EASY-DRIVER LabVIEW Instrument Driver User's Manual

# Overview

EASY-DRIVER LabVIEW Instrument Driver is a set of VI’s, developed for LabVIEW 2013 and later releases

(LabVIEW™ is a Trademark of National Instruments Corp.), that allows to configure and monitor the majority of the parameters of remotely controlled CAEN ELS's EASY-DRIVER Power Supply module.

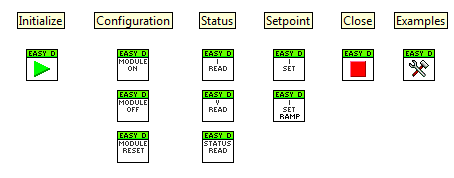
## System requirements and installation setup

Please follow the installation instructions in order to correctly install the EASY-DRIVER LabVIEW Instrument Driver into your environment:

* copy the " CAENels EASY-DRIVER " folder into your current LabView release path - e.g. for LabVIEW 2010 "...\National Instruments\LabVIEW 2010\instr.lib",
* run LabVIEW,
* the EASY-DRIVER LabVIEW Instrument Driver should appear on you "Instrument I/O" -> "Instr Drivers" palette.

# Function Classification

EASY-DRIVER LabVIEW Instrument Driver VIs are divided into 5 groups:



**Connection Initialization VIs:**

* CAENels EASY-DRIVER.lvlib:ED\_Initialize.vi

**Configuration VIs:**

* CAENels EASY-DRIVER.lvlib:ED\_MOFF.vi
* CAENels EASY-DRIVER.lvlib: ED\_MON.vi
* CAENels EASY-DRIVER.lvlib: ED\_MRESET.vi

**Status VIs:**

* CAENels EASY-DRIVER.lvlib: ED\_MRI.vi
* CAENels EASY-DRIVER.lvlib: ED\_MRV.vi
* CAENels EASY-DRIVER.lvlib: ED\_MST.vi

**Setpoint VIs:**

* CAENels EASY-DRIVER.lvlib: ED\_MWI.vi
* CAENels EASY-DRIVER.lvlib: ED\_MRM.vi

**Connection Close VIs:**

* CAENels EASY-DRIVER.lvlib: ED\_Close.vi

**Example VIs:**

* CAENels EASY-DRIVER.lvlib:EASY-DRIVER Example .vi

## Data Types

 Cluster (error codes)

 Connection ID

 String

 32 bit, integer numeric

 Double-precision, floating-point numeric

# Function Description

The present sections describe in detail the EASY-DRIVER LabVIEW Instrument Driver; more details about parameters description and ranges can be found in the EASY-DRIVER User’s Manual, as well as the required hardware configuration.

## Initalize VIs

### CAENels EASY-DRIVER.lvlib:ED\_Initialize.vi

Initializes the connection with the EASY-DRIVER module at the specified IP address.

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**Controls and indicators**

** IP address** is the address with which you want to establish a connection. This address can be in IP dot notation or it can be a hostname.

** error in (no error)** describes error conditions that occur before this node runs. This input provides **standard error in** functionality:

** status** is TRUE (X) if an error occurred before this node ran or FALSE (checkmark) to indicate a warning or that no error occurred before this node ran. The default is FALSE.

** code** is the error or warning code. The default is 0. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning. The default is an empty string.

** connection ID** is a network connection refnum that uniquely identifies the TCP connection. Use this value to refer to this connection in subsequent VI calls.

** error out** contains error information. This output provides standard error out functionality:

** status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

** code** is the error or warning code. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning.

## Configuration VIs

### CAENels EASY-DRIVER.lvlib:ED\_MOFF.vi

MOFF block turns off the EASY-DRIVER output driver, thus disabling the output terminals.

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**Controls and indicators**

** connection ID** is a network connection refnum that uniquely identifies the TCP connection.

** error in (no error)** describes error conditions that occur before this node runs. This input provides **standard error in** functionality:

** status** is TRUE (X) if an error occurred before this node ran or FALSE (checkmark) to indicate a warning or that no error occurred before this node ran. The default is FALSE.

** code** is the error or warning code. The default is 0. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning. The default is an empty string.

** connection ID out** returns the same value as **connection ID**.

** error out** contains error information. This output provides standard error out functionality:

** status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

** code** is the error or warning code. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning.

### CAENels EASY-DRIVER.lvlib: ED\_MON.vi

The MON (Module ON) command turns ON the EASY-DRIVER output driver, thus enabling the output terminals and allowing the power supply to regulate and feed current to the connected load.

After the reception of a "MON" command, the power supply automatically sets output current to 0A.

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**Controls and indicators**

** connection ID** is a network connection refnum that uniquely identifies the TCP connection.

** error in (no error)** describes error conditions that occur before this node runs. This input provides **standard error in** functionality:

** status** is TRUE (X) if an error occurred before this node ran or FALSE (checkmark) to indicate a warning or that no error occurred before this node ran. The default is FALSE.

** code** is the error or warning code. The default is 0. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning. The default is an empty string.

** connection ID out** returns the same value as **connection ID**.

** error out** contains error information. This output provides standard error out functionality:

** status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

** code** is the error or warning code. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning.

### CAENels EASY-DRIVER.lvlib: ED\_MRESET.vi

The MRESET block is used to perform a complete reset of the EASY-DRIVER module status register. This is needed, for example, to enable the channel output again after a fault condition has been fixed.

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**Controls and indicators**

** connection ID** is a network connection refnum that uniquely identifies the TCP connection.

** error in (no error)** describes error conditions that occur before this node runs. This input provides **standard error in** functionality:

** status** is TRUE (X) if an error occurred before this node ran or FALSE (checkmark) to indicate a warning or that no error occurred before this node ran. The default is FALSE.

** code** is the error or warning code. The default is 0. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning. The default is an empty string.

** connection ID out** returns the same value as **connection ID**.

** error out** contains error information. This output provides standard error out functionality:

** status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

** code** is the error or warning code. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning.

## Status VIs

### CAENels EASY-DRIVER.lvlib:ED\_MRI.vi

The MRI block returns the readback value of the power supply actual output current.

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**Controls and indicators**

** connection ID** is a network connection refnum that uniquely identifies the TCP connection.

** error in (no error)** describes error conditions that occur before this node runs. This input provides **standard error in** functionality:

** status** is TRUE (X) if an error occurred before this node ran or FALSE (checkmark) to indicate a warning or that no error occurred before this node ran. The default is FALSE.

** code** is the error or warning code. The default is 0. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning. The default is an empty string.

** connection ID out** returns the same value as **connection ID**.

**** **current** is readback value of the power supply actual output current.

** error out** contains error information. This output provides standard error out functionality:

** status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

** code** is the error or warning code. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning.

### CAENels EASY-DRIVER.lvlib: ED\_MRV.vi

The MRV block returns the readback value of the power supply actual output voltage.

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**Controls and indicators**

** connection ID** is a network connection refnum that uniquely identifies the TCP connection.

** error in (no error)** describes error conditions that occur before this node runs. This input provides **standard error in** functionality:

** status** is TRUE (X) if an error occurred before this node ran or FALSE (checkmark) to indicate a warning or that no error occurred before this node ran. The default is FALSE.

** code** is the error or warning code. The default is 0. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning. The default is an empty string.

** connection ID out** returns the same value as **connection ID**.

**** **voltage** is readback value of the power supply actual output voltage.

** error out** contains error information. This output provides standard error out functionality:

** status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

** code** is the error or warning code. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning.

### CAENels EASY-DRIVER.lvlib: ED\_MST.vi

The MST block returns the value of the EASY-DRIVER power supply internal status. The internal status register has 8 bits and so its representation is composed by 2 hexadecimal values. For additional information regarding the status register, please refer to the Status Register structure in the User's manual.

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**Controls and indicators**

** connection ID** is a network connection refnum that uniquely identifies the TCP connection.

** error in (no error)** describes error conditions that occur before this node runs. This input provides **standard error in** functionality:

** status** is TRUE (X) if an error occurred before this node ran or FALSE (checkmark) to indicate a warning or that no error occurred before this node ran. The default is FALSE.

** code** is the error or warning code. The default is 0. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning. The default is an empty string.

** connection ID out** returns the same value as **connection ID**.

**** **MST response** is the value of the EASY-DRIVER power supply internal status register.

** error out** contains error information. This output provides standard error out functionality:

** status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

** code** is the error or warning code. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning.

## Setpoint VIs

### CAENels EASY-DRIVER.lvlib: ED\_MWI.vi

The MWI block is used to set the output current. This command is usually needed when running feedback-related applications and for small changes in the output current. The use of this command is alternative to the MRM Command (ramping current command), which is advised for regular use.

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**Controls and indicators**

** connection ID** is a network connection refnum that uniquely identifies the TCP connection.

** current** sets the new value of current setpoint.

** error in (no error)** describes error conditions that occur before this node runs. This input provides **standard error in** functionality:

** status** is TRUE (X) if an error occurred before this node ran or FALSE (checkmark) to indicate a warning or that no error occurred before this node ran. The default is FALSE.

** code** is the error or warning code. The default is 0. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning. The default is an empty string.

** connection ID out** returns the same value as **connection ID**.

** error out** contains error information. This output provides standard error out functionality:

** status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

** code** is the error or warning code. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning.

### CAENels EASY-DRIVER.lvlib: ED\_MRM.vi

The MRM block is used to perform a ramp to the given current setpoint. The use of this command is alternative to the MWI command. The default value of the current slew-rate is stored in the parameter table.

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**Controls and indicators**

** connection ID** is a network connection refnum that uniquely identifies the TCP connection.

** current** sets the new value of current setpoint.

** error in (no error)** describes error conditions that occur before this node runs. This input provides **standard error in** functionality:

** status** is TRUE (X) if an error occurred before this node ran or FALSE (checkmark) to indicate a warning or that no error occurred before this node ran. The default is FALSE.

** code** is the error or warning code. The default is 0. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning. The default is an empty string.

** connection ID out** returns the same value as **connection ID**.

** error out** contains error information. This output provides standard error out functionality:

** status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

** code** is the error or warning code. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning.

## Close VIs

### CAENels EASY-DRIVER.lvlib:ED\_Close.vi

Closes the connection with the EASY-DRIVER module at the specified connection ID.

**Connector Pane**



**Controls and indicators**

** connection ID** is a network connection refnum that uniquely identifies the TCP connection.

** error in (no error)** describes error conditions that occur before this node runs. This input provides **standard error in** functionality:

** status** is TRUE (X) if an error occurred before this node ran or FALSE (checkmark) to indicate a warning or that no error occurred before this node ran. The default is FALSE.

** code** is the error or warning code. The default is 0. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

** source** specifies the origin of the error or warning and is, in most cases, the name of the node that produced the error or warning. The default is an empty string.

** error out** contains error information. This output provides standard error out functionality:

** status** is TRUE (X) if an error occurred or FALSE (checkmark) to indicate a warning or that no error occurred.

** code** is the error or warning code. If **status** is TRUE, **code** is an error code. If **status** is FALSE, **code** is 0 or a warning code.

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