FLUKE®

LabVIEW Driver

For NORMA 4000/5000 Power Analyzer

Reference Manual

June 2007

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Note

This document is compliant with LNOPA01 LabVIEW Instrument Driver version 1.6.1.

Introduction

This reference manual documents the instrument driver for the Fluke NORMA 4000/5000 Power Analyzer instruments. The driver contains VIs for opening, configuring, taking measurements from, and closing the instrument.

For more information about how to work with instrument drivers in LabVIEW, please refer to your LabVIEW documentation.

Note

This instrument driver is designed to work with LabVIEW 7.

Installation

The driver files should be placed into your ...LabVIEW\INSTR.LIB\LNOPA01 directory.

Common

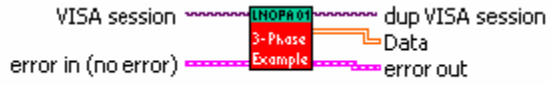
LNOPA01 Getting Started

This VI is an application performing simple three phase measurement.

LNOPA01 Three Phase Measurement Example

This VI is an example that shows how to use the driver VIs. It configures the instrument and takes a measurement. The following settings are configured with this VI:

- Connection set to 3W
- Config Input set all inputs to DC
- Config Range set all phases to Autorange ON
- Config Sync set phase to 1, Channel to voltage, Sync state to ON and Level to 25%
- Averaging Interval set to 0.1 s
- Initiate Continuous set state to ON
- Averaging Status set timeout to 5 s
- Measurements Functions set to U, I, P, S, Q and lambda on all three phases and total



Data This indicator returns the measurement values in a 2D array. The columns contain values for phases L1, L2, L3 and Total. The rows contain U, I, P, S, Q and lambda.

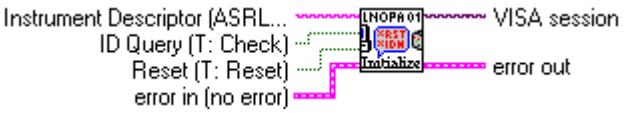
LNOPA01 Initialize

LNOPA01 Initialize

This VI passes the addressing information in the instrument descriptor to the Instr Open VI and returns the instrument ID. You can optionally reset the instrument by setting the front panel reset control. You must run this VI before using any of the instrument driver VIs for this instrument.

Notes

(1) If the Initialize VI is multiple called for TCPIP Socket, only one session is opened (no duplicate sessions are created). Take the care at close. The session can be closed only one time.



Reset (T: Reset) Selects whether or not to reset the instrument.

Valid Range:
T: Reset (default)
F: Don't Reset.

ID Query (T: Check) Selects whether or not to check the instrument's ID and Device.

Type registers to be sure the instrument is the type expected.

Valid Range:
T: Check (default)
F: Don't Check.

error in (no error) error in is a cluster that describes the error status before this VI executes. If error in indicates that an error occurred before this VI was called, this VI may choose not to execute its function, but just pass the error through to its error out cluster. If no error has occurred, then this VI executes normally and sets its own error status in error out. Use the error handler VIs to look up the error code and to display the corresponding error message. Using error in and error out clusters is a convenient way to check errors and to specify execution order by wiring the error output from one subVI to the error input of the next.

Valid Range:
Not Applicable

Default:
status= False (no error)
code = 0
source = empty string

status status is TRUE if an error occurred before this VI was called, or FALSE if not. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code.

Valid Range:
T: Error
F: No Error (default)

code code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.

Valid Range:
Not Applicable

Default: 0

source source is a string that indicates the origin of the error, if any. Usually source is the name of the VI in which the error occurred.

Default:
Empty String

Instrument Descriptor (ASRL1::INSTR) (string)

A string that uniquely identifies the instrument to open or initialize. The grammar for the instrument descriptor is shown below. Parameters are shown in lower-case and optional parameters are shown in square brackets ([]).

Default Value: ASRL1::INSTR

GPIB - GPIB[bd]::prim addr[::sec addr]
VXI - VXI[bd]::logical addr
GPIB-VXI - GPIB-VXI[bd][::prim addr]::logical addr
Serial - ASRL[port]
TCPIP Socket - TCPIP[board]::[ip addr]::[soc port]::SOCKET

Parameters (default value):
bd - GPIB board (0)
prim addr - GPIB primary address (1)
sec addr - GPIB secondary address (none)
logical addr - VXI logical address
port - COM port number
board - the Ethernet card number (0)

ip addr - ip address
soc port - the socket port number

EXAMPLES:

A GPIB instrument on GPIB board 0, at primary address 5, and no secondary addressing.

GPIB::5

A RS-232 instrument on COM port 1.

ASRL1

A TCPIP instrument on the LAN (one ethernet card number in the PC). The instrument IP address is 192.168.2.250, SOCKET is 23 (default value).

TCPIP0::192.168.2.250::23::SOCKET

error out error out is a cluster that describes the error status after this VI executes. If an error occurred before this VI was called, error out is the same as error in. Otherwise, error out shows the error, if any, that occurred in this VI. Use the error handler VIs to look up the error code and to display the corresponding error message. Using error in and error out clusters is a convenient way to check errors and to specify execution order by wiring the error output from one subVI to the error input of the next.

Valid Range:
Not Applicable

Default:
status= False (no error)
code = 0
source = empty string

status status is TRUE if an error occurred, or FALSE if not. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code.

Valid Range:
T: Error
F: No Error (default)

code code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.

Valid Range:
Not Applicable
Default: 0

source source is a string that indicates the origin of the error, if any. Usually source is the name of the VI in which the error occurred.

Default:
Empty String

VISA session A unique reference to an instrument I/O session. It identifies which device to communicate with and all configuration information to perform the I/O. See the initialize VI for more information.

Valid Range:
Not Applicable

Default:
Not Applicable

LNOPA01 Close

This VI closes the I/O interface with the instrument.

I/O **VISA session** A unique reference to an instrument I/O session. It identifies which device to communicate with and all configuration information to perform the I/O. See the initialize VI for more information.

Valid Range:
Not Applicable

Default:
Not Applicable

error in (no error) error in is a cluster that describes the error status before this VI executes. If error in indicates that an error occurred before this VI was called, this VI may choose not to execute its function, but just pass the error through to its error out cluster. If no error has occurred, then this VI executes normally and sets its own error status in error out. Use the error handler VIs to look up the error code and to display the corresponding error message. Using error in and error out clusters is a convenient way to check errors and to specify execution order by wiring the error output from one subVI to the error input of the next.

Valid Range:
Not Applicable

Default:
status= False (no error)
code = 0
source = empty string

TF **status** status is TRUE if an error occurred before this VI was called, or FALSE if not. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code.

Valid Range:
T: Error
F: No Error (default)

I32 **code** code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.

Valid Range:
Not Applicable

Default: 0

abc **source** source is a string that indicates the origin of the error, if any. Usually source is the name of the VI in which the error occurred.

Default:
Empty String

error out error out is a cluster that describes the error status after this VI executes. If an error occurred before this VI was called, error out is the same as error in. Otherwise, error out shows the error, if any, that occurred in this VI. Use the error handler VIs to look up the error code and to display the corresponding error message. Using error in and error out clusters is a convenient way to check errors and to specify execution order by wiring the error output from one subVI to the error input of the next.

Valid Range:
Not Applicable

Default:
status= False (no error)
code = 0
source = empty string

status status is TRUE if an error occurred, or FALSE if not. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code.

Valid Range:
T: Error
F: No Error (default)

code code is the number identifying an error or warning. If status is TRUE, code is a non-zero error code. If status is FALSE, code can be zero or a warning code. Use the error handler VIs to look up the meaning of this code and to display the corresponding error message.

Valid Range:
Not Applicable

Default: 0

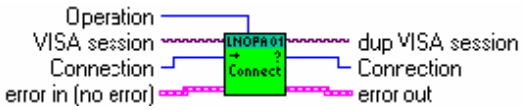
source source is a string that indicates the origin of the error, if any. Usually source is the name of the VI in which the error occurred.

Default:
Empty String

Connection

LNOPA01 Connection

This VI sets/gets the type of connection the instrument uses to perform the measurement.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Connection This control sets the type of connection.

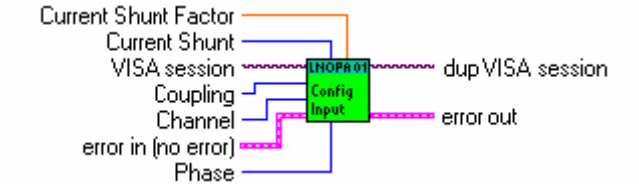
Valid Range:
0 − 3W (Default Value)
1 − 2W

I32 **Connection** This control returns the connection type.

Input

LNOPA01 Configure Input

This VI configures the specified input of the instrument.



I32 **Coupling** This control selects input coupling.

Valid Range:
0 − DC (Default Value)
1 − AC

DBL **Current Shunt Factor** This control sets the shunt factor for the voltage current inputs.

Valid Range: 0.0 to 1.0e+12

Default Value: 1.0

Note

This control is active only if selected input is the current input (1, 3, 5, 7, 9, 11) with external current shunt.

I32 **Current Shunt** This control sets the shunt type for specified current input.

Valid Range:
0 − Internal (Default Value)
1 − External

Note

This control is active only if selected input is the current input (1, 3, 5, 7, 9, 11).

I32 **Channel** This control sets the input channel, on which the coupling is set.

Valid Range:
0 − Current (Default Value)
1 − Voltage

I32 **Phase** This control selects the phase.

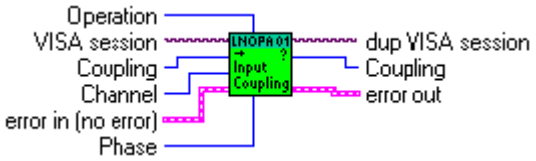
Valid Range:
6 channel model: 1 to 3
12 channel model: 1 to 6

Use -1 to apply setting to all phases.

Default Value: 1

LNOPA01 Input Coupling

This VI sets/gets the input coupling of the selected input.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Coupling** This control sets coupling for the specified input.

Valid Range:
0 − DC (Default Value)
1 − AC

I32 **Channel** This control sets the input channel, on which the coupling is set.

Valid Range:
0 − Current (Default Value)
1 − Voltage

I32 **Phase** This control selects the phase.

Valid Range:
6 channel model: 1 to 3
12 channel model: 1 to 6

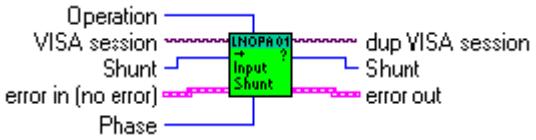
Use -1 to apply setting to all phases.

Default Value: 1

I32 **Coupling** Returns coupling on selected input.

LNOPA01 Input Shunt

This VI sets/gets the shunt used on current input.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Shunt** This control sets the shunt type for specified current input.

Valid Range:
0 − Internal (Default Value)
1 − External

I32 **Phase** This control selects the phase.

Valid Range:
6 channel model: 1 to 3
12 channel model: 1 to 6

Use -1 to apply setting to all phases.

Default Value: 1

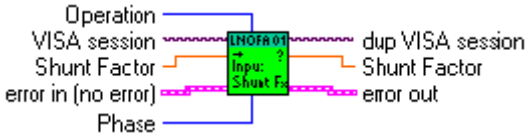
I32 **Shunt** Returns the shunt type on selected current input.

LNOPA01 Input Shunt Factor

This VI sets/gets the shunt factor for the voltage current inputs of the instrument.

Notes

(1) This setting applies when EXTernal input shunt is selected.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

DBL **Shunt Factor** This control sets the shunt factor for the voltage current inputs.

Valid Range: 0.0 to 1.0e+12

Default Value: 1.0

I32 **Phase** This control selects the phase.

Valid Range:
6 channel model: 1 to 3
12 channel model: 1 to 6

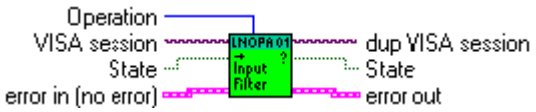
Use -1 to apply setting to all phases.

Default Value: 1

DBL **Shunt Factor** Returns the shunt factor of the voltage current inputs.

LNOPA01 Input Filter State

This VI sets/gets the state of the input antialiasing filters. Filters on all channels are switched at a time by this VI.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

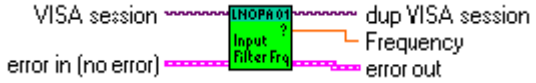
TF **State** This control sets the state of input antialiasing filters.

Valid Values:
F − Off
T − On (Default Value)

TF **State** Returns the input anti-aliasing filters state.

LNOPA01 Input Filter Low Pass Frequency

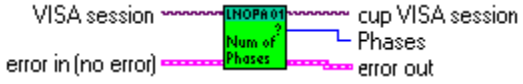
This VI returns the cutoff frequency of the input low-pass filters in Hz.



DBL **Frequency** Returns the cutoff frequency of the input low-pass filter in Hz. All inputs use filters with the same cut-off frequency.

LNOPA01 Number of Phases

This VI returns the number of available phases.

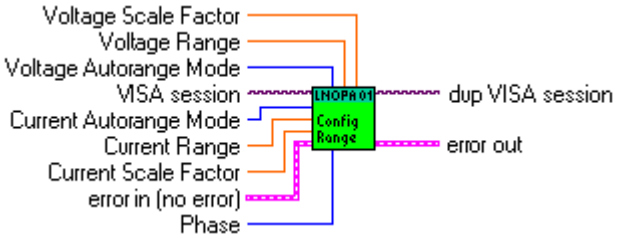


I32 **Phases** Returns the number of phases.

Range

LNOPA01 Configure Range

This VI configures the input range of power channels.



I32 **Current Autorange Mode** This control sets the autoranging mode on the current channel.

Valid Range:
0 − Off
1 − On (Default Value)
2 − Once

I32 **Phase** This control selects the phase.

Valid Range:

6 channel model: 1 to 3
12 channel model: 1 to 6

Use -1 to apply setting to all phases.

Default Value: 1

I32 **Voltage Autorange Mode** This control sets the autoranging mode on the voltage channel.

Valid Range:
0 − Off
1 − On (Default Value)
2 − Once

DBL **Current Range** This control sets the input current range.

Valid Range:
0.03, 0.1, 0.3, 1.0, 3.0, 10.0 A or V

A − Internal Current Shunt
V − External Current Shunt

Default Value: 10.0

Note

Value passed to this control is coerced to the next higher valid range value if 1 above next lower valid range value.

DBL **Voltage Range** This control sets the input voltage range.

Valid Range:
0.3, 1.0, 3.0, 10.0, 30.0, 100.0, 300.0, 1000.0 V

Default Value: 1000.0

Note

Value passed to this control is coerced to the next higher valid range value if 1% above next lower valid range value.

DBL **Current Scale Factor** This control sets the current scaling factor.

Valid Range: 0.0 to 1.0e12

Default Value: 1.0

DBL **Voltage Scale Factor** This control sets the voltage scaling factor.

Valid Range: 0.0 to 1.0e12

Default Value: 1.0

LNOPA01 Range Auto

This VI sets/gets auto ranging mode of selected input channel.

I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Mode** This control sets the autoranging mode on the selected channel.

Valid Range:
0 − Off
1 − On (Default Value)
2 − Once

I32 **Channel** This control sets the input channel, on which the range is set.

Valid Range:
0 − Current (Default Value)
1 − Voltage

I32 **Phase** This control selects the phase.

Valid Range:
6 channel model: 1 to 3
12 channel model: 1 to 6

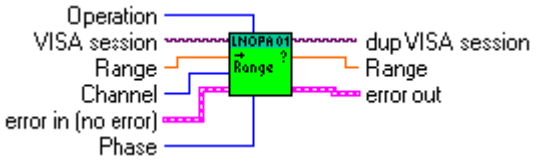
Use -1 to apply setting to all phases.

Default Value: 1

I32 **Mode** Returns the autoranging mode.

LNOPA01 Range

This VI sets/gets the input range if the autoranging is off.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

DBL **Range** This control sets the input range.

Valid Range:

Current: 0.03, 0.1, 0.3, 1.0, 3.0, 10.0 A or V
A − Internal Current Shunt
V − External Current Shunt

Voltage: 0.3, 1.0, 3.0, 10.0, 30.0, 100.0, 300.0, 1000.0 V

Default Value: 10.0

Note

Value passed to this control is coerced to the next higher valid range value if 1% above next lower valid range value.

I32 **Channel** This control sets the input channel, on which the range is set.

Valid Range:
0 − Current (Default Value)
1 − Voltage

I32 **Phase** This control selects the phase.

Valid Range:
6 channel model: 1 to 3
12 channel model: 1 to 6

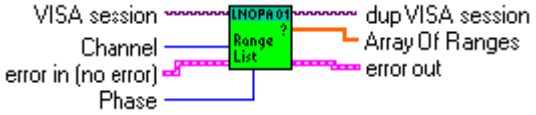
Use -1 to apply setting to all phases.

Default Value: 1

DBL **Range** Returns the input range.

LNOPA01 Range List

This function queries the list of input ranges of the selected input channel.



I32 **Channel** This control selects the channel.

Valid Range:
0 - Current (Default Value)
1 - Voltage

Phase This control selects the phase.

Valid Range:
6 channel model: 1 to 3
12 channel model: 1 to 6

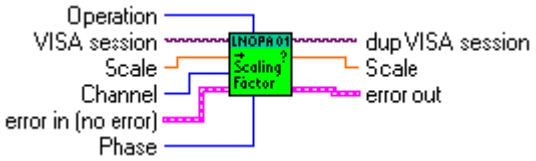
Default Value: 1

Array Of Ranges Returns an array of valid ranges for selected channel in basic units (A or V).

Range This indicator returns the input range.

LNOPA01 Scaling Factor

This VI sets/gets the voltage/current scaling factor that reflects conversion ratio of any voltage/ current transformers or dividers employed. Voltage or current on the specified channel is multiplied by this scaling factor before any further processing. All signal quantities that are calculated on the base of the current and/or voltage are scaled by this factor.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 - Set (Default Value)
1 - Get

Scale This control sets the scaling factor.

Valid Range: 0.0 to 1.0e12

Default Value: 1.0

Channel This control sets the input channel.

Valid Range:
0 − Current (Default Value)
1 − Voltage

Phase This control selects the phase.

Valid Range:
6 channel model: 1 to 3
12 channel model: 1 to 6

Use -1 to apply setting to all phases.

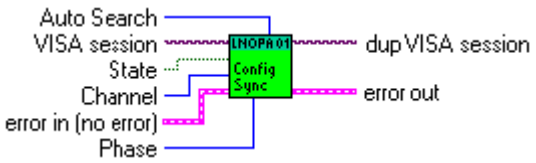
Default Value: 1

Scale Returns the scaling factor.

Sync

LNOPA01 Configure Sync

This VI configures the instrument synchronization system.



TF **State** This control sets the synchronization state.

Valid Range:
F − Off
T − On (Default Value)

I32 **Channel** This control sets the input channel, on which the source filter frequency is set.

Valid Range:
0 – Current
1 − Voltage (Default Value)
2 − External

I32 **Phase** This control selects the phase.

Valid Range:
6 channel model: 1 to 3
12 channel model: 1 to 6

Default Value: 1

I32 **Auto Search** This control sets the synchronization mode.

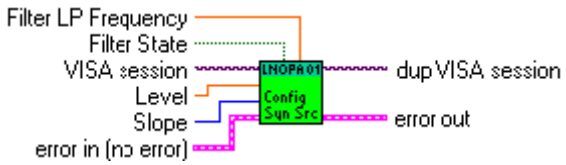
Valid Range:
0 − Off (Default Value)
1 − On
2 − Once

Note

Off - Automatic sensing of synchronization source is off.
On - Instrument is continuously sensing the best synchronization source.
Once - Instrument sets the best synchronization source when this function is called.

LNOPA01 Configure Sync Source

This VI configures the instrument synchronization system.



DBL **Level** This control sets the synchronization level.

Valid Range: −150% to 150% of input range

Default Value: 0.0%

I32 **Slope** This control sets the active slope of the synchronization signal.

Valid Range:
0 − Positive (Default Value)
1 − Negative

TF **Filter State** This control sets the filter state.

Valid Range:
F − Off (Default Value)
T − On

DBL **Filter LP Frequency** This control sets the synchronization source low-pass filter cutoff frequency.

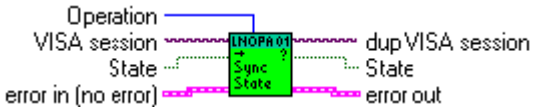
Valid Range:
10.0e3 Hz (Default Value)
1.0e3 Hz
100.0 Hz

Note

Passed value is coerced to the next higher valid value if 10% above the next lower valid value.

LNOPA01 Sync State

This VI sets/gets whether the averaging interval is controlled by signal frequency on selected input or not. If synchronization is turned on, the actual averaging period is kept to be a first integer multiple of the sync signal period greater than user-specified nominal averaging period. If synchronization is turned off, the actual averaging period is equal to the user-specified nominal averaging period rounded to integer multiple of sample periods.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

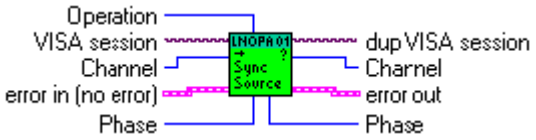
TF **State** This control sets the synchronization state.

Valid Range:
F − Off
T − On (Default Value)

TF **State** Returns the synchronization state.

LNOPA01 Sync Source

This VI sets/gets the signal source for synchronization and frequency measurement.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Channel** This control selects the synchronization source.

Valid Range:
0 − Current
1 − Voltage (Default Value)
2 − External

I32 **Phase** This control selects the phase.

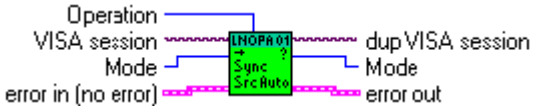
Valid Range:
6 channel model: 1 to 3
12 channel model: 1 to 6
Default Value: 1

I32 **Channel** Returns the sync channel.

I32 **Phase** Returns the sync source phase.

LNOPA01 Sync Source Auto

This VI sets/gets how the instrument synchronizes to measured signal.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Mode** This control sets the synchronization mode.

Valid Range:
0 − Off (Default Value)
1 – On
2 − Once

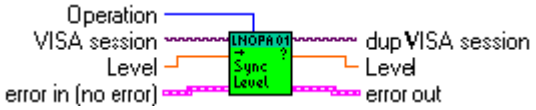
Note

Off - Automatic sensing of synchronization source is off.
On - Instrument is continuously sensing the best synchronization source.
Once - Instrument sets the best synchronization source when this VI is called.

I32 **Mode** Returns the synchronization mode.

LNOPA01 Sync Level

This VI sets/gets the synchronization level at which the selected input signal period is measured by the synchronization circuitry of the instrument. Each input channel has its own synchronization level.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:

0 − Set (Default Value)
1 − Get

DBL **Level** This control sets the synchronization level.

Valid Range: -150% to 150% of input range

Default Value: 0.0%

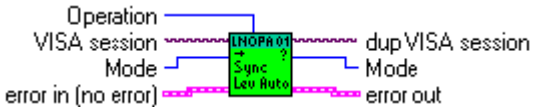
Note

Depending on the selected sync level unit, this parameter can be set either as relative (in %) or absolute (in volts or amps). For relative unit, the range is -150.0 to 150.0. For absolute unit, the range is from -150% to 150% of the actual input range on the sync source channel.

DBL **Level** Returns the synchronization level.

LNOPA01 Sync Level Auto

This VI sets/gets the automatic setting of the sync level. Each input channel has its own synchronization level mode setting.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Mode** This control sets the sync level mode.

Valid Range:
0 − Off (Default Value)
1 − On
2 − Once

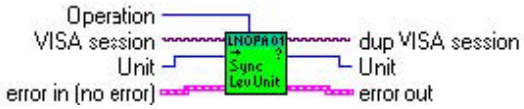
Note

Off − The sync level is fixed.
On − The sync level is continuously adapted to signal.
Once − When received, the instrument finds the best sync level and sets the automatic sync leveling to OFF.

I32 **Mode** Returns the sync level mode.

LNOPA01 Sync Level Unit

This VI sets/gets the unit for synchronization level.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

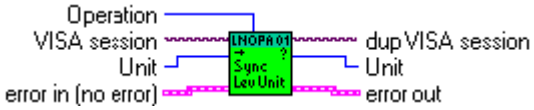
I32 **Unit** This control sets the unit.

Valid Range:
0 − Absolute
1 − Percent (Default Value)

I32 **Unit** Returns the unit.

LNOPA01 Sync Slope

This VI sets/gets the slope of the synchronization signal. Each input channel has its own synchronization slope.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

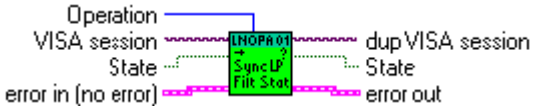
I32 **Slope** This control sets the synchronization slope.

Valid Range:
0 − Positive (Default Value)
1 − Negative

I32 **Slope** Returns the slope.

LNOPA01 Sync LP Filter State

This VI sets/gets the synchronization signal filter. The filtering is applied to the signal on input channel that is selected as a synchronization source. This command has no effect if the selected sync source is EXTernal.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

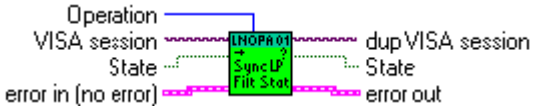
TF **State** This control sets the sync low-pass filter state.

Valid Range:
F − Off (Default Value)
T − On

TF **State** Returns the sync low-pass filter state.

LNOPA01 Sync LP Filter Frequency

This VI sets/gets the synchronization signal filter low pass frequency. This command has no effect if the selected sync source is EXTernal. The frequency unit is Hz.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

DBL **Filter LP Frequency** This control sets the synchronization source low-pass filter cutoff frequency.

Valid Range:
10.0e3 Hz (Default Value)
1.0e3 Hz
100.0 Hz

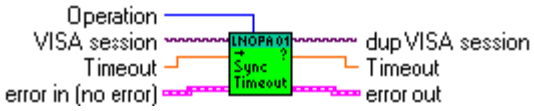
Note

Passed value is coerced to the next higher valid value if 10% above the next lower valid value.

DBL **Frequency** Returns the low-pass filter cutoff frequency.

LNOPA01 Sync Timeout

This VI sets/gets the synchronization timeout in seconds. Instrument will start averaging after the timeout if no sync signal is available. Timeout is active only if synchronization is on.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

DBL **Timeout** This control sets the synchronization timeout in seconds.

Valid Range: 0.0 to 3600 s
Default Value: 0.6 s

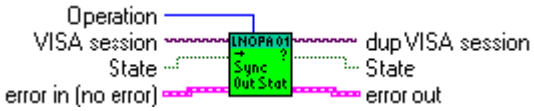
DBL **Timeout** Returns the timeout value in seconds.

LNOPA01 Sync Output State

This VI sets/gets the synchronization output state.

Note

Switching Sync State OFF or Sync Source EXT switches Sync Output State to OFF.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

TF **State** This control sets the synchronization output state.

Valid Range:
F − Off (Default)
T − On

Note

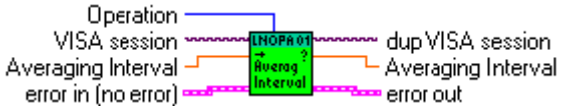
T − On can be set only if synchronization source (LNOPA01 Sync Source.vi) is not set to External.

TF **State** Returns synchronization output state.

Timebase

LNOPA01 Averaging Interval

This VI sets/gets the nominal averaging interval. In synchronous mode the actual averaging interval is changing "on-the-fly". The nominal averaging interval is extended to next full signal period.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

DBL **Averaging Interval** This control sets the averaging interval in seconds.

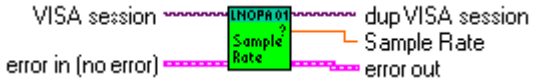
Valid Range: 0.015 to 3600 s

Default Value: 0.3 s

DBL **Averaging Interval** Returns the averaging interval in seconds.

LNOPA01 Sample Rate

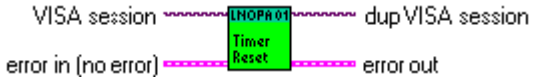
This VI queries the sample rate of the instrument's ADCs. The sample rate is fixed and thus cannot be changed.



DBL **Sample Rate** Returns the instrument sample rate in Hz.

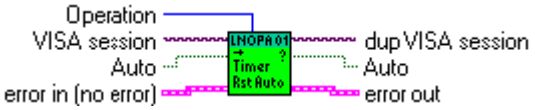
LNOPA01 Timer Reset

This VI resets the internal timer of the instrument.



LNOPA01 Timer Reset Auto

This VI sets/gets the instrument's internal timer reset state.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 – Set (Default Value)
1 – Get

Auto This control enables/disables automatic timer reset on at switch from Initiate Continuous = Off to Initiate Continuous = On.

Valid Range:
F − Off (Default Value)
T − On

Auto This control gets the auto reset state.

LNOPA01 Query Timer Reset Time

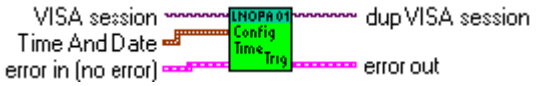
This VI queries the absolute time of the last timer reset.

Reset Time Returns the time and date of the last timer reset. The time and date is the form of the standard LabVIEW Date/Time cluster. In order to be able to represent fractions of seconds, the cluster member 'second' uses DBL data type. LabVIEW will automatically typecast its standard Date/Time cluster when necessary.

Trigger

LNOPA01 Configure Start Time Trigger

This VI sets the start trigger time and configures the time of start.



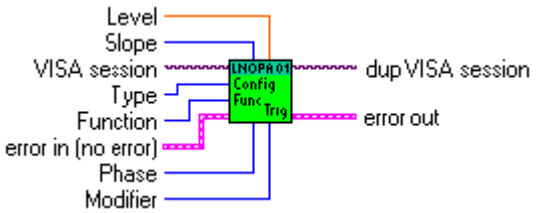
Time And Date This control sets the trigger time and date. The time and date is the form of the standard LabVIEW Date/Time cluster. In order to be able to represent fractions of seconds, the cluster member 'second' uses DBL data type. LabVIEW will automatically typecast its standard Date/Time cluster when necessary. Only seconds, minutes, hours, days of month, months, and years have values.

Valid Values:

second	0 to 59
minute	0 to 59
hour	0 to 23
day of month	1 to 31
month	1 to 12
year	1960 -2050

LNOPA01 Configure Function Trigger

This VI configures the start function trigger.



Type This control selects the trigger type.

Valid Values:
0 − Stop trigger
1 − Start trigger (Default Value)

I32 **Function** This control sets the type of voltage measurement function.

Valid Range:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD 28 -Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency

50 − Averaging Interval
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
60 − Averaging Interval Relative Timestamp
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

Note

Values 51 to 56 are available only with option Process Interface.

I32 **Phase** This control specifies the phase number.

Valid Range:
For Measurement:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
9 − Voltage Harmonic
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic

39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC

are Valid Values
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD

are Valid Values:
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
10 − Voltage TRMS Phase-To-Phase Harmonic
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase

are Valid Values:
12, 23, 31, 123: for three channel model
12, 23, 31, 45, 56, 64, 123, 456: for six channel model

For Measurement: 49 -Frequency
50 − Averaging Interval
60 − Averaging Interval Relative Timestamp

is valid -1 only

For Measurements:
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]

are valid values: 1 to 4, the values are independent of number of phases

For Measurement:
56 -Raw Process Input Value [V/Hz]

are valid values: 1 to 8, the values are independent of number of phases

For Measurements:
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic

are Valid Values:
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)

For Measurements:
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
12, 23, 31: for three channel model
12, 23, 31, 45, 56, 64: for six channel model

I32 **Modifier** This control specifies the modifier of voltage measurement function.

Note

Only None, Positive Integral and Negative Integral are available now.

Valid Range:
For Measurement:

1 − Voltage Mean (Mean value of Voltage)
16 − Current Mean (Mean value of Current)
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic

are Valid Values
0 − None
1 − Minimum
2 − Maximum
3 − Integral Positive
4 − Integral Negative
5 − Integral

For Measurement:
0 − Voltage True RMS (True RMS Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor

12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
31 − Power Factor (Power Factor)
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency 51 -Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
0 − None
1 − Minimum
2 − Maximum

For Measurement:
50 − Averaging Intervals
60 − Averaging Interval Relative Timestamp

is Valid Value:
0 − None

Note

The integral modifiers are available only if integration is enabled.

I32 **Slope** This control sets the trigger slope for recording an averaged measurement function.

Valid Range:
0 − Positive (Default Value)
1 − Negative

DBL **Level** This control sets the trigger level for source <function>.

Valid Range:
0.0 to max

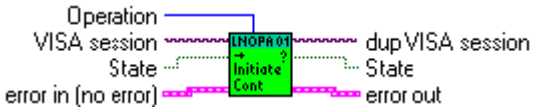
Default Value:
0.0

Notes

The trigger source has to be an averaged function.

LNOPA01 Initiate Continuous

This VI sets/gets the state of continuous measurement initiation.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 -Set (Default Value)
1 -Get

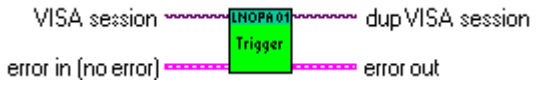
TF **State** This control sets the state of continuous initiation.

Valid Range:
F -Off
T -On (Default Value)

TF **State** Returns continuous initiation state.

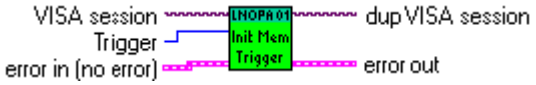
LNOPA01 Trigger

This VI triggers the measurement.



LNOPA01 Initiate Memory Trigger

This function initiates the memory trigger.



I32 **Trigger** This control selects the trigger should be initiate.

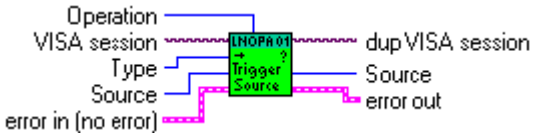
Valid Values:
1 − Start trigger (Default Value)

LNOPA01 Trigger Source

This VI sets/gets the start/stop trigger source.

Note

This VI does not return function name, if source function selected.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Type** This control selects the trigger type.

Valid Values:
0 − Stop trigger
1 − Start trigger (Default Value)

I32 **Source** This control sets the state of continuous initiation.

Valid Range:
0 − Function
1 − Manual
2 − Bus
3 − Time
4 − Immediate (Default Value)
5 − Synchronization Signal

Note

0 − Function: condition on an averaged measurement function causes the trigger. The measurement function is set to VOLT1. If you want to use different function, configure it with Configure Function Trigger.

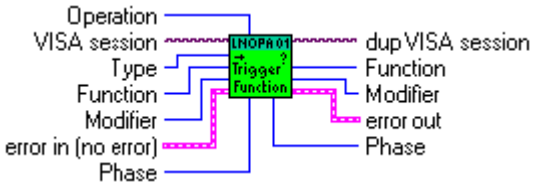
1 − Manual: The signal is user-generated, such by pressing a front panel key.
2 − Bus: Will trigger, when a *TRG command is received.
3 − Time: Will trigger at exact time.
4 − Immediate: No waiting for an vent occurs.
5 − Synchronization Signal: Will trigger whenever an edge of the synchronization signal

is detected. This source is valid only for REALtime sweep (to use the EXTernal signal jack as a trigger the SYNC source have to be set to EXTernal).

I32 **Source** Returns the state of continuous initiation.

LNOPA01 Trigger Function

This VI sets/gets the trigger source to function.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Type** This control selects the trigger type.

Valid Values:
0 -Stop trigger
1 -Start trigger (Default Value)

I32 **Function** This control sets the type of voltage measurement function.

Valid Range:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content

27 − Current TH
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
50 − Averaging Interval
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
60 − Averaging Interval Relative Timestamp
61 − Electrical Efficiency 62 -Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

Note
Values 51 to 56 are available only with option Process Interface.

I32 **Phase** This control specifies the phase number.

Valid Range:
For Measurement:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)

9 − Voltage Harmonic
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC

are Valid Values
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD

are Valid Values:
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
10 − Voltage TRMS Phase-To-Phase Harmonic

57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase

are Valid Values:
12, 23, 31, 123: for three channel model
12, 23, 31, 45, 56, 64, 123, 456: for six channel model

For Measurement:
49 − Frequency
50 − Averaging Interval
60 − Averaging Interval Relative Timestamp

is valid -1 only

For Measurements:
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]

are valid values: 1 to 4, the values are independent of number of phases

For Measurement:
56 -Raw Process Input Value [V/Hz]

are valid values: 1 to 8, the values are independent of number of phases

For Measurements:
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic

are Valid Values:
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)

For Measurements:
65 -Voltage THD Phase-To-Phase
66 -Voltage Harmonic Content Phase-To-Phase
67 -Voltage Fundamental Content Phase-To-Phase

are Valid Values:
12, 23, 31: for three channel model
12, 23, 31, 45, 56, 64: for six channel model

Modifier This control specifies the modifier of voltage measurement function.

Note

Only None, Positive Integral and Negative Integral are available now.

Valid Range:
For Measurement:

1 − Voltage Mean (Mean value of Voltage)
16 − Current Mean (Mean value of Current)
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
32 − Power Active Harmonic

33 − Power Apparent Harmonic
34 − Power Reactive Harmonic

are Valid Values
0 − None
1 − Minimum
2 − Maximum
3 − Integral Positive
4 − Integral Negative
5 − Integral

For Measurement:
0 − Voltage True RMS (True RMS Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
31 − Power Factor (Power Factor)
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − -Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]

53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
0 − None
1 − Minimum
2 − Maximum

For Measurement:
50 − Averaging Intervals
60 − Averaging Interval Relative Timestamp

is Valid Value:
0 − None

Note

The integral modifiers are available only if integration is enabled.

I32 **Function** This control sets the type of voltage measurement function.

Valid Range:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic

24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
50 − Averaging Interval
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
60 − Averaging Interval Relative Timestamp
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

Note
Values 51 to 56 are available only with option Process Interface.

I32 **Phase** This control specifies the phase number.

Valid Range:
For Measurement:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)

4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
9 − Voltage Harmonic
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC

are Valid Values
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD

are Valid Values:
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
10 − Voltage TRMS Phase-To-Phase Harmonic
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase

are Valid Values:

12, 23, 31, 123: for three channel model
12, 23, 31, 45, 56, 64, 123, 456: for six channel model

For Measurement:
49 − Frequency
50 − Averaging Interval
60 − Averaging Interval Relative Timestamp

is valid -1 only

For Measurements:
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − -Rotational Asynchronousity [%]
55 − Motor Efficiency [%]

are valid values: 1 to 4, the values are independent of number of phases

For Measurement:
56 − Raw Process Input Value [V/Hz]

are valid values: 1 to 8, the values are independent of number of phases

For Measurements:
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic

are Valid Values:
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)

For Measurements:
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
12, 23, 31: for three channel model
12, 23, 31, 45, 56, 64: for six channel model

Modifier This control specifies the modifier of voltage measurement function.

Note

Only None, Positive Integral and Negative Integral are available now.

Valid Range:
For Measurement:

1 − Voltage Mean (Mean value of Voltage)
16 − Current Mean (Mean value of Current)
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic

are Valid Values
0 − None
1 − Minimum
2 − Maximum
3 − Integral Positive
4 − Integral Negative
5 − Integral

For Measurement:
0 − Voltage True RMS (True RMS Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
31 − Power Factor (Power Factor)
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic

46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
0 − None
1 − Minimum
2 − Maximum

For Measurement:
50 − Averaging Intervals
60 − Averaging Interval Relative Timestamp

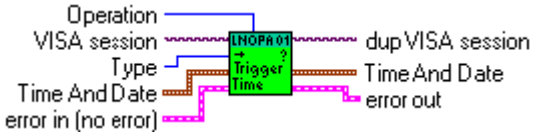
is Valid Value:
0 − None

Note

The integral modifiers are available only if integration is enabled.

LNOPA01 Trigger Time

This VI sets/gets the trigger time.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Time And Date This control sets the trigger time and date. The time and date is the form of the standard LabVIEW Date/Time cluster. In order to be able to represent fractions of seconds, the cluster member 'second' uses DBL data type. LabVIEW will automatically

typecast its standard Date/Time cluster when necessary. Only values second, minute, hour, day of month, month and year have

Valid Values:
seconds − 0 to 59
minute − 0 to 59
hour − 0to23
day of month − 1 to 31
month − 1to12
year − 1960 - 2050

Type This control selects the trigger type.

Valid Values:
1 − Start trigger (Default Value)

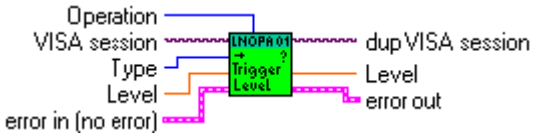
Note

Only for start trigger can be set time.

Time And Date Returns the trigger time and date. The time and date is the form of the standard LabVIEW Date/Time cluster. In order to be able to represent fractions of seconds, the cluster member 'second' uses DBL data type. LabVIEW will automatically typecast its standard Date/Time cluster when necessary.

LNOPA01 Trigger Level

This VI sets/gets the trigger level.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Type This control selects the trigger type.

Valid Values:
0 − Stop trigger
1 − Start trigger (Default Value)

Level This control sets the trigger level for source <function>.

Valid Range:
0.0 to max

Default Value:
0.0

Note

The trigger source has to be an averaged function.

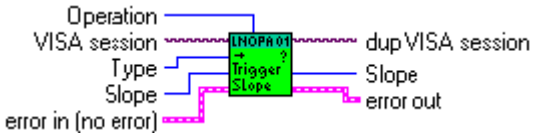
Level Returns the level for source <function>.

Note

The trigger source has to be an averaged function.

LNOPA01 Trigger Slope

This VI sets/gets the trigger slope.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Type** This control selects the trigger type.

Valid Values:
0 − Stop trigger
1 − Start trigger (Default Value)

I32 **Slope** This control sets the trigger slope for recording an averaged measurement function.

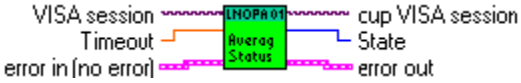
Valid Range:
0 − Positive (Default Value)
1 − Negative

I32 **Slope** Returns the trigger slope for recording an averaged measurement function.

Status

LNOPA01 Averaging Status

This VI queries the averaging status synchronously or asynchronously. In synchronous mode, this VI waits for the averaging to complete.

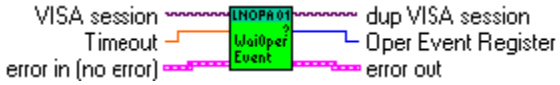


DBL **Timeout** Specifies the timeout for averaging status query. If zero is passed, this function does not wait for the averaging to complete. Non-zero value specifies the time this VI waits for the averaging to complete. The unit is seconds. If the averaging does not complete within this time, error 0xBFFC09F2 is generated.

I32 **State** Returns the averaging state.

LNOPA01 Wait For Operation Status Event

This VI queries the operation event register synchronously or asynchronously. In synchronous mode, this VI waits for an event to happen.



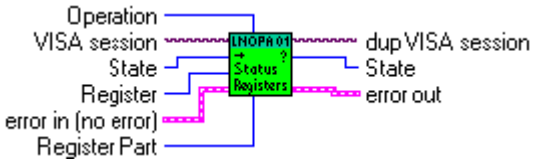
DBL **Timeout** Specifies the timeout for averaging status query. If zero is passed, this function does not wait for the averaging to complete. Non-zero value specifies the time this VI waits for the averaging to complete. The unit is seconds. If the averaging does not complete within this time, error 0xBFFC09F2 is generated.

I16 **Oper Event Register** This indicator returns the Operation Event Register value.

Bit	Description
0	reserved
1	reserved
2	RANGing
3	SWEeping
4	MEASuring
5	Waiting for TRIGger
6	reserved
7	reserved
8	SYNChronized
9	reserved
10	AVERaging

LNOPA01 Status Registers

This VI sets/gets the instrument status registers.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

U16 **State** This control sets the register value.

Valid Range:
Service Request Enable
Service Standard Event Status Enable Register: 0 to 255

Operation and Questionable Registers: 0 to 65535

Note

Condition and Event parts of cannot be set.

I32 **Register** This control sets the register.

Valid Range:
0 − Status Byte
1 − Service Request Enable Service
2 − Standard Event Status Register
3 − Standard Event Status Enable Register
4 − Operation Status Register (Default Value)
5 − Questionable Status Register
6 − Questionable Voltage Status Register
7 − Questionable Current Status Register

Note

Status Byte and Standard Event Status Register cannot be set.

I32 **Register Part** This control sets the register part.

Valid Range:
0 − Condition
1 − Positive Transition
2 − Negative Transition
3 − Event
4 − Enable (Default Value)

Note

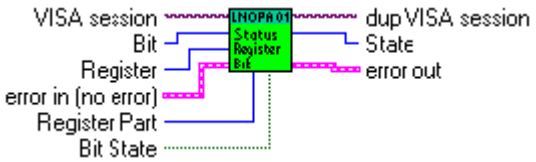
(1) This control does not apply to STB, SRE, ESR and ESE registers.

(2) Condition and Event parts cannot be set.

U16 **State** Returns the register value.

LNOPA01 Status Register Bit

This VI sets one bit of status register and returns new register value.



U16 **Bit** This control sets the register bit.

Valid Range:
Service Request Enable
Service Standard Event Status Enable Register: 0 to 7

Operation and Questionable Registers: 0 to 15

I32 **Register** This control sets the register.

Valid Range:
0 − Status Byte
1 − Service Request Enable Service
2 − Standard Event Status Register
3 − Standard Event Status Enable Register
4 − Operation Status Register (Default Value)

5 − Questionable Status Register
6 − Questionable Voltage Status Register
7 − Questionable Current Status Register

Note

Status Byte and Standard Event Status Register can not be set.

I32 **Register Part** This control sets the register part.

Valid Range:
0 − Condition
1 − Positive Transition
2 − Negative Transition
3 − Event
4 − Enable (Default Value)

Note

This control does not apply to STB, SRE, ESR and ESE registers. Condition and Event parts cannot be set.

Condition and Event parts cannot be set.

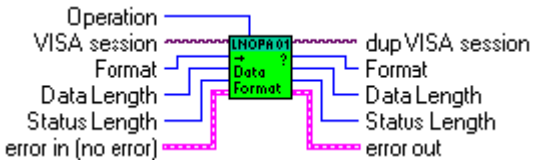
TF **Bit State**

U16 **State** Returns the register value.

Data Format

LNOPA01 Data Format

This VI sets/gets the format of the measured data transferred from the instrument.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Format** This control specifies the data type for data transfers.

Valid Range:
0 − ASCII (Default Value)
1 − Binary

I32 **Data Length** This control specifies the length of data.

Valid Range:
ASCII: 0 to 8 decimal places in exponential notation
Binary: 32 or 64 bits in FP format

Default Value: 6

I32 **Status Length** This control specifies the data status information length.

Valid Range:
ASCII: parameter ignored
Binary: 8, 16, 32 bits in binary integer format

Default Value: 8

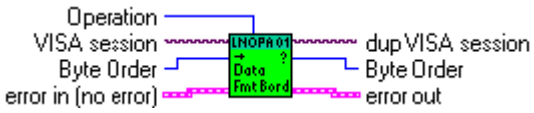
I32 **Format** Returns the data type.

I32 **Data** Length Returns the data length.

I32 **Status Length** Returns the status information length.

LNOPA01 Data Format Byte Order

This VI sets/gets the byte order for binary data transfers.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

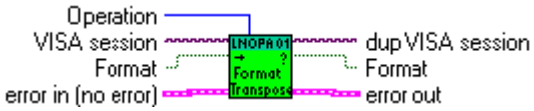
I32 **Byte Order** This control specifies the byte order of binary data.

Valid Range:
0 − Normal (Default Value)
1 − Swapped

I32 **Byte Order** Returns the byte order of binary data.

LNOPA01 Format Transpose

This VI sets/gets the transpose state for buffer, memory and spectrum data.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

TF **Format** This control specifies the transpose for the buffer, memory and spectrum data.

Valid Range:
F − False (Default Value)
T − True

Note

(1) False: Group by intervals/lines: the data will be returned in order all values from interval 1/harm. line 1, all values from interval 2/harm. line 2 ... .

(2) True: Group by measurement functions: the data will be returned in order all values/harm. lines of function 1, all values/harm. lines of function 2 ... .

Format Returns the format setting.

F − grouped by interval/harm. lines
T − grouped by measurement functions

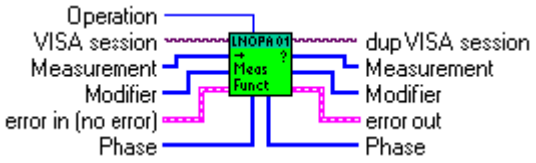
Measurement Function

LNOPA01 Measurement Functions

This VI sets/gets the active measurement functions. Concurrent functions must be enabled if multiple functions are selected.

Note

All input arrays to this VI must be of the same size.



Measurement This control sets the array of voltage measurement function.

Valid Range:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
28 − Power Active (Active Power)

29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
50 − Averaging Interval
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
60 − Averaging Interval Relative Timestamp
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

Note

Values 51 to 56 are available only with option Process Interface.

[I32] **Phase** This control specifies the array of phase numbers.

Valid Range:
For Measurement:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)

9 − Voltage Harmonic
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC

are Valid Values
-1: Sum of 1st 3-phase system (phase 1 … phase 3)

460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD

are Valid Values:
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
10 − Voltage TRMS Phase-To-Phase Harmonic
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase

are Valid Values:
12, 23, 31, 123: for three channel model
12, 23, 31, 45, 56, 64, 123, 456: for six channel model

For Measurement:
49 − Frequency
50 − Averaging Interval
60 − Averaging Interval Relative Timestamp

is valid -1 only

For Measurements:
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]

are valid values: 1 to 4, the values are independent of number of phases

For Measurement:
56 − Raw Process Input Value [V/Hz]

are valid values: 1 to 8, the values are independent of number of phases

For Measurements:
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic

are Valid Values:
-1: Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)

For Measurements:
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
12, 23, 31: for three channel model
12, 23, 31, 45, 56, 64: for six channel model

[I32] **Modifier** This control specifies the array of modifiers of voltage measurement function.

Note

Only None, Positive Integral and Negative Integral are available now.

Valid Range:
For Measurement:

1 − Voltage Mean (Mean value of Voltage)
16 − Current Mean (Mean value of Current)
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)

30 − Power Reactive (Reactive Power)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic

are Valid Values
0 − None
1 − Minimum
2 − Maximum
3 − Integral Positive
4 − Integral Negative
5 − Integral

For Measurement:
0 − Voltage True RMS (True RMS Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
31 − Power Factor (Power Factor)
35 − Power Factor Harmonic
36 – Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency

51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
0 − None
1 − Minimum
2 − Maximum

For Measurement:
50 − Averaging Intervals
60 − Averaging Interval Relative Timestamp

is Valid Value:
0 − None

Note
The integral modifiers are available only if integration is enabled.

I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

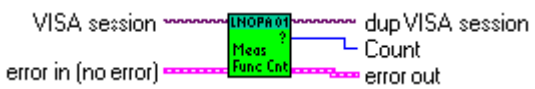
I32 **Measurement** Returns array of measurement functions.

I32 **Phase** Returns array of phases.

I32 **Modifier** Returns array of modifiers.

LNOPA01 Functions All State

This VI enables/disables all measurement functions.

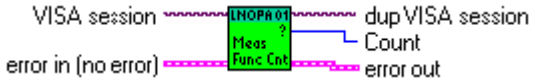


TF **State** This control sets the state.

Valid Values:
F − Off
T − On (Default Value)

LNOPA01 Function Count

This VI queries the number of measurement functions that are ON.



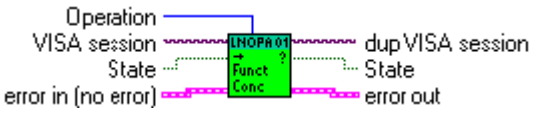
I32 **Count** Returns the number of measurement functions that are ON.

LNOPA01 Concurrent Functions State

This VI sets/gets the concurrent functions state. The state must be On in order to be able to specify multiple measurement functions for readout from the instrument.

Note

This VI configures whether the SENSor block should be configured to SENSe one function at a time or SENSe more than one function at a time (concurrently).



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

TF **State** This control sets the concurrent functions state.

Valid Range:
F − Off
T − On (Default Value)

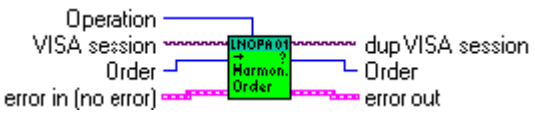
Note

(1) On -the function(s) specified as parameter(s) to the LNOPA01 Measurement Functions.vi are turned on, while the state of other functions is set to off.
(2) Off -the LNOPA01 Measurement Functions.vi acts as a one-of-n switch selecting the indicated function to be the only sensed function.

TF **State** Returns the state of concurrent functions.

LNOPA01 Harmonic Order

This VI sets/gets the harmonic order.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Order** This control sets the harmonic order.

Valid Range:
1 to max. harmonic

Default Value:
1

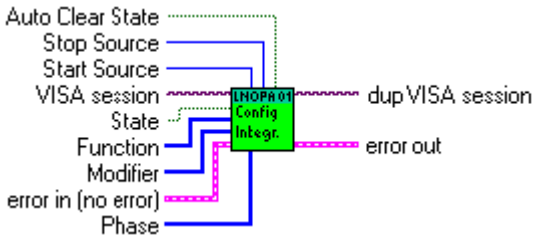
I32 **Order** Returns the harmonic order.

Calculate Functions

Integration

LNOPA01 Configure Integration

This VI configures the integration.



TF **State** This control sets the state of integration (enabled/disabled).

Valid Range:
F − Off (Default Value)
T − On

I32 **Start Source** This control sets the start source of function calculation.

Valid Range:
0 − Command (Default Value)
1 − Time
2 − Manual

Note

Command: Starts the integration upon receipt of the start command (Start Integration Immediate) 1 -Time: Starts the integration at time. 2 -Manual: Starts the integration when the user presses a key on the front panel of the instrument.

I32 **Stop Source** This control sets the stop source of function calculation.

Valid Range:
0 − Command (Default Value)
1 − Time
2 − Manual
3 − Integration interval

Note

0 − Command: Stops the integration upon receipt of the start command (Stop Integration Immediate).
1 − Time: Stops the integration at time.
2 − Manual: Stops the integration when the user presses a key on the front panel of the instrument.
3 − Integration interval: Stops the integration after interval.

TF **Auto Clear State** This control sets the auto clear state.

Valid Range:
F − Off (Default Value)
T − On

Note

If On is set, the values are cleared at the start.

I32 **Function** This control specifies the array of measurement functions. Each element in the passed array should represent one measurement function.

Valid Range:

1 − Mean Value Of Voltage
16 − Mean Value Of Current
28 − Active Power
29 − Apparent Power
30 − Reactive Power
32 − Active Power Harmonic
33 − Apparent Power Harmonic
34 − Reactive Power Harmonic

I32 **Phase** This control specifies the array of phases.

Valid Values:
-1: Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

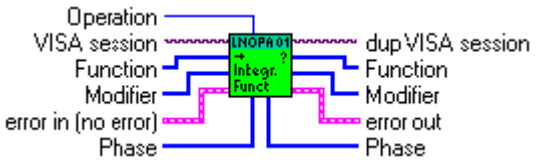
I32 **Modifier** Not used now. For future use.

LNOPA01 Integration Functions

This VI sets/gets the function list for the integral calculation.

Note

All input arrays to this VI must be of the same size.



I32 **Function** This control specifies the array of measurement functions. Each element in the passed array should represent one measurement function.

Valid Range:

1 − Mean Value of Voltage
16 − Mean Value of Current
28 − Active Power
29 − Apparent Power
30 − Reactive Power
32 − Active Power Harmonic
33 − Apparent Power Harmonic
34 − Reactive Power Harmonic

Phase This control specifies the array of phases.

Valid Values:
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

Modifier Not used now. For future use.

Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

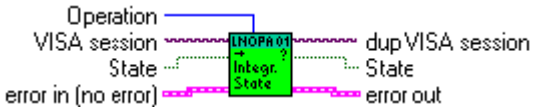
Function Returns array of integration functions.

Phase Returns array of phases.

Modifier Returns array of modifiers.

LNOPA01 Integration State

This VI sets/gets the state of integration.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

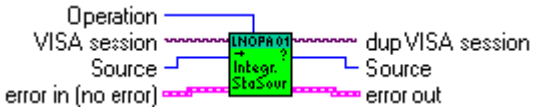
State This control sets the state of integration (enabled/disabled).

Valid Range:
F − Off (Default Value)
T − On

State Returns the state of integration.

LNOPA01 Integration Start Source

This VI sets/gets the integration start source.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Source This control sets the start source of function calculation.

Valid Range:
0 − Command (Default Value)
1 − Time
2 − Manual

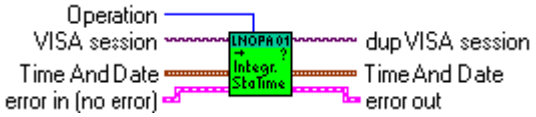
Note

0 − Command: Starts the integration upon receipt of the start command (Start Integration Immediate).
1 − Time: Starts the integration at time.
2 − Manual: Starts the integration when the user presses a key on the front panel of the instrument.

Source Returns the start source of function calculation.

LNOPA01 Integration Start Time

This VI sets/gets integration start time. The integration starts when the instrument's internal date/time is equal to the time specified with this command.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Time And Date This control sets the time for time start source. The time and date is the form of the standard LabVIEW Date/Time cluster. In order to be able to represent fractions of seconds, the cluster member 'second' uses DBL data type. LabVIEW will automatically typecast its standard Date/Time cluster when necessary. Only values second, minute, hour, day of month, month and year have

Valid Values:

seconds	0 to 59
minute	0 to 59
hour	0 to 23
day of month	-1 to 31

month 1 to 12
year 1960 to 2050

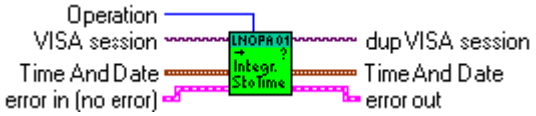
Time And Date Returns the time for time start source. The time and date is the form of the standard LabVIEW Date/Time cluster. In order to be able to represent fractions of seconds, the cluster member 'second' uses DBL data type. LabVIEW will automatically typecast its standard Date/Time cluster when necessary.

LNOPA01 Integration Stop Source

This VI sets/gets the integration stop source.

Note

Stopping integration does not reset the integrated values to zero.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Source This control sets the stop source of function calculation.

Valid Range:
0 − Command (Default Value)
1 − Time
2 − Manual
3 − Integration interval

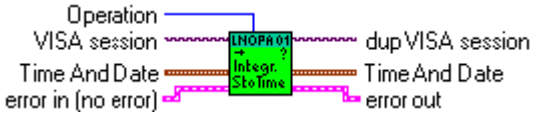
Note

0 − Command: Stops the integration upon receipt of the start command (Stop Integration Immediate).
1 − Time: Stops the integration at time.
2 − Manual: Stops the integration when the user presses a key on the front panel of the instrument.
3 − Integration interval: Stops the integration after interval.

Source Returns the stop source of function calculation.

LNOPA01 Integration Stop Time

This VI sets/gets sets the integration stop time. The integration stops when the instrument's internal date/time is equal to the time specified with this command.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Time And Date This control sets the time for time stop source. The time and date is the form of the standard LabVIEW Date/Time cluster. In order to be able to represent fractions of seconds, the cluster member 'second' uses DBL data type. LabVIEW will automatically typecast its standard Date/Time cluster when necessary. Only values second, minute, hour, day of month, month and year have

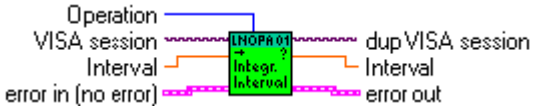
Valid Values:

seconds	0 to 59
minute	0 to 59
hour	0 to 23
day of month	1 to 31
month	1 to 12
year	1960 to 2050

Time And Date Returns the time for time stop source. The time and date is the form of the standard LabVIEW Date/Time cluster. In order to be able to represent fractions of seconds, the cluster member 'second' uses DBL data type. LabVIEW will automatically typecast its standard Date/Time cluster when necessary.

LNOPA01 Integration Interval

This VI sets/gets the integration interval. The integration after this interval elapses from the start of the integration.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Interval This control specifies the integration interval.

Valid Range: 0 to ...

Default Value: 0

Interval Returns the integration interval.

LNOPA01 Start Integration Immediate

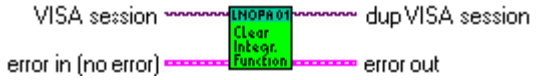
This VI starts the integration immediately.

LNOPA01 Stop Integration Immediate

This VI stops the integration immediately.

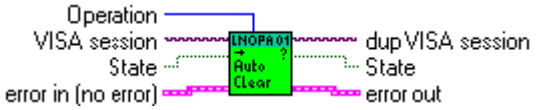
LNOPA01 Clear Integration Function

This VI clears (resets) the integration functions immediately.



LNOPA01 Auto Clear State

This VI sets/gets the auto clear state of integration.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

TF **State** This control sets the auto clear state.

Valid Range:
F − Off (Default Value)
T − On

Note

If On is set, the values are cleared at the start.

TF **State** Returns the state of integration.

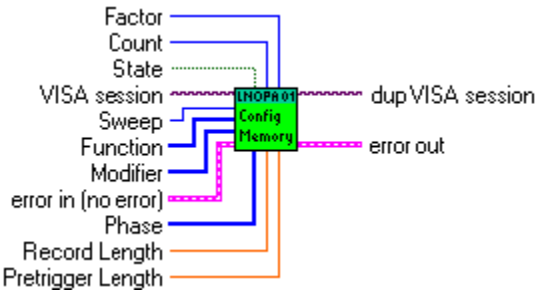
Memory Record

LNOPA01 Configure Memory

This VI configures the memory recording.

Note

(1) All input arrays to this function must be of the same size.
(2) This VI sets the Record Length and Pretrigger Length to 0.0 first to prevent Instrument Error. Then the parameter values will be set.



TF **State** This control sets the state of given sweep.

Valid Range:
F − Off (Default Value)
T − On

I32 **Sweep** This control sets the type of sweep.

Valid Range:
0 − Realtime (Default Value)

Note

Average will be used in future.

I32 **Count** This control sets the count of given sweep.

Valid Range:
0 to 1000

Default Value:
1

DBL **Pretrigger Length** This control sets the pretrigger length in second.

Valid Range:
0.0 to MEM_RECORD_MAX

Default Value:
0.0

DBL **Record Length** This control sets the record length in second.

Valid Range:
0.0 to MEM_RECORD_MAX

Default Value:
100.0

Note

This record length includes pretrigger length.

I32 **Factor** Sets the sample factor.

Valid Range:
1 to 65535

Default Value:
1

Note

The value has to be smaller then record length (setRecordLength) and pretrigger record length (setPretriggerLength).

I32 **Function** This control specifies the array of measurement functions. Each element in the passed array should represent one measurement function.

Valid Range for Sweep Realtime:
0 − True RMS Voltage
15 − True RMS Current
28 − Active Power
51 − Shaft torque [Nm]
52 − Rotational speed [rpm]
53 − Mechanical power [W]

Valid Range for Sweep Average:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − -Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)

30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
50 − Averaging Interval
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
60 − Averaging Interval Relative Timestamp
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

Note

Values 51 to 56 are available only with option Process Interface.

Phase This control specifies the array of phase numbers.

Valid Range:
For Measurement:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
9 − Voltage Harmonic

15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC

are Valid Values
-1: Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD

are Valid Values:
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
10 − Voltage TRMS Phase-To-Phase Harmonic
57 − Voltage Mean Phase-To-Phase

58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase

are Valid Values:
12, 23, 31,123: for three channel model
12, 23, 31, 45, 56, 64, 123, 456: for six channel model

For Measurement:
49 − Frequency
50 − Averaging Interval
60 − Averaging Interval Relative Timestamp

is valid -1 only

For Measurements:
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]

are valid values: 1 to 4, the values are independent of number of phases

For Measurement:
56 − Raw Process Input Value [V/Hz]

are valid values: 1 to 8, the values are independent of number of phases

For Measurements:
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic

are Valid Values:
-1: Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)

For Measurements:
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
12, 23, 31: for three channel model
12, 23, 31, 45, 56, 64: for six channel model

[I32] **Modifier** This control specifies the array of modifiers of voltage measurement function.

Note

Only None, Positive Integral and Negative Integral are available now.

Valid Range:
For Measurement:

1 − Voltage Mean (Mean value of Voltage)
16 − Current Mean (Mean value of Current)
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic

are Valid Values
0 − None
1 − Minimum
2 − Maximum
3 − Integral Positive
4 − Integral Negative
5 − Integral

For Measurement:
0 − Voltage True RMS (True RMS Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
31 − Power Factor (Power Factor)
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]

55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC

are Valid Values:
0 − None
1 − Minimum
2 − Maximum

For Measurement:
50 − Averaging Intervals
60 − Averaging Interval Relative Timestamp

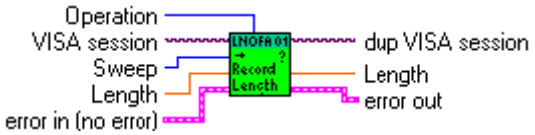
is Valid Value:
0 − None

Note

The integral modifiers are available only if integration is enabled.

LNOPA01 Record Length

This VI sets/gets the record length.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Sweep** This control sets the type of sweep.

Valid Range:
0 − Realtime (Default Value)

Note

Average will be used in future.

DBL **Length** This control sets the record length in seconds.

Valid Range:
0.0 to MEM_RECORD_MAX
Default Value:
100.0

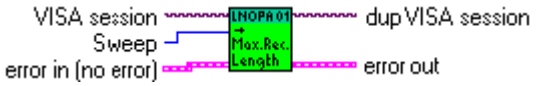
Note

This record length includes pretrigger length.

DBL **Length** Returns the record length in seconds.

LNOPA01 Max Record Length

This VI sets the record length to maximum. The whole free memory is used for data recording.



I32 **Sweep** This control sets the type of sweep.

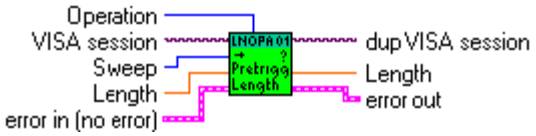
Valid Range:
0 − Realtime (Default Value)

Note

Average will be used in future.

LNOPA01 Pretrigger Length

This VI sets/gets the pretrigger length.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Sweep** This control sets the type of sweep.

Valid Range:
0 − Realtime (Default Value)

Note

Average will be used in future.

DBL **Length** This control sets the pretrigger length in seconds.

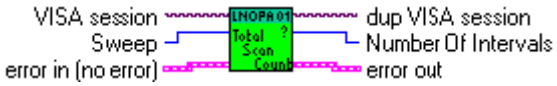
Valid Range:
0.0 to MEM_RECORD_MAX

Default Value:
0.0

DBL **Length** Returns the pretrigger length in seconds.

LNOPA01 Total Scan Count

This VI returns the number of averaging intervals that will be acquired. If the synchronization is On, then for SWEep2 (Average) this query will return only an approximate number of averaging intervals in pretrigger calculated as pretrigger length/nominal averaging interval.



I32 **Sweep** This control sets the type of sweep.

Valid Range:
0 − Realtime (Default Value)

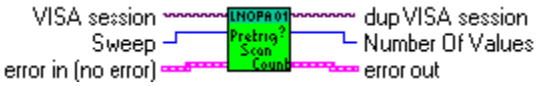
Notes

Average will be used in future.

I32 **Number Of Intervals** Returns the number of averaging intervals.

LNOPA01 Pretrigger Scan Count

This VI returns the number of values in pretrigger. If the synchronization is On, then for SWEep2 (Average) this query will return only an approximate number of averaging intervals in pretrigger calculated as pretrigger length/nominal averaging interval.



I32 **Sweep** This control sets the type of sweep.

Valid Range:
0 − Realtime (Default Value)

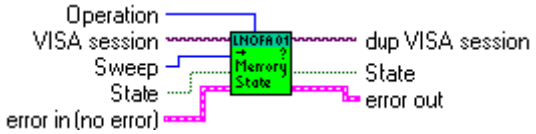
Note

Average will be used in future.

I32 **Number Of Values** Returns the number of values in pretrigger.

LNOPA01 Memory State

This VI sets/gets the state of selected sweep. Only one of sweep can be enabled at time. Transition from OFF to ON clears the memory.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

TF **State** This control sets the state of selected sweep.

Valid Range:
F − Off (Default Value)
T − On

I32 **Sweep** This control sets the type of sweep.

Valid Range:
0 − Realtime (Default Value)

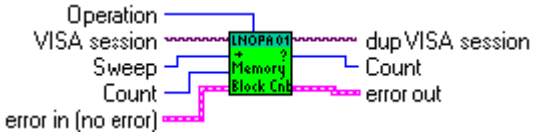
Note

Average will be used in future.

TF **State** Returns the state of selected sweep.

LNOPA01 Memory Block Count

This VI sets/gets the number of blocks of the selected sweep.



I32 **Sweep** This control sets the type of sweep.

Valid Range:
0 − Realtime (Default Value)

Note

Average will be used in future.

I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Count** This control sets the block count of selected sweep.

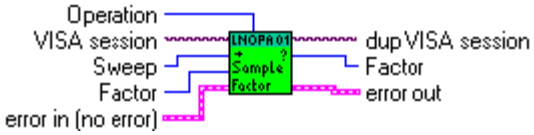
Valid Range:
0 to 65535

Default Value:
1

I32 **Count** Returns the block count of selected sweep.

LNOPA01 Sample Factor

This VI sets/gets the sample factor. Specifies that every n^{th} value produced by the SENSe block is saved into memory.



I32 **Sweep** This control sets the type of sweep.

Valid Range:
0 − Realtime (Default Value)

Note

Average will be used in future.

Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Factor Sets the sample factor.

Valid Range:
1 to 65535

Default Value:
1

Note

The value has to be smaller then record length (LNOPA01 Record Length.vi) and pretrigger record length (LNOPA01 Pretrigger Length.vi).

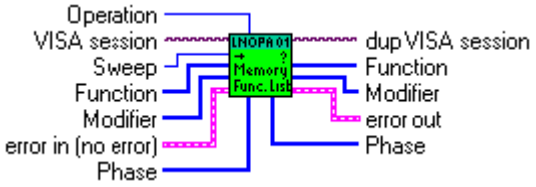
Factor Returns the sample factor.

LNOPA01 Memory Function List

This VI sets/gets the functions for memory recording.

Note

All input arrays to this function must be of the same size.



Function This control specifies the array of measurement functions. Each element in the passed array should represent one measurement function.

Valid Range for Sweep Realtime:
0 − True RMS Voltage
15 − True RMS Current
28 − Active Power
51 − Shaft torque [Nm]
52 − Rotational speed [rpm]
53 − Mechanical power [W]

Valid Range for Sweep Average:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)

6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
50 − Averaging Interval
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
60 − Averaging Interval Relative Timestamp

61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

Note

Values 51 to 56 are available only with option Process Interface.

[I32] **Phase** This control specifies the array of phase numbers.

Valid Range:
For Measurement:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
9 − Voltage Harmonic
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic

63 − True RMS Voltage Without DC
64 − True RMS Current Without DC

are Valid Values
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD

are Valid Values:
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
10 − Voltage TRMS Phase-To-Phase Harmonic
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase

are Valid Values:
12, 23, 31, 123: for three channel model
12, 23, 31, 45, 56, 64, 123, 456: for six channel model

For Measurement:
49 − Frequency
50 − Averaging Interval
60 − Averaging Interval Relative Timestamp

is valid -1 only

For Measurements:
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]

are valid values: 1 to 4, the values are independent of number of phases

For Measurement:
56 − Raw Process Input Value [V/Hz]

are valid values: 1 to 8, the values are independent of number of phases

For Measurements:
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic

are Valid Values:
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)

For Measurements:
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
12, 23, 31: for three channel model
12, 23, 31, 45, 56, 64: for six channel model

[I32] **Modifier** This control specifies the array of modifiers of voltage measurement function.

Note

Only None, Positive Integral and Negative Integral are available now.

Valid Range:
For Measurement:

1 − Voltage Mean (Mean value of Voltage)
16 − Current Mean (Mean value of Current)
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic

are Valid Values
0 − None
1 − Minimum
2 − Maximum
3 − Integral Positive
4 − Integral Negative
5 − Integral

For Measurement:
0 − Voltage True RMS (True RMS Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)

21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
31 − Power Factor (Power Factor)
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
0 − None
1 − Minimum
2 − Maximum

For Measurement:
50 − Averaging Intervals
60 − Averaging Interval Relative Timestamp

is Valid Value:
0 − None

Note

The integral modifiers are available only if integration is enabled.

I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Sweep** This control sets the type of sweep.

Valid Range:
0 − Realtime (Default Value)

Note
Average will be used in future.

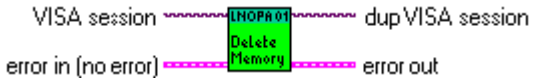
[I32] **Function** Returns the array of memory functions.

[I32] **Phase** Returns the array of phase numbers.

[I32] **Modifier** Returns the array of modifiers.

LNOPA01 Delete Memory

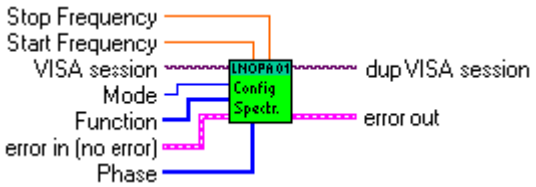
This VI deletes all memory.



Spectrum

LNOPA01 Configure Spectrum

This VI configures the spectrum measurement.



I32 **Mode** This control sets the harmonics calculation method.

Valid Range:
0 − FFT (Default Value)
1 − DFT

DBL **Start Frequency** This control sets the start frequency of the harmonics calculation.

Valid Range:
0.0 (Default Value)

Note
This function will accept only 0. Implemented only for compatibility reasons.

DBL **Stop Frequency** This control sets the stop frequency of the harmonics calculation.

Valid Range:
10.0 to sample rate/2

Default Value:
10.0

[I32] **Function** This control specifies the array of measurement functions for spectrum calculation. Each element in the passed array should represent one measurement function.

Valid Range:
0 − True RMS Voltage
15 − True RMS Current
28 − Active Power

Note

Only sampled values can be a part of the list.

[I32] **Phase** This control specifies the array of phases.

Valid Range:
for 6 channel model: 1 to 3
for 12 channel model: 1 to 6

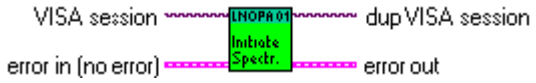
-1: Sum of all phases

LNOPA01 Initiate Spectrum

This VI initiates a single frequency transform measurement.

Note

The SENS:SWE1:STAT (Set Sweep State -memory storage samples) have to be OFF, otherwise the error -221, Settings conflict, will be generated.

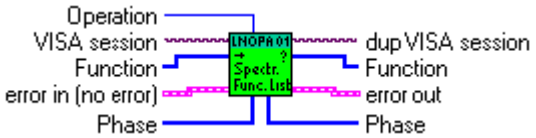


LNOPA01 Spectrum Function List

This VI sets/gets the frequency function list. Only sampled values can be a part of this list.

Note

All input arrays to this function must be of the same size.



[I32] **Function** This control specifies the array of measurement functions for spectrum calculation. Each element in the passed array should represent one measurement function.

Valid Range:
0 − True RMS Voltage
15 − True RMS Current
28 − Active Power

Note

Only sampled values can be a part of the list.

[I32] **Phase** This control specifies the array of phases.

Valid Range:
for 6 channel model:
1 to 3 for 12 channel model:
1 to 6 -1 : Sum of all phases

Operation This control specifies whether this VI either sets or gets the instrument setting(s).

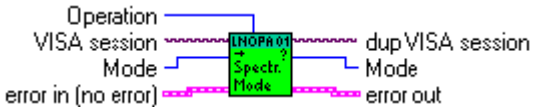
Valid Range:
0 − Set (Default Value)
1 − Get

Function Returns the array of functions configured for spectrum calculation.

Phase Returns the array of phase number.

LNOPA01 Spectrum Mode

This VI sets/gets the harmonics calculation method.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Mode This control sets the harmonics calculation method.

Valid Range:
0 − FFT (Default Value)
1 − DFT

Note

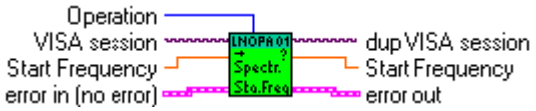
(1) FFT -Calculates an FFT amplitude spectrum. Number of lines is determined by the instrument and depends on the stop frequency, anti-aliasing filters setting and instrument model.

(2) DFT -Calculates a DFT amplitude spectrum, i.e. the amplitude of the calculated fundamental frequency and its integer multiples. Number of lines (harmonics) is always 41 including the DC component.

Mode Returns the harmonics calculation method.

LNOPA01 Spectrum Start Frequency

This VI sets/gets start frequency of harmonics calculation.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

DBL **Start Frequency** This control sets the start frequency of the harmonics calculation.

Valid Range:
0.0 (Default Value)

Note

This function will accept only 0. Implemented only for compatibility reasons.

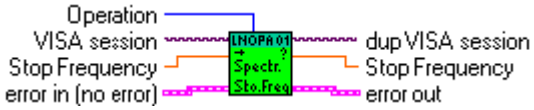
DBL **Start Frequency** Returns the start frequency of harmonics calculation.

Note

This function will return only 0. Implemented only for compatibility reasons.

LNOPA01 Spectrum Stop Frequency

This VI sets/getsstop frequency of the harmonics calculation.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

DBL **Stop Frequency** This control sets the upper frequency of the harmonics calculation (frequency of the rightmost FFT or DFT spectrum line).

Valid Range:
10.0 to sample rate/2

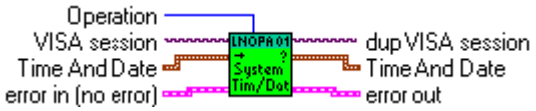
Default Value:
10.0

DBL **Stop Frequency** Returns the upper frequency of the harmonics calculation.

System

LNOPA01 System Time and Date

This VI sets/gets the internal instrument's clock date and time.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

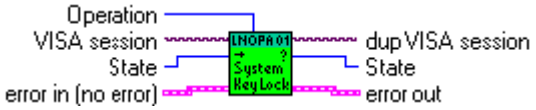
Time And Date This control sets the system time and date. The time and date is the form of the standard LabVIEW Date/Time cluster. In order to be able to represent fractions of seconds, the cluster member 'second' uses DBL data type. LabVIEW will automatically typecast its standard Date/Time cluster when necessary.

If all zero values are passed, the local PC system time is set on the instrument.

Time And Date Returns the internal instrument time and date. The time and date is the form of the standard LabVIEW Date/Time cluster. In order to be able to represent fractions of seconds, the cluster member 'second' uses DBL data type. LabVIEW will automatically typecast its standard Date/Time cluster when necessary.

LNOPA01 System Key Lock

This VI sets/gets the state of the instrument's front panel lock.



State This control sets the front panel lock.

Valid Range:
0 − Off
1 − On (Default Value)
2 − Remote

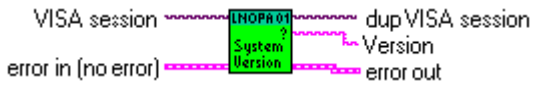
Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

State Returns the front panel lock state.

LNOPA01 System Version

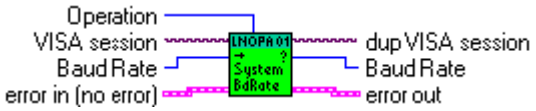
This VI queries the SCPI compliance version.



Version Returns the SCPI compliance version.

LNOPA01 System Baud Rate

This VI sets/gets the RS-232 communication baud rate.



I32 **Baud Rate** This control sets the RS-232 communication baud rate on the instrument.

Valid Values:
1200, 2400, 4800, 9600, 19200, 38400, 57600, 115200 baud

Default Value: 115200 baud

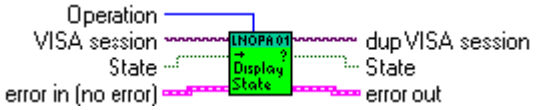
I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Baud Rate** Returns the RS-232 baud rate the instrument uses.

LNOPA01 Display State

This VI sets/gets the state of the instrument's main window.



TF **State** This control sets the state of instrument's main window.

Valid Values:
F − Off (Default Value)
T − On

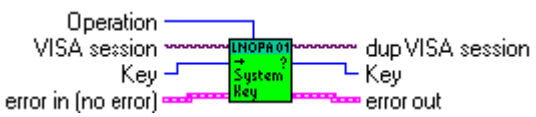
I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

TF **State** Returns the state of instrument's main window.

LNOPA01 System Key

This VI simulates/returns the pressing of given key on the front panel keyboard.



I32 **Key** This control sets the simulated key.

Valid Range:
0 − None
1 − Enter (Default Value)
2 − Esc
3 − Up
4 − Down
5 − Left
6 − Right
7 − Sum
8 − PHA
9 − Wav
10 − Num
11 − Rec
12 − DSO
13 − VEC
14 − HAM
15 − Prn
16 − Mem
17 − Hold
18 − F1
19 − F2
20 − F3
21 − F4
22 − F5
23 − F6

Note

0 -None : No key is sent to the instrument.

Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Key Returns the pressed key.

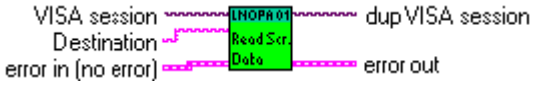
Returned Values:
0 − None
1 − Enter
2 − Esc
3 − Up
4 − Down
5 − Left
6 − Right
7 − Sum
8 − PHA
9 − Wav
10 − Num
11 − Rec
12 − DSO
13 − VEC
14 − HAM
15 − Prn
16 − Mem

17 − Hold
18 − F1
19 − F2
20 − F3
21 − F4
22 − F5
23 − F6

Hardcopy

LNOPA01 Read Screen Data

This VI returns the screen dump data in internal format sufficient for PC program KarinScr.exe.



abc **Destination** The file name, the data should be stored.

Default Value:
"c:\dump.scr"

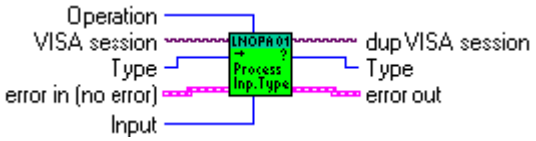
Process Interface

Process Input

LNOPA01 Process Input Type

This VI sets/gets the process input sensor type.

Note
This VI is valid only if optional process interface is available.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Type** This control sets the input type to match the sensor type.

Valid Range:
0 − Voltage (Default Value)
1 − Frequency

I32 **Input** This control selects the general process input.

Valid Range: 1 to 8

Default Value: 1

Note

1 to 4, corresponds Torque[1..4]
5 to 8, corresponds Speed[1..4]

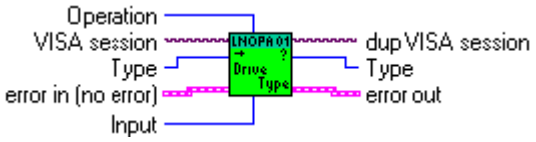
I32 **Type** Returns process input type.

LNOPA01 Drive Type

This VI sets/gets the drive type. The setting affects calculation of slip and efficiency.

Note

This VI is valid only if optional process interface is available.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Type** This control sets the drive type for selected input.

Valid Range:
0 − Motor (Default Value)
1 − Generator

I32 **Input** This control selects the input.

Valid Range:
1 to 4

Default Value: 1

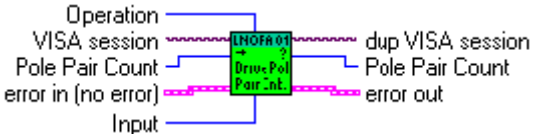
I32 **Type** Returns the drive type for selected input.

LNOPA01 Drive Pole Pair Count

This VI sets/gets the number of polepairs of the drive. This setting is used for slip calculation.

Note

This VI is valid only if optional process interface is available.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Pole Pair** Count This control sets the drive pole pair count.

Valid Range:
1 to 99

Default Value:
1

I32 **Input** This control selects the input.

Valid Range:
1 to 4

I32 Default Value: 1

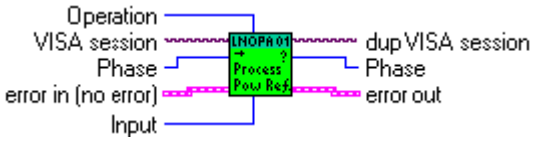
Pole Pair Count Returns the drive pole-pair count.

LNOPA01 Process Power Reference

This VI sets/gets the measured electrical power used for efficiency calculation.

Note

This VI is valid only if optional process interface is available.



I32 **Input** This control selects the process input.

Valid Range:
1 to 4

Default Value:
1

I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Phase** This control specifies the phase number.

Valid Range:
-1 : Sum of all phases
1 to 6: Phases 1 to 6.

Default Value:
1

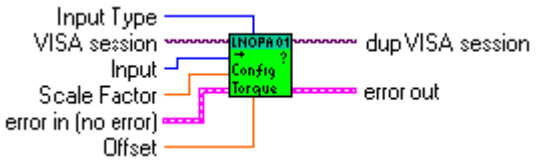
I32 **Phase** Returns the phase number.

LNOPA01 Configure Torque

This VI configures the torque input.

Note

This VI is valid only if optional process interface is available.



I32 **Input** This control selects the torque input.

Valid Range:
1 to 4

Default Value: 1

DBL **Scale Factor** Sets the scaling factor.

Valid Range:
-1.0E+6 to 1.0E+6

Default Value:
1.0 [Nm/V]

DBL **Offset** Sets the offset.

Valid Range:
-1.0E+6 to 1.0E+6

Default Value:
0.0 V

I32 **Input Type** This control sets the shunt type for specified current input.

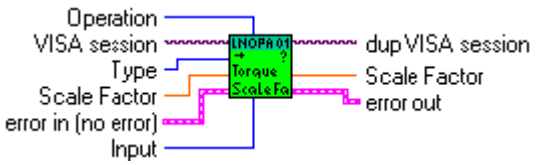
Valid Range:
0 − Internal (Default Value)
1 − External

LNOPA01 Torque Scale Factor

This VI sets/gets the torque scaling factor for the input that reflects conversion ratio of torque sensors employed. The difference between the value on the respective input and the specified offset is multiplied by this scaling factor before any further processing.

Note

This VI is valid only if optional process interface is available.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Type** This control selects the input sensor type.

Valid Range:
0 − Voltage (Default Value)
1 − Frequency

I32 **Input** This control selects the torque input.

Valid Range:
1 to 4

Default Value: 1

DBL **Scale Factor** Sets the scale factor.

Valid Range:
-1.0E+6 to 1.0E+6

Default Value:
1.0 [Nm/V]

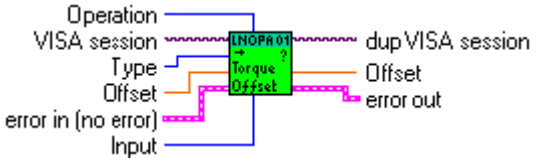
DBL **Scale Factor** Returns the scale factor.

LNOPA01 Torque Offset

This VI sets/gets the input value that corresponds to torque offset (zero value). This value is subtracted from the measured value at the input before this difference is multiplied by the scaling factor.

Note

This function is valid only if optional process interface is available.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Type** This control selects the input sensor type.

Valid Range:
0 − Voltage (Default Value)
1 − Frequency

I32 **Input** This control selects the torque input.

Valid Range:
1 to 4

Default Value: 1

DBL **Offset** Sets the offset.

Valid Range:
-1.0E+6 to 1.0E+6

Default Value:
0.0 V

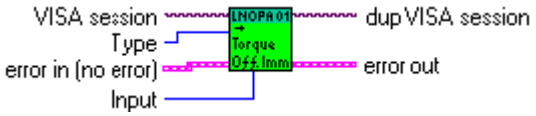
DBL **Offset** Returns the offset.

LNOPA01 Torque Offset Immediate

This VI sets the torque offset value from the currently measured value. The measurement must be valid (no overload / undefined value).

Note

This VI is valid only if optional process interface is available.



I32 **Type** This control selects the input sensor type.

Valid Range:
0 − Voltage (Default Value)
1 − Frequency

I32 **Input** This control selects the torque input.

Valid Range:
1 to 4

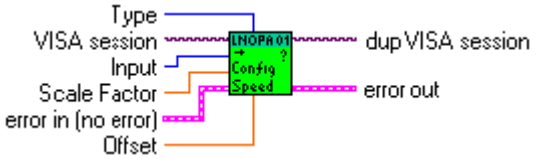
Default Value: 1

LNOPA01 Configure Speed

This VI configures the speed input.

Note

This VI is valid only if optional process interface is available.



I32 **Input** This control selects the torque input.

Valid Range:
1 to 4

Default Value: 1

DBL **Scale Factor** Sets the scale factor.

for Voltage: -1.0E+6 to 1.0E+6 V
for Frequency (rpm/Hz): -1.0E+6 to 1.0E+6 rpm/Hz
for Frequency (pulses/rev.): 1 to 100000 pul/rev

Default Value:
1.0

Note

For Frequency (pulses/rev.) are only integer values valid. The decimal part will be discarded.

DBL **Offset** Sets the offset.

Valid Range:
-1.0E+6 to 1.0E+6

Default Value:
0.0

Note

The units are V or Hz according to the selected Type.

I32 **Type** This control selects the input sensor type.

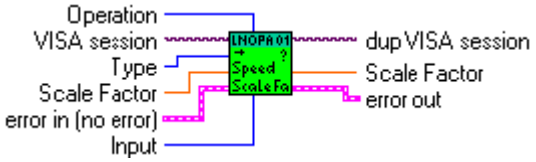
Valid Range:
0 − Voltage (Default Value)
1 − Frequency (rpm/Hz)
2 − Frequency (pulses/revolution)

LNOPA01 Speed Scale Factor

This VI sets/gets the speed scaling factor for the input that reflects conversion ratio of speed sensors employed. The difference between the voltage on the respective input and the specified offset is multiplied by this scaling factor before any further processing.

Note

This VI is valid only if optional process interface is available.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Type** This control selects the input sensor type.

Valid Range:
0 − Voltage (Default Value)
1 − Frequency (pulses/revolution)
2 − Frequency (rpm/Hz)

I32 **Input** This control selects the torque input.

Valid Range:
1 to 4

Default Value: 1

DBL **Scale Factor** Sets the scale factor.

Valid Range:
for Voltage: -1.0E+6 to 1.0E+6 V

for Frequency (rpm/Hz): -1.0E+6 to 1.0E+6rpm/Hz
for Frequency (pulses/rev.): 1 to 100000 pul/rev

Default Value:
1.0

Note

For Frequency (pulses/rev.) are only integer values valid. The decimal part will be discarded.

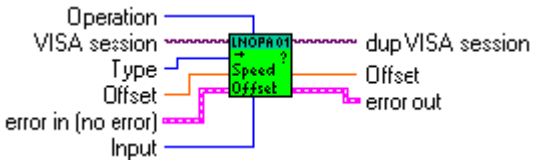
DBL **Scale Factor** Returns the scaling factor.

LNOPA01 Speed Offset

This VI sets/gets the speed offset (zero value). This value is subtracted from the measured value at the input before this difference is multiplied by the scaling factor.

Note

This VI is valid only if optional process interface is available.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

I32 **Type** This control selects the input sensor type.

Valid Range:
0 − Voltage (Default Value)
1 − Frequency

I32 **Input** This control selects the speed input.

Valid Range:
1 to 4

Default Value: 1

DBL **Offset** Sets the offset.

Valid Range:
-1.0+6 to 1.0E+6
Default Value:
0.0

Note

The units are V or Hz according to the selected Type.

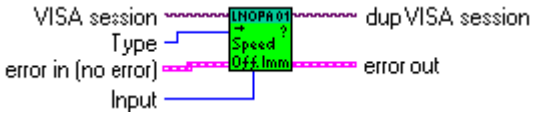
DBL **Offset** Returns the offset.

LNOPA01 Speed Offset Immediate

This VI sets the speed offset value from the currently measured value. The measurement must be valid (no overload).

Note

This VI is valid only if optional process interface is available.



I32 **Type** This control selects the input sensor type.

Valid Range:
0 − Voltage (Default Value)
1 − Frequency

I32 **Input** This control selects the speed input.

Valid Range:
1 to 4

Default Value: 1

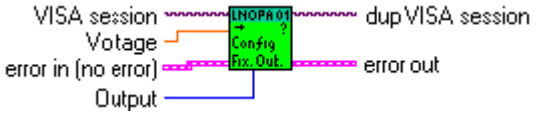
Process Output

LNOPA01 Configure Fixed Output

This VI configures the fixed process output.

Note

This VI is valid only if optional process interface is available.



DBL **Voltage** This control sets the process output voltage.

Valid Range:
-10.3 to 10.3

Default Value:
0.0

I32 **Output** This control selects the process output.

Valid Range:
1 to 4

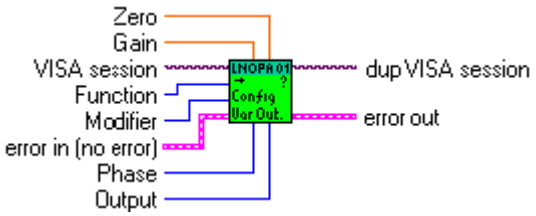
Default Value:
1

LNOPA01 Configure Variable Output

This VI configures the variable process output.

Note

This VI is valid only if optional process interface is available.



I32 **Output** This control selects the process output.

Valid Range:
1 to 4

Default Value:
1

I32 **Function** This control sets the type of voltage measurement function.

Valid Range:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)

32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
50 − Averaging Interval
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
60 − Averaging Interval Relative Timestamp
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

Note

Values 51 to 56 are available only with option Process Interface.

132 **Phase** This control specifies the phase number.

Valid Range:
For Measurement:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
9 − Voltage Harmonic
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)

17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC

are Valid Values
-1: Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD

are Valid Values:
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
10 − Voltage TRMS Phase-To-Phase Harmonic
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase

are Valid Values:
12, 23, 31, 123: for three channel model
12, 23, 31, 45, 56, 64, 123, 456: for six channel model

For Measurement:
49 − Frequency
50 − Averaging Interval
60 − Averaging Interval Relative Timestamp

is valid -1 only

For Measurements:
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]

are valid values: 1 to 4, the values are independent of number of phases

For Measurement:
56 − Raw Process Input Value [V/Hz]

are valid values: 1 to 8, the values are independent of number of phases

For Measurements:
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic

are Valid Values:
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)

For Measurements:
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
12, 23, 31: for three channel model
12, 23, 31, 45, 56, 64: for six channel model

Modifier This control specifies the modifier of voltage measurement function.

Note
Only None, Positive Integral and Negative Integral are available now.

Valid Range:
For Measurement:

1 − Voltage Mean (Mean value of Voltage)
16 − Current Mean (Mean value of Current)
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic

are Valid Values
0 − None
1 − Minimum

2 − Maximum
3 − Integral Positive
4 − Integral Negative
5 − Integral

For Measurement:
0 − Voltage True RMS (True RMS Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
31 − Power Factor (Power Factor)
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase

58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
0 − None
1 − Minimum
2 − Maximum

For Measurement:
50 − Averaging Interval

is Valid Value:
0 − None

Note

The integral modifiers are available only if integration is enabled.

DBL **Gain** This control sets the scaling for the output. The difference between the actual value of the reference function and the ZERO value is multiplied by this factor to calculate the output voltage.

Valid Range:
-1.0E+6 to 1.0E+6 V/Ref

Default Value:
1.0

DBL **Zero** This control sets the offset for the output. This value is subtracted from the actual value of the reference function before this difference is multiplied by the GAIN setting to calculate the output voltage.

Valid Range:
-1.0E+6 to 1.0E+6 Ref

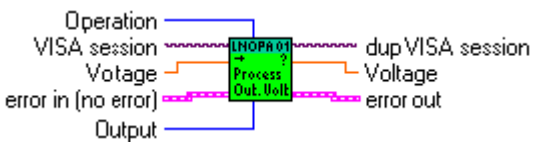
Default Value:
0.0

LNOPA01 Process Output Voltage

This VI sets/gets the process output voltage for fixed mode.

Note

This VI is valid only if optional process interface is available.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Voltage This control sets the process output voltage.

Valid Range: -10.3 to 10.3

Default Value: 0.0

Note

The process output voltage can be set only for fixed mode.

Output This control selects the process output.

Valid Range:
1 to 4

Default Value:
1

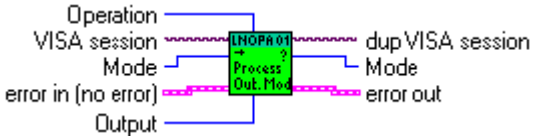
Voltage Returns the process output voltage.

LNOPA01 Process Output Mode

This VI sets/gets the operating mode of the analogue outputs.

Note

This VI is valid only if optional process interface is available.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Mode This control sets the operating mode of the analogue outputs.

Valid Range:
0 − Fixed (Default Value)
1 − Variable

Note

0 − Fixed -The output voltage is directly specified.
1 − Variable -After every measurement the output voltage is calculated from the FEEDed measurement function using the specified GAIN and ZERO values.

Output This control selects the process output.

Valid Range:
1 to 4

Default Value:
1

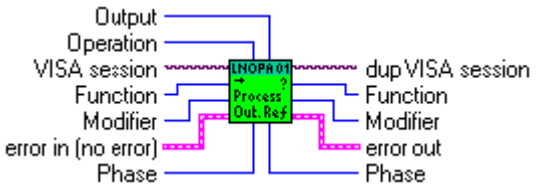
Mode Returns the operating mode of the analogue outputs.

LNOPA01 Process Output Reference

This VI sets/gets the process output reference function for variable mode.

Note

This VI is valid only if optional process interface is available.



Operation This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

Output This control selects the process output.

Valid Range:
1 to 4

Default Value:
1

Function This control sets the type of voltage measurement function.

Valid Range:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic

24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
50 − Averaging Interval
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 – Voltage Form Factor Phase-To-Phase
60 − Averaging Interval Relative Timestamp
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

Note

Values 51 to 56 are available only with option Process Interface.

I32 **Phase** This control specifies the phase number.

Valid Range:
For Measurement:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)

3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
9 − Voltage Harmonic
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC

are Valid Values
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD

are Valid Values:
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
10 − Voltage TRMS Phase-To-Phase Harmonic
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase

are Valid Values:
12, 23, 31, 123: for three channel model
12, 23, 31, 45, 56, 64, 123, 456: for six channel model

For Measurement:
49 − Frequency
50 − Averaging Interval
60 − Averaging Interval Relative Timestamp

is valid -1 only

For Measurements:
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]

are valid values: 1 to 4, the values are independent of number of phases

For Measurement:
56 − Raw Process Input Value [V/Hz]

are valid values: 1 to 8, the values are independent of number of phases

For Measurements:
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic

are Valid Values:
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)

For Measurements:
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
12, 23, 31: for three channel model
12, 23, 31, 45, 56, 64: for six channel model

Modifier This control specifies the modifier of voltage measurement function.

Note

Only None, Positive Integral and Negative Integral are available now.

Valid Range:
For Measurement:

1 − Voltage Mean (Mean value of Voltage)
16 − Current Mean (Mean value of Current)
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic

are Valid Values
0 − None
1 − Minimum
2 − Maximum
3 − Integral Positive
4 − Integral Negative
5 − Integral

For Measurement:

0 − Voltage True RMS (True RMS Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
31 − Power Factor (Power Factor)
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic

45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
0 − None
1 − Minimum
2 − Maximum

For Measurement:
50 − Averaging Intervals
60 − Averaging Interval Relative Timestamp

is Valid Value:
0 − None

Note

The integral modifiers are available only if integration is enabled.

I32 **Function** Returns the measurement function.

I32 **Phase** Returns the phase number.

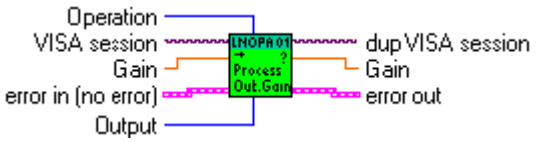
I32 **Modifier** Returns the modifier of voltage measurement function.

LNOPA01 Process Output Gain

This VI sets/gets the scaling for the output. The difference between the actual value of the reference function and the ZERO value is multiplied by this factor to calculate the output voltage.

Note

This function is valid only if optional process interface is available.



DBL **Gain** This control sets the scaling for the output. The difference between the actual values of the reference function and the ZERO value is multiplied by this factor to calculate the output voltage.

Valid Range:
-1.0E+6 to 1.0E+6 V/Ref

Default Value:
1.0

I32 **Output** This control selects the process output.

Valid Range:
1 to 4

Default Value:
1

I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

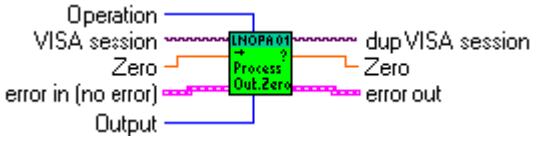
DBL **Gain** Returns the scaling for the output.

LNOPA01 Process Output Zero

This VI sets/gets the offset for the output. This value is subtracted from the actual value of the reference function before this difference is multiplied by the GAIN setting to calculate the output voltage.

Note

This VI is valid only if optional process interface is available.



I32 **Operation** This control specifies whether this VI either sets or gets the instrument setting(s).

Valid Range:
0 − Set (Default Value)
1 − Get

DBL **Zero** This control sets the offset for the output. This value is subtracted from the actual value of the reference function before this difference is multiplied by the GAIN setting to calculate the output voltage.

Valid Range:
-1.0E+6 to 1.0E+6 Ref

Default Value:
0.0

I32 **Output** This control selects the process output.

Valid Range:
1 to 4

Default Value:
1

DBL **Zero** Returns offset for the output.

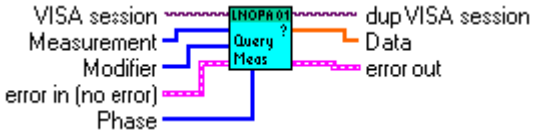
Measurement

LNOPA01 Query Measurements

This VI queries last valid measurements. No measurement is initiated with this function.

Note

All measured values returned by this function come from the same averaging interval.



I32 **Measurement** This control sets the array of voltage measurement function.

Valid Range:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)

20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
50 − Averaging Interval
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
60 − Averaging Interval Relative Timestamp
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

Note

Values 51 to 56 are available only with option Process Interface.

Phase This control specifies the array of phase numbers.

Valid Range:
For Measurement:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
9 − Voltage Harmonic
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC

are Valid Values
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
24 − Current Form Factor

25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD

are Valid Values:
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
10 − Voltage TRMS Phase-To-Phase Harmonic
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase

are Valid Values:
12, 23, 31,123: for three channel model
12, 23, 31, 45, 56, 64, 123, 456: for six channel model

For Measurement:
49 − Frequency
50 − Averaging Interval
60 − Averaging Interval Relative Timestamp

is valid -1 only

For Measurements:
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]

are valid values: 1 to 4, the values are independent of number of phases

For Measurement:
56 − Raw Process Input Value [V/Hz]

are valid values: 1 to 8, the values are independent of number of phases

For Measurements:
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic

are Valid Values:
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)

For Measurements:
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
12, 23, 31: for three channel model

12, 23, 31, 45, 56, 64: for six channel model

[I32] **Modifier** This control specifies the array of modifiers of voltage measurement function.

Note
Only None, Positive Integral and Negative Integral are available now.

Valid Range:
For Measurement:

1 − Voltage Mean (Mean value of Voltage)
16 − Current Mean (Mean value of Current)
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic

are Valid Values
0 − None
1 − Minimum
2 − Maximum
3 − Integral Positive
4 − Integral Negative
5 − Integral

For Measurement:
0 − Voltage True RMS (True RMS Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
31 − Power Factor (Power Factor)
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial

43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
0 − None
1 − Minimum
2 − Maximum

For Measurement:
50 − Averaging Intervals
60 − Averaging Interval Relative Timestamp

is Valid Value:
0 − None

Note

The integral modifiers are available only if integration is enabled.

[DBL] **Data** This indicator returns values of selected measurements in basic units.

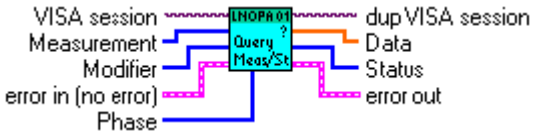
LNOPA01 Query Measurements with Status Num

This VI queries the last valid measurements along with the status of each measurement.

Note

(1) All measured values returned by this VI come from the same averaging interval.

(2) The Status is returned in UInt32 array. For UInt8 array see LNOPA01 Query Measurement Status.vi this vi was used in previous driver versions.



I32 **Measurement** This control sets the array of voltage measurement function.

Valid Range:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)

37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
50 − Averaging Interval
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase
60 − Averaging Interval Relative Timestamp
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

Note

Values 51 to 56 are available only with option Process Interface.

[I32] **Phase** This control specifies the array of phase numbers.

Valid Range:
For Measurement:
0 − Voltage True RMS (True RMS Voltage)
1 − Voltage Mean (Mean value of Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 – Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
9 − Voltage Harmonic
15 − Current True RMS (True RMS Current)
16 − Current Mean (Mean value of Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor

22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
31 − Power Factor (Power Factor)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC

are Valid Values
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD

are Valid Values:
1 to 3: for three channel model
1 to 6: for six channel model

For Measurement:
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
10 − Voltage TRMS Phase-To-Phase Harmonic
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase

are Valid Values:
12, 23, 31, 123: for three channel model
12, 23, 31, 45, 56, 64, 123, 456: for six channel model

For Measurement:
49 − Frequency
50 − Averaging Interval
60 − Averaging Interval Relative Timestamp

is valid -1 only

For Measurements:
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]

are valid values: 1 to 4, the values are independent of number of phases

For Measurement:
56 − Raw Process Input Value [V/Hz]

are valid values: 1 to 8, the values are independent of number of phases

For Measurements:
61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic

are Valid Values:
-1 : Sum of 1st 3-phase system (phase 1 … phase 3)
460: Sum of 2nd 3-phase system (phase 4 … phase 6)

For Measurements:
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
12, 23, 31: for three channel model
12, 23, 31, 45, 56, 64: for six channel model

[I32] **Modifier** This control specifies the array of modifiers of voltage measurement function.

Note

Only None, Positive Integral and Negative Integral are available now.

Valid Range:
For Measurement:

1 − Voltage Mean (Mean value of Voltage)
16 − Current Mean (Mean value of Current)
28 − Power Active (Active Power)
29 − Power Apparent (Apparent Power)
30 − Power Reactive (Reactive Power)
32 − Power Active Harmonic
33 − Power Apparent Harmonic
34 − Power Reactive Harmonic

are Valid Values
0 − None
1 − Minimum
2 − Maximum
3 − Integral Positive

4 − Integral Negative
5 − Integral

For Measurement:
0 − Voltage True RMS (True RMS Voltage)
2 − Voltage Rectified Mean (Rectified Mean Voltage)
3 − Voltage Peak-To-Peak (Peak-to-peak Voltage)
4 − Voltage Highest Value (Highest value within averaging interval)
5 − Voltage Lowest Value (Lowest value within averaging interval)
6 − Voltage Crest Factor (Voltage Crest Factor)
7 − Voltage Absolute Phase (Voltage Absolute Phase)
8 − Voltage True RMS Phase-To-Phase (True RMS phase-to-phase Voltage)
9 − Voltage Harmonic
10 − Voltage TRMS Phase-To-Phase Harmonic
11 − Voltage Form Factor
12 − Voltage Harmonic Content
13 − Voltage Fundamental Content
14 − Voltage THD
15 − Current True RMS (True RMS Current)
17 − Current Rectified Mean (Rectified Mean Current)
18 − Current Peak-To-Peak (Peak-to-peak Current)
19 − Current Highest Value (Highest value within averaging interval)
20 − Current Lowest Value (Lowest value within averaging interval)
21 − Current Crest Factor
22 − Current Absolute Phase (Current Absolute Phase)
23 − Current Harmonic
24 − Current Form Factor
25 − Current Harmonic Content
26 − Current Fundamental Content
27 − Current THD
31 − Power Factor (Power Factor)
35 − Power Factor Harmonic
36 − Power Corrected (Corrected Power)
37 − Phase
38 − Phase Harmonic
39 − Impedance
40 − Resistance Serial
41 − Resistance Parallel
42 − Reactance Serial
43 − Reactance Parallel
44 − Impedance Harmonic
45 − Resistance Serial Harmonic
46 − Resistance Parallel Harmonic
47 − Reactance Serial Harmonic
48 − Reactance Parallel Harmonic
49 − Frequency
51 − Shaft Torque [Nm]
52 − Rotational Speed [rpm]
53 − Mechanical Power [W]
54 − Rotational Asynchronousity [%]
55 − Motor Efficiency [%]
56 − Raw Process Input Value [V/Hz]
57 − Voltage Mean Phase-To-Phase
58 − Voltage Rectified Mean Phase-To-Phase
59 − Voltage Form Factor Phase-To-Phase

61 − Electrical Efficiency
62 − Electrical Efficiency Harmonic
63 − True RMS Voltage Without DC
64 − True RMS Current Without DC
65 − Voltage THD Phase-To-Phase
66 − Voltage Harmonic Content Phase-To-Phase
67 − Voltage Fundamental Content Phase-To-Phase

are Valid Values:
0 − None
1 − Minimum
2 − Maximum

For Measurement:
50 − Averaging Intervals
60 − Averaging Interval Relative Timestamp

is Valid Value:
0 − None

Note
The integral modifiers are available only if integration is enabled.

[DBL] **Data** This indicator returns values of selected measurements.

[U32] **Status** Returns status of the measurement on the corresponding index.

Valid Values:
0 − normal
1 − underrange
2 − overrange
8 − invalid

Note

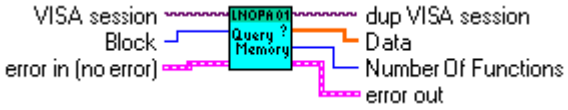
(1) Underrange -The returned value is valid, but the signal amplitude is too low for the given range, so the measurement precision is reduced.

(2) Overrange -The instrument returns a measurement value, but the input signal amplitude is too high for the given range. This causes the input signal to be clipped to an amplitude within the current range. Because the measurement value is calculated from clipped sampled data, the returned value can be more or less outside the specification.

(3) Undefined -The instrument was not able to calculate a valid value or the requested function is no longer available. This could be caused by e.g. loss of synchronization (no valid frequency, harmonics, ...). The instrument returns an Not A Number for the measurement.

LNOPA01 Query Memory

This function queries the data from memory.



Block This control specifies the number of block should be read.

Valid Range: 1 to number of block

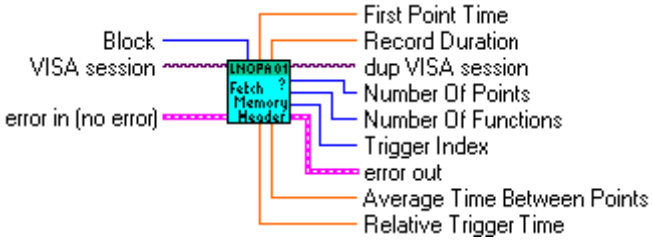
Default Value: 1

Data Returns the data from the memory.

Number Of Functions Returns number of functions recorded into memory in the selected block.

LNOPA01 Fetch Memory Data Header

This VI reads the memory data header for selected block.



Block This control specifies the number of block.

Valid Range: 1 to number of blocks

Default Value: 1

Number Of Points Returns the number of points per function in the selected block.

Number Of Functions Returns the number of functions in the selected block.

Trigger Index Returns the trigger index.

First Point Time Returns the first point time relative to trigger.

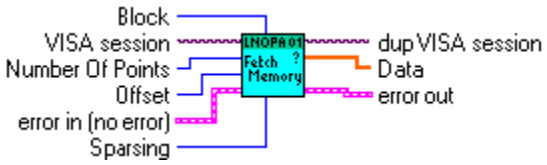
Record Duration Returns the record duration.

Relative Trigger Time Returns the trigger time relative to timer reset time.

Average Time Between Points Returns the average time between two points.

LNOPA01 Fetch Memory

This function reads the data from memory.



Block This control specifies the number of block should be read.

Valid Range: 1 to number of blocks

Default Value: 1

I32 **Number Of Points** This control specifies the number of sparsed averaging intervals/samples. It means the number of points for each function stored into memory.

Valid Range:
1 to number of points

Default Value:
1

Note

This number determines the number of points will be returned for each function. It doesn't mean the total returned number of points. Example: Three functions are stored into memory (Voltage, current and power on phase 1). The Number Of Points 1000 means, that 1000 point for each function will be returned. Altogether, it will be 3000 points.

I32 **Offset** This control specifies the offset in memory. The data from memory will be read from this offset.

Note

Example: There are 1000 points stored into memory. Offset is set to 50. The first returned points has index 50 in the memory.

I32 **Sparsing** This control specifies the sparsing.

Valid Values:
1 to number of points

Default Value:
1

Note

The sparsing is the step between the returned points. Example: There are 1000 points per function stored into memory. Offset is set to 0 and sparsing to 10. The returned points have the indexes 0, 10, 20 ... in the memory.

DBL **Data** Returns the data from instrument memory.

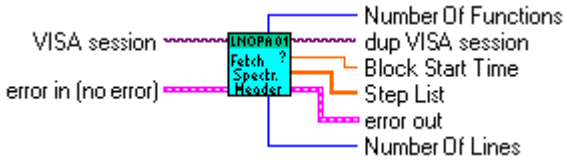
Note

The data are grouped by intervals/lines. It means, that the data are stored in the array in order F1(t1),F2(t1)... Fn(t1),F1(t2),F2(t2)...Fn(t2), ... , F1(tn),F2(tn) ... Fn(tn) Example: There are Voltage, Current and Power on phase 1 stored in the memory. The data are returned in order U1(t1),I1(t1),P1(t1),U1(t2),I1(t2),P1(t2) ....

DBL **Numeric**

LNOPA01 Fetch Spectrum Data Header

This function reads the spectrum preamble.



Block Start Time Returns the seconds relative to timer reset time (call LNOPA01 Query Timer Reset Time.vi to get timer reset time).

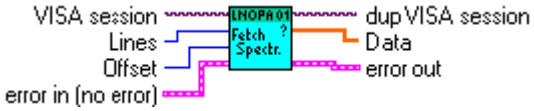
Number Of Lines Returns the number of points (spectrum lines) per function.

Number Of Functions Returns the number of functions configured for spectrum calculation.

Step List Returns the list of frequency steps (FFT) or fundamental frequencies(DFT).

LNOPA01 Fetch Spectrum

This function reads the spectrum data.



Lines This control specifies the number of lines should be read.

Valid Range:
0 to number of lines

Default value:
1

Note

If this parameter is set to 0, all lines are read.

Offset This control specifies the start line, should be return.

Valid Range:
0 to number of lines

Default Value:
0

Note

(1) If the lines + offset exceeds the highest line, the error "-222, Data out of range" is generated.

(2) If this function is sent during harmonic measurement or if no harmonics measurement has been performed the error "-230, Data corrupt or state" is generated.

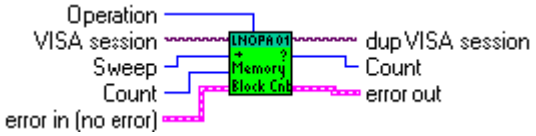
Data Returns the spectrum data.

Note

The data are grouped by lines. It means, that the data are stored in the array in order F1(t1),F2(t1)... Fn(t1),F1(t2),F2(t2)...Fn(t2), ... , F1(tn),F2(tn) ... Fn(tn) Example: There are functions Voltage, Current and Power on phase 1 configured for spectrum calculation. The data are returned in order U1(t1),I1(t1),P1(t1),U1(t2),I1(t2),P1(t2) ....

LNOPA01 Actual Memory Block Count

This function returns the number of blocks acquired in memory.



I32 **Number Of Blocks** Returns the number of blocks in the memory.

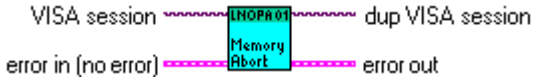
LNOPA01 Free Memory

This function returns the free bytes in memory.

I32 **Free Memory Bytes** Returns the free memory bytes.

LNOPA01 Memory Abort

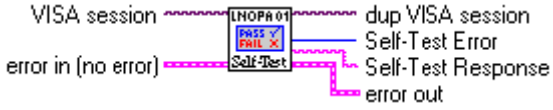
This function aborts the memory recording and resets the operation bits.



Utility

LNOPA01 Self-Test

This VI causes the instrument to perform a self-test and returns the results.

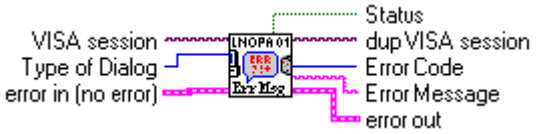


abc **Self-Test Response** Returns the string returned from the self test. See the device's operation manual for an explanation of the string's contents.

U32 **Self-Test Error** This control contains the value returned from the instrument self test. Zero means success. For any other code, see the device's operator's manual.

LNOPA01 Error Message

This VI contains all the instrument specific error codes and descriptions. Use this VI after executing several instrument driver VIs to recognize and display any errors that may have occurred. This VI takes the Status Code returned by the instrument driver functions, interprets it and returns it as a user readable string.



I32 **Type of Dialog** This selects the style of dialog box to display when an error occurs.

Valid Range:
0 − No Dialog (Default)
1 − A Dialog With an OK Button
2 − A Dialog With a Continue and Stop Button.

abc **Error Message** Returns the interpreted Error Code as a user readable message string.

Default:
empty

TF **Status** Indicates the occurrence of an error.

Valid Range:
F − No error (default)
T − An error has occurred.

I32 **Error Code** Displays the error code associated with an error.

Valid Range:
Dependent on instrument

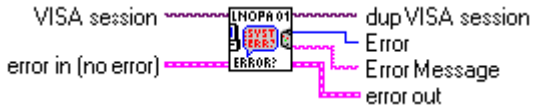
Default:
0

LNOPA01 Reset

This VI resets the instrument to a known state and sends initialization commands to the instrument that set programmatic variables to the state necessary for the operation of the instrument driver.

LNOPA01 Error Query

This VI reads an error code from the instrument's error queue.

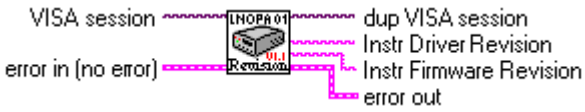


abc **Error Message** Returns the error message string read from the instrument's error message queue.

I32 **Error** Indicates the error number of the returned error.

LNOPA01 Revision Query

This VI queries the current instrument firmware revision and instrument driver revision.

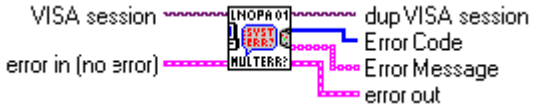


Instr Firmware Revision This indicates the revision of the instrument's firmware. The instrument manufacturer controls this version and its capabilities.

Instr Driver Revision This indicates the revision of this instrument driver's software.

LNOPA01 Error Query (Multiple)

This VI reads the error queue from the instrument. It expects to see errors in SCPI format (#,"error message"). It continues to read from the error queue until it reads a 0, "No error".



Error Code Returns the array of error numbers that were stored in the instrument's error queue.

Error Message Returns the array of the errors from the instrument's error queue.

LNOPA01 Instrument Options

This VI returns a list of instrument options.

Options Implemented options.

LNOPA01 Clear Status

This VI clears the instrument status. It means, the STB and ESR registers, all events registers and error queue will be cleared.

LNOPA01 Get Instrument Configuration

This VI reads the configuration string from instrument. It returns the sequence of commands, should be sent into instrument to set current configuration.

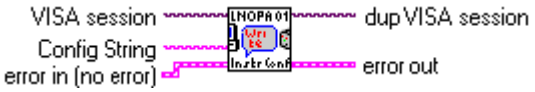
Note

Use LNOPA01 Write Instrument Configuration.vi to send the sequence to the instrument.

Config String Returns the configuration commands. This string can be send to the instrument later to set the same configuration.

LNOPA01 Write Instrument Configuration

This VI sends the configuration string from instrument. The configuration string is the sequence of commands, should be sent into instrument to set current configuration. Call LNOPA01 Get Instrument Configuration.vi to get the configuration string from the instrument.



Config String This control contains the configuration commands.

Note

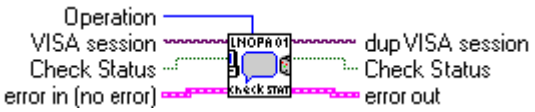
Call LNOPA01 Get Instrument Configuration.vi to get the configuration string from the instrument.

LNOPA01 Check Status

This VI enables/disables status checking. When enabled, instrument status (ESR register) is checked for errors upon completion of each VI. The status information is cleared from ESR register. Read the instrument's error queue using Error Query.vi to see more detailed error information.

Note

Disable the status checking to increase the performance.



Check Status This control sets the status checking.

Valid Range:
False − Off (Default Value)
True − On

Operation This control specifies whether this VI either sets or gets the setting(s) on the instrument. When in the set mode use the VI LNOPA01 Check State.vi to determine if the settings were adopted by the instrument successfully. Alternatively, you can use the LNOPA01 Error Query.vi, which provides more elaborate error reports.

Valid Range:
0 − Set (Default Value)
1 − Get

Check Status Returns the status checking state.