uninstall

2. 2 Uninstall

- 1) Select [Control Panel] from the Windows [Start] menu, and then open [Programs and Features].
- 2) Select Advantest TASRemoteAPI from the list and click [Uninstall].
- 3) When the following confirmation message box is displayed, click the **[OK]** button:



4) The User Account Control dialog box is then displayed. Click the **[Continue]** button.

This completes uninstall of this option.

2–4

3 - 1

3. License Management

This chapter describes the license management of the functions for this option. By registering a license, the functions for this option become enabled.

To register a license, a password sheet is required.

The product numbers are the following:

- PYSI75-08M
- PYSI74-08M

3. 1 Registering Licenses

Register a license to the TAS7500 system according to the following procedure:

1) Prepare the password sheet sent by Advantest.

```
Figure 3-1 Sample Password Sheet (CpuFixed)
```

```
License Password Sheet

Date of issue: December 20, 2013

Serial#: C050012

# Product Number -> PYSI75-08M

# License Type -> CpuFixed

# Expiration Client License -> 000

# Password -> AA9DCC963F0B685A9FDF710091C164E9A

# Expiration Date -> 2017/03/22

# Number of License -> 1

#***** license *****

CpuFixed 000 AA9DCC963F0B685A9FDF710091C164E9A 00000edcba98 PYSI75-08M

2017/03/22 1 00000edcba98 ← Enter this line.
```

- 2) Select [Start]→[All Programs]→[Accessories]→[Command Prompt] with the right mouse button. Then click [Run as administrator (A)...].
- 3) The User Account Control dialog box is then displayed. Click the [Continue] button.
- 4) To register a license, enter the command using the one line that begins with "CpuFixed 000 ..." shown in Figure 3-1 as an argument. The following shows an example execution:

3. License Management

Figure 3-2 Example Execution of License Registration

```
C:\>%PLMS_ROOT%\bin¥License_Add CpuFixed 000 AA9DCC963F0B685A9FDF7100
91C164E9A000000edcba98 PYSI75-08M 2017/03/22 1 00000edcba98J
License Added
C:\>
```

3–2

4. Basic Usage of Remote APIs

This chapter describes the procedure for using Remote APIs and a basic example program.

4. 1 Navigation Window

When the automatic control measurement option license is enabled, the Server menu is added to the Navigation window.



4. 1. 1 Server

The following items can be selected from in the **[Server]** menu:

♦ [Server] → [Start]

This command starts Remote API Server. By executing this command, the TAS7500 system is initialized if not initialized yet, and the menus and buttons other than the Stop command are disabled.

If a window such as the Measurement window is displayed, this command cannot be executed.

♦ [Server] → [Stop]

This command terminates Remote API Server and enables the disabled menus and buttons. If the TAS7500 system is running, it is terminated after Remote API Server is terminated.

4. Basic Usage of Remote APIs

4. 2 Operating Procedures

The following is the procedure for using Remote APIs:

- 1) Adjusting the optical system (Terahertz Optical Sampling System only)
- 2) Starting Remote API Server on the TAS7500 system
- 3) Executing the program from the PC for remotely controlling the TAS7500 system
- 4) Terminating Remote API Server on the TAS7500 system

4. 2. 1 Adjusting Optical System

The optical system of the Terahertz Optical Sampling System needs to be adjusted in advance.

→ For more information on how to adjust the optical system, refer to TAS7x00 Series Terahertz Optical Sampling System Instruction Manual.

4. 2. 2 Starting Remote API Server

To remotely control the TAS7500 system, Remote API Server needs to be started on the TAS7500 system in advance. The following is the procedure for starting Remote API Server:

- 1) From the Navigation window, execute [Server] \rightarrow [Start].
- 2) If the Terahertz Optical Sampling System has not been initialized, a message confirming the connection status of the terahertz source and detector modules is displayed. After confirming the status, click the **[OK]** button. After clicking the button, it takes about 15 minutes for the system to be initialized.
- 3) Once Remote API Server has started, **[Remote API Server]** is added to the title and the following window is displayed:



Workaround if Remote API Server cannot be started

The following is the procedure when an error occurs in Remote API Server startup:

- 1) Exit the TAS7500 system.
- 2) Click [Start] \rightarrow [Control Panel] \rightarrow [System and Security] \rightarrow [System].
- 3) Click [Advanced System Settings].

- 4) Click [Environment Variables (N)...] in the Advanced tab.
- 5) Click [New (W)...] of [System variables (S)].
- 6) Enter "TAS7500_REMOTEAPI_PORT" in **[Variable name (N)]** and a port number (an arbitrary value from 1024 to 49151) in **[Variable value (V)]**, and then click the **[OK]** button.
- 7) Click the **[OK]** button in the transition source window to close the window.
- 8) Start the TAS7500 system.
- 9) Start Remote API Server. If an error occurs again, perform the steps in this procedure again. When doing so, change the port number.

4. Basic Usage of Remote APIs

4. 2. 3 Executing Programs from PC Used for Remote Control

This section describes an example in which Excel VBA is used to perform background and sample measurements and then the data is obtained with the TAS7500 system. In this example, data is output to Sheet 1.

```
Sub main()
    Set api = CreateObject("ATTAS.Remote.API")
    ' Connects to the TAS7500 system.
    Call api.Connect("127.0.0.1")
    ' Resets the TAS7500 system.
    Call api.Reset
    ' Performs background measurement by specifying a measurement unit, frequency
      resolution, and how many times the background measurement is cumulated.
    Call api.MeasureBackground(1, 7.6, 1024)
    ' Obtains background data using frequency data.
    Set bgdata = api.GetBackground(1)
    xAxis = bgdata.GetXValue
    yAxisBg = bgdata.GetYValue
    ' Performs sample measurement by specifying a measurement units, frequency
      resolution, and how many times the background measurement is cumulated.
    Call api.MeasureSample(1, 7.6, 1024)
    ' Obtains sample data using frequency data.
    Set samdata = api.GetSample(1)
    yAxisSam = samdata.GetYValue
    ' Enters the obtained data in cells of Sheet 1.
    idx = 1
    For Each x In xAxis
        Sheet1.Cells(idx, 1) = x
        Sheet1.Cells(idx, 2) = yAxisBg(idx - 1)
        Sheet1.Cells(idx, 3) = yAxisSam(idx - 1)
        idx = idx + 1
    Next
End Sub
```

- 🖳 Tip -

Remote APIs have a Microsoft COM (Component Object Model) interface. When programming, reference the COM object corresponding to each language.

4-4

4. 2. 4 Terminating Remote API Server

To terminate Remote API Server, execute **[Server]** \rightarrow **[Stop]** from the Navigation window. When Remote API Server has been terminated, the disabled menus and buttons become enabled.

Navigation		
Server		Version
Measure Setup	Analysis	EXIT

5. MeasurementResult Class

5. 1 Member Functions

This section describes the member functions of the MeasurementResult class.

Namespace: ATTAS.Remote.MeasurementResult

5. 1. 1 GetXValue

Returns the X-axis data array of measurement results.

♦ Syntax

<Excel VBA>

GetXValue()

Return value

<Excel VBA>

Return value type	Description
Double ()	X-axis data array of measurement results

5. 1. 2 GetYValue

Returns the Y-axis data array of measurement results.

Syntax

<Excel VBA>

GetYValue()

5. MeasurementResult Class

♦ Return value

<Excel VBA>

Return value type	Description	
Double ()	Y-axis data array of measurement results	

5. 1. 3 IsOverflow

Returns the overflow status of measurement result data.

♦ Syntax

<Excel VBA>

IsOverflow()

Return value

<Excel VBA>

Return value type	Description
Boolean	Overflow status of measurement result data

Details

Returns true if overflow of the measurement result data occurs. Otherwise false.



Overflow means that data items that exceed the data range (-1 to +1 (V)) for time data exist. The value -1 or +1 is set for the data items that exceed the data range. Check for overflow using this member function to verify the validity of data as needed.

6. 1 Member Functions

6–1

6. API Class

6. 1 Member Functions

This section describes the member functions of the API class.

Namespace: ATTAS.Remote.API

6. 1. 1 GetVersion

Returns the API class version.

♦ Syntax

<Excel VBA>

GetVersion()

Return value

<Excel VBA>

Return value type	Description	
String	API class version (Example: "R1.0")	

6. 1. 2 Connect

Establishes communication with the TAS7500 system.

Syntax

<Excel VBA>

```
Connect(address [, port])
```

6. API Class

Arguments

<Excel VBA>

Argument name	I/O	Data type	Description
address	In	String	IP address or host name
port	In	Integer	Port number for Remote API Server of the TAS7500 system Default value: 47500

Error conditions

- 1) When the TAS7500 system cannot be connected.
- 2) When Remote API Server is not running on the TAS7500 system.
- 👝 🖳 Tip

After the port number is changed in 4. 2. 2 "Starting Remote API Server" on page 4-2, set the value to the port.

6. 1. 3 Disconnect

Discontinues communication with the TAS7500 system.

♦ Syntax

<Excel VBA>

Disconnect()

6. 1. 4 Reset

Initializes the TAS7500 system.

♦ Syntax

<Excel VBA>

Reset()

6. 1 Member Functions

6-3

Details

Clears the measurement result cache of the TAS7500 system.

Error conditions

1) The TAS7500 system is not connected.

6. 1. 5 MeasureBackground

Starts background measurement.

♦ Syntax

<Excel VBA>

MeasureBackground(unitNo, resolution, cumulatedNumber)

Arguments

<Excel VBA>

Argument name	I/O	Data type	Description
unitNo	In	Integer	Measurement unit number (1, 2)
resolution	In	Double	Frequency resolution [GHz] (1.9, 3.8, 7.6, 61.0)
cumulatedNumber	In	Integer	Cumulated number (power of 2 between 1 to 16384)

Details

To obtain measurement results, use the GetBackground member function immediately after executing this member function.

Error conditions

- 1) The TAS7500 system is not connected.
- 2) A value that cannot be specified as a measurement unit number is entered.
- 3) A value that cannot be specified as a frequency resolution is entered.
- 4) A value that cannot be specified as a cumulated number is entered.
- 🖳 Tip -
 - By performing background measurement, the subsequent sample measurement is executed using the same trigger signal as the background measurement.

6. API Class

• Measurement unit numbers are those that define the measurement units shown by icons in the Navigation window, in order from the left. For example, only 1 can be specified for the Terahertz Optical Sampling System.

6. 1. 6 MeasureSample

Starts sample measurement.

♦ Syntax

<Excel VBA>

MeasureSample(unitNo, resolution, cumulatedNumber)

♦ Arguments

<Excel VBA>

Argument name	I/O	Data type	Description
unitNo	In	Integer	Measurement unit number (1, 2)
resolution	In	Double	Frequency resolution [GHz] (1.9, 3.8, 7.6, 61.0)
cumulatedNumber	In	Integer	Cumulated number (power of 2 between 1 to 16384)

Details

To obtain measurement results, use the GetSample member function immediately after executing this member function.

Error conditions

- 1) The TAS7500 system is not connected.
- 2) A value that cannot be specified as a measurement unit number is entered.
- 3) A value that cannot be specified as a frequency resolution is entered.
- 4) A value that cannot be specified as a cumulated number is entered.

6. 1. 7 GetBackground

Waits for the end of background measurement and obtains the results.

6. 1 Member Functions

6–5

Syntax

<Excel VBA>

GetBackground(resultKind [,timeout])

Arguments

<Excel VBA>

Argument name	I/O	Data type	Description
resultKind	In	Integer	Output format (0, 1) TimeDomain data: 0 FrequencyDomain data: 1
timeout	In	Integer	Timeout time [ms] Default value: 900000

Return value

<Excel VBA>

Return value type	Description
MeasurementResult	Measurement result (X-axis, Y-axis, overflow)

Details

Waits for the end of background measurement and obtains the results when this member function is executed after the MeasureBackground member function is executed. Result data when a measurement error occurs is invalid.

If 1 (FrequencyDomain data) is specified for the output format, the band to be output depends on the module at the time of measurement.

Standard module:	0 to 5 THz
Wideband module:	0 to 8 THz
Low-frequency module:	0 to 3 THz

Error conditions

- 1) The TAS7500 system is not connected.
- 2) A measurement error occurs.
- 3) Measurement timeout occurs.

6. API Class

4) A value less than 0 is set to the timeout time.

- 🖳 Tip -

The default timeout time value is the longest command execution time in the TAS7500 system.

6. 1. 8 GetSample

Waits for the end of sample measurement and obtains the results.

Syntax

<Excel VBA>

GetSample(resultKind [, timeout])

Arguments

<Excel VBA>

Argument name	I/O	Data type	Description
resultKind	In	Integer	Output format (0, 1) TimeDomain data: 0 FrequencyDomain data: 1
timeout	In	Integer	Timeout time [ms] Default value: 900000

Return value

<Excel VBA>

Return value type	Description
MeasurementResult	Measurement result (X-axis data, Y-axis data, overflow)

Details

Waits for the end of sample measurement and obtains the results when this member function is executed after the MeasureSample member function is executed Result data when a measurement error occurs is invalid.

6. 1 Member Functions

If 1 (FrequencyDomain data) is specified for the output format, the band to be output depends on the module at the time of measurement.

Standard module:0 to 5 THzWideband module:0 to 8 THzLow-frequency module:0 to 3 THz

- Error conditions
 - 1) The TAS7500 system is not connected.
 - 2) A measurement error occurs.
 - 3) Measurement timeout occurs.
 - 4) A value less than 0 is set to the timeout time.

📂 🖳 Tip

The default timeout time value is the longest command execution time in the TAS7500 system.

6. 1. 9 WaitToFinish

Waits until the end of a command.

♦ Syntax

<Excel VBA>

```
WaitToFinish([timeout])
```

Arguments

<Excel VBA>

Argument name	I/O	Data type	Description
timeout	In	Integer	Timeout time [ms] Default value: 900000

Details

Used for commands including those having long callbacks from the TAS7500 system (AdjustLaser member function).

6. API Class

Error conditions

- 1) The TAS7500 system is not connected.
- 2) A value less than 0 is set to the timeout time.
- 📂 🖳 Tip

The default timeout time value is the longest command execution time in the TAS7500 system.

Program example

<Excel VBA>

```
Sub main()
    Set api = CreateObject("ATTAS.Remote.API")
    ' Connects to the TAS7500 system.
    Call api.Connect("127.0.0.1")
    ' Resets the TAS7500 system.
    Call api.Reset
    ' Corrects the laser.
    Call api.AdjustLaser
    ' Waits for the completion of laser correction.
    Call api.WaitToFinish
    ' Performs background measurements by specifying a measurement unit, frequency
      resolution, and how many times the background measurement is cumulated.
    Call api.MeasureBackground(1, 7.6, 1024)
    ' Obtains background data using frequency data.
         ~ (Omitted) ~
    ' Performs sample measurement by specifying a measurement units, frequency
      resolution, and how many times the background measurement is cumulated.
    Call api.MeasureSample(1, 7.6, 1024)
    ' Obtains sample data using frequency data.
    ' ~ (Omitted) ~
    ' Enters the obtained data in cells of Sheet 1.
    .
         ~ (Omitted) ~
End Sub
```

6. 1 Member Functions

6–9

6. 1.10 IsBusy

Obtains whether a command is being executed.

Syntax

<Excel VBA>

IsBusy()

Return value

<Excel VBA>

Return value type	Description
Boolean	Execution status (true: during execution, false: standby)

Details

Obtains whether a command is being executed on the TAS7500 system.

Error conditions

1) The TAS7500 system is not connected.

6. 1.11 Stop

Stops the execution of a command.

Syntax

<Excel VBA>

Stop()

Details

Stops the execution of the command being executed on the TAS7500 system.

Error conditions

1) The TAS7500 system is not connected.

6. API Class

- 🖳 Tip –

The Stop command cannot stop the AdjustLaser member function.

6. 1.12 SetDryAirPurge

Sets the dry air purge to on or off.

Syntax

<Excel VBA>

SetDryAirPurge(unitNo, purgeOn)

Arguments

<Excel VBA>

Argument name	I/O	Data type	Description
unitNo	In	Integer	Measurement unit number (1, 2)
purgeOn	In	Boolean	Purge status (true: purge on, false: purge off)

Error conditions

1) The TAS7500 system is not connected.

2) A value that cannot be specified as a measurement unit number is entered.

- In Tip -

This member function cannot be used because the Terahertz Optical Sampling System does not have a dry air purge function.

6. 1.13 AdjustLaser

Corrects the laser.

6. 1 Member Functions

Syntax

<Excel VBA>

AdjustLaser()

Details

Execution of this member function takes approx. 10 minutes.

Error conditions

1) The TAS7500 system is not connected.

Program example

 \rightarrow For the program example, refer to 6. 1. 9 "WaitToFinish" on page 6-7.

- R Tip -

Laser correction is performed periodically (about once every hour) to stabilize the TAS7500 system. Due to this laser correction, measurement and other operations are forced to wait for several minutes. By executing this member function and letting the laser correction complete, measurement and other operations can be started without being forced to wait until the next laser correction is performed.

6. 1.14 SetAutoAdjustLaser

Sets ON or OFF for periodically-executed laser automatic correction.

Syntax

<Excel VBA>

SetAutoAdjustLaser(enable)

♦ Arguments

<Excel VBA>

Argument name	I/O	Data type	Description
enable	In	Boolean	Laser correction statuses (true: automatic correction ON, false: automatic correction OFF)

6. API Class

Details

Laser automatic correction is executed periodically (appox. one-hour interval) to stabilize the TAS7500 system.

This member function sets whether to execute this correction.

♦ Error conditions

1) The TAS7500 system is not connected.

Appendix 1. Error Messages

An exception is output if an error occurs in Remote APIs or TAS7500 system. The following shows the error codes (HResult), descriptions of them, and major causes of each error:

HResult	Description	Major cause of error
0xa0001001	Indicates that a communication error has occurred.	The server is not running. Not connected to the LAN.
0xa0001002	Indicates that the unit and/or measurement module cannot be found.	There is not a dry air unit.
0xa0001fff	Indicates that an internal error has occurred.	An error has occurred on the TAS7500 system.
0x80131505	Indicates that a timeout has occurred.	Measurement was not completed within the timeout time.
0x80070057	Indicates that an incorrect argument has been given.	An incorrect value has been entered as the mea- surement unit number.
0x80131509	Indicates that the member function cannot be executed.	There was an attempt to obtain measurement results when measurement was not executed.

The following example shows the error code (HResult) when an error has occurred and the Excel VBA for displaying the error message.

```
Sub main()
    ' Supplements the exception.
   On Error GoTo ErrorHandler
    Set api = CreateObject("ATTAS.Remote.API")
    ' Connects to the TAS7500 system.
    ' Resets the TAS7500 system.
    ' Performs measurement with the TAS7500 system.
    •
         ~ (Omitted) ~
    Exit Sub
ErrorHandler:
    ' Displays the error code (HResult).
   MsgBox(Err.Number)
   ' Displays the error message.
   MsgBox(Err.Description)
End Sub
```

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