

# ARGES pH Sensor Manual

## Product Overview

The ARGES pH sensor is an intelligent submersible solid state sensor manufactured by Keynes Control. It is manufactured using a high grade PVC (Polyvinyl Chloride) tube, and is fitted with a high performance wet mate network connector. The sensor is purely digital in operation and offers high performance measurements with a minimal temperature effect on the electronics. The advanced power saving design ensures the sensor is ideal for remote operations. The sensor can be used as a standalone sensor or as part of a multiparameter system. All ARGES sensors have built-in temperature sensors that can be used to record the sample temperature.

The sensor is fully user configurable and supports the advanced SDI12 V1.4 protocol.



## Product Images

This is a photograph of the pH Sensor, featuring a sleek black finish with its name prominently displayed for easy identification. The sensor has a unique identifier for easy network location.

These photographs showcase the pH Sensor in action, being used to test river quality in Abingdon, Oxfordshire.



Figure 1



Figure 2



Figure 3



Figure 4

## QLOG Applications Software

The ARGES pH sensor is supplied with a copy of the QLOG applications software. QLOG gives the user the ability to make configuration changes, take measurements, display real-time measurements and store results in spreadsheet format CSV text files for easy analysis.

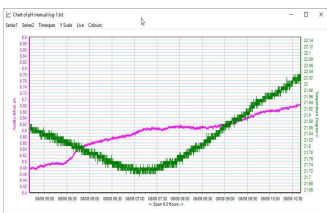


Figure 5

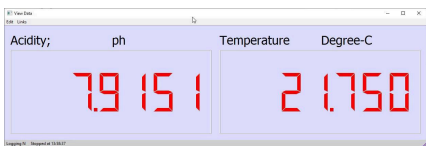


Figure 7

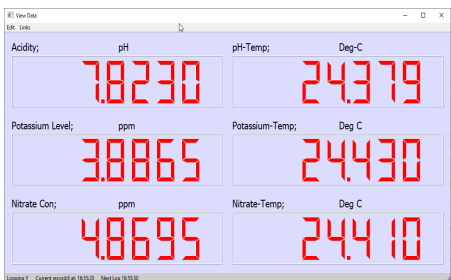


Figure 8

The images above show real-time measurements of pH in a series of panel meters and charts.

## ARGES pH Technical Features

Measurement range:	0 - 14 pH
Resolution:	0.1 pH - 4 digits 1 decimal places
Accuracy:	+/- 0.1 pH - Typical
Temperature	0 - 50 Deg C
Response	1 Sec Typically
Sensor recalibration Period	approximately 720 hours of use
pH range	0 - 14
Temperature Sensor	NTC 0 - 50 Deg C / 0.2 % accuracy
Store dry for long lifetime	
Sensor Type	Reference Cell + Glass Bulb
Built-in Digital Networks	SDI12 / RS485 / MODBUS Digital Communications
Calibration Details	Embedded - Last calibration date / User
Calibration Points	2 Point - others on request
Measurement Parameter Selection	User selectable measurement parameters
Standby Current	1 mA

The calibration procedure used with the pH sensor is described on page 9. The easiest way to calibrate a pH is to use the free QLOG software and buffer solutions.

## Measurement Integrity

A pH sensor makes measurements using a combination of solid state sensors to make a pH reading.. A solid state reference and a glass bulb sensor element form the pH sensor. The solid reference cell offers superior performance under pressure compared to gel based alternatives. The pH sensor does not require the reference cell to be refilled with a reagent.

## Measurement Variables

The following variables are available for use with the pH sensor.

The user can adjust the order and measurement variables being sent out from the sensor.

Letter	Description	Name	Units
	Main Sensor Readings		
A	Primary Value	pH	pH
B	Temperature	Deg	°C
E	mV pH	mV	mV
M	Temperature	DegC	°C

Table 1

## Communications with Windows PCs

### Equipment Required:

- |                          |                                                                                    |
|--------------------------|------------------------------------------------------------------------------------|
| 1. USB-SDI12-AG1         | Figures 9-12, USB to SDI12 media converter for use with the ARGES chemical sensors |
| 2. USB Cable             | Figure 13, Type 2.0 Male A to Type Male B cable                                    |
| 3. ARGES Network cable   | Figure 16                                                                          |
| 4. ARGES Extension cable | Figure 15                                                                          |

## Software

Use the Keynes Controls QLOG software

Download a copy from the [www.keynes-controls.co.uk](http://www.keynes-controls.co.uk) website and install onto a Windows Operating system computer. The software should run on Windows XP, 10 and 11 operating systems.

The software can be used without restriction. Any similar software that supports SDI12 network operations can be used instead.



Figure 9



Figure 10



Figure 11



Figure 12

Figures 14 and 16 show the network cables used with all ARGES chemical sensors.



Figure 13 USB 2.0 Type A Male to Type B Male



Figure 14



Figure 15 - ARGES Sensor network extension cable



Figure 16 ARGES Network Cable



Figure 17

Figure 17 opposite shows the ARGES network cable attached to the pH sensor.

Secure the sensor to the network cable using the red locking cap.

## Hardware Installation

The cables used with the ARGES pH sensor, media converter and network cables can only be fitted together in a single combination. It is not possible to connect the instrumentation together incorrectly.

1. Connect the USB cable into the base of the USB-SDI12-AG1 media converter. See Figures 10 and 13 on page 3 above.
2. Connect the orange extension cable or ARGES network cable to the blue binder connector on the USB-SDI12-AG1 media converter. See Figures 11 and 12 on page 3, or 18 and 19 below.



Figure 18



Figure 19

Network cable connection to the USB-SDI12-AG1 media converter.

Figure 18 shows the network cable alignment to the USB-SDI12-AG1 media cable.

A white marker on the Blue Binder connectors has to line-up for the cable to push onto the media converter.

Figure 19 shows the network cable terminated onto the media converter.

3. The black ARGES network cable shown in figure 16 above, is waterproof and safe for submergence with the pH sensor. It is terminated with a moulded 5-pin connector that fastens to the sensor and a blue IP68 rated Binder connector.

The 5-pin sensor terminating socket on the network cable is moulded into the cable end and ensures high integrity and reliable connection. The moulded socket is wet mate capable.

The orange extension cable is terminated with Binder IP68 plugs.

4. Terminate the ARGES network cable to pH sensor. It only fits one way onto the gold connector at the rear of the sensor. See Figure 22 below.. Lock into place on the sensor using the red securing ring.
5. Using the USB interface cable, Plug the USB type A socket into a standard USB port on the Windows PC. See Figures 9 and 13 on page 3 for more details.

As long as the Windows PC is powered on, and the USB port is operating to the correct technical specification then the blue status LED on the USBSDI12-AG1 media converter will illuminate. See Figure 12 on page 3.



Figure 20 - ARGES Network Cable



Figure 21 - ARGES Network Extension cable

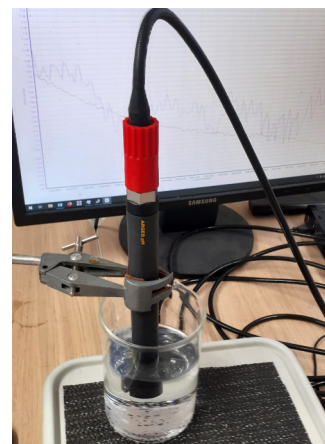


Figure 22 - pH sensor with network cable attached

## Powering the ARGES pH Sensor

The ARGES pH sensor is powered directly from the PC USB port via the USB-SDI12-AG1 media converter.

The USB-SDI12-AG1 media converter can power single sensors and multiparameter systems directly from the PC USB Port.



Figure 23 - USB-SDI12-AG1 Media Converter

## USB-SDI12-AG1 Device Drivers

The device driver software for the usb media converter automatically loads into the PC so long as an Internet connection is made. The media converter uses the FTDI chipset and the driver software is frequently already part of the Microsoft Windows operating systems.

## Further Information

All items shown in this document are available from the keynes Controls online shop.

See [keynes-controls.co.uk](http://keynes-controls.co.uk) for details, or E-mail [sales@keynes-controls.com](mailto:sales@keynes-controls.com)

## Pin-outs

The pin-out is standard on all ARGES range of chemical sensors.

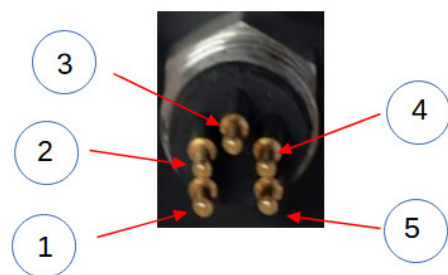


Figure 24

View looking into the sensor connector.

1 = - RS485

2 = + RS485

3 = SDI12 Data

4 = Gnd

5 = + 12V DC

## QLOG Software Quick User Guide

The ARGES pH sensor supports multiple digital communication networks. This manual only considers using the SDI12 network for communications using the USB media converter and QLOG software.

Required Information:

1. COM Port used by the USB-SDI12-AG1 media converter.

Use the Device Manager feature of the operating system to locate the USB-SDI12-AG1 COM port number.

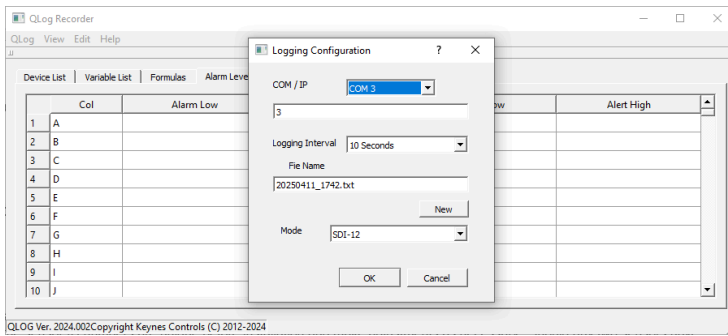


Figure 25 - QLOG Configuration Window

Enter the USB media converter COM port number into the QLOG Software Configuration Window.

The QLOG software has to identify the media converter so the sensor measurements can be read.

Select **QLOG - Configuration** menu option

The Window opposite will appear. Select the COM port number from the pull down list. In the example COM port 3 has been selected.

## QLOG Application Software Download

<https://keynes-controls.co.uk/q-log-software/>

## Network Selection

The ARGES pH sensor automatically detects the network on which has been connected by reading the network traffic.

The **USB-SDI12-AG1** media converter used with the ARGES pH sensor only supports the SDI12 network. Upon connecting the media converter to the instrument then the SDI12 network will be activated.

Select **SDI-12** menu option from the pull down list. See Figure 20 above.

## Recommended Sample Rate

1. A single sensor connected directly to a PC or similar data acquisition system

Maximum sample rate **1 Second**

Recommended sample rate **5 Seconds**

Once all the configuration settings have been assigned press the 'OK' button to store.

### Multiparameter Housing Sample rate

2. The fastest sample rate for a fully populated 7 Port SONDE is **10 Seconds**

Recommended sample rate is **30 Seconds**.

It is now possible to scan the network and identify the sensor

# Scanning the SDI12 Network

Select **F9** on the PC keyboard, or select 'Scan for Devices' from the QLOG menu system



Figure 26

Part Number: USB-SDI12-AG1

The USB-SDI12-AG1 media converter status indicators will flash on and off, see Figure 23 above.

## Identify pH Sensors in the network.

The SDI12 network supports 10 sensors each with an individual ID number for identification. The SDI12 ID number is an integer ranging from 0 to 9. Each sensor has a unique ID address.

Each sensor also has an Product Description string, in the case of the pH sensor this is

**a14KEYNESCOISELEC105pH00n** where a= ID Number n = Number sensors on the network

This has been assigned by Keynes Controls Ltd and is a standard feature of the SDI12 protocol.

where **a = ID number of the sensor**      **n = Number of sensor type on a network.**

Factory Default settings : **ID = 0** for all sensor types

Once the pH sensor has been identified on the network then it will appear under the Device list tab in the QLOG Software.

0							
1							
2	211214KEYNESCOISELEC105pH0002	ARGES pH	A..A	Setup	Config	IDv1.4	
3							

pH sensor initial network identification.

0							
1							
2	211214KEYNESCOISELEC105pH0002	ARGES pH	D..G	Setup	Config	IDv1.4	
3							

Figure 27 - Device List after a network scan

Figure 27 opposite shows 1 x pH sensor with **ID = 2**

Figure 24 shows a typical network scan when a single sensor is being used and has been identified as a pH sensor. The QLOG software does not yet understand what has to be done with the measurements that will be returned from the pH sensor.

The ARGES pH sensor returns typically 4 parameters. The user can set the number and order of the return parameters.

Note. The 4th column shown in Figure 24 shows the cell locations where the measurements will be stored in the results file. The QLOG software uses the same cell references as that of the common spreadsheets.

The first pH sensor above is shown storing measurements into cells A .. A. This is not possible and so no readings will make sense.

The first 3 cells referenced A..C are reserved and cannot be used by the user. The first cell that can be used is 'D', and you can see the second sensor shown storing values into cells D .. G.

Select '**Auto Assign**' function to automatically assign cell storage. See Figure 27 on page 8.



# Understanding the Sensor Parameters

An SDI12 sensor can return multiple measurements back to the PC or any other data acquisition system controlling the network.

The QLOG software has to be told which measurements the ARGES pH sensor will be sending to the PC to make sense of the results.

The ARGES pH sensor returns

Raw pH Output	pH
Base Concentration pH	pH
Temperature Corrected pH	pH
Sample Temperature	°C

## pH Measurements

L..R	Setup	Config	IDv1.4	
S..AB	Setup	Config	IDv1.4	
AC..AL	Setup	Config	IDv1.4	
AM..AQ	Setup	Config	IDv1.4	

Figure 28

Select the 'Setup' Button. See column 4 in Figure 24 (page 7).

The Device Setup Window shown in Figure 24 will appear.

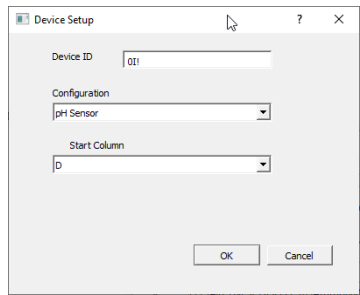


Figure 29 - pH Device Setup Window

Figure 26 opposite shows the QLOG device setup window for the current pH sensor.

Select the 'OK' button.

Ensure the 'pH Sensor' option is shown in the Window. Adjust with the pull down menu options as necessary.

The Start column into which the measurements are to be stored is defined under the 'Start Column' tab. In the example the cell location is shown as 'A'. This can be adjusted. Any cell after C required.

The **Auto Assign** function will assign the correct cell location for measurement storage automatically.

Once all the sensors on a network have been identified and set the cell locations for the measurements can be automatically assigned.

Repeat for all sensors on the network.

Once the pH sensor has been identified then the measurements can be stored into the results file

Using the menu system shown below

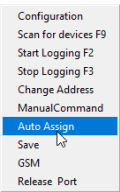


Figure 30

Select 'Auto Assign' menu option.

The menu is also used to start and stop the data acquisition operations, change the sensor ID etc ..

The QLOG sensor can now be used for measurements. Everything is configured.

0						
1						
2	2I/214KEYNESCOISELEC105pH0002	ARGES pH	D..G	Setup	Config	IDv1.4
3						

Figure 31

Once the **Auto Assign** function has been activated then the cell references used by the different sensors are automatically assigned.

Figure 28 opposite shows part of a Device List for a multiparameter SONDE with a pH sensor



set to ID 2.

Real-time Measurements

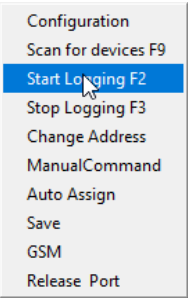


Figure 32

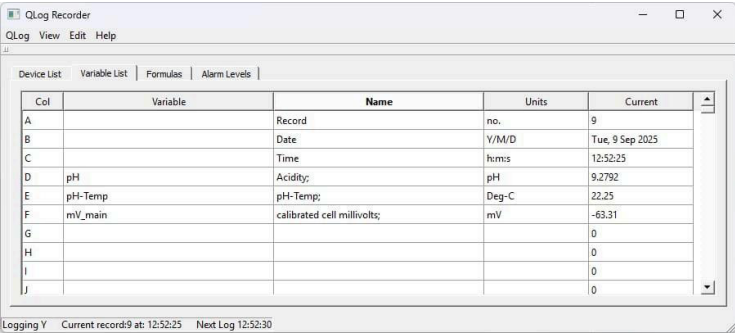


Figure 33 Real-time measurements

In order to observe measurements from the pH sensor, select the **'Start Logging'** option.

The status indicators on the USB-SDI12-AG1 indicator will flash as measurements are sent from the sensor.

The light level shown is the background level at the time of measurements.

# Changing the sensor ID number

It is possible to change the sensor ID number using the QLOG software.

The simplest way is to use the Change Address option from the QLOG software.

Select the 'Change Address'option as shown below.

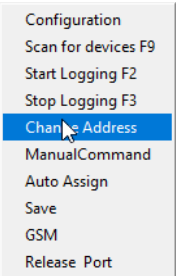


Figure 34

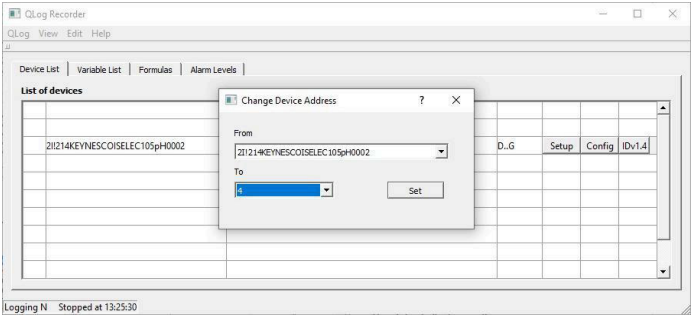


Figure 35 - Change Address Window

The example shows the Change Window configure to adjust a sensor with original ID of 2 to a new ID of 4

Press the 'Set' button to store the new ID.

The QLOG software will scan the network to identify the sensor.

Ensure each sensor has a unique ID number.

The QLOG software will automatically re-scan the network and update the sensor reference on the 'Device List'.

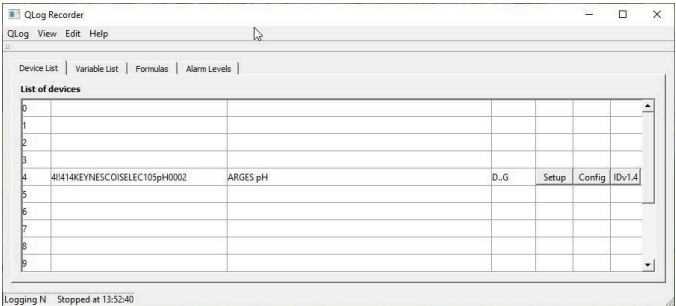


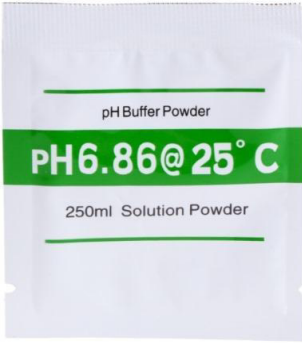
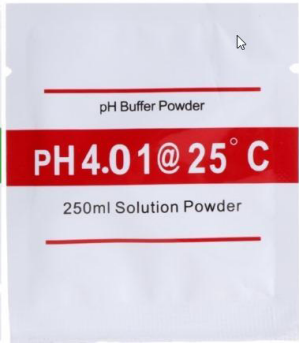
Figure 36 - Updated Device List

# Calibration Solutions

Calibrating the ARGES pH sensor requires two calibration buffer solutions, at around 6 and 9 pH. The following is an example of how to mix such solutions from buffer powder.

The calibration buffer solutions can be purchased from a range of 3rd party suppliers.

Using the common pH buffer solutions:



Directions for use:  
Completely empty the powder into a clean 250ml glass beaker. Add 250ml of Deionized Water to the beaker. Stir until the powder has completely dissolved.  
pH solution accuracy is  $\pm 0.0$  pH

°C	pH4.00	pH6.86	pH9.18
10	4.00	6.92	9.33
15	4.00	6.90	9.28
20	4.00	6.88	9.23
25	4.00	6.86	9.18
30	4.01	6.85	9.14
35	4.02	6.84	9.10
40	4.03	6.84	9.07
45	4.04	6.83	9.04
50	4.06	6.83	9.02

1. Empty a sachet of powder for a given pH into a clean beaker capable of holding 250ml of water. It is important that there are no contaminants in the beaker, as that may cause a change in the pH.
2. Fill the beaker with 250ml of deionised water.
3. Mix thoroughly.

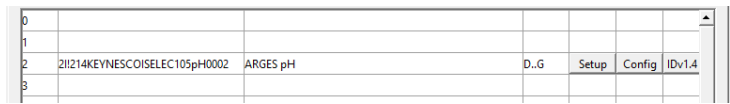
## User Calibration

Keynes Controls recommends re-calibrating the sensor before operation.

The easiest way to calibrate the ARGES pH sensor is to use the free QLOG software and set the sensor into **Configuration Mode**. Under normal operation the QLOG software only returns only pH and temperature in Degrees Celsius.

The calibration mode shows the output from the ARGES pH sensor from pH to milli-Volts.

Press the **'Setup'** button.



0					
1					
2	21I214KEYNESCOISELEC105pH0002	ARGES pH	D..G	Setup	Config IDv1.4
3					

Figure 37

The Window shown in Figure 38 will appear

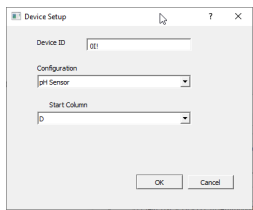


Figure 38 - pH Setup Window

Select **'User pH Sensor Calibration'** option from the pull down menu system from the **'Configuration'** list.

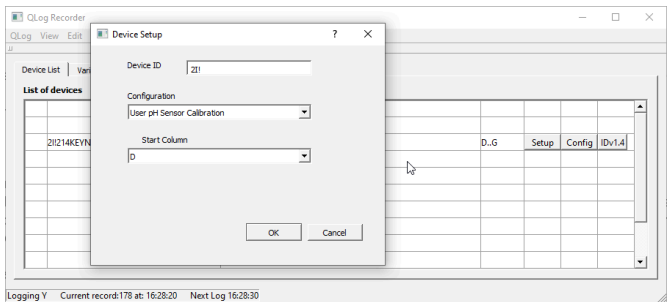


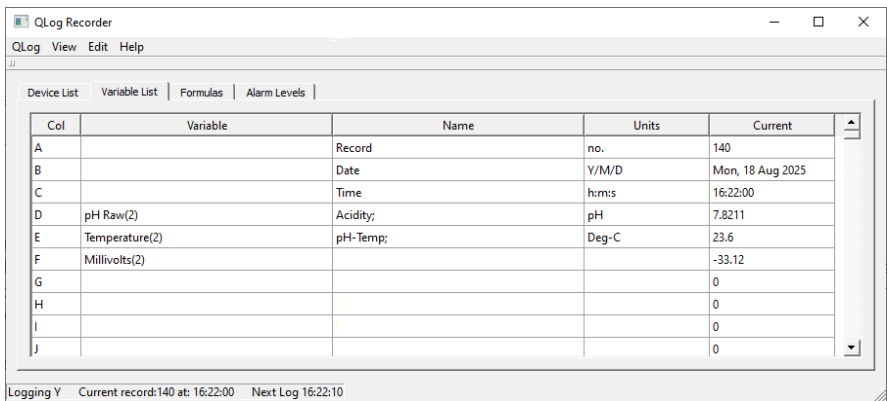
Figure 39

Figure 39 will appear.

Select the **'OK'** button to activate.

## Variable List

The Variable List Window will appear. The pH value in milli-Volts can be observed. Record the milli-volt level for the specified pH buffer solution.



Col	Variable	Name	Units	Current
A		Record	no.	140
B		Date	Y/M/D	Mon, 18 Aug 2025
C		Time	h:m:s	16:22:00
D	pH Raw(2)	Acidity;	pH	7.8211
E	Temperature(2)	pH-Temp;	Deg-C	23.6
F	Millivolts(2)			-33.12
G				0
H				0
I				0
J				0

The example shown in Figure 40 shows the measurements returned using a calibration standard of pH = 9.18

Buffer pH 9.18 = - 33.12 **milli-Volts**

Measured pH = 7.82 - ignore

Repeat the operation for a second pH calibration standard.

Make test measurements at the 2 pH calibration points. Record the raw values and sample temperature.

For normal river monitoring the calibration points mentioned above will be satisfactory for many applications. Once some idea as to the levels of pH in the water source is known then the sensor calibration factors can be adjusted to be closer in range and higher accuracy results.

Clean the sensor in de-ionised water before sampling with the second calibration solution. Make sure the sensor is clean before deployment.

Use the temperature sensor built into the ARGES pH sensor to give the sample temperature. When possible, calibrate the sensor at the temperature into which it will be deployed.

Enter the raw pH level as measured by the instrument at the known calibration level (pH). In the example above this will be for 4.01 and 9.18 pH calibration points.

To enter configuration mode, press the **Config** button adjacent to the sensor requiring configuration changes as shown in Figure 41.

0						
1						
2	211214KEYNESCOISELEC105pH0002	ARGES pH	D..G	Setup	Config	IDv1.4
3						

Figure 41

Sample ARGES pH sensor configuration.

## Saving Calibration Information into the sensor.

To store new parameters into the ARGES pH sensor simply enter the new parameter into the table and press the adjacent '**Set**' button.

If using a Keynes Controls USB-SDI12-AG1 interface then the status indicators will flash briefly indicating that the new parameter has been sent to the instrument.

Edit Sensor Configuration			
Property	Value	tool	Set
Identify	14KEYNESCOHPROB107pH0002		
Output variables	AME	Tool	Set
Molecular ion mass mg/uMol	1.0000	Tool	Set
Scale mg/L to ppm	1.0000	Tool	Set
First point mV	119.55	Tool	Set
First point pH	4.0100	Tool	Set
Second point mV	-58.880	Tool	Set
Second point pH	9.1800	Tool	Set

Figure 42 pH Sensor Configuration Window

Variables:

**A = pH**

**M = Temperature °C**

It does not matter in which order the pH calibration points are entered into the Configuring settings, see Figure 42 above.

## ARGES pH Sensor Configuration Settings

The ARGES pH sensor is fully user configurable. Figure 42 above shows the Configuration Window for the sensor.

### Setting the pH Calibration Parameters

The sensor uses a 2 point calibration system to report measured pH levels.

First Point mV (raw)	: 4.01	pH calibration solution	119.550
Second Point mV (raw)	: 9.18	pH calibration solution	- 58.880

The values of 16.870 and 119.550 are the measurements reported from the ARGES pH sensor in Manufacturer Setup Mode using a pH 6.86 and pH 9.18 calibration solution respectively. To store new parameters into the instrument configuration select the '**Set**' button.

In practice, it is possible to use any combination of the pH buffer solutions to calibrate this sensor.

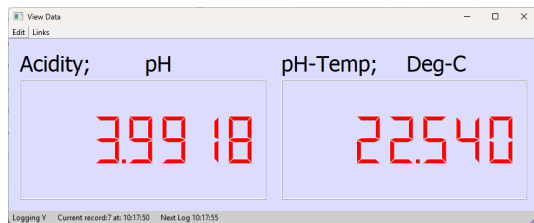


Figure 43 - pH first point Calibration

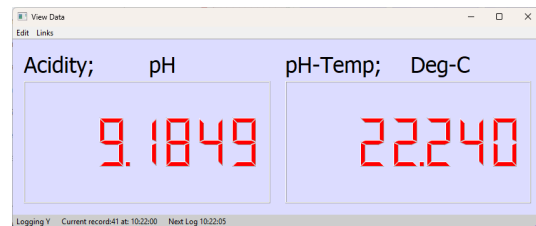


Figure 44 - pH second point calibration

# Output Variables

The ARGES pH sensor returns only 2 variables upon receipt of a measurement command. The parameters returned are

**pH**                      **Unit: pH**  
**Temperature**        **Unit: Degree C**

aM0! - starts measurement    aD0! returns a + pH + Temperature (Degrees Celsius)

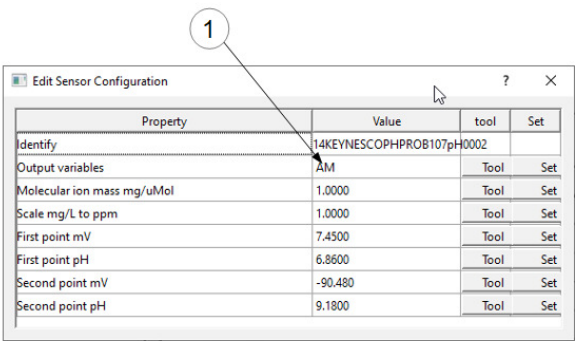


Figure 45 - ARGES pH Sensor Configuration

The pH sensor Output Variables can be altered.

Refer to the parameters available in Table 1 shown on page 2.

There are only 4 parameters available for the user.

Activate the **'Set'** button to store new parameters into the sensor.

aM!aD0! AM - returns 2 values for the D0 command.

A = pH                                      E = Cell mV  
B = Temperature °C                      M = Temperature °C

aM!aD1! Command - returns up to 4 values for the D1 measurement command.

set the output variables to be returned from the sensor using the D1 command Sensor Serial Number.

The pH sensor serial number is factory set.

Maximum data type: 16 x alpha-numeric characters.

## Additional User Defined Output Variables

The aM!aD1! Command can be used to set additional parameters to be sent out by the sensor

4 user assigned variables are used with this command.

Assign the variables from the Table 1 shown in page 2.

The ability to set the variables.



# Calibration Temperature

This is the temperature at which sensor calibration operations were performed. Under ideal conditions the calibration temperature should be close to the deployment temperature for the chosen water source.

Units: °C  
Calibration temperature : 18.850 °C

Calibration temperature	18.850	Tool	Set
Calibration temperature	18.850	Tool	Set

Figure 46 Calibration Temperature Setting - pH Sensor Configuration

Enter the calibration temperature and press 'Set' to store the new value into the sensor.

pH measurements are commonly not subject to any significant error due to changes in temperature.

## Manufactures Probe Type ID

This is a sensor type as shown on the device list Window.

Each sensor type has a unique identifier and this is a standard feature for intelligent sensors operating on the SDI12 network.

## Caring for the ARGES pH sensor

The ARGES pH sensors are precision instruments and should be treated with care. It is important that no trace of a previous sample is left on the instrument as it can affect future readings.

1. Clean the sensor head using distilled / de-ionised water and dry with a soft cloth.  
Make sure there is no residue visible on the optics.  
Do not touch the sensor optical window with any sharp object.
2. Check that the 5 way connection fitted onto the top of the sensor is clean and free of debris/  
Remove any debris found between the pins and wash with distilled water. Tap water can be used if required.
3. Keep the head hydrated if possible. It can take the sensor several hours to settle if starting measurements from a completely dry state.

Should the sensor have been deployed into a heavily contaminated water source then soak the sensor in Isopropanol Alcohol. This will kill any bacteria left on the sensor housing.



Figure 47



Figure 48

Figure 47 shows the 5-Pin connector fitted onto the pH sensor.



Figure 49 - a pH sensor inside a multiparameter housing.

Remove the shade cap and clean the sensors fitted into a multiparameter housing.

Use de-ionised water when possible. Dry with a soft cloth

Remove any contamination and detritus before redeployment.

## Settling Time

**Dry :** The pH sensor should settle from being dry to being operational in about 2 hours. Where possible keep the sensor head immersed in water when not in use.

**Wet:** The pH sensor in a hydrated state settles to its working level in approximately 1 minute.

## Sensor Deployment



Figure 50 - Shade Cap



Figure 51 - SONDE deployed

The ARGES pH sensor can be directly deployed into a water source. Take care not to damage the sensor head. Connect to a Windows PC using the USB interface. Make sure that the sensor head is submerged.

The ARGES pH sensor can be fitted into any of the multiparameter housings and will operate with any of the other ARGES sensors. Clean with de-ionised water after use and dry with a soft cloth.

When fitted into a multiparameter housing ensure that the shade cap for the complete unit is installed.

The images below show the different multiparameter housing configurations with the shade cap attached. The pH sensor is shown test calibrated in the multiparameter housing before deployment.



Figure 52 - SONDE being calibrated



Figure 53



Figure 54

Charts and Panel Meters

The QLOG software can be configured to show real-time measurements on panel meters and charts as shown below

Select the 'View' tab from the main QLOG window to select the panel meter and chart options.  
The charts support up to 2 Y axis parameters, so pH and temperature values can be shown on the same plot.

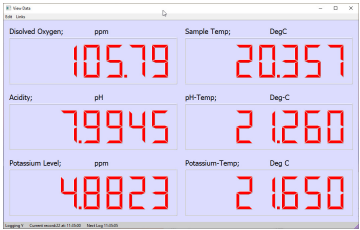


Figure 55 -

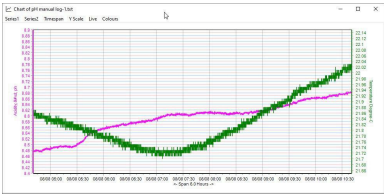


Figure 56 -

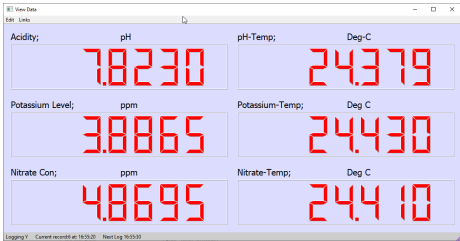


Figure 57 -

SDI12 V 1.4 Features

The ARGES pH sensor supports SDI12 V1.4 and as such can automatically assign the measurement SI units sent out by the sensor, so long that it has been correctly configured. The sensor configuration is factory set before shipment.

0									
1									
2	211214KEYNESCOISELEC105pH0002	ARGES pH	D..G	Setup	Config	IDv1.4			
3									

Figure 58

The Window in Figure 48 will appear. Let all the parameters in the table be downloaded from the sensor then press the 'Update' button. The status LED indicators on a USB-SDI12-AG1 media converter will stop flashing once all of the parameters have been sent.

The ARGES Tryptophan sensor will report the measurements into QLOG with the SI units for area measurement automatically defined.

SDI12 V1.4 assigned SI Units

The ARGES pH sensor supports the SDI12 V1.4 protocol and as such supplies measurements directly in SI units.

The SI units for the pH sensor are factory set and are shown in Figure 59 opposite.

The parameters shown in Figure 59 will download from the sensor.

Wait for the table to fill in as shown then press 'Update' button. The SI units will appear adjacent to the measurements in the QLOG results window,

SDI12 V1.4 Documentation						
	Cmd	Response	col	Variable	Name	Units
1	2IM_001!	2IM_001!2,pH,pH,Acidity;	3	pH	Acidity;	pH
2	2IM_002!	2IM_002!2,pH-Temp,Deg-C,pH-Temp;	4	pH-Temp	pH-Temp;	Deg-C
3	2IM_003!	2IM_003!2,mV_main,mV,calibrated cell milli...	5	mV_main	calibrated cell milli...	mV
4	2IM_004!	2IM_004!2				
5	2IM_005!	2IM_005!2				
6	2IM_006!	2IM_006!2				
7	2IM_007!	2IM_007!2				
8	2IM_008!	2IM_008!2				
9	2IM_009!	2IM_009!2				
10	2IM_010!	2IM_010!2				

Figure 59 - pH SDI12 V1.4 Settings

## Supported Commands

Table 2 below lists the commands supported by the pH Sensor

Start measurement	<b>aM!</b>	a05\r\n where 05 = time delay before measurement sent
Send ID	<b>aI!</b>	a14KEYNESCOISELEC105pH00n Part description assigned by Keynes
Address Query	<b>?!</b>	Where a = ID number - 0 - 9 (standard) / (a..z) Enhanced SDI-12 0 - 9 / a - z for RS485
Change Address	<b>aAb!</b>	where a = Initial address and b = Final address
Start Measurement	<b>aM!</b>	Make a measurement - a = address of sensor Example 1M! starts a measurement for sensor with ID=1
Set Output Variables	<b>XCSTR0</b>	Sets the parameter order for measurements sent from the sensor - factory set BCDM
Read Serial Number	<b>aXSN!</b>	Instrument Response a+Serial-number
Calibration Date	<b>aXCD!</b>	Instrument Response a+date
First Calibration point electrical (pH)	<b>XCA0</b>	Typical value = 4.01
First point uncompensated (mV)	<b>XCA1</b>	Typical value = 119.55
Second point (pH)	<b>XCA2</b>	Typical value = 9.18
Second point uncompensated (mV)	<b>XCA3</b>	Typical value = 16.87
Temperature Compensation % per Degree C	<b>XCA20</b>	Typical 0.03 % per/Degree C
<b>SDI12 V1.14 (Default factory settings)</b>		
String ID = A	<b>XVIDS0</b>	pH level as directly measured by the sensor.
String ID = B	<b>XVIDS1</b>	Sample temperature

# Device List

Figure 49 shows the ‘Device List’ Tab.

All sensors in a 3-port multiparameter housing have been identified on the SDI12 network and are listed here.

3 ARGES sensors have been identified

- ID = 0 Dissolved Oxygen
- ID = 2 pH
- ID = 3 Potassium

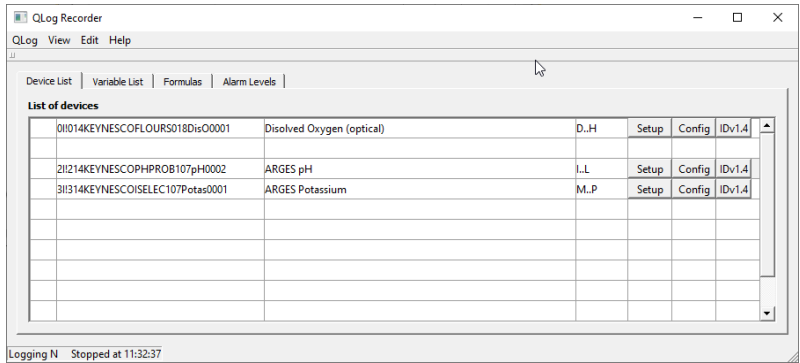


Figure 60 - Device List Window

# QLOG Charts & Panel Meters

Use the ‘View’ Tab to select and configure the real-time charts and panel meters.

The QLOG software supports up to 4 x dual Y axis real-time charts.

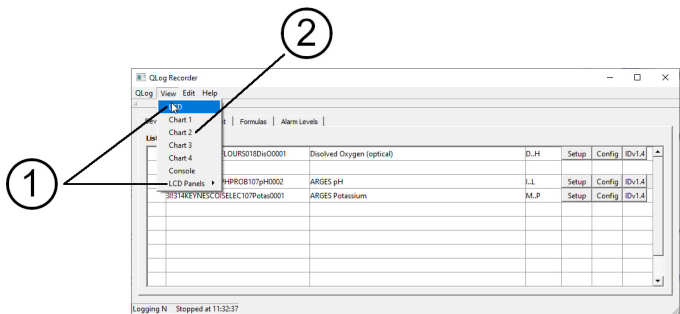


Figure 61

- 1 = Panel Meter Selection
- 2 = Charts Selection

# Parameter Selection

Any parameter that can be seen on the 'Variable List' Window can be displayed in a panel meter and/or chart.

Once the panel meter or chart has been activated then the measurements to be displayed can be selected.

The real-time charts have the ability to display 2 x sensor parameters on the Y-axis using a common time base. Ideal for comparing results between different sensors.

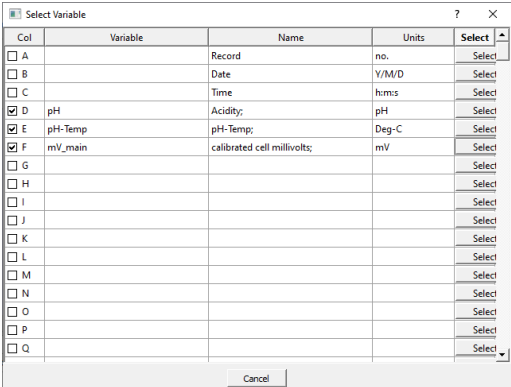


Figure 62

Choose the parameter to display  
and activate the 'Select' button for the chosen parameter.

The panel meter below shows the standard output variables from the pH sensor.

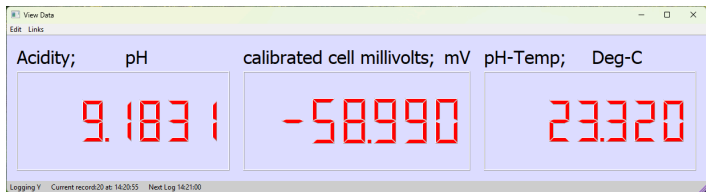
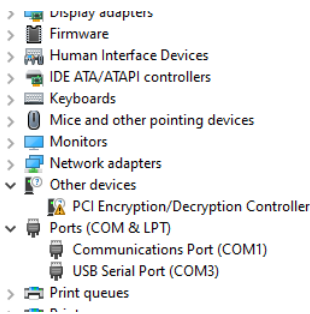


Figure 63

## Windows 10 Device Manager Window



The USB-SDI12-AG1 media converter used in the examples above is shown identified as

### USB Serial Port (COMM 3)

as shown in the image opposite.



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