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## X8705ILS Driver Manual

### *ALSTOM ILSA Interface IEC 60870-5-103 Protocol Driver*

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## X8705ILS technical specifications

### General information

The X8705ILS driver was developed to communicate with Areva Alstom protections that use the ILSA interface.

The ILSA interface conforms to the international IEC 60870-5-103 standard.

This driver uses the unbalanced transmission procedure, as it is normally used in SCADA systems in which a master station controls the data traffic by polling outstations sequentially.

The master station is the primary station that initiates all message transfers while secondary stations (slaves) may transmit only when they are polled.

IEC 60870-5-103 protocol standard admits exclusive frame format FT 1.2 defined in IEC 60870-5-1 (Transmission frame formats). Formats with fixed and variable block length are admitted. Also the single control characters E5H are used. The transmission of data bytes takes place after the principle "LSB first". This is an asynchronous protocol with hamming distance = 4. The sequence of user data characters is terminated by a 8 bits checksum. The checksum is the arithmetic sum over all user data octets.

Frame with variable length is used for data transmission of user data between controlling and controlled station.

Link address field is fixed with 1-byte length.

Originator address field is not included in telegrams.

Common address of ASDU is fixed with 1-byte length.

Information object address field is fixed with 2-byte length.

This driver supports RS485 networking to connect multiple slave devices to a single computer.

This driver supports direct communication to a serial port.

Also supports tcp/ip communication through an ethernet-to-serial converter such as Moxa or Exemys, without needing to install a COM port redirector or creating a virtual COM port.

### Command list

#### Generic IEC 870-5-103 ILSA Commands

##### *Get Disturbance Record*

###### **Description of this command:**

Requests the protection to send the disturbance record that correspond to a selected record number. Requires a valid driver license. Format of output files is COMTRADE ASCII. Both .cfg and .dat are generated according to IEEE Standard Common Format for Transient Data Exchange (COMTRADE) for Power Systems (2001 format). Additional .hdr and .inf files are generated, and can include user-supplied information through the DriverP8 parameter. This command automatically forces a minimum timeout of 3000 ms.

###### **Methods used to run this command:**

Analog Input (ReadNumericValues)

###### **Number of points accepted by this command:**

1-8

###### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

###### **Meaning of the DriverP1 parameter:**

2

###### **Meaning of the DriverP2 parameter:**

Record index to be downloaded (0-7) where 0=newest and 7=oldest.

###### **Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

###### **Meaning of the DriverP4 parameter:**

Function type:

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128 = Distance protection (typical setting, use with PD-522)  
160 = Overcurrent protection  
176 = Transformer differential protection (use with PQ-721)  
192 = Line differential protection  
254 = Generic classification GEN  
255 = Global classification GLB

**Meaning of the DriverP5 parameter:**

Number of data request retries before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Indicates the path where the COMTRADE files will be generated. If this property is empty, the local driver folder is used by default.

**Meaning of the DriverP7 parameter:**

Indicates a TriggerTime that should not be downloaded if it happens to be the last TriggerTime available in the protection. If empty, the last TriggerTime available is downloaded. Format must be 'YYYY-MM-DD hh:mm:ss.uuuuu000', where uuuuu=microseconds.

**Meaning of the DriverP8 parameter:**

Comma-separated list with additional information about the protection to be used in the .hdr and .inf files. Format: FieldName1=value1,FieldName2=value2,etc. Example: ID=123456,SerialNumber=A55GH77,Port=Ethernet

**Meaning of the DriverP9 parameter:**

Filename root for .hdr, .cfg, .dat and .inf files. If empty, 'X8705ILS\_DisturbanceRecord.Relayxxx.hdr', 'X8705ILS\_DisturbanceRecord.Relayxxx.cfg', 'X8705ILS\_DisturbanceRecord.Relayxxx.dat' and 'X8705ILS\_DisturbanceRecord.Relayxxx.inf' will be used, where xxx is the protection unit address. Existing files with same name are overwritten.

**Values that are returned:**

Value in PointValue (0) = Number of channels downloaded  
Value in PointValue (1) = Record number  
Value in PointValue (2) = Frequency  
Value in PointValue (3) = First sample (always 0)  
Value in PointValue (4) = Trigger point  
Value in PointValue (5) = Number of samples  
Value in PointValue (6) = Number of analog channels  
Value in PointValue (7) = Number of digital channels  
Text in PointText (0) = Download status  
Text in PointText (1) = Record number (text version, can be 'n/a' when report is not available))  
Text in PointText (2) = Device Identification  
Text in PointText (3) = First sample time  
Text in PointText (4) = Trigger time  
Text in PointText (5) = Last sample time  
Text in PointText (6) = Comma-separated list of analog channel names  
Text in PointText (7) = Comma-separated list of first 10 digital channel names

## Get Disturbance Record List

**Description of this command:**

Returns a list of disturbance records available, ordered by date and time, newest first. Record number is returned in PointValue and fault time in PointText. If the number of records found is less than the number of points reserved, remaining pointvalues are set to -1 and pointtexts are set to 'n/a'.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

1-8

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

1

**Meaning of the DriverP2 parameter:**

Not used.

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:  
0 = Use English format (MM/DD/YYYY hh:mm:ss.000)  
1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

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**Meaning of the DriverP4 parameter:**

Function type:

128 = Distance protection (typical setting, use with PD-522)

160 = Overcurrent protection

176 = Transformer differential protection (use with PQ-721)

192 = Line differential protection

254 = Generic classification GEN

255 = Global classification GLB

**Meaning of the DriverP5 parameter:**

Number of data request retries before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

Not used.

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = Newest disturbance record number

Text in PointText (0) = Date and time of newest disturbance record

- ...

Text in PointText (DriverNumPoints-1) = Oldest disturbance record number

Value in PointValue (DriverNumPoints-1) = Date and time of oldest disturbance record

## *Read All Events*

**Description of this command:**

Requests the protection to send the signal events that correspond to a selected record number, followed by the monitoring signal, diagnostic, operating data and overload recording events.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

1

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

7

**Meaning of the DriverP2 parameter:**

Record index to be downloaded (0-7) where 0=newest and 7=oldest.

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Function type:

128 = Distance protection (typical setting, use with PD-522)

160 = Overcurrent protection

176 = Transformer differential protection (use with PQ-721)

192 = Line differential protection

254 = Generic classification GEN

255 = Global classification GLB

**Meaning of the DriverP5 parameter:**

Number of data request retries before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Indicates the path where the event file will be generated. If this property is empty, the local driver folder is used by default.

**Meaning of the DriverP7 parameter:**

Number of previous records to be also downloaded to the same file (0-7). If 0 or empty, only record index indicated in DriverP2 is downloaded. If not 0, the oldest record is read first.

**Meaning of the DriverP8 parameter:**

Not used.

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## **Meaning of the DriverP9 parameter:**

Filename for event file. If empty, 'X8705ILS\_Events.Relayxxx.txt' will be used, where xxx is the protection unit address given in DriverP0.

## **Values that are returned:**

Value in PointValue (0) = Indicates how many events have been extracted.

Text in PointText (0) = Description of last event extracted (n/a if no events extracted).

## *Read Diagnostic Recording Events*

### **Description of this command:**

Requests the protection to send the diagnostic recording events.

### **Methods used to run this command:**

Analog Input (ReadNumericValues)

### **Number of points accepted by this command:**

1

### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

### **Meaning of the DriverP1 parameter:**

10

### **Meaning of the DriverP2 parameter:**

Type Identification (0-255). Use 8Ch for PD552 and PQ721.

### **Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### **Meaning of the DriverP4 parameter:**

Not used.

### **Meaning of the DriverP5 parameter:**

Number of data request retries before discarding the whole communication.

### **Meaning of the DriverP6 parameter:**

Indicates the path where the event file will be generated. If this property is empty, the local driver folder is used by default.

### **Meaning of the DriverP7 parameter:**

Not used.

### **Meaning of the DriverP8 parameter:**

Not used.

### **Meaning of the DriverP9 parameter:**

Filename for event file. If empty, 'X8705ILS\_Events.Relayxxx.txt' will be used, where xxx is the protection unit address given in DriverP0.

## **Values that are returned:**

Value in PointValue (0) = Indicates how many events have been extracted.

Text in PointText (0) = Description of last event extracted (n/a if no events extracted).

## *Read Monitoring Signal Recording Events*

### **Description of this command:**

Requests the protection to send the monitoring signal recording events.

### **Methods used to run this command:**

Analog Input (ReadNumericValues)

### **Number of points accepted by this command:**

1

### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

### **Meaning of the DriverP1 parameter:**

5

### **Meaning of the DriverP2 parameter:**

Type Identification (0-255). Use 8Ch for PD552 and PQ721.

### **Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### **Meaning of the DriverP4 parameter:**

Not used.

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**Meaning of the DriverP5 parameter:**

Number of data request retries before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Indicates the path where the event file will be generated. If this property is empty, the local driver folder is used by default.

**Meaning of the DriverP7 parameter:**

Not used.

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Filename for event file. If empty, 'X8705ILS\_Events.Relayxxx.txt' will be used, where xxx is the protection unit address given in DriverP0.

**Values that are returned:**

Value in PointValue (0) = Indicates how many events have been extracted.

Text in PointText (0) = Description of last event extracted (n/a if no events extracted).

## *Read Multiple Information Objects*

**Description of this command:**

Reads a number of information objects based on a list of individual address and formats. The addresses need not to be consecutive.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

1-100

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

Type Identification (0-255). Use 8Ch for PD552 and PQ721.

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY)

1 = Use Spanish format (DD/MM/YYYY)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

Comma-separated list of information object addresses using the format

xxxxyy[format],xxxxyy[format],...,xxxxyy[format] where:

- xxx = Address 1 of information object, as a decimal number (000-255)

- yyy = Address 2 of information object, as a decimal number (000-255)

- format = optional format for data received, where:

- d=return as date value

- t=return as time value

- s=return as text

- B=return as byte value (0 to 255)

- B1=return as scaled byte value (0.0 to 25.5)

- B2=return as scaled byte value (0.00 to 2.55)

- B3=return as scaled byte value (0.000 to 0.255)

- c=return as char value (-128 to 127)

- c1=return as scaled char value (-12.8 to 12.7)

- c2=return as scaled char value (-1.28 to 1.27)

- c3=return as scaled char value (-0.128 to 0.127)

- i=return as integer (-32768 to 32767)

- i1=return as scaled integer/10 (-3276.8 to 3276.7)

- i2=return as scaled integer/100 (-327.68 to 327.67)

- i3=return as scaled integer/1000 (-32.768 to 32.767)

- u=return as unsigned integer (0 to 65535)

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- u1=return as scaled unsigned integer/10 (0.0 to 6553.5)
- u2=return as scaled unsigned integer/100 (0.00 to 655.35)
- u3=return as scaled unsigned integer/1000 (0.000 to 65.535)
- @=return as a string from a built-in string list based on the obtained unsigned integer register value
- b[bit]=return bit value as '0' or '1', where [bit] is optional and indicates a specific bit number, other than 1 (see note below).
- a[bit]=return bit value as 'active' or 'inactive'
- A[bit]=return bit value as 'Active' or 'Inactive'
- l[bit]=return bit value as 'high' or 'low'
- L[bit]=return bit value as 'High' or 'Low'
- o[bit]=return bit value as 'on' or 'off'
- O[bit]=return bit value as 'On' or 'Off'
- y[bit]=return bit value as 'yes' or 'no'
- Y[bit]=return bit value as 'Yes' or 'No'
- [bit] = If not given, bit 1 is assumed as the bit containing the flag status and bit 2 is assumed to indicate a 'Without function' condition. If a number between 0 and 7 is given, that will be the only bit considered to establish the flag status.
- Example = 003090:d,003091:t (this list returns date and time from PD552 and PQ721)

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = First information object as number

Text in PointText (0) = First information object as text

Value in PointValue (1) = Second information object as number

Text in PointText (1) = Second information object as text

...

Value in PointValue (DriverNumPoints-1) = Last information object as number

Text in PointText (DriverNumPoints-1) = Last information object as text

## *Read Operating Data Recording Events*

**Description of this command:**

Requests the protection to send the operating data recording events.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

1

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

6

**Meaning of the DriverP2 parameter:**

Type Identification (0-255). Use 8Ch for PD552 and PQ721.

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of data request retries before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Indicates the path where the event file will be generated. If this property is empty, the local driver folder is used by default.

**Meaning of the DriverP7 parameter:**

Not used.

**Meaning of the DriverP8 parameter:**

Not used.

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## **Meaning of the DriverP9 parameter:**

Filename for event file. If empty, 'X8705ILS\_Events.Relayxxx.txt' will be used, where xxx is the protection unit address given in DriverP0.

## **Values that are returned:**

Value in PointValue (0) = Indicates how many events have been extracted.

Text in PointText (0) = Description of last event extracted (n/a if no events extracted).

## *Read Overload Recording Events*

### **Description of this command:**

Requests the protection to send the overload recording events.

### **Methods used to run this command:**

Analog Input (ReadNumericValues)

### **Number of points accepted by this command:**

1

### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

### **Meaning of the DriverP1 parameter:**

11

### **Meaning of the DriverP2 parameter:**

Type Identification (0-255). Use 8Ch for PD552 and PQ721.

### **Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### **Meaning of the DriverP4 parameter:**

Not used.

### **Meaning of the DriverP5 parameter:**

Number of data request retries before discarding the whole communication.

### **Meaning of the DriverP6 parameter:**

Indicates the path where the event file will be generated. If this property is empty, the local driver folder is used by default.

### **Meaning of the DriverP7 parameter:**

Not used.

### **Meaning of the DriverP8 parameter:**

Not used.

### **Meaning of the DriverP9 parameter:**

Filename for event file. If empty, 'X8705ILS\_Events.Relayxxx.txt' will be used, where xxx is the protection unit address given in DriverP0.

## **Values that are returned:**

Value in PointValue (0) = Indicates how many events have been extracted.

Text in PointText (0) = Description of last event extracted (n/a if no events extracted).

## *Read Signal Events*

### **Description of this command:**

Requests the protection to send the signal events that correspond to a selected record number.

### **Methods used to run this command:**

Analog Input (ReadNumericValues)

### **Number of points accepted by this command:**

1

### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

### **Meaning of the DriverP1 parameter:**

3

### **Meaning of the DriverP2 parameter:**

Record index to be downloaded (0-7) where 0=newest and 7=oldest.

### **Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### **Meaning of the DriverP4 parameter:**

Function type:

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128 = Distance protection (typical setting, use with PD-522)  
160 = Overcurrent protection  
176 = Transformer differential protection (use with PQ-721)  
192 = Line differential protection  
254 = Generic classification GEN  
255 = Global classification GLB

**Meaning of the DriverP5 parameter:**

Number of data request retries before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Indicates the path where the event file will be generated. If this property is empty, the local driver folder is used by default.

**Meaning of the DriverP7 parameter:**

Number of previous records to be also downloaded to the same file (0-7). If 0 or empty, only record index indicated in DriverP2 is downloaded. If not 0, the oldest record is read first.

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Filename for event file. If empty, 'X8705ILS\_Events.Relayxxx.txt' will be used, where xxx is the protection unit address given in DriverP0.

**Values that are returned:**

Value in PointValue (0) = Indicates how many events have been extracted for all records.  
Text in PointText (0) = Description of last event extracted (n/a if no events extracted).

## *Reset Remote Link*

**Description of this command:**

Sends a Reset Remote Link command to the protection. This command can be sent to IEC870-5-103 based slave devices before they respond, although it is already sent automatically by most commands.

**Methods used to run this command:**

Digital Output (WriteBooleanValues)

**Number of points accepted by this command:**

1

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

1

**Values that are sent:**

Value in PointValue (0) = Ignored

## *Send Short Message*

**Description of this command:**

Sends a custom short message command to the protection.

**Methods used to run this command:**

Digital Output (WriteBooleanValues)

**Number of points accepted by this command:**

1

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

Frame type to be sent (0 to 15), where:

- Bit 3 = RES = Reserved (typically 0)
- Bit 2 = PRM = Primary message (typically 1 for master / controlling station)
- Bit 1 = FCB Frame count bit: 0 - 1 = alternating bit for successive SEND/CONFIRM or REQUEST/RESPOND services per station.
- Bit 0 = FCV Frame count bit valid (1 if alternating function of FCB bit is valid)

**Meaning of the DriverP3 parameter:**

Function code to be sent, where:

- 0 = Reset remote link
- 1 = Reset of user process

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- 2 = Reserved for balanced mode
- 3 = User data
- 4 = User data
- 5 = Reserved
- 6 = Reserved for special use agreement
- 7 = Function code sent by Areva Alstom S&R-103
- 8 = Expected response specifies access demand
- 9 = Request status of link
- 10 = Request user data class 1
- 11 = Request user data class 2
- 12 = Reserved
- 13 = Reserved
- 14 = Reserved for special use by agreement
- 15 = Reserved for special use by agreement

## Meaning of the DriverP4 parameter:

- Expected function code to be received, where:
- 0 = CONFIRM ACK: Positive acknowledgement
  - 1 = CONFIRM NACK: message not accepted, link busy
  - 2 = Reserved
  - 3 = Reserved
  - 4 = Reserved
  - 5 = Reserved
  - 6 = Reserved for special use by agreement
  - 7 = Reserved for special use by agreement
  - 8 = RESPOND User data
  - 9 = RESPOND NACK: requested data not available
  - 10 = Reserved
  - 11 = RESPOND Status of link or access demand
  - 12 = Reserved
  - 13 = Reserved for special use by agreement
  - 14 = Link service not functioning
  - 15 = Link service not implemented

## Values that are sent:

- Value in PointValue (0) = Ignored

## Synchronize

### Description of this command:

Sets a new time in the protection using the PC clock date and time.

*This command follows this procedure:*

- The driver sends the current PC clock date and time (plus the estimated transmission delay indicated in DriverP6) to the protection.
- Returns status or error information about the synchronization result.

### Methods used to run this command:

Analog Input (ReadNumericValues)

### Number of points accepted by this command:

1-3

### Meaning of the DriverP0 parameter:

Unit Address (1-255).

### Meaning of the DriverP1 parameter:

4

### Meaning of the DriverP2 parameter:

Not used.

### Meaning of the DriverP3 parameter:

Indicates the format for returned dates:

- 0 = Use English format (MM/DD/YYYY hh:mm:ss.000)
- 1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### Meaning of the DriverP4 parameter:

Not used.

### Meaning of the DriverP5 parameter:

Not used.

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**Meaning of the DriverP6 parameter:**

Estimated communication delay when transmitting data to the protection, in milliseconds. This delay has to do with the communication link and compensates the elapsed time between the moment the driver transmits the telegram with the PC clock date and time to the protection and the moment the telegram is received and processed by the protection.

**Values that are returned:**

Value in PointValue (0) = 1 if synchronized OK, 2 if error synchronizing.

Text in PointText (0) = Returned status or error message.

Text in PointText (1) = PC clock date and time at the moment of synchronization.

Text in PointText (2) = PC clock date and time at the moment of synchronization corrected with transmission delay, actually sent to the protection.

[Alstom PD-552 Commands]

## Alstom PD-552 Commands

### *Read phys. state signals LED 2-16*

**Description of this command:**

Returns a set of values for phys. state signals LED 2-16.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

15

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

8Ch

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

085000:A,085003:A,085006:A,085009:A,085012:A,085015:A,085018:A,085021:A,085024:A,085027:A,085030:A,085033:A,085036:A,085039:A,085042:A

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = LED H02 (Blocked/faulty)

Value in PointValue (1) = LED H03 (Warning)

Value in PointValue (2) = LED H04 (Fault A)

Value in PointValue (3) = LED H05 (Fault B)

Value in PointValue (4) = LED H06 (Fault C)

Value in PointValue (5) = LED H07 (Fault N)

Value in PointValue (6) = LED H08 (Gen. trip signal)

Value in PointValue (7) = LED H09 (Direction Nbw)

Value in PointValue (8) = LED H10

Value in PointValue (9) = LED H11

Value in PointValue (10) = LED H12

Value in PointValue (11) = LED H13

Value in PointValue (12) = LED H14

Value in PointValue (13) = LED H15

Value in PointValue (14) = LED H16

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## *Read Log. State Signals 1*

**Description of this command:**

Returns a set of flags for Log. State Signals 1.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

20

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

8Ch

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

040060:Y,040061:Y,036045:Y,004061:Y,036086:Y,036051:Y,037018:Y,041022:Y,036047:Y,037070:Y,004060:Y,037071:Y,004065:Y,021013:Y,034017:Y,036006:Y,036007:Y,036008:Y,036023:Y,036071:Y

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = MAIN Blocking 1 EXT

Value in PointValue (1) = MAIN Blocking 2 EXT

Value in PointValue (2) = MAIN Trip cmd. block. EXT

Value in PointValue (3) = MAIN M.c.b. trip V EXT

Value in PointValue (4) = MAIN M.c.b. trip Vref EXT

Value in PointValue (5) = MAIN CB closed sig. EXT

Value in PointValue (6) = MAIN Man. trip cmd. EXT

Value in PointValue (7) = MAIN Man. close cmd. EXT

Value in PointValue (8) = MAIN Manual close EXT

Value in PointValue (9) = MAIN Test mode EXT

Value in PointValue (10) = MAIN Protect. not ready

Value in PointValue (11) = MAIN Test mode

Value in PointValue (12) = MAIN Blocked/faulty

Value in PointValue (13) = MAIN Trip cmd. blocked

Value in PointValue (14) = MAIN Manual trip signal

Value in PointValue (15) = MAIN Trip signal 1 A

Value in PointValue (16) = MAIN Trip signal 1 B

Value in PointValue (17) = MAIN Trip signal 1 C

Value in PointValue (18) = MAIN Gen. trip signal 2

Value in PointValue (19) = MAIN Gen. trip command 1

## *Read Log. State Signals 2*

**Description of this command:**

Returns a set of flags for Log. State Signals 2.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

20

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**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

8Ch

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

036022:Y,038103:Y,037009:Y,036001:Y,036002:Y,036003:Y,036070:Y,036100:Y,090019:Y,093040:Y,090010:Y,090021:Y,093041:Y,098011:Y,098000:Y,098021:Y,098002:Y,098003:Y,098004:Y,098006:Y

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = MAIN Gen. trip command 2

Value in PointValue (1) = MAIN Final trip

Value in PointValue (2) = MAIN Close command

Value in PointValue (3) = MAIN Starting A

Value in PointValue (4) = MAIN Starting B

Value in PointValue (5) = MAIN Starting C

Value in PointValue (6) = SFMON Warning (LED)

Value in PointValue (7) = SFMON Warning (relay)

Value in PointValue (8) = SFMON Blocking HW failure

Value in PointValue (9) = SFMON Hardware clock failure

Value in PointValue (10) = SFMON Battery failure

Value in PointValue (11) = SFMON Protection failure

Value in PointValue (12) = SFMON Clock sync. error

Value in PointValue (13) = SFMON M.c.b. trip Vref

Value in PointValue (14) = SFMON M.c.b. trip V

Value in PointValue (15) = SFMON FF. V triggered

Value in PointValue (16) = SFMON BUOC not active

Value in PointValue (17) = SFMON BUOC active w/o ARC

Value in PointValue (18) = SFMON BUOC active with ARC

Value in PointValue (19) = SFMON Telecom. faulty/PSIG

## *Read Log. State Signals 3*

**Description of this command:**

Returns a set of flags for Log. State Signals 3.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

15

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

8Ch

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

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1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

098018:Y,098016:Y,098017:Y,098014:Y,093071:Y,098001:Y,003030:Y,004060:Y,004065:Y,036050:Y,015064:Y,004069:Y,004068:Y,003090:d,003091:t

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = SFMON Peripheral fault  
Value in PointValue (1) = SFMON Meas.circ.V I faulty  
Value in PointValue (2) = SFMON Meas. circ. V faulty  
Value in PointValue (3) = SFMON Vneg triggered  
Value in PointValue (4) = SFMON Module A RAM faulty  
Value in PointValue (5) = SFMON Phase sequ. V faulty  
Value in PointValue (6) = MAIN Protection enabled  
Value in PointValue (7) = MAIN Protect. not ready  
Value in PointValue (8) = MAIN Blocked/faulty  
Value in PointValue (9) = ARC Blocking EXT  
Value in PointValue (10) = ARC Enabled  
Value in PointValue (11) = ARC Blocked  
Value in PointValue (12) = ARC Ready  
Value in PointValue (13) = MAIN Date  
Value in PointValue (14) = MAIN Time of day

*Read phys. state signals INP 61-96*

**Description of this command:**

Returns a set of values for phys. state signals INP 61-96.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

24

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

8Ch

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

152090:L,152093:L,152096:L,152099:L,152102:L,152105:L,152108:L,152111:L,152114:L,152117:L,152120:L,152123:L,152126:L,152129:L,152132:L,152135:L,152138:L,152141:L,152144:L,152147:L,152150:L,152153:L,152156:L,152159:L

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

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## Values that are returned:

Value in PointValue (0) = INP State U 61  
Value in PointValue (1) = INP State U 62  
Value in PointValue (2) = INP State U 63  
Value in PointValue (3) = INP State U 64  
Value in PointValue (4) = INP State U 65  
Value in PointValue (5) = INP State U 66  
Value in PointValue (6) = INP State U 71  
Value in PointValue (7) = INP State U 72  
Value in PointValue (8) = INP State U 73  
Value in PointValue (9) = INP State U 74  
Value in PointValue (10) = INP State U 75  
Value in PointValue (11) = INP State U 76  
Value in PointValue (12) = INP State U 81  
Value in PointValue (13) = INP State U 82  
Value in PointValue (14) = INP State U 83  
Value in PointValue (15) = INP State U 84  
Value in PointValue (16) = INP State U 85  
Value in PointValue (17) = INP State U 86  
Value in PointValue (18) = INP State U 91  
Value in PointValue (19) = INP State U 92  
Value in PointValue (20) = INP State U 93  
Value in PointValue (21) = INP State U 94  
Value in PointValue (22) = INP State U 95  
Value in PointValue (23) = INP State U 96

*Read phys. state signals INP 101-216*

## Description of this command:

Returns a set of values for phys. state signals INP 101-216.

## Methods used to run this command:

Analog Input (ReadNumericValues)

## Number of points accepted by this command:

24

## Meaning of the DriverP0 parameter:

Unit Address (1-255).

## Meaning of the DriverP1 parameter:

0

## Meaning of the DriverP2 parameter:

8Ch

## Meaning of the DriverP3 parameter:

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

## Meaning of the DriverP4 parameter:

Not used.

## Meaning of the DriverP5 parameter:

Number of retries with next information object, before discarding the whole communication.

## Meaning of the DriverP6 parameter:

Not used.

## Meaning of the DriverP7 parameter:

152162:L,152165:L,152168:L,152171:L,152174:L,152177:L,152180:L,152183:L,152186:L,152189:L,152192:L,152195:L,153086:L,153089:L,153092:L,153095:L,153098:L,153101:L,153104:L,153107:L,153110:L,153113:L,153116:L,153119:L

## Meaning of the DriverP8 parameter:

Not used.

## Meaning of the DriverP9 parameter:

Not used.

## Values that are returned:

Value in PointValue (0) = INP State U 101  
Value in PointValue (1) = INP State U 102  
Value in PointValue (2) = INP State U 103  
Value in PointValue (3) = INP State U 104

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Value in PointValue (4) = INP State U 105  
Value in PointValue (5) = INP State U 106  
Value in PointValue (6) = INP State U 111  
Value in PointValue (7) = INP State U 112  
Value in PointValue (8) = INP State U 113  
Value in PointValue (9) = INP State U 114  
Value in PointValue (10) = INP State U 115  
Value in PointValue (11) = INP State U 116  
Value in PointValue (12) = INP State U 201  
Value in PointValue (13) = INP State U 202  
Value in PointValue (14) = INP State U 203  
Value in PointValue (15) = INP State U 204  
Value in PointValue (16) = INP State U 205  
Value in PointValue (17) = INP State U 206  
Value in PointValue (18) = INP State U 211  
Value in PointValue (19) = INP State U 212  
Value in PointValue (20) = INP State U 213  
Value in PointValue (21) = INP State U 214  
Value in PointValue (22) = INP State U 215  
Value in PointValue (23) = INP State U 216

## *Read phys. state signals OUTP 61-98*

### **Description of this command:**

Returns a set of values for phys. state signals OUTP 61-98.

### **Methods used to run this command:**

Analog Input (ReadNumericValues)

### **Number of points accepted by this command:**

32

### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

### **Meaning of the DriverP1 parameter:**

0

### **Meaning of the DriverP2 parameter:**

8Ch

### **Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### **Meaning of the DriverP4 parameter:**

Not used.

### **Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

### **Meaning of the DriverP6 parameter:**

Not used.

### **Meaning of the DriverP7 parameter:**

150120:A,150123:A,150126:A,150129:A,150132:A,150135:A,150138:A,150141:A,150144:A,150147:A,150150:A,150153:A,150156:A,150159:A,150162:A,150165:A,150168:A,150171:A,150174:A,150177:A,150180:A,150183:A,150186:A,150189:A,150192:A,150195:A,150198:A,150201:A,150204:A,150207:A,150210:A,150213:A

### **Meaning of the DriverP8 parameter:**

Not used.

### **Meaning of the DriverP9 parameter:**

Not used.

### **Values that are returned:**

Value in PointValue (0) = OUTP State K 61

Value in PointValue (1) = OUTP State K 62

Value in PointValue (2) = OUTP State K 63

Value in PointValue (3) = OUTP State K 64

Value in PointValue (4) = OUTP State K 65

Value in PointValue (5) = OUTP State K 66

Value in PointValue (6) = OUTP State K 67

Value in PointValue (7) = OUTP State K 68

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Value in PointValue (8) = OUTP State K 71  
Value in PointValue (9) = OUTP State K 72  
Value in PointValue (10) = OUTP State K 73  
Value in PointValue (11) = OUTP State K 74  
Value in PointValue (12) = OUTP State K 75  
Value in PointValue (13) = OUTP State K 76  
Value in PointValue (14) = OUTP State K 77  
Value in PointValue (15) = OUTP State K 78  
Value in PointValue (16) = OUTP State K 81  
Value in PointValue (17) = OUTP State K 82  
Value in PointValue (18) = OUTP State K 83  
Value in PointValue (19) = OUTP State K 84  
Value in PointValue (20) = OUTP State K 85  
Value in PointValue (21) = OUTP State K 86  
Value in PointValue (22) = OUTP State K 87  
Value in PointValue (23) = OUTP State K 88  
Value in PointValue (24) = OUTP State K 91  
Value in PointValue (25) = OUTP State K 92  
Value in PointValue (26) = OUTP State K 93  
Value in PointValue (27) = OUTP State K 94  
Value in PointValue (28) = OUTP State K 95  
Value in PointValue (29) = OUTP State K 96  
Value in PointValue (30) = OUTP State K 97  
Value in PointValue (31) = OUTP State K 98

*Read phys. state signals OUTP 101-218*

**Description of this command:**

Returns a set of values for phys. state signals OUTP 101-218.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

32

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

8Ch

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

150216:A,150219:A,150222:A,150225:A,150228:A,150231:A,150234:A,150237:A,150240:A,150243:A,150246:A,150249:A,150252:A,150255:A,151002:A,151005:A,151200:A,151203:A,151206:A,151209:A,151212:A,151215:A,151218:A,151221:A,151224:A,151227:A,151230:A,151233:A,151236:A,151239:A,151242:A,151245:A

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = OUTP State K 101

Value in PointValue (1) = OUTP State K 102

Value in PointValue (2) = OUTP State K 103

Value in PointValue (3) = OUTP State K 104

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Value in PointValue (4) = OUTP State K 105  
Value in PointValue (5) = OUTP State K 106  
Value in PointValue (6) = OUTP State K 107  
Value in PointValue (7) = OUTP State K 108  
Value in PointValue (8) = OUTP State K 111  
Value in PointValue (9) = OUTP State K 112  
Value in PointValue (10) = OUTP State K 113  
Value in PointValue (11) = OUTP State K 114  
Value in PointValue (12) = OUTP State K 115  
Value in PointValue (13) = OUTP State K 116  
Value in PointValue (14) = OUTP State K 117  
Value in PointValue (15) = OUTP State K 118  
Value in PointValue (16) = OUTP State K 201  
Value in PointValue (17) = OUTP State K 202  
Value in PointValue (18) = OUTP State K 203  
Value in PointValue (19) = OUTP State K 204  
Value in PointValue (20) = OUTP State K 205  
Value in PointValue (21) = OUTP State K 206  
Value in PointValue (22) = OUTP State K 207  
Value in PointValue (23) = OUTP State K 208  
Value in PointValue (24) = OUTP State K 211  
Value in PointValue (25) = OUTP State K 212  
Value in PointValue (26) = OUTP State K 213  
Value in PointValue (27) = OUTP State K 214  
Value in PointValue (28) = OUTP State K 215  
Value in PointValue (29) = OUTP State K 216  
Value in PointValue (30) = OUTP State K 217  
Value in PointValue (31) = OUTP State K 218

## *Read DeviceID Parameters*

### **Description of this command:**

Returns a set of values DeviceID Parameters.

### **Methods used to run this command:**

Analog Input (ReadNumericValues)

### **Number of points accepted by this command:**

11

### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

### **Meaning of the DriverP1 parameter:**

0

### **Meaning of the DriverP2 parameter:**

8Ch

### **Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### **Meaning of the DriverP4 parameter:**

Not used.

### **Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

### **Meaning of the DriverP6 parameter:**

Not used.

### **Meaning of the DriverP7 parameter:**

000000:u,002120:u2,002122:d,002121:u,002125:u,002124:u1,000001:u,000002:u,000035:u,000036:u,000037:u

### **Meaning of the DriverP8 parameter:**

Not used.

### **Meaning of the DriverP9 parameter:**

Not used.

### **Values that are returned:**

Value in PointValue (0) = DVICE Device type

Value in PointValue (1) = DVICE Software version

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Text in PointText (2) = DVICE SW date  
Value in PointValue (3) = DVICE Text version data model  
Value in PointValue (4) = DVICE Serial number 1  
Value in PointValue (5) = DVICE Serial number 2  
Value in PointValue (6) = DVICE Order No. 1  
Value in PointValue (7) = DVICE Order No. 2  
Value in PointValue (8) = DVICE Device Id  
Value in PointValue (9) = DVICE Substation Id  
Value in PointValue (10) = DVICE Feeder Id

## *Read Measured Operating Data*

### **Description of this command:**

Returns a set of values for Measured Operating Data.

### **Methods used to run this command:**

Analog Input (ReadNumericValues)

### **Number of points accepted by this command:**

31

### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

### **Meaning of the DriverP1 parameter:**

0

### **Meaning of the DriverP2 parameter:**

8Ch

### **Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### **Meaning of the DriverP4 parameter:**

Not used.

### **Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

### **Meaning of the DriverP6 parameter:**

Not used.

### **Meaning of the DriverP7 parameter:**

003090:d,003091:t,004040:u2,005050:u,005036:u,005034:u,005055:u,005040:u,006040:u,007040:u,005010:u,004043:u,008042:u1,009042:u1,005042:u1,006042:u1,007042:u1,005012:u1,004041:u1,005046:u1,008044:u1,009044:u1,005044:u1,006044:u1,007044:u1,004050:i1,004052:i1,005061:u2,005062:u2,005063:u2,005064:u2

### **Meaning of the DriverP8 parameter:**

Not used.

### **Meaning of the DriverP9 parameter:**

Not used.

### **Values that are returned:**

Text in PointText (0) = MAIN Date

Text in PointText (1) = MAIN Time of day

Value in PointValue (2) = MAIN Frequency (Hz)

Value in PointValue (3) = MAIN Current IP max prim. (A)

Value in PointValue (4) = MAIN IP max prim. delay (A)

Value in PointValue (5) = MAIN IP max prim. stored (A)

Value in PointValue (6) = MAIN Current IP min prim. (A)

Value in PointValue (7) = MAIN Current A prim. (A)

Value in PointValue (8) = MAIN Current B prim. (A)

Value in PointValue (9) = MAIN Current C prim. (A)

Value in PointValue (10) = MAIN Current Sum. IP prim. (A)

Value in PointValue (11) = MAIN Current IN prim. (A)

Value in PointValue (12) = MAIN Voltage VPG max prim. (kV)

Value in PointValue (13) = MAIN Voltage VPG min prim. (kV)

Value in PointValue (14) = MAIN Voltage A-G prim. (kV)

Value in PointValue (15) = MAIN Voltage B-G prim. (kV)

Value in PointValue (16) = MAIN Voltage C-G prim. (kV)

Value in PointValue (17) = MAIN Voltage Sum. VPG Div. 3 prim. (kV)

Value in PointValue (18) = MAIN Voltage VNG prim. (kV)

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Value in PointValue (19) = MAIN Voltage Vref prim. (kV)  
Value in PointValue (20) = MAIN Voltage VPP max prim. (kV)  
Value in PointValue (21) = MAIN Voltage VPP min prim. (kV)  
Value in PointValue (22) = MAIN Voltage A-B prim. (kV)  
Value in PointValue (23) = MAIN Voltage B-C prim. (kV)  
Value in PointValue (24) = MAIN Voltage C-A prim. (kV)  
Value in PointValue (25) = MAIN Active power P prim. (MW)  
Value in PointValue (26) = MAIN Reactive power Q prim. (MVar)  
Value in PointValue (27) = MAIN Active energy outp. prim. (MWh)  
Value in PointValue (28) = MAIN Active energy inp. prim. (MWh)  
Value in PointValue (29) = MAIN Reactive energy outp. prim. (MVar h)  
Value in PointValue (30) = MAIN Reactive energy inp. prim. (MVar h)

## *Read Measured Fault Data*

### **Description of this command:**

Returns a set of values for Measured Fault Data.

### **Methods used to run this command:**

Analog Input (ReadNumericValues)

### **Number of points accepted by this command:**

29

### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

### **Meaning of the DriverP1 parameter:**

0

### **Meaning of the DriverP2 parameter:**

8Ch

### **Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### **Meaning of the DriverP4 parameter:**

Not used.

### **Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

### **Meaning of the DriverP6 parameter:**

Not used.

### **Meaning of the DriverP7 parameter:**

004102,009100,009024,009020,009021,009022,009023,009026,009025,008010,004021,004079,  
004025,004026,004024,004049,004048,004029,004028,004023,004027,004022,004037,004038,  
004039,004091:u3,004089:u,004090:u2,009098:u

### **Meaning of the DriverP8 parameter:**

Not used.

### **Meaning of the DriverP9 parameter:**

Not used.

### **Values that are returned:**

Text in PointText (0) = OL\_DA Overload duration (s)  
Text in PointText (1) = GF\_DA GF recording time (min)  
Text in PointText (2) = GF\_DA GF duration pow.meas (min)  
Text in PointText (3) = GF\_DA Voltage VNG p.u. (VNG.nom)  
Text in PointText (4) = GF\_DA Current IN p.u. (IN.nom)  
Text in PointText (5) = GF\_DA Curr. IN act p.u. (IN.nom)  
Text in PointText (6) = GF\_DA Curr.IN reac p.u. (IN.nom)  
Text in PointText (7) = GF\_DA GF durat. curr.meas. (min)  
Text in PointText (8) = GF\_DA Curr. IN filt. p.u. (IN.nom)  
Text in PointText (9) = FT\_DA Fault duration (s)  
Text in PointText (10) = FT\_DA Running time (s)  
Text in PointText (11) = FT\_DA Meas. loop selected  
Text in PointText (12) = FT\_DA Fault current P p.u. (Inom)  
Text in PointText (13) = FT\_DA Flt.volt. PG/PP p.u. (Vnom)  
Text in PointText (14) = FT\_DA Fault loop angle P (degrees)  
Text in PointText (15) = FT\_DA Fault curr. N p.u. (Inom)  
Text in PointText (16) = FT\_DA Fault loop angle N (degrees)

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Text in PointText (17) = FT\_DA Fault react. prim. (Ohms)  
Text in PointText (18) = FT\_DA Fault reactance sec. (Ohms)  
Text in PointText (19) = FT\_DA Fault impedance sec. (Ohms)  
Text in PointText (20) = FT\_DA Fault locat. percent (%)  
Text in PointText (21) = FT\_DA Fault location (km)  
Text in PointText (22) = FT\_DA Load imped.post-flt. (Ohms)  
Text in PointText (23) = FT\_DA Load angle post-flt. (degrees)  
Text in PointText (24) = FT\_DA Resid.curr. post-flt (Inom)  
Text in PointText (25) = ASC Volt. magn. diff. (Vnom)  
Text in PointText (26) = ASC Angle difference (degrees)  
Text in PointText (27) = ASC Freq. difference (Hz)  
Text in PointText (28) = GFSC Angle VNG/IN (degrees)  
[Alstom PQ-721 Commands]

## Alstom PQ-721 Commands

### Read State Signal Functions 1

#### Description of this command:

Returns a first set of flag states for State Signal Functions.

#### Methods used to run this command:

Analog Input (ReadNumericValues)

#### Number of points accepted by this command:

23

#### Meaning of the DriverP0 parameter:

Unit Address (1-255).

#### Meaning of the DriverP1 parameter:

0

#### Meaning of the DriverP2 parameter:

8Ch

#### Meaning of the DriverP3 parameter:

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

#### Meaning of the DriverP4 parameter:

Not used.

#### Meaning of the DriverP5 parameter:

Number of retries with next information object, before discarding the whole communication.

#### Meaning of the DriverP6 parameter:

Not used.

#### Meaning of the DriverP7 parameter:

041006:Y,041007:Y,041002:Y,041003:Y,041004:Y,041011:Y,041012:Y,041013:Y,041015:Y,004080:Y,004081:Y,037030:Y,037031:Y,037032:Y,037033:Y,037034:Y,037035:Y,037036:Y,037037:Y,040016:Y,040017:Y,040018:Y,040019:Y

#### Meaning of the DriverP8 parameter:

Not used.

#### Meaning of the DriverP9 parameter:

Not used.

#### Values that are returned:

Value in PointValue (0) = OVL Trip signal

Value in PointValue (1) = OVL Trip command

Value in PointValue (2) = DIFF Diff 1 trip signal

Value in PointValue (3) = DIFF Diff 2 trip signal

Value in PointValue (4) = DIFF Diff 3 trip signal

Value in PointValue (5) = DIFF Harmonic block act.

Value in PointValue (6) = DIFF Saturat. discr. act.

Value in PointValue (7) = DIFF Overflux. block act.

Value in PointValue (8) = DIFF Filter running

Value in PointValue (9) = PASS Buchholz alarm

Value in PointValue (10) = PASS Buchholz trip

Value in PointValue (11) = PASS Output 1 (updating)

Value in PointValue (12) = PASS Output 2 (updating)

Value in PointValue (13) = PASS Output 3 (updating)

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Value in PointValue (14) = PASS Output 4 (updating)  
Value in PointValue (15) = PASS Output 1 (latching)  
Value in PointValue (16) = PASS Output 2 (latching)  
Value in PointValue (17) = PASS Output 3 (latching)  
Value in PointValue (18) = PASS Output 4 (latching)  
Value in PointValue (19) = PASS Input 1 EXT  
Value in PointValue (20) = PASS Input 2 EXT  
Value in PointValue (21) = PASS Input 3 EXT  
Value in PointValue (22) = PASS Input 4 EXT

## *Read State Signal Functions 2*

### **Description of this command:**

Returns a second set of flag states for State Signal Functions.

### **Methods used to run this command:**

Analog Input (ReadNumericValues)

### **Number of points accepted by this command:**

22

### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

### **Meaning of the DriverP1 parameter:**

0

### **Meaning of the DriverP2 parameter:**

8Ch

### **Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### **Meaning of the DriverP4 parameter:**

Not used.

### **Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

### **Meaning of the DriverP6 parameter:**

Not used.

### **Meaning of the DriverP7 parameter:**

040020:Y,041005:Y,004065:Y,021013:Y,036045:Y,037018:Y,041001:Y,041010:Y,041008:Y,041009:Y,037072:Y,037073:Y,037074:Y,037075:Y,037070:Y,037071:Y,035000:Y,036089:Y,041014:Y,035001:Y,035002:Y,036070:Y

### **Meaning of the DriverP8 parameter:**

Not used.

### **Meaning of the DriverP9 parameter:**

Not used.

### **Values that are returned:**

Value in PointValue (0) = PASS Output 1 (t)

Value in PointValue (1) = REF Trip signal

Value in PointValue (2) = MAIN Blocked/faulty

Value in PointValue (3) = MAIN Trip cmd. blocked

Value in PointValue (4) = MAIN Trip cmd. block EXT

Value in PointValue (5) = MAIN Man. trip cmd. EXT

Value in PointValue (6) = MAIN Trip command

Value in PointValue (7) = MAIN Trip signal

Value in PointValue (8) = I>IND Overcurrent/end b

Value in PointValue (9) = I>IND Overcurrent/end c

Value in PointValue (10) = ILSA Command enable EXT

Value in PointValue (11) = ILSA Command enable

Value in PointValue (12) = ILSA Sig./meas.block EXT

Value in PointValue (13) = ILSA Sig./meas. block

Value in PointValue (14) = PCILS Test mode EXT

Value in PointValue (15) = PCILS Test mode

Value in PointValue (16) = FREC Fault occurrence

Value in PointValue (17) = FREC Trigger EXT

Value in PointValue (18) = FREC Id> triggered

Value in PointValue (19) = FREC Signal mem. overflow

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Value in PointValue (20) = FREC Faulty time tag  
Value in PointValue (21) = MON Warning

## *Read State Signal LED*

### **Description of this command:**

Returns status of Signal LEDs

### **Methods used to run this command:**

Analog Input (ReadNumericValues)

### **Number of points accepted by this command:**

12

### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

### **Meaning of the DriverP1 parameter:**

0

### **Meaning of the DriverP2 parameter:**

8Ch

### **Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### **Meaning of the DriverP4 parameter:**

Not used.

### **Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

### **Meaning of the DriverP6 parameter:**

Not used.

### **Meaning of the DriverP7 parameter:**

057000:A,057002:A,057004:A,057006:A,057008:A,057010:A,057012:A,057014:A,057016:A,057018:A,057020:A,057022:A

### **Meaning of the DriverP8 parameter:**

Not used.

### **Meaning of the DriverP9 parameter:**

Not used.

### **Values that are returned:**

Value in PointValue (0) = LED H01 (Warning)

Value in PointValue (1) = LED H02 (Operation)

Value in PointValue (2) = LED H03 (Blocked/faulty)

Value in PointValue (3) = LED H04 (Diff. 1 trip)

Value in PointValue (4) = LED H05 (Diff. 2 trip)

Value in PointValue (5) = LED H06 (Diff. 3 trip)

Value in PointValue (6) = LED H07 (Harm. block)

Value in PointValue (7) = LED H08 (Sat. discrim.)

Value in PointValue (8) = LED H09 (Buchholz alarm)

Value in PointValue (9) = LED H10 (Buchholz trip)

Value in PointValue (10) = LED H11 (Overcurrent b)

Value in PointValue (11) = LED H12 (Overcurrent c)

## *Read State Sign. Bin Outp.*

### **Description of this command:**

Returns State Sign. Bin Outp.

### **Methods used to run this command:**

Analog Input (ReadNumericValues)

### **Number of points accepted by this command:**

8

### **Meaning of the DriverP0 parameter:**

Unit Address (1-255).

### **Meaning of the DriverP1 parameter:**

0

### **Meaning of the DriverP2 parameter:**

8Ch

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**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

051000:A,051002:A,051004:A,051006:A,051008:A,051010:A,051012:A,051014:A

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = OUTP State K 11

Value in PointValue (1) = OUTP State K 12

Value in PointValue (2) = OUTP State K 13

Value in PointValue (3) = OUTP State K 14

Value in PointValue (4) = OUTP State K 21

Value in PointValue (5) = OUTP State K 22

Value in PointValue (6) = OUTP State K 23

Value in PointValue (7) = OUTP State K 24

## *Read State Sign. Bin Inp.*

**Description of this command:**

Returns State Sign. Bin Inp.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

8

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

8Ch

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

054000:L,054003:L,054006:L,054009:L,054012:L,054015:L,054018:L,054021:L

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = INP State U 11

Value in PointValue (1) = INP State U 12

Value in PointValue (2) = INP State U 13

Value in PointValue (3) = INP State U 14

Value in PointValue (4) = INP State U 21

Value in PointValue (5) = INP State U 22

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Value in PointValue (6) = INP State U 23  
Value in PointValue (7) = INP State U 24

## Read IDENT Parameters

### Description of this command:

Returns a set of IDENT Parameters.

### Methods used to run this command:

Analog Input (ReadNumericValues)

### Number of points accepted by this command:

11

### Meaning of the DriverP0 parameter:

Unit Address (1-255).

### Meaning of the DriverP1 parameter:

0

### Meaning of the DriverP2 parameter:

8Ch

### Meaning of the DriverP3 parameter:

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

### Meaning of the DriverP4 parameter:

Not used.

### Meaning of the DriverP5 parameter:

Number of retries with next information object, before discarding the whole communication.

### Meaning of the DriverP6 parameter:

Not used.

### Meaning of the DriverP7 parameter:

000000:u,000001:u,000002:u,000050:u,000053:u1,000079:@,000080:@,002000:u2,002018:u2,0  
02048:u2,002049:u2

### Meaning of the DriverP8 parameter:

Not used.

### Meaning of the DriverP9 parameter:

Not used.

### Values that are returned:

Value in PointValue (0) = IDENT Device type

Value in PointValue (1) = IDENT Order No. 1/2

Value in PointValue (2) = IDENT Order No. 2/2

Value in PointValue (3) = IDENT Auxiliary voltage (V)

Value in PointValue (4) = IDENT Nominal frequency (Hz)

Value in PointValue (5) = IDENT Model

Value in PointValue (6) = IDENT Add. HW modules

Value in PointValue (7) = IDENT Data model

Value in PointValue (8) = IDENT SW version L

Value in PointValue (9) = IDENT SW version OS

Value in PointValue (10) = IDENT SW version A

Nombre2=Read IDENT Order Ext. Numbers

SubComando2=X8705ILS,AI,35,"[RELE.DIRECCION]","0","8Ch","1","","0",""

000003:u,000001:u,000002:u,000050:u,000053:u1,000079:@,000080:@,002000:u2,002018:u2,0

02048:u2,002049:u2",""," Tags2="\$0:IDENT Order ext. No. 01", "\$1:IDENT Order ext. No. 02",

"\$2:IDENT Order ext. No. 03", "\$3:IDENT Order ext. No. 04", "\$4:IDENT Order ext. No. 05",

"\$5:IDENT Order ext. No. 06", "\$6:IDENT Order ext. No. 07", "\$7:IDENT Order ext. No. 08",

"\$8:IDENT Order ext. No. 09", "\$9:IDENT Order ext. No. 10", "\$10:IDENT Order ext. No. 11",

"\$11:IDENT Order ext. No. 12", "\$12:IDENT Order ext. No. 13", "\$13:IDENT Order ext. No. 14",

"\$14:IDENT Order ext. No. 15", "\$15:IDENT Order ext. No. 16", "\$16:IDENT Order ext. No. 17",

"\$17:IDENT Order ext. No. 18", "\$18:IDENT Order ext. No. 19", "\$19:IDENT Order ext. No. 20",

"\$20:IDENT Order ext. No. 21", "\$21:IDENT Order ext. No. 22", "\$22:IDENT Order ext. No. 23",

"\$23:IDENT Order ext. No. 24", "\$24:IDENT Order ext. No. 25", "\$25:IDENT Order ext. No. 26",

"\$26:IDENT Order ext. No. 27", "\$27:IDENT Order ext. No. 28", "\$28:IDENT Order ext. No. 29",

"\$29:IDENT Order ext. No. 30", "\$30:IDENT Order ext. No. 31", "\$31:IDENT Order ext. No. 32",

"\$32:IDENT Order ext. No. 33", "\$33:IDENT Order ext. No. 34", "\$34:IDENT Order ext. No. 35",

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## *Read IDENT Order Ext. Numbers 1-18*

**Description of this command:**

Returns IDENT Order Ext. Numbers. from 1 to 18

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

18

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

8Ch

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

000003:u,000004:u,000005:u,000006:u,000007:u,000008:u,000009:u,000010:u,000011:u,000012:u,000013:u,000014:u,000015:u,000016:u,000017:u,000018:u,000019:u,000020:u

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = IDENT Order ext. No. 1

Value in PointValue (1) = IDENT Order ext. No. 2

Value in PointValue (2) = IDENT Order ext. No. 3

Value in PointValue (3) = IDENT Order ext. No. 4

Value in PointValue (4) = IDENT Order ext. No. 5

Value in PointValue (5) = IDENT Order ext. No. 6

Value in PointValue (6) = IDENT Order ext. No. 7

Value in PointValue (7) = IDENT Order ext. No. 8

Value in PointValue (8) = IDENT Order ext. No. 9

Value in PointValue (9) = IDENT Order ext. No. 10

Value in PointValue (10) = IDENT Order ext. No. 11

Value in PointValue (11) = IDENT Order ext. No. 12

Value in PointValue (12) = IDENT Order ext. No. 13

Value in PointValue (13) = IDENT Order ext. No. 14

Value in PointValue (14) = IDENT Order ext. No. 15

Value in PointValue (15) = IDENT Order ext. No. 16

Value in PointValue (16) = IDENT Order ext. No. 17

Value in PointValue (17) = IDENT Order ext. No. 18

## *Read IDENT Order Ext. Numbers 19-35*

**Description of this command:**

Returns IDENT Order Ext. Numbers. from 19 to 35

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

17

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

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**Meaning of the DriverP2 parameter:**

8Ch

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

000021:u,000022:u,000023:u,000024:u,000025:u,000026:u,000027:u,000028:u,000029:u,000030:

u,000031:u,000032:u,000033:u,000034:u,000035:u,000036:u,000037:u

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = IDENT Order ext. No. 19

Value in PointValue (1) = IDENT Order ext. No. 20

Value in PointValue (2) = IDENT Order ext. No. 21

Value in PointValue (3) = IDENT Order ext. No. 22

Value in PointValue (4) = IDENT Order ext. No. 23

Value in PointValue (5) = IDENT Order ext. No. 24

Value in PointValue (6) = IDENT Order ext. No. 25

Value in PointValue (7) = IDENT Order ext. No. 26

Value in PointValue (8) = IDENT Order ext. No. 27

Value in PointValue (9) = IDENT Order ext. No. 28

Value in PointValue (10) = IDENT Order ext. No. 29

Value in PointValue (11) = IDENT Order ext. No. 30

Value in PointValue (12) = IDENT Order ext. No. 31

Value in PointValue (13) = IDENT Order ext. No. 32

Value in PointValue (14) = IDENT Order ext. No. 33

Value in PointValue (15) = IDENT Order ext. No. 34

Value in PointValue (16) = IDENT Order ext. No. 35

## *Read Measured Operating Data*

**Description of this command:**

Returns a set of values for Measured Operating Data.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

19

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

8Ch

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

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**Meaning of the DriverP7 parameter:**

005086:u3,005087:u3,005088:u3,006086:u3,006087:u3,006088:u3,007086:u3,007087:u3,007088:u3,008086:u3,008087:u3,005080:u3,005081:u3,006080:u3,006081:u3,007080:u3,007081:u3,008080:u3,008081:u3

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = OMEAS Current Ia A p.u. (In)  
Value in PointValue (1) = OMEAS Current Ib A p.u. (In)  
Value in PointValue (2) = OMEAS Current Ic A p.u. (In)  
Value in PointValue (3) = OMEAS Current Ia B p.u. (In)  
Value in PointValue (4) = OMEAS Current Ib B p.u. (In)  
Value in PointValue (5) = OMEAS Current Ic B p.u. (In)  
Value in PointValue (6) = OMEAS Current Ia C p.u. (In)  
Value in PointValue (7) = OMEAS Current Ib C p.u. (In)  
Value in PointValue (8) = OMEAS Current Ic C p.u. (In)  
Value in PointValue (9) = OMEAS Current IN1 p.u. (In)  
Value in PointValue (10) = OMEAS Current IN2 p.u. (In)  
Value in PointValue (11) = OMEAS Diff. current 1 (IB)  
Value in PointValue (12) = OMEAS Restrain. current 1 (IB)  
Value in PointValue (13) = OMEAS Diff. current 2 (IB)  
Value in PointValue (14) = OMEAS Restrain. current 2 (IB)  
Value in PointValue (15) = OMEAS Diff. current 3 (IB)  
Value in PointValue (16) = OMEAS Restrain. current 3 (IB)  
Value in PointValue (17) = OMEAS Diff. current N (IB)  
Value in PointValue (18) = OMEAS Restrain. current N (IB)

## *Read Event Counters Fault Data*

**Description of this command:**

Returns a set of values for Event Counters - Measured Operating Data and Event Recordings.

**Methods used to run this command:**

Analog Input (ReadNumericValues)

**Number of points accepted by this command:**

17

**Meaning of the DriverP0 parameter:**

Unit Address (1-255).

**Meaning of the DriverP1 parameter:**

0

**Meaning of the DriverP2 parameter:**

8Ch

**Meaning of the DriverP3 parameter:**

Indicates the format for returned dates:

0 = Use English format (MM/DD/YYYY hh:mm:ss.000)

1 = Use Spanish format (DD/MM/YYYY hh:mm:ss.000)

**Meaning of the DriverP4 parameter:**

Not used.

**Meaning of the DriverP5 parameter:**

Number of retries with next information object, before discarding the whole communication.

**Meaning of the DriverP6 parameter:**

Not used.

**Meaning of the DriverP7 parameter:**

004010:u,004020:u,004019:u,005082:u2,005083:u2,005084:u2,005085:u2,006082:u2,006083:u2,006084:u2,006085:u2,007082:u2,007083:u2,007084:u2,007085:u2,008082:u2,008083:u2

**Meaning of the DriverP8 parameter:**

Not used.

**Meaning of the DriverP9 parameter:**

Not used.

**Values that are returned:**

Value in PointValue (0) = FREC No. system disturb.

Value in PointValue (1) = FREC No. of faults

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Value in PointValue (2) = MON No. of mon. signals  
Value in PointValue (3) = FMEAS Diff. current 1 (IB)  
Value in PointValue (4) = FMEAS Restrain.current (IB)  
Value in PointValue (5) = FMEAS 2\*f0 current 1 (IB)  
Value in PointValue (6) = FMEAS 5\*f0 current 1 (IB)  
Value in PointValue (7) = FMEAS Diff. current 2 (IB)  
Value in PointValue (8) = FMEAS Restrain.current 2 (IB)  
Value in PointValue (9) = FMEAS 2\*f0 current 2 (IB)  
Value in PointValue (10) = FMEAS 5\*f0 current 2 (IB)  
Value in PointValue (11) = FMEAS Diff. current 3 (IB)  
Value in PointValue (12) = FMEAS Restrain.current 3 (IB)  
Value in PointValue (13) = FMEAS 2\*f0 current 3 (IB)  
Value in PointValue (14) = FMEAS 5\*f0 current 3 (IB)  
Value in PointValue (15) = FMEAS Diff. current N (IB)  
Value in PointValue (16) = FMEAS Restrain.current N (I

## 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  
[1007] DRIVER (Internal): Code logic error  
[1008] DRIVER (Internal): Command execution requires a valid license  
[1010] DRIVER (Internal): Error calculating elapsed milliseconds  
[1201] DRIVER (System): Error closing %s  
[1202] DRIVER (System): Error creating %s  
[1208] DRIVER (System): Error seeking end of %s  
[1210] DRIVER (System): Error writing to %s  
[1214] DRIVER (System): Error deleting %s  
[1300] PROTOCOL (Timeout): No answer  
[1313] PROTOCOL (Timeout): No answer from meter after retrying with a Start Communications message  
[1317] PROTOCOL (Remote): Link service not functioning  
[1318] PROTOCOL (Remote): Unexpected response from remote device  
[1332] PROTOCOL (Remote): Invalid date received  
[1333] PROTOCOL (Remote): Couldn't decode received date  
[1334] PROTOCOL (Remote): Invalid time received  
[1338] PROTOCOL (Remote): Couldn't decode reference date  
[1342] REPLY (Remote): Error synchronizing device or synchronization is not supported  
[1350] PROTOCOL (Remote): Reply from different unit address  
[1363] PROTOCOL (Remote): Invalid record/fault number received  
[1364] REPLY (Remote): Record number not available in remote device  
[1366] REPLY (Remote): Too many analog fault values received  
[1367] REPLY (Remote): Too many analog samples received  
[1368] REPLY (Remote): Unexpected number of analog samples received  
[1414] PROTOCOL (Format): Invalid received data length  
[1433] PROTOCOL (Format): Validation error in device response  
[1449] PROTOCOL (Format): Invalid device address in reply  
[1457] PROTOCOL (Format): Unexpected cause value in response  
[1468] PROTOCOL (Format): Invalid link control field in response  
[1469] PROTOCOL (Format): Invalid FCB in response  
[1470] PROTOCOL (Format): Invalid PRM in response  
[1471] PROTOCOL (Format): Invalid DFC in response  
[1472] PROTOCOL (Format): Different ASDU number received  
[1473] PROTOCOL (Format): Different information object address received  
[1476] PROTOCOL (Format): Unknown cause value in response  
[2001] CONFIG (DataType): Analog outputs are not supported by this driver  
[2002] CONFIG (DataType): Digital inputs are not supported by this driver  
[2177] CONFIG (NumValues): Too many values (max=100)  
[2305] CONFIG (List): Address list is empty  
[2306] CONFIG (List): Invalid format of address list

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[2307] CONFIG (List): Invalid address 1 in address list  
[2308] CONFIG (List): Invalid address 2 in address list  
[2309] CONFIG (List): Unsupported format in address list  
[3022] CONFIG (P0): Invalid device address (1-255)  
[3508] CONFIG (P1): Invalid command  
[4158] CONFIG (P2): Invalid record number (0-7)

## Supported devices

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

AEG PQ-721 Differential Protections  
AREVA ALSTOM PS-441 Directional Time-Overcurrent Protective Device  
AREVA ALSTOM PD-522 Distance Protection Devices  
AREVA ALSTOM PQ-721 Differential Protections

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