

MATH/MEASURE CONTROL REFERENCE

This section provides a reference guide for all controls used by the various 'processors' available in the instrument's Math and Measure subsystems.

Math/Measure Control Reference

This section of the manual is concerned with documenting the controls used by the numerous Math/Measure “processors” in the X-Stream DSO. The basic structure is very similar to that used in the preceding section, with one basic exception.

In the Math and Measure sections of the DSO, the automation hierarchy is more dynamic than it is elsewhere. When a math or measure operator is selected, its controls “appear” in the hierarchy, switching out the controls used by the previously selected operator.

For example, when the FFT operator is selected as Operator 1 of Math Function F1:

```
app.Math.F1.Operator1 = "FFT"
```

The following controls will be available:

```
app.Math.F1.Operator1Setup.Algorithm
app.Math.F1.Operator1Setup.FillType
app.Math.F1.Operator1Setup.SuppressDC
app.Math.F1.Operator1Setup.Type
app.Math.F1.Operator1Setup.Window
```

The nodes in the automation hierarchy that behave in this way include:

```
app.Math.Fx.Operator1Setup
app.Math.Fx.Operator2Setup

app.Measure.Px.Operator

app.PassFail.Q1.Operator
```

In order to clarify this dependency, the titles of each of the sections in this chapter follow this format:

AVERAGE

Processor
Name

app.Math.Fx.OperatorYSetup (Operator = "Average")

Path to controls, where:
Fx := { F1, F2, F3, F4, F5, F6, F7, F8 } and
OperatorYSetup := { Operator1Setup, Operator2Setup }

AVERAGE***app.Math.Fx.OperatorYSetup (Operator = "Average")***

Description

Waveform Averaging.

AverageType	Enum
ClearSweeps	Action
Sweeps	Integer

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Turn trace F1 on and setup to average the data from C1
' Average mode is set to Continuous
app.Math.F1.View = True
app.Math.F1.Operator1 = "Average"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Source1 = "C1"
app.Math.F1.Operator1Setup.AverageType = "Continuous"
app.Math.F1.Operator1Setup.Sweeps = 50
```

AverageType***Enum***

Description

Sets/Queries the averaging mode. Continuous and Summation modes are supported.

Values

Continuous
Summed

ClearSweeps***Action***

Description

Clears all averaged sweeps.

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Clear sweeps for average in trace F1.
app.Math.F1.Operator1Setup.ClearSweeps
```

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Sweeps

Integer

Range: From 1 to 1000000, step 1

Description

Sets/Queries the number of sweeps to be averaged when trace Fx is set to averaging: continuous or summed.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set number of sweeps to be averaged in trace F1 as 20.
app.Math.F1.Operator1Setup.Sweeps = 20
```

BOXCAR

app.Math.Fx.OperatorYSetup (Operator = "Boxcar")

Rectangular BoxCar filter (local running average) of specified length.

Length

Integer

Range: From 2 to 50, step 1

Description

Sets / Queries the length, in samples, of the boxcar FIR filter (i.e., the running average of a local set of "length" points)

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set the filter length for the boxcar function in trace F1
app.Math.F1.View = True
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Boxcar"
app.Math.F1.Operator1Setup.Length = 20
```

CORRELATION *app.Math.Fx.OperatorYSetup (Operator = "Correlation")*

Correlates a portion of one waveform to another.

CorrLength	Double
CorrStart	Double

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure correlation in F3 using a length of 3.5 divisions,
' starting at the first division.
app.Math.F3.View = True
app.Math.F3.Operator1 = "Correlation"
app.Math.F3.Operator1Setup.CorrLength = 3.5
app.Math.F3.Operator1Setup.CorrStart = 1
```

CorrLength

Double

Range: From 0.001 to 10, step 0.001

Description

Sets/Queries the length (in graticule divisions) of the section of the first input trace that is used in the calculation of correlation.

CorrStart

Double

Range: From 0 to 9.999, step 0.001

Description

Sets/Queries the position (in graticule divisions) of the start of the section of trace 1 that is used in the correlation function in trace Fx.

DERIVATIVE***app.Math.Fx.OperatorYSetup (Operator = "Derivative")***

Computes the derivative of the waveform: $(\text{next_sample_value} - \text{this_sample_value}) / \text{horizontal_sample_interval}$.

EnableAutoScale	Bool
FindScale	Action
VerOffset	Double
VerScale	DoubleLockstep

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Start a find scale operation for derivative function trace F1
app.Math.F1.View = True
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Derivative"
app.Math.F1.Operator1Setup.FindScale
```

EnableAutoScale***Bool*****Description**

Sets/Queries whether the Autoscale function is enabled for derivative function trace Fx. If enabled, an Autoscale operation is performed whenever the setup changes.

FindScale***Action*****Description**

Initiates a Find Scale action, to set a suitable vertical scale for the derivative function trace Fx.

VerOffset***Double***

Range: From -1e+006 to 1e+006, step 1e-009

Description

Sets/Queries the vertical offset of derivative function trace Fx.

VerScale***DoubleLock step***

Range: From 1e-012 to 1e+013, step 10000, locked to 1-2-5

Description

Sets/Queries the vertical scale of derivative function Fx.

DESKEW

app.Math.Fx.OperatorYSetup (Operator = "Deskew")

Deskew waveform by shifting it in time.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set the displacement of the trace F3 to 3.7e-9
app.Math.F3.View = True
app.Math.F3.MathMode = "OneOperator"
app.Math.F3.Operator1 = "Deskew"
app.Math.F3.Operator1Setup.WaveDeskew = 3.7e-9
```

WaveDeskew

Double

Range: From -0.1 to 0.1, step 1e-012

Description

Sets/Queries the displacement in time of trace Fx. A positive value delays the signal: a negative one makes it appear earlier.

ENVELOPE

app.Math.Fx.OperatorYSetup (Operator = "Envelope")

Envelope of minimum and maximum values for an ensemble of sweeps.

ClearSweeps	Action
Sweeps	Integer

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F3 to be an envelope of C1
app.Math.F3.View = True
app.Math.F3.Source1 = "C1"
app.Math.F3.MathMode = "OneOperator"
app.Math.F3.Operator1 = "Envelope"
app.Math.F3.Operator1Setup.Sweeps = 1000
```

ClearSweeps

Action

Description

Initiates a Clear Sweeps operation for envelope function trace Fx.

Sweeps

Integer

Range: From 1 to 1000000, step 1

Description

Sets/Queries the maximum number of sweeps to be used by envelope function trace Fx.

ERES

app.Math.Fx.OperatorYSetup (Operator = "EnhancedResolution")

Enhanced resolution achieved through FIR filtering, using well behaved filters, with precalculated noise gain.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F3 to be an ERes of C1
app.Math.F3.View = True
app.Math.F3.Source1 = "C1"
app.Math.F3.MathMode = "OneOperator"
app.Math.F3.Operator1 = "Eres"
app.Math.F3.Operator1Setup.Bits = "2"
```

Bits

Enum

Description

Sets/Queries the increase in resolution in bits for the enhanced resolution function. Be sure to specify the value as a string, and not as a floating point number, for example, "0.5", "1", "1.5", "2", "2.5", or "3".

Values

0.5
1
1.5
2
2.5
3

EXCELMATH*app.Math.Fx.OperatorYSetup (Operator = "ExcelMath")*

Performs Math in Excel. Transfers 1 or 2 waveforms into Excel and reads the resulting waveform.

AddChart	Action
AddLabels	Action
Advanced	Bool
ClearSheet	Action
CreateDemoSheet	Action
FindScale	Action
NewSheet	Bool
OutputCell	String
OutputEnable	Bool
OutputHeaderCell	String
Scaling	Enum
Source1Cell	String
Source1Enable	Bool
Source1HeaderCell	String
Source2Cell	String
Source2Enable	Bool
Source2HeaderCell	String
SpreadsheetFilename	FileName
Status	String
WithHeader	Bool

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F3 to process C1 in Excel using a demo-sheet
app.Math.F3.View = True
app.Math.F3.Source1 = "C1"
app.Math.F3.MathMode = "OneOperator"
app.Math.F3.Operator1 = "ExcelMath"
app.Math.F3.Operator1Setup.CreateDemoSheet
```

AddChart**Action****Description**

Adds a chart to the current Excel spreadsheet.

AddLabels**Action****Description**

Adds labels to the cells of the array headers in the Excel spreadsheet.

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Advanced

Bool

Description

Enables/Disables/Queries the advanced Excel settings. By default, the cell ranges used to store the input waveform, and to retrieve the calculated waveform, are preset.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set function trace F3 to be an Excel function.
app.Math.F3.Operator1 = "ExcelMath"

' Enable the use of the advanced settings.
app.Math.F3.Operator1Setup.Advanced = True
```

ClearSheet

Action

Description

Clears the contents of the current Excel spreadsheet.

CreateDemoSheet

Action

Description

Creates a "demo sheet," an excel spreadsheet pre-labeled, and with the output column equation preset to invert the input data.

FindScale

Action

Description

Sets a suitable scale for the output data from Excel on the instrument graticule when scaling has been set to manual.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set function trace F3 to be an Excel function.
app.Math.F3.Operator1 = "ExcelMath"

' Set the scaling from the Excel spreadsheet to automatic.
app.Math.F3.Operator1Setup.Scaling = "Manual"

' Find a suitable scale for the output data
' on the instrument graticule.
app.Math.F3.Operator1Setup.FindScale
```

NewSheet**Bool**

Description

Enables/Disables/Queries the creation of a new Excel spreadsheet. If a new sheet is not to be created, an existing file name must be specified in the SpreadsheetFilename control.

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Set function trace F3 to be an Excel function.
app.Math.F3.Operator1 = "ExcelMath"

' Enable the creation of a new Excel spreadsheet.
app.Math.F3.Operator1Setup.NewSheet = True
```

OutputCell**String**

Range: Any number of characters

Description

Sets/Queries the cell label for output in the Excel function Fx. This cell marks the start (top) of the array of data to be taken from Excel into the instrument.

OutputEnable**Bool**

Description

Enables/Disables/Queries the transfer of output data from Excel to the instrument. If a one-way computation is required, where results of the Excel processing are not required, this should be set to False to increase performance.

OutputHeaderCell**String**

Range: Any number of characters

Description

Sets/Queries the header cell label for output in Excel function Fx. This is the starting cell for the header that carries setup information about the output waveform, from Excel to the instrument. Only used if the WithHeader control is set to True.

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Scaling

Enum

Description

Sets/Queries the method of scaling the output trace from the Excel spreadsheet.

Values

Automatic	Automatically scale the output waveform to full-scale
FromSheet	Retrieve scaling information from the output header in the spreadsheet
Manual	Manually auto-scale when FindScale is pressed

Source1Cell

String

Range: Any number of characters

Description

Sets/Queries the cell label for source 1 in Excel function Fx. This cell marks the start (top) of the array into which data from the first source waveform is transferred.

Source1Enable

Bool

Description

Enables/Disables/Queries the transfer of source 1 data from the instrument to Excel.

Source1HeaderCell

String

Range: Any number of characters

Description

Sets/Queries the header cell label for source 1 in Excel function Fx. This is the starting cell for the header that carries setup information about waveform 1, from the instrument to Excel. This information includes waveform length, vertical and horizontal units, vertical and horizontal framing information, and horizontal scaling and offset information. Only used when the WithHeader control is set to True.

Source2Cell

String

Range: Any number of characters

Description

Sets/Queries the cell label for source 2 in Excel function Fx. This cell marks the start (top) of the array into which data from the second source waveform is transferred.

Source2Enable

Bool

Description

Enables/Disables/Queries the transfer of source 2 data from the instrument to Excel.

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")
```

```
' Set function trace F1 to be an Excel function.
app.Math.F1.Operator1 = "ExcelMath"

' Enable the transfer of source 2 data from the instrument to
Excel.
```

Source2HeaderCell**String**

Range: Any number of characters

Description

Sets/Queries the header cell label for source 2 in Excel function Fx. This is the starting cell for the header that carries setup information about waveform 2 from the instrument to Excel. This information includes waveform length, vertical and horizontal units, vertical and horizontal framing information, and horizontal scaling and offset information. Only used when the WithHeader control is set to True.

SpreadsheetFilename**FileName**

Range: Any number of characters

Description

Sets/Queries the file name of the current Excel spreadsheet.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set function trace F3 to be an Excel function.
app.Math.F3.Operator1 = "ExcelMath"

' Disable the creation of a new Excel spreadsheet.
app.Math.F3.Operator1Setup.NewSheet = False

' Select the filename of the existing Excel spreadsheet to be
used.
```

Status**String**

Range: Any number of characters

Description

Inspects the status of the Excel-and-instrument combination. Examples are "OK", or "Excel not installed".

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WithHeader

Bool

Description

Enables/Disables/Queries the presence of headers with the waveform

FFT***app.Math.Fx.OperatorYSetup (Operator = "FFT")***

Fast Fourier Transform of waveform data.

Algorithm	Enum
FillType	Enum
SuppressDC	Bool
Type	Enum
Window	Enum

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F3 to perform an FFT of C1
app.Math.F3.View = True
app.Math.F3.Source1 = "C1"
app.Math.F3.MathMode = "OneOperator"
app.Math.F3.Operator1 = "FFT"
app.Math.F3.Operator1Setup.Algorithm = "Power2"
app.Math.F3.Operator1Setup.Window = "VonHann"
app.Math.F3.Operator1Setup.Type = "PowerSpectrum"
```

Algorithm***Enum*****Description**

Sets/Queries the algorithm for the FFT in function trace Fx.

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Set function trace F4 to FFT.
app.Math.F4.Operator1 = "FFT"

' Set the FFT algorithm to power of two.
app.Math.F4.Operator1Setup.Algorithm = "Power2"
```

Values

```
LeastPrime
Power2
```

FillType***Enum*****Description**

Sets/Queries the type of trace fill to use in the FFT function trace Fx.

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Values

Truncate
ZeroFill

SuppressDC

Bool

Description

Enables/Disables suppression of the value at zero frequency in the FFT spectrum.

Type

Enum

Description

Sets/Queries the type of FFT spectrum for function trace Fx.

Values

Imaginary	Imaginary part of the complex spectrum
Magnitude	Magnitude with linear vertical scale
Phase	Phase
PowerDensity	Power Density
PowerSpectrum	Power Spectrum
Real	Real part of the complex spectrum

Window

Enum

Description

Sets/Queries the type of window for FFT function trace Fx.

Values

BlackmanHarris
FlatTop
Hamming
Rectangular
VonHann

FILTER*app.Math.Fx.OperatorYSetup (Operator = "Filter")*

Processes waveform using specified digital filter.

AutoLength	Bool
CosineBeta	Double
CustomFilename	FileName
FilterKind	Enum
FilterType	Enum
FirOrIir	Enum
GaussianBT	Double
HighFreqPass	Double
LowFreqPass	Double
NumberOfTaps	Integer
PassBandAttenuation	Double
PassBandRipple	Double
Rolloff	Double
StopBandAttenuation	Double
TransitionWidth	Double
Window	Enum

Example

```

' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1 to filter C1
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Filter"
app.Math.F1.Operator1Setup.FirOrIir = "FIR"
app.Math.F1.Operator1Setup.FilterKind = "LowPass"
app.Math.F1.Operator1Setup.AutoLength = True

```

AutoLength**Bool****Description**

Enables/Disables/Queries status of the auto-length feature for the filter.

CosineBeta**Double**

Range: From 0 to 100, step 1

Description

Sets/Queries the constant beta for the raised root cosine filter Fx, as a percentage.

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CustomFilename

FileName

Range: Any number of characters

Description

Sets/Queries the name of the current custom file for filter Fx. Valid only when FilterKind is set to "Custom".

FilterKind

Enum

Description

Sets/Queries kind of filter to use in function Fx.

Values

BandPass
BandStop
Custom
Gaussian
HighPass
LowPass
RaisedCosine
RaisedRootCosine

FilterType

Enum

Description

Sets/Queries the type of filter to use in function Fx.

Values

Bessel
Butterworth
Chebyshev
InverseChebyshev

FirOrIir

Enum

Description

Sets/Queries whether filter Fx is an FIR filter or an IIR filter.

Values

FIR	Finite Impulse Response Filter
IIR	Infinite Impulse Response Filter

GaussianBT**Double**

Range: From 0 to 100, step 1

Description

Sets/Queries the value of the Gaussian BT constant for filter Fx. Valid only when FilterKind is set to "Gaussian".

HighFreqPass**Double**

Range: From 1000 to 1e+010, step 1

Description

Sets/Queries the higher cut-off frequency for high-pass filter Fx.

LowFreqPass**Double**

Range: From 1000 to 1e+010, step 1

Description

Sets/Queries the lower cut-off frequency for band-pass filter Fx.

NumberOfTaps**Integer**

Range: From 0 to 2001, step 1

Description

Sets/Queries the number of taps in filter Fx. Valid only when the AutoLength control is set to False.

PassBandAttenuation**Double**

Range: From 0.5 to 20, step 0.1

Description

Sets/Queries the pass-band attenuation of filter Fx.

PassBandRipple**Double**

Range: From 0.5 to 20 step 0.1

Description

Sets/Queries the pass-band ripple.

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Rolloff

Double

Range: From 1 to 1000, step 0.1

Description

Sets/Queries the roll-off of filter Fx.

StopBandAttenuation

Double

Range: From 10 to 100, step 0.001

Description

Sets/Queries the stop-band attenuation of filter Fx.

TransitionWidth

Double

Range: From 0 to 1e+010, step 1

Description

Sets/Queries the width of the transition in the frequency spectrum of filter Fx.

Window

Enum

Description

Sets/Queries the type of window for filter Fx.

Values

Bartlett
Blackman
Hamming
Hanning
Kaiser
Rectangular

FLOOR

app.Math.Fx.OperatorYSetup (Operator = "Floor")

Most negative or minimum values for an ensemble of sweeps.

ClearSweeps	Action
Sweeps	Integer

Example

```

' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1 to measure the Floor of the first 1000
' sweeps of C1
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Floor"
app.Math.F1.Operator1Setup.Sweeps = 1000

```

ClearSweeps

Action

Description

Initiates a Clear Sweeps action for Floor function trace Fx.

Sweeps

Integer

Range: From 1 to 1000000, step 1

Description

Sets/Queries the maximum number of sweeps for Floor function trace Fx.

HISTOGRAM *app.Math.Fx.OperatorYSetup (Operator = "Histogram")*

Histogram of the values of a parameter. Or, if a waveform is used as the input, histogram the waveform sample amplitudes.

AutoFindScale	Bool
Bins	DoubleLockstep
Center	Double
ClearSweeps	Action
FindScale	Action
HorScale	DoubleLockstep
Values	Integer
VerScaleType	Enum

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1 to histogram the first 200000 sample
' values from source waveform C1 into 50 bins.
' Auto find-scale is enabled.
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Histogram"
app.Math.F1.Operator1Setup.AutoFindScale = True
app.Math.F1.Operator1Setup.Bins = 50
app.Math.F1.Operator1Setup.Values = 200000
```

AutoFindScale *Bool*

Description
Enables/Disables automatic scale setting for histogram function Fx.

Bins *DoubleLock step*

Range: From 20 to 2000, step 1, locked to 1-2-5
Description
Sets/Queries the number of bins in histogram function Fx.

Center**Double**

Range: From -1e+010 to 1e+010, step 1e-012

Description

Sets/Queries the horizontal value at the center of the graticule of histogram function Fx.

ClearSweeps**Action**

Description

Clears the contents of all the bins of histogram function Fx.

FindScale**Action**

Description

Creates a suitable horizontal position and scale to include all the non-empty bins of histogram Fx.

HorScale**DoubleLock step**

Range: From 1e-012 to 1e+012, step 0.01, locked to 1-2-5

Description

Sets/Queries the horizontal scale in units per division for histogram function Fx. Use the FindScale control to automatically determine the scale by looking at the non-zero populated bins.

Values**Integer**

Range: From 20 to 2000000000, step 1

Description

Sets/Queries the maximum number of values from the source result to include in the histogram function Fx.

VerScaleType**Enum**

Description

Sets/Queries the way that the vertical scale is calculated as histogram Fx grows.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set function F1 as histogram.
app.Math.F1.Operator1 = "Histogram"

' Set the vertical scale type to linear with constant maximum.
app.Math.F1.Operator1Setup.VerScaleType = "LinConstMax"
```

Values

LinConstMax	Linear scale with constant maximum value
Linear	Linear scale

INTEGRAL

app.Math.Fx.OperatorYSetup (Operator = "Integral")

Integral of the linearly rescaled (multiplier and adder) input.

Adder	Double
FindScale	Action
Multiplier	Double
VerOffset	Double
VerScale	DoubleLockstep

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1 to integrate C1
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Integral"
app.Math.F1.Operator1Setup.Multiplier = 2
app.Math.F1.Operator1Setup.Adder = 0.1
app.Math.F1.Operator1Setup.FindScale
```

Adder

Double

Range: From -1e-009 to 1e-009, step 1e-012

Description

Sets/Queries the additive A for integral function Fx.

FindScale

Action

Description

Initiates an action to find suitable vertical offset and scale for integral function trace Fx.

Multiplier

Double

Range: From -1e+006 to 1e+006, step 1e-006

Description

Sets/Queries the multiplying constant M for integral function Fx.

VerOffset***Double***Range: From $-1\text{e}+006$ to $1\text{e}+006$, step $1\text{e}-012$

Description

Sets/Queries the vertical offset for integral function trace Fx.

VerScale***DoubleLock step***Range: From $1\text{e}-009$ to $1\text{e}+007$ step 0.01, locked to 1-2-5

Description

Sets/Queries the vertical scale for integral function trace Fx.

INTERPOLATE *app.Math.Fx.OperatorYSetup (Operator = "Interpolate")*

Interpolate, producing more points in the resulting waveform using linear, cubic, or weighted sin(x)/x algorithms.

Expand	DoubleLockstep
InterpolateType	Enum

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1 to interpolate C1
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Interpolate"
app.Math.F1.Operator1Setup.InterpolateType = "Cubic"
app.Math.F1.Operator1Setup.Expand = 5
```

Expand *DoubleLock step*

Range: From 2 to 50, step 0.1, locked to 1-2-5
Description
Sets/Queries the sampling expansion ratio for the interpolation function Fx.

InterpolateType *Enum*

Description
Sets/Queries the type of interpolation for function trace Fx.

- Values
- Cubic
 - Linear
 - SinXX

MATH SCRIPT *app.Math.Fx.OperatorYSetup (Operator = "WaveScript")*

Visual basic script that produces a waveform from one or two input waveforms.

Math script

Code	String
Language	Enum
Status	String

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Place sample program code in a string
' This will invert the first 200 points of the waveform
code = "function Update()" + vbcrLf
code = code + "    unscaledData = InResult.DataArray(False)" +
vbcrLf
code = code + "    For i = 0 to 200" + vbcrLf
code = code + "        unscaledData(i) = -unscaledData(i)" +
vbcrLf
code = code + "    next" + vbcrLf
code = code + "    OutResult.DataArray(False) = unscaledData" +
vbcrLf
code = code + "end Function"

' Configure F1 to integrate C1
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Math Script"
```

Code

String

Range: Any number of characters

Description

Sets/Queries the scripting code used in math script function Fx. For complete details of programming the instrument in VBScript, please view the online Help and the relevant section of this manual.

PART TWO: REFERENCE

Language

Enum

Description

Sets/Queries the language used for math script function Fx.

Values

JScript	Java Script
VBScript	Visual Basic Script

Example

```
app.Math.F1.Operator1Setup.Language = "VBScript"  
app.Math.F1.Operator1Setup.Code = code
```

Status

String

Range: Any number of characters

Description

Inspects the status of the script operation. A typical message would be "Error at line 23, Type mismatch"; or "OK" if the supplied code executed successfully.

MATHCADMATH*app.Math.Fx.OperatorYSetup (Operator = "MathcadMath")*

Produces a waveform using a user specified Mathcad function.

Advanced	Bool
FindScale	Action
NewSheet	Bool
OutputEnable	Bool
OutputHeaderVar	String
OutputVar	String
Reload	Action
Scaling	Enum
Source1Enable	Bool
Source1HeaderVar	String
Source1Var	String
Source2Enable	Bool
Source2HeaderVar	String
Source2Var	String
Status	String
WithHeader	Bool
WorksheetFilename	FileName

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1 to process C1 using Mathcad
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "MathcadMath"
```

Advanced***Bool*****Description**

Enables/Disables/Queries the use of the advanced features. When in advanced mode the names used for source and output vectors, in addition to names used for source and output headers, may be modified from their default values.

FindScale***Action*****Description**

Sets a suitable vertical scale of the Mathcad output trace on the instrument graticule. Valid only when Manual scaling is specified.

PART TWO: REFERENCE

NewSheet

Bool

Description

Enables/Disables/Queries the creation of a new Mathcad worksheet.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set function F1 as Mathcad calculation.
app.Math.F1.Operator1 = "MathcadMath"
' Enable creation of a new Mathcad worksheet.
app.Math.F1.Operator1Setup.NewSheet = True
```

OutputEnable

Bool

Description

Enables/Disables/Queries the transmission of output data from Mathcad to the instrument.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set function F1 as Mathcad calculation.
app.Math.F1.Operator1 = "MathcadMath"
' Enable transmission of output data.
app.Math.F1.Operator1Setup.OutputEnable = True
```

OutputHeaderVar

String

Range: Any number of characters

Description

Sets/Queries the name in Mathcad of the output header variable.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set function F1 as Mathcad calculation.
app.Math.F1.Operator1 = "MathcadMath"
' Enables use of headers.
app.Math.F1.Operator1Setup.WithHeader = True
' Sets the name of the output header variable
app.Math.F1.Operator1Setup.OutputHeaderVar = "header1"
```


OutputVar**String**

Range: Any number of characters

Description

Sets/Queries the name in Mathcad of the output variable.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set function F1 as Mathcad calculation.
app.Math.F1.Operator1 = "MathcadMath"
' Sets the name of the output variable in Mathcad.
app.Math.F1.Operator1Setup.OutputVar = "output3"
```

Reload**Action**

Description

Reloads a specified Mathcad worksheet. If the worksheet does exist, the system creates an empty one with a name of the form "UntitledN", where N is an integer.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set function F1 as Mathcad calculation.
app.Math.F1.Operator1 = "MathcadMath"
' Specifies a Mathcad worksheet name.
app.Math.F1.Operator1Setup.WorksheetFilename = "XStream34.mcd"
' Reload a Mathcad worksheet.
app.Math.F1.Operator1Setup.Reload
```

Scaling**Enum**

Description

Sets/Queries the method of vertical scaling of the Mathcad output trace on the instrument graticule.

Values

Automatic
Manual

Source1Enable**Bool**

Description

Enables/Disables/Queries the transmission of source 1 data from the instrument to Mathcad.

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Source1HeaderVar

String

Range: Any number of characters

Description

Sets/Queries the name in Mathcad of input 1 header variable.

Source1Var

String

Range: Any number of characters

Description

Sets/Queries the name in Mathcad of input variable 1.

Source2Enable

Bool

Description

Enables/Disables/Queries the transmission of source 2 data from the instrument to Mathcad.

Source2HeaderVar

String

Range: Any number of characters

Description

Sets/Queries the name in Mathcad of input 2 header variable.

Source2Var

String

Range: Any number of characters

Description

Sets/Queries the name in Mathcad of input variable 2.

Status

String

Range: Any number of characters

Description

Inspects the status of the Mathcad calculation.

WithHeader

Bool

Description

Enables/Disables/Queries inclusion of headers in the Mathcad calculation.

WorksheetFilename

FileName

Range: Any number of characters

Description

Sets/Queries a Mathcad worksheet file name.

MATLAB MATH*app.Math.Fx.OperatorYSetup (Operator= "MATLABWaveform")*

Produces a waveform using a user specified MATLAB function.

MATLABCode	String
MATLABPlot	Bool
MATLABScalePerDiv	Double
MATLABZeroOffset	Double

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1 to process C1 using MATLAB
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "MATLAB math"
app.Math.F1.Operator1Setup.MATLABCode = "WformOut = -0.5 * WformIn"
```

MATLABCode**String**

Range: Any number of characters

Description

Sends/Inspects the MATLAB code.

MATLABPlot**Bool**

Description

Enables/Disables a MATLAB plot.

MATLABScalePerDiv**Double**

Range: From 1e-009 to 1e+009, step 1e-009

Description

Sets/Queries the vertical scale in units per division, of the MATLAB output trace on the instrument graticule.

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MATLABZeroOffset

Double

Range: From -1e+009 to 1e+009, step 1e-009

Description

Sets/Queries the vertical zero offset of the MATLAB output trace on the scope graticule. This is the position on the graticule where zero is found: a positive offset moves the trace downwards; a negative offset moves it upwards.

PHISTOGRAM*app.Math.Fx.OperatorYSetup (Operator = "PersistenceHistogram")*

Histogram of a slice of a persistence map.

CenterCursor	Action
ClearSweeps	Action
CutDirection	Enum
HorCutCenter	Double
HorCutWidth	Double
PctCutWidth	Double
VerCutCenter	Double
VerCutWidth	Double

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1 to generate a slice of the persistence map of C1
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "PHistogram"
app.Math.F1.Operator1Setup.CutDirection = "Horizontal"
app.Math.F1.Operator1Setup.HorCutWidth = 10e-3
app.Math.F1.Operator1Setup.CenterCursor
```

CenterCursor**Action****Description**

Centralizes the cut on the graticule for persistence histogram Fx.

ClearSweeps**Action****Description**

Initiates a clearance of the contents of persistence histogram Fx.

CutDirection**Enum****Description**

Sets/Queries the direction of the cut the persistence histogram Fx.

Values

Horizontal	Cut persistence map horizontally
Vertical	Cut persistence map vertically

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HorCutCenter

Double

Range: From -10 to 10, step 0.0001

Description

Sets/Queries the position of the center of the horizontal cut (measured in the units of vertical scale) of the slice to be used in the persistence histogram Fx.

HorCutWidth

Double

Range: From -10 to 10, step 0.0001

Description

Sets/Queries the width of the horizontal cut (measured in the units of vertical scale) of the slice to be used in persistence histogram Fx.

PctCutWidth

Double

Range: From 0 to 100, step 0.1

Description

Sets/Queries the width of the cut in percent.

VerCutCenter

Double

Range: From -1 to 1, step 1e-009

Description

Sets/Queries the position of the center of the vertical cut (measured in the units of horizontal scale) of the slice to be used in persistence histogram Fx.

VerCutWidth

Double

Range: From -1 to 1, step 1e-009

Description

Sets/Queries the width of the vertical cut (measured in the units of horizontal scale) of the slice to be used in the persistence histogram Fx.

PTRACE MEAN *app.Math.Fx.OperatorYSetup (Operator = "PersistenceTraceMean")*

Create a waveform from the mean of a persistence map.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1 to generate a waveform from the
' mean value of the persistence map of C1
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Ptrace mean"
app.Math.F1.Operator1Setup.ClearSweeps
```

ClearSweeps

Action

Description

Clears the contents of persistence mean trace Fx.

PTRACE RANGE

app.Math.Fx.OperatorYSetup (Operator = "PersistenceTraceRange")

Generates a waveform with a width derived from a population range of a persistence map.

ClearSweeps	Action
PctPopulation	Double

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Ptrace range"
app.Math.F1.Operator1Setup.ClearSweeps
app.Math.F1.Operator1Setup.PctPopulation = 50.0
```

ClearSweeps

Action

Description

Clears the contents of persistence range trace Fx.

PctPopulation

Double

Range: From 0.5 to 100, step 0.5

Description

Sets/Queries the percentage of the persistence population that is spanned by persistence range trace Fx.

PTRACE SIGMA

app.Math.Fx.OperatorYSetup (Operator = "PersistenceTraceSigma")

Generates a waveform with a width derived from the sigma of a persistence map.

ClearSweeps	Action
Sigma	Double

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Ptrace sigma"
app.Math.F1.Operator1Setup.ClearSweeps
app.Math.F1.Operator1Setup.Sigma = 5.0
```

ClearSweeps

Action

Description
Clears the contents of persistence sigma trace Fx.

Sigma

Double

Range: From 0.5 to 10, step 0.1
Description
Sets/Queries the number of standard deviations of the persistence population that is spanned by sigma trace Fx.

RESCALE

app.Math.Fx.OperatorYSetup (Operator = "Rescale")

Linearly transform the vertical values of a waveform.

Adder	Double
CustomUnit	Bool
Multiplier	Double
Unit	String

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Rescale"
app.Math.F1.Operator1Setup.Adder = 2.0
app.Math.F1.Operator1Setup.Multiplier = 3.0
app.Math.F1.Operator1Setup.CustomUnit = True
app.Math.F1.Operator1Setup.Unit = "DEG"
```

Adder

Double

Range: From -1.79769e+308 to 1.79769e+308, step 0
Description
 Sets/Queries the additive constant A in the rescale function $F_x = M.Input + A$

CustomUnit

Bool

Description
 Enables/Disables the application of a custom unit of measurement to rescale function trace F_x .

Multiplier

Double

Range: From -1.79769e+308 to 1.79769e+308 step 0
Description
 Sets/Queries the multiplicative constant M in the rescale function $F_x = M.Input + A$.

Unit***String***

Range: Any number of characters

Description

Sets/Queries the custom unit for rescale function trace Fx. Only used when the CustomUnit control is set to True.

ROOF

app.Math.Fx.OperatorYSetup (Operator = "Roof")

The most positive or maximum values for an ensemble of sweeps, or "Roof."

ClearSweeps	Action
Sweeps	Integer

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1 to measure the Roof of the first 1000
' sweeps of C1
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Roof"
app.Math.F1.Operator1Setup.Sweeps = 1000
```

ClearSweeps **Action**

Description
Initiates a clear sweeps action for roof function trace Fx.

Sweeps **Integer**

Range: From 1 to 1000000, step 1
Description
Sets/Queries the maximum number of sweeps for Roof function trace Fx.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set function trace F2 to roof.
app.Math.F2.Operator1 = "Roof"
' Set the maximum number of sweeps to 150.
app.Math.F2.Operator1Setup.Sweeps = 150
```

SEGMENT *app.Math.Fx.OperatorYSetup (Operator = "SegmentSelect")*

Selects one waveform from a group of waveforms.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Enable sequence acquisition mode, collect 10 segments
app.Acquisition.Horizontal.NumSegments = 10
app.Acquisition.Horizontal.SampleMode = "Sequence"

' Configure F1 to show the 5th of the 10 collected segments
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Segment"
app.Math.F1.Operator1Setup.SelectedSegment = 5
```

SelectedSegment

Integer

Range: From 1 to 1000000000, step 1

Description

In sequence mode, sets/queries the number of the segment selected from a set.

SPARSE

app.Math.Fx.OperatorYSetup (Operator = "Sparse")

Waveform sparser, will reduce the number of points in the output waveform by skipping points in the input, and starting at a given offset.

SparsingFactor	Integer
SparsingPhase	Integer

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Configure F1 to sparse C1 by a factor of 100
app.Math.F1.View = True
app.Math.F1.Source1 = "C1"
app.Math.F1.MathMode = "OneOperator"
app.Math.F1.Operator1 = "Sparse"
app.Math.F1.Operator1Setup.SparsingFactor = 100
```

SparsingFactor *Integer*

Range: From 1 to 1000000, step 1
Description
Sets/Queries the factor by which the number of samples is reduced in the sparsing function Fx.

SparsingPhase *Integer*

Range: From 0 to 0, step 1
Description
Sets/Queries the number of the first sample that will be accepted by the sparsing function Fx.

TRACK

app.Math.Fx.OperatorYSetup (Operator = "Track")

The "Track" function gives a waveform of equivalent horizontal scale to the source waveform, but of a measurement on that waveform.

AutoFindScale	Bool
Center	Double
FindScale	Action
VerScale	DoubleLockstep

AutoFindScale

Bool

Description

Enables/Disables the automatic setting of the vertical scale and vertical offset for Track trace Fx.

Center

Double

Range: From -1e+010 to 1e+010, step 1e-012

Description

Sets/Queries the vertical position of the center of Track trace Fx.

FindScale

Action

Description

Sets the vertical scale and offset to optimum values to display Track trace Fx.

VerScale

DoubleLock step

Range: From 1e-012 to 1e+012 step 0.01, locked to 1-2-5

Description

Sets/Queries the vertical scale of Track trace Fx.

TREND

app.Math.Fx.OperatorYSetup (Operator = "Trend")

Trend of the values of a parameter, if connected to a parameter result source, or a trend of the sample values of a waveform, if connected to a waveform result.

AutoFindScale	Bool
Center	Double
ClearSweeps	Action
FindScale	Action
Values	Integer
VerScale	DoubleLockstep

AutoFindScale

Bool

Description

Enables/Disables the automatic setting of the vertical scale and vertical offset for Trend trace Fx.

Center

Double

Range: From -1e+010 to 1e+010, step 1e-012

Description

Sets/Queries the vertical position of the center of Trend trace Fx.

ClearSweeps

Action

Description

Clears the contents of Trend trace Fx.

FindScale

Action

Description

Sets the vertical scale and offset to optimum values to display Trend trace Fx.

Values

Integer

Range: From 20 to 1000000, step 1

Description

Sets/Queries the number of visible values in Trend trace Fx.

VerScale

DoubleLock step

Range: From 1e-012 to 1e+012 step 0.01, locked to 1-2-5

Description

Sets/Queries the vertical scale of Trend trace Fx.

MATHCADPARAMARITH *app.Measure.Px.Operator (ArithEngine = "MathcadParamArith")*

Advanced	Bool
NewSheet	Bool
OutputEnable	Bool
OutputHeaderVar	String
OutputVar	String
Reload	Action
Source1Enable	Bool
Source1HeaderVar	String
Source1Var	String
Source2Enable	Bool
Source2HeaderVar	String
Source2Var	String
Status	String
WithHeader	Bool
WorksheetFilename	FileName

Advanced**Bool**

Description

Enables/Disables/Queries use of advanced features for Mathcad parameter Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Enables use of advanced features.
app.Measure.P3.Operator.Advanced = True
```

NewSheet**Bool**

Description

Enables/Disables/Queries the use of a new Mathcad worksheet for parameters.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Enable new Mathcad worksheet.
app.Measure.P3.Operator.NewSheet = True
```

PART TWO: REFERENCE

OutputEnable

Bool

Description

Enables/Disables/Queries transmission of output data from Mathcad to the instrument.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Enables transmission of Mathcad output to the instrument.
app.Measure.P3.Operator.OutputEnable = True
```

OutputHeaderVar

String

Range: Any number of characters

Description

Sets/Queries the name of the output variable header in Mathcad parameter Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Sets the name of the Mathcad output header variable
app.Measure.P3.Operator.OutputHeaderVar = "outputheader"
```

OutputVar

String

Range: Any number of characters

Description

Sets/Queries the name of the output variable in Mathcad parameter Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Sets the name of the Mathcad output variable
app.Measure.P3.Operator.OutputVar = "output7"
```

Reload**Action**

Description

Reloads the specified Mathcad file.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Specify a Mathcad worksheet filename.
app.Measure.P3.Operator.WorksheetFilename =
"C:\XStreamMathcad\Param233.mcd"
' Reload the specified Mathcad file.
app.Measure.P3.Operator.Reload
```

Source1Enable**Bool**

Description

Enables/Disables/Queries transmission of source data 1 from instrument to Mathcad.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Enables transmission of source 1 data to instrument.
app.Measure.P3.Operator.Source1Enable = True
```

Source1HeaderVar**String**

Range: Any number of characters

Description

Sets/Queries the name of the input variable 1 header in Mathcad parameter Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Sets the name of the Mathcad source 1 header variable
app.Measure.P3.Operator.Source1HeaderVar = "input1header"
```

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Source1Var

String

Range: Any number of characters

Description

Sets/Queries the name of input variable 1 in Mathcad parameter Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Sets the name of the source 1 variable
app.Measure.P3.Operator.Source1Var = "input1"
```

Source2Enable

Bool

Description

Enables/Disables/Queries transmission of source data 2 from instrument to Mathcad.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Enables transmission of source 2 data to instrument.
app.Measure.P3.Operator.Source2Enable = True
```

Source2HeaderVar

String

Range: Any number of characters

Description

Sets/Queries the name of input variable 2 header in Mathcad parameter Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Sets the name of the Mathcad source 2 header variable
app.Measure.P3.Operator.Source2HeaderVar = "input2header"
```

Source2Var**String**

Range: Any number of characters

Description

Sets/Queries the name of input variable 2 in Mathcad parameter Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Sets the name of the source 2 variable
app.Measure.P3.Operator.Source2Var = "input2"
```

Status**String**

Range: Any number of characters

Description

Inspects the status of Mathcad parameter calculation Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Inspect status of Mathcad parameter calculation.
MathcadStatus = app.Measure.P3.Operator.Status
```

WithHeader**Bool**

Description

Enables/Disables/Queries the presence of headers with variables with Mathcad parameter Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Enables inclusion of headers with data.
app.Measure.P3.Operator.WithHeader = True
```

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WorksheetFilename

FileName

Range: Any number of characters

Description

Sets/Queries the name of the current Mathcad file for parameter Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 as Mathcad calculation.
app.Measure.P3.ParamEngine = "MathcadParam"
' Specify a Mathcad worksheet filename.
app.Measure.P3.Operator.WorksheetFilename =
"C:\XStreamMathcad\Param233.mcd"
```

P INVERT*app.Measure.Px.Operator (ArithEngine = "ParamInvert")*

This engine produces the reciprocal of the input parameter.

CycleForTimeUnits***Bool***

Description

Sets/Queries the use of period as the measurement for time units, rather than 1/Hz.

When true, if there are seconds in the vertical dimensions of the source parameter, it is assumed that there is an implicit "cycles" per second. Thus the resulting units upon inversion is Hertz (cycles per second).

P SCRIPT

app.Measure.Px.Operator (ArithEngine = "ParamScript")

Calculates a parameter result from one or two parameter inputs

Code	String
Language	Enum
Status	String
Timeout	Double

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Place sample program code in a string
' This will the square of the input value times 3.1
code =      "function Update()" + vbcrLf
code = code + "    value = InResult.Value(False)" + vbcrLf
code = code + "    OutResult.Value(False) = value * value * 3.1"
+ vbcrLf
code = code + "end Function"

' Configure P1 as a scripting component
app.Measure.P1.View = True
app.Measure.P1.Source1 = "C1"
app.Measure.P1.MeasurementType = "math"
app.Measure.P1.ArithEngine = "P Script"
app.Measure.P1.Operator.Language = "VBScript"
app.Measure.P1.Operator.Code = code
```

Code

String

Range: Any number of characters

Description

Sets/Queries the code used to calculate parameter Px. This code is, of course, text.

Language

Enum

Description

Sets/Queries the language for parameter script Fx (i.e., choice of scripting language).

Values

JScript

VBScript

Status***String***

Range: Any number of characters

Description

Inspects the status of parameter script Px. A typical message is "Error in line 14, Expected end of statement."

Timeout***Double***

Range: From 1 to 12000, step 0.001

Description

Sets/Queries the time-out for parameter script Px.

PART TWO: REFERENCE

Q *app.Measure.Px.Operator (ParamEngine = "EyeQ")*

Calculates the Q-factor based on a vertical slice from the (assumed input) eye diagram. The width of the vertical slice is specified through PctCutWidth

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.Pl.ParamEngine = "EyeQ"
```

PctCutWidth

Double

Range: From 0 to 100, step 0.1

Description

Sets/Queries the vertical slice or cut width in percent.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Sets the cut width to 8%.
app.Measure.Pl.Operator.PctCutWidth = 8
```

AREA

app.Measure.Px.Operator (ParamEngine = "Area")

Calculates the area of the input waveform relative to zero.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to area.
app.Measure.P1.View = True
app.Measure.P1.MeasurementType = "measure"
app.Measure.P1.ParamEngine = "Area"
app.Measure.P1.Source1 = "C1"

' Enable cyclic calculation of area.
app.Measure.P1.Operator.Cyclic = True

' Set markers to simple.
app.Measure.P1.Operator.CursorDisplay = "Simple"
```

Cyclic

Bool

Description

Enables/Disables cyclic calculation of area parameter Px, which is calculated using a whole number of cycles of the signal.

Note: Help Markers aid in selecting the region of the waveform where measurement is made.

AVG POWER *app.Measure.Px.Operator (ParamEngine = "EyeAvgPower")*

The measurement is assumed to be on an eye-diagram, and the percentage of a unit-interval at the center of the eye is used to estimate the average power.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

app.Measure.Pl.ParamEngine = "EyeAvgPower"

' Sets the cut width to 8% of the unit interval.
app.Measure.Pl.Operator.PctCutwidth = 8
```

PctCutWidth

Double

Range: From 0 to 100, step 0.1

Description

Sets/Queries the cut width in percent.

DPERIOD@LEVEL*app.Measure.Px.Operator (ParamEngine = "DeltaPeriodAtLevel")*

Delta-period at level, the difference between successive (adjacent periods), also known as "cycle-to-cycle jitter."

AbsLevel	Double
BaseFrequency	Double
FindBaseFrequency	Action
FindLevel	Action
GroupSize	Integer
Hysteresis	Double
LevelType	Enum
PercentLevel	Double
SignalType	Enum
Slope	Enum
StartCycle	Integer
StdBaseFrequency	Enum
UseBaseFrequency	Enum

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta period at level.
app.Measure.MeasureMode = "MyMeasure"
app.Measure.P1.MeasurementType = "measure"
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"

' Set level type to absolute.
app.Measure.P1.Operator.LevelType = "Absolute"

' Set the measurement level to 5 mV.
app.Measure.P1.Operator.AbsLevel = 0.005
```

AbsLevel**Double**

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the absolute measuring level for parameter period at level Px.

PART TWO: REFERENCE

BaseFrequency

Double

Range: From 1 to 4e+010, step 1000

Description

Sets/Queries the base frequency of the signal for the parameter delta period at level. This only has effect when the UseBaseFrequency = "Custom", otherwise the base frequency is set directly from the standard selection.

When the period measurements are made on a data-stream instead of a clock, the engine needs to be told, or to learn, the base frequency (effective clock frequency). Since precision is exceptionally important, it's most often the case that the engine is asked to find the frequency, and then this control is queried to verify that the correct frequency has been found.

FindBaseFrequency

Action

Description

Finds the base frequency of the signal by inspecting the signal, if you are not supplying a standard value or a custom value.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta period at level.
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"
' Find the base frequency of the signal.
app.Measure.P1.Operator.FindBaseFrequency
```

FindLevel

Action

Description

Finds the 50 percent level for delta period measurements. Level type may be either absolute or percentage.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta period at level.
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"
' Find the 50 percent level.
app.Measure.P1.Operator.FindLevel
```

GroupSize*Integer*

Range: From 1 to 128, step 1

Description

Sets/Queries the size of a group of consecutive cycles for the delta period at level parameter Px. This is an advanced feature.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta period at level.
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"
' Set up for clock signal.
app.Measure.P1.Operator.SignalType = "Clock"
' Set the group size to 8.
app.Measure.P1.Operator.GroupSize = 8
```

Hysteresis*Double*

Range: From 0 to 10, step 0.1

Description

Sets the hysteresis range for parameter delta-period at level Px, specified in divisions. Hysteresis can be used to obtain good noise rejection.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta period at level.
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"
' Set the hysteresis range to 0.9 division. (+- 0.45 divisions)
app.Measure.P1.Operator.Hysteresis = 0.9
```

LevelType*Enum*

Description

Sets/Queries whether the level is absolute or a percentage of the amplitude of the signal for Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta period at level.
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"
```

PART TWO: REFERENCE

```
' Set level type to absolute.  
app.Measure.P1.Operator.LevelType = "Absolute"
```

Values

Absolute
Percent

PercentLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the percentage measuring level for parameter delta-period at level Px.

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
  
' Set parameter P1 to delta period at level.  
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"  
' Set level type to percentage.  
app.Measure.P1.Operator.LevelType = Percent  
' Set the measurement level to 55%  
app.Measure.P1.Operator.PercentLevel = 55
```

SignalType

Enum

Description

Sets/Queries the type of data specified for the measurement of delta-period at level.

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
  
' Set parameter P1 to delta period at level.  
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"  
' Set the signal type to data.  
app.Measure.P1.Operator.SignalType = "Data"
```

Values

Clock
Data

Slope**Enum**

Description

Sets/Queries the polarity of the transitions for measuring parameter delta-period at level.

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
  
' Set parameter P1 to delta period at level.  
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"  
' Set transtion polarity to negative.  
app.Measure.P1.Operator.LevelType = "Neg"
```

Values

Both
Neg
Pos

PART TWO: REFERENCE

StartCycle

Integer

Range: From 0 to 0, step 1

Description

Sets/Queries the start cycle when measuring over groups of clock cycles

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta period at level.
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"
' Set up for clock signal.
app.Measure.P1.Operator.SignalType = "Clock"
' Set the group size to 8.
app.Measure.P1.Operator.GroupSize = 8
' Set the start cycle to 2.
app.Measure.P1.Operator.StartCycle = 2
```

StdBaseFrequency

Enum

Description

Sets/Queries the standard base frequency, sending or receiving a string from the list of standard frequencies.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta period at level.
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"
' Set up to use the standard frequency
app.Measure.P1.Operator.UseBaseFrequency = "Standard"
' Set the standard base frequency to 2.048 MHz.
app.Measure.P1.Operator.StdBaseFrequency = "2.048MHz"
```

Values

1.544MHz
139.264MHz
155.52MHz
2.048MHz
2488.32MHz
34.368MHz
44.736MHz

51.84MHz
622.08MHz
8.448MHz

UseBaseFrequency**Enum**

Description

Sets/Queries the choice of a specified base frequency as custom or standard. When "custom" is selected, you must specify or find the base frequency.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta period at level.
app.Measure.P1.ParamEngine = "DeltaPeriodAtLevel"
' Set up to use a standard base frequency.
app.Measure.P1.Operator.UseBaseFrequency = "Standard"
```

Values

Custom
Standard

DTIME@LEVEL

app.Measure.Px.Operator (ParamEngine = "DeltaTimeAtLevel")

A calculation of the time between two highly specific transitions.

AbsLevel1	Double
AbsLevel2	Double
FindLevel1	Action
FindLevel2	Action
Hysteresis1	Double
Hysteresis2	Double
LevelType1	Enum
LevelType2	Enum
PercentLevel1	Double
PercentLevel2	Double
Slope1	Enum
Slope2	Enum

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.MeasureMode = "MyMeasure"
app.Measure.P1.MeasurementType = "measure"
app.Measure.P1.ParamEngine = "DeltaTimeAtLevel"
' Set level type for trace 1 to absolute.
app.Measure.P1.Operator.LevelType1 = "Absolute"
' Set the measurement level for trace 1 to 25 mV
app.Measure.P1.Operator.AbsLevel1 = 0.025
```

AbsLevel1

Double

Range: From -100 to 100, step 1e-005

Description

Sets/Queries the absolute measuring level for the first transition time, if LevelType1 = "Absolute".

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "DeltaTimeAtLevel"
' Set level type for trace 1 to absolute.
app.Measure.P1.Operator.LevelType1 = "Absolute"
' Set the measurement level for trace 1 to 25 mV
app.Measure.P1.Operator.AbsLevel1 = 0.025
```

AbsLevel2**Double**

Range: From -100 to 100, step 1e-005

Description

Sets/Queries the absolute measuring level for the second transition time, if LevelType2 = "Absolute".

FindLevel1**Action**

Description

Sets the measurement level automatically for the first transition time. (Works for both percent and absolute level modes.)

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "DeltaTimeAtLevel"
' Find the level for trace 1.
app.Measure.P1.Operator.FindLevel1
```

FindLevel2**Action**

Description

Sets the measurement level automatically for second transition (for LevelType2 either "Percent" or "Absolute").

Hysteresis1**Double**

Range: From 0 to 10, step 0.1

Description

Sets/Queries the hysteresis level in graticule divisions for first transition time. (This is an advanced feature.)

Hysteresis2**Double**

Range: From 0 to 10, step 0.1

Description

Sets/Queries the hysteresis level in graticule divisions for the second transition. (This is an advanced feature.)

PART TWO: REFERENCE

LevelType1

Enum

Description

Sets/Queries whether to use absolute level or percent level for the first transition time.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "DeltaTimeAtLevel"
' Set level type for trace 1 to percentage.
app.Measure.P1.Operator.LevelType1 = "Percent"
' Set the measurement level for trace 1 to 55%
app.Measure.P1.Operator.PercentLevel1 = 55
```

Values

Absolute
Percent

LevelType2

Enum

Description

Sets/Queries whether to use absolute level or percent level for specifying the second transition.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "DeltaTimeAtLevel"
' Set level type for trace 2 to absolute.
app.Measure.P1.Operator.LevelType2 = "Absolute"
' Set the measurement level for trace 2 to 15 mV
app.Measure.P1.Operator.AbsLevel2 = 0.015
```

Values

Absolute
Percent

PercentLevel1

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the measuring level, in percent, for the first transition if LevelType1 = "Percent".

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "DeltaTimeAtLevel"
' Set level type for trace 1 to percentage.
app.Measure.P1.Operator.LevelType1 = "Percent"
' Set the measurement level for trace 1 to 55%
app.Measure.P1.Operator.PercentLevel1 = 55
```

PercentLevel2**Double**

Range: From 0 to 100, step 1

Description

Sets/Queries the measuring level, in percent, for the second transition if LevelType2 = "Percent".

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "DeltaTimeAtLevel"
' Set level type for trace 2 to percentage.
app.Measure.P1.Operator.LevelType2 = "Percent"
' Set the measurement level for trace 2 to 45%
app.Measure.P1.Operator.PercentLevel2 = 45
```

Slope1**Enum****Description**

Sets/Queries the transition polarity of trace 1 for delta time at level Fx.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "DeltaTimeAtLevel"
' Set edge polarity for trace 1 to positive.
app.Measure.P1.Operator.Slope1 = "Pos"
```

Values

Both
Neg
Pos

Slope2

Enum

Description

Sets/Queries the transition polarity of the second transition time.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "DeltaTimeAtLevel"
' Set edge polarity for the second transition to both.
app.Measure.P1.Operator.Slope2 = "Both"
```

Values

Both
Neg
Pos

DUTY@LEVEL*app.Measure.Px.Operator (ParamEngine = "DutyAtLevel")*

AbsLevel	Double
FindLevel	Action
Hysteresis	Double
HysteresisPct	Double
HysteresisType	Enum
LevelType	Enum
PercentLevel	Double
Slope	Enum

AbsLevel**Double**

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the absolute level used if LevelType = "Absolute"

FindLevel**Action**

Description

Causes the engine to find a suitable level for either LevelType ("Absolute" or "Percent").

Hysteresis**Double**

Range: From 0 to 10, step 0.1

Description

Sets/Queries the hysteresis range in divisions for duty at level Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "DutyAtLevel"
' Set hysteresis measurement type to divisions.
app.Measure.P1.Operator.HysteresisType = "Divisions"
' Set the hysteresis to 0.8 divisions.
app.Measure.P1.Operator.Hysteresis = 0.8
```

PART TWO: REFERENCE

HysteresisPct

Double

Range: From 0 to 100, step 0.1

Description

Sets/Queries the percent hysteresis range for duty at level Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "DutyAtLevel"
' Set hysteresis measurement type to percentage.
app.Measure.P1.Operator.HysteresisType = "Percent"
' Set the percent hysteresis to 55%
app.Measure.P1.Operator.HysteresisPct = 55
```

HysteresisType

Enum

Description

Sets/Queries whether to set the hysteresis range in divisions or percent of the signal amplitude.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "DutyAtLevel"
' Set hysteresis measurement type to percentage.
app.Measure.P1.Operator.HysteresisType = "Percent"
' Set the percent hysteresis to 55%
app.Measure.P1.Operator.HysteresisPct = 55
```

Values

Divisions
Percent

LevelType

Enum

Values

Absolute
Percent

PercentLevel**Double**

Range: From 0 to 100, step 1

Description

Using ParamEngine = "DutyAtLevel", refer to the corresponding variable for the Delta Time At Level parameter.

Slope**Enum**

Description

Sets/Queries the polarity of the first transition used (i.e., classic duty factor is for setting "Pos")

Values

Neg
Pos

PART TWO: REFERENCE

DWIDTH@LEVEL

app.Measure.Px.Operator (ParamEngine = "DeltaWidthAtLevel")

Calculates the Difference (delta) between adjacent width measurements.

AbsLevel	Double
FindLevel	Action
Hysteresis	Double
LevelType	Enum
PercentLevel	Double
Slope	Enum

AbsLevel

Double

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the absolute level used if LevelType = "Absolute"

FindLevel

Action

Description

Causes the engine to find a suitable level for either LevelType ("Absolute" or "Percent")

Hysteresis

Double

Range: From 0 to 10, step 0.1

Description

Sets/Queries the hysteresis setting for this measurement. (This is an advanced feature.)

LevelType

Enum

Description

Sets/Queries whether to use absolute level or percent level for the last (ending) transition time.

Values

Absolute
Percent

PercentLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the percentage level to be used if the LevelType = "Percent".

Slope

Enum

Description

Sets/Queries which polarity transition is used as the start (first) of the width measurement.

Values

Both

Neg

Pos

PART TWO: REFERENCE

EDGE@LEVEL

app.Measure.Px.Operator (ParamEngine = "EdgeAtLevel")

Counts the number of transitions or edges in the input waveform.

AbsLevel	Double
FindLevel	Action
Hysteresis	Double
LevelType	Enum
PercentLevel	Double
Slope	Enum

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

app.Measure.Pl.ParamEngine = "EdgeAtlevel"
```

AbsLevel

Double

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the absolute level used to detect edges, when LevelType = "Absolute"

FindLevel

Action

Description

Causes the engine to find a suitable level for either LevelType ("Absolute" or "Percent")

Hysteresis

Double

Range: From 0 to 10, step 0.1

Description

Sets/Queries the hysteresis used for edge detection in divisions. (This is an advanced feature.)

LevelType

Enum

Description

Sets/Queries whether to use absolute or percent levels.

Values

Absolute
Percent

PercentLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the percent level threshold used for detection of edges when LevelType = "Percent".

Slope

Enum

Description

Sets/Queries the polarity of the edges detected.

Values

- Both
- Neg
- Pos

EXCELPARAM

app.Measure.Px.Operator (ParamEngine = "ExcelParam")

AddChart	Action
AddLabels	Action
Advanced	Bool
ClearSheet	Action
CreateDemoSheet	Action
NewSheet	Bool
OutputCell	String
OutputEnable	Bool
OutputHeaderCell	String
Source1Cell	String
Source1Enable	Bool
Source1HeaderCell	String
Source2Cell	String
Source2Enable	Bool
Source2HeaderCell	String
SpreadsheetFilename	FileName
Status	String
WithHeader	Bool

AddChart

Action

Description

Adds a chart to the output worksheet.

AddLabels

Action

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

Advanced

Bool

Description

Sets/Queries whether advanced features of this component are enabled.

ClearSheet

Action

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

CreateDemoSheet

Action

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

NewSheet**Bool**

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

OutputCell**String**

Range: Any number of characters

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

OutputEnable**Bool**

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

OutputHeaderCell**String**

Range: Any number of characters

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

Source1Cell**String**

Range: Any number of characters

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

Source1Enable**Bool**

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

Source1HeaderCell**String**

Range: Any number of characters

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

Source2Cell**String**

Range: Any number of characters

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

Source2Enable**Bool**

Description

Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

PART TWO: REFERENCE

Source2HeaderCell *String*
Range: Any number of characters
Description
Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

SpreadsheetFilename *FileName*
Range: Any number of characters
Description
Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

Status *String*
Range: Any number of characters
Description
Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

WithHeader *Bool*
Description
Using ParamEngine = "ExcelParam", refer to the corresponding variable for the ExcelMath function.

EXT. RATIO***app.Measure.Px.Operator (ParamEngine = "ExtinctionRatio")***

Extinction Ratio assumes it is operating on an eye diagram (persistence result).

CalcType	Enum
PctCutWidth	Double

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to ExtinctionRatio
app.Measure.P1.ParamEngine = "ExtinctionRatio"
```

CalcType***Enum*****Description**

Sets/Queries the calculation type.

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

app.Measure.P1.ParamEngine = "ExtinctionRatio"
' Set the calculation type to linear.
app.Measure.P1.Operator.CalcType = "Linear"
```

Values

dB
linear

PctCutWidth***Double***

Range: From 0 to 100, step 0.1

Description

Sets/Queries the percent cut width. This specifies which region of the eye diagram (about the center of the eye) will be used to estimate extinction ratio.

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to delta time at level.
app.Measure.P1.ParamEngine = "ExtinctionRatio"
' Set the percent cut width to 15%.
app.Measure.P1.Operator.PctCutWidth = 15
```

EYE AMPLITUDE

app.Measure.Px.Operator (ParamEngine = "EyeAmplitude")

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
  
app.Measure.P1.ParamEngine = "EyeAmplitude"
```

PctCutWidth

Double

Range: From 0 to 100, step 0.1

Description

Sets/Queries the percent cut width. This specifies which region of the eye diagram (about the center of the eye) will be used to estimate eye amplitude.

EYE BER

app.Measure.Px.Operator (ParamEngine = "EyeBER")

Estimates the BER based on a cut through the (assumed input) Eye Diagram.

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
app.Measure.P1.ParamEngine = "EyeBER"
```

PctCutWidth

Double

Range: From 0 to 100, step 0.1

Description

Sets/Queries the percent cut width. This specifies which region of the eye diagram (about the center of the eye) will be used to estimate Bit Error Rate

EYE HEIGHT *app.Measure.Px.Operator (ParamEngine = "EyeHeight")*

Estimates the difference between the high (one level) and low (zero level) of the (assumed input) eye diagram, based on a vertical slice centered on the eye diagram of a specified width, PctCutWidth.

CalcUnits	Enum
PctCutWidth	Double

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.P1.ParamEngine = "EyeHeight"
app.Measure.P1.Operator.PctCutWidth = 7
```

CalcUnits *Enum*

Description

Using ParamEngine = "EyeHeight", refer to the corresponding variable for the Extinction Ratio parameter.

Values

dB
linear

PctCutWidth *Double*

Range: From 0 to 100, step 0.1

Description

Sets/Queries the percent cut width. This specifies which region of the eye diagram (about the center of the eye) will be used to estimate eye height.

FALL@LEVEL *app.Measure.Px.Operator (ParamEngine = "FallAtLevel")*

Calculates the fall time at specified arbitrary levels.

HighAbs	Double
HighPct	Double
LevelsAre	Enum
LowAbs	Double
LowPct	Double

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.P1.ParamEngine = "FallAtLevel"

' Set measurement level type to percent.
app.Measure.P1.Operator.LevelsAre = "Percent"
' Set the higher percent level to 85 percent.
app.Measure.P1.Operator.HighPct = 85
' Set the higher percent level to 15 percent.
app.Measure.P1.Operator.HighPct = 15
```

HighAbs**Double**

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the upper (first) transition level, if LevelsAre = "Absolute".

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to fall time at set levels.
app.Measure.P1.ParamEngine = "FallAtLevel"
' Set measurement level type to absolute.
app.Measure.P1.Operator.LevelsAre = "Absolute"
' Set the higher absolute level to 120 mV.
app.Measure.P1.Operator.HighAbs = 0.12
```

HighPct**Double**

Range: From 11 to 95, step 1

Description

Sets/Queries the upper (first) transition level, if LevelsAre = "Percent".

PART TWO: REFERENCE

LevelsAre

Enum

Description

Sets/Queries whether the measurement levels are absolute or relative to the trace.

Values

Absolute

Percent

LowAbs

Double

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the lower (second) transition level, if LevelsAre = "Absolute".

LowPct

Double

Range: From 5 to 89, step 1

Description

Sets/Queries the lower (second) transition level, if LevelsAre = "Percent".

FREQ@LEVEL*app.Measure.Px.Operator (ParamEngine = "FrequencyAtLevel")*

Calculates the frequency based on a specified transition level.

AbsLevel	Double
BaseFrequency	Double
FindBaseFrequency	Action
FindLevel	Action
Hysteresis	Double
LevelType	Enum
PercentLevel	Double
SignalType	Enum
Slope	Enum
StdBaseFrequency	Enum
UseBaseFrequency	Enum

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.P1.ParamEngine = "FrequencyAtlevel"
```

AbsLevel**Double**

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the transition level, if LevelType = "Percent".

BaseFrequency**Double**

Range: From 1 to 4e+010, step 1000

Description

Sets/Queries a custom (non-standard) base frequency to be used when SignalType = "Data" and when UseBaseFrequency = "Custom"

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to frequency at level.
app.Measure.P1.ParamEngine = "FrequencyAtLevel"
' Set the instrument to treat the input waveform as a data
stream.
app.Measure.P1.Operator.SignalType = "Data"
' Set the instrument to use a non-standard base frequency.
app.Measure.P1.Operator.UseBaseFrequency = "Custom"
' Set the base frequency to 23.79 MHz. (note this is a number not
```

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```
a string,  
'however a string would work just as well)  
app.Measure.P1.Operator.BaseFrequency = 23.79e6
```

FindBaseFrequency

Action

Description

Set the base frequency by inspection of the data signal, is SignalType = "Data"

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
  
' Set parameter P1 to frequency at level.  
app.Measure.P1.ParamEngine = "FrequencyAtLevel"  
' Set the instrument to use a non-standard base frequency.  
app.Measure.P1.Operator.UseBaseFrequency = "Custom"  
' Find the base frequency from the signal.  
app.Measure.P1.Operator.FindBaseFrequency
```

FindLevel

Action

Description

Causes the engine to find a suitable level for either LevelType ("Absolute" or "Percent").

Hysteresis

Double

Range: From 0 to 10, step 0.1

Description

Sets/Queries the hysteresis level. (This is an advanced feature.)

LevelType

Enum

Description

Sets/Queries whether the levels used are specified in "Percent" or "Absolute".

Values

Absolute
Percent

PercentLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the transition level, if LevelType = "Percent".

SignalType**Enum**

Description

Sets/Queries the input signal type. When "Data" is selected, the periods are the same as for an NRZ datastream, with changing states on whole periods of the assumed "clock."

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to frequency at level.
app.Measure.P1.ParamEngine = "FrequencyAtLevel"
' Set input signal type to data
app.Measure.P1.Operator.SignalType = "Data"
```

Values

Clock
Data

Slope**Enum**

Description

Sets/Queries the polarity of the transitions to be used to estimate whole cycles.

Values

Neg
Pos

StdBaseFrequency**Enum**

Description

Sets/Queries the selection of standard frequencies (an enumerated list). This setting only has effect if UseBaseFrequency = "Standard".

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to frequency at level.
app.Measure.P1.ParamEngine = "FrequencyAtLevel"
' Set the instrument to use a standard base frequency.
app.Measure.P1.Operator.UseBaseFrequency = "Standard"
' Set the standard base frequency to 155.52MHz
app.Measure.P1.Operator.StdBaseFrequency = "155.52MHz"
'or alternately set to third choice in (zero based index) list
app.Measure.P1.Operator.StdBaseFrequency = 2
```

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Values

1.544MHz
139.264MHz
155.52MHz
2.048MHz
2488.32MHz
34.368MHz
44.736MHz
51.84MHz
622.08MHz
8.448MHz

UseBaseFrequency

Enum

Description

Sets/Queries whether to use a custom base frequency or a standard base frequency for frequency at level.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to frequency at level.
app.Measure.P1.ParamEngine = "FrequencyAtLevel"
' Set the instrument to use a standard base frequency.
app.Measure.P1.Operator.UseBaseFrequency = "Standard"
```

Values

Custom
Standard

FWXX***app.Measure.Px.Operator (ParamEngine = "FullWidthAtXX")***

Calculates the full width (of a histogram or distribution) at a specified fraction of the maximum height.

(This is a generalized case of FWHM, or full width at half maximum.)

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.P1.ParamEngine = "FullWidthAtXX"
'set the fraction to 25 percent
app.Measure.P1.Operator.HFractionHt = .25
```

HFractionHt***Double***

Range: From 0 to 100, step 1

Description

Sets/Queries the fraction (as a percentage) of the maximum height at which the full width of a histogram will be measured.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Sets the fraction of the height for parameter P2 to 25%.
app.Measure.P2.Operator.HFractionHt = 25
```

HALF PERIOD *app.Measure.Px.Operator (ParamEngine = "HalfPeriod")*

AbsLevel	Double
FindLevel	Action
Hysteresis	Double
LevelType	Enum
PercentLevel	Double
Slope	Enum

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
app.Measure.Pl.ParamEngine = "HalfPeriod"
```

AbsLevel

Double

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the transition level, if LevelType = "Absolute".

FindLevel

Action

Description

Causes the engine to find a suitable level for either LevelType ("Absolute" or "Percent").

Hysteresis

Double

Range: From 0 to 10, step 0.1

Description

Sets/Queries the hysteresis level in divisions (this is an advanced feature).

LevelType

Enum

Description

Sets/Queries whether the levels used are specified in "Percent" or "Absolute".

Values

Absolute
Percent

PercentLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the transition level, if LevelType = "Percent".

Slope	Enum
Description	Sets/Queries the polarity of the transitions to be used to estimate whole cycles.
Values	
Both	
Neg	
Pos	

HOLD TIME

app.Measure.Px.Operator (ParamEngine = "HoldTime")

Calculates the "Hold" time for a data or clock signal.

ClockAbsLevel	Double
ClockFindLevel	Action
ClockHysteresis	Double
ClockLevelIs	Enum
ClockPctLevel	Double
ClockSlope	Enum
CursorDisplay	Enum
DataAbsLevel	Double
DataFindLevel	Action
DataHysteresis	Double
DataLevelIs	Enum
DataPctLevel	Double
DataSlope	Enum

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to hold time
app.Measure.P1.ParamEngine = "HoldTime"
' Set clock level type to absolute.
app.Measure.P1.Operator.ClockLevelIs = "Absolute"
' Set the absolute clock level to 30 mV.
app.Measure.P1.Operator.ClockAbsLevel = 0.03
'or alternatively to 32 millivolts
app.Measure.P1.Operator.ClockAbsLevel = "32mV"
```

ClockAbsLevel

Double

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the absolute measuring level for the clock input, if ClockLevelIs = "Absolute".

ClockFindLevel

Action

Description

Causes the engine to find a suitable level for either ClockLevelIs setting ("Absolute" or "Percent").

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")
```



```
' Set parameter P1 to hold time at set levels.
app.Measure.P1.ParamEngine = "HoldTime"

' Find the measuring level for the clock signal.
app.Measure.P1.Operator.ClockFindLevel
```

ClockHysteresis**Double**

Range: From 0 to 10, step 0.1

Description

Sets/Queries the hysteresis range in divisions for the clock input signal.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to hold time at set levels.
app.Measure.P1.ParamEngine = "HoldTime"

' Set the clock hysteresis to 0.8 divisions.
app.Measure.P1.Operator.ClockHysteresis = 0.8
```

ClockLevelIs**Enum**

Description

Sets/Queries whether the clock level is set as absolute or percent for hold time Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to hold time at set levels.
app.Measure.P1.ParamEngine = "HoldTime"

' Set clock level type to absolute.
app.Measure.P1.Operator.ClockLevelIs = "Absolute"
```

Values

Absolute
Percent

ClockPctLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the percent measuring level for the clock input.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to hold time at set levels.
app.Measure.P1.ParamEngine = "HoldTime"
' Set clock level type to percent.
app.Measure.P1.Operator.ClockLevelIs = "Percent"
' Set the percent clock level to 45
app.Measure.P1.Operator.ClockPctLevel = 45
```

ClockSlope

Enum

Description

Sets/Queries the slope for the measured transitions for the clock input signal.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to hold time at set levels.
app.Measure.P1.ParamEngine = "HoldTime"
' Set the clock slope to positive.
app.Measure.P1.Operator.ClockSlope = "Pos"
```

Values

Both
Neg
Pos

CursorDisplay

Enum

Description

Sets/Queries the type of cursor display for hold time.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to hold time at set levels.
```

```

app.Measure.P1.ParamEngine = "HoldTime"
' Set the type of cursor display as simple.
app.Measure.P1.Operator.CursorDisplay = "Simple"

```

Values

Detailed
 Off
 Simple

DataAbsLevel**Double**

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the absolute measuring level for the data input.

Example

```

' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to hold time at set levels.
app.Measure.P1.ParamEngine = "HoldTime"
' Set data level type to absolute.
app.Measure.P1.Operator.DataLevelIs = "Absolute"
' Set the absolute data level to 30 mV.
app.Measure.P1.Operator.DataAbsLevel = 0.03

```

DataFindLevel**Action****Description**

Automatically finds a suitable level for the Data signal, for either DataLevelIs ("Absolute" or "Percent").

Example

```

' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to hold time at set levels.
app.Measure.P1.ParamEngine = "HoldTime"
' Find the measuring level for the data signal.
app.Measure.P1.Operator.DataFindLevel

```

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DataHysteresis

Double

Range: From 0 to 10, step 0.1

Description

Sets/Queries the hysteresis range in divisions for the data input signal.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to hold time at set levels.
app.Measure.P1.ParamEngine = "HoldTime"
' Set the data hysteresis to 0.8 divisions.
app.Measure.P1.Operator.DataHysteresis = 0.8
```

DataLevellIs

Enum

Description

Sets/Queries whether the data level is set as absolute or percent for hold time Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to hold time at set levels.
app.Measure.P1.ParamEngine = "HoldTime"
' Set data level type to percent.
app.Measure.P1.Operator.DataLevelIs = "Percent"
```

Values

Absolute
Percent

DataPctLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the percent measuring level for the data input.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to hold time at set levels.
app.Measure.P1.ParamEngine = "HoldTime"
' Set data level type to percent.
```

```
app.Measure.P1.Operator.DataLevelIs = "Percent"  
' Set the percent data level to 55  
app.Measure.P1.Operator.DataPctLevel = 55
```

DataSlope**Enum**

Description

Sets/Queries the polarity of the transitions measured for the data input signal.

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
  
' Set parameter P1 to hold time at set levels.  
app.Measure.P1.ParamEngine = "HoldTime"  
' Set the data slope to negative.  
app.Measure.P1.Operator.DataSlope = "Neg"
```

Values

Both
Neg
Pos

LEVEL@X

app.Measure.Px.Operator (ParamEngine = "LevelAtX")

CursorShape	Enum
HorValue	Double
LevelCursor	Bool
Marker	Bool
PinToData	Bool
TimeCursor	Bool

CursorShape

Enum

Description

Sets/Queries the cursor shape.

Example

```
Set app = CreateObject("LeCroy.XStreamDSO")
```

```
' Set parameter P1 to level at X
```

```
app.Measure.P1.ParamEngine = "LevelAtX"
```

```
' Sets the cursor to difference.
```

```
app.Measure.P1.Operator.CursorShape = "Difference"
```

Values

Absolute

Difference

Reference

HorValue

Double

Range: From -1.79769e+308 to 1.79769e+308, step 0

Description

Sets/Queries the horizontal position at which the level is to be measured.

Example

```
' Visual Basic Script
```

```
Set app = CreateObject("LeCroy.XStreamDSO")
```

```
' Set parameter P1 to level at X
```

```
app.Measure.P1.ParamEngine = "LevelAtX"
```

```
' Set the horizontal value to 120 ns.
```

```
app.Measure.P1.Operator.HorValue = 0.12e-6
```

LevelCursor**Bool**

Description

Sets/Queries whether the level cursor is visible.

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to level at X
app.Measure.P1.ParamEngine = "LevelAtX"

' Remove the level cursor.
app.Measure.P1.Operator.LevelCursor = False
```

Marker**Bool**

Description

Sets/Queries whether the marker is visible.

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to level at X
app.Measure.P1.ParamEngine = "LevelAtX"

' Remove the marker.
app.Measure.P1.Operator.Marker = False
```

PinToData**Bool**

Description

Sets/Queries whether the measurement is taken from the nearest data point (pin to data) or not (based on the interpolated value at X).

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to level at X
app.Measure.P1.ParamEngine = "LevelAtX"

' Disables pin to data to allow interpolated measurements.
app.Measure.P1.Operator.PinToData = False
```

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TimeCursor

Bool

Description

Sets/Queries whether the time cursor is visible.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to level at X
app.Measure.P1.ParamEngine = "LevelAtX"
' Remove the time cursor.
app.Measure.P1.Operator.TimeCursor = False
```


MATHCADPARAM*app.Measure.Px.Operator (ParamEngine = "MathcadParam")*

Advanced	Bool
NewSheet	Bool
OutputEnable	Bool
OutputHeaderVar	String
OutputVar	String
Reload	Action
Source1Enable	Bool
Source1HeaderVar	String
Source1Var	String
Source2Enable	Bool
Source2HeaderVar	String
Source2Var	String
Status	String
WithHeader	Bool
WorksheetFilename	FileName

Advanced***Bool***

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

NewSheet***Bool***

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

OutputEnable***Bool***

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

OutputHeaderVar***String***

Range: Any number of characters

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

OutputVar***String***

Range: Any number of characters

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

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Reload

Action

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

Source1Enable

Bool

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

Source1HeaderVar

String

Range: Any number of characters

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

Source1Var

String

Range: Any number of characters

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

Source2Enable

Bool

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

Source2HeaderVar

String

Range: Any number of characters

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

Source2Var

String

Range: Any number of characters

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

Status***String***

Range: Any number of characters

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

WithHeader***Bool***

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

WorksheetFilename***FileName***

Range: Any number of characters

Description

Using ParamEngine = "MathcadParam", refer to the corresponding variable for the MathcadMath function.

MATLAB PARAM

app.Measure.Px.Operator (ParamEngine = "MATLABParameter")

MATLABCode	String
MATLABPlot	Bool
MATLABScalePerDiv	Double
MATLABZeroOffset	Double

MATLABCode

String

Range: Any number of characters

Description

Using ParamEngine = "MATLAB param", refer to the corresponding variable for the MATLABMath function.

MATLABPlot

Bool

Description

Using ParamEngine = "MATLAB param", refer to the corresponding variable for the MATLABMath function.

MATLABScalePerDiv

Double

Range: From 1e-009 to 1e+009, step 1e-009

Description

Using ParamEngine = "MATLAB param", refer to the corresponding variable for the MATLABMath function.

MATLABZeroOffset

Double

Range: From -1e+009 to 1e+009, step 1e-009

Description

Using ParamEngine = "MATLAB param", refer to the corresponding variable for the MATLABMath function.

MAXIMUM*app.Measure.Px.Operator (ParamEngine = "Maximum")*

Calculates the maximum vertical value of the waveform.

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
app.Measure.P1.ParamEngine = "Maximum"
```

MEAN

app.Measure.Px.Operator (ParamEngine = "Mean")

Calculates the mean value of the input waveform's vertical values. When Cyclic = true, the range of values used is limited to a whole number of cycles.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to mean.
app.Measure.P1.ParamEngine = "Mean"

' Set the mean parameter for cyclic measurements.
app.Measure.P1.Operator.Cyclic = true
```

Cyclic

Bool

Description

Sets/Queries whether the mean parameter Px is to be measured over a number of complete cycles.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P2 to mean.
app.Measure.P2.ParamEngine = "Mean"

' Set the mean parameter for cyclic measurements.
app.Measure.P2.ParamEngine.Cyclic = True
```

MEDIAN

app.Measure.Px.Operator (ParamEngine = "Median")

Calculates the median (division between two halves) of the probability distribution of an input waveform. For periodic signals it is advisable to use Cyclic = True.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.P1.ParamEngine = "Median"
' Set the measurement for a periodic signal
app.Measure.P1.Operator.Cyclic = true
```

Cyclic

Bool

Description

Sets/Queries whether the median parameter Px is to be measured over an integral number of complete cycles.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P2 to median.
app.Measure.P2.ParamEngine = "Median"
' Set the median parameter for cyclic measurements.
app.Measure.P2.Operator.Cyclic = True
```

MINIMUM

app.Measure.Px.Operator (ParamEngine = "Minimum")

Calculates the minimum value of a waveform.

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
  
app.Measure.P1.ParamEngine = "Minimum"
```


NB PHASE

app.Measure.Px.Operator (ParamEngine = "NarrowBandPhase")

Estimates the phase of the frequency component at the specified Frequency.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to narrow band phase.
app.Measure.P1.ParamEngine = "NarrowBandPhase"
' Set the frequency at which the phase is to be measured to 691
MHz.
app.Measure.P1.Operator.Frequency = "691MHz"
' or alternatively to 299MHz
```

Frequency

Double

Range: From 10 to 1e+010, step 1

Description

Sets/Queries the frequency at which the narrow band phase is to be measured.

NB POWER

app.Measure.Px.Operator (ParamEngine = "NarrowBandPower")

Measures the power found at a given frequency.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to narrow band phase.
app.Measure.P1.ParamEngine = "NarrowBandPower"
' Set the frequency at which the power is to be measured to 235
MHz.
```

Frequency

Double

Range: From 10 to 1e+010, step 1

Description

Sets/Queries the frequency at which the narrow band power is to be measured.

NPTS

app.Measure.Px.Operator (ParamEngine = "npoints")

Counts the number of (sample or data) points in the input waveform.

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
app.Measure.P3.ParamEngine = "npoints"  
  
' Also count the points extending off the grid  
app.Measure.P3.Operator.UsePointsInFrame = false
```

UsePointsInFrame

Bool

Description

Sets/Queries whether to use the number of points in the graticule, or the total number of points in the trace.

Note: In many cases there are points off screen in the source waveform; but in particular, in the X-Stream standard architecture, waveforms are often "clipped to frame" already. This setting is most useful when using the WebEdit mode.

ONE LEVEL

app.Measure.Px.Operator (ParamEngine = "EyeOneLevel")

Estimates the high level for the (assumed input) eye diagram, based on a slice through the middle of the eye diagram of specified width, PctCutWidth.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.Pl.ParamEngine = "EyeOneLevel"
app.Measure.Pl.Operator.PctCutWidth = 8
```

PctCutWidth

Double

Range: From 0 to 100, step 0.1

Description

Sets/Queries the width of the vertical slice through the eye, from which the one level is estimated.

PARAM SCRIPT*app.Measure.Px.Operator (ParamEngine = "ParamScript")*

Calculates a parameter from a waveform based on VBScript or JavaScript.

Code	String
Language	Enum
Status	String
Timeout	Double

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Place sample program code in a string
' This will calculate the mean of all of the data points
code = "Function Update()" + vbcrLf
code = code + "    numSamples = InResult.Samples" + vbcrLf
code = code + "    unscaledData = InResult.DataArray(False)" +
vbcrLf
code = code + "    mean = 0" + vbcrLf
code = code + "    For i = 0 to numSamples-1" + vbcrLf
code = code + "        mean = mean + unscaledData(i)" + vbcrLf
code = code + "    next" + vbcrLf
code = code + "    if numSamples > 0 then mean = mean/numSamples"
+ vbcrLf
code = code + "    OutResult.Value = mean" + vbcrLf
code = code + "end Function"

' Configure P1 as a scripting component
app.Measure.P1.View = True
app.Measure.P1.Source1 = "C1"
app.Measure.P1.MeasurementType = "measure"
app.Measure.P1.ParamEngine = "ParamScript"
app.Measure.P1.Operator.Language = "VBScript"
```

Code**String**

Range: Any number of characters

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Language	<i>Enum</i>
Description	
Sets/Queries which scripting language is to be used	
Values	
JScript	
VBScript	
Status	<i>String</i>
Range: Any number of characters	
Description	
Queries status, as reported by the scripting engine (errors).	
Timeout	<i>Double</i>
Range: From 1 to 12000, step 0.001	
Description	
Sets/Queries Timeout for scripting calculation.	

PERCENTILE *app.Measure.Px.Operator (ParamEngine = "Percentile")*

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")

app.Measure.Pl.ParamEngine = "Percentile"

' Set the percentile level to 67%.(i.e. will calculate percentile
  @ 67%)

app.Measure.Pl.Operator.HPctPop = 67
```

HPctPop

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the percentage of the population that falls to the left of (or below) the desired percentile. For example, the median is the 50th percentile, or the horizontal coordinate of the histogram at which 50% of the population falls to the left.

PERIOD@LEVEL

app.Measure.Px.Operator (ParamEngine = "PeriodAtLevel")

Calculates the period of the input, using a specified level and slope.

AbsLevel	Double
BaseFrequency	Double
FindBaseFrequency	Action
FindLevel	Action
Hysteresis	Double
LevelType	Enum
PercentLevel	Double
SignalType	Enum
Slope	Enum
StdBaseFrequency	Enum
UseBaseFrequency	Enum

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
app.Measure.P1.ParamEngine = "PeriodAtLevel"
```

AbsLevel

Double

Range: From -100 to 100, step 1e-007

Description

Using ParamEngine = "PeriodAtLevel", refer to the corresponding variable for the Delta Time At Level parameter.

BaseFrequency

Double

Range: From 1 to 4e+010, step 1000

Description

Sets/Queries the frequency to be used as a reference when SignalType = "Data"; otherwise, not used.

FindBaseFrequency

Action

Description

Automatically finds (by analyzing the input) the base frequency for a SignalType = "Data".

FindLevel**Action**

Description

Causes the engine to find a suitable level for either LevelType ("Absolute" or "Percent")

Hysteresis**Double**

Range: From 0 to 10, step 0.1

Description

Sets/Queries the Hysteresis level used for edge or transition detection. (This is an advanced feature.)

LevelType**Enum**

Description

Sets/Queries whether the levels of the signal amplitude are "Percent" or "Absolute".

Values

Absolute

Percent

PercentLevel**Double**

Range: From 0 to 100, step 1

Description

Sets/Queries the percent level to be used when LevelType = "Percent".

SignalType**Enum**

Description

Using ParamEngine = "PeriodAtLevel", refer to the corresponding variable for the Frequency At Level parameter.

Values

Clock

Data

PART TWO: REFERENCE

Slope

Enum

Description

Using ParamEngine = "PeriodAtLevel", refer to the corresponding variable for the Delta Time At Level parameter.

Values

Neg
Pos

StdBaseFrequency

Enum

Description

Using ParamEngine = "PeriodAtLevel", refer to the corresponding variable for the Frequency At Level parameter.

Values

1.544MHz
139.264MHz
155.52MHz
2.048MHz
2488.32MHz
34.368MHz
44.736MHz
51.84MHz
622.08MHz
8.448MHz

UseBaseFrequency

Enum

Description

Sets/Queries which frequency to use, a "Standard" frequency or "Custom" frequency, as specified by BaseFrequency. This control only has effect when the SignalType = "Data".

Values

Custom
Standard

PHASE*app.Measure.Px.Operator (ParamEngine = "Phase")*

OutputType	Enum
RefAbsLevel	Double
RefFindLevel	Action
RefHysteresis	Double
RefLevelType	Enum
RefPercentLevel	Double
RefSlope	Enum
SigAbsLevel	Double
SigFindLevel	Action
SigHysteresis	Double
SigLevelType	Enum
SigPercentLevel	Double
SigSlope	Enum

OutputType*Enum*

Description

Sets/Queries the output type for Phase Px.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to phase difference.
app.Measure.P1.ParamEngine = "Phase"

' Set the output unit as radians.
app.Measure.P1.Operator.OutputType = "Radians"
```

Values

Degrees
Percent
Radians

RefAbsLevel*Double*

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the test level for the reference trace in absolute units.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to phase difference.
app.Measure.P1.ParamEngine = "Phase"
```

PART TWO: REFERENCE

```
' Set the reference trace test level in absolute units as 10 mV.
app.Measure.P1.Operator.RefAbsLevel = 0.01
```

RefFindLevel

Action

Description

Finds the test level for the reference trace.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 to phase difference.
app.Measure.P3.ParamEngine = "Phase"
' Find the test level for the reference trace.
app.Measure.P3.Operator.RefFindLevel
```

RefHysteresis

Double

Range: From 0 to 10, step 0.1

Description

Sets/Queries the hysteresis range for the reference trace.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to phase difference.
app.Measure.P1.ParamEngine = "Phase"
' Set the reference hysteresis in graticule divisions.
app.Measure.P1.Operator.RefHysteresis = 0.7
```

RefLevelType

Enum

Description

Sets/Queries the unit of measurement for the test level of the reference trace.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to phase difference.
app.Measure.P1.ParamEngine = "Phase"
' Set the reference level to be measured in absolute units.
app.Measure.P1.Operator.RefLevelType = "Absolute"
```

Values

Absolute
Percent

RefPercentLevel*Double*

Range: From 0 to 100, step 1

Description

Sets/Queries the test level for the reference trace in percent.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 to phase difference.
app.Measure.P3.ParamEngine = "Phase"
' Set the reference test level in percent.
app.Measure.P3.Operator.RefPercentLevel = 55
```

RefSlope*Enum*

Description

Sets/Queries the polarity of the measured reference transitions.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P1 to phase difference.
app.Measure.P1.ParamEngine = "Phase"
' Set the reference slope to negative.
app.Measure.P1.Operator.RefSlope = "Neg"
```

Values

Both
Neg
Pos

SigAbsLevel*Double*

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the test level for the signal in absolute units.

SigFindLevel*Action*

Description

Causes the engine to find a suitable level for either SigLevelType ("Absolute" or "Percent").

PART TWO: REFERENCE

SigHysteresis

Double

Range: From 0 to 10, step 0.1

Description

Sets/Queries the hysteresis range for the signal.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P3 to phase difference.
app.Measure.P3.ParamEngine = "Phase"
' Set the signal hysteresis in graticule divisions.
app.Measure.P3.Operator.SigHysteresis = 0.7
```

SigLevelType

Enum

Description

Sets/Queries which level to use "Percent" or "Absolute" for transitions on the signal.

Values

Absolute
Percent

SigPercentLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the test level for the signal in percent.

SigSlope

Enum

Description

Sets/Queries the polarity of the measured signal transitions.

Values

Both
Neg
Pos

RISE@LEVEL*app.Measure.Px.Operator (ParamEngine = "RiseAtLevel")*

Calculates the rise time (transition time on a rising edge) using two specified levels.

HighAbs	Double
HighPct	Double
LevelsAre	Enum
LowAbs	Double
LowPct	Double

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.MeasureMode = "MyMeasure"
app.Measure.Pl.ParamEngine = "RiseAtLevel"
app.Measure.Pl.Operator.LevelsAre = "Percent"
app.Measure.Pl.Operator.HighPct = 70
app.Measure.Pl.Operator.LowPct = 30
```

HighAbs***Double***

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the higher (second) level crossing used, if LevelsAre = "Absolute".

HighPct***Double***

Range: From 11 to 95, step 1

Description

Sets/Queries the higher (second) level crossing used, if LevelsAre = "Percent".

LevelsAre***Enum*****Description**

Sets/Queries whether the levels used are "Absolute" or "Percent".

Values

Absolute
Percent

LowAbs***Double***

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the lower (first) level crossing used, if LevelsAre = "Absolute".

PART TWO: REFERENCE

LowPct	Double
Range:	From 5 to 89, step 1
Description	Sets/Queries the lower (first) level crossing used, if LevelsAre = "Percent".

RMS***app.Measure.Px.Operator (ParamEngine = "RootMeanSquare")***

Calculates the root mean square of the values of the input waveform.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.MeasureMode = "MyMeasure"
app.Measure.P1.ParamEngine = "RMS"
```

Cyclic***Bool*****Description**

Sets/Queries whether the RMS is measured over an integral number of cycles (suggested for periodic signals).

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")

' Set parameter P2 to RMS.
app.Measure.P2.ParamEngine = "RMS"

' Set the RMS parameter for cyclic measurements.
app.Measure.P2.ParamEngine.Cyclic = True
```

SETUP

app.Measure.Px.Operator (ParamEngine = "Setup")

Calculates the setup time associated with a pair of input waveforms for Clock and Data.

ClockAbsLevel	Double
ClockFindLevel	Action
ClockHysteresis	Double
ClockLevells	Enum
ClockPctLevel	Double
ClockSlope	Enum
CursorDisplay	Enum
DataAbsLevel	Double
DataFindLevel	Action
DataHysteresis	Double
DataLevells	Enum
DataPctLevel	Double
DataSlope	Enum
Summary	String

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
app.Measure.MeasureMode = "MyMeasure"  
app.Measure.Pl.ParamEngine = "Setup"
```

ClockAbsLevel

Double

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the level used if ClockLevells = "Absolute".

ClockFindLevel

Action

Description

Causes the engine to find a suitable level for either ClockLevells ("Absolute" or "Percent").

ClockHysteresis

Double

Range: From 0 to 10, step 0.1

Description

Using ParamEngine = "Setup", refer to the corresponding variable for the Hold Time parameter.

ClockLevell**Enum**

Description

Sets/Queries whether the Clock signal levels are specified in "Percent" or "Absolute".

Values

Absolute
Percent

ClockPctLevel**Double**

Range: From 0 to 100 step 1

Description

Using ParamEngine = "Setup", please refer to the corresponding variable for the Hold Time parameter.

ClockSlope**Enum**

Description

Sets/Queries the polarity of transitions of the Clock signal.

Values

Both
Neg
Pos

CursorDisplay**Enum**

Description

Using ParamEngine = "Setup", refer to the corresponding variable for the Hold Time parameter.

Values

Detailed
Off
Simple

DataAbsLevel**Double**

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the level used if the ClockLevell = "Percent"

PART TWO: REFERENCE

DataFindLevel

Action

Description

Causes the engine to find a suitable level for either DataLevells ("Absolute" or "Percent")

DataHysteresis

Double

Range: From 0 to 10, step 0.1

Description

Using ParamEngine = "Setup", refer to the corresponding variable for the Hold Time parameter.

DataLevells

Enum

Description

Sets/Queries whether the Data signal level is DataAbsLevel or DataPctLevel.

Values

Absolute

Percent

DataPctLevel

Double

Range: From 0 to 100, step 1

Description

Using ParamEngine = "Setup", refer to the corresponding variable for the Hold Time parameter.

DataSlope

Enum

Description

Sets/Queries the polarity of transitions to be used for the Data signal.

Values

Both

Neg

Pos

Summary

String

Range: Any number of characters

Description

Using ParamEngine = "Setup", refer to the corresponding variable for the Hold Time parameter.

SKEW*app.Measure.Px.Operator (ParamEngine = "Skew")*

Calculates the skew between two clock signal waveforms.

Clock1AbsLevel	Double
Clock1FindLevel	Action
Clock1Hysteresis	Double
Clock1Levells	Enum
Clock1PctLevel	Double
Clock1Slope	Enum
Clock2AbsLevel	Double
Clock2FindLevel	Action
Clock2Hysteresis	Double
Clock2Levells	Enum
Clock2PctLevel	Double
Clock2Slope	Enum

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.MeasureMode = "MyMeasure"
app.Measure.Pl.ParamEngine = "Skew"
```

Clock1AbsLevel**Double**

Range: From -100 to 100, step 1e-007

Clock1FindLevel**Action****Description**

Automatically find a suitable level for Clock1, for either "Percent" or "Absolute" levels.

Clock1Hysteresis**Double**

Range: From 0 to 10, step 0.1

Description

Sets/Queries hysteresis for transition detection used for Clock1.

Clock1Levells**Enum****Description**

Sets/Queries whether to use Percent or Absolute levels for Clock1.

Values

Absolute
Percent

PART TWO: REFERENCE

Clock1PctLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the "Percent" of the amplitude of Clock1 to use for a transition level, if Clock1Levells = "Percent".

Clock1Slope

Enum

Description

Sets/Queries the polarity of transitions detected on Clock1.

Values

Both
Neg
Pos

Clock2AbsLevel

Double

Range: From -100 to 100, step 1e-007

Description

Using ParamEngine = "Skew", refer to the corresponding variable for the Hold Time parameter.

Clock2FindLevel

Action

Description

Using ParamEngine = "Skew", refer to the corresponding variable for the Hold Time parameter.

Clock2Hysteresis

Double

Range: From 0 to 10, step 0.1

Description

Sets/Queries hysteresis for transition detection used for Clock1.

Clock2Levells

Enum

Description

Sets/Queries whether to use Percent or Absolute levels for Clock2.

Values

Absolute
Percent

Clock2PctLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the "Percent" of the amplitude of Clock2 to use for a transition level, if Clock2Levells = "Percent".

Clock2Slope

Enum

Description

Sets/Queries the polarity of transitions detected on Clock2.

Values

- Both
- Neg
- Pos

STD DEV *app.Measure.Px.Operator (ParamEngine = "StandardDeviation")*

Calculates the standard deviation of the input waveform's vertical values.

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.MeasureMode = "MyMeasure"
' Set parameter P1 to standard deviation.
app.Measure.P1.ParamEngine = "StandardDeviation"
' Set the RMS parameter for cyclic measurements.
app.Measure.P1.Operator.Cyclic = True
```

Cyclic

Bool

Description

Sets/Queries whether the standard deviation is to be measured over an integral number of complete cycles.

TIE@LEVEL*app.Measure.Px.Operator (ParamEngine = "TIE")*

Calculates the Time Interval Error: the errors in observed transition times relative to a series of expected times (virtual clock).

AbsLevel	Double
BaseFrequency	Double
CutOffDivisor	Double
DatalsNRZ	Bool
FindBaseFrequency	Action
FindLevel	Action
Hysteresis	Double
IncludeVirtualEdges	Bool
LevelType	Enum
PercentLevel	Double
ResultScaling	Enum
SignalType	Enum
Slope	Enum
StdBaseFrequency	Enum
UseBaseFrequency	Enum
UseGoldenPLL	Bool

Example

```
' Visual Basic Script
Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.MeasureMode = "MyMeasure"
app.Measure.Pl.ParamEngine = "TIE"
```

AbsLevel**Double**

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the absolute transition level to be used when LevelType = "Absolute".

BaseFrequency**Double**

Range: From 1 to 4e+010, step 1000

Description

Using ParamEngine = "TIE", refer to the corresponding variable for the Delta Period At Level parameter.

CutOffDivisor**Double**

Range: From 20 to 10000, step 1

Description

Sets/Queries the cut-off divisor for the "Golden PLL".

PART TWO: REFERENCE

DatalsNRZ

Bool

Description

Sets/Queries whether the signal is of NRZ type.

FindBaseFrequency

Action

Description

Automatically determines the Base Frequency for the expected virtual clock.

FindLevel

Action

Description

Using ParamEngine = "TIE", refer to the corresponding variable for the Delta Period At Level parameter.

Hysteresis

Double

Range: From 0 to 10, step 0.1

Description

Sets/Queries hysteresis for transition detection used for the input waveform.

IncludeVirtualEdges

Bool

Description

Sets/Queries whether to include virtual edges in the series of interval errors reported by this measurement.

LevelType

Enum

Description

Sets/Queries whether to use Percent or Absolute levels.

Values

Absolute

Percent

PercentLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the "Percent" of the amplitude of the input waveform for a transition detection, if LevelType = "Percent".

ResultScaling***Enum***

Description

Sets/Queries whether the measurement is to be displayed in seconds (Time) or in unit intervals (UI).

Values

Time
UI

SignalType***Enum***

Description

Sets/Queries whether the input signal is a Clock or Data.

Values

Clock
Data

Slope***Enum***

Description

Sets/Queries the polarity of transitions detected.

Values

Both
Neg
Pos

StdBaseFrequency***Enum***

Description

Sets/Queries a standard base frequency from a list of frequencies. This value is only used if the UseBaseFrequency = "Standard".

Values

1.544MHz
139.264MHz
155.52MHz
2.048MHz
2488.32MHz
34.368MHz
44.736MHz
51.84MHz
622.08MHz
8.448MHz

PART TWO: REFERENCE

UseBaseFrequency

Enum

Description

Sets/Queries whether to use the custom base frequency or one chosen from a list of standard frequencies.

Values

Custom
Standard

UseGoldenPLL

Bool

Description

Sets/Queries whether to use a golden PLL for the expected times.

TIME@LEVEL*app.Measure.Px.Operator (ParamEngine = "TimeAtLevel")*

AbsLevel	Double
FindLevel	Action
Hysteresis	Double
HysteresisPct	Double
HysteresisType	Enum
LevelType	Enum
PercentLevel	Double
Slope	Enum

AbsLevel**Double**

Range: From -100 to 100, step 1e-007

Description

Sets/Queries the level for transitions detected on the input waveform if LevelType = "Absolute".

FindLevel**Action**

Description

Using ParamEngine = "TimeAtLevel", please refer to the corresponding variable for the Delta Time At Level parameter.

Hysteresis**Double**

Range: From 0 to 10, step 0.1

Description

Sets/Queries hysteresis for transition detection used.

HysteresisPct**Double**

Range: From 0 to 100, step 0.1

Description

Sets/Queries the hysteresis as a percentage of signal amplitude, if HysteresisType = "Percent".

HysteresisType**Enum**

Description

Sets/Queries whether hysteresis is specified in divisions, or if it is a percentage of the input waveform amplitude.

Values

Divisions

Percent

PART TWO: REFERENCE

LevelType

Enum

Description

Using ParamEngine = "TimeAtLevel", refer to the corresponding variable for the Delta Time At Level parameter.

Values

Absolute
Percent

PercentLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the "Percent" of the amplitude of the input waveform is used for detecting transitions if LevelType = "Percent".

Slope

Enum

Description

Sets/Queries the polarity of transitions detected.

Values

Both
Neg
Pos

WIDTH@LEVEL*app.Measure.Px.Operator (ParamEngine = "WidthAtLevel")*

Calculates the width of pulses in the input waveform at specified levels.

AbsLevel	Double
FindLevel	Action
FirstWhenBoth	Enum
Hysteresis	Double
HysteresisPct	Double
HysteresisType	Enum
LevelType	Enum
PercentLevel	Double
Slope	Enum

Example

```
' Visual Basic Script

Set app = CreateObject("LeCroy.XStreamDSO")
app.Measure.MeasureMode = "MyMeasure"
' Set parameter P1 to width at level.
app.Measure.P1.ParamEngine = "WidthAtLevel"
' Set first used polarity to negative.
app.Measure.P1.Operator.Slope = "Both"
app.Measure.P1.Operator.FirstWhenBoth = "Neg"
```

AbsLevel**Double**

Range: From -100 to 100 step 1e-007

Description

Sets/Queries the level for transitions detected on the input waveform, if LevelType = "Absolute".

FindLevel**Action****Description**

Automatically finds a suitable level for the width measurement, for either case of LevelType.

FirstWhenBoth**Enum****Description**

Sets/Queries the polarity of the first accepted transition when both polarities are used.

Values

Neg
Pos

PART TWO: REFERENCE

Hysteresis

Double

Range: From 0 to 10, step 0.1

Description

Sets/Queries hysteresis for transition detection if HysteresisType = "Absolute".

HysteresisPct

Double

Range: From 0 to 100, step 0.1

Description

Sets/Queries hysteresis in percent for transition detection if HysteresisType = "Percent".

HysteresisType

Enum

Description

Sets/Queries whether to use Percent or Divisions for hysteresis.

Values

Divisions

Percent

LevelType

Enum

Description

Sets/Queries whether to use Percent or Absolute levels.

Values

Absolute

Percent

PercentLevel

Double

Range: From 0 to 100, step 1

Description

Sets/Queries the "Percent" of the amplitude of the input waveform, if LevelType = "Percent".

Slope

Enum

Description

Sets/Queries the polarity of transitions detected.

Values

Both

Neg

Pos

X AT PEAK

app.Measure.Px.Operator (ParamEngine = "XAtPeak")

Estimates the horizontal position of the Nth most significant peak in a distribution

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
app.Measure.MeasureMode = "MyMeasure"  
app.Measure.Pl.ParamEngine = "XAtPeak"  
' Set the parameter to measure location of the 4th peak.  
app.Measure.Pl.Operator.PeakNumber = 4
```

PeakNumber

Integer

Range: From 1 to 10000, step 1

Description

Sets/Queries the horizontal position of the Nth highest peak of a histogram.

ZERO LEVEL *app.Measure.Px.Operator (ParamEngine = "EyeZeroLevel")*

Estimates the low level for the (assumed input) eye diagram, based on a slice through the middle of the eye diagram of specified width, PctCutWidth.

Example

```
' Visual Basic Script  
Set app = CreateObject("LeCroy.XStreamDSO")  
app.Measure.Pl.ParamEngine = "EyeZeroLevel"  
app.Measure.Pl.Operator.PctCutWidth = 8
```

PctCutWidth

Double

Range: From 0 to 100, step 0.1

Description

Sets/Queries the width of the vertical slice through the eye, from which the zero level is estimated.

