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Agilent E5022A/B and E5023A Hard Disk Read/Write Test System

Programming Manual for E5039A/B/C

Seventh Edition

Software Revision
This manual applies directly to system which has
the software revision B.02.70 and above



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Sample Program

A sample program is installed in the PC. The sample program list is described in the programming manual.

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1 Introduction

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Introduction

Welcome to the Agilent Technologies E5022/E5023 Programming Manual for E5039A/B. This manual provides the information on bit error measurement functions of E5039A/B used for programming.

About This Manual

This manual contains the following chapters:

- Chapter 1, Introduction : gives an overview of this manual.
- Chapter 2, Programming : shows example programs in Visual Basic for E5039A/B measurement.
- Chapter 3, Function Reference for E5039A/B: provides information on bit error measurement functions.
- Appendix A, Manual Changes : provides information on changes and updated versions of the manual.

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2 Sample Program

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Example Program

This section describes the example programs for typical measurements. The sample program is saved at the directory named “c:\Program Files\Agilent\E5022\doc\vb\sample1.vbp”

As the programming manual explains, Measurement Sequence is basically divided into six steps; Initializing, Drive On, Auto Configuration, Common Setup & Precompensation Setup, Measurement and Closing. This section provides only measuement portion for bit error measurement. The other portions are described in the programming manual.

Bit Error Test Measurement

The bit error test measurement allows you to observe the bit error analysis. See Chapter 4 in the Operation Manual for its measurement definition.

Example 2-1. Sample Program

```
Private Sub CmdBer_Click()
    Const BerUserDataBitRate As Double = 120000000# ' User Data Bit Rate [bps]
    Const ReferenceClock As Double = 20000000# ' Channel IC Reference Clock

    Const BerTestPattern1 As String = "11001000" ' Test Pattern in Binary Format

    Const TrackPreambleLength As Long = 1000 ' Track Preamble Length [Byte]
    Const GapLength As Long = 55 ' Dummy if the gap length is Auto [Byte]
    Const SectPreambleLength As Long = 100 ' Sector Preamble Length [Byte]
    Const DataLength As Long = 1024 ' Data Length [Byte]
    Const NoOfSector As Integer = 10 ' Number of Sector per Track
    Const noofave As Integer = 1
    Const MeasByteCount As Double = 1000 ' Measurement Byte Count [Byte]
    Const ErrBitPerByte As Double = 1 ' Error Bit Per Byte
    '
    Dim FilterCutOffFreq As Double, FilterBoost As Double
    Dim bitLength As Long, symbol As Long, totalSector As Long, lostSector As Long
    Dim NumOfSize As Long, ErrorCount() As Long, LostCount() As Long
    Dim ber As Double, delay(2) As Double, Property1() As Double
    Dim Disp As String
    Dim IcName As String * 10
    Dim i As Integer
    ' FilterCutOffFreq = 20000000#
    ' FilterBoost = 5.5
    ' Property1(0) = xxxx
    ' Properry1(1) = xxxx
    '
    ErrorCheck hpe5022_BER_channelIcIdn_Q(HpE5022, IcName)
    ErrorCheck hpe5022_BER_userDataBitRate(HpE5022, BerUserDataBitRate)
```


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```
ErrorCheck hpe5022_BER_channelIcReferenceClock(HpE5022, ReferenceClock)
'
' Create BER Data Pattern
'
bitLength = Len(BerTestPattern1)
ErrorCheck hpe5022_BER_userPattern(HpE5022, hpe5022_BER_PAT_1, hpe5022_USER_DATA_BIN, bitLength, _
                                   BerTestPattern1)
ErrorCheck hpe5022_BER_selectPattern(HpE5022, hpe5022_BER_PAT_1)
'
' Define Track and Sector Format
'
ErrorCheck hpe5022_BER_trackFormat(HpE5022, TrackPreambleLength, NoOfSector, VI_FALSE, GapLength)
ErrorCheck hpe5022_BER_sectorFormat(HpE5022, SectPreambleLength, DataLength)
ErrorCheck hpe5022_BER_berMeasByteCount(HpE5022, MeasByteCount)
ErrorCheck hpe5022_BER_errorBitPerByte(HpE5022, ErrBitPerByte)
ErrorCheck hpe5022_BER_channelIcFirCoefReset(HpE5022)
'
' Specify Low Pass Filter
'
' ErrorCheck hpe5022_BER_channelIcLowPassFilter(HpE5022, FilterCutOffFreq, FilterBoost)
'
' Define Precompensation
'
' ErrorCheck hpe5022_BER_channelIcPrecompDelay(HpE5022, Delay(0))
ErrorCheck hpe5022_BER_channelIcPrecompState(HpE5022, VI_TRUE)
'
' Define Encorder
'
ErrorCheck hpe5022_BER_channelIcEndec(HpE5022, VI_TRUE, hpe5022_BER_ENDEC_8_9, VI_TRUE)
'
'  Define Channel IC Property
'
' ErrorCheck hpe5022_BER_channelIcProperty(HpE5022, hpe5022_BER_CIC_xxxx_PROP_xxx, Property1(0))
'
'
' Define Logging Mode
'
ErrorCheck hpe5022_BER_berDataLoggingMode(HpE5022, VI_TRUE, hpe5022_BER_RAW_DATA_ALL)
'
' Define Optimization
'
ErrorCheck hpe5022_BER_optimizeState(HpE5022, hpe5022_BER_OPT_LPF, VI_TRUE)
ErrorCheck hpe5022_BER_optimizeState(HpE5022, hpe5022_BER_OPT_FIR, VI_TRUE)
ErrorCheck hpe5022_BER_optimizeState(HpE5022, hpe5022_BER_OPT_PREC_DEL_COAR, VI_TRUE)
ErrorCheck hpe5022_BER_optimizeState(HpE5022, hpe5022_BER_OPT_PREC_DEL_FINE, VI_TRUE)
ErrorCheck hpe5022_BER_optimize(HpE5022)
'
ErrorCheck hpe5022_BER_channelIcLowPassFilter_Q(HpE5022, FilterCutOffFreq, FilterBoost)
'
```


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```
    ' Perform Measurement
    '
    ErrorCheck hpe5022_BER_measureBer(HpE5022, hpe5022_SEQ_ER_WR_M, noofave)
    '
    ' Query Test Result
    '
    ErrorCheck hpe5022_BER_ber_Q(HpE5022, ber, symbol, totalSector, lostSector)
    ErrorCheck hpe5022_BER_sectorErrorCountSize_Q(HpE5022, NumOfSize)
    ReDim ErrorCount(NumOfSize - 1)
    ReDim LostCount(NumOfSize - 1)
    ErrorCheck hpe5022_BER_sectorErrorCount_Q(HpE5022, ErrorCount(0), LostCount(0))
    '
    Disp$ = "Bit Error Rate: " + vbCrLf _
          + "BER: " + Format(ber, "0.00E-##") + vbCrLf _
          + "Symbol: " + Format(symbol, "###0") + vbCrLf _
          + "Total Sector: " + Format(totalSector, "###0") + vbCrLf _
          + "Lost Sector: " + Format(lostSector, "###0") + vbCrLf + vbCrLf _
          + "Filter Cut Off: " + Format(FilterCutOffFreq, "0.00E-##") + " Hz" + vbCrLf _
          + "Filter Boost: " + Format(FilterBoost, "0.00") + " dB" + vbCrLf
    For i = 0 To NumOfSize - 1
       Disp$ = Disp$ + Format(ErrorCount(i), "0.0") + " : " + Format(LostCount(i), "0.0") + vbCrLf
    Next i
    LblChannelICName.Caption = IcName$
    LblResult.Caption = Disp$
    '
End Sub
```

Description

The test data pattern of the bit error measurement is different from the other measurement. The “hpe5022_BER_userPattern” and “hpe5022_BER_userPattern” functions defines the pattern. The “hpe5022_BER_selectPattern” function selects the pattern.

Functions used in this measurement

“hpe5022_BER_userDataBitRate”

“hpe5022_BER_trackFormat”

“hpe5022_BER_sectorFormat”

“hpe5022_BER_selectPattern”

“hpe5022_BER_userPattern”

“hpe5022_BER_channelIc_Idn_Q”

“hpe5022_BER_channelIcReferenceClock”

“hpe5022_BER_channelIcLowPassFilter_Q”

“hpe5022_BER_channelIcFirCoefReset”

“hpe5022_BER_channelIcPrecompState”

“hpe5022_BER_channelIcEndec”

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“hpe5022_BER_optimizeState”

“hpe5022_BER_optimize”

“hpe5022_BER_berMeasByteCount”

“hpe5022_BER_errorBitPerByte”

“hpe5022_BER_berDataLoggingMode”

“hpe5022_BER_measureBer”

“hpe5022_BER_ber_Q”

“hpe5022_BER_sectorErrorCountSize_Q”

“hpe5022_BER_sectorErrorCount_Q”

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Bit Error Track Profile Measurement

The bit error track profile measurement allows you to observe read offset characteristics of the bit error rate.

Example 2-2. Sample Program

```
Private Sub CmdBerTrackProfile_Click()

    Const BerUserDataBitRate As Double = 120000000#

    Const ReferenceClock As Double = 20000000#

    '

    Const BerTestPattern1 As String = "11001000"

    '

    Const TrackPreambleLength As Long = 1000

    Const GapLength As Long = 55 ' Dummy if the gap length is Auto

    Const SectPreambleLength As Long = 100

    Const DataLength As Long = 1024

    Const NoOfSector As Integer = 32

    Const noofave As Integer = 1

    Const MeasByteCount As Double = 1000

    Const ErrBitPerByte As Double = 1

    Const otcThreshold As Double = 0.001

    '

    Const NumOfPoint As Integer = 21

    Const OffsetRange As Double = 0.000002

    '

    Dim bitLength As Long, symbol As Long, totalSector As Long, lostSector As Long

    Dim ber As Double, otc As Double, otcPos As Double, otcNeg As Double

    Dim offset(NumOfPoint - 1) As Double

    Dim result(NumOfPoint - 1) As Double

    Dim Disp As String

    Dim i As Integer

    '

    ErrorCheck hpe5022_BER_userDataBitRate(HpE5022, BerUserDataBitRate)

    ErrorCheck hpe5022_BER_channelIcReferenceClock(HpE5022, ReferenceClock)

    '

    ' Create BER Data Pattern

    '

    bitLength = Len(BerTestPattern1)

    ErrorCheck hpe5022_BER_userPattern(HpE5022, hpe5022_BER_PAT_1, hpe5022_USER_DATA_BIN, bitLength, _

                                       BerTestPattern1)

    ErrorCheck hpe5022_BER_selectPattern(HpE5022, hpe5022_BER_PAT_1)

    '

    ' Define Track and Sector Format
```


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```
'
ErrorCheck hpe5022_BER_trackFormat(HpE5022, TrackPreambleLength, NoOfSector, VI_FALSE, GapLength)
ErrorCheck hpe5022_BER_sectorFormat(HpE5022, SectPreambleLength, DataLength)
ErrorCheck hpe5022_BER_berMeasByteCount(HpE5022, MeasByteCount)
ErrorCheck hpe5022_BER_errorBitPerByte(HpE5022, ErrBitPerByte)
ErrorCheck hpe5022_BER_channelIcFirCoefReset(HpE5022)
'
' Precompensation State
'
ErrorCheck hpe5022_BER_channelIcPrecompState(HpE5022, VI_TRUE)
'
' Define Encorder
'
ErrorCheck hpe5022_BER_channelIcEndec(HpE5022, VI_TRUE, hpe5022_BER_ENDEC_8_9, VI_TRUE)
'
' Defiene OTC Threshold Level
'
ErrorCheck hpe5022_BER_otcThreshold(HpE5022, otcThreshold)
'
' Define Optimization
'
ErrorCheck hpe5022_BER_optimizeState(HpE5022, hpe5022_BER_OPT_LPF, VI_TRUE)
ErrorCheck hpe5022_BER_optimizeState(HpE5022, hpe5022_BER_OPT_FIR, VI_TRUE)
ErrorCheck hpe5022_BER_optimizeState(HpE5022, hpe5022_BER_OPT_PREC_DEL_COAR, VI_TRUE)
ErrorCheck hpe5022_BER_optimizeState(HpE5022, hpe5022_BER_OPT_PREC_DEL_FINE, VI_TRUE)
ErrorCheck hpe5022_BER_optimize(HpE5022)
'
ErrorCheck hpe5022_BER_measureTrackProfile(HpE5022, hpe5022_SEQ_ER_WR_M, hpe5022_MEAS_BER _
                                          , NumOfPoint, OffsetRange, noofave)
ErrorCheck hpe5022_executionMode(HpE5022, hpe5022_EXEC_WAIT_START)

ErrorCheck hpe5022_BER_trackProfileData_Q(HpE5022, hpe5022_DATA_BER, offset(0), result(0))
ErrorCheck hpe5022_BER_calculateOtc_Q(HpE5022, otc, otcPos, otcNeg)
Disp$ = "Bit Error Rate: " + vbCrLf _
      + "OTC: " + Format(otc, "0.00E-##") + vbCrLf _
      + "OTC Positive: " + Format(otcPos, "0.00E-##") + vbCrLf _
      + "OTC Negative: " + Format(otcNeg, "0.00E-##") + vbCrLf + vbCrLf _
      + "Offset  :  BER" + vbCrLf
For i = 0 To NumOfPoint - 1
   Disp$ = Disp$ + Format(offset(i), "0.00E-##") _
                 + " : " + Format(result(i), "0.00E-##") + vbCrLf
Next i
LblResult.Caption = Disp$
```


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```
End Sub
```

Functions used in this measurement

“hpe5022_wai”

“hpe5022_abort”

“hpe5022_executionMode”

“hpe5022_BER_userDataBitRate”

“hpe5022_BER_trackFormat”

“hpe5022_BER_sectorFormat”

“hpe5022_BER_selectPattern”

“hpe5022_BER_userPattern”

“hpe5022_BER_channelIc_Idn_Q”

“hpe5022_BER_channelIcReferenceClock”

“hpe5022_BER_channelIcLowPassFilter_Q”

“hpe5022_BER_channelIcFirCoefReset”

“hpe5022_BER_channelIcPrecompState”

“hpe5022_BER_channelIcEndec”

“hpe5022_BER_optimizeState”

“hpe5022_BER_optimize”

“hpe5022_BER_berMeasByteCount”

“hpe5022_BER_errorBitPerByte”

“hpe5022_BER_measureTrackProfile”

“hpe5022_BER_trackProfileData_Q”

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3 Function Reference

This section describes the functions related with the measurement by bit error analysis. Bit Error measurement is performed by a bit error test module. If an Agilent E5039A/B is not installed in your system, this function cannot be used.

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BER Data Pattern Definition Function

hpe5022_BER_userDataBitRate

C Syntax

ViStatus hpe5022_BER_userDataBitRate(ViSession id, ViReal64 dataRate);

Visual Basic Syntax

hpe5022_BER_userDataBitRate(ByVal id As Long, ByVal dataRate As Double) As Long

Description

This function specifies the user data bit rate. This rate represents the speed at which the user data is recorded on the media.

Parameters

- id

  Description: Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction: IN

- dataRate

  Description: Specifies the user data bit rate.

  Direction: IN

  Values

Name	Value
hpe5022_USER_BPS_MIN	50×10^6
hpe5022_USER_BPS_MAX	800×10^6

  Unit: bps (bit per second)

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘dataRate’ is out of range.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also “hpe5022_BER_userDataBitRate_Q” on page 22

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hpe5022_BER_userDataBitRate_Q

C Syntax

ViStatus hpe5022_BER_userDataBitRate_Q(ViSession id, ViPReal64 dataRate);

Visual Basic Syntax

hpe5022_BER_userDataBitRate_Q(ByVal id As Long, ByRef dataRate As Double) As Long

Description

This function returns the data bit rate specified by the “hpe5022_BER_userDataBitRate” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- dataRate

  Description — Returns the user data bit rate.

  Direction — OUT

  Unit — bps (bit per second).

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_userDataBitRate” on page 20

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hpe5022_BER_trackFormat

C Syntax

ViStatus hpe5022_BER_trackFormat(ViSession id, ViInt32 tracPre, ViInt16 sector, ViBoolean gapAuto, ViInt32 gap);

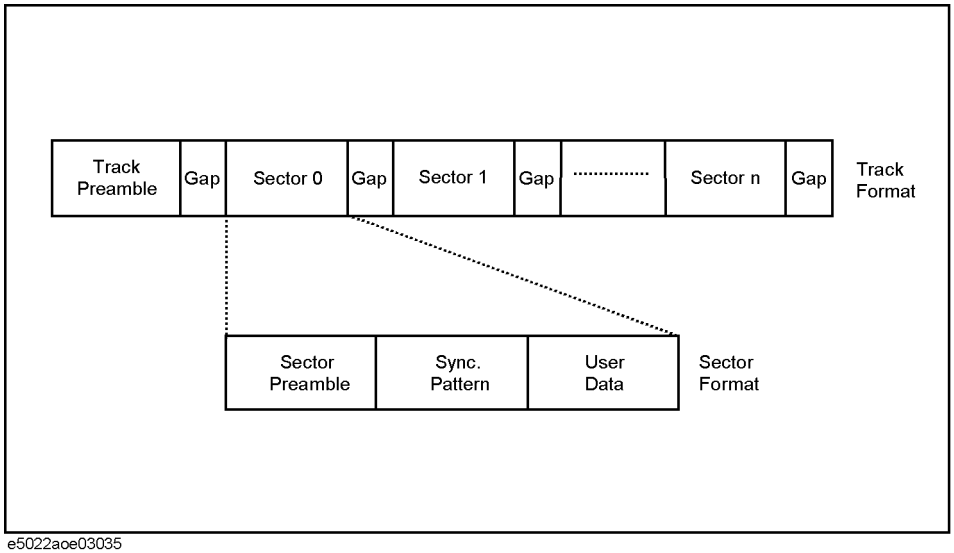
Visual Basic Syntax

hpe5022_BER_trackFormat(ByVal id As Long, ByVal tracPre As Long, ByVal sector As Integer, ByVal gapAuto As Integer, ByVal gap As Long) As Long

Description

This function specifies the track format. The track is consisted of the track preamble, sector and gap. The sector format is defined by the “hpe5022_BER_sectorFormat” function. The patterns of the track preamble and gap depends on the read channel IC.

Figure 3-1 **Track and Sector Format**



e5022aoe03035

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- tracPre

  Description — Specifies the length of the track preamble.

  Direction — IN

  Preset Value — 1000

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Values

Name	Value
hpe5022_BER_TRAC_PRE_LENG_MIN	100
hpe5022_BER_TRAC_PRE_LENG_MAX	100,000

Unit Byte

- sector

  Description Specifies the number of sectors per track.

  Direction IN

  Preset Value (hpe5022_BER_SECT_COUN_MIN)

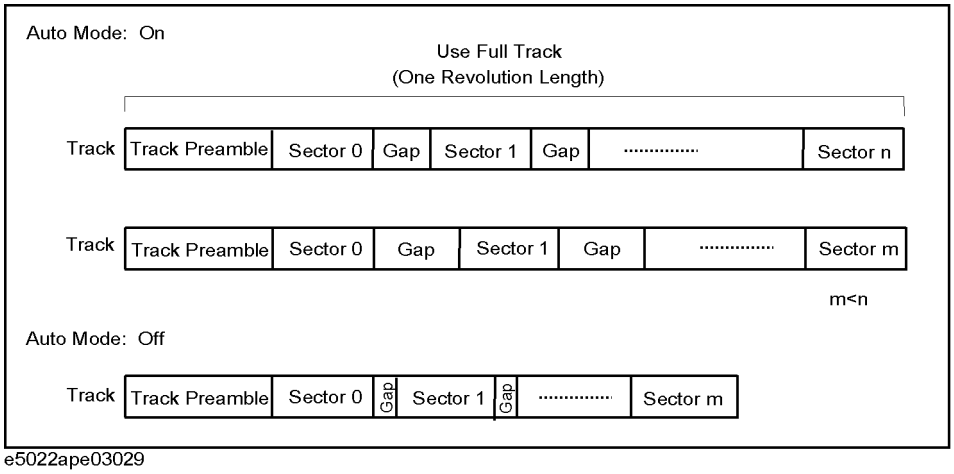
  Values

Name	Value
hpe5022_BER_SECT_COUN_MIN	1
hpe5022_BER_SECT_COUN_MAX	1024

- gapAuto

  Description Specifies the length of gap to adjust automatically. In auto mode, the length of gap is adjusted so that the data length occupies the entire track length. For example, if the number of sectors is decreased, the length of gap is extended so that the length of track does not change.

Figure 3-2 Auto Gap Length



e5022ape03029

Direction IN

Preset Value VI_FALSE

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Values

Name	Value	Description
VI_FALSE	0	auto mode is Off
VI_TRUE	1	auto mode is On

- gap

  Description: Specifies the length of the gap. When ‘gapAuto’ is set to “VI_TRUE”, this value is not valid.

  Direction: IN

  Preset Value

  Unit: Byte

  Values

Name	Value
hpe5022_BER_GAP_LENG_MIN	1
hpe5022_BER_GAP_LENG_MAX	100,000

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘tracPre’, ‘sector’, ‘gapAuto’ and/or ‘gap’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_trackFormat_Q” on page 26

“hpe5022_BER_sectorFormat” on page 28

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hpe5022_BER_trackFormat_Q

C Syntax

ViStatus hpe5022_BER_trackFormat_Q(ViSession id, ViPInt32 tracPre, ViPInt16 sector, ViPBoolean gapAuto, ViPInt32 gap);

Visual Basic Syntax

hpe5022_BER_trackFormat_Q(ByVal id As Long, ByRef tracPre As Long, ByRef sector As Integer, ByRef gapAuto As Integer, ByRef gap As Long) As Long

Description

This function returns the track format specified by the “hpe5022_BER_trackFormat” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — OUT

- tracPre

  Description — Returns the length of the track preamble.

  Direction — OUT

  Unit — Byte

- sector

  Description — Returns the number of sectors per track.

  Direction — OUT

- gapAuto

  Description — Returns the mode if the length of gap is set automatically.

  Direction — OUT

  Values — Same as ‘gapAuto’ parameter in the “hpe5022_BER_trackFormat” function.

- gap

  Description — Returns the length of the gap. When ‘gapAuto’ is set to “VI_TURE”, the value set automatically is returned.

  Direction — OUT

  Unit — Byte

Return Values

Completion Code	Description
VI_SUCCESS	No Error

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Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also “hpe5022_BER_trackFormat” on page 23

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hpe5022_BER_sectorFormat

C Syntax

ViStatus hpe5022_BER_sectorFormat(ViSession id, ViInt32 sectPre, ViInt32 data);

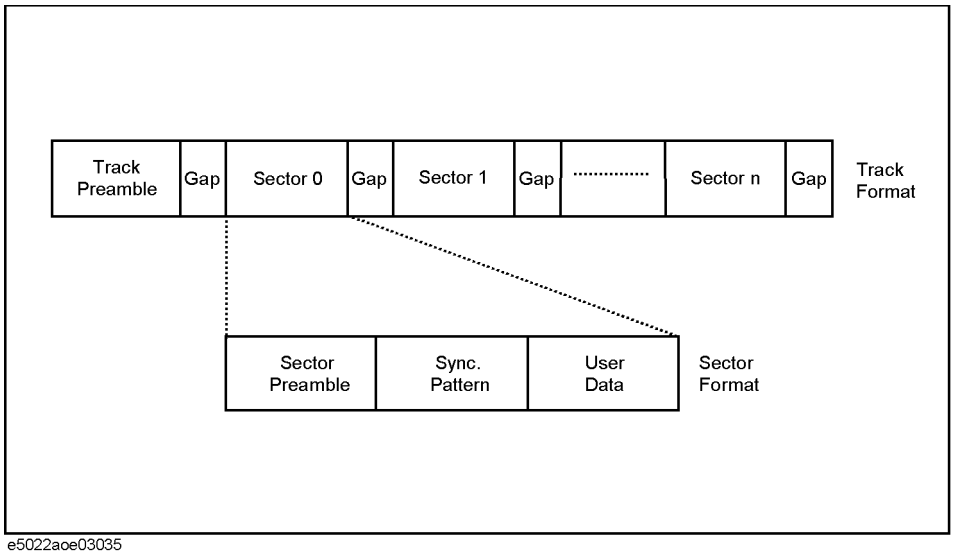
Visual Basic Syntax

hpe5022_BER_sectorFormat(ByVal id As Long, ByVal sectPre As Long, ByVal data As Long) As Long

Description

This function specifies the sector format. A sector consists of a sector preamble, a synchronize pattern and data pattern. The pattern of sector preamble depends on channel IC. The number of sectors in a track is specified by “hpe5022_BER_trackFormat”. The sector data can be extracted by the “hpe5022_BER_sectorPattern_Q” function.

Figure 3-3 Track and Sector Format



e5022aoe03035

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- sectPre

  Description — Specifies the length of the sector preamble.

  Direction — IN

  Preset Value — 100

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Values

Name	Value
hpe5022_BER_SECT_PRE_LENG_MIN	28
hpe5022_BER_SECT_PRE_LENG_MAX	50,000

Unit Byte

- data

Description Specifies the length of data.

Direction IN

Preset Value 1000

Values

Name	Value
hpe5022_BER_SECT_DATA_LENG_MIN	12
hpe5022_BER_SECT_DATA_LENG_MAX	1,000,000

Unit Byte

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘sectPre’ and/or ‘data’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_sectorFormat_Q” on page 30

“hpe5022_BER_trackFormat” on page 23

“hpe5022_BER_sectorPattern_Q” on page 44

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hpe5022_BER_sectorFormat_Q

C Syntax

ViStatus hpe5022_BER_sectorFormat_Q(ViSession id, ViPInt32 sectPre, ViPInt32 data);

Visual Basic Syntax

hpe5022_BER_sectorFormat_Q(ByVal id As Long, ByRef sectPre As Long, ByRef data As Long) As Long

Description

This function returns the sector format specified by the “hpe5022_BER_sectorFormat” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- sectPre

  Description — Returns the length of the sector preamble.

  Direction — OUT

  Unit — Byte

- data

  Description — Returns the length of data.

  Direction — OUT

  Unit — Byte

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of HP E5039A is not opened at initialize. Check if the HP E5039A is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_sectorFormat” on page 28

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hpe5022_BER_selectPattern

C Syntax

ViStatus hpe5022_BER_selectPattern(ViSession id, ViInt16 pat);

Visual Basic Syntax

hpe5022_BER_selectPattern(ByVal id As Long, ByVal pat As Integer) As Long

Description

This function selects the data pattern for bit error measurement. Agilent E5022/E5023 has six user-specified data patterns for bit error measurement. Each data pattern should be specified by either “hpe5022_BER_prbsPattern” or “hpe5022_BER_userPattern” function in advance.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- pat

  Description — Selects the data pattern number to be used.

  Direction — IN

  Preset Value — hpe5022_BER_PAT_1 (31)

  Values

Name	Value	Description
hpe5022_BER_PAT_1	31	BER pattern 1
hpe5022_BER_PAT_2	32	BER pattern 2
hpe5022_BER_PAT_3	33	BER pattern 3
hpe5022_BER_PAT_4	34	BER pattern 4
hpe5022_BER_PAT_5	35	BER pattern 5
hpe5022_BER_PAT_6	36	BER pattern 6

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘pat’ is out of range.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_selectPattern_Q” on page 33

“hpe5022_BER_prbsPattern” on page 34

“hpe5022_BER_userPattern” on page 38

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hpe5022_BER_selectPattern_Q

C Syntax

ViStatus hpe5022_BER_selectPattern_Q(ViSession id, ViPInt16 pat);

Visual Basic Syntax

hpe5022_BER_selectPattern_Q(ByVal id As Long, ByRef pat As Integer) As Long

Description

This function returns the selected data pattern for bit error measurement by “hpe5022_BER_selectPattern” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- pat

  Description — Returns the selected data pattern for bit error measurement.

  Direction — OUT

  Values — Same as ‘pat’ parameter in the “hpe5022_BER_selectPattern” function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_selectPattern” on page 31

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hpe5022_BER_prbsPattern

C Syntax

ViStatus hpe5022_BER_prbsPattern(ViSession id, ViInt16 pat, ViInt32 rand_coef, ViInt32 rand_init);

Visual Basic Syntax

hpe5022_BER_prbsPattern(ByVal id As Long, ByVal pat As Integer, ByVal rand_coef As Long, ByVal rand_init As Long) As Long

Description

This function configures the PRBS (pseudo random bit sequence) pattern and assigns the data pattern number. The “hpe5022_BER_selectPattern” function selects the data pattern number to be used for bit error measurement.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- pat

  Description — Selects the data pattern number to be assigned.

  Direction — IN

  Values — Same as ‘pat’ parameter in the “hpe5022_BER_selectPattern” function.

- rand_coef

  Description — Specifies the coefficients of the pseudo random sequence’s generating polynomial. LSB represents the 0’th order coefficient of the generating polynomial. This function can generate a pseudo random data up to a maximum of 16th order.

  Direction — IN

  Preset Value — 137 (X^7+X^3+1)

  Values

Name	Value
hpe5022_BER_RAND_COEF_MIN	3
hpe5022_BER_RAND_COEF_MAX	65535

- rand_init

  Description — Specifies the initial value of the pseudo random generator.

  Direction — IN

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Values

Name	Value
hpe5022_BER_RAND_INIT_MIN	1
hpe5022_BER_RAND_INIT_MAX	65535

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid
hpe5022_ERROR_INV_PARAMETER	The following parameter ‘pat’, ‘rand_coef’ and/or ‘rand_init’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_selectPattern” on page 31

“hpe5022_BER_prbsPattern_Q” on page 36

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hpe5022_BER_prbsPattern_Q

C Syntax

ViStatus hpe5022_BER_prbsPattern_Q(ViSession id, ViInt16 pat, ViPInt32 rand_coef, ViPInt32 rand_init);

Visual Basic Syntax

hpe5022_BER_prbsPattern_Q(ByVal id As Long, ByVal pat As Integer, ByRef rand_coef As Long, ByRef rand_init As Long) As Long

Description

This function returns the PRBS pattern configuration.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- pat

  Description — Selects the data pattern number.

  Direction — IN

  Values — Same as ‘pat’ parameter in the “hpe5022_BER_selectPattern” function.

- rand_coef

  Description — Returns the pseudo-random sequence of the generating polynomial.

  Direction — OUT

- rand_init

  Description — Returns the initial value of the pseudo-random generator.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid
hpe5022_ERROR_INV_PARAMETER	The parameter ‘pat’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of HP E5039A is not opened at initialize. Check if the HP E5039A is included in the rsrcArray of the "hpe5022_init" function.

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Error Code	Description
hpe5022_ERROR_PAT_MISMATCH	The selected pattern is a user defined data pattern. Use the "hpe5022_BER_userPattern_Q" function instead of this function.

See Also

"hpe5022_BER_prbsPattern" on page 34

"hpe5022_BER_selectPattern" on page 31

"hpe5022_BER_userPattern_Q" on page 40

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hpe5022_BER_userPattern

C Syntax

ViStatus hpe5022_BER_userPattern(ViSession id, ViInt16 pat, ViInt16 dataForm, ViInt32 bitLength, const ViChar data[]);

Visual Basic Syntax

hpe5022_BER_userPattern(ByVal id As Long, ByVal pat As Integer, ByVal dataForm As Integer, ByVal bitLength As Long, ByVal data As String) As Long

Description

This function specifies the user-defined data pattern. This data pattern is not the channel data but the user data. The “hpe5022_BER_selectPattern” function selects the data pattern.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- pat

  Description — Selects the data pattern to be assigned

  Direction — IN

  Values — Same as ‘pat’ parameter in the “hpe5022_BER_selectPattern” function.

- dataForm

  Description — Selects the format of ‘data’ parameter. Hexadecimal or binary format are available.

  Direction — IN

  Values

Name	Value	Description
hpe5022_USER_DATA_HEX	0	Hexadecimal format (0-F or 0-f)
hpe5022_USER_DATA_BIN	1	Binary format (0,1)

- bitLength

  Description — Specifies the user-defined data bit length.

  Direction — IN

  Preset Value — 1 (in binary format, for all BER user data pattern)

  Unit — Bit

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Values

Name	Value
hpe5022_PAT_LENGTH_MIN	1
hpe5022_PAT_LENGTH_MAX	32,768

- data

  Description — Specifies the user-defined data. In case of the hexadecimal format, the data is generated from the most significant bit to the least significant bit.

  Direction — IN

  Preset Value — 1 (in binary format, for all BER user data pattern)

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘pat’, ‘dataForm’ ‘bitLength’ and/or ‘data’ is out of range.
hpe5022_ERROR_INV_DATA_SIZE	The length of the ‘data’ is shorter than the ‘ bitlength’. Check the data length
hpe5022_ERROR_INV_DATA_TYPE	‘ data’ includes an invalid character. Check the data.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_selectPattern” on page 31

“hpe5022_BER_userPattern_Q” on page 40

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hpe5022_BER_userPattern_Q

C Syntax

ViStatus hpe5022_BER_userPattern_Q(ViSession id, ViInt16 pat, ViInt16 dataForm, ViPInt32 bitLength, ViChar data);

Visual Basic Syntax

hpe5022_BER_userPattern_Q(ByVal id As Long, ByVal pat As Integer, ByVal dataForm As Integer, ByRef bitLength As Long, ByVal data As String) As Long

Description

This function returns the user-defined data pattern specified by the “hpe5022_BER_userPattern” function. When the selected data pattern is defined by the “hpe5022_BER_prbsPattern”, the data bit stream is returned by this function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- pat

  Description — Selects the data pattern number.

  Direction — IN

  Values — Same as ‘pat’ parameter in the “hpe5022_BER_selectPattern” function.

- dataForm

  Description — Selects the format of ‘data’ parameter. Hexadecimal or binary formats are available.

  Direction — IN

  Values — Same as ‘dataForm’ parameter in the “hpe5022_BER_userPattern” function.

- bitLength

  Description — Returns the user-defined data bit length.

  Direction — OUT

  Unit — Bit

- data

  Description — Returns the user-defined data. When the ‘dataForm’ parameter is set to “hpe5022_USER_DATA_HEX”, the returned data is in Hexadecimal format. When the ‘dataForm’ parameter is set to “hpe5022_USER_DATA_BIN”, the returned data is in binary format.

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Direction OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘pat’ and/or ‘dataForm’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_userPattern” on page 38

“hpe5022_BER_selectPattern” on page 31

“hpe5022_BER_prbsPattern_Q” on page 36

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hpe5022_BER_patternType_Q

C Syntax

ViStatus hpe5022_BER_patternType_Q(ViSession id, ViInt16 pat, ViPInt16 patType);

Visual Basic Syntax

hpe5022_BER_patternType_Q(ByVal id As Long, ByVal pat As Integer, ByRef patType As Integer) As Long

Description

This function returns the type of data pattern, i.e. user data pattern or pseudo random sequence data pattern.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- pat

  Description — Selects the data pattern number to query the type of data pattern.

  Direction — IN

  Values — Same as ‘pat’ parameter in the “hpe5022_BER_selectPattern” function.

- patType

  Description — Returns the type of data pattern.

  Direction — OUT

  Values

Name	Value	Description
hpe5022_BER_PAT_TYPE_PRBS	1	PRBS Data Pattern
hpe5022_BER_PAT_TYPE_USER	2	User Data Pattern

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘pat’ is out of range.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also “hpe5022_BER_selectPattern” on page 31

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hpe5022_BER_sectorPattern_Q

C Syntax

ViStatus hpe5022_BER_sectorPattern_Q (ViSession id, ViInt16 pat, ViInt16 sector, ViChar data[]);

Visual Basic Syntax

hpe5022_BER_sectorPattern_Q(ByVal id As Long, ByVal pat As Integer, ByVal sector As Integer, ByVal data As String) As Long

Description

This function returns the data pattern in the specified sector of the specified data pattern.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- pat

  Description — Selects the data pattern number to query data pattern.

  Direction — IN

  Values — Same as 'pat' parameter in the "hpe5022_BER_selectPattern" function.

- sector

  Description — Specifies the sector number to query. The sector number begins at 0. The number of sectors is specified by the "hpe5022_BER_trackFormat" function.

  Direction — IN

- data

  Description — Returns the data pattern in the specified sector. The data is in hexadecimal format.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'pat' and/or 'sector' is out of range.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_selectPattern” on page 31

“hpe5022_BER_trackFormat” on page 23

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hpe5022_BER_adjacentTrackPattern

C Syntax

ViStatus hpe5022_BER_adjacentTrackPattern(ViSession id, ViInt16 backAdjType, ViInt16 backAdjPat, ViReal64 backAdjPos, ViInt16 foreAdjType, ViInt16 foreAdjPat, ViReal64 foreAdjPos);

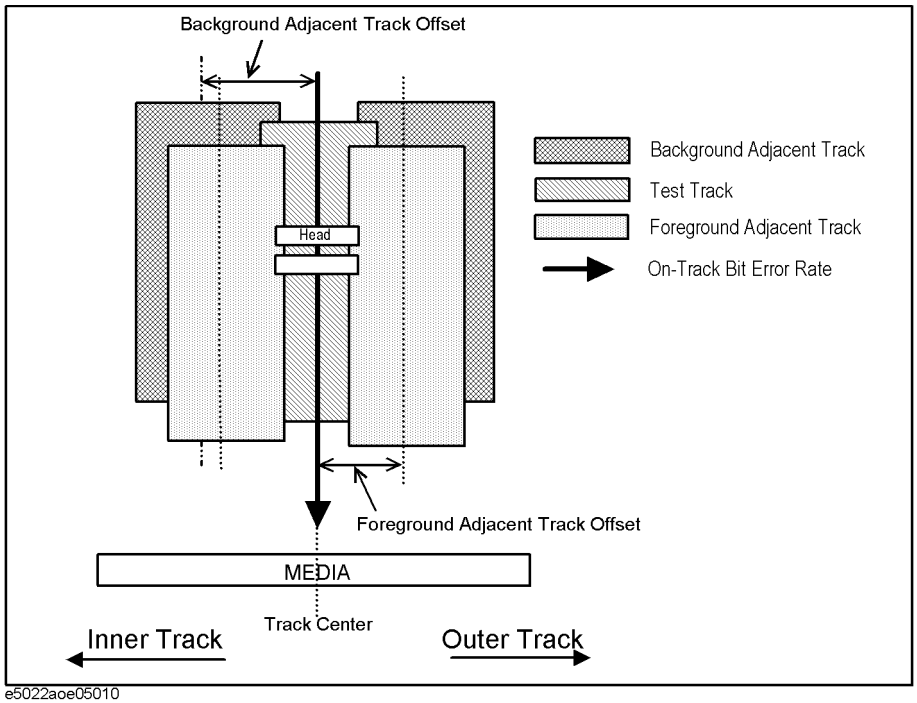
Visual Basic Syntax

hpe5022_BER_adjacentTrackPattern(ByVal id As Long, ByVal backAdjType As Integer, ByVal backAdjPat As Integer, ByVal backAdjPos As Integer, ByVal foreAdjType As Integer, ByVal foreAdjPat As Integer, ByVal foreAdjPos As Integer) As Long

Description

This function is used to set up the background and foreground adjacent track configurations for ‘On-Track BER’ and ‘Bathtub’ measurements.

Figure 3-4 Adjacent Track Position



Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- backAdjType

  Description — Specifies the type of background adjacent track.

  Direction — IN

  Preset Value — hpe5022_BER_ADJACENT_TRACK_NONE

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Values

Types of Background Adjacent Track	Value
hpe5022_BER_ADJACENT_TRACK_NONE	0
hpe5022_BER_ADJACENT_TRACK_INNER	1
hpe5022_BER_ADJACENT_TRACK_OUTER	2
hpe5022_BER_ADJACENT_TRACK_BOTH	3

- backAdjPat

  Description Specifies the type of data pattern of the background adjacent track.

  Direction IN

  Preset Value hpe5022_BER_PAT_2

  Values

Data Pattern	Value
hpe5022_BER_PAT_1	31
hpe5022_BER_PAT_2	32
hpe5022_BER_PAT_3	33
hpe5022_BER_PAT_4	34
hpe5022_BER_PAT_5	35

- backAdjPos

  Description Specifies the write offset position where the background adjacent track is to be written. See Figure 3-4.

  Direction IN

  Preset Value 1.0×10^{-6}

  Value

Condition
0 ≤ **backAdjPos** ≤ hpe5022_TRACK_OFFSET_MAX where, hpe5022_TRACK_OFFSET_MAX = 6.0×10^{-6}

  Unit Meter

- foreAdjType

  Description Specifies the type of foreground adjacent track.

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Direction IN

Preset Value hpe5022_BER_ADJACENT_TRACK_NONE

Values

Types of Foreground Adjacent Track	Value
hpe5022_BER_ADJACENT_TRACK_NONE	0
hpe5022_BER_ADJACENT_TRACK_INNER	1
hpe5022_BER_ADJACENT_TRACK_OUTER	2
hpe5022_BER_ADJACENT_TRACK_BOTH	3

- foreAdjPat

  Description Specifies the type of data pattern of the foreground adjacent track.

  Direction IN

  Preset Value hpe5022_BER_PAT_2

  Values

Data Pattern	Value
hpe5022_BER_PAT_1	31
hpe5022_BER_PAT_2	32
hpe5022_BER_PAT_3	33
hpe5022_BER_PAT_4	34
hpe5022_BER_PAT_5	35

- foreAdjPos

  Description Specifies the write offset position where the foreground adjacent track is to be written. See Figure 3-4.

  Direction IN

  Preset Value 1.0×10^{-6}

  Value

Condition
$0 \le$ **foreAdjPos** $\le$ hpe5022_TRACK_OFFSET_MAX where, hpe5022_TRACK_OFFSET_MAX = 6.0×10^{-6}

  Unit Meter

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameters ‘backAdjType’, ‘backAdjPat’, ‘backAdjPos’ , ‘foreAdjType’, ‘foreAdjPat’ and/or ‘foreAdjPos’are out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_adjacentTrackPattern_Q” on page 50

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hpe5022_BER_adjacentTrackPattern_Q

C Syntax

ViStatus hpe5022_BER_adjacentTrackPattern_Q(ViSession id, ViPInt16 backAdjType, ViPInt16 backAdjPat, ViPReal64 backAdjPos, ViPInt16 foreAdjType, ViPInt16 foreAdjPat, ViPReal64 foreAdjPos);

Visual Basic Syntax

hpe5022_BER_adjacentTrackPattern_Q(ByVal id As Long, ByRef backAdjType As Integer, ByRef backAdjPat As Integer, ByRef backAdjPos As Double, ByRef foreAdjType As Integer, ByRef foreAdjPat As Integer, ByRef foreAdjPos As Double) As Long

Description

This function reports the set up background and foreground adjacent track configurations for ‘On-track BER’ and ‘Bathtub’ measurements.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- backAdjType

  Description — Returns the type of background adjacent track.

  Direction — OUT

- backAdjPat

  Description — Returns the type of data pattern of the background adjacent track.

  Direction — OUT

- backAdjPos

  Description — Returns the write offset position where the background adjacent track is written.

  Direction — OUT

- foreAdjType

  Description — Returns the type of foreground adjacent track.

  Direction — OUT

- foreAdjPat

  Description — Retuns the type of data pattern of the foreground adjacent track.

  Direction — OUT

- foreAdjPos

  Description — Returns the write offset position where the foreground

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adjacent track is written.

Direction OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_adjacentTrackPattern” on page 46

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hpe5022_BER_triggerDelayTime

C Syntax

ViStatus hpe5022_BER_triggerDelayTime(ViSession id, ViReal64 time);

Visual Basic Syntax

hpe5022_BER_triggerDelayTime(ByVal id As Long, ByVal time As Double) As Long

Description

This function specifies the trigger delay time from the index of the spinstand.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- time

  Description — Specifies the trigger delay time in second.

  Direction — IN

  Preset Value — 200 x 10^{-6} [sec]

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'time' is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_triggerDelayTime_Q" on page 53

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hpe5022_BER_triggerDelayTime_Q

C Syntax

ViStatus hpe5022_BER_triggerDelayTime_Q(ViSession id, ViPReal64 time);

Visual Basic Syntax

hpe5022_BER_triggerDelayTime_Q(ByVal id As Long, ByRef time As Double) As Long

Description

This function returns the trigger delay time from the index of the spinstand.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- time

  Description — Returns the trigger delay time specified in the "hpe5022_BER_triggerDelayTime" function.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_triggerDelayTime" on page 52

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hpe5022_BER_userSyncPattern

C Syntax

ViStatus hpe5022_BER_userSyncPattern(ViSession id, ViInt16 dataForm, ViInt16 fieldLength, ViInt32 bitLength, const ViChar data[]);

Visual Basic Syntax

hpe5022_BER_userSyncPattern(ByVal id As Long, ByVal dataForm As Integer, ByVal fieldLength As Integer, ByVal bitLength As Long, ByVal data As String) As Long

Description

This function is used to specify the user-defined synchronized pattern. This function is available only for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- dataForm

  Description — Specifies the format of data.

  Direction — IN

  Values

Name	Value	Description
hpe5022_BER_DATA_HEX	0	Hexadecimal format (0-F or 0-f)
hpe5022_BER_DATA_BIN	1	Binary format (0, 1)

- fieldLength

  Description — Specifies the user-defined synchronized field length. This value is the distance between the first synchronized mark end and user data pattern start in bytes.

  Direction — IN

  Preset Value — hpe5022_BER_USER_SYNC_FIELD_LENGTH_MIN

  Values

Name	Value
hpe5022_BER_SYNC_FIELD_LENGTH_MIN	0
hpe5022_BER_SYNC_FIELD_LENGTH_MAX	256

- bitLength

  Description — Specifies the user-defined synchronized pattern bit length. If this value is 0, the user-defned synchronized pattern is

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disabled.

Direction IN

Preset Value hpe5022_BER_SYNC_PATT_LENGTH_MIN

Value

Name	Value
hpe5022_BER_SYNC_PATT_LENGTH_MIN	0
hpe5022_BER_SYNC_PATT_LENGTH_MAX	32

- data

  Description Specifies the user-defined synchronized pattern data. User-defined synchronized pattern bit sequence is generated MSB first and LSB last in hexadecimal data format.

  Direction IN

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

"hpe5022_BER_userSyncPattern_Q" on page 56"

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hpe5022_BER_userSyncPattern_Q

C Syntax

ViStatus hpe5022_BER_userSyncPattern_Q(ViSession id, ViInt16 dataForm, ViPInt16 fieldLength, ViPInt32 bitLength, ViChar data[]);

Visual Basic Syntax

hpe5022_BER_userSyncPattern_Q(ByVal id As Long, ByVal dataForm As Integer, ByRef fieldLength As Integer, ByRef bitLength As Long, ByVal data As String) As Long

Description

This function queries the user-defined synchronized pattern. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- dataForm

  Description — Specifies the format of data to be returned.

  Direction — IN

  Values

Name	Value	Description
hpe5022_BER_DATA_HEX	0	Hexadecimal format (0-F or 0-f)
hpe5022_BER_DATA_BIN	1	Binary format (0, 1)

- fieldLength

  Description — Returns the user-defined synchronized field length in bytes.

  Direction — OUT

- bitLength

  Description — Returns the user-defined synchronized pattern bit length.

  Direction — OUT

- data

  Description — Returns the user-defined synchronized pattern data.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

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Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C cannot be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also “hpe5022_BER_userSyncPattern” on page 54“

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hpe5022_BER_userSyncPatternState

C Syntax

ViStatus hpe5022_BER_userSyncPatternState(ViSession id, ViBoolean state);

Visual Basic Syntax

hpe5022_BER_userSyncPatternState(ByVal id As Long, ByVal state As Integer) As Long

Description

This function specifies the state of the user-defined synchronized pattern. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction IN

- state

  Description Specifies the state of the user-defined synchronized pattern.

  Direction IN

  Values

Name	Value	Description
VI_TRUE	1	The user-defined synchronized pattern specified by hpe5022_BER_userSyncPattern function is enable.
VI_FALSE	0	The user-defined synchronized pattern specified by hpe5022_BER_userSyncPattern function is disable.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_userSyncPatternState_Q” on page 59“

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hpe5022_BER_userSyncPatternState_Q

C Syntax

ViStatus hpe5022_BER_userSyncPatternState_Q(ViSession id, ViPBoolean state);

Visual Basic Syntax

hpe5022_BER_userSyncPatternState_Q(ByVal id As Long, ByRef state As Integer) As Long

Description

This function returns the state of the user-defined synchronized pattern. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction IN

- state

  Description Returns the state of the user-defined synchronized pattern.

  Direction OUT

  Values

Name	Value	Description
VI_TRUE	1	The user-defined synchronized pattern specified by hpe5022_BER_userSyncPattern function is enable.
VI_FALSE	0	The user-defined synchronized pattern specified by hpe5022_BER_userSyncPattern function is disable.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_userSyncPatternState” on page 58“

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hpe5022_BER_sectorState

C Syntax

ViStatus hpe5022_BER_sectorState(ViSession id, ViInt16 sector, ViBoolean state);

Visual Basic Syntax

hpe5022_BER_sectorState(ByVal id As Long, ByVal sector As Integer, ByVal state As Integer) As Long

Description

This function specifies the read state of specified sector in read operation. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction IN

- sector

  Description Specifies the sector number.

  Direction IN

  Values

Name	Value
Minimum Sector Number	0
Maximum Sector Number	hpe5022_BER_SECT_COUN_MAX – 1

- state

  Description Specifies the read state of sector.

  Direction IN

  Preset Value VI_TRUE

  Values

Name	Value	Description
VI_TRUE	1	The specified sector is read normally.
VI_FALSE	0	The specified sector is skipped to read.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

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Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘sector’ and/or ‘state’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also “hpe5022_BER_sectorState_Q” on page 62“

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hpe5022_BER_sectorState_Q

C Syntax

ViStatus hpe5022_BER_sectorState_Q(ViSession id, ViInt16 sector, ViPBoolean state);

Visual Basic Syntax

hpe5022_BER_sectorState_Q(ByVal id As Long, ByVal sector As Integer, ByRef state As Integer) As Long

Description

This function returns the read state of specified sector in read operation. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction IN

- sector

  Description Specifies the sector number.

  Direction IN

  Values

Name	Value
Minimum Sector Number	0
Maximum Sector Number	hpe5022_BER_SECT_COUN_MAX – 1

- state

  Description Returns the read state of the sector.

  Direction OUT

  Values

Name	Value	Description
VI_TRUE	1	The specified sector is read normally.
VI_FALSE	0	The specified sector is skipped to read.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

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Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘sector’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also “hpe5022_BER_sectorState” on page 60“

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hpe5022_BER_sectorStateReset

C Syntax

ViStatus hpe5022_BER_sectorStateReset(ViSession id);

Visual Basic Syntax

hpe5022_BER_sectorStateReset(ByVal id As Long) As Long

Description

This function sets all sector state to reset value (i.e. VI_TRUE). This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

"hpe5022_BER_sectorState" on page 60"

"hpe5022_BER_sectorState_Q" on page 62"

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hpe5022_BER_sectorCount

C Syntax

ViStatus hpe5022_BER_sectorCount(ViSession id, ViInt16 sector);

Visual Basic Syntax

hpe5022_BER_sectorCount(ByVal id As Long, ByVal sector As Integer) As Long

Description

This function specifies the number of sectors.

Parameters

- id

  Description: Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction: IN

- sector

  Description: Specifies the number of sectors per track.

  Direction: IN

  Preset Value: (hpe5022_BER_SECT_COUN_MIN)

  Values

Name	Value
hpe5022_BER_SECT_COUN_MIN	1
hpe5022_BER_SECT_COUN_MAX	1024

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'tracPre', 'sector', 'gapAuto' and/or 'gap' is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_sectorCount_Q" on page 66

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hpe5022_BER_sectorCount_Q

C Syntax

ViStatus hpe5022_BER_sectorCount_Q(ViSession id, ViPInt16 sector);

Visual Basic Syntax

hpe5022_BER_sectorCount_Q(ByVal id As Long, ByRef sector As Integer) As Long

Description

This function returns the number of sectors.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — OUT

- sector

  Description — Returns the number of sectors per track.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_sectorCount" on page 65

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hpe5022_BER_sectorGatePeriod

C Syntax

ViStatus hpe5022_BER_sectorGatePeriod(ViSession id, ViReal64 period);

Visual Basic Syntax

hpe5022_BER_sectorGatePeriod(ByVal id As Long, ByVal period As Double) As Long

Description

This function specifies the sector gate period. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- period

  Description — Specifies the sector gate period in seconds.

  Direction — IN

  Preset Value — hpe5022_BER_GATE_PERIOD_MIN

  Values

Name	Value
hpe5022_BER_GATE_PERIOD_MIN	10×10^{-6}
hpe5022_BER_GATE_PERIOD_MAX	26×10^{-3}

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_INV_PARAMETER	The parameter 'period' is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

"hpe5022_BER_sectorGatePeriod_Q" on page 68"

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hpe5022_BER_sectorGatePeriod_Q

C Syntax

ViStatus hpe5022_BER_sectorGatePeriod_Q(ViSession id, ViPReal64 period);

Visual Basic Syntax

hpe5022_BER_sectorGatePeriod_Q(ByVal id As Long, ByRef period As Double) As Long

Description

This function returns the sector gate period. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- period

  Description — Returns the sector gate period in seconds.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_sectorGatePeriod” on page 67“

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hpe5022_BER_writeGate

C Syntax

ViStatus hpe5022_BER_writeGate(ViSession id, ViReal64 trigDelay, ViReal64 aperture);

Visual Basic Syntax

hpe5022_BER_writeGate(ByVal id As Long, ByVal trigDelay As Double, ByVal aperture As Double) As Long

Description

This function specifies the write gate delay and aperture time. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- trigDelay

  Description — Specifies the write gate delay time in seconds.

  Direction — IN

  Preset Value — hpe5022_BER_GATE_DEL_MIN

  Values

Name	Value
hpe5022_BER_GATE_DEL_MIN	125×10^{-9}
hpe5022_BER_GATE_DEL_MAX	25×10^{-3}

- aperture

  Description — Specifies the write gate aperture time in seconds.

  Direction — IN

  Preset Value — hpe5022_BER_GATE_APER_MIN

  Values

Name	Value
hpe5022_BER_GATE_APER_MIN	1×10^{-6}
hpe5022_BER_GATE_APER_MAX	25×10^{-3}

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘trigDelay’ and/or ‘aperture’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_writeGate_Q” on page 71“

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hpe5022_BER_writeGate_Q

C Syntax

ViStatus hpe5022_BER_writeGate_Q(ViSession id, ViPReal64 trigDelay, ViPReal64 aperture);

Visual Basic Syntax

hpe5022_BER_writeGate_Q(ByVal id As Long, ByRef trigDelay As Double, ByRef aperture As Double) As Long

Description

This function returns the write gate delay and aperture time. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- trigDelay

  Description — Returns the write gate delay time in seconds.

  Direction — OUT

- aperture

  Description — Returns the write gate aperture time in seconds.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

"hpe5022_BER_writeGate" on page 69"

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hpe5022_BER_readGate

C Syntax

ViStatus hpe5022_BER_readGate(ViSession id, ViReal64 trigDelay, ViReal64 aperture);

Visual Basic Syntax

hpe5022_BER_readGate(ByVal id As Long, ByVal trigDelay As Double, ByVal aperture As Double) As Long

Description

This function specifies the read gate delay and aperture time. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- trigDelay

  Description — Specifies the read gate delay time in seconds.

  Direction — IN

  Preset Value — hpe5022_BER_GATE_DEL_MIN

  Values

Name	Value
hpe5022_BER_GATE_DEL_MIN	125×10^{-9}
hpe5022_BER_GATE_DEL_MAX	25×10^{-3}

- aperture

  Description — Specifies the read gate aperture time in seconds.

  Direction — IN

  Preset Value — hpe5022_BER_GATE_APER_MIN

  Values

Name	Value
hpe5022_BER_GATE_APER_MIN	1×10^{-6}
hpe5022_BER_GATE_APER_MAX	25×10^{-3}

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘trigDelay’ and/or ‘aperture’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_readGate_Q” on page 74“

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hpe5022_BER_readGate_Q

C Syntax

ViStatus hpe5022_BER_readGate_Q(ViSession id, ViPReal64 trigDelay, ViPReal64 aperture);

Visual Basic Syntax

hpe5022_BER_readGate_Q(ByVal id As Long, ByRef trigDelay As Double, ByRef aperture As Double) As Long

Description

This function returns the read gate delay and aperture time. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- trigDelay

  Description — Returns the read gate delay time in seconds.

  Direction — OUT

- aperture

  Description — Returns the read gate aperture time in seconds.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_readGate” on page 72“

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hpe5022_BER_syncWindow

C Syntax

ViStatus hpe5022_BER_syncWindow(ViSession id, ViReal64 window);

Visual Basic Syntax

hpe5022_BER_syncWindow(ByVal id As Long, ByVal window As Double) As Long

Description

This function specifies the time to search the synchronized pattern from the read gate start. If the synchronized pattern is not detected during this time, the sector is considered as a lost sector. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- window

  Description — Specifies the time to search the synchronized pattern from the read gate start point in seconds.

  Direction — IN

  Preset Value — hpe5022_BER_SYNC_WINDOW_MIN

  Values

Name	Value
hpe5022_BER_SYNC_WINDOW_MIN	1×10^{-6}
hpe5022_BER_SYNC_WINDOW_MAX	25×10^{-3}

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'window' is out of range.

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Error Code	Description
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also “hpe5022_BER_syncWindow_Q” on page 77“

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hpe5022_BER_syncWindow_Q

C Syntax

ViStatus hpe5022_BER_syncWindow_Q(ViSession id, ViPReal64 window);

Visual Basic Syntax

hpe5022_BER_syncWindow_Q(ByVal id As Long, ByRef window As Double) As Long

Description

This function returns the time to search the synchronized pattern from the read gate start. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- window

  Description — Returns the time to search the synchronized pattern from the read gate start point in seconds.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

"hpe5022_BER_syncWindow" on page 75"

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hpe5022_BER_syncWindowMode

C Syntax

ViStatus hpe5022_BER_syncWindowMode(ViSession id, ViInt16 mode);

Visual Basic Syntax

hpe5022_BER_syncWindowMode(ByVal id As Long, ByVal mode As Integer) As Long

Description

This function specifies the synchronized pattern window mode (auto or manual). If the auto mode is selected, synchronized pattern window is set to the read gate aperture time. If the manual mode is selected, synchronized pattern window is set to the value specified by “hpe5022_BER_syncWindow” function. This “hpe5022_BER_syncWindowMode” function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- mode

  Description — Specifies the synchronized pattern window mode (auto or manual).

  Direction — IN

  Preset Value — (hpe5022_BER_SYNC_WINDOW_MODE_AUTO)

  Values

Name	Value
hpe5022_BER_SYNC_WINDOW_MODE_AUTO	0
hpe5022_BER_SYNC_WINDOW_MODE_MAN	1

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.

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Error Code	Description
hpe5022_ERROR_INV_PARAMETER	The parameter ‘mode’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also “hpe5022_BER_syncWindowMode” on page 78“

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hpe5022_BER_syncWindowMode_Q

C Syntax

ViStatus hpe5022_BER_syncWindowMode_Q(ViSession id, ViPInt16 mode);

Visual Basic Syntax

hpe5022_BER_syncWindowMode_Q(ByVal id As Long, ByRef mode As Integer) As Long

Description

This function returns the synchronized pattern window mode (auto or manual). This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- mode

  Description — Returns the synchronized pattern window mode (auto or manual).

  Direction — OUT

  Values — Same as ‘mode’ parameter in the “hpe5022_BER_syncWindowMode” function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_syncWindowMode” on page 78“

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Channel IC Configuration Function

hpe5022_BER_channelIc_Idn_Q

C Syntax

ViStatus hpe5022_BER_channelIcIdn_Q(ViSession id, ViPString chip);

Visual Basic Syntax

hpe5022_BER_channelIcIdn_Q(ByVal id As Long, ByVal chip As String) As Long

Description

This function returns the name of the installed channel IC.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- chip

  Description — Returns the name of the installed channel IC.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

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hpe5022_BER_channelIcReferenceClock

C Syntax

ViStatus hpe5022_BER_channelIcReferenceClock(ViSession id, ViReal64 clk);

Visual Basic Syntax

hpe5022_BER_channelIcReferenceClock(ByVal id As Long, ByVal clk As Double) As Long

Description

This function specifies the reference clock of the time base generator.

Parameters

- id

  Description: Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction: IN

- clk

  Description: Specifies the reference clock.

  Direction: IN

  Values

Name	Value
hpe5022_BER_REF_CLOC_MIN	1×10^{6}
hpe5022_BER_REF_CLOC_MAX	100×10^{6}

  Unit: Hz

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'clk' is out of range.
hpe5022_ERROR_NOT_INIT	The resource of HP E5039A is not opened at initialize. Check if the HP E5039A is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_channelIcReferenceClock_Q" on page 56

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hpe5022_BER_channelIcReferenceClock_Q

C Syntax

ViStatus hpe5022_BER_channelIcReferenceClock_Q(ViSession id, ViPReal64 clk);

Visual Basic Syntax

hpe5022_BER_channelIcReferenceClock_Q(ByVal id As Long, ByRef clk As Double) As Long

Description

This function returns the time base generator's reference clock specified by the "hpe5022_BER_channelIcReferenceClock" function.

Parameters

- id

  Description: Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction: IN

- clk

  Description: Returns the reference clock.

  Direction: OUT

  Unit: Hz

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_channelIcReferenceClock" on page 55

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hpe5022_BER_channelIcLowPassFilter

C Syntax

ViStatus hpe5022_BER_channelIcLowPassFilter(ViSession id, ViReal64 fc, ViReal64 boost);

Visual Basic Syntax

hpe5022_BER_channelIcLowPassFilter(ByVal id As Long, ByVal fc As Double, ByVal boost As Double) As Long

Description

This function specifies the cut-off frequency and boost gain of the low pass filter in the channel IC.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- fc

  Description — Specifies the cut-off frequency of the low pass filter.

  Direction — IN

  Unit — Hz

- boost

  Description — Specifies the boost gain of the low pass filter.

  Direction — IN

  Unit — dB

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_channelIcLowPassFilter_Q" on page 58

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hpe5022_BER_channelIcLowPassFilter_Q

C Syntax

ViStatus hpe5022_BER_channelIcLowPassFilter_Q(ViSession id, ViPReal64 fc, ViPReal64 boost);

Visual Basic Syntax

hpe5022_BER_channelIcLowPassFilter_Q(ByVal id As Long, ByRef fc As Double, ByRef boost As Double) As Long

Description

This function returns the cut-off frequency and boost gain of the low pass filter in the channel IC.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- fc

  Description — Returns the cut-off frequency of the low pass filter.

  Direction — OUT

  Unit — Hz

- boost

  Description — Returns the boost gain of the low pass filter.

  Direction — OUT

  Unit — dB

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of HP E5039A is not opened at initialize. Check if the HP E5039A is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_channelIcLowPassFilter” on page 57

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hpe5022_BER_channelIcFirCoefReset

C Syntax

ViStatus hpe5022_BER_channelIcFirCoefReset(ViSession id)

Visual Basic Syntax

hpe5022_BER_channelIcFirCoefReset(ByVal id As Long) As Long

Description

This function resets the TAP coefficient of the FIR filter. The TAP coefficient is set to the default value. The “hpe5022_BER_channelIcProperty” function configures the TAP coefficient of the FIR filter.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NSUP_FUNC	This function is not available for the installed IC.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_channelIcProperty” on page 77

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hpe5022_BER_channelIcPrecompDelay

C Syntax

ViStatus hpe5022_BER_channelIcPrecompDelay(ViSession id, const ViReal64 precDel[]);

Visual Basic Syntax

hpe5022_BER_channelIcPrecompDelay(ByVal id As Long, ByRef precDel As Double) As Long

Description

This function specifies the write precompensation delay value of the channel IC. Agilent E5022/E5023 allows you to specify two bits before target bit. The pattern for precompensation is “10x”, “01x” and “11x” (x is the target bit) and specify the delay time for each pattern. The precompensation is activated by the “hpe5022_BER_channelIcPrecompState” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- precDel

  Description — Specifies the write precompensation delay value in ratio of the timebase generator period. This parameter is array type and the size is 3.
  The precDel [0] is the delay values of the pattern “10x”, PrecDel[1] is for the pattern “01x” and the preDel[2] is for “11x”.

  Direction — IN

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid
hpe5022_ERROR_INV_PARAMETER	The parameter ‘precDel’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of HP E5039A is not opened at initialize. Check if the HP E5039A is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_channelIcPrecompState” on page 62

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hpe5022_BER_channelIcPrecompDelay_Q

C Syntax

ViStatus hpe5022_BER_channelIcPrecompDelay_Q(ViSession id, ViReal64 precDel[]);

Visual Basic Syntax

hpe5022_BER_channelIcPrecompDelay_Q(ByVal id As Long, ByRef precDel As Double) As Long

Description

This function returns the write precompensation delay value of the channel IC.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- precDel

  Description — Returns the write precompensation delay value in ratio of the time base generator period. The precDel [0-2] are the values of the pattern "10x", "01x" and '11x" respectively.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_channelIcPrecompDelay" on page 60

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hpe5022_BER_channelIcPrecompState

C Syntax

ViStatus hpe5022_BER_channelIcPrecompState(ViSession id, ViBoolean state);

Visual Basic Syntax

hpe5022_BER_channelIcPrecompState(ByVal id As Long, ByVal state As Integer) As Long

Description

This function selects if the write precompensation is activated. The "hpe5022_BER_channelIcPrecompDelay" function specifies the precompensation delay time.

Parameters

- id

  Description: Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction: IN

- state

  Description: Selects if the precompensation is activated.

  Direction: IN

  Preset Value: VI_FALSE

  Values

Name	Value	Description
VI_TRUE	1	Precompensation is on.
VI_FALSE	0	Precompensation is off

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_channelIcPrecompDelay" on page 60

"hpe5022_BER_channelIcPrecompState_Q" on page 63

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hpe5022_BER_channelIcPrecompState_Q

C Syntax

ViStatus hpe5022_BER_channelIcPrecompState_Q(ViSession id, ViPBoolean state);

Visual Basic Syntax

hpe5022_BER_channelIcPrecompState_Q(ByVal id As Long, ByRef state As Integer) As Long

Description

This function returns the write precompensation state.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- state

  Description — Returns if the precompensation is activated.

  Direction — OUT

  Values — Same as ‘state’ parameter in the “hpe5022_BER_channelIcPrecompState” function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_channelIcPrecompState” on page 62

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hpe5022_BER_channelIcEndec

C Syntax

ViStatus hpe5022_BER_channelIcEndec(ViSession id, ViBoolean scramble, ViInt16 blocEndec, ViBoolean precode);

Visual Basic Syntax

hpe5022_BER_channelIcEndec(ByVal id As Long, ByVal scramble As Integer, ByVal blocEndec As Integer, ByVal precode As Integer) As Long

Description

This function configures the encoder / decoder functions. The scramble, modulation and precoding can be specified in this function.

Parameters

- id

  Description: Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction: IN

- scramble

  Description: Selects if the scrambler is activated.

  Direction: IN

  Preset Value: VI_FALSE

  Values

Name	Value	Description
VI_TRUE	1	Scrambler is active.
VI_FALSE	0	Scrambler is not active.

- blocEndec

  Description: Specifies the bloc encoding / decoding method.

  Direction: IN

  Preset Value: Depends on the channel IC. See the manual of the channel IC.

  Values

Name	Value	Description
hpe5022_BER_ENDEC_OFF	0	Bypass block ENDEC
hpe5022_BER_ENDEC_8_9	1	8/9
hpe5022_BER_ENDEC_16_17	2	16/17
hpe5022_BER_ENDEC_24_25	3	24/25

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Name	Value	Description
hpe5022_BER_ENDEC_16_18	4	16/18
hpe5022_BER_ENDEC_32_34	5	32/34
hpe5022_BER_ENDEC_24_26	6	24/26
hpe5022_BER_ENDEC_32_33	7	32/33
hpe5022_BER_ENDEC_48_49	8	48/49
hpe5022_BER_ENDEC_48_50	9	48/50
hpe5022_BER_ENDEC_48_51	10	48/51
hpe5022_BER_ENDEC_48_52	11	48/52
hpe5022_BER_ENDEC_50_51	12	50/51
hpe5022_BER_ENDEC_50_52	13	50/52
hpe5022_BER_ENDEC_50_53	14	50/53
hpe5022_BER_ENDEC_50_54	15	50_54
hpe5022_BER_ENDEC_96_100	16	96/100
hpe5022_BER_ENDEC_96_102	17	96/102

- precode

  Description Specifies the switching state of the precoder.

  Direction IN

  Preset Value Depends on the channel IC. See the manual of the channel IC.

  Values

Name	Value	Description
VI_TRUE	1	Precoder is on.
VI_FALSE	0	Precoder is off.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.

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Error Code	Description
hpe5022_ERROR_INV_PARAMETER	Either one of the parameters ‘blocEndec’, ‘scramble’ and/or ‘precode’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_NSUP_FUNC	This function is not available for the installed IC.

See Also “hpe5022_BER_channelIcEndec_Q” on page 67

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hpe5022_BER_channelIcEndec_Q

C Syntax

ViStatus hpe5022_BER_channelIcEndec_Q(ViSession id, ViPBoolean scramble, ViPInt16 blocEndec, ViPBoolean precode);

Visual Basic Syntax

hpe5022_BER_channelIcEndec_Q(ByVal id As Long, ByRef scramble As Integer, ByRef blocEndec As Integer, ByRef precode As Integer) As Long

Description

This function returns the encoder / decoder configuration specified by the “hpe5022_BER_channelIcEndec” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- scramble

  Description — Returns if the scrambler is activated.

  Direction — OUT

  Value — Same as ‘scramble’ parameter in the “hpe5022_BER_channelIcEndec” function.

- blocEndec

  Description — Returns the bloc encoding / decoding method.

  Direction — OUT

  Value — Same as ‘blocEndec’ parameter in the “hpe5022_BER_channelIcEndec” function.

- precode

  Description — Returns if the precoder is activated.

  Direction — OUT

  Value — Same as ‘precode’ parameter in the “hpe5022_BER_channelIcEndec” function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_NSUP_FUNC	This function is not available for the installed IC.

See Also “hpe5022_BER_channelIcEndec” on page 64

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hpe5022_BER_channelIcDetectorType

C Syntax

ViStatus hpe5022_BER_channelIcDetectorType (ViSession id, ViInt16 detType);

Visual Basic Syntax

hpe5022_BER_channelIcDetectorType(ByVal id As Long, ByVal detType As Integer) As Long

Description

This function selects the detector type. Either PR4, EPR4, EEPR4 or advanced can be selected.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- detType

  Description — Specifies the detector type. When the installed channel IC has a detector type other than PR4, EPR4 and EEPR4, the type is assigned as “hpe5022_BER_DET_ADVANCED”.

  Direction — IN

  Values

Name	Value	Description
hpe5022_BER_DET_ADVANCED	0	Advanced
hpe5022_BER_DET_PR4	1	PR4
hpe5022_BER_DET_EPR4	2	EPR4
hpe5022_BER_DET_EEPR4	3	EEPR4

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘detType’ is out of range.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_NSUP_FUNC	The selected detector type is not available for the installed channel IC.

See Also “hpe5022_BER_channelIcDetectorType_Q” on page 71

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hpe5022_BER_channelIcDetectorType_Q

C Syntax

ViStatus hpe5022_BER_channelIcDetectorType _Q(ViSession id, ViPInt16 detType);

Visual Basic Syntax

hpe5022_BER_channelIcDetectorType_Q(ByVal id As Long, ByRef detType As Integer) As Long

Description

This function returns the detector type specified by the “hpe5022_BER_channelIcDetectorType” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- DetType

  Description — Returns the detector type.

  Direction — OUT

  Values — Same as ‘type’ parameter in the “hpe5022_BER_channelIcDetectorType” function

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_channelIcDetectorType” on page 69

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hpe5022_BER_selectTestSignal

C Syntax

ViStatus hpe5022_BER_selectTestSignal(ViSession id, ViInt16 testNum);

Visual Basic Syntax

hpe5022_BER_selectTestSignal(ByVal id As Long, ByVal testNum As Integer) As Long

Description

This function selects the test signal from the test signal 1/2 connectors on the E5039A/B front panel. You can monitor the output of the channel IC through these connectors. The signal is selectable depending on the option of Agilent E5039A/B. See the manual supplement of Agilent E5039A/B.

Parameters

- id

  Description: Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction: IN

- testNum

  Description: Specifies the selected test signal number.

  Direction: IN

  Values

Name	Value	Description
hpe5022_BER_TEST_SIGNAL0	0	Test Signal 0
hpe5022_BER_TEST_SIGNAL1	1	Test Signal 1
hpe5022_BER_TEST_SIGNAL2	2	Test Signal 2
hpe5022_BER_TEST_SIGNAL4	3	Test Signal 3

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'testNum' is out of range.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_NSUP_FUNC	The selected signal number is not available for the installed channel IC.

See Also “hpe5022_BER_selectTestSignal_Q” on page 74

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hpe5022_BER_selectTestSignal_Q

C Syntax

ViStatus hpe5022_BER_selectTestSignal_Q(ViSession id, ViPInt16 testNum);

Visual Basic Syntax

hpe5022_BER_selectTestSignal_Q(ByVal id As Long, ByRef testNum As Integer) As Long

Description

This function returns the test signal from the test signal 1/2 connectors on the E5039A/B front panel.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- testNum

  Description — Returns the selected test signal number.

  Direction — OUT

  Value — Same as 'testNum' parameter in the "hpe5022_BER_selectTestSignal" function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_selectTestSignal" on page 72

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hpe5022_BER_testSignalString_Q

C Syntax

ViStatus hpe5022_BER_testSignalString_Q(ViSession id, ViInt16 testNum, ViPString port1_str, ViPString port2_str);

Visual Basic Syntax

hpe5022_BER_testSignalString_Q(ByVal id As Long, ByVal testNum As Integer, ByVal port1_str As String, ByVal port2_str As String) As Long

Description

This function returns the name of the specified test signal from the test signal 1/2 connectors on the Agilent E5039A/B front panel. See a manual for your channel IC about signals for the detail.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- testNum

  Description — Specifies the test signal number.

  Direction — IN

  Value — Same as 'testNum' parameter in the "hpe5022_BER_selectTestSignal" function.

- port1_str

  Description — Returns the name of the signal from the Test Signal 1 connector of the E5039A/B front panel.

  Direction — OUT

- port2_str

  Description — Returns the name of the signal from the Test Signal 2 connector of the E5039A/B front panel.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'testNum' is out of range.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_NSUP_FUNC	The selected signal number is not available for the installed channel IC.

See Also “hpe5022_BER_selectTestSignal” on page 72

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hpe5022_BER_channelIcProperty

C Syntax

ViStatus hpe5022_BER_channelIcProperty(ViSession id, ViInt32 property, const ViReal64 value []);

Visual Basic Syntax

hpe5022_BER_channelIcProperty(ByVal id As Long, ByVal property As Long, ByRef value As Double) As Long

Description

This function specifies the configuration of time base divider, low pass filter, FIR filter and so on of the channel IC. See the Manual Supplement for Agilent E5039A/B Option for the detailed information since the property depends on each channel IC.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- property

  Description — Specifies the property, such as time base divider, low pass filter, FIR filter, and so on, to specify.

  Direction — IN

- value

  Description — Specifies the property values for the selected property

  Direction — IN

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘property’ and/or ‘value’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_channelIcProperty_Q” on page 78

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hpe5022_BER_channelIcProperty_Q

C Syntax

ViStatus hpe5022_BER_channelIcProperty_Q(ViSession id, ViInt32 property, ViPReal64 value []);

Visual Basic Syntax

hpe5022_BER_channelIcProperty_Q(ByVal id As Long, ByVal property As Long, ByRef value As Double) As Long

Description

This function returns configurations of the channel IC specified by the "hpe5022_BER_channelIcProperty" function

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- property

  Description — Specifies the property, such as time base divider, low pass filter, FIR filter, and so on, to specify.

  Direction — IN

- value

  Description — Returns the property values for the selected property.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'property' is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_channelIcProperty" on page 77

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hpe5022_BER_channelIcByteSize_Q

C Syntax

ViStatus hpe5022_BER_channelIcByteSize_Q(ViSession id, ViPInt 16 bits);

Visual Basic Syntax

hpe5022_BER_channelIcByteSize_Q(ByVal id As Long, ByRef bits As Integer) As Long

Description

This function returns the number of bits per byte. However, the number of bits per byte depend on the channel IC and its configurations.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- bits

  Description — This parameter returns the number of bits per byte.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_channelIcProperty" on page 77

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hpe5022_BER_channelIcUpdateState

C Syntax

ViStatus hpe5022_BER_channelIcUpdateState(ViSession id);

Visual Basic Syntax

hpe5022_BER_channelIcUpdateState Lib “hpe5022_32.dll” (ByVal id As Long) As Long

Description

This function updates the BER measurement state when the current read channel IC register is set. This function should be called when the setting routine of the read channel IC register is completed.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_SETUP	The read channel IC register setting is invalid.

See Also

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hpe5022_BER_channelIcRegister

C Syntax

ViStatus hpe5022_BER_channelIcRegister(ViSession id, ViInt32 addr, ViInt32 upperBitPos, ViInt32 lowerBitPos, ViInt32 data);

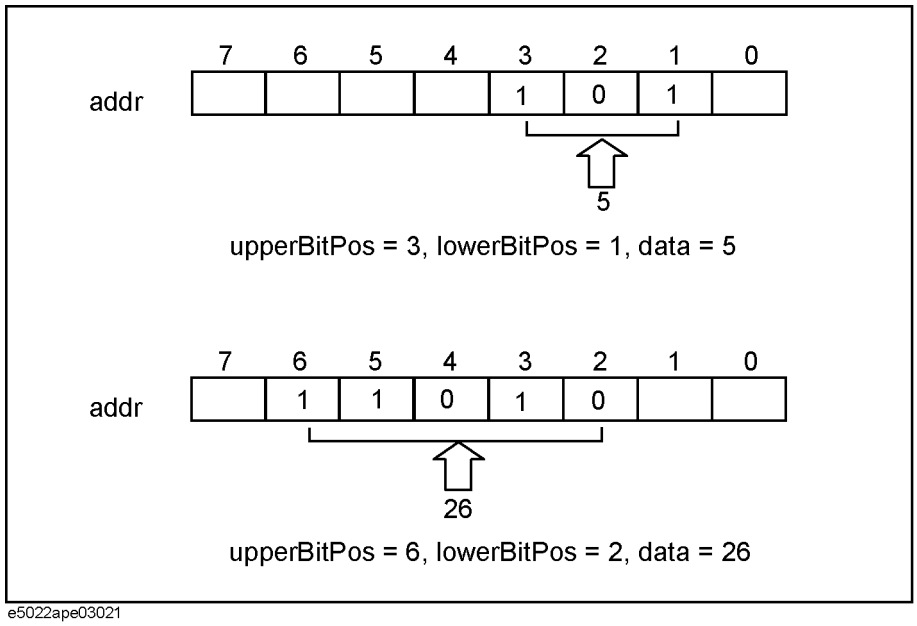
Visual Basic Syntax

hpe5022_BER_channelIcRegister(ByVal id As Long, ByVal addr As Long, ByVal upperBitPos As Long, ByVal lowerBitPos As Long, ByVal data As Long) As Long

Description

This function writes a specified data to the specified address of the channel IC register. The upper bit position and lower bit position are specified. Figure 3-5 shows an example.

Figure 3-5 Register Setting Example



e5022ape03021

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- addr

  Description — Specifies the address of the register.

  Direction — IN

  Values

Name	Value
hpe5022_BER_REG_ADDR_MIN	0
hpe5022_BER_REG_ADDR_MAX	0x3ffff

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- upperBitPos

  Description Specifies the upper bit position of the register.

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_DATA_BIT_MIN	0
hpe5022_BER_REG_DATA_BIT_MAX	15

- lowerBitPos

  Description Specifies the lower bit position of the register.

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_DATA_BIT_MIN	0
hpe5022_BER_REG_DATA_BIT_MAX	15

- data

  Description Specifies the data to write.

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_DATA_MIN	0
hpe5022_BER_REG_DATA_MAX	65,535

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘addr’, ‘upperBitPos’, ‘lowerBitPos’ and/or ‘data’ is out of range.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_channelIcRegister_Q” on page 84

“hpe5022_BER_channelIcMultipleRegisters” on page 86

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hpe5022_BER_channelIcRegister_Q

C Syntax

ViStatus hpe5022_BER_channelRegister_Q(ViSession id, ViInt32 addr, ViInt32 upperBitPos, ViInt32 lowerBitPos, ViPInt32 data);

Visual Basic Syntax

hpe5022_BER_channelRegister_Q(ByVal id As Long, ByVal addr As Long, ByVal upperBitPos As Long, ByVal lowerBitPos As Long, ByRef data As Long) As Long

Description

This function returns data from the specified channel IC address.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- addr

  Description — Specifies the address of the register.

  Direction — IN

  Value — Same as 'addr' parameter in the "hpe5022_BER_channelIcRegister" function.

- upperBitPos

  Description — Specifies the upper bit position of the register.

  Direction — IN

  Value — Same as 'upperBitPos' parameter in the "hpe5022_BER_channelIcRegister" function.

- lowerBitPos

  Description — Specifies the lower bit position of the register.

  Direction — IN

  Value — Same as 'lowerBitPos' parameter in the "hpe5022_BER_channelIcRegister" function.

- data

  Description — Returns the data in the specified bits.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

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Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘addr’, ‘upperBitPos’ and/or ‘lowerBitPos’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also “hpe5022_BER_channelIcRegister” on page 81

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hpe5022_BER_channelIcMultipleRegisters

C Syntax

ViStatus hpe5022_BER_channelIcMultipleRegisters(ViSession id, ViInt32 points, const ViInt32 addr[], const ViInt32 data[]);

Visual Basic Syntax

hpe5022_BER_channelIcMultipleRegisters(ByVal id As Long, ByVal points As Long, ByRef addr As Long, ByRef data As Long) As Long

Description

This function writes a specified data to several address of the channel IC.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- points

  Description — Specifies the number of channel IC register.

  Direction — IN

  Values

Name	Value
hpe5022_BER_REG_COUN_MIN	1
hpe5022_BER_REG_COUN_MAX	256

- addr

  Description — Specifies the array of the channel IC register address. The size of array is specified by the ‘points’ parameter.

  Direction — IN

  Values

Name	Value
hpe5022_BER_REG_ADDR_MIN	0
hpe5022_BER_REG_ADDR_MAX	0x3ffff

- data

  Description — Specifies the data array. The array size is specified by the ‘points’ parameter. Each value in array is the data of the address that corresponds to the same order value in the array of the ‘addr’ parameter.

  Direction — IN

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Values

Name	Value
hpe5022_BER_REG_DATA_MIN	0
hpe5022_BER_REG_DATA_MAX	65,535

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘points’, ‘addrs’ and/or ‘data’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_channelIcMultipleRegisters_Q” on page 115

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hpe5022_BER_channelIcMultipleRegisters_Q

C Syntax

ViStatus hpe5022_BER_channelIcMultipleRegisters_Q(ViSession id, ViInt32 points, const ViInt32 addr[], ViInt32 data[]);

Visual Basic Syntax

hpe5022_BER_channelIcMultipleRegisters_Q(ByVal id As Long, ByVal points As Long, ByRef addr As Long, ByRef data As Long) As Long

Description

This function returns the register values from specified channel IC register addresses.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- points

  Description — Specifies the number of points for channel IC register address.

  Direction — IN

  Values

Name	Value
hpe5022_BER_REG_COUN_MIN	1
hpe5022_BER_REG_COUN_MAX	256

- addr

  Description — Specifies the element array of the channel IC register address. The size of array is specified by the ‘points’ parameter.

  Direction — IN

  Values

Name	Value
hpe5022_BER_REG_ADDR_MIN	0
hpe5022_BER_REG_ADDR_MAX	0x3ffff

- data

  Description — Returns the array of the register data.

  Direction — OUT

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘points’ and/or ‘addrs’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_channelIcMultipleRegisters” on page 113.

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hpe5022_BER_channelIcRegistersSave

C Syntax

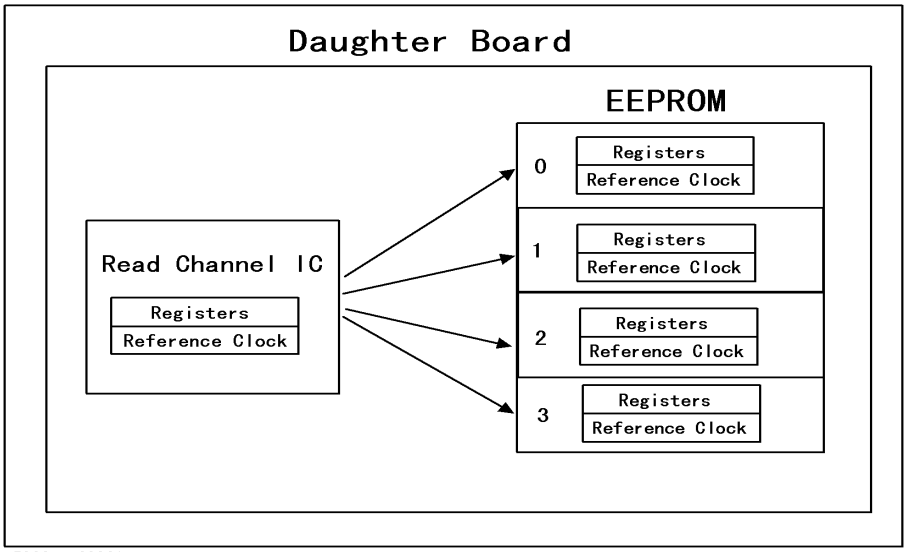
ViStatus hpe5022_BER_channelIcRegisterSave(ViSession id, ViInt16 configNum);

Visual Basic Syntax

hpe5022_BER_channelIcRegistersSave(ByVal id As Long, ByVal configNum As Integer) As Long

Description

This function saves all register values and current reference clock of the read channel IC to the EEPROM by the specified configuration number.



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Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- configNum

  Description — Specifies the configuration number to save the register value and reference clock into the EEPROM.

  Direction — IN

  Values

Name	Value	Description
hpe5022_BER_REG_CONF_0	0	Configuration 0
hpe5022_BER_REG_CONF_1	1	Configuration 1
hpe5022_BER_REG_CONF_2	2	Configuration 2
hpe5022_BER_REG_CONF_3	3	Configuration 3

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘configNum’ is out of range.
hpe5022_ERROR_MEMORY	Can’t access to memory or failed check sum.

See Also

“hpe5022_BER_channelIcRegistersRecall” on page 90

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hpe5022_BER_channelIcRegistersRecall

C Syntax

ViStatus hpe5022_BER_channelIcRegistersRecall(ViSession id, ViInt16 configNum);

Visual Basic Syntax

hpe5022_BER_channelIcRegistersRecall(ByVal id As Long, ByVal configNum As Integer) As Long

Description

This function recalls all register values and current reference clock of the read channel IC from the EEPROM by the specified configuration.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- configNum

  Description — Specifies the configuration number to recall the register value and reference clock from the EEPROM.

  Direction — IN

  Values

Name	Value	Description
hpe5022_BER_REG_CONF_0	0	Configuration 0
hpe5022_BER_REG_CONF_1	1	Configuration 1
hpe5022_BER_REG_CONF_2	2	Configuration 2
hpe5022_BER_REG_CONF_3	3	Configuration 3

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_PARAMETER	The parameter 'configNum' is out of range.
hpe5022_ERROR_MEMORY	Can't access to memory or failed check sum.

See Also

"hpe5022_BER_channelIcRegistersSave" on page 88

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hpe5022_BER_channelIcInfoFile_Q

C Syntax

ViStatus hpe5022_BER_channelIcInfoFile_Q(ViSession id, ViPString fileName);

Visual Basic Syntax

hpe5022_BER_channelIcInfoFile_Q(ByVal id As Long, ByVal fileName As String) As Long

Description

This function returns the read channel IC information file name.This function is only available for use with the E5039C bit error test module. The E5039C's module driver requires the data file which includes information on the read channel IC on the channel board. The read IC information file includes the following information:

— Read channel IC name and manufacturer data

— Read channel IC register data (bit field, address, etc.)

— Byte length (bits in symbol) data

— First sync mark pattern data

— Preamble data

— Revision register

— Channel quality register

— Register settings for IDLE, READ, and Write operation

— Register settings for sequence start and end

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- fileName

  Description — Returns the read channel IC information file name. Maximum number of characters is hpe5022_FILE_NAME_LENGTH_MAX (= 512).

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id is invalid.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

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BER Pattern Write Function

hpe5022_BER_write

C Syntax

ViStatus hpe5022_BER_write(ViSession id, ViReal64 offset);

Visual Basic Syntax

hpe5022_BER_write(ByVal id As Long, ByVal offset As Double) As Long

Description

This function executes the write sequence. The sequence of this function is as follows:

1. Set the write current specified by “hpe5022_writeCurrent” function.
2. Move the head to the write offset from the track center.
3. Write the data pattern specified by “hpe5022_BER_selectPattern” function.

Function that executes measurement, such as the “hpe5022_BER_measureBer”, performs the write sequence automatically, use this function if you want to write a data pattern only.

Parameters

- id

  Description: Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction: IN

- offset

  Description: Specifies the write offset position from the track center.

  Direction: IN

  Values

Name	Description
hpe5022_TRACK_OFFSET_MIN	-6.0×10^{-6}
hpe5022_TRACK_OFFSET_MAX	6.0×10^{-6}

  Unit: Meter

Return Values

Completion Code	Description
VI_SUCCESS	No Error

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Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘offset’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_selectPattern” on page 31

“hpe5022_writeCurrent”

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Optimization Function

hpe5022_BER_optimizeState

C Syntax

ViStatus hpe5022_BER_optimizrState(ViSession id, ViInt16 category, ViBoolean state);

Visual Basic Syntax

hpe5022_BER_optimizeState(ByVal id As Long, ByVal category As Integer, ByVal state As Integer) As Long

Description

This function specifies the optimization state. The “hpe5022_BER_optimize” function performs the optimization. The selected category will be optimized.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- category

  Description — Selects the category to perform optimization.

  Direction — IN

  Values

Name	Value	Description
hpe5022_BER_OPT_INIT	0	Initialization
hpe5022_BER_OPT_LPF	1	Low Pass filter
hpe5022_BER_OPT_FIR	2	FIR Filter
hpe5022_BER_OPT_PREC_DEL_COAR	3	Precompensation Delay coarse
hpe5022_BER_OPT_PREC_DEL_FINE	4	Precompensation Delay Fine

- state

  Description — Selects the optimization state for the selected category.

  Direction — IN

  Preset Value — VI_TRUE for all categories.

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Values

Name	Value	Description
VI_TRUE	1	Optimization will be done.
VI_FALSE	0	Optimization won't be done

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'category' and/or 'state' is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_optimize" on page 98

"hpe5022_BER_optimizeState_Q" on page 95

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hpe5022_BER_optimizeState_Q

C Syntax

ViStatus hpe5022_BER_optimizrState_Q(ViSession id, ViInt16 category, ViPBoolean state);

Visual Basic Syntax

hpe5022_BER_optimizeState_Q(ByVal id As Long, ByVal category As Integer, ByRef state As Integer) As Long

Description

This function returns the optimization state.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- category

  Description — Selects the category of optimization to query

  Direction — IN

  Value — Same as ‘category’ parameter in the “hpe5022_BER_optimizeState” function.

- state

  Description — Returns the optimization state for the selected category.

  Direction — OUT

  Value — Same as ‘state’ parameter in the “hpe5022_BER_optimizeState” function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘category’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of HP E5039A is not opened at initialize. Check if the HP E5039A is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_optimizeState” on page 93

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hpe5022_BER_optimizeSequenceConfig

C Syntax

ViStatus hpe5022_BER_optimizeSequenceConfig(ViSession id, ViInt16 seqType);

Visual Basic Syntax

hpe5022_BER_optimizeSequenceConfig(ByVal id As Long, ByVal seqType As Integer) As Long

Description

This function specifies the sequence type of the optimization. The "hpe5022_BER_optimize" function performs the optimization. The selected sequence will be used in the optimization. When the "hpe5022_SEQ_M" is selected, the precompensation must be turned off.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- seqType

  Description — Selects the sequence type of the optimization.

  Direction — IN

  Values

Name	Value	Description
hpe5022_SEQ_ER_WR_M	0	Erase -> Write -> Optimize
hpe5022_SEQ_WR_M	1	Write -> Optimize
hpe5022_SEQ_M	2	Optimize only

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'seqType' is out of range.

See Also

"hpe5022_BER_optimize" on page 98

"hpe5022_BER_optimizeSequenceConfig_Q" on page 97

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hpe5022_BER_optimizeSequenceConfig_Q

C Syntax

ViStatus hpe5022_BER_optimizeSequenceConfig_Q(ViSession id, ViPInt16 seqType);

Visual Basic Syntax

hpe5022_BER_optimizeSequenceConfig_Q(ByVal id As Long, ByRef seqType As Integer) As Long

Description

This function returns a sequence type of the optimization. The “hpe5022_BER_optimize” function performs the optimization.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- seqType

  Description — Returns a sequence type of the optimization.

  Direction — OUT

  Values — Same as ‘seqType’ parameter in the “hpe5022_BER_optimizeSequenceConfig” function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.

See Also

“hpe5022_BER_optimize” on page 98

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hpe5022_BER_optimize

C Syntax

ViStatus hpe5022_BER_optimize(ViSession id);

Visual Basic Syntax

hpe5022_BER_optimize(ByVal id As Long) As Long

Description

This function performs an optimization of BER. The selected categories by the “hpe5022_BER_optimizeState” function are optimized. The “hpe5022_BER_optimizeSequenceConfig” function allows you to perform an erase and a write sequence before the optimization.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_EXCESS_TRACK_DATA	The data overflow a track at one revolution at the bit error measurement. Change the setting of the user data rate, rpm , track number, track format or sector format.
hpe5022_ERROR_HARD_HAMP	Hardware error is detected in the head amplifier.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_SETUP	Sequence type and category setting is invalid. Change the sequence type or category. When the “hpe5022_SEQ_M” is selected, the precompensation must be turned off.
hpe5022_ERROR_INV_DRIVE_CONDITION	The spinstand drive is turned off. Turn it on before executing this function. See the “hpe5022_driveState” function.
hpe5022_ERROR_OPT_FAIL	The optimization is failed. All sector is lost.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of HP E5039A is not opened at initialize. Check if the HP E5039A is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_optimizeState” on page 93

“hpe5022_BER_optimizeSequenceConfig” on page 96

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Track Offset Compensation

This section describes the function of a track offset compensation for a bit error test.

hpe5022_BER_trackOffsetCompInterval

C Syntax

ViStatus hpe5022_BER_trackOffsetCompInterval(ViSession id, ViInt32 interval);

Visual Basic Syntax

hpe5022_BER_trackOffsetCompInterval(ByVal id As Long, ByVal interval As Integer) As Long

Description

This function specifies the number of revolutions for the track offset compensation sequence interval. In the bit error test, the position is compensated at each revolution specified by the this function when the track offset compensation state is turned on. The E5022A reads the data a several revolutions in this test in order to make a small bit error rate measurement. In this case, this function reads the burst data and compensates the head position at each revolution specified by this function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- interval

  Description — Specifies a interval revolution of the track offset compensation.

  Direction — IN

  Values

Name	Value
hpe5022_TRACK_OFFSET_COMP_INTERVAL_MIN	1
hpe5022_TRACK_OFFSET_COMP_INTERVAL_MAX	10000

  Preset Value — 100

Return Values

Completion Code	Description
VI_SUCCESS	No Error

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Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘interval’ is out of range.

See Also

“hpe5022_BER_trackOffsetCompInterval_Q” on page 102

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hpe5022_BER_trackOffsetCompInterval_Q

C Syntax

ViStatus hpe5022_BER_trackOffsetCompInterval_Q(ViSession id, ViPInt32 interval);

Visual Basic Syntax

hpe5022_BER_trackOffsetCompInterval_Q(ByVal id As Long, ByRef period As Integer) As Long

Description

This function returns the number of spindle revolutions that is track offset compensation sequence interval.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- interval

  Description — Returns a interval revolution of the track offset compensation.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.

See Also

“hpe5022_BER_trackOffsetCompInterval” on page 100

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Bit Error Rate Measurement Function

hpe5022_BER_berMeasByteCount

C Syntax

ViStatus hpe5022_BER_berMeasByteCount(ViSession id, ViReal64 byteNum);

Visual Basic Syntax

hpe5022_BER_berMeasByteCount(ByVal id As Long, ByVal byteNum As Double) As Long

Description

This function specifies the number of read bytes for a user data. You should enter a value more than reciprocal number of required error bit rate. This function is valid for BER, BER track profile and 747 measurements.

The real read bytes is shown in the following equation. This quantity of data is used for the bit error rate analysis.

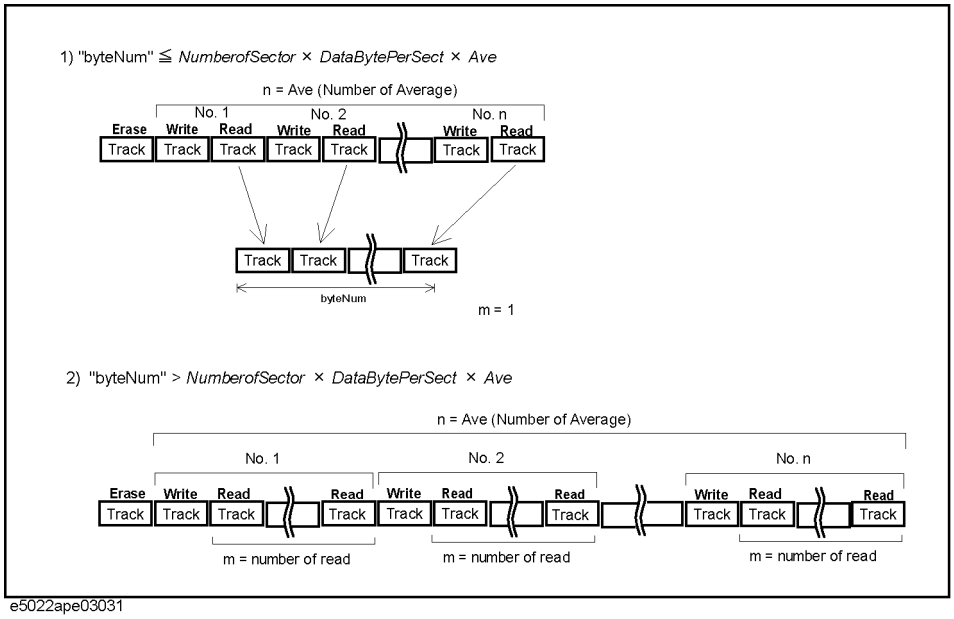
$$ReadBytes = (NumberOfSector \times DataBytePerSect) \times Ave \times m$$

Where:

- NumberOfSector= ‘sector’ of “hpe5022_BER_sectorFormat”
- DataBytePerSect = ‘data’ of “hpe5022_BER_sectorFormat”
- Ave = ‘ave’ of “hpe5022_BER_measureBer”, “hpe5022_BER_measureTrackProfile” or “hpe5022_BER_747Config”
- m = Minimum integer value meets (ReadBytes ≥ ‘byteNum’)

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Figure 3-6 **Measurement Bytes**



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Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- byteNum

  Description — Specifies the number of measurement bytes for user data. The value over a reciprocal number of an expected bit error rate should be specified.

  Direction — IN

  Preset value — hpe5022_BER_MEAS_BYTE_COUN_MIN (1)

  Values

Name	Value
hpe5022_BER_MEAS_BYTE_COUN_MIN	1

The maximum limit value is as follows.

$$MaximumValue = 1 \times 10^{6} \times DataBytePerSect \times Sect \times Ave$$

Where:

— DataBytePerSect = 'data' of

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"hpe5022_BER_sectorFormat"

— Sect = 'sector' of "hpe5022_BER_trackFormat"

— Ave = 'ave' of "hpe5022_BER_measureBer", "hpe5022_BER_measureTrackProfile" or "hpe5022_BER_747Config"

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'byteNum' is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_berMeasByteCount_Q" on page 106

"hpe5022_BER_sectorFormat" on page 28

"hpe5022_BER_trackFormat" on page 23

"hpe5022_BER_measureBer" on page 113

"hpe5022_BER_measureTrackProfile" on page 131

"hpe5022_BER_747Config" on page 147

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hpe5022_BER_berMeasByteCount_Q

C Syntax

ViStatus hpe5022_BER_berMeasByteCount_Q(ViSession id, ViPReal64 byteNum);

Visual Basic Syntax

hpe5022_BER_berMeasByteCount_Q(ByVal id As Long, ByRef byteNum As Double) As Long

Description

This function returns the number of read bytes specified by the “hpe5022_BER_berMeasByteCount” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- byte

  Description — Returns the number of read bytes.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also

“hpe5022_BER_berMeasByteCount” on page 103

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hpe5022_BER_errorBitPerByte

C Syntax

ViStatus hpe5022_BER_errorBitPerByte(ViSession id, ViReal64 bit);

Visual Basic Syntax

hpe5022_BER_errorBitPerByte(ByVal id As Long, ByVal bit As Double) As Long

Description

This function specifies the number of error bits per byte. Agilent E5022/E5023 compares the bit stream by a byte and counts the bytes where an error has occurred. This value is used for bit error rate calculation. See the "hpe5022_BER_ber_Q" function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- bit

  Description — Specifies the number of error bits per byte.

  Direction — IN

  Preset value — hpe5022_BER_ERROR_BITS_PER_BYTE_MIN (1)

  Values

Name	Value
hpe5022_BER_ERR_BITS_PER_BYTE_MIN	1
hpe5022_BER_ERR_BITS_PER_BYTE_MAX	9

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter 'bit' is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_errorBitPerByte_Q" on page 109

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“hpe5022_BER_ber_Q” on page 118

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hpe5022_BER_errorBitPerByte_Q

C Syntax

ViStatus hpe5022_BER_errorBitPerByte_Q(ViSession id, ViPReal64 bit);

Visual Basic Syntax

hpe5022_BER_errorBitPerByte_Q(ByVal id As Long, ByRef bit As Double) As Long

Description

This function returns the number of error bits per byte specified by the “hpe5022_BER_errorBitPerByte” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- bit

  Description — Returns the number of error bits per byte.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_errorBitPerByte” on page 107

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hpe5022_BER_berDataLoggingMode

C Syntax

ViStatus hpe5022_BER_berDataLoggingMode(ViSession id, ViBoolean sectorData, ViInt16 rawData);

Visual Basic Syntax

hpe5022_BER_berDataLoggingMode(ByVal id As Long, ByVal sectorData As Integer, ByVal rawData As Integer) As Long

Description

This function selects the data logging mode. The logging mode is effective for the “hpe5022_BER_sectorErrorCount_Q” and “hpe5022_BER_errorRawData_Q” functions.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- sectorData

  Description — Selects the sector data logging mode. This value must be set to “VI_TRUE” when “hpe5022_BER_sectorErrorCount_Q” function is used. The “VI_FALSE” makes a measurement faster.

  Direction — IN

  Preset value — VI_FALSE

  Values

Name	Value	Description
VI_FALSE	0	Sector data is not stored.
VI_TRUE	1	All sector data is stored.

- rawData

  Description — Selects the raw data logging mode. This parameter is effective for the “hpe5022_BER_errorRawData_Q” function. The “hpe5022_BER_RAW_DATA_LAST_REV” makes a measurement faster.

  Direction — IN

  Preset value — hpe5022_BER_RAW_DATA_ALL (1)

  Values

Name	Value	Description
hpe5022_BER_RAW_DATA_ALL	1	All raw data is stored.

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Name	Value	Description
hpe5022_BER_RAW_DATA_LAST_REV	2	Raw data is stored for the last revolution only

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘sectorData’ and/or ‘rawData’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_berDataLoggingMode_Q” on page 112

“hpe5022_BER_sectorErrorCount_Q” on page 124

“hpe5022_BER_errorRawData_Q” on page 128

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hpe5022_BER_berDataLoggingMode_Q

C Syntax

ViStatus hpe5022_BER_berDataLoggingMode_Q(ViSession id, ViPBoolean sectorData, ViPInt16 rawData);

Visual Basic Syntax

hpe5022_BER_berDataLoggingMode_Q(ByVal id As Long, ByRef sectorData As Integer, ByRef rawData As Integer) As Long

Description

This function returns the data logging mode specified by the “hpe5022_BER_berDataLoggingMode” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- sectorData

  Description — Returns the sector data logging mode.

  Direction — OUT

  Values — Same as ‘sectorData’ parameter in the “hpe5022_BER_berDataLoggingMode” function.

- rawData

  Description — Returns the raw data logging mode.

  Direction — OUT

  Values — Same as ‘rawData’ parameter in the “hpe5022_BER_berDataLoggingMode” function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_berDataLoggingMode” on page 110

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hpe5022_BER_burstThreshold

C Syntax

ViStatus hpe5022_BER_burstThreshold(ViSession id, ViInt16 length, ViInt16 counts);

Visual Basic Syntax

hpe5022_BER_burstThreshold(ByVal id As Long, ByVal length As Integer, ByVal counts As Integer) As Long

Description

This function specifies the burst length threshold parameters. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- length

  Description — Specifies the burst length threshold in bytes. When consecutive errors occur for more than ‘length’ [bytes], this error block is regarded as a burst error.

  Direction — IN

  Preset Value — (hpe5022_BER_BURST_LENGTH_THR_MIN)

  Values

Name	Value
hpe5022_BER_BURST_LENGTH_THR_MIN	1
hpe5022_BER_BURST_LENGTH_THR_MAX	31

- counts

  Description — Specifies the burst error criterion to count as a lost sector. If burst occurs more than this value, the sector is considered as a lost sector. When this value is set to 0, the sector is not counted as a lost sector even if the burst occurs any number of times (except that it is an actual lost sector).

  Direction — IN

  Preset Value — (hpe5022_BER_BURST_COUN_THR_MIN)

  Values

Name	Value
hpe5022_BER_BURST_COUN_THR_MIN	0
hpe5022_BER_BURST_COUN_THR_MAX	4095

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘length’ and/or ‘counts’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_burstThreshold_Q” on page 146“

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hpe5022_BER_burstThreshold_Q

C Syntax

ViStatus hpe5022_BER_burstThreshold_Q(ViSession id, ViPInt16 length, ViPInt16 counts);

Visual Basic Syntax

hpe5022_BER_burstThreshold_Q(ByVal id As Long, ByRef length As Integer, ByRef counts As Integer) As Long

Description

This function returns the burst length threshold parameters. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- length

  Description — Returns the burst length threshold in bytes.

  Direction — OUT

  Values — Same as 'length' parameter in the "hpe5022_BER_burstThreshold" function.

- counts

  Description — Returns the burst error count threshold.

  Direction — OUT

  Values — Same as 'counts' parameter in the "hpe5022_BER_burstThreshold" function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

"hpe5022_BER_burstThreshold" on page 144"

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hpe5022_BER_measureBer

C Syntax

ViStatus hpe5022_BER_measureBer(ViSession id, ViInt16 seqType, ViInt16 ave);

Visual Basic Syntax

hpe5022_BER_measureBer(ByVal id As Long, ByVal seqType As Integer, ByVal ave As Integer) As Long

Description

This function measures the on-track error rate. The detailed sequence of this function is as follows:

1. Move the head to the write offset position as specified by the "hpe5022_writeTrackOffset" function.
2. If seqType is set to "hpe5022_SEQ_ER_WR_M", three track erase is executed.

   If seqType is set to "hpe5022_SEQ_ER_WR_M" or "hpe5022_SEQ_WR_M", write the data pattern specified by the "hpe5022_BER_selectPattern" function.
3. Write the background adjacent track as specified by "hpe5022_BER_adjacentTrackPattern" function. This is optional depending on measurement applications.
4. Write the test track as specified by "hpe5022_BER_write" function.
5. Write the foreground adjacent track as specified by "hpe5022_BER_adjacentTrackPattern" function. This is optional depending on measurement applications.
6. Move the head to the read offset position specified by the "hpe5022_readTrackOffset" function.
7. Read and compare the read back data with the original data sequence.
8. When the read data length is less than the length specified by the "hpe5022_BER_berMeasByteCount" function, iterate data comparison for the next revolution. (See Figure 3-6).
9. Iterate step 2 to step 8 to get the average results.

The "hpe5022_BER_ber_Q" function returns the measurement result.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- seqType

  Description — Selects the type of measurement sequence.

  Direction — IN

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Values

Name	Value	Description
hpe5022_SEQ_ER_WR_M	0	Erase ->Write ->Measure
hpe5022_SEQ_WR_M	1	Write ->Measure
hpe5022_SEQ_M	2	Measure

- ave

  Description Specifies the number of measurement counts to be averaged.

  Direction IN

  Values

Name	Value	Description
hpe5022_BER_COUN_MIN	1	Minimum counts to be averaged.
hpe5022_BER_COUN_MAX	64	Maximum counts to be averaged.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_EXCESS_TRACK_DATA	The data overflow a track at one revolution. Change the setting of the user data rate, rpm , track number, track format or sector format.
hpe5022_ERROR_HARD_HAMP	Hardware error is detected in the head amplifier.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_DRIVE_CONDITION	The spinstand drive is turned off. Turn it on before executing this function. See the “hpe5022_driveState” function.
hpe5022_ERROR_INV_PARAMETER	The parameters ‘seqType’ and/or ‘ave’ is out of range.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_PARAMETER_SET_FAILED	The measurement data byte exceeds limit. See “hpe5022_BER_berMeasByteCount” function.

See Also

“hpe5022_BER_selectPattern” on page 31

“hpe5022_BER_ber_Q” on page 118

“hpe5022_BER_berMeasByteCount” on page 103

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hpe5022_BER_setupBer

C Syntax

ViStatus hpe5022_BER_setupBer(ViSession id, ViInt16 seqType, ViInt16 ave, ViPObject testHndl);

Visual Basic Syntax

hpe5022_BER_setupBer(ByVal id As Long, ByVal seqType As Integer, ByVal ave As Integer, ByRef testHndl As Long) As Long

Description

This function assigns the bit error measurement sequence to the specified test identifier. See the “hpe5022_BER_measureBer” function for details of the sequence. This function does not execute the measurement. Measurement is executed by the “hpe5022_measure” function with the test identifier specified in this function.

The “hpe5022_BER_ber_Q” function returns the measurement result.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- seqType

  Description — Specifies the sequence type of BER measurement.

  Direction — IN

  Values — Same as ‘seqtype’ parameter in the “hpe5022_BER_measureBer” function.

- ave

  Description — Specifies the average count.

  Direction — IN

  Values

Name	Value	Description
hpe5022_BER_COUN_MIN	1	Minimum counts to be averaged.
hpe5022_BER_COUN_MAX	64	Maximum counts to be averaged.

- testHndl

  Description — Returns the test identifier. This identifier is used to execute BER measurement by the “hpe5022_measure” function.

  Direction — OUT

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘seqType’ is out of range.
hpe5022_ERROR_MEM_ALLOC	Lack of memory. Release the finished setup function using the “hpe5022_releaseSetup” function.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_measureBer” on page 113

“hpe5022_measure”

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hpe5022_BER_ber_Q

C Syntax

ViStatus hpe5022_BER_ber_Q(ViSession id, ViPReal 64 ber, ViPInt32 symbol, ViPInt32 totalSector, ViPInt32 lostSector);

Visual Basic Syntax

hpe5022_BER_ber_Q(ByVal id As Long, ByRef ber As Double, ByRef symbol As Long, ByRef totalSector As Long, ByRef lostSector As Long) As Long

Description

This function returns the bit error measurement result.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- ber

  Description — Returns the measured bit error rate. When all sectors become lost sectors, a value of 1 is returned as result. Bit error rate is calculated from the equation below.

$$BER = \frac{ErrBitPerByte \times Symbol}{(TotalSector - LostSector) \times DataBytePerSect \times 8}$$

  Where:

  ErrBitPerByte ='bit' of "hpe5022_BER_errorBitPerByte"

  Symbol = 'symbol' of this function

  DataBytePerSect = 'data' of "hpe5022_BER_sectorFormat"

  TotalSector = 'totalSector' of this function

  LostSector = 'lostSector' of this function

  Direction — OUT

- symbol

  Description — Returns the number of error symbols. Agilent E5022/E5023 compares the bit stream by byte and counts the byte where an error has occured. Error symbol represents the number of error bytes.

  Direction — OUT

- totalSector

  Description — Returns the number of total sectors. The number of total

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sectors include the number of lost sectors.

Direction OUT

- lostSector

  Description Returns the number of lost sectors. Lost sector represents the sector where a synchronized pattern is not found.

  Direction OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INACCURATE_BER	The ‘ber’ and ‘symbol’ results are not accurate because there are too many errors to counts.
hpe5022_ERROR_DATA_CORRUPT	The bit error measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_measureBer” on page 113

“hpe5022_BER_setupBer” on page 116

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hpe5022_BER_berEx_Q

C Syntax

ViStatus hpe5022_BER_berEx_Q(ViSession id, ViPReal 64 ber, ViPInt32 symbol, ViPInt32 burst, VipInt32 totalSector, ViPInt32 lostSector);

Visual Basic Syntax

hpe5022_BER_berEx_Q(ByVal id As Long, ByRef ber As Double, ByRef symbol As Long, ByRef burst As Long, ByRef totalSector As Long, ByRef lostSector As Long) As Long

Description

This function returns the bit error measurement result.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- ber

  Description — Returns the measured bit error rate. When all sectors become lost sectors, a value of 1 is returned as result. Bit error rate is calculated from the equation below.

$$BER = \frac{ErrBitPerByte \times Symbol}{(TotalSector - LostSector) \times DataBytePerSect \times 8}$$

  Where:

  ErrBitPerByte ='bit' of "hpe5022_BER_errorBitPerByte"

  Symbol = 'symbol' of this function

  DataBytePerSect = 'data' of "hpe5022_BER_sectorFormat"

  TotalSector = 'totalSector' of this function

  LostSector = 'lostSector' of this function

  Direction — OUT

- symbol

  Description — Returns the number of error symbols. Agilent E5022/E5023 compares the bit stream by byte and counts the byte where an error has occured. Error symbol represents the number of error bytes.

  Direction — OUT

- burst

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Description Returns the number of burst error array. If an E5039A/B is used as the BER module, it always returns 0.

Direction OUT

- totalSector

  Description Returns the number of total sectors. The number of total sectors include the number of lost sectors.

  Direction OUT

- lostSector

  Description Returns the number of lost sectors. Lost sector represents the sector where a synchronized pattern is not found.

  Direction OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INACCURATE_BER	The ‘ber’ and ‘symbol’ results are not accurate because there are too many errors to counts.
hpe5022_ERROR_DATA_CORRUPT	The bit error measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_ber_Q” on page 152

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hpe5022_BER_berDataSize_Q

C Syntax

ViStatus hpe5022_BER_berDataSize_Q(ViSession id, ViPInt32 size);

Visual Basic Syntax

hpe5022_BER_ berDataSize_Q(ByVal id As Long, ByRef size As Long) As Long

Description

This function returns the size of the BER data.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- size

  Description — Returns the size of the BER data.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_DATA_CORRUPT	The bit error measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_measureBer" on page 113

"hpe5022_BER_setupBer" on page 116

"hpe5022_BER_berData_Q" on page 121

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hpe5022_BER_berData_Q

C Syntax

ViStatus hpe5022_BER_berData_Q(ViSession id, ViInt32 symbol[], ViInt32 lostSector[]);

Visual Basic Syntax

hpe5022_BER_berData_Q(ByVal id As Long, ByRef symbol As Long, ByRef lostSector As Long) As Long

Description

This function returns the BER data.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- symbol

  Description — Returns the number of error symbols in array. The Agilent E5022/E5023 compares the bit stream by byte and counts the byte where an error has occurred.

  Direction — OUT

- lostSector

  Description — Returns the number of lost sectors. The returned data is in array . The function “hpe5022_BER_berDataSize_Q”returns the size of the array.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INACCURATE_BER	The ‘symbol’ and ‘lostSector’ results are not accurate because there are too many errors to counts.
hpe5022_ERROR_DATA_CORRUPT	The bit error measurement data is corrupt. Check if your measurement sequence is correct.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_setupBer” on page 116

“hpe5022_BER_berDataSize_Q” on page 120

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hpe5022_BER_berDataEx_Q

C Syntax

ViStatus hpe5022_BER_berDataEx_Q(ViSession id, ViInt32 symbol[], ViInt32 burst[], ViInt32 lostSector[]);

Visual Basic Syntax

hpe5022_BER_berDataEx_Q(ByVal id As Long, ByRef symbol As Long, ByRef burst As Long, ByRef lostSector As Long) As Long

Description

This function returns the BER data.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- symbol

  Description — Returns the number of error symbols in array. The Agilent E5022/E5023 compares the bit stream by byte and counts the byte where an error has occurred.

  Direction — OUT

- burst

  Description — Returns the number of burst error array. If an E5039A/B is used as the BER module, contents of this array are all 0.

  Direction — OUT

- lostSector

  Description — Returns the number of lost sectors. The returned data is in array . The function "hpe5022_BER_berDataSize_Q"returns the size of the array.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INACCURATE_BER	The 'symbol' and 'lostSector' results are not accurate because there are too many errors to counts.

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Error Code	Description
hpe5022_ERROR_DATA_CORRUPT	The bit error measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_berData_Q” on page 157

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hpe5022_BER_sectorErrorCountSize_Q

C Syntax

ViStatus hpe5022_BER_sectorErrorCountSize_Q (ViSession id, ViPInt32 size);

Visual Basic Syntax

hpe5022_BER_sectorErrorCountSize_Q(ByVal id As Long, ByRef size As Long) As Long

Description

This function returns the size of array data returned by the “hpe5022_BER_sectorErrorCount_Q” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- size

  Description — Returns the size of array data returned by the “hpe5022_BER_sectorErrorCount_Q” function. The size is the same as the number specified by the ‘sector’ parameter of “hpe5022_BER_trackFormat” function if the measurement done properly.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_DATA_CORRUPT	The bit error measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_trackFormat” on page 23

“hpe5022_BER_sectorErrorCount_Q” on page 124

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hpe5022_BER_sectorErrorCount_Q

C Syntax

ViStatus hpe5022_BER_sectorErrorCount_Q(ViSession id, ViInt32 err[], ViInt32 lost[]);

Visual Basic Syntax

hpe5022_BER_sectorErrorCount_Q(ByVal id As Long, ByRef err As Long, ByRef lost As Long) As Long

Description

This function returns the total of error symbol, lost sectors for each sector. The “hpe5022_BER_measureBer” or “hpe5022_BER_setupBer” function must be executed before this function is performed. The logging mode of the “hpe5022_BER_berDataLoggingMode” function must be set to “VI_TRUE”.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- err

  Description — Returns the total of number of error symbol for each sector. The returned data is in array form. The “hpe5022_BER_sector ErrorCountSize_Q” function returns the size of array. Sector number begins at 0. The err [0] represents the number of errors for sector no. 0. Err[n] is the number of errors that corresponds to a particular sector no. n.

  Direction — OUT

  Unit — Byte

- lost

  Description — Returns the number of lost sectors. The returned data is in array. The “hpe5022_BER_sectorErrorCountSize_Q” function returns the size of array. The lost[0] represents the lost sector 0. The lost[n] represents the number of lost sector [n].

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.

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Error Code	Description
hpe5022_ERROR_INACCURATE_BER	The ‘err’ result is not accurate because there are too many errors to count.
hpe5022_ERROR_DATA_CORRUPT	The bit error measurement data is corrupt. Check if your measurement sequence is correct or if the logging mode has been set to “VI_TRUE”.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_sectorErrorCountSize_Q” on page 123

“hpe5022_BER_measureBer” on page 113

“hpe5022_BER_setupBer” on page 116

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hpe5022_BER_sectorErrorCountEx_Q

C Syntax

ViStatus hpe5022_BER_sectorErrorCountEx_Q(ViSession id, ViInt32 err[], ViInt32 burst[], ViInt32 lost[]);

Visual Basic Syntax

hpe5022_BER_sectorErrorCountEx_Q(ByVal id As Long, ByRef err As Long, ByRef burst As Long, ByRef lost As Long) As Long

Description

This function returns the total count of error symbol, burst error, and lost sectors for each sector. The “hpe5022_BER_measureBer” or “hpe5022_BER_setupBer” function must be executed before this function is performed. The logging mode of the “hpe5022_BER_berDataLoggingMode” function must be set to “VI_TRUE”.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- err

  Description — Returns the total of number of error symbol for each sector. The returned data is in array form. The “hpe5022_BER_sector ErrorCountSize_Q” function returns the size of array. Sector number begins at 0. The err [0] represents the number of errors for sector no. 0. Err[n] is the number of errors that corresponds to a particular sector no. n.

  Direction — OUT

  Unit — Byte

- burst

  Description — Returns the number of burst error array. If an E5039A/B is used as the BER module, contents of this array are all 0.

  Direction — OUT

- lost

  Description — Returns the number of lost sectors. The returned data is in array. The “hpe5022_BER_sectorErrorCountSize_Q” function returns the size of array. The lost[0] represents the lost sector 0. The lost[n] represents the number of lost sector [n].

  Direction — OUT

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INACCURATE_BER	The ‘err’ result is not accurate because there are too many errors to count.
hpe5022_ERROR_DATA_CORRUPT	The bit error measurement data is corrupt. Check if your measurement sequence is correct or if the logging mode has been set to “VI_TRUE”.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_sectorErrorCountSize_Q” on page 123

“hpe5022_BER_measureBer” on page 113

“hpe5022_BER_setupBer” on page 116

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hpe5022_BER_errorLengthHistogram_Q

C Syntax

ViStatus hpe5022_BER_errorLengthHistogram_Q (ViSession id, ViInt32 err[]);

Visual Basic Syntax

hpe5022_BER_errorLengthHistogram_Q(ByVal id As Long, ByRef err As Long) As Long

Description

This function returns the error length histogram. The "hpe5022_BER_measureBer" or "hpe5022_BER_setupBer" function must be executed before this function is performed.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- err

  Description — Returns the data (set in array) of the error length. The size of array is 10. The err[0] to err[8] are the number of error lengths 1 to 9, respectively. Err[9] represents the number of error length over 10.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INACCURATE_BER	The result is not accurate because there are too many errors to count.
hpe5022_ERROR_DATA_CORRUPT	The bit error measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_measureBer" on page 113

"hpe5022_BER_setupBer" on page 116

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hpe5022_BER_errorRawDataSize_Q

C Syntax

ViStatus hpe5022_BER_errorRawDataSize_Q (ViSession id, ViPInt32 size);

Visual Basic Syntax

hpe5022_BER_errorRawDataSize_Q(ByVal id As Long, ByRef size As Long) As Long

Description

This function returns the size of array data returned by the “hpe5022_BER_errorRawData_Q” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- size

  Description — Returns the size of the array data returned by the “hpe5022_BER_errorRawData_Q” function.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_DATA_CORRUPT	The bit error measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_errorRawData_Q” on page 128

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hpe5022_BER_errorRawData_Q

C Syntax

ViStatus hpe5022_BER_errorRawData_Q (ViSession id, ViInt32 sector[], ViInt32 locate[], ViInt32 rdData[], ViInt32 wrData[]);

Visual Basic Syntax

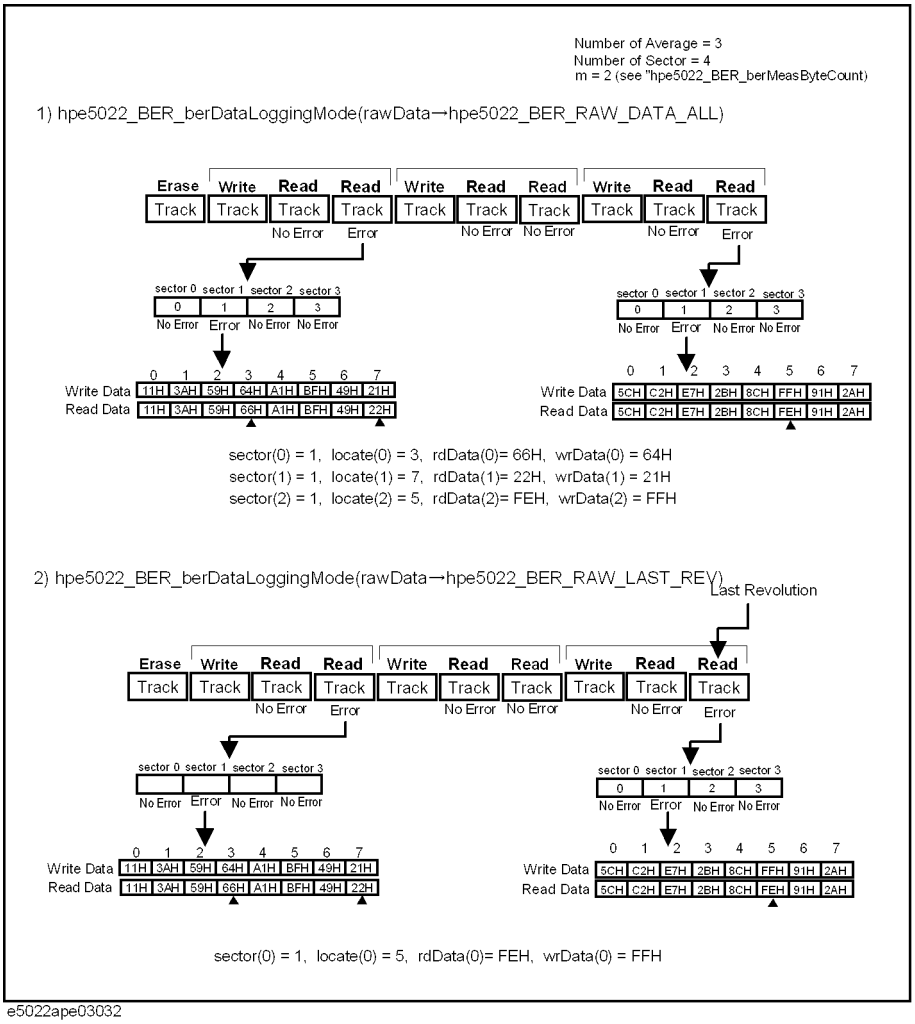
hpe5022_BER_errorRawData_Q(ByVal id As Long, ByRef sector As Long, ByRef locate As Long, ByRef rdData As Integer, ByRef wrData As Integer) As Long

Description

This function returns the sector number and position in the sector where an error has occurred. Figure 3-7 shows an example. When sector on a track is one, the read back data will all be zero.

BER measurement must be done before this function is performed.

Figure 3-7 Error Raw Data Output Example



e5022ape03032

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Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- sector

  Description — Returns the sector number where an error occurred. The returned data is set in array. When the raw data logging mode of "hpe5022_BER_berDataLoggingMode" is set to "hpe5022_BER_RAW_DATA_LAST_REV," the data only of the last revolution is returned. The size of array is returned by the "hpe5022_BER_errorRawDataSize_Q" function.

  Direction — OUT

- locate

  Description — Returns the location byte in the sector where an error has occurred. The returned data is set in array. The size of array is returned by the "hpe5022_BER_errorRawDataSize_Q" function.

  Direction — OUT

- rdData

  Description — Returns the read back data. The returned data is set in array. The size of array is returned by the "hpe5022_BER_errorRawDataSize_Q" function.

  Direction — OUT

- wrData

  Description — Returns the write data. The returned data is set in array. The size of array is returned by the "hpe5022_BER_errorRawDataSize_Q" function.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.

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Error Code	Description
hpe5022_ERROR_INACCURATE_BER	Some errors are not listed in the array. because there are too many errors to count.
hpe5022_ERROR_DATA_CORRUPT	The bit error measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_measureBer” on page 113

“hpe5022_BER_setupBer” on page 116

“hpe5022_BER_errorRawDataSize_Q” on page 127

“hpe5022_BER_berDataLoggingMode” on page 110

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Bit Error Rate Track Profile Measurement

hpe5022_BER_measureTrackProfile

C Syntax

ViStatus hpe5022_BER_measureTrackProfile(ViSession id, ViInt16 seqType, ViInt16 measFunc, ViInt16 points, ViReal64 range, ViInt16 ave);

Visual Basic Syntax

hpe5022_BER_measureTrackProfile(ByVal id As Long, ByVal seqType As Integer, ByVal measFunc As Integer, ByVal points As Integer, ByVal range As Double, ByVal ave As Integer) As Long

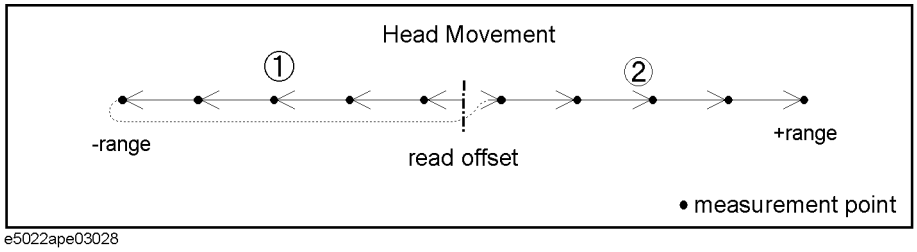
Description

This function measures the track profile of the bit error rate according to the specified sequence type. There are three sequence types: 1) erase, write data, then measure 2) no erase, write data, then measure 3) measure only. The detailed sequence is as follows:

1. Create the offset array data, offset[i] according to parameters ‘points’ and ‘range’. The offset data is from -range to +range by a step of (2×range/(points-1)).
2. Move the head to the write offset position as specified by the “hpe5022_writeTrackOffset” function.
3. If seqType is set to “hpe5022_SEQ_ER_WR_M”, three track erase is performed (i.e, the track and gaps between tracks are erased).
4. Write the background adjacent track as specified by “hpe5022_BER_adjacentTrackPattern” function.
5. Write the test track as specified by “hpe5022_BER_write” function.
6. Write the foreground adjacent track as specified by “hpe5022_BER_adjacentTrackPattern” function.
7. Move the head to the read offset position as specified by the “hpe5022_readTrackOffset” function.
8. Perform read operation to adjust AGC and adaptive FIR.
9. Iterate to measure error rate while moving the read track offset according to the offset array (i.e, step 8 is repeated to build the bathtub curve). The offset direction is from track center to the -range. (See Figure 3-8).
10. Iterate step 2 to step 9, to get the number of average results.

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Figure 3-8 **Head Movement at Track Profile Measurement**



e5022ape03028

The “hpe5022_BER_trackProfileData_Q” function returns the measurement results.

Parameters

- id

  Description Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction IN

- seqType

  Description Selects the type of measurement sequence.

  Direction IN

  Values

Name	Value	Description
hpe5022_SEQ_ER_WR_M	0	Erase ->Write ->Measure
hpe5022_SEQ_WR_M	1	Write ->Measure
hpe5022_SEQ_M	2	Measure

- measFunc

  Description Specifies the type of measurement. The parameter “hpe5022_MEAS_BER” should be selected.

  Direction OUT

  Value

Name	Value	Description
hpe5022_MEAS_BER	11	Measure BER

- points

  Description Specifies the number of track offset points to be measured.

  Direction IN

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Values

Name	Value
hpe5022_TRACK_PROFILE_SIZE_MIN	1
hpe5022_TRACK_PROFILE_SIZE_MAX	201

- range

  Description — Specifies the read track offset range. The read track offset can be set from -range to +range by a step of (2×range/(points-1)).

  Direction — IN

  Unit — Meter

  Values

Name	Value
hpe5022_TRACK_OFFSET_MAX	6.0×10^{-6}

- ave

  Description — Specifies the number of bit error rate measurements to be averaged.

  Direction — IN

  Values

Name	Value
hpe5022_BER_TRACK_PROFILE_COUNT_MIN	1
hpe5022_BER_TRACK_PROFILE_COUNT_MAX	100

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_EXCESS_TRACK_DATA	The data overflows the track at one revolution. Change the setting of the user data rate, rpm , track number, track format or sector format.

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Error Code	Description
hpe5022_ERROR_HARD_HAMP	Hardware error is detected in the head amplifier.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_DRIVE_CONDITION	The spinstand drive is turned off. Turn it on before executing this function. See the “hpe5022_driveState” function.
hpe5022_ERROR_INV_PARAMETER	The parameters ‘seqType’, ‘measFunc’, ‘points’, ‘range’ or/and ‘ave’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_PARAMETER_SET_FAILED	The measurement data byte exceeds limit. See “hpe5022_BER_berMeasByteCount” function.

See Also “hpe5022_BER_trackProfileData_Q” on page 138

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hpe5022_BER_setupTrackProfile

C Syntax

ViStatus hpe5022_BER_setupTrackProfile(ViSession id, ViInt16 seqType, ViInt16 measFunc, ViInt16 points, const ViReal64 range, ViInt16 ave, ViPObject testHndl);

Visual Basic Syntax

hpe5022_BER_setupTrackProfile(ByVal id As Long, ByVal seqType As Integer, ByVal measFunc As Integer, ByVal points As Integer, ByVal range As Double, ByVal ave As Integer, ByRef testHndl As Long) As Long

Description

This function assigns the BER track profile measurement sequence to the specified test identifier. See the “hpe5022_BER_measureTrackProfile” function for details of the sequence. This function does not execute the measurement. Measurement is executed by the “hpe5022_measure” function with the test identifier specified in this function.

The “hpe5022_BER_trackProfileData_Q” function returns the measurement result

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- seqType

  Description — Selects the type of measurement sequence.

  Direction — IN

  Values — Same as ‘seqType’ parameter in the “hpe5022_BER_measureTrackProfile” function.

- measFunc

  Description — Specifies the type of measurement.

  Direction — IN

  Values — Same as ‘measFunc’ parameter in the “hpe5022_BER_measureTrackProfile” function.

- points

  Description — Specifies the number of track offset points to be measured.

  Direction — IN

  Values — Same as ‘points’ parameter in the “hpe5022_BER_measureTrackProfile” function.

- range

  Description — Specifies the read track offset range. The read track offset will be set from -range to +range by a step of (2×range/(points-1)).

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Direction IN

Unit Meter

Values Same as ‘range’ parameter in the “hpe5022_BER_measureTrackProfile” function.

- ave

  Description Specifies the average count.

  Direction IN

  Values

Name	Value
hpe5022_BER_TRACK_PROFILE_COUNT_MIN	1
hpe5022_BER_TRACK_PROFILE_COUNT_MAX	100

- testHndl

  Description Returns the test identifier. This identifier is used to execute the BER’s Track Profile measurement by the “hpe5022_measure” function.

  Direction OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	Either one of the following parameters ‘seqType’, ‘measFunc’ , ‘points’, ‘range’ or/and ‘ave’ is out of range.
hpe5022_ERROR_MEM_ALLOC	Lack of memory. Release the finished setup function using the “hpe5022_releaseSetup” function.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_measureTrackProfile” on page 131

“hpe5022_measure” on page 294

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“hpe5022_BER_trackProfileData_Q” on page 138

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hpe5022_BER_trackProfileData_Q

C Syntax

ViStatus hpe5022_BER_trackProfileData_Q(ViSession id, ViInt16 dataType, ViReal64 offset[], ViReal64 data[]);

Visual Basic Syntax

hpe5022_BER_trackProfileData_Q(ByVal id As Long, ByVal dataType As Integer, ByRef offset As Double, ByRef data As Double) As Long

Description

This function returns the track profile data of the specified data type.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- dataType

  Description — Specifies the type of data to be reported. The parameter “hpe5022_DATA_BER” should be selected.

  Direction — IN

  Value

Name	Value	Description
hpe5022_DATA_BER	16	BER Data

- offset

  Description — Returns the data (set in array) of track offset. The size of array is specified by the ‘points’ parameter in the “hpe5022_BER_measureTrackProfile” or “hpe5022_BER_setupTrackProfile” function.

  Direction — OUT

- data

  Description — Returns the data (set in array) of the parameter specified by the 'dataType'. The array size is specified by ‘points’ parameter in the “hpe5022_BER_measureTrackProfile” or “hpe5022_BER_setupTrackProfile” function. Each value in array is the measurement result with respect to the read offset specified by the ‘range’ and ‘points’ parameters in the “hpe5022_BER_measureTrackProfile” or “hpe5022_BER_setupTrackProfile” function.

  Direction — OUT

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘dataType’ is out of range.
hpe5022_ERROR_DATA_CORRUPT	The BER track profile measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_measureTrackProfile” on page 131

“hpe5022_BER_setupTrackProfile” on page 135

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hpe5022_BER_otcThreshold

C Syntax

ViStatus hpe5022_BER_otcThreshold(ViSession id, ViReal64 otcThr);

Visual Basic Syntax

hpe5022_BER_otcThreshold(ByVal id As Long, ByVal otcThr As Double) As Long

Description

This function specifies the threshold level of the bit error rate for OTC (off-track capability).

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- otcThr

  Description — Specifies the threshold of bit error rate for OTC. The bit error rate is defined as

  Direction — IN

  Preset Value — 1×10^{-3}

  Values

Name	Value
hpe5022_BER_OTC_THR_MIN	0
hpe5022_BER_OTC_THR_MIN	1

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘otcThr’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of HP E5039A is not opened at initialize. Check if the HP E5039A is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_otcThreshold_Q” on page 142

“hpe5022_BER_calculateOtc_Q” on page 143

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“hpe5022_BER_measureTrackProfile” on page 131

“hpe5022_BER_setupTrackProfile” on page 135

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hpe5022_BER_otcThreshold_Q

C Syntax

ViStatus hpe5022_BER_otcThreshold_Q(ViSession id, ViPReal64 otcThr);

Visual Basic Syntax

hpe5022_BER_otcThreshold_Q(ByVal id As Long, ByRef otcThr As Double) As Long

Description

This function returns the threshold level specified by the “hpe5022_BER_otcThreshold” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- otcThr

  Description — Returns the threshold level.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_otcThreshold” on page 140

“hpe5022_BER_calculateOtc_Q” on page 143

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hpe5022_BER_calculateOtc_Q

C Syntax

ViStatus hpe5022_BER_calculateOtc_Q(ViSession id, ViPReal64 otc, ViPReal64 otcPos, ViPReal64 otcNeg);

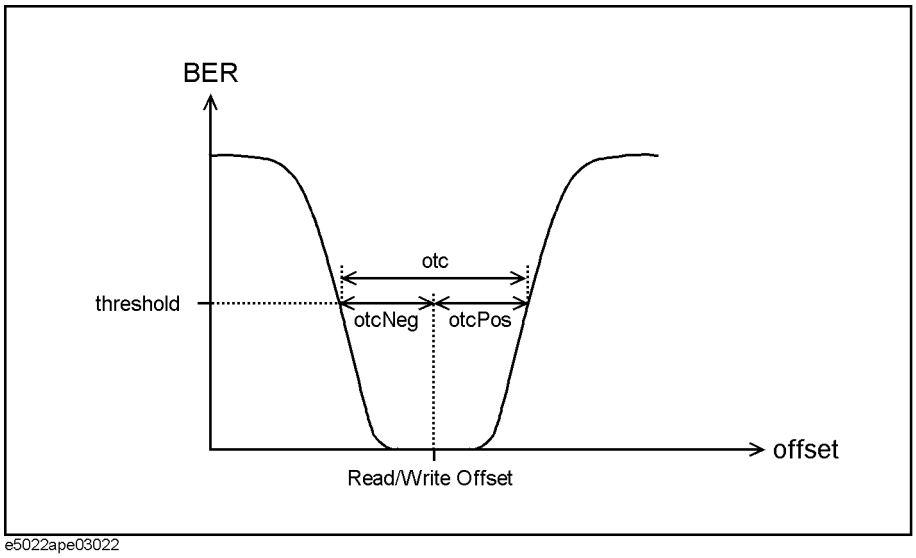
Visual Basic Syntax

hpe5022_BER_calculateOtc_Q(ByVal id As Long, ByRef otc As Double, ByRef otcPos As Double, ByRef otcNeg As Double) As Long

Description

This function calculates the OTC (off-track capability) for bit error rate track profile measurement. The definition of OTC is shown in Figure 3-9. The threshold level is specified by the “hpe5022_BER_otcThreshold” function.

Figure 3-9 OTC Definition



Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- otc

  Description — Returns the calculated OTC. This represents the width of the bath tub curve at threshold level.

  Unit — Meter

  Direction — OUT

- otcPos

  Description — Returns the positive OTC. This represents the width from the write track offset position to the positive/right side of the OTC.

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Unit Meter

Direction OUT

- otcNeg

  Description Returns the negative OTC. This represents the width from the write track offset position to the negative/left side of the OTC.

  Unit Meter

  Direction OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_THRESHOLD_NOT_FOUND	The threshold level is not found on the bath tub curve. Check the track profile measurement result.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_otcThreshold” on page 140

“hpe5022_BER_trackProfileData_Q” on page 138

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hpe5022_BER_trackProfileDataEx_Q

C Syntax

ViStatus hpe5022_BER_trackProfileDataEx_Q(ViSession id, ViInt16 dataType, ViReal64 offset[], ViReal64 ber[], ViInt32 symbol[], ViInt32 totalSector[], ViInt32 lostSector[]);

Visual Basic Syntax

hpe5022_BER_trackProfileDataEx_Q(ByVal id As Long, ByVal dataType As Integer, ByRef offset As Double, ByRef ber As Double, ByRef symbol As Integer, ByRef totalSector As Integer, ByRef lostSector As Integer) As Long

Description

This function reports the track profile data of the bathtub measurement.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- dataType

  Description — Specifies the data type to be queried. Select "hpe5022_DATA_BER".

  Direction — IN

  Values

Name	Value	Description
hpe5022_DATA_BER	16	BER Data

- offset

  Description — Returns the track profile offset in array order. The array size is specified by the parameter 'points' in the "hpe5022_BER_measureTrackProfile" and "hpe5022_BER_setupTrackProfile" functions.

  Unit — Meter

  Direction — OUT

- ber

  Description — Returns the error rate data in array order.

  Direction — OUT

- symbol

  Description — Returns the total number of error symbols in array order.

  Direction — OUT

- totalSector

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Description Returns the number of total sectors in array order.

Direction OUT

- lostSector

  Description Returns the total number of lost sectors in array order.

  Direction OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘dataType’ is out of range.
hpe5022_ERROR_DATA_CORRUPT	The track profile data is corrupt.

See Also

“hpe5022_BER_measureTrackProfile” on page 131

“hpe5022_BER_setupTrackProfile” on page 135

“hpe5022_BER_trackProfileData_Q” on page 138

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hpe5022_BER_errorThreshold

C Syntax

ViStatus hpe5022_BER_errorThreshold(ViSession id, ViReal64 errThreshold);

Visual Basic Syntax

hpe5022_BER_errorThreshold(ByVal id As Long, ByVal errThreshold As Double) As Long

Description

This function specifies the threshold BER. This value affects the bath tub and 747 measurements. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- errThreshold

  Description — Specifies the threshold BER. The error counting sequence is discontinued when the BER reaches this threshold. If this value is set to hpe5022_BER_ERROR_THR_MIN, the BER threshold is infinity.

  Direction — IN

  Preset Value — (hpe5022_BER_ERROR_THR_MIN)

  Values

Name	Value
hpe5022_BER_ERROR_THR_MIN	0
hpe5022_BER_ERROR_THR_MAX	1

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘errThreshold’ is out of range.

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Error Code	Description
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also “hpe5022_BER_errorThreshold_Q” on page 189“

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hpe5022_BER_errorThreshold_Q

C Syntax

ViStatus hpe5022_BER_errorThreshold_Q(ViSession id, ViPReal64 errThreshold);

Visual Basic Syntax

hpe5022_BER_errorThreshold_Q(ByVal id As Long, ByRef errThreshold As Double) As Long

Description

This function returns the threshold BER. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- errThreshold

  Description — Returns the threshold BER.

  Direction — OUT

  Values — Same as 'errThreshold' parameter in the "hpe5022_BER_errorThreshold" function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

"hpe5022_BER_errorThreshold" on page 187"

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hpe5022_BER_errorThresholdMode

C Syntax

ViStatus hpe5022_BER_errorThresholdMode(ViSession id, ViInt16 mode);

Visual Basic Syntax

hpe5022_BER_errorThresholdMode(ByVal id As Long, ByVal mode As Integer) As Long

Description

This function specifies the error threshold mode. This value affects the bath tub and 747 measurements. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- mode

  Description — Specifies the threshold BER mode (auto or manual). If this value is set to hpe5022_BER_ERROR_THR_MODE_AUTO, the error threshold is otcThreshold specified by “hpe5022_BER_otcThreshold” function.

  Direction — IN

  Preset Value — (hpe5022_BER_ERROR_THR_MODE_MAN)

  Values

Name	Value
hpe5022_BER_ERROR_THR_MODE_AUTO	0
hpe5022_BER_ERROR_THR_MODE_MAN	1

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.

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Error Code	Description
hpe5022_ERROR_INV_PARAMETER	The parameter ‘mode’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also “hpe5022_BER_errorThresholdMode_Q” on page 192“

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hpe5022_BER_errorThresholdMode_Q

C Syntax

ViStatus hpe5022_BER_errorThresholdMode_Q(ViSession id, ViPInt16 mode);

Visual Basic Syntax

hpe5022_BER_errorThresholdMode_Q(ByVal id As Long, ByRef mode As Integer) As Long

Description

This function returns the error threshold mode. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- mode

  Description — Returns the threshold BER mode (auto or manual).

  Direction — OUT

  Values — Same as ‘mode’ parameter in the “hpe5022_BER_errorThresholdMode” function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_errorThresholdMode” on page 190“

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hpe5022_BER_channelIcAdaptiveRegister

C Syntax

ViStatus hpe5022_BER_channelIcAdaptiveRegister(ViSession id, ViInt32 points, const ViInt32 addr[]);

Visual Basic Syntax

hpe5022_BER_channelIcAdaptiveRegister(ByVal id As Long, ByVal points As Long, ByRef addr As Long) As Long

Description

This function specifies the adaptive register list. The adaptive registers specified by this function are used in sequences including the following parameter sweep functions:

"hpe5022_BER_measureTrackProfile" on page 171

"hpe5022_BER_measure747" on page 202

"hpe5022_BER_measureChannelIcRegisterSweep" on page 220

"hpe5022_BER_measureChannelIcMultipleRegisterSweep" on page 229.

When the above sweep functions are exeduted, the adaptive registers are varied and the BER is degraded even if swept parameters are restored. Therefore, these registers should be recovered to the previous values when swept parameters are restored. This function is only available for use with the E5039C bit error test module.

.

Parameters

- id

  Description Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction IN

- points

  Description Specifies the number of address list. The minimum value is 0.

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_COUN_MAX	256

- addr

  Description Specifies the array of adaptive register address.

  Direction IN

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Values

Name	Value
hpe5022_BER_REG_ADDR_MIN	0
hpe5022_BER_REG_ADDR_MAX	0x3ffff
hpe5022_BER_REG_COUN_MAX	256

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘points’ and/or ‘addr’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_channelIcAdaptiveRegister” on page 193“

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hpe5022_BER_channelIcAdaptiveRegister_Q

C Syntax

ViStatus hpe5022_BER_channelIcAdaptiveRegister_Q(ViSession id, ViPInt32 points, ViInt32 addr[]);

Visual Basic Syntax

hpe5022_BER_channelIcAdaptiveRegister_Q(ByVal id As Long, ByRef points As Long, ByRef addr As Long) As Long

Description

This function returns the adaptive register list. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- points

  Description — Returns the number of address list.

  Direction — OUT

  Values — Same as 'points' parameter in the "hpe5022_BER_channelIcAdaptiveRegister" function.

- addr

  Description — Returns the array of adaptive register address.

  Direction — OUT

  Values — Same as 'addr' parameter in the "hpe5022_BER_channelIcAdaptiveRegister" function.

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

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See Also “hpe5022_BER_channelIcAdaptiveRegister” on page 193“

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747 Measurement Function

hpe5022_BER_747Config

C Syntax

ViStatus hpe5022_BER_747Config(ViSession id, ViInt16 old_pat, ViReal64 old_pos, ViInt16 adj_pat, ViInt32 trk_prof_size, const ViReal64 trk_prof_range, ViInt16 trk_prof_ave);

Visual Basic Syntax

hpe5022_BER_747Config(ByVal id As Long, ByVal old_pat As Integer, ByVal old_pos As Double, ByVal adj_pat As Integer, ByVal trk_prof_size As Long, ByRef trk_prof_range As Double, ByVal trk_prof_ave As Integer) As Long

Description

This function configures the 747 test. The of old track pattern, its position, track profile measurement configuration are specified in this function. The “hpe5022_BER_measure747” or “hpe5022_BER_setup747” function performs the 747 measurement.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- old_pat

  Description — Specifies the old data pattern.

  Direction — IN

  Preset Value — hpe5022_BER_PAT_2

  Values — Same as ‘pat’ parameter in the “hpe5022_BER_selectPattern” function.

- old_pos

  Description — Specifies the write offset position where the old data pattern is written.

  Direction — IN

  Preset Value — 1.0×10^{-6}

  Values

Name	Value
hpe5022_TRACK_OFFSET_MIN	-6.0×10^{-6}
hpe5022_TRACK_OFFSET_MAX	6.0×10^{-6}

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Unit Meter

- adj_pat

  Description Specifies the data pattern of the adjacent track.

  Direction IN

  Preset Value hpe5022_BER_PAT_2

  Values Same as ‘pat’ parameter in the “hpe5022_BER_selectPattern” function.

- trk_prof_size

  Description Specifies the number of points for track profile measurement.

  Direction IN

  Preset Value 21

  Values

Name	Value
hpe5022_TRACK_PROFILE_SIZE_MIN	1
hpe5022_TRACK_PROFILE_SIZE_MAX	201

- trk_prof_range

  Description Specifies the track offset range of the track profile measurement.

  Direction IN

  Preset Value 3.0×10^{-6}

  Values

Name	Value
hpe5022_TRACK_OFFSET_MAX	6.0×10^{-6}

  Unit Meter

- trk_prof_ave

  Description Specifies the average count of track profile measurement.

  Direction IN

  Preset Value 1

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Values

Name	Value
hpe5022_BER_TRACK_PROFILE_COUNT_MIN	1
hpe5022_BER_TRACK_PROFILE_COUNT_MAX	100

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘oldpat’, ‘old_pos’, ‘adj_pat’, ‘trk_prof_size’ and/or ‘trk_prof_range’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_747Config_Q” on page 150

“hpe5022_BER_measure747” on page 152

“hpe5022_BER_setup747” on page 155

“hpe5022_BER_747Data_Q” on page 158

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hpe5022_BER_747Config_Q

C Syntax

ViStatus hpe5022_BER_747Config_Q(ViSession id, ViPInt16 old_pat, ViPReal64 old_pos, ViPInt16 adj_pat, ViPInt32 trk_prof_size, ViPReal64 trk_prof_range, ViPInt16 trk_prof_ave);

Visual Basic Syntax

hpe5022_BER_747Config_Q(ByVal id As Long, ByRef old_pat As Integer, ByRef old_pos As Double, ByRef adj_pat As Integer, ByRef trk_prof_size As Long, ByRef trk_prof_range As Double, ByRef trk_prof_ave As Integer) As Long

Description

This function returns the 747 test configuration specified by the “hpe5022_BER_747Config” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- old_pat

  Description — Returns the old data pattern.

  Direction — OUT

- old_pos

  Description — Returns the write offset position where the old data pattern is written.

  Direction — OUT

- adj_pat

  Description — Returns the data pattern of the adjacent track.

  Direction — OUT

- trk_prof_size

  Description — Returns the number of points for track profile measurement.

  Direction — OUT

- trk_prof_range

  Description — Returns the list of track offset range for track profile measurement.

  Direction — OUT

- trk_prof_ave

  Description — Returns the average count of track profile measurement.

  Direction — OUT

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_747Config” on page 147

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hpe5022_BER_measure747

C Syntax

ViStatus hpe5022_BER_measure747(ViSession id, ViInt32 points, const ViReal64 offset[]);

Visual Basic Syntax

hpe5022_BER_measure747(ByVal id As Long, ByVal points As Long, ByRef offset As Double) As Long

Description

This function performs the 747 test. The 747 measures the OTC (off-track capability) versus the track offset when BER is measured. The sequence is written below.

1. Set i to zero (i = 0)
2. Perform three track erase. (i.e, Gaps between track are also erased.)
3. Move the head to the position specified by the parameter '+oldPos' of the "hpe5022_BER_747Config" function.
4. Write the data pattern specified by the parameter 'old_pat' of the "hpe5022_BER_747Config" function.
5. Move the head to the position specified by the parameter 'oldPos'.
6. Write the data pattern specified by the parameter '-old_pat'.
7. Move the head to the position specified by the "hpe5022_writeTrackOffset" function.
8. Write the data pattern on the test track selected by the "hpe5022_BER_selectPattern" function.
9. Move the head to the position specified by the parameter 'offset[i]'.
10. Write the data pattern specified by the parameter 'adj_pat' of the "hpe5022_BER_747Config" function.
11. Move the head to the position specified by the parameter '-offset[i]'.
12. Write the data pattern specified by the parameter 'adj_pat'.
13. Measure the track profile of the test track according to 'trk_prof_size' and 'trk_prof_range' of the "hpe5022_BER_747Config" function. The track profile measurement sequence is the same as the "hpe5022_BER_measureTrackProfile" function.
14. Calculate OTC. The threshold level to calculate OTC is specified by the "hpe5022_BER_otcThreshold" function.
15. Increment i by 1. (i = i+1).
16. If i is not equal to 'points', go to the step 9.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

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Direction IN

- points

  Description Specifies the number of measurement points to build the 747 curve. This number must be the same as the array size of 'offset'

  Direction IN

  Values

Name	Value
hpe5022_BER_747_SIZE_MIN	0
hpe5022_BER_747_SIZE_MAX	201

- offset

  Description Specifies the distance between the track center and its adjacent track to be listed in array order. The array size is specified by 'points'. The distance data in array must be listed from outer track to inner track.

  Direction IN

  Values

Name	Value
hpe5022_TRACK_OFFSET_MIN	0
hpe5022_TRACK_OFFSET_MAX	6.0×10^{-6}

  Unit Meter

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_EXCESS_TRACK_DATA	The data overflows a track at one revolution. Change the setting of the user data rate, rpm , track number, track format or sector format.
hpe5022_ERROR_HARD_HAMP	Hardware error is detected in the head amplifier.

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Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_DRIVE_CONDITION	The spinstand drive is turned off. Turn it on before executing this function. See the “hpe5022_driveState” function.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘points’ and/or ‘offset’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_PARAMETER_SET_FAILED	The measurement data byte exceeds the limit. See “hpe5022_BER_berMeasByteCount” function.

See Also

“hpe5022_BER_747Config” on page 147

“hpe5022_BER_selectPattern” on page 31

“hpe5022_BER_747Data_Q” on page 158

“hpe5022_BER_measureTrackProfile” on page 131

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hpe5022_BER_setup747

C Syntax

ViStatus hpe5022_BER_setup747(ViSession id, ViInt32 points, const ViReal64 offset[], ViPObject testHndl);

Visual Basic Syntax

hpe5022_BER_setup747(ByVal id As Long, ByVal points As Long, ByRef offset As Double, ByRef testHndl) As Long

Description

This function assigns the 747 measurement sequence to the specified test identifier. See the “hpe5022_BER_measure747” function for details of the sequence. This function does not execute the measurement. Measurement is executed by the “hpe5022_measure” function with the test identifier specified in this function.

The “hpe5022_BER_747Data_Q” function returns the measurement result.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- points

  Description — Specifies the number of measurement points to build the 747 curve. This number must be the same as the array size of ‘offset’

  Direction — IN

  Values — Same as ‘points’ parameter in the “hpe5022_BER_measure747” function.

- offset

  Description — Specifies the distance between the track center and the adjacent track in array format. The array size is specified by ‘points’. The data in array must be listed from outer track to inner track.

  Direction — IN

  Unit — Meter

  Values — Same as ‘offset’ parameter in the “hpe5022_BER_measure747” function.

- testHndl

  Description — Returns the test identifier. This identifier is used to execute the 747 test by the “hpe5022_measure” function.

  Direction — OUT

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘point’ or/and ‘offset’ is out of range.
hpe5022_ERROR_MEM_ALLOC	Lack of memory. Release the finished setup function using the “hpe5022_releaseSetup” function.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_747Config” on page 147

“hpe5022_measure” on page 294

“hpe5022_BER_measure747” on page 152

“hpe5022_BER_747Data_Q” on page 158

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hpe5022_BER_747DataSize_Q

C Syntax

ViStatus hpe5022_BER_747DataSize_Q(ViSession id, ViPInt32 size);

Visual Basic Syntax

hpe5022_BER_747DataSize_Q(ByVal id As Long, ByRef size As Long) As Long

Description

This function returns the array size of 747 test returned by the “hpe5022_BER_747Data_Q” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- size

  Description — Returns the 747’s test data size.

  The size will be the same as the value of ‘point’ specified by the “hpe5022_BER_measure747” or “hpe5022_BER_setup747” function if measurement is done properly.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_DATA_CORRUPT	The 747 measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of HP E5039A is not opened at initialize. Check if the HP E5039A is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_measure747” on page 152

“hpe5022_BER_setup747” on page 155

“hpe5022_BER_747Data_Q” on page 158

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hpe5022_BER_747Data_Q

C Syntax

ViStatus hpe5022_BER_747Data_Q(ViSession id, ViReal64 data[]);

Visual Basic Syntax

hpe5022_BER_747Data_Q(ByVal id As Long, ByRef data As Double) As Long

Description

This function returns the data of the 747 Test.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- data

  Description — Returns the data (set in array) of the 747's test result. The size of array is specified by the 'points' parameter in the "hpe5022_BER_measure747" or "hpe5022_BER_setup747" function. Each value in array is the measurement result of each adjacent track offset that corresponds to the same order value in the array of the adjacent track offset list. The "hpe5022_BER_747DataSize_Q" function also returns the size of array.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_DATA_CORRUPT	The 747 measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of HP E5039A is not opened at initialize. Check if the HP E5039A is included in the rsrcArray of the "hpe5022_init" function.

See Also

"hpe5022_BER_measure747" on page 152

"hpe5022_BER_setup747" on page 155

"hpe5022_BER_747DataSize_Q" on page 157

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Channel Quality Measurement Function

hpe5022_BER_autoRangeChannelQuality

C Syntax

ViStatus hpe5022_BER_autoRangeChannelQuality (ViSession id);

Visual Basic Syntax

hpe5022_BER_autoRangeChannelQuality (ByVal id As Long) As Long

Description

This function executes auto ranging for the channel quality. Executing this function measures a channel quality and optimize an range. It is recommended to execute this function before a channel quality measurement is made. The “hpe5022_BER_optimize” function includes this function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_AUTO_RANGE_FAIL	Failure in autoranging. Check if the parameter setting and head is correct.
hpe5022_ERROR_HARD_HAMP	Hardware error is detected in the head amplifier.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_DRIVE_CONDITION	The spinstand drive is turned off. Turn it on before executing this function. See the “hpe5022_driveState” function.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

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See Also

“hpe5022_BER_measureChannelQuality” on page 161

“hpe5022_BER_setupChannelQuality” on page 163

“hpe5022_BER_optimize” on page 98

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hpe5022_BER_measureChannelQuality

C Syntax

ViStatus hpe5022_BER_measureChannelQuality(ViSession id, ViInt16 seqType);

Visual Basic Syntax

hpe5022_BER_measureChannelQuality(ByVal id As Long, ByVal seqType As Integer) As Long

Description

This function measures the channel quality. The detailed sequence is as follows:

1. Move the head to the write track offset position specified by the "hpe5022_writeTrackOffset" function.
2. If seqType is set to "hpe5022_SEQ_ER_WR_M", erase the track.
3. If seqType is set to "hpe5022_SEQ_ER_WR_M" or "hpe5022_SEQ_WR_M", write the data pattern specified by the "hpe5022_BER_selectPattern" function.
4. Move the head to the read track offset position specified by the "hpe5022_readTrackOffset" function.
5. Measure the channel quality for one revolution.

The "hpe5022_BER_channelQuality_Q" function returns the measurement result

Parameters

- id

  Description: Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction: IN

- seqType

  Description: Selects the sequence type.

  Direction: IN

  Values

Name	Value	Value
hpe5022_SEQ_ER_WR_M	0	Erase ->Write ->Measure
hpe5022_SEQ_WR_M	1	Write ->Measure
hpe5022_SEQ_M	2	Measure

Return Values

Completion Code	Description
VI_SUCCESS	No Error

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Error Code	Description
hpe5022_ERROR_EXCESS_TRACK_DATA	The data overflows a track at one revolution. Change the setting of the user data rate, rpm , track number, track format or sector format.
hpe5022_ERROR_HARD_HAMP	Hardware error is detected in the head amplifier.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_DRIVE_CONDITION	The spinstand drive is turned off. Turn it on before executing this function. See the “hpe5022_driveState” function.
hpe5022_ERROR_INV_PARAMETER	The parameters ‘seqType’ is out of range.
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039A/B can not be opened during initialization. Check if Agilent E5039A/B is included in the rsrcArray of the “hpe5022_init” function.

See Also “hpe5022_BER_channelQuality_Q” on page 165

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hpe5022_BER_setupChannelQuality

C Syntax

ViStatus hpe5022_BER_setupChannelQuality(ViSession id, ViInt16 seqType, ViPObject testHndl);

Visual Basic Syntax

hpe5022_BER_setupChannelQuality(ByVal id As Long, ByVal seqType As Integer, ByRef testHndl As Long) As Long

Description

This function assigns the channel quality measurement sequence to the specified test identifier. See the “hpe5022_BER_measureChannelQuality” function for details of the sequence. This function does not execute measurement. Measurement is executed by the “hpe5022_measure” function with the test identifier specified in this function.

The “hpe5022_BER_channelQuality_Q” function returns the measurement result.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- seqType

  Description — Selects the sequence type of BER measurement.

  Direction — IN

  Values — Same as ‘seqtype’ parameter in the “hpe5022_BER_measureChannelQuality” function.

- testHndl

  Description — Returns the test identifier. This identifier is used to execute channel quality measurement by the “hpe5022_measure” function.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘seqType’ is out of range.

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Error Code	Description
hpe5022_ERROR_MEM_ALLOC	Lack of memory. Release the finished setup function using the “hpe5022_releaseSetup” function.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_measureChannelQuality” on page 161

“hpe5022_measure” on page 294

“hpe5022_BER_channelQuality_Q” on page 165

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hpe5022_BER_channelQuality_Q

C Syntax

ViStatus hpe5022_BER_channelQuality_Q (ViSession id, ViPReal64 cha_qual, ViPInt32 err_count, ViPInt32 totalSector, ViPInt32 lostSector);

Visual Basic Syntax

hpe5022_BER_channelQuality_Q(ByVal id As Long, ByRef chan_qual As Double, ByRef err_count As Long, ByRef totalSector As Long, ByRef lostSector As Long) As Long

Description

This function returns the channel quality measurement result.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- chan_qual

  Description — Returns the measured channel quality.

  Direction — OUT

- err_count

  Description — Returns the number of error symbols. The Agilent E5022/E5023 compares the bit stream by byte and counts the byte where an error has occurred. The error count represents the number of error bytes.

  Direction — OUT

- totalSector

  Description — Returns the number of total sectors. The number of total sector includes the number of lost sector. The returned value will be the same as the number of sectors specified by “hpe5022_BER_trackFormat” function if the measurement done properly.

  Direction — OUT

- lostSector

  Description — Returns the number of lost sectors. The lost sector means a sector where a synchronized pattern is not found.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

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Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_DATA_CORRUPT	The channel quality measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_measureChannelQuality” on page 161

“hpe5022_BER_setupChannelQuality” on page 163

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hpe5022_BER_channelQualityRawDataSize_Q

C Syntax

ViStatus hpe5022_BER_channelQualityRawDataSize_Q (ViSession id, ViPInt32 size);

Visual Basic Syntax

hpe5022_BER_channelQualityRawDataSize_Q(ByVal id As Long, ByRef size As Long) As Long

Description

This function returns the size of array data returned by the “hpe5022_BER_channelQualityRawData_Q” function.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- size

  Description — Returns the size of the array data returned by the “hpe5022_BER_channelQualityRawData_Q” function. The returned value will be the same as ‘sector’ specified by “hpe5022_BER_trackFormat” function if measurement is done properly.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_DATA_CORRUPT	The channel quality measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_channelQualityRawData_Q” on page 168

“hpe5022_BER_trackFormat” on page 23

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hpe5022_BER_channelQualityRawData_Q

C Syntax

ViStatus hpe5022_BER_channelQualityRawData_Q (ViSession id, ViPReal64 chan_qual[], ViInt32 err_count[]);

Visual Basic Syntax

hpe5022_BER_channelQualityRawData_Q(ByVal id As Long, ByRef chan_qual As Double, ByRef error_count As Long) As Long

Description

This function returns the measurement result of the channel quality for each sector.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- chan_qual

  Description — Returns the data of channel quality for each sectors. The returned data is set in array. The size of array is returned by the "hpe5022_BER_channelQualityRawDataSize_Q" function. The average of this array will be the same as the 'chan_qual' of the "hpe5022_BER_channelQuality_Q" function.

  Direction — OUT

- error_count

  Description — Returns the number of error. Agilent E5022/E5023 compares the bit stream by a byte and counts the byte where error has occurred. Error count represents the number of error byte.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_DATA_CORRUPT	The channel quality measurement data is corrupt. Check if your measurement sequence is correct.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_measureChannelQuality” on page 161

“hpe5022_BER_setupChannelQuality” on page 163

“hpe5022_BER_channelQualityRawDataSize_Q” on page 167

“hpe5022_BER_channelQuality_Q” on page 165

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Channel IC Register Sweep Measurement

hpe5022_BER_measureChannelIcRegisterSweep

C Syntax

ViStatus hpe5022_BER_measureChannelIcRegisterSweep(ViSession id, ViInt16 seqType, ViInt32 addr, ViInt32 upperBitPos, ViInt32 lowerBitPos, ViInt16 points, ViInt32 reg_list[]);

Visual Basic Syntax

hpe5022_BER_measureChannelIcRegisterSweep(ByVal id As Long, ByVal seqType As Integer, ByVal addr As Long, ByVal upperBitPos As Long, ByVal lowerBitPos As Long, ByVal points As Integer, ByRef reg_list As Long) As Long

Description

This function performs the channel IC register value sweep. This function allows you to measure the channel quality and error counts while changing the value of the register.

There are two sequence types: 1) write a data, then measure and repeat write and measure sequence. 2) write a data, then repeat measurement. The detailed sequence are as follows:

1. Set i to zero (i = 0)
2. Move the head to the write track offset position specified by the “hpe5022_writeTrackOffset” function.
3. Write the data pattern specified by the “hpe5022_BER_selectPattern” function.
4. Move the head to the read track offset position specified by the “hpe5022_readTrackOffset” function.
5. Set the specified register at ‘reg_list[i]’ (see parameters).
6. Measure the channel quality and error counts.
7. Increment i by 1. (i = i+1).
8. If seqType is set to “hpe5022_SEQ_WR_M”, go to the step 3.

   If it is set to “hpe5022_SEQ_M”, go to the step 6.
9. Repeat the measurement until the end of reg_list array.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- seqType

  Description — Specifies the sequence type of the Channel IC register

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sweep.

Direction IN

Values

Name	Value	Description
hpe5022_SEQ_WR_M	1	Write → Measure → Write → Measure → ...
hpe5022_SEQ_M	2	Write → Measure → Measure → Measure → ...

- addr

  Description Specifies the channel IC register address.

  Direction IN

Name	Value
hpe5022_BER_REG_ADDR_MIN	0
hpe5022_BER_REG_ADDR_MAX	0x3ffff

- upperBitPos

  Description Specifies the channel IC register's upper bit position.

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_DATA_BIT_MIN	0
hpe5022_BER_REG_DATA_BIT_MAX	15

- lowerBitPos

  Description Specifies the channel IC register's lower bit position.

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_DATA_BIT_MIN	0
hpe5022_BER_REG_DATA_BIT_MAX	15

- points

  Description Specifies the number of points of register sweep.

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Direction IN

Values

Name	Value
hpe5022_BER_REG_SWEEP_COUN_MIN	1
hpe5022_BER_REG_SWEEP_COUN_MAX	128

- reg_list

  Description Specifies the channel IC register value list.

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_DATA_MIN	1
hpe5022_BER_REG_DATA_MAX	65,535

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_EXCESS_TRACK_DATA	The data overflows a track at one revolution. Change the setting of the user data rate, rpm , track number, track format or sector format.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_DRIVE_CONDITION	The spinstand drive is turned off. Turn it on before executing this function. See the “hpe5022_driveState” function.
hpe5022_ERROR_INV_PARAMETER	Either one of the parameters ‘seqType’ ‘addr’, ‘upperBitPos’, ‘lowerBitPos’, ‘points’ or ‘reg_list’ is out of range.

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Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_setupChannelIcRegisterSweep” on page 224

“hpe5022_BER_channelIcRegisterSweepData_Q” on page 227

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hpe5022_BER_setupChannelIcRegisterSweep

C Syntax

ViStatus hpe5022_BER_setupChannelIcRegisterSweep(ViSession id, ViInt16 seqType, ViInt32 addr, ViInt32 upperBitPos, ViInt32 lowerBitPos, ViInt16 points, ViInt32 reg_list[], ViPObject testHndl);

Visual Basic Syntax

hpe5022_BER_setupChannelIcRegisterSweep(ByVal id As Long, ByVal seqType As Integer, ByVal addr As Long, ByVal upperBitPos As Long, ByVal lowerBitPos As Long, ByVal points As Integer, ByRef reg_list As Long, ByRef testHndl As Long) As Long

Description

This function assigns the Channel IC Register Sweep measurement sequence then returns a test identifier. See the "hpe5022_BER_measureChannelIcRegisterSweep" function for details of the sequence. This function does not execute the measurement. Measurement is executed by the "hpe5022_measure" function with the test identifier specified in this function.

The "hpe5022_BER_channelIcRegisterSweepData_Q" function returns the measurement result.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- seqType

  Description — Selects the sequence type of the channel IC register sweep.

  Direction — IN

  Values — Same as 'seqType' parameter in the "hpe5022_BER_measureChannelIcRegisterSweep" function.

- addr

  Description — Specifies the channel IC register address.

  Direction — IN

  Values — Same as 'addr' parameter in the "hpe5022_BER_measureChannelIcRegisterSweep" function.

- upperBitPos

  Description — Specifies the channel IC register's upper bit position.

  Direction — IN

  Values — Same as 'upperBitPos' parameter in the "hpe5022_BER_measureChannelIcRegisterSweep"

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function.

- lowerBitPos

  Description — Specifies the channel IC register's lower bit position.

  Direction — IN

  Values — Same as 'lowerBitPos' parameter in the "hpe5022_BER_measureChannelIcRegisterSweep" function.

- points

  Description — Specifies the number of points for register sweep.

  Direction — IN

  Values — Same as 'points' parameter in the "hpe5022_BER_measureChannelIcRegisterSweep" function.

- reg_list

  Description — Specifies the channel IC register value list.

  Direction — IN

  Values — Same as 'reg_list' parameter in the "hpe5022_BER_measureChannelIcRegisterSweep" function.

- testHndl

  Description — Returns the test identifier. This identifier is used to execute the measurement by the "hpe5022_measure" function.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	Either one of the parameters 'seqType' 'addr', 'upperBitPos', 'lowerBitPos', 'points' or 'reg_list' is out of range.

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Error Code	Description
hpe5022_ERROR_MEM_ALLOC	Lack of memory. Release the finished setup function using the “hpe5022_releaseSetup” function.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_measureChannelIcRegisterSweep” on page 170

“hpe5022_measure” on page 294

“hpe5022_BER_channelIcRegisterSweepData_Q” on page 176

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hpe5022_BER_channelIcRegisterSweepData_Q

C Syntax

ViStatus hpe5022_BER_channelIcRegisterSweepData_Q(ViSession id, ViReal64 chan_qual[], ViInt32 err_count[], ViInt32 lostSector[]);

Visual Basic Syntax

hpe5022_BER_channelIcRegisterSweepData_Q(ByVal id As Long, ByRef chan_qual As Double, ByRef err_count As Long, ByRef lostSector As Long) As Long

Description

This function returns the channel IC register value sweep data from the specified data.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- chan_qual

  Description — Returns the measured channel quality in array. The size of array is specified by the ‘points’ parameter in the “hpe5022_BER_measureChannelIcRegisterSweep” or “hpe5022_BER_setupChannelIcRegisterSweep” function. Each value in array is the measurement result with respect to the register value that corresponds to the same order value in the array of the register value list (reg_list).

  Direction — OUT

- err_count

  Description — Returns the number of error. Agilent E5022/E5023 compares the bit stream by a byte and counts the byte where error has occurred. The error count means the number of error byte. Each value in array is the measurement result with respect to the register value that corresponds to the same order value in the array of the register value list (reg_list).

  Direction — OUT

- lostSector

  Description — Returns the number of lost sectors in array. The lost sector means a sector where a synchronized pattern is not found. The size of array is specified by the ‘points’ parameter in the “hpe5022_BER_measureChannelIc RegisterSweep” or “hpe5022_BER_setupChannelIc RegisterSweep” function. Each value in array is the measurement result with respect to the register value that corresponds to the same order value in the array of the register value list (reg_list).

  Direction — OUT

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Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_DATA_CORRUPT	The register sweep measurement data is corrupt. Check if your measurement sequence is correct.
hpe5022_ERROR_NOT_INIT	The resource of E5039A/B can not be opened during initialization. Check if E5039A/B is included in the rsrcArray of the "hpe5022_init" function.

See Also

“hpe5022_BER_measureChannelIcRegisterSweep” on page 170

“hpe5022_BER_setupChannelIcRegisterSweep” on page 173

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hpe5022_BER_measureChannelIcMultipleRegisterSweep

C Syntax

ViStatus hpe5022_BER_measureChannelIcMultipleRegisterSweep(ViSession id, ViInt16 seqType, ViInt16 regPoints, const ViInt32 addr[], const ViInt32 upperBitPos[], const ViInt32 lowerBitPos[], ViInt16 sweepPoints, ViInt32 reg_list[]);

Visual Basic Syntax

hpe5022_BER_measureChannelIcMultipleRegisterSweep(ByVal id As Long, ByVal seqType As Integer, ByVal regPoints As Integer, ByVal addr As Long, ByVal upperBitPos As Long, ByVal lowerBitPos As Long, ByVal sweepPoints As Integer, ByRef reg_list As Long) As Long

Description

This function performs the channel IC register value sweep measurement. This function affects only bits between specified upper bit position and lower bit position. This function is available for use with the E5039A/B/C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- seqType

  Description — Specifies the sequence type of the channel IC register sweep.

  Direction — IN

  Values

Name	Value	Description
hpe5022_SEQ_WR_M	1	Write → Measure → Write → Measure → ...
hpe5022_SEQ_M	2	Write → Measure → Measure → Measure → ...

- regPoints

  Description — Specifies the number of channel IC registers to sweep.

  Direction — IN

  Values

Name	Value
hpe5022_BER_REG_ELEM_COUN_MIN	1
hpe5022_BER_REG_ELEM_COUN_MAX	16

- addr

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Description Specifies the channel IC register address. The length of the array is ‘regPoints.’

Direction IN

Values

Name	Value
hpe5022_BER_REG_ADDR_MIN	0
hpe5022_BER_REG_ADDR_MAX	0x3ffff

- upperBitPos

  Description Specifies the upper bit position of the channel IC register. The length of the array is ‘regPoints.’

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_DATA_BIT_MIN	0
hpe5022_BER_REG_DATA_BIT_MAX	15

- lowerBitPos

  Description Specifies the lower bit position of the channel IC register. The length of the array is ‘regPoints.’

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_DATA_BIT_MIN	0
hpe5022_BER_REG_DATA_BIT_MAX	15

- sweepPoints

  Description Specifies the number of register sweep points.

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_SWEEP_COUN_MIN	1
hpe5022_BER_REG_SWEEP_COUN_MAX	128

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- reg_list

  Description — Specifies the channel IC register value list. The sweep data 'reg_list' is one-dimensional array and includes 'sweepPoints' blocks of multiple registers per read/write operation. The number of registers in a block is 'regPoints.' As a result, the length of the list is 'regPoints' × 'sweepPoints.'

  'regPoints' × 'sweepPoints' must be ≤ hpe5022_BER_REG_SWEEP_REG_COUN_MAX.

  Direction — IN

  Values

Name	Value
hpe5022_BER_REG_DATA_MIN	0
hpe5022_BER_REG_DATA_MAX	65535
hpe5022_BER_REG_SWEEP_REG_COUN_MAX	500

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	One or more of the parameters, 'seqType,' 'regPoints,' 'addr,' 'upperBitPos,' 'lowerBitPos,' 'sweepPoints,' or 'reg_list,' are out of range.
hpe5022_ERROR_INV_DRIVE_CONDITION	The spinstand drive is turned off. Turn it on before executing this function. See the "hpe5022_driveState" function.
hpe5022_ERROR_EXCESS_TRACK_DATA	The data overflows a track at one revolution. Change the setting of the user data rate, rpm , track number, track format or sector format.
hpe5022_ERROR_HARD_HAMP	Hardware error is detected in the head amplifier.

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Error Code	Description
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_setupChannelIcMultipleRegisterSweep” on page 233“

“hpe5022_BER_channelIcMultipleRegisterSweepData_Q” on page 237“

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hpe5022_BER_setupChannelIcMultipleRegisterSweep

C Syntax

ViStatus hpe5022_BER_setupChannelIcMultipleRegisterSweep(ViSession id, ViInt16 seqType, ViInt16 regPoints, const ViInt32 addr[], const ViInt32 upperBitPos[], const ViInt32 lowerBitPos[], ViInt16 sweepPoints, ViInt32 reg_list[], const ViPObject testHndl);

Visual Basic Syntax

hpe5022_BER_setupChannelIcMultipleRegisterSweep(ByVal id As Long, ByVal seqType As Integer, ByVal regPoints As Integer, ByVal addr As Long, ByVal upperBitPos As Long, ByVal lowerBitPos As Long, ByVal sweepPoints As Integer, ByRef reg_list As Long, ByRef testHndl As Long) As Long

Description

This function sets up the sequence of the channel IC multiple register value sweep. This function is available for use with the E5039A/B/C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- seqType

  Description — Specifies the sequence type of the channel IC multiple register sweep.

  Direction — IN

  Values

Name	Value	Description
hpe5022_SEQ_WR_M	1	Write → Measure → Write → Measure → ...
hpe5022_SEQ_M	2	Write → Measure → Measure → Measure → ...

- regPoints

  Description — Specifies the number of channel IC registers to sweep.

  Direction — IN

  Values

Name	Value
hpe5022_BER_REG_ELEM_COUN_MIN	1
hpe5022_BER_REG_ELEM_COUN_MAX	16

- addr

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Description Specifies the channel IC register address. The length of the array is ‘regPoints.’

Direction IN

Values

Name	Value
hpe5022_BER_REG_ADDR_MIN	0
hpe5022_BER_REG_ADDR_MAX	0x3ffff

- upperBitPos

  Description Specifies the uupper bit position of the channel IC register. The length of the array is ‘regPoints.’

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_DATA_BIT_MIN	0
hpe5022_BER_REG_DATA_BIT_MAX	15

- lowerBitPos

  Description Specifies the lower bit position of the channel IC register. The length of the array is ‘regPoints.’

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_DATA_BIT_MIN	0
hpe5022_BER_REG_DATA_BIT_MAX	15

- sweepPoints

  Description Specifies the number of register sweep points.

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_SWEEP_COUN_MIN	1
hpe5022_BER_REG_SWEEP_COUN_MAX	128

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- reg_list

  Description Specifies the channel IC register value list. The sweep data 'reg_list' is one-dimensional array and includes 'sweepPoints' blocks of multiple registers per read/write operation. The number of registers in a block is 'regPoints.' As a result, the length of the list is 'regPoints' × 'sweepPoints.'

  'regPoints' × 'sweepPoints' must be ≤ hpe5022_BER_REG_SWEEP_REG_COUN_MAX.

  Direction IN

  Values

Name	Value
hpe5022_BER_REG_DATA_MIN	0
hpe5022_BER_REG_DATA_MAX	65535
hpe5022_BER_REG_SWEEP_REG_COUN_MAX	500

- testHndl

  Description Returns the test handle.

  Direction OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_INV_PARAMETER	One or more of the parameters, 'seqType,' 'regPoints,' 'addr,' 'upperBitPos,' 'lowerBitPos,' 'sweepPoints,' or 'reg_list,' are out of range.
hpe5022_ERROR_MEM_ALLOC	Lack of memory. Release the finished setup function using the "hpe5022_releaseSetup" function.

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Error Code	Description
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also “hpe5022_BER_measureChannelIcMultipleRegisterSweep” on page 229“

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hpe5022_BER_channelIcMultipleRegisterSweepData_Q

C Syntax

ViStatus hpe5022_BER_channelIcMultipleRegisterSweepData_Q(ViSession id, ViReal64 chan_qual[], ViInt32 err_count[], ViInt32 lostSector[]);

Visual Basic Syntax

hpe5022_BER_channelIcMultipleRegisterSweepData_Q(ByVal id As Long, ByRef chan_qual As Double, ByRef err_count As Long, ByRef lostSector As Long) As Long

Description

This function returns the data of the channel IC multiple register value sweep. The list length is specified by 'sweepPoints' in "hpe5022_BER_setupChannelIcMultipleRegisterSweep" on page 233 or "hpe5022_BER_measureChannelIcMultipleRegisterSweep" on page 229. This function is available for use with the E5039A/B/C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- chan_qual

  Description — Returns the channel quality.

  Direction — OUT

  Values

Name	Value
hpe5022_BER_REG_SWEEP_REG_COUN_MAX	500

- err_count

  Description — Returns the number of errors.

  Direction — OUT

  Values

Name	Value
hpe5022_BER_REG_SWEEP_REG_COUN_MAX	500

- lostSector

  Description — Returns the number of lost sectors.

  Direction — OUT

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Values

Name	Value
hpe5022_BER_REG_SWEEP_REG_COUN_MAX	500

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_DATA_CORRUPT	The register sweep measurement data is corrupt. Check if your measurement sequence is correct.

See Also

“hpe5022_BER_measureChannelIcMultipleRegisterSweep” on page 229“

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hpe5022_BER_channelBoardIoData

C Syntax

ViStatus hpe5022_BER_channelBoardIoData(ViSession id, ViInt32 addr, ViInt32 data);

Visual Basic Syntax

hpe5022_BER_channelBoardIoData(ByVal id As Long, ByVal addr As Long, ByVal data As Long) As Long

Description

This function writes the specified data into the specified channel board I/O address. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction IN

- addr

  Description Specifies the channel board I/O address.

  Direction IN

  Values

Name	Value
hpe5022_BER_IO_ADDR_MIN	0x00000
hpe5022_BER_IO_ADDR_MAX	0x7ffff

- data

  Description Specifies the channel board I/O data.

  Direction IN

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.

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Error Code	Description
hpe5022_ERROR_INV_PARAMETER	The parameter ‘addr’ or ‘data’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also “hpe5022_BER_channelBoardIoData_Q” on page 241“

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hpe5022_BER_channelBoardIoData_Q

C Syntax

ViStatus hpe5022_BER_channelBoardIoData_Q(ViSession id, ViInt32 addr, ViInt32 data);

Visual Basic Syntax

hpe5022_BER_channelBoardIoData_Q(ByVal id As Long, ByVal addr As Long, ByRef data As Long) As Long

Description

This function returns the channel board I/O data from the specified channel board I/O address. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction IN

- addr

  Description Specifies the channel board I/O address.

  Direction IN

  Values

Name	Value
hpe5022_BER_IO_ADDR_MIN	0x00000
hpe5022_BER_IO_ADDR_MAX	0x7ffff

- data

  Description Returns the channel board I/O data.

  Direction OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.

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Error Code	Description
hpe5022_ERROR_INV_PARAMETER	The parameter ‘addr’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_channelBoardIoData_Q” on page 241“

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hpe5022_BER_channelBoardRomData

C Syntax

ViStatus hpe5022_BER_channelBoardRomData(ViSession id, ViInt32 addr, ViInt32 size, const ViInt32 data[]);

Visual Basic Syntax

hpe5022_BER_channelBoardRomData(ByVal id As Long, ByVal addr As Long, ByVal size As Long, ByRef data As Long) As Long

Description

This function writes the data to the channel board EEPROM. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- addr

  Description — Specifies the channel board EEPROM address. The range of this parameter is questionable by “hpe5022_BER_channelBoardRomAddressRange_Q” on page 247.

  Direction — IN

- size

  Description — Specifies the data size to be written to channel board EEPROM. The value should be greater than 0.

  Direction — IN

- data

  Description — Specifies the data array to be written to channel board EEPROM.

  Direction — IN

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.

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Error Code	Description
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.
hpe5022_ERROR_INV_PARAMETER	The parameter ‘addr,’ ‘size,’ or ‘data’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also “hpe5022_BER_channelBoardRomData_Q” on page 245“

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hpe5022_BER_channelBoardRomData_Q

C Syntax

ViStatus hpe5022_BER_channelBoardRomData_Q(ViSession id, ViInt32 addr, ViInt32 size, ViInt32 data[]);

Visual Basic Syntax

hpe5022_BER_channelBoardRomData_Q(ByVal id As Long, ByVal addr As Long, ByVal size As Long, ByRef data As Long) As Long

Description

This function reads and returns the data from the channel board EEPROM. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the “hpe5022_init” function.

  Direction — IN

- addr

  Description — Specifies the channel board EEPROM address. The upper and lower limit values can be queried by “hpe5022_BER_channelBoardRomAddressRange_Q” on page 247.

  Direction — IN

- size

  Description — Specifies the data size to read from the channel board EEPROM. The value should be greater than 0.

  Direction — IN

- data

  Description — Returns the data array of the channel board EEPROM.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the “hpe5022_init” function.
hpe5022_ERROR_INV_ID	The handle specified by ‘id’ is invalid.

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Error Code	Description
hpe5022_ERROR_INV_PARAMETER	The parameter ‘addr’ or ‘size’ is out of range.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

“hpe5022_BER_channelBoardRomData” on page 243“

“hpe5022_BER_channelBoardRomAddressRange_Q” on page 247“

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hpe5022_BER_channelBoardRomAddressRange_Q

C Syntax

ViStatus hpe5022_BER_channelBoardRomAddressRange_Q(ViSession id, ViPInt32 address_min, ViPInt32 address_max);

Visual Basic Syntax

hpe5022_BER_channelBoardRomAddressRange_Q(ByVal id As Long, ByRef address_min As Long, ByRef address_max As Integer) As Long

Description

This function returns the address range of the channel board EEPROM. This function is only available for use with the E5039C bit error test module.

Parameters

- id

  Description — Specifies the system identifier. This is given by the "hpe5022_init" function.

  Direction — IN

- address_min

  Description — Returns the minimum address of the channel board EEPROM.

  Direction — OUT

- address_max

  Description — Returns the maximum address of the channel board EEPROM.

  Direction — OUT

Return Values

Completion Code	Description
VI_SUCCESS	No Error

Error Code	Description
hpe5022_ERROR_NOT_INIT	The resource of Agilent E5039C can not be opened during initialization. Check if the Agilent E5039C is included in the rsrcArray of the "hpe5022_init" function.
hpe5022_ERROR_INV_ID	The handle specified by 'id' is invalid.
hpe5022_ERROR_NSUP_FUNC	This function is not supported by the module currently in use.

See Also

"hpe5022_BER_channelBoardRomData" on page 243"

"hpe5022_BER_channelBoardRomData_Q" on page 245"

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A Manual Changes

This appendix contains the information of the firmware/software versions and or configurations of the Agilent Technologies E5022A/B. The information in this manual applies directly to an Agilent Technologies E5022A/B whose firmware/software revision is listed on the title page of this manual.

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Changes in Revision A.04.30 from Revion A.04.20

The following functions have been added.

- hpe5022_BER_optimizeSequenceConfig
- hpe5022_BER_optimizeSequenceConfig_Q
- hpe5022_BER_trackOffsetCompInterval
- hpe5022_BER_trackOffsetCompInterval_Q

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Changes in Revision A.04.20 from Revion A.04.10.xx

The following values are added in the “hpe5022_BER_channelIcEndec” function.

- hpe5022_BER_ENDEC_96_100
- hpe5022_BER_ENDEC_96_102

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Changes in Revision A.04.00.01 from Revion A.04.00

The following functions are added.

- “hpe5022_BER_adjacentTrackPattern”
- “hpe5022_BER_adjacentTrackPattern_Q”

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