Industrial communication solutions for Windows

XOPTOMUX Driver Manual

Opto22 I/O Optomux Modules Protocol Driver

Contents

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XOPTOMUX technical specifications

General information

XOPTOMUX allows you to connect to I/O OPTO22 modules compatible with the OPTOMUX rack. The protocol used is the Two-Pass Protocol, configurable through jumper B10.
The driver adds the new commands which may be applied only to REV-1 brain-boards or more current ones. Upon trying to run commands which are not implemented in the brain-board used, an 'Unknown Command' error code will be displayed.

Command list

Setup Commands

Power Up Clear

Description of this command:
Prevents OPTOMUX from returning a Power-up Clear Expected error message in response to the first instruction following application of power. This command is also known as command A.
Methods used to run this command:
Digital Output
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
65

Reset

Description of this command:
Resets OPTOMUX to power-up conditions.
For example:
- All outputs OFF
- All modules configured as input
- Protocol according to jumper B10
- Watchdog disabled
- Turn-Around delay = 0
- Counters/duration timers cancelled
- Latches reset
- Timer resolution = 10ms. This command is also known as command B.
Methods used to run this command:
Digital Output
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
66

Set Turn-Around Delay

Description of this command:
Configures the time the OPTOMUX waits before answering to a command sent by the host. This command is also known as command C.
Methods used to run this command:
Digital Output

Number of points accepted by this command:

1

Meaning of the DriverP0 parameter:

Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:

67

Meaning of the DriverP2 parameter:

Defines the delay to be use.

- 0 = No Delay
- 1 = 10 ms
- 2 = 100 ms
- 3 = 500 ms

Set Digital/Analog Watchdog Delay

Description of this command:

Sets the action to be taken by OPTOMUX if after a specific time it does not receive communication from the host. Both for the digital and analog cases, the command acts upon the 16 rack modules. This command is also known as command D.

Methods used to run this command:

Digital Output

Number of points accepted by this command:

1

Meaning of the DriverP0 parameter:

Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:

68

Meaning of the DriverP2 parameter:

Defines the watchdog delay to be use according the module type. Both in Analogue and Digital modules, this command referes to all outputs. -For Digital Watchdog Delay:

- 0 = watchdog disabled.
- 1 = 10 seconds, turn all outputs OFF.
- 2 = 1 minute, turn all outputs OFF.
- 3 = 10 minutes, turn all outputs OFF.
- 4 = watchdog disabled.
- 5 = 10 seconds, turn output 0 ON, all other outputs OFF.
- 6 = 1 minute, turn output 0 ON, all other outputs OFF.
- 7 = 10 minutes, turn output 0 ON, all other outputs OFF.
- For Analog Watchdog Delay:
- 10 = watchdog disabled.
- 11 = 10 seconds, write zero scale to all outputs.
- 12 = 1 minute, write zero scale to all outputs.
- 13 = 10 minutes, write zero scale to all outputs.
- 14 = watchdog disabled.
- 15 = 10 seconds, write full scale to all outputs.
- 16 = 1 minute, write full scale to all outputs.
- 17 = 10 minutes, write full scale to all outputs.

Identify OPTOMUX Type

Description of this command:

Asks OPTOMUX to be identified whether as analog or digital controller. This command is also known as command F.

Methods used to run this command:

Digital Input

Number of points accepted by this command:

1

Meaning of the DriverP0 parameter:

Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:

70

Values that are returned:

- 0 = Digital OPTOMUX.

- 1 = Analog OPTOMUX.

Set Digital Watchdog Data (Enhanced Digital Watchdog)

Description of this command:
Sets a group of digital outputs to be automatically turned off (set to 0) if a communication error is detected by the OPTOMUX device.
A package of up to 16 channels is required to determine which output will be affected by this command.
A delay time must be specified in the parameter P2.

Important note:
The Watchdog delay time is expressed in tens of milliseconds and should always be greater than 20 (200 ms), unless you want to disable this feature in which case you should set P2 to 0.
Example:
- P2 = 500 means 5000 ms, 5 seconds
- P2 = 0   means disable
This command is also known as command m.

Methods used to run this command:
Digital Output

Number of points accepted by this command:
1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
209

Meaning of the DriverP2 parameter:
Determines the Watchdog delay time, see Important Note above.

Set Analog Watchdog Data (Enhanced Digital Watchdog)

Description of this command:
This command allows you to configure the value to which a certain analog output will be taken when OPTOMUX detecta a communications error with the host. The value will be the value used by OPTOMUX to be assigned to the output upon host failure. This command is also known as command m.

Methods used to run this command:
Analog Output

Number of points accepted by this command:
1

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
109

Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15).

Set Timer Resolution

Description of this command:
This command allows you to configure a global timer value for all timing functions on the OPTOMUX digital brain. The value will be the one used by OPTOMUX to be assigned to the output upon host failure. This command is also known as command n.

Important note:This command affects the time base for the entire
OPTOMUX brain board. It also affects the timing
resolution for the following commands:
- Set Time Delay
- Initiate Square Wave
- High Resolution Square Wave
- Retrigger Time Delay
- Generate N Pulses
- Start ON Pulse
- Start OFF Pulse
- Read Pulse Complete Bits
- Read Duration Counters

- Read and Clear Duration Counters

Methods used to run this command:
Digital Output

Number of points accepted by this command:
1

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
110

Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15).

Set Temperature Probe Type

Description of this command:
Configures all temperature input modules so that temperatures may be read directly. This command is also known as command k.

Methods used to run this command:
Digital Output

Number of points accepted by this command:
1

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
107

Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15). If a number of module=16 is specified, the command will affect all modules.

Meaning of the DriverP3 parameter:
Defines the temperature probe type:
- 0 = No temperature probe.
- 1 = ICTD Probe (AD4 Module).
- 2 = 10 Ohm RTD Probe (AD14T Module).
- 3 = 100 Ohm RTD Probe (AD10T Module).
- 4 = Type J Thermocouple (AD5/AD5T).
- 5 = Type K Thermocouple (AD8/AD8T).
- 6 = Type R Thermocouple (AD17T).
- 7 = Type S Thermocouple (AD17T).
- 8 = Type T Thermocouple (AD18T).
- 9 = Type E Thermocouple (AD19T).
[I/O Configuration Commands]

I/O Configuration Commands

Configure Positions

Description of this command:
This command allows you to configure each position within a rack as input or output.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 0=input, 1=output. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 to function as inputs. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 0=input, 1=output.

Value in PointValue (0) referes to the first module and so on. Observe that the
HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command G.
Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
171

Configure as Inputs

Description of this command:
This command allows you to configure certain positions within a rack as inputs, leaving all other
positions unchanged.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the
HMITalk1.PointValue() property. This value should be constructed following this criteria: The
number is first constructed as a binary number. Each module is referenced by a binary digit:
1=input, 0=unchanged. The leftmost bit in the number referes to the first module while the
rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to
function as inputs and positions 2 and 3 will remain unchanged. All other positions are
unchanged. The final number must be converted to its hexadecimal or decimal equivalent:
10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be
assigned to the corresponding module positions. Each module is configured using a binary digit:
1=input, 0=unchanged.
Value in PointValue (0) referes to the first module and so on. Observe that the
HMITalk1.DriverNumPoints property must be correctly set. Those modules not reached by the
package will be filled with 0 (unchanged).
This command is also known as command H.
Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
172

Configure as Outputs

Description of this command:
This command allows you to configure certain positions within a rack as outputs, leaving all other
positions unchanged.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the
HMITalk1.PointValue() property. This value should be constructed following this criteria: The
number is first constructed as a binary number. Each module is referenced by a binary digit:
1=output, 0=unchanged. The leftmost bit in the number referes to the first module while the
rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to
function as outputs and positions 2 and 3 will remain unchanged. All other positions are
unchanged. The final number must be converted to its hexadecimal or decimal equivalent:
10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be
assigned to the corresponding module positions. Each module is configured using a binary digit:
1=output, 0=unchanged.

Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set. Those modules not reached by the package will be filled with 0 (unchanged).
This command is also known as command I.
Important note:This command is a uppercase i, NOT a lowercasse L.
Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
173

Read Module Configuration

Description of this command:
Returns I/O configuration of a rack in two different formats:
- Through an Analog Input as entire value whose bits indicate each module configuration.
- Through an Digital Input a package of up to 16 HMITalk1.PointValue() channels where each one indicates each module configuration. It is important to set properly the HMITalk1.DriverNumPoints property. Meaning of each bit:
0 = Configured as input.
1 = Configures as output. This command is also known as command j.
Methods used to run this command:
Analog Input / Digital Input
Number of points accepted by this command:
Analog Input:1, DI:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
206
[Digital Read/Write Commands]

Digital Read/Write Commands

Write Digital Outputs

Description of this command:
It allows to modify the status of digital output modules (1=ON, 0=OFF). In case of using it through an Analog Output, the value sent will be the one stored in the HMITalk1.PointValue() property. If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16). Thus, HMITalk1.DriverNumPoints must be properly set. Those modules not reached by the package will be filled with 0 (OFF). This command is also known as command J.
Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
174

Activate Digital Outputs

Description of this command:
Activates digital outputs modules.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=Turned On 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to

function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the

Value in PointValue () property.

- If used through a Digital Output, the value will be set up based on the

Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=Turned On, 0=unchanged.

Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set. Those modules not reached by the package will be filled with 0 (unchanged).

This command is also known as command K.

Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
175

Deactivate Digital Outputs

Description of this command:
Deactivates digital ouptus modules.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=Turned Off, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the

Value in PointValue () property.

- If used through a Digital Output, the value will be set up based on the

Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=Turned Off, 0=unchanged.

Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set. Those modules not reached by the package will be filled with 0 (unchanged).

This command is also known as command L.

Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
176

Read Digital On/Off Status

Description of this command:
Returns the status of the digital input modules in a rack
in two different formats:
- Through an Analog Input as entire value whose bits indicate each module status.
- Through a package of up to 16 HMITalk1.PointValue() channels where each HMITalk1.PointValue() channel indicates each module status (1=ON, 0=OFF). It is important to set properly the HMITalk1.DriverNumPoints property. This command is also known as command M.

Methods used to run this command:
Analog Input / Digital Input
Number of points accepted by this command:
Analog Input:1, DI:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
177
[Digital Latch Commands]

Digital Latch Commands

Set Latch Edges

Description of this command:
Set positions configured as inputs to latch on either ON to OFF or OFF to ON transitions.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=ON to OFF, 0=OFF to ON. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=ON to OFF, 0=OFF to ON.
Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command N.
Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
178

Set Latch Off to On

Description of this command:
Set positions to latch on OFF to ON transitions.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=OFF to ON, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=OFF to ON, 0=unchanged.
Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command O.

Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
179

Set Latch On to Off

Description of this command:
Set positions to latch on ON to OFF transitions.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the
HMITalk1.PointValue() property. This value should be constructed following this criteria: The
number is first constructed as a binary number. Each module is referenced by a binary digit:
1=ON to OFF, 0=unchanged. The leftmost bit in the number referes to the first module while
the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4
to function as outputs and positions 2 and 3 will remain unchanged. All other positions are
unchanged. The final number must be converted to its hexadecimal or decimal equivalent:
10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be
assigned to the corresponding module positions. Each module is configured using a binary digit:
1=ON to OFF, 0=unchanged.
Value in PointValue (0) referes to the first module and so on. Observe that the
HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command P.
Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
180

Read Latches

Description of this command:
Returns the modules that have been latched in two different
formats:
- Through an Analog Input as entire value whose bits indicate each module status.
- Through an Digital Input a package of up to 16 HMITalk1.PointValue() channels where each
Value in PointValue () channel indicates each module status. It is important to set properly the
HMITalk1.DriverNumPoints property. This command is also known as command Q.
Methods used to run this command:
Analog Input / Digital Input
Number of points accepted by this command:
Analog Input:1, DI:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
181

Read and Clear Latches

Description of this command:
Returns the modules that have been latched and then resets the
modules to non-latched status in two different formats:
- Through an Analog Input as entire value whose bits indicate each module status.

- Through an Digital Input a package of up to 16 Digital Input where each DI indicates each module status. This command is also known as command R.

Methods used to run this command:
Analog Input / Digital Input

Number of points accepted by this command:
Analog Input:1, DI:1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
182

Clear Latches

Description of this command:
Sets latches for specified input positions to unlatched state.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=unlatched, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=unlatched, 0=unchanged.
Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command S.

Methods used to run this command:
Analog Output / Digital Output

Number of points accepted by this command:
Analog Output:1, DO:1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
183
[Digital Counting Commands]

Digital Counting Commands

Start/Stop Counters

Description of this command:
Starts and stops counting of OFF to ON transitions at specified input positions.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=SET, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=SET, 0=unchanged.

Value in PointValue (0) refers to the first module and so on. Observe that the
HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command T.

Methods used to run this command:
Analog Output / Digital Output

Number of points accepted by this command:
Analog Output:1, DO:1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
184

Start Counters

Description of this command:
Starts counting of OFF to ON transitions at specified input positions.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the
HMITalk1.PointValue() property. This value should be constructed following this criteria: The
number is first constructed as a binary number. Each module is referenced by a binary digit:
1=SET, 0=unchanged. The leftmost bit in the number refers to the first module while the
rightmost bit refers to the last module. For example: 10011 configures positions 0,1 and 4 to
function as outputs and positions 2 and 3 will remain unchanged. All other positions are
unchanged. The final number must be converted to its hexadecimal or decimal equivalent:
10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be
assigned to the corresponding module positions. Each module is configured using a binary digit:
1=SET, 0=unchanged.
Value in PointValue (0) refers to the first module and so on. Observe that the
HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command U.

Methods used to run this command:
Analog Output / Digital Output

Number of points accepted by this command:
Analog Output:1, DO:1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
185

Stop Counters

Description of this command:
Stops counting of OFF to ON transitions at specified input positions.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the
HMITalk1.PointValue() property. This value should be constructed following this criteria: The
number is first constructed as a binary number. Each module is referenced by a binary digit:
1=SET, 0=unchanged. The leftmost bit in the number refers to the first module while the
rightmost bit refers to the last module. For example: 10011 configures positions 0,1 and 4 to
function as outputs and positions 2 and 3 will remain unchanged. All other positions are
unchanged. The final number must be converted to its hexadecimal or decimal equivalent:
10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be
assigned to the corresponding module positions. Each module is configured using a binary digit:
1=SET, 0=unchanged.
Value in PointValue (0) refers to the first module and so on. Observe that the
HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command V.

Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
186

Read Counters

Description of this command:
This command allows you to read a package of up to 16 counters. It is also known as command W.
Methods used to run this command:
Analog Input
Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
187
Meaning of the DriverP2 parameter:
Defines the number of the first rack module (0-15).

Read and Clear Counters

Description of this command:
It allows to read a package of up to 16 counters before clear. This command is also known as command X.
Methods used to run this command:
Analog Input
Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
188
Meaning of the DriverP2 parameter:
Defines the number of the first rack module (0-15).

Clear Counters

Description of this command:
Resets counters for specified input positions.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=SET, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=SET, 0=unchanged.
Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command Y.
Methods used to run this command:
Analog Output / Digital Output

Number of points accepted by this command:
 Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
 Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
 189
 [Digital Time Delay/Pulse Commands]

Digital Time Delay/Pulse Commands

Set Time Delay

Description of this command:
 This command is also known as command Z.
Methods used to run this command:
 Analog Output
Number of points accepted by this command:
 1
Meaning of the DriverP0 parameter:
 Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
 90
Meaning of the DriverP2 parameter:
 Defines the number of the first rack module (0-15). If a number of module=16 is specified, the command will affect all modules.
Meaning of the DriverP3 parameter:
 Defines the delay type to be used:
  - 0 = Normal Operation - turn off existing delay.
  - 1 = When instructed to go from OFF to ON, turn ON for desired time, then turn OFF.
  - 2 = When instructed to go from OFF to ON, stay OFF for desired time, then turn ON.
  - 3 = When instructed to go from ON to OFF, turn OFF for desired time, then turn ON.
  - 4 = When instructed to go from ON to OFF, stay ON for desired time, then turn OFF.
  - 5 = Initiate a continuous square wave with ON and OFF times computed as follows: ON time = 2.56 * Analog Output/256 seconds OFF time = 2.56 * Analog Output%256 seconds
  - 6 = Initiate a continuous high resolution square wave with ON and OFF times computed as follows: ON time = Analog Output/256 seconds OFF time = Analog Output%256 seconds

Initiate Square Wave

Description of this command:
 Initiates the square wave generation. This command is also known as command Z with the modifier = 5.
Methods used to run this command:
 Analog Output
Number of points accepted by this command:
 1
Meaning of the DriverP0 parameter:
 Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
 90
Meaning of the DriverP2 parameter:
 Defines the number of the first rack module (0-15). If a number of module=16 is specified, the command will affect all modules.
Meaning of the DriverP3 parameter:
 5

High Resolution Square Wave

Description of this command:
 Initiates the high resolution square wave generation. This command is also known as command Z with the modifier = 6.
Methods used to run this command:
 Analog Output

Number of points accepted by this command:
   1
Meaning of the DriverP0 parameter:
   Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
   90
Meaning of the DriverP2 parameter:
   Defines the number of the first rack module (0-15). If a number of module=16 is specified, the command will affect all modules.
Meaning of the DriverP3 parameter:
   6

Retrigger Time Delay

Description of this command:
   Restarts or triggers an existing time delay.
   Notes:
      - If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=SET, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the
   Value in PointValue () property.
      - If used through a Digital Output, the value will be set up based on the
   Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=SET, 0=unchanged.
   Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set.
   This command is also known as command h.
Methods used to run this command:
   Analog Output / Digital Output
Number of points accepted by this command:
   Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
   Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
   204

Start ON Pulse

Description of this command:
   Used to generate a pulse ON during a specified time frame given by the Analog Output value in increases of the timer resolution setting. This command is also known as command k.
Methods used to run this command:
   Analog Output
Number of points accepted by this command:
   1
Meaning of the DriverP0 parameter:
   Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
   207
Meaning of the DriverP2 parameter:
   Defines the number of the first rack module (0-15). If a number of module=16 is specified, the command will affect all modules.

Start OFF Pulse

Description of this command:
   Used to generate a pulse OFF during a specified time frame given by the Analog Output value in increases of the timer resolution setting. This command is also known as command l.

Methods used to run this command:
Analog Output
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
208
Meaning of the DriverP2 parameter:
Defines the number of the first rack module (0-15). If a number of module=16 is specified, the command will affect all modules.

Generate n Pulses

Description of this command:
Used to generate a specific number of pulses. This command is also known as command i. The Analog Output value defines the number of pulses to be generated.
Methods used to run this command:
Analog Output
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
105
Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15). If a number of module=16 is specified, the command will affect all modules.
Meaning of the DriverP3 parameter:
Represents one half of the period for the pulses in increments of the timer resolution setting.
[Digital Pulse Duration Measurement Commands]

Digital Pulse Duration Measurement Commands

Set Pulse Trigger Polarity

Description of this command:
Instructs Optomux to measure ON and OFF pulses.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=SET, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=SET, 0=unchanged.
Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command a.
Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
197

Trigger on Positive Pulse

Description of this command:

Sets the specified positions to measure the duration of positive (ON) pulses.

Notes:

- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=SET, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the

Value in PointValue () property.

- If used through a Digital Output, the value will be set up based on the

Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=SET, 0=unchanged.

Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set.

This command is also known as command b.

Methods used to run this command:

Analog Output / Digital Output

Number of points accepted by this command:

Analog Output:1, DO:1-16

Meaning of the DriverP0 parameter:

Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:

198

Trigger on Negative Pulse

Description of this command:

Sets the specified positions to measure the duration of negative (OFF) pulses.

Notes:

- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=SET, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the

Value in PointValue () property.

- If used through a Digital Output, the value will be set up based on the

Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=SET, 0=unchanged.

Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set.

This command is also known as command c.

Methods used to run this command:

Analog Output / Digital Output

Number of points accepted by this command:

Analog Output:1, DO:1-16

Meaning of the DriverP0 parameter:

Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:

199

Read Pulse Complete Bits

Description of this command:

Returns the modules which have completed the duration of a

pulse in two different formats:

    - Through an Analog Input as an entire value whose bits indicate the status of each module.

    - Through an Digital Input a package of up to 16 HMITalk1.PointValue() channels where each Value in PointValue () channel indicates the status of each module (1=Finished, 0=Not finished). It is important to set properly the HMITalk1.DriverNumPoints property. This command is also known as command d.

Methods used to run this command:
Analog Input / Digital Input

Number of points accepted by this command:
Analog Input:1, DI:1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
200

Read Pulse Duration Counters

Description of this command:
It allows to read a package of up to 16 counters. This command is also known as command e.

Methods used to run this command:
Analog Input

Number of points accepted by this command:
1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
201

Meaning of the DriverP2 parameter:
Defines the number of the first rack module (0-15).

Read and Clear Pulse Duration Counters

Description of this command:
It allows to read a package of up to 16 counters and after reading, resets them to zero. This command is also known as command f.

Methods used to run this command:
Analog Input

Number of points accepted by this command:
1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
202

Meaning of the DriverP2 parameter:
Defines the number of the first rack module (0-15).

Clear Pulse Duration Counters

Description of this command:
Clears the duration counters and pulse complete bits for the specified positions to enable measurement of the next pulse.

Notes:

    - If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=SET, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the

Value in PointValue () property.

    - If used through a Digital Output, the value will be set up based on the

Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be
assigned to the corresponding module positions. Each module is configured using a binary digit:
1=SET, 0=unchanged.
Value in PointValue (0) referes to the first module and so on. Observe that the
HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command g.
Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
203
[Analog Read/Write Commands]

Analog Read/Write Commands

Write Analog Output

Description of this command:
It allows to write one output at a time. This command is also known as command J.
Methods used to run this command:
Analog Output
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
74
Meaning of the DriverP2 parameter:
Defines the number of the rack module (0-15).

Read Analog Outputs

Description of this command:
It allows to read a package of up to 16 analog output. This command is also known as command
K.
Methods used to run this command:
Analog Input
Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
75
Meaning of the DriverP2 parameter:
Defines the number of the first rack module (0-15).

Update Analog Output

Description of this command:
It allows to update one output at a time. This command is also known as command S.
Methods used to run this command:
Analog Output
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
83
Meaning of the DriverP2 parameter:
Defines the number of the rack module (0-15).

Read Analog Inputs

Description of this command:
It allows to read a package of up to 16 analog input. This command is also known as command L.
Methods used to run this command:
Analog Input
Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
76
Meaning of the DriverP2 parameter:
Defines the number of the first rack module (0-15).

Read and Average Analog Input

Description of this command:
It allows to read an analog input averaged over a specified number of samples. This command is also known as command M.
Methods used to run this command:
Analog Input
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
77
Meaning of the DriverP2 parameter:
Defines the number of the rack module (0-15).
Meaning of the DriverP3 parameter:
Defines the number of samples to be used to calculate the average (0-255). The larger the number of samples, the longer the time invested by the equipment in setting up the response and sending it.

Start Analog Input Averaging

Description of this command:
It allows to read analog input averaged over a specified number of samples. This command is also known as command T.
Methods used to run this command:
Digital Output
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
84
Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15). If a number of module=16 is specified, the command will affect all modules.
Meaning of the DriverP3 parameter:
Defines the number of samples to be used to calculate the average (the larger the number of samples, the longer the time invested by the equipment in setting up the response and sending it).

Read Average Complete Bits

Description of this command:
Returns the modules that have completed averaging of the analog inputs triggered through the Start Input Averaging command (84).
Returns information in two different formats:
- Through an Analog Input as an entire value whose bits indicate the status of each module.
- Through a package of up to 16 Digital Input where each DI indicates the status of each module (1=Finished, 0=Not finished). This command is also known as command i.

Methods used to run this command:
Analog Input / Digital Input
Number of points accepted by this command:
Analog Input:1, DI:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
105

Read Analog Inputs Average Data

Description of this command:
It allows to read a package of up to 16 analog input averaged after having sent a Start Input Averaging command (84). This command is also known as command U.
Methods used to run this command:
Analog Input
Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
85
Meaning of the DriverP2 parameter:
Defines the number of the first rack module (0-15).

Read Temperature Inputs

Description of this command:
It allows to read a package of up to 16 analog input, indicating temperatures in centigrades degrees directly. It will return -273 when it is below the defined scale and 2047 when it is above the defined scale. This command is also known as command l.
Methods used to run this command:
Analog Input
Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
108
Meaning of the DriverP2 parameter:
Defines the number of the first rack module (0-15).
Meaning of the DriverP3 parameter:
If 0, values are treated as unsigned numbers. If 1, values are treated as signed numbers.

Read Average Temperature Inputs

Description of this command:
It allows to read a package of up to 16 analog input, indicating averaged temperatures in centigrades degrees directly. It will return -273 when it is below the defined scale and 2047 when it is above the defined scale. This command is also known as command o.
Methods used to run this command:
Analog Input
Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
111
Meaning of the DriverP2 parameter:
Defines the number of the first rack module (0-15).
[Analog Input Range Commands]

Analog Input Range Commands

Set Input Range

Description of this command:
It allows to define the operation ranges for the analog input modules, one module at a time. Requires to use two Analog Output , so one of them must be a CHILD. The first Analog Output will define the low limit and the second Analog Output, the high limit. This command is also known as command N.

Methods used to run this command:
Analog Output

Number of points accepted by this command:
1

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
78

Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15). If a number of module=16 is specified, the command will affect all modules.

Read High Out-of-Range Latches

Description of this command:
Returns the modules which are above the high limit
defined in two different formats:
    - Through an Analog Input as an entire value whose bits indicate the status of each module.
    - Through a package of up to 16 Digital Input where each DI indicates the status of each module. This command is also known as command O.

Methods used to run this command:
Analog Input / Digital Input

Number of points accepted by this command:
Analog Input:1, DI:1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
79

Read Low Out-of-Range Latches

Description of this command:
Returns the modules which are below the low limit
defined in two different formats:
    - Through an Analog Input as an entire value whose bits indicate the status of each module.
    - Through a package of up to 16 Digital Input where each DI indicates the status of each module. This command is also known as command O.

Methods used to run this command:
Analog Input / Digital Input

Number of points accepted by this command:
Analog Input:1, DI:1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
279

Read and Clear High Out-of-Range Latches

Description of this command:
Returns the modules which are above the high limit and then resets latches (both for low and high),in
two different formats:
    - Through an Analog Input as an entire value whose bits indicate the status of each module.
    - Through a package of up to 16 Digital Input where each DI indicates the status of each module. This command is also known as command P.

Methods used to run this command:
Analog Input / Digital Input
Number of points accepted by this command:
Analog Input:1, DI:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
80

Read and Clear Low Out-of-Range Latches

Description of this command:
Returns the modules which are below the low limit and then resets latches (both for low and high),in
two different formats:
- Through an Analog Input as an entire value whose bits indicate the status of each module.
- Through a package of up to 16 Digital Input where each DI indicates the status of each module. This command is also known as command P.
Methods used to run this command:
Analog Input / Digital Input
Number of points accepted by this command:
Analog Input:1, DI:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
280

Clear Out-of-Range Latches

Description of this command:
Resets latches that report which modules are out of range.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=SET, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=SET, 0=unchanged.
Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command Q.
Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
81

Read Lowest Values

Description of this command:
It allows to read a package of up to 16 analog values, indicating which was the lower value read from each module. This command is also known as command a.
Methods used to run this command:
Analog Input

Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
97
Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15).

Clear Lowest Values

Description of this command:
Resets the minimum values reached by each module.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=SET, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=SET, 0=unchanged.
Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command b.
Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
98

Read and Clear Lowest Values

Description of this command:
It allows to read a package of up to 16 analog values, indicating which was the lowest value read from each module, and then resets the accumulators of the requested modules. This command is also known as command c.
Methods used to run this command:
Analog Input
Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
99
Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15).

Read Peak Values

Description of this command:
It allows to read a package of up to 16 analog values, indicating which was the highest value read from each module. This command is also known as command d.
Methods used to run this command:
Analog Input

Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
100
Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15).

Clear Peak Values

Description of this command:
Resets peak values in each module.
Notes:
- If it is sent through an Analog Output, the value used will be the one stored in the HMITalk1.PointValue() property. This value should be constructed following this criteria: The number is first constructed as a binary number. Each module is referenced by a binary digit: 1=SET, 0=unchanged. The leftmost bit in the number referes to the first module while the rightmost bit referes to the last module. For example: 10011 configures positions 0,1 and 4 to function as outputs and positions 2 and 3 will remain unchanged. All other positions are unchanged. The final number must be converted to its hexadecimal or decimal equivalent: 10011b = 13h = 19d and then assigned to the
Value in PointValue () property.
- If used through a Digital Output, the value will be set up based on the
Value in PointValue (0) status and the next HMITalk1.PointValue() channels (up to 16) will be assigned to the corresponding module positions. Each module is configured using a binary digit: 1=SET, 0=unchanged.
Value in PointValue (0) referes to the first module and so on. Observe that the HMITalk1.DriverNumPoints property must be correctly set.
This command is also known as command e.
Methods used to run this command:
Analog Output / Digital Output
Number of points accepted by this command:
Analog Output:1, DO:1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
101

Read and Clear Peak Values

Description of this command:
It allows to read a package of up to 16 analog values, indicating which was the highest value read from each module, and then resets the accumulators of the requested modules. This command is also known as command f.
Methods used to run this command:
Analog Input
Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
102
Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15).
[Analog Gain/Offset Commands]

Analog Gain/Offset Commands

Calculate Offsets

Description of this command:
Tells OPTOMUX to calculate and return the offsets being read at that time. This command is normally used during the initial tuning and it only makes sense if the values provided as input at

that moment are to be considered the scale beginning. The values obtained may be later used through the Set Offset (87) command to set them in the modules permanently. It allows to read a package of up to 16 offsets. This command is also known as command g.

Methods used to run this command:
Analog Input

Number of points accepted by this command:
1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
103

Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15).

Set Offset

Description of this command:
It allows to write the offset value to a specific module at a time. This command is also known as command W.

Methods used to run this command:
Analog Output

Number of points accepted by this command:
1

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
87

Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15). If a number of module=16 is specified, the command will affect all modules.

Calculate and Set Offsets

Description of this command:
Tells OPTOMUX to calculate and return the offsets being read at that time and besides, writes the offset value calculated in each selected module. It allows to read a package of up to 16 offsets. This command is also known as command h.

Methods used to run this command:
Analog Input

Number of points accepted by this command:
1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
104

Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15).

Calculate Gain Coefficients

Description of this command:
Tells OPTOMUX to calculate and return the gain coefficients being read at that time. This command is normally used during the initial tuning and it only makes sense if the values provided as input at that moment are to be considered the scale beginning. The values obtained may be used later through the Set Gain Coefficient command (89) to have them set in the modules permanently. It allows to read a package of up to 16 gain coefficients. This command is also known as command X.

Methods used to run this command:
Analog Input

Number of points accepted by this command:
1-16

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
88
Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15).

Set Gain Coefficient

Description of this command:
It allows to write the gain coefficient value to a specific module at a time. This command is also known as command Y.
Methods used to run this command:
Analog Output
Number of points accepted by this command:
1
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
89
Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15). If a number of module=16 is specified, the command will affect all modules.

Calculate and Set Gain Coefficients

Description of this command:
Tells OPTOMUX to calculate and return the gain coefficients being read at that time and besides, writes the gain coefficient value calculated in each selected module. It allows to read a package of up to 16 gain coefficients. This command is also known as command Z.
Methods used to run this command:
Analog Input
Number of points accepted by this command:
1-16
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
90
Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15).
[Analog Waveform Commands]

Analog Waveform Commands

Set Output Waveform

Description of this command:
Tells OPTOMUX to start a constant waveform in the output module specified. Requires the use of two HMITalk1.PointValue() channels. Thus, HMITalk1.DriverNumPoints should be set to 2. The first HMITalk1.PointValue() channel will define the high limit, and the second, the low limit of the waveform. (Values 0 and 255 for Analog Output match 0% and 100% of the range defined in the module). This command is also known as command R.
Methods used to run this command:
Analog Output
Number of points accepted by this command:
2
Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).
Meaning of the DriverP1 parameter:
82
Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15). If a number of module=16 is specified, the command will affect all modules.
Meaning of the DriverP3 parameter:
Defines the rate of the waveform:
- 00 = Disable waveform.

- 01 = 2.18 minutes
- 02 = 3.28 minutes
- 03 = 4.37 minutes
- 04 = 5.46 minutes
- 05 = 6.56 minutes
- 06 = 7.65 minutes
- 07 = 8.74 minutes
- 08 = 1.09 minutes
- 09 = 32.8 seconds
- 10 = 21.8 seconds
- 11 = 16.4 seconds
- 12 = 13.1 seconds
- 13 = 10.9 seconds
- 14 = 9.4 seconds
- 15 = 8.2 seconds

Meaning of the DriverP4 parameter:
Defines the type of waveform to be generated:
- 0 = Square wave with 50% duty cicle.
- 1 = Triangle wave with a positive initial scope.
- 2 = Ramp Up, waveform terminates upon reaching the upper limit.
- 3 = Continuous Ramp Up.
- 4 = Square wave (50% duty cycle).
- 5 = Triangle wave; initial slope = DOWN.
- 6 = Ramp Down, waveform terminates at lower limit.
- 7 = Continuous Ramp Down.

Values that are sent:
Value in PointValue (0) = Defines the waveform high limit.
Value in PointValue (1) = Defines the waveform low limit.

Improved Output Waveform

Description of this command:
Tells OPTOMUX to start a constant waveform in the output module specified. Requires the use of three HMITalk1.PointValue() channels. Thus, HMITalk1.DriverNumPoints should be set to 2. The first HMITalk1.PointValue() channel will define the high limit, the second one, the low limit, and the third one, will define the waveform period. (Values 0 and 4095 for Analog Output match 0% and 100% of the range defined in the module). (Period is calculated as the Analog Output value times 100 miliseconds. For very short periods, the wave may be little smooth since OPTOMUX updates all waveforms every 50 miliseconds.) This command is also known as command V.

Methods used to run this command:
Analog Output

Number of points accepted by this command:
3

Meaning of the DriverP0 parameter:
Defines the number of OPTOMUX rack pointed (0-255).

Meaning of the DriverP1 parameter:
86

Meaning of the DriverP2 parameter:
Defines the number of rack module (0-15). If a number of module=16 is specified, the command will affect all modules.

Meaning of the DriverP3 parameter:
Defines the type of waveform to be generated:
- 0 = Disable waveform.
- 1 = Triangle wave with a positive initial slope.
- 2 = Ramp Up, waveform terminates upon reaching the upper limit.
- 3 = Sawtooth, continuous ramp up.
- 4 = Square wave, 50% duty cycle.
- 5 = Triangle wave with negative initial slope.
- 6 = Ramp Down, waveform terminates at lower limit.
- 7 = Sawtooth, continuous ramp down.

Values that are sent:
Value in PointValue (0) = Defines the waveform high limit.
Value in PointValue (1) = Defines the waveform low limit.

Value in PointValue (2) = Defines the waveform period.

Error messages

The following list shows the possible error messages that can be returned by the driver during a failed communication in the 'Status' property.

[1005] DRIVER (Internal): Invalid driver stage
[1300] PROTOCOL (Timeout): No answer
[1433] PROTOCOL (Format): Validation error in device response
[2108] CONFIG (NumValues): Invalid number of channels (must be 2)
[2109] CONFIG (NumValues): Invalid number of channels (must be 3)
[2147] CONFIG (NumValues): Only one value can be read or written
[2149] CONFIG (NumValues): Only one value can be written
[2189] CONFIG (NumValues): Too many values (max=16)
[3014] CONFIG (P0): Invalid device address (0-255)
[3508] CONFIG (P1): Invalid command
[4055] CONFIG (P2): Invalid delay number (0-3)
[4062] CONFIG (P2): Invalid first rack module number (0-15)
[4085] CONFIG (P2): Invalid rack module number (0-15)
[4086] CONFIG (P2): Invalid rack module number (0-16)
[4087] CONFIG (P2): Invalid rack module number (0-255)
[4124] CONFIG (P2): Invalid watchdog delay (0-7 and 10-17)
[4536] CONFIG (P3): Invalid delay type (0-6)
[4546] CONFIG (P3): Invalid number (0-255)
[4551] CONFIG (P3): Invalid number of samples (0-255)
[4559] CONFIG (P3): Invalid rate of the waveform (0-15)
[4574] CONFIG (P3): Invalid temperature probe type (0-9)
[4583] CONFIG (P3): Invalid waveform type (0-7)
[5038] CONFIG (P4): Invalid waveform type (0-7)
[8047] CONFIG (Remote): Checksum error informed by device
[8068] CONFIG (Remote): Communications link watch-dog time-out error
[8084] CONFIG (Remote): Data field error
[8184] CONFIG (Remote): Input buffer overrun
[8238] CONFIG (Remote): Not printable ASCII character received
[8267] CONFIG (Remote): Power-Up Clear expected (command ignored)
[8325] CONFIG (Remote): Specified limits invalid
[8342] CONFIG (Remote): Undefined command
[8351] CONFIG (Remote): Unknown error type
[8355] CONFIG (Remote): Unknown response from OPTOMUX rack (check communication links)

Supported devices

This driver can communicate with these devices, but is not necessarily limited to this list:

OPTO22 I/O modules compatible with the OPTOMUX rack.