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ORBISPHERE Model 6110 OPC Client/Server Link

04/2015, Edition 2

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Prerequisites

PC

- Make sure that the OPC client software is installed and configured on the PC, following the instructions provided by the OPC client software provider

6110 Instrument

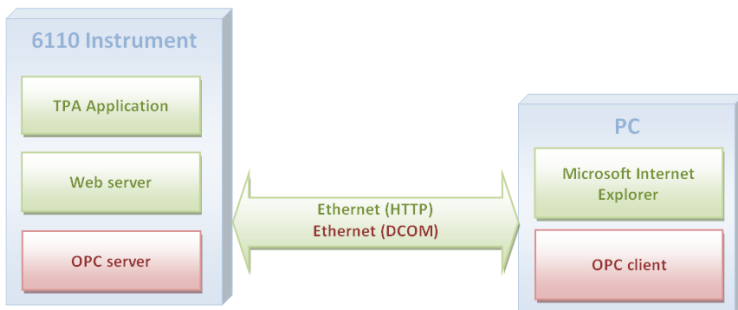
Verify the TPA software version and operating system by selecting **CONFIGURATION > Instrument parameters > System information** from the instrument and checking the main board installed versions.

- If the TPA software version is 3.03 or later, then the OPC link can be successfully installed
- Otherwise, for a successful installation, make sure that the TPA software version is 2.11 or later and that the operating system is version 1.10 or later

Overview

OPC (Open Process Control) is a software interface standard that allows Windows PC programs to communicate with industrial hardware devices. The OPC client software is installed on a PC and communicates directly with the OPC server installed on the 6110 instrument (as illustrated in Figure 1).

Figure 1 Ethernet configuration between 6110 instrument and local PC



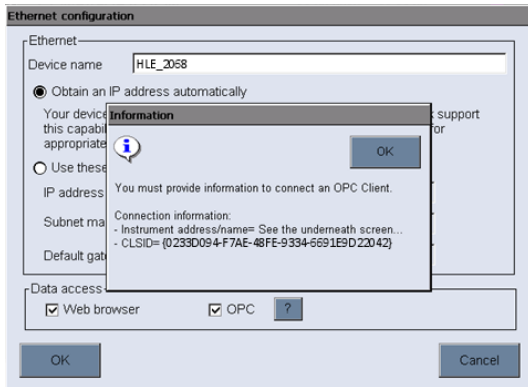
The OPC server feature allows communication with up to 5 OPC clients at the same time.

Set up the link between server and client

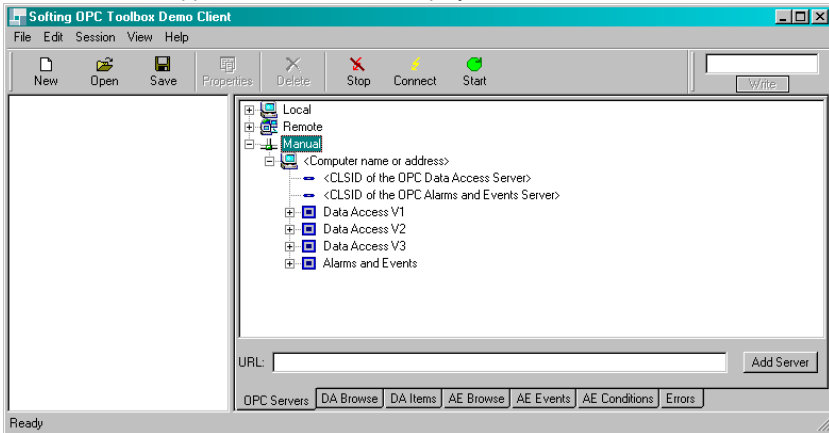
The server is installed on the 6110 instrument and the client on the PC. Follow these instructions to establish the link between the two.

Note: The PC screen shots illustrated below are from the **Softing OPC** software. If using software from a different supplier the screens will differ but the concept is still the same.

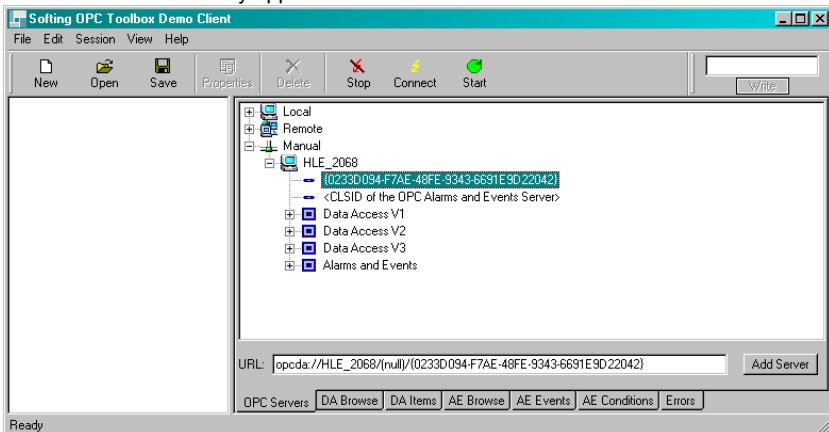
1. From the **CONFIGURATION** menu on the instrument select **Communication option** and then press the **Ethernet configuration** button.
2. Make a note of the instrument ID displayed in the **Device name** box of this screen, then check the **OPC** option at the bottom of the screen.
3. The first time this option is selected, a registration key is required. This can be found on the case of the Hach-Lange supplied OPC CD-ROM. Enter the registration key in the box provided.
4. After the registration key has been validated, press the information button next to the OPC checkbox to display the CLSID number as illustrated below. Make a note of this number.



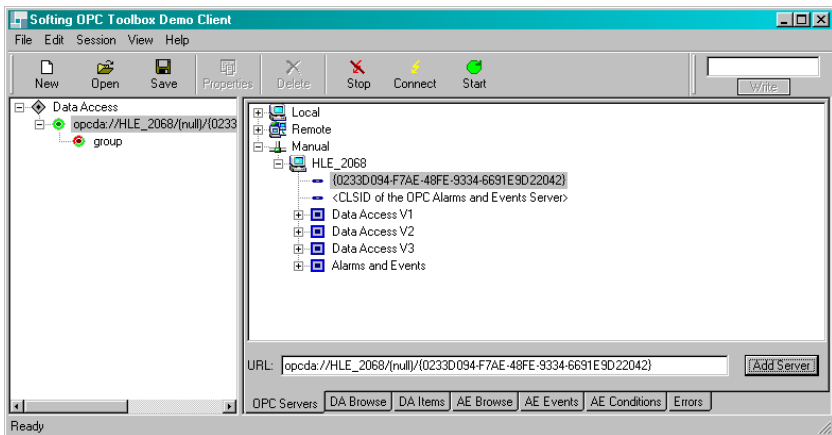
5. Start the OPC client application on the PC to display the initial screen.



6. Enter the CLSID number in the **<CLSID of the OPC Data Access Server>** field followed by the instrument ID in the **<Computer name or address>** field. Click on the CLSID number and the server URL will automatically appear in the URL box.

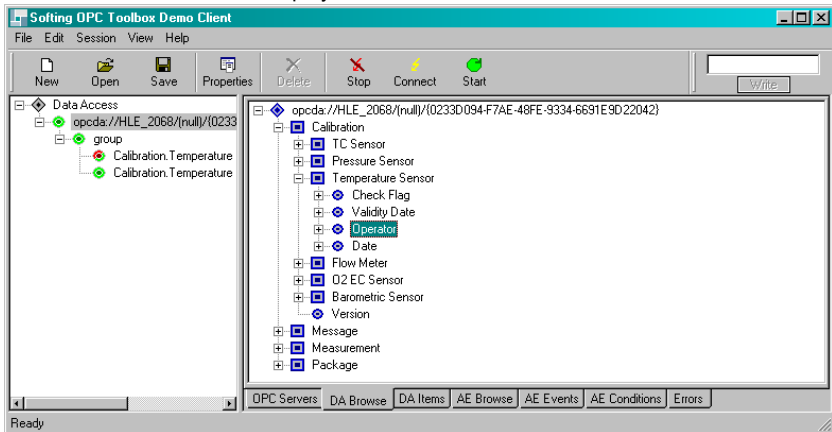


7. Click on the Add Server button to establish the link between the 6110 instrument and the PC.



Note: If communications problems are encountered between the OPC client and server it may be necessary to adjust the DCOM and/or Firewall configurations. Information on these can be found on the internet or from your OPC client software supplier.

8. Click on the DA Browse tab to display the data available.



Refer to the documentation for the OPC client software installed for details on accessing the data available.

OPC items

The OPC protocol identifies the data passed between server and client with a three level hierarchy called an item. The item may contain data, error messages, warning messages, etc.

To ensure total synchronization between PC and instrument, all modifications that are made to data elements on the instrument are automatically sent to the client PC as a message item.

The following data items are sent in read-only format from the instrument to the OPC client, and represent data from the 6110 instrument:

- **Package** - Data about the package currently selected by the instrument
- **Measurement** - Data about the last measurement made by the instrument
- **Calibration** - Data about the current calibration parameters being used by the instrument

Note: No historical data is available from the instrument.

Message items can be sent from the instrument to the OPC client ("**Message Out**" items) and from the OPC client to the instrument ("**Message In**" items).

All date fields are formatted according to the ISO 8601 extended format "YYYY-MM-DDThh:mm:ssZ" where "T" is the Date/Time separator and "Z" signifies "UTC time". An undefined date is sent as "0000-00-00T00:00:00Z"

"Message.Out.Package" item

The item "Package" is considered as **Level 1** in the three level hierarchy described in [OPC items](#) on page 5.

Level 2	Level 3
Version of the package data structure	
Name	
Index	
Solubility	
Measurement mode	
Formula 1	
Formula 2	
Formula 3	
Formula 4	
Formula 5	
Comment	
Volume	
Height	
Tilt position	
Backstop	
Type	
TP O2	Max Min Enabled
O2 liquid	Max Min Enabled
OS HS	Max Min Enabled
CO2 total	Max Min Enabled
CO2 liquid	Max Min Enabled
CO2 HS	Max Min Enabled

Level 2	Level 3
CO2 P/T	Max Min Enabled
HS volume	Max Min Enabled
Liquid volume	Max Min Enabled
DO2	Max Min Enabled
CO2 true	Max Min Enabled
Formula 1	Max Min Enabled
Formula 2	Max Min Enabled
Formula 3	Max Min Enabled
Formula 4	Max Min Enabled
Formula 5	Max Min Enabled

"Message.Out.Measure" item

The item "Measure" is considered as **Level 1** in the three level hierarchy described in [OPC items](#) on page 5.

Level 2	Level 3
Version of the measure data structure	
Time	
Record Nb	
User	ID Name
Package	ID Name

Level 2	Level 3
HS volume	
Liquid volume	
Package volume	
HS O2 quantity	
Liquid O2 quantity	
Total O2 quantity	
Liquid dissolved O2 concentration	
HS CO2 quantity	
Liquid CO2 quantity	
Total CO2 quantity	
CO2 pressure temperature	
CO2 true	
Liquid temperature	
Chamber temperature	
Barometric pressure	
HS pressure	
Formula 1	
Formula 2	
Formula 3	
Formula 4	
Formula 5	
User value	V1 V2
User comment	C1 C2 C3 C4 C5
Mode	
Normalization	
Normalization temperature	
Warnings	
Errors	

"Message.Out.Calibration" item

The item "Calibration" is considered as **Level 1** in the three level hierarchy described in [OPC items](#) on page 5.

Level 2	Level 3
Version of the calibration data structure	
TC sensor	Date Operator Validity date Check flag
O2 EC sensor	Date Operator Validity date Check flag
Flow meter	Date Operator Validity date Check flag
Temperature sensor	Date Operator Validity date Check flag
Pressure sensor	Date Operator Validity date Check flag
Barometric pressure sensor	Date Operator Validity date Check flag

"Measure.Errors" item

This item provides a list of any error(s) associated with the measurement. This is a **flag** field where the indicated value is computed by the addition of all active errors.

Error value	Error description
0x0000	No error
0x0001	Emergency error
0x0002	Motor error
0x0004	Door error
0x0008	Cover error
0x0010	Foam error
0x0020	Flow error
0x0040	Inferior pressure

Error value	Error description
0x0080	No package
0x0100	Ultrasound
0x0200	Upper limit
0x0400	Clear flag detection
0x0800	P2 too low
0x1000	HS pressure unstable
0x2000	Abort
0x4000	Wrong computation error
0x8000	Unknown error

"Measure.Warnings" item

This item provides a list of any warning(s) associated with the measurement. This is a **flag** field where the indicated value is computed by the addition of all active warnings.

Warning value	Warning description
0x0000	No warning
0x0001	Unstable reference pressure
0x0002	Package unmatched
0x0004	US time out gas exp.
0x0008	Reserved
0x0010	HS O2 unstable
0x0020	Insufficient gas
0x0040	Degas
0x0080	US insufficient gas
0x0100	Temperature time out
0x0200	HS pressure too low
0x0400	CO2 T2 out of specifications

"Messages.Message In.User ID" item

This item contains the user ID defined on the 6110 instrument.

"Messages.Message In.User Password" item

This item contains the user password defined on the 6110 instrument.

"Messages.Message In.New Package" item

This item specifies the index number of the next package to analyze. The index number starts at '1' and the maximum value is defined by the 6110 instrument. The index number must be a valid package number on the 6110 instrument.

Note: The package must be created directly on the 6110 instrument, or through a web browser connected to the 6110 web server. It cannot be created using the OPC link

"Messages.Message In.Show" item

This item shows the specified message on the instrument.

"Messages.Messages Out.State" item

This output item indicates when the package can be changed for a new measurement analysis.

State value	Stet description
Ready	The package ID can be set in order to start a measurement analysis. Note: Check the "Message Out.Errors" item to check if the analysis is able to start (see "Messages.Message Out.Errors" item on page 11).
Busy	The system is busy (e.g. measurement in progress, configuration being edited, etc.), preventing a measurement analysis being started.

"Messages.Message Out.Errors" item

This output item provides information about any error(s) associated with the system. An error prevents the instrument from running a measurement analysis. The instrument requires attention to correct the fault. This is a **flag** field where the indicated value is computed by the addition of all active errors.

Error value	Error description
0x00000000	No error
0x00000001	EC board
0x00000002	ADIO board
0x00000004	CTRL board
0x00000008	O2 sensor
0x00000010	O2 sensor residual
0x00000020	O2 sensor noisy
0x00000040	TC chip
0x00000080	Temperature sensor
0x00000100	Flow sensor
0x00000200	Pressure sensor
0x00000400	Foam detector
0x00000800	Electrovalves
0x00001000	Motor
0x00002000	Ultrasound
0x00004000	Protection cover
0x00008000	Front door
0x00010000	Emergency stop
0x00020000	Sensor status

Error value	Error description
0x00040000	Antifoam counter
0x00080000	Pending action
0x00100000	Pending manual action
0x00200000	No flow
0x00400000	RIM detector error
0x00800000	Upper limit
0x01000000	System initialization required
0x02000000	Communication error
0x04000000	ADIO board KO
0x08000000	CTRL board KO
0x10000000	EC board KO
0x20000000	CO2 foam out of specifications
0x40000000	Foam too many times

"Messages.Message Out.Warnings" item

This output item provides information about any warning(s) associated with the system. A warning does not prevent the instrument from running a measurement analysis. This is a **flag** field where the indicated value is computed by the addition of all active warnings.

The list items are identical to those listed in the corresponding errors table (see "[Messages.Message Out.Errors](#)" item on page 11).

"Messages.Message Out.Message In Last Error" item

This item indicates the last error raised by an incoming OPC message. For example, when a "Message In.New Package" item (see "[Messages.Message In.New Package](#)" item on page 10) requests setting the package to one that is not defined on the 6110 instrument, the error value will be "POOR".

Note: In the following table "*par_name*" represents the parameter name to which the error relates.

Error value	Error description
NONE	No error
UNKN <i>par_name</i>	Unknown parameter
POOR <i>par_name</i>	Parameter out of range
TYPE <i>par_name</i>	Parameter wrong type
DENY <i>par_name</i>	Parameter access denied
NR <i>par_name</i>	Not ready, a command has been received at the wrong time



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