CONEX-CC

Single-Axis DC Motion with Controller/Driver

LabVIEW Drivers

V2.0.x

Newport®
Experience | Solutions

For Motion, Think Newport™

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Preface

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First printing 2010.

CONEX-CC
LabVIEW Drivers

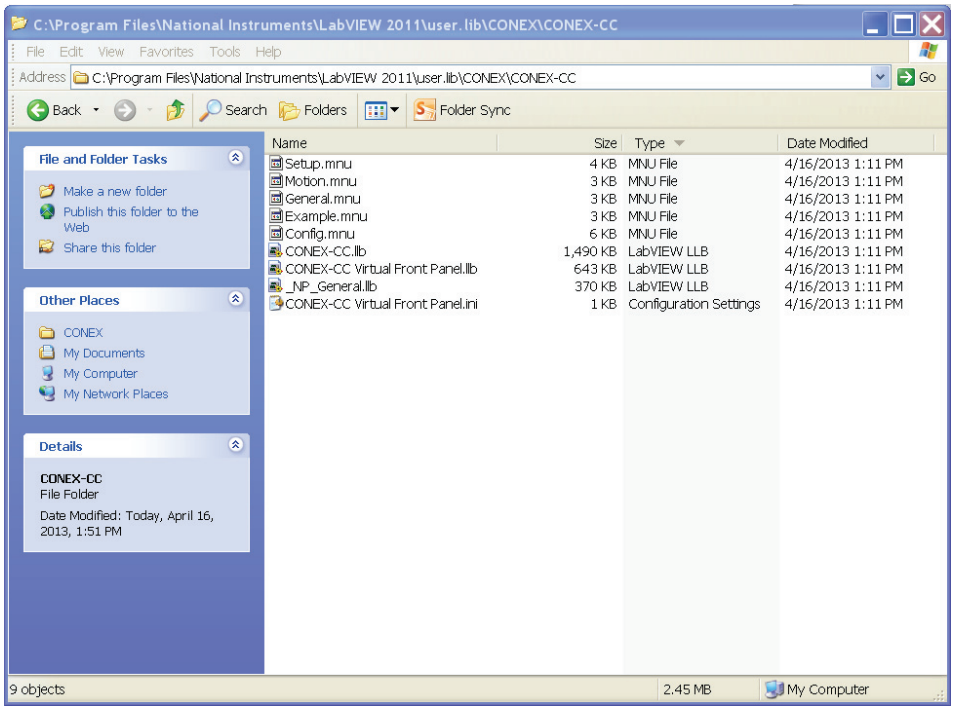
1.0 CONEX-CC LabVIEW Drivers

The CONEX-CC LabVIEW drivers have been developed under LABVIEW 2010

NOTE

You must use at least the 2010 of LabVIEW.

Copy the directory CONEX-CC Controller_Drivers under the directory **user.lib** (\CONEX\CONEX-CC) of LabVIEW 20xx.



This directory contains documented VIs, menu to access the different VIs and controls defined to use the CONEX-CC, and the different menus where the VIs will be in LabVIEW:

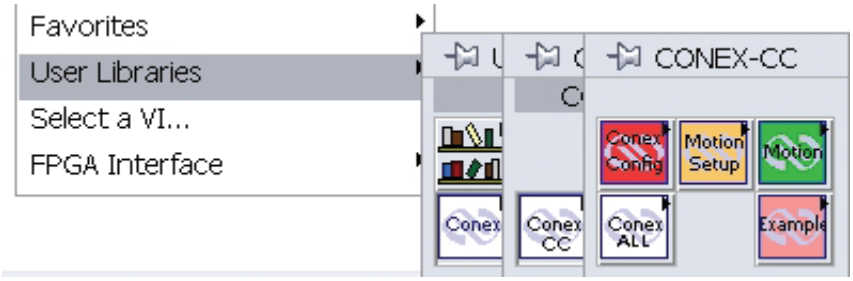
Config: VIs to change configuration parameters (those used for setup after reset or end of configuration mode).

Conex-ALL: VIs to change configuration that all CONEX devices have and general communication Vis.

Mot. Setup: VIs to change working parameters (those lost when switching off the controller).

Motion: VIs to move or stop the positioner.
Example: CONEX-CC Virtual Front panel VIs.

You select both **CONEX** menu and CONEX-CC Controller-Drivers sub-menu from User Libraries:



When you activate the Help window, you will see the description of each of the VIs.

Click on a menu then select a VI. Place it and connect it.

You must use the connection VIs to setup connection. The Connect CONEX-CC device.vi will find the CONEX on the USB ports and setup connection for you, so that you can just connect it to the first subvi. These VIs are in the CONEX-ALL (General) menu.

Communication settings:

COM port – (Use the samples to find it or look under Device Manager)

Baud Rate – 921600 (USB serial speed)

In each VI, there is a Communication Cluster that contains the following elements:

VISA resource name in: VISA resource name is passed to low level VI's

Device name in: Readable description of device

Controller address in: Channel number

Note on Controller Address:
(Important for other devices with multiple RS485 connections, used to match command syntax of these similar RS485 instruments, however, for USB connection only one channel is addressed per USB cable, so all addresses can be set to 1, regardless of number of connected devices.)

error in: The **error in** cluster can accept error information wired from VIs previously called. Use this information to decide if any functionality should be bypassed in the event of errors from other VIs.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

status: The **code** input identifies the error or warning.

The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

code: The code input identifies the error or warning.

The pop-up option Explain Error (or Explain Warning) gives more information about the error displayed.

source: The **source** string describes the origin of the error or warning.

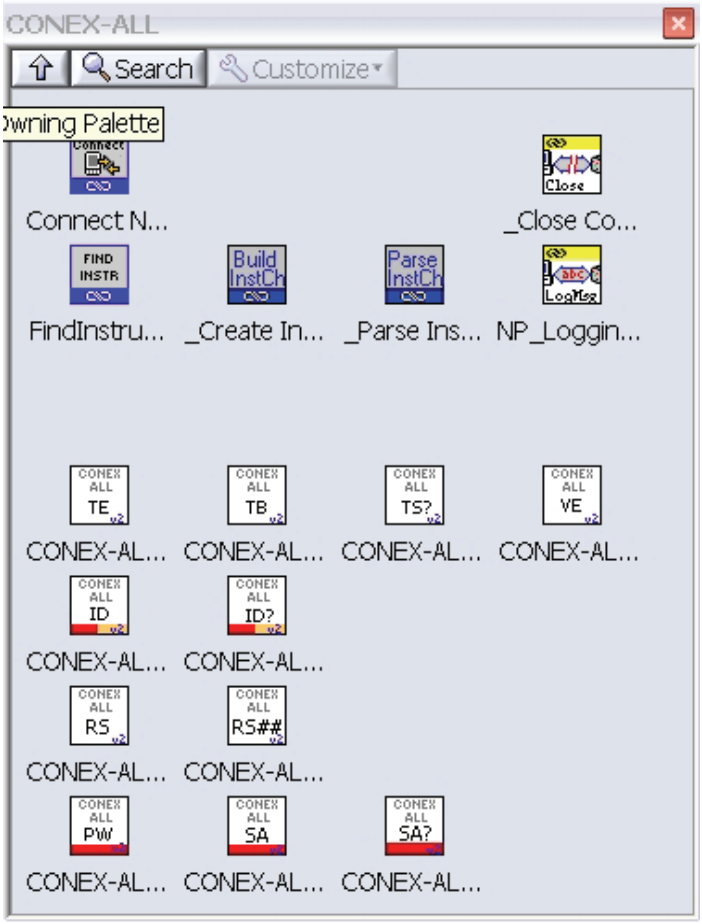
The pop-up option **Explain Error** (or Explain Warning) gives more information about the error displayed.

2.0 VI's Libraries

2.1 CONEX-ALL General Menu – Communication VI's

The Communication VISs at the top are low-level sub-VIs that talk to the device for you. The lower VIs with white background are configuration Vis common to all the CONEX family of devices.

The "Connect Newport Instrument.vi" will setup a connection and build a Connection Cluster that is all you need to pass to the other CONEX-CC specific function sub-VIs.

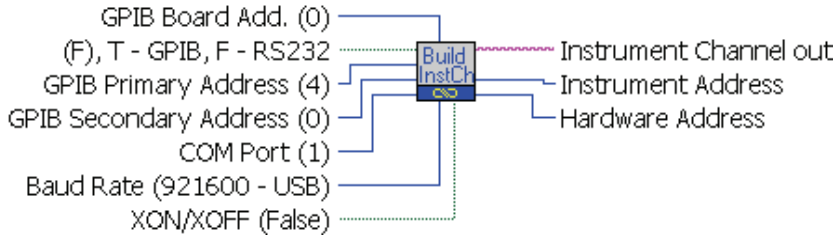


2.1.1 _Create Instrument Channel.vi

Builds the instrument channel handle (string) for an instrument connected over GPIB or RS-232. The default output String for a USB is RS-232 at a Baud Rate of 921600.

This string should be passed in and out of the library VIs to control the specified insrument. Different handles should be used for controlling multiple instruments.

This will also initialize the RS-232 port to the speed specified; which must be done manually if not using this VI.



(F), T - GPIB, F - RS232

GPIB Primary Address (4)

COM Port (1)

GPIB Secondary Address (0)

GPIB Board Add. (0)

Baud Rate (921600 - USB)

XON/XOFF (False)

Instrument Channel out

Instrument Address

Hardware Address

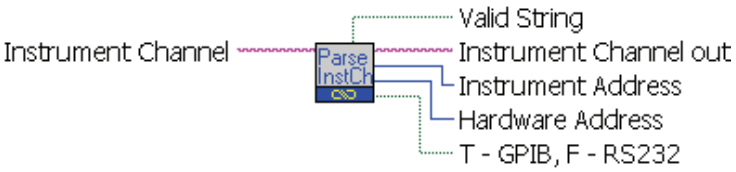
2.1.2 _Close Communications.vi

error in (no error)

Instrument Channel

Instrument Channel

2.1.3 _Parse Instrument Channel.vi



Instrument Channel in

Instrument Channel out

Instrument Address

Hardware Address

T - GPIB, F - RS232

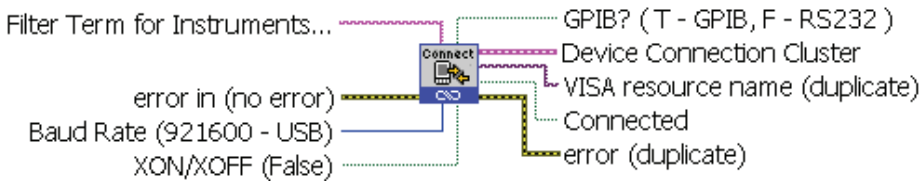
Valid String

2.1.4 Connect Newport Instrument.vi

Connect Newport Device

Get list of instrument, filter (if set) and allow for selection of device to talk to.

This is generic selection of the instrument to connected to, so look in system settings or on device to verify it is the correct port.



Instrument Filter Term for Instruments ("" - none)
String used to verify expected device is found.

error in (no error)

Baud Rate (921600 - USB)

XON/XOFF (False)

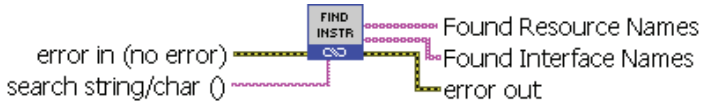
Connected
Connected = true when connection is successful

VISA resource name (duplicate)

error (duplicate)

GPIB? (T - GPIB, F - RS232)

2.1.5 FindInstrument.vi



search string/char ()

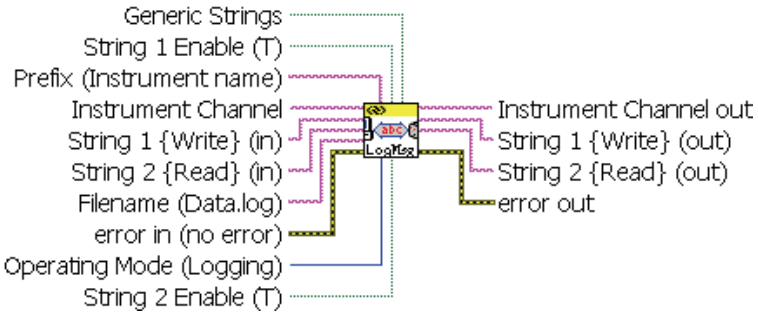
error in (no error)

error out

Found Resource Names

Found Interface Names

2.1.6 NP_Logging.vi



error in (no error)

Operating Mode (Logging)

String 1 {Write} (in)

String 2 {Read} (in)

Filename (Data.log)

Generic Strings

String 1 Enable (T)

String 2 Enable (T)

Prefix (Instrument name)

Instrument Channel

error out

String 2 {Read} (out)

String 1 {Write} (out)

Instrument Channel out

2.2 CONEX-ALL Enter-Leave CONFIGURATION State v2.vi

Go to CONFIGURATION State
Configuration State?
T - In Configuration State

2.3 CONEX-ALL Get Command Error String v2.vi

Error code
Error Code

Error description
Description of input error code.

2.4 CONEX-ALL Get Controller Version v2.vi

Expected Device (CONEX-CC)

Response
Full Response

Controller Version
Controller Version information

IsExpectedDevice?
Is CONEX - CC?

2.5 CONEX-ALL Get Controller's address v2.vi

Controller's address
Controllers address

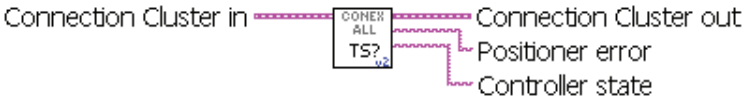
2.6 CONEX-ALL Get Identifier v2.vi

Identifier
Identification of attached hardware.

2.7 CONEX-ALL Get Last Command Error v2.vi

Error code
Last Command Error

2.8 CONEX-ALL Get Positioner Error And Controller State v2.vi



Positioner error
Positioner Error

Controller state
Controller State

2.9 CONEX-ALL Reset Controller v2.vi

Resets CONEX-CC

2.10 CONEX-ALL Reset Controller's Address To 1 v2.vi

2.11 CONEX-ALL Set Controller's address v2.vi

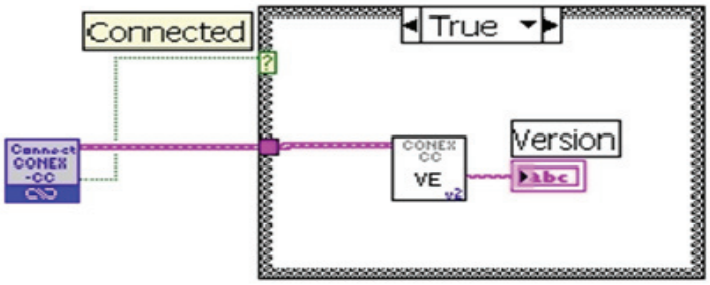
Controller's address
Controller's RS-485 address

2.12 CONEX-ALL Set Identifier v2.vi

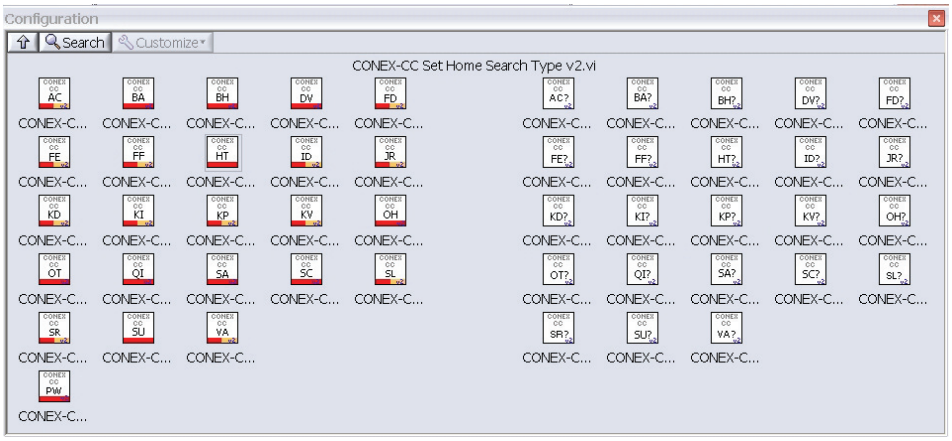
Stage Identifier
Stage Identifier

2.13 Examples

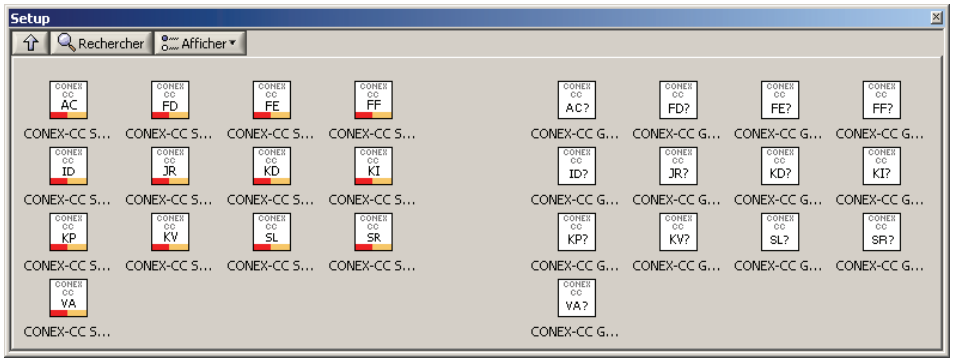
CONEX-Sample.vi shows how easy it is to find, connect and get version:



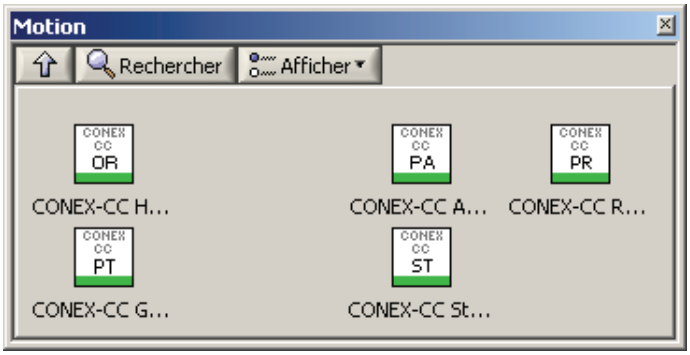
2.14 CONEX Configuration



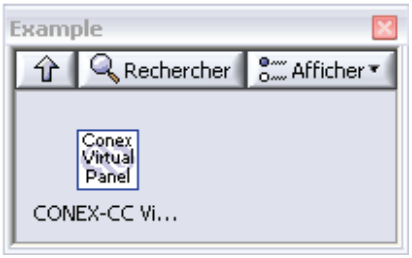
2.15 Motion Setup

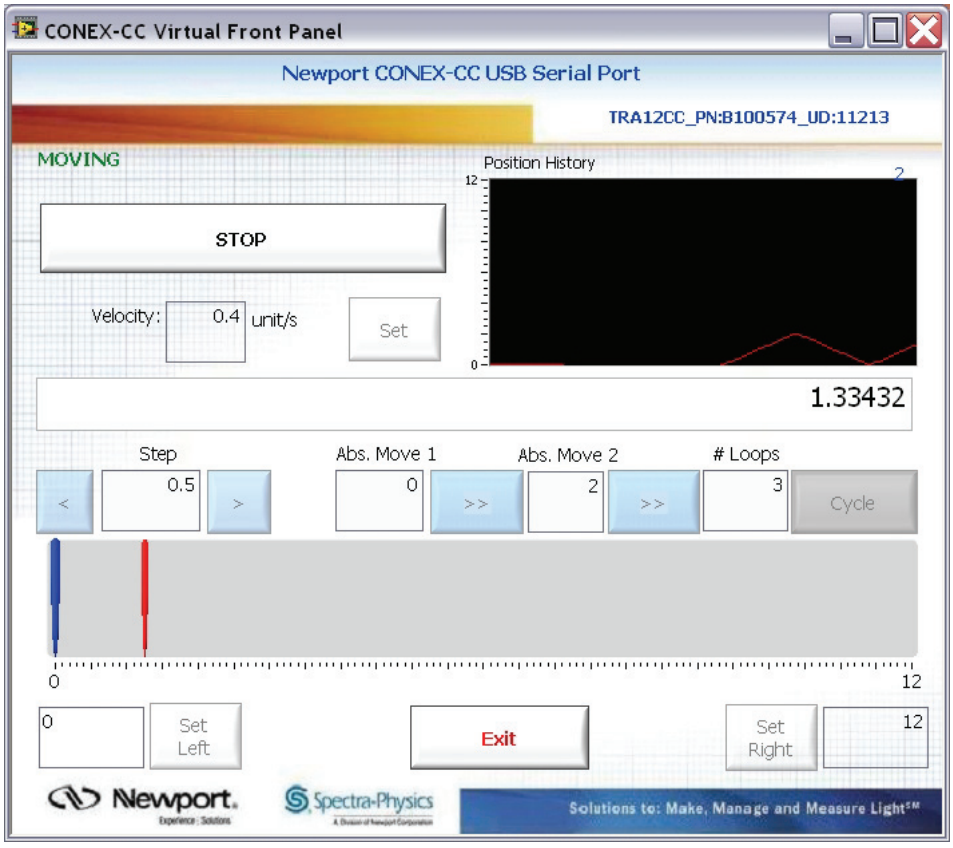


2.16 Motion



2.17 Example





3.0 VI'S Description

3.1 CONEX-CC Absolute Move v2.vi

Set Absolute Position Move to start.

Target position
Absolute Position target

3.2 CONEX-CC Configure Simultaneous Started Move v2.vi

Set Simultaneous Started Move.

Target position
Simultaneous Move Position target

3.3 CONEX-CC Enter-Leave CONFIGURATION State v2.vi

Set Configuration State to Enabled or Disabled.

T - Enabled - Enter Configuration state.

F - Leave Configuration state.

Go to CONFIGURATION State
Configuration State?
T - In Configuration State

3.4 CONEX-CC Enter-Leave DISABLE State v2.vi

Enable Ready State or Disabled State

Generally used after connecting to allow for moves to start, as device starts in Disabled state.

Ready? (false=DISABLE true=READY)
Ready? flag
true - Ready to move
false – Disabled

3.5 CONEX-CC Execute Simultaneous Started Move v2.vi

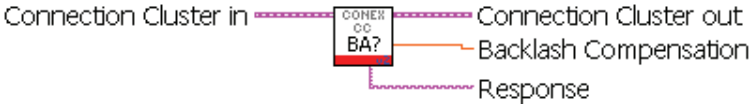
SE - Execute simultaneous started move

3.6 CONEX-CC Get Acceleration v2.vi

AC? - Get acceleration

Acceleration
Acceleration value

3.7 CONEX-CC Get Backlash Compensation v2.vi



BA? - Get backlash compensation

Response
Full Backlash Compensation Response string

Backlash Compensation
Backlash Compensation

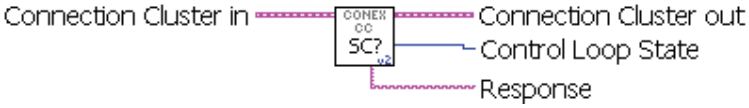
3.8 CONEX-CC Get Command Error String v2.vi

Get description of error from error code.

Error code
Error Code

Error description
Description of input error code.

3.9 CONEX-CC Get Control Loop State v2.vi

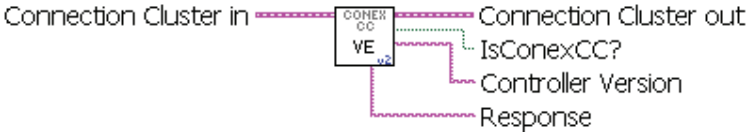


SC? - Get control loop state

Response
Contol Loop State full Response

Control Loop State
Contol Loop State

3.10 CONEX-CC Get Controller Version v2.vi



VE - Get controller revision information

Controller Version
Controller Version information

IsConexCC?
Is CONEX - CC?

3.11 CONEX-CC Get Controller's RS485 address v2.vi

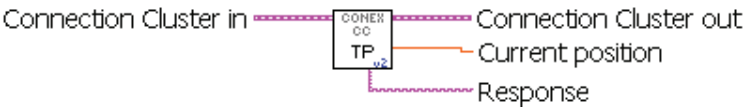
SA? - Set controller's RS-485 address

3.12 CONEX-CC Get Current Configuration Parameters v2.vi

ZT - Get current configuration parameters

abc **Configuration parameters**
Configuration parameters for device

3.13 CONEX-CC Get Current Position v2.vi



TP? - Get Current Position

abc **Response**
Current Position Response

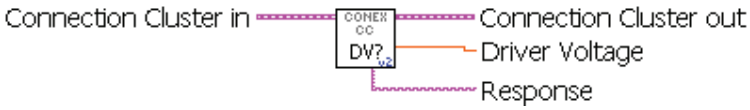
DBL **Current position**
Current Position

3.14 CONEX-CC Get Derivative Gain v2.vi

KD? - Get derivative gain

DBL **Derivative Gain**
Derivative Gain

3.15 CONEX-CC Get Driver Voltage v2.vi

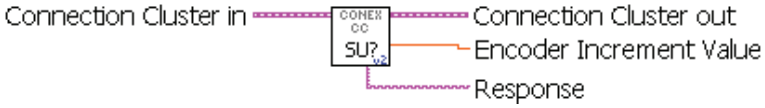


DV? - Get driver voltage

Response
Driver Voltage

Driver Voltage
Driver Voltage

3.16 CONEX-CC Get Encoder Increment Value v2.vi

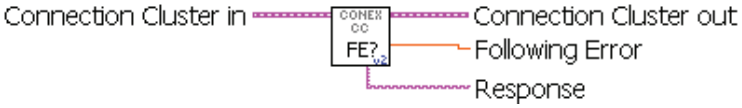


SU? - Get encoder increment value

Response
Encoder Increment Value Response

Encoder Increment Value
Encoder Increment Value

3.17 CONEX-CC Get Following Error Limit v2.vi

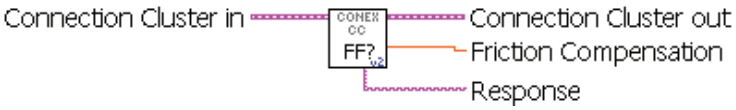


FE? - Get following error limit

Response
Following Error Response

Following Error
Following Error

3.18 CONEX-CC Get Friction Compensation v2.vi



FF? - Get friction compensation

Response
Friction Compensation Response

Friction Compensation
Friction Compensation

3.19 CONEX-CC Get Home Search Time-out v2.vi

OT? - Get HOME search time-out

Response
Home Search Time-out Response

Home Search Time-out
Home Search Time-out

3.20 CONEX-CC Get Home Search Type v2.vi

HT? - Get HOME search type

Response
HOME search type Response

Home Search Type
HOME search type

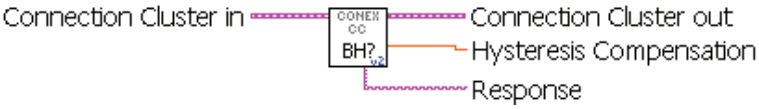
3.21 CONEX-CC Get Home Search Velocity v2.vi

OH? - Get HOME search velocity

Response
HOME search velocity Response

Home Search Velocity
HOME search velocity

3.22 CONEX-CC Get Hysteresis Compensation v2.vi



BH? - Get hysteresis compensation

Response
Hysteresis compensation Response

Hysteresis Compensation
Hysteresis compensation

3.23 CONEX-CC Get Integral Gain v2.vi

KI? - Get integral gain

Integral Gain
Integral gain

3.24 CONEX-CC Get Jerk Time v2.vi

JR? - Get jerk time

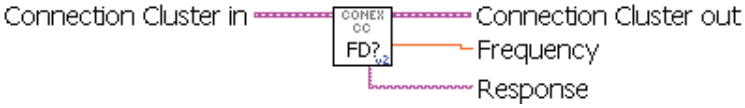
Jerk Time
Jerk Time

3.25 CONEX-CC Get Last Command Error v2.vi

TE? - Get Error

Error code
Last Command Error

3.26 CONEX-CC Get Low Pass Filter for Kd v2.vi

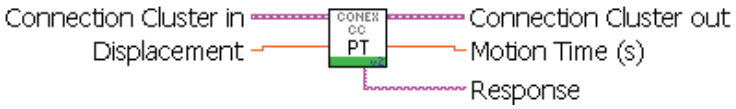


FD? - Get low pass filter cut off frequency for Kd

Response
Low pass filter cut off frequency for Kd Response

Frequency
Low pass filter cut off frequency for Kd

3.27 CONEX-CC Get Motion Time for a Relative Move v2.vi



PT - Get motion time for a relative move

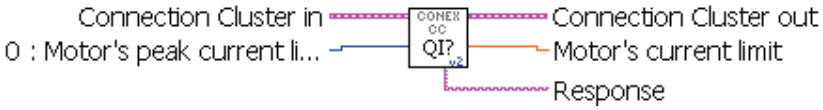
Input size of move to make, and it will output time for move.

Displacement
Displacement to find time to achieve

Response
Motion time for a relative move Response

Motion Time (s)
Motion time for a relative move

3.28 CONEX-CC Get Motor's Current Limits v2.vi



QIx? - Get motor's current limits

Motor peak current selection of limit to query:

0: Motor's peak current limit (default)

1: Motor's rms current limit

2: Motor's rms current averaging time

Motor Query Type (0 - Peak Current)

Response
Motor's current limits Response

Motor's current limit
Motor's current limits

3.29 CONEX-CC Get Negative Software Limit v2.vi

Get Negative Software Limit

Motor Query Type (0 - Peak Current) Left limit
Negative Software Limit

3.30 CONEX-CC Get Positioner Error And Controller State v2.vi

TS? - Get Positioner Error and Controller State

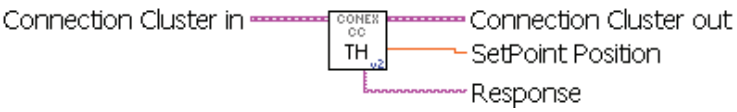
3.31 CONEX-CC Get Positive Software Limit v2.vi

SR? - Get Positive Software Limit

3.32 CONEX-CC Get Proportional Gain v2.vi

KP? - Get proportional gain

3.33 CONEX-CC Get SetPoint Position v2.vi

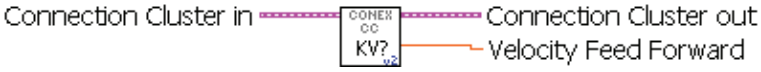


TH? - Get set-point position

3.34 CONEX-CC Get Stage Identifier v2.vi

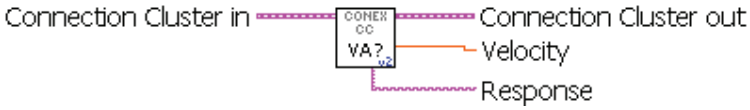
ID? - Get Stage Identifier

3.35 CONEX-CC Get Velocity Feed Forward v2.vi



KV? - Get velocity feed forward

3.36 CONEX-CC Get Velocity v2.vi

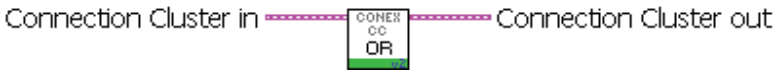


VA? - Get Velocity

Response
Velocity Response

Velocity
Velocity

3.37 CONEX-CC Home search v2.vi



Home stage

3.38 CONEX-CC Relative Move v2.vi

PR - Relative Move

Relative displacement
Relative Move Displacement

3.39 CONEX-CC Reset Controller v2.vi

RS - Reset controller

3.40 CONEX-CC Reset Controller's Address To 1 v2.vi

RS## - Reset controller's address to 1

3.41 CONEX-CC Set Acceleration v2.vi

AC - Set acceleration

Acceleration
Acceleration

3.42 CONEX-CC Set Backlash Compensation v2.vi

BA - Set backlash compensation

DBL **Backlash**
Backlash compensation

3.43 CONEX-CC Set Control Loop State v2.vi

SC - Set control loop state

I32 **Control Loop State**
Control loop state

3.44 CONEX-CC Set Controller's RS-485 address v2.vi

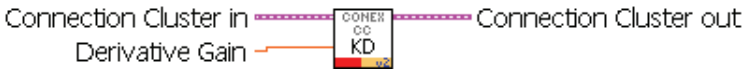
SA - Set controller's RS-485 address

NOTE

For CONEX over USB the RS-485 Address will always be 1, this command will not change the address. Each USB bus (cable) only talks to the attached device, not to any other device. Therefore, having the option of changing the address is not needed.

I32 **Controller's address**
Controller's RS-485 address

3.45 CONEX-CC Set Derivative Gain v2.vi



KD - Set derivative gain

DBL **Derivative Gain**
Derivative gain

3.46 CONEX-CC Set Driver Voltage v2.vi

DV - Set driver voltage

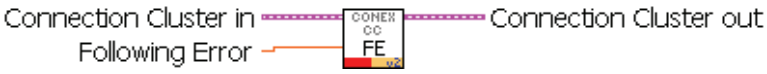
DBL **Driver Voltage**
Driver voltage

3.47 CONEX-CC Set Encoder Increment Value v2.vi

SU - Set encoder increment value

DBL **Encoder increment value**
Encoder increment value

3.48 CONEX-CC Set Following Error Limit v2.vi



FE - Set following error limit

DBL **Following Error**
Following error limit

3.49 CONEX-CC Set Friction Compensation v2.vi

FF - Set friction compensation

DBL **Friction Compensation**
Friction compensation

3.50 CONEX-CC Set Home Search Time-out v2.vi

OT - Set Home Search Time-out

DBL **Home Search Time-out**
Home Search Time-out

3.51 CONEX-CC Set Home Search Type v2.vi

HT - Set HOME search type

DBL **Home Search Type**
HOME search type

3.52 CONEX-CC Set Home Search Velocity v2.vi

OH - Set HOME search velocity

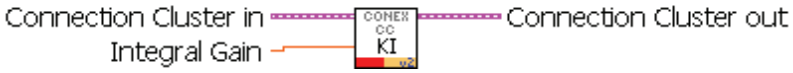
DBL **Home Search Velocity**
HOME search velocity

3.53 CONEX-CC Set Hysteresis Compensation v2.vi

BH - Set hysteresis compensation

DBL **Hysteresis**
Hysteresis

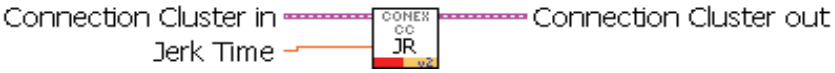
3.54 CONEX-CC Set Integral Gain v2.vi



KI - Set integral gain

DBL **Integral Gain**
Integral Gain

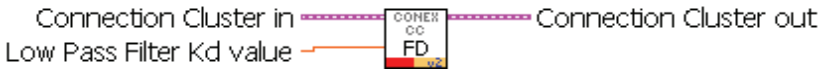
3.55 CONEX-CC Set Jerk Time v2.vi



JR - Set jerk time

DBL **Jerk Time**
Jerk Time

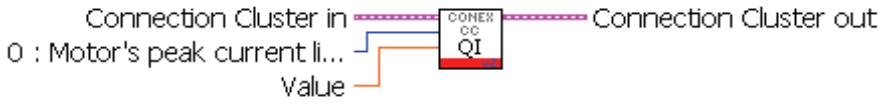
3.56 CONEX-CC Set Low Pass Filter for Kd v2.vi



FD - Set Low Pass Filter for Kd

DBL **Low Pass Filter Kd value**
Low Pass Filter Kd value

3.57 CONEX-CC Set Motor's Current Limits v2.vi



QIx - Set motor's current limits

Motor Limit Types:

0: Motor's peak current limit (default)

1: Motor's rms current limit

2: Motor's rms current averaging time

The Type of limit must be selected and the value to set.

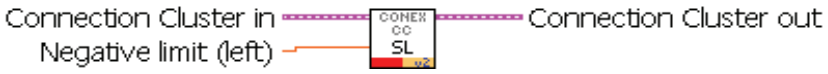
NOTE

Right click on the Type and selecting {Create Constant} will create an easy selection for the type.

Value
New Motor's Limit for Type selected

Motor's Limit Type Select (0 - Peak current)
Motor Limit Type select

3.58 CONEX-CC Set Negative Software Limit v2.vi



Set Negative Limit of travel

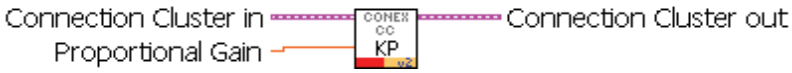
Negative limit (left)

3.59 CONEX-CC Set Positive Software Limit v2.vi

SR - Set Positive limit (right)

Positive limit (right)
Positive limit (right)

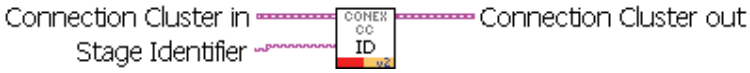
3.60 CONEX-CC Set Proportional Gain v2.vi



KP - Set proportional gain

DBL **Proportional Gain**
Proportional Gain

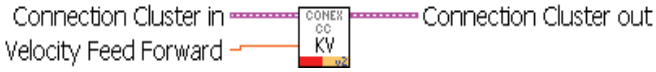
3.61 CONEX-CC Set Stage Identifier v2.vi



ID - Set Stage Identifier

abc **Stage Identifier**
Stage Identifier

3.62 CONEX-CC Set Velocity Feed Forward v2.vi



KV - Set velocity feed forward

DBL **Velocity Feed Forward**
Velocity Feed Forward

3.63 CONEX-CC Set Velocity v2.vi

VA - Set Velocity

DBL **Velocity**
Velocity

3.64 CONEX-CC Stop Motion v2.vi

ST - Stop Motion

Service Form

Your Local Representative

Tel.: _____

Fax: _____

Name: _____

Company: _____

Address: _____

Country: _____

P.O. Number: _____

Item(s) Being Returned: _____

Model#: _____

Return authorization #: _____
(Please obtain prior to return of item)

Date: _____

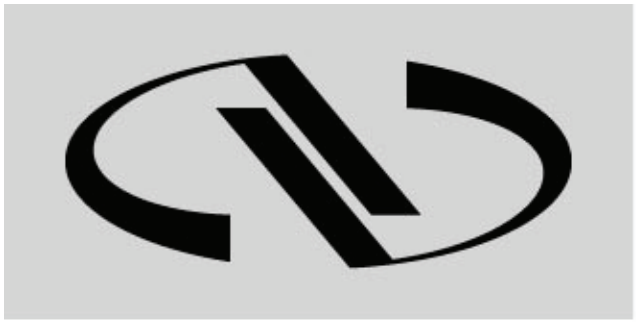
Phone Number: _____

Fax Number: _____

Serial #: _____

Description: _____

Reasons of return of goods (please list any specific problems): _____



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