ARGES Tryptophan Sensor Manual

Product Overview

The ARGES Tryptophan sensor is an intelligent submersible fluorometer manufactured by Keynes Control and is manufactured using high grade stainless-steel tube and is fitted with a high performance wet mate network connector. The sensor is purely digital in operation and offers high performance measurements. 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 fluorometers 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.

The sensor offers many advanced configuration settings and these include operating range, order of measurements sent across a network and

Product Images

This is a photograph of the Tryptophan Sensor, featuring a sleek silver finish with its name prominently displayed for easy identification.

These photographs showcase the Tryptophan 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 Tryptophan 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.

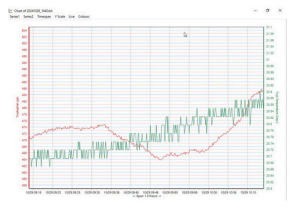


Figure 5

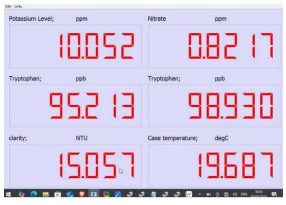


Figure 6

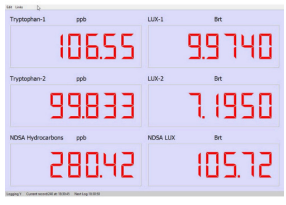


Figure 7

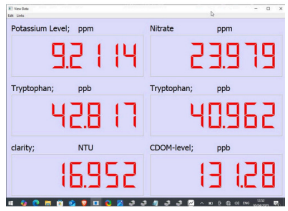


Figure 8

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

Tryptophan Technical Features

Measurement range:		0.5 to 2000 ppb - User configurable range
Resolution:		0.01 ppb - 6 digits 2 decimal places
Accuracy:		+/- 1 ppb % of reading - Typical
Temperature		0 - 50 Deg C
Response		1 Sec Typically
Sensor recalibration Period		approximately 2 year between Calibration
pH range		0 - 14
Temperature Sensor		NTC 0 - 50 Deg C / 0.2 % accuracy
Store dry for long lifetime		
Sensor Type		Fluorometer
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
Background light level		Measureemnt integrity light level measurement
Detection		300 - 400 nm
Integrated Serial number		Built-in seneor serial number - download on request

The calibration procedure used with the Tryptophan sensors follows the same procedures as described on page 9 for all of the ARGES range of fluorometers. The easiest way to calibrate a fluorometer is to use the free QLOG software and set the sensor to calibration mode.

Measurement Integrity

A fluorometer makes measurements using light and as such has to be deployed into the correct environment. The sensor will return a measurement upon instruction to do so, but should the operating conditions be wrong then the measurements will be contaminated and wrong. There is no way to post process fluorometer results to allow for corrupt measurements.

The ARGHES Tryptophan sensor monitors the background light level and this is available to the user as a measurement variable.

Measurement Variables

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

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

Letter	Description	Name	Units
	Main Sensor Readings		
A	Raw Concentration Output	sraw	LUMMA
B	Base Concentration Output (Tryptophan)	btp	ppb
C	Temperature corrected output (Tryptophan)	tctrp	ppb
	Temperature		
K	Sample Temperature	TempD	Degree Celsius
	Diagnostic Output		
L	Background light level as % of range	lightp	%
Y	User set analogue output level 0-2 V DC		V DC

Table 1

Communications to a Windows PC

Equipment Required:

1. USB-SDI12-AG1 — USB to SDI12 media converter for use with the ARGES chemical sensors. Figure HK
2. USB Cable — Type 2.0 Male A to Type Male B cable.
3. ARGES Network cable — Figure GG
4. ARGES Extension cable — Figure LB

Software

Use the Keynes Controls QLOG software

Download a copy from the www.keynes-controls.co.uk web site 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

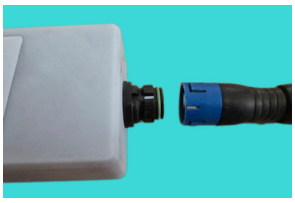


Figure 11

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 Tryptophan sensor.

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

Hardware Installation

The cables used with the ARGES Tryptophan 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 Figure 13 above.

2. Connect the orange extension cable or ARGES network cable to the blue binder connector on the USB-SDI12-AG1 media converter. See Figure 11 above.

Figure 18

Figure 19

Network cable connection to the USB-SDI12-AGI 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. Connect the ARGES sensor cable to the blue Binder port fitted to the orange extension cable, or directly onto the USB media converter. See figures 18 and 19 above.

   The black ARGES network cable is waterproof and safe for submergence with the Tryptophan 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 ARGES network cable to Tryptophan sensor. It only fits one way onto the gold connector at the rear of the sensor. See Figure 17 above. 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 Figure 13 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 HK above.

Figure 20 - ARGES Network Cable

Figure 21 - ARGES Network Extension cable

Powering the ARGES Tryptophan Sensor

The ARGES Tryptophan 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.

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 for details

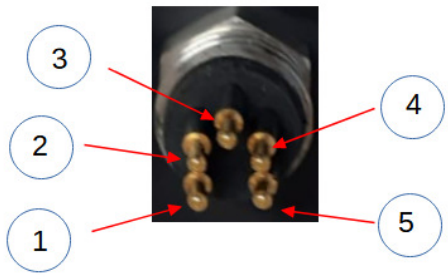
or

E-mail sales@keynes-controls.com

Pin-outs

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

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 Tryptophan 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.

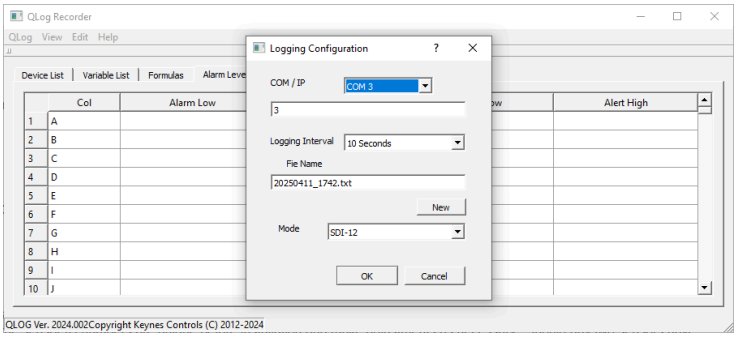


Figure 22 - QLOG Configuration Window

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.

Network Selection

The ARGEs Tryptophan automatically detects the network on which has been connected by reading the network traffic.

The **USB-SDI12-AG1** media converter used with the ARGERS Tryptophan 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 23

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

Identify Tryptophan Sensor 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 Typrophan sensor this is
a14KEYNESCOFLOURS017Tryp000n

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

Device List | Variable List | Formulas | Alarm Levels |

List of devices

0	0!!013KEYNESCOWIPERA002wip243101		D..A	Setup	Config	IDv1.4
1	1!!114KEYNESCOISELEC105Potas0001		A..A	Setup	Config	IDv1.4
2						
3						
4						
5						
6	6!!614KEYNESCOFLOURS017Tryp0002		A..A	Setup	Config	IDv1.4
7	7!!714KEYNESCOFLOURS017Tryp0001		A..A	Setup	Config	IDv1.4

Figure 24 - Device List after a network scan

Figure 22 opposite shows 2 x Tryptophan sensors with **ID = 6** and **ID = 7** on the SDI12 network.

Figure 24 shows a typical network scan when multiple sensors are being used and has identified two Tryptophan sensors. The QLOG software does not yet understand what has to be done with the measurements that will be returned from the different sensors.

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 Tryptophan sensors both are shown storing measurements into cells A .. A. This is not possible and so no readings will make sense.

The first four cells reference A..D are reserved. and cannot be used by the User.

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 Tryptophan sensor will be sending to the PC in order to make sense of the results.

The ARGEs Tryptophan sensor returns

Raw Tryptophan Output
Base Concentration Tryptophan ppb
Temperature Corrected Tryptophan ppb
Sample Temperature Deg C

Tryptophan Measurements

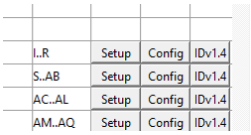


Figure 25

Select the '**Setup**' Button. See column 4 in Figure 24 (page 6).

and the Device Setup Window shown in Figure 24 will appear.

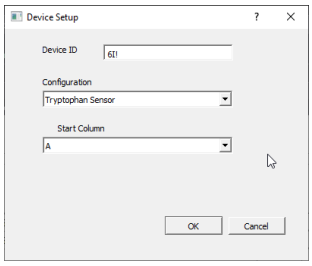


Figure 26 - Tryptophan Device Setup Window

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

Select the '**OK'** button.

Ensure the '**Tryptophan 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 D 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 Typtophan sensor has been identified then the measurements can be stored into the results file

Using the menu system shown below

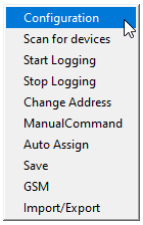


Figure 27

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 to make measurements. Everything is configured.

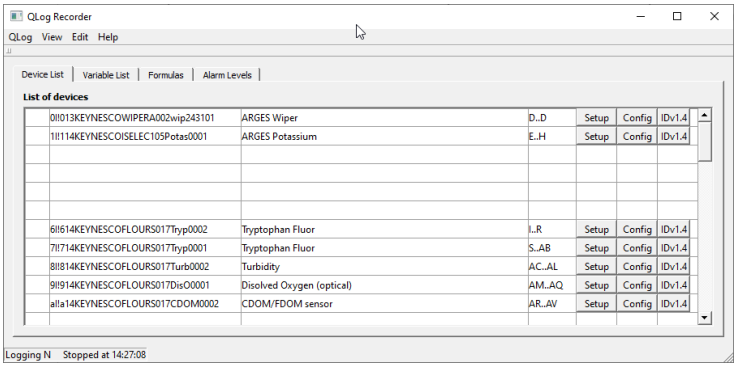


Figure 28

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

Figure 28 opposite shows a complete Device List for a 7 Port multiparameter SONDE with Tryptophan sensors with ID set as 6 and 7 respectively.

Real-time Measurements

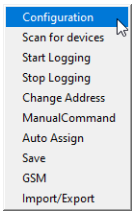


Figure 29

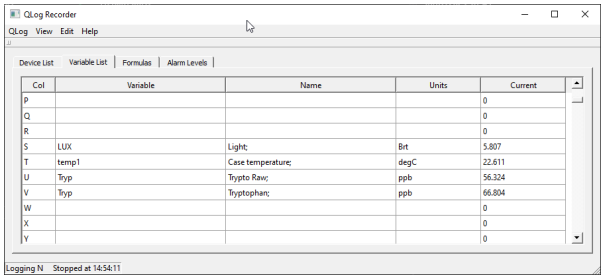


Figure 30 Real-time measurements

In order to observe measurements from the Tryptophan sensor

Select '**Start Logging**' option.

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

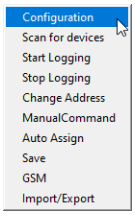
The light level shown is the background level at the time of measurements.

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.



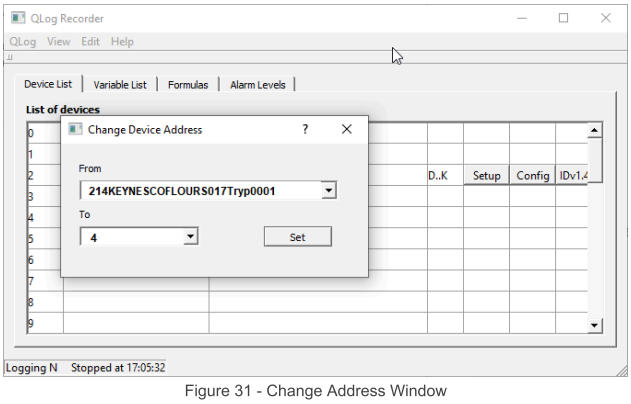


Figure 31 - Change Address Window

The example shows the Change Window configure to adjust a sensor with original ID = 2

to a new ID = 4

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

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

Make sure each sensor has a unique ID number.

Analogue Output

The ARGES Tryptophan sensor can be supplied with an analogue output in the range of 0 .. 2 DC proportional to the measured concentration of Tryptophan.

Calibration Solutions

Calibrating the ARGES Tryptophan sensor requires two calibration solutions, one of 1000 ppb and one of 50 ppb. These solutions are most easily made from a base solution of 1000 ppm.

In order to produce a 1000 ppm solution, mix ion salts and deionised water in the following ratios. Masses are provided to make 1 kg of solution.

Chemicals		Ratio	Mass for 1kg	
Ion	Solute		Solute	Water
Tryptophan	Tryptophan Powder (99.5% pure)	1 : 989	1.01 g	999.0 g

Using these values will provide a solution with a concentration of 1000±1 ppm.

To produce a solution of 1000 ppb, mix 1 gram of base solution into 999 grams of deionised water.

To produce a solution of 50 ppb, dilute a 1000 ppb solution with deionised water in a 1 : 19 ratio.

Sensor Calibration

The calibration procedure used with the Tryptophan sensors follows the same procedures as described on page YY for all of the ARGES range of fluorometers. The easiest way to calibrate a fluorometer is to use the free QLOG software and to set the sensor into configuration mode.

Make test measurements at the 2 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 Tryptophan 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 deionised water before sampling with the second calibration solution. Make sure the sensor is clean.

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

Enter the raw tryptophan level as measured by the instrument at the known calibration level (ppb). In the example above this will be for 50 and 1000 ppb calibration points.

To enter configuration mode, press the **Config** button adjacent to the sensor requiring configuration changes as shown in Figure 32.

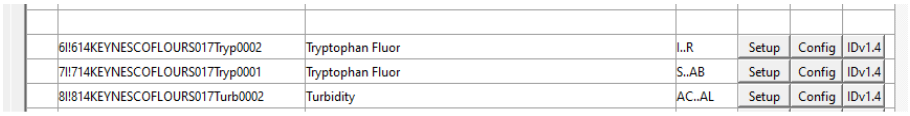


Figure 32

Sample ARGES Tryptophan sensor configuration.

Saving Calibration Information into the sensor.

To store new parameters into the ARGES Tryptophan 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.

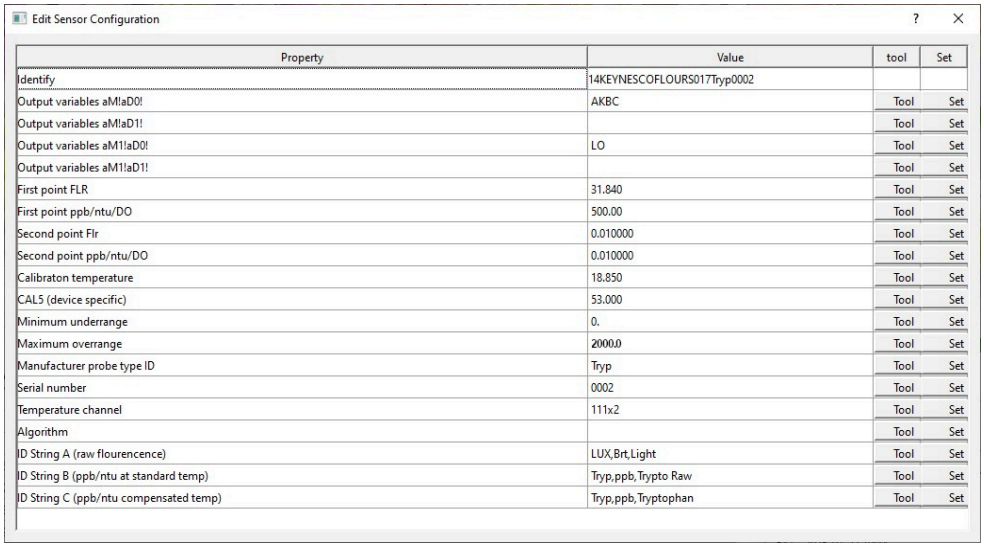


Figure 33 Tryptophan Sensor Configuration Window

ARGES Tryptophan Sensor Configuration Settings

The ARGEs Tryptophan sensor is fully user configurable. Figure33 above shows the Configuration Window for the sensor.

Setting the Tryptophan Calibration Parameters

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

First Point FLR (Raw value) : 500 ppb calibration solution 31.840
Second Point FLR (raw) : 50 ppb calibration 0.01000

The value of 31.840 is the measurement reported from the ARGES Tryptophan sensor in Manufacturer Setup Mode using a 500 ppb test solution. To store new parameters into the instrument configuration select the '**Set'** button.

Maximum Concentration Level

Maximum Overange: Sets the maximum level of measurement that the sensor can return
Maximum Overange: 2000 ppb See Figure 33 above.

In this example a ARGES Tryptophan sensor has a maximum range of 2000 ppb before an out of range error message is returned.

The sensor will not return a value greater than 2000 ppb.

Minimum Concentration Level

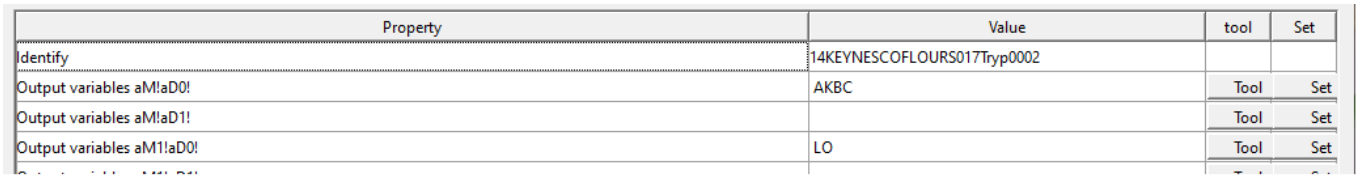
Minimum underrange: Sets the minimum level of measurement that the sensor can return
Minimum underrange: 0 ppb

Note - Tryptophan sensor will be set to operate from 0 to 2000 ppb only. Should the sensor be calibrated over the range 0 to 100 ppb then the out of range message can be set to operate over the 0 to 100 ppb range.

Output Variables

The ARGES Tryptophan sensor can be configured to return any of the variables listed in Table1 above. The user has the facility to adjust the measurement parameters being sent out by the sensor..

Figure KK below shows a sample of the Tryptophan sensor Configuration Window where the output variables are assigned.



Property	Value	tool	Set
Identify	14KEYNESCOFLOURS017Tryp0002		
Output variables aM!aD0!	AKBC	Tool	Set
Output variables aM!aD1!		Tool	Set
Output variables aM1!aD0!	LO	Tool	Set

Figure 34 AGES Tryptophan Configuration Window - Return Parameters

aM!aD0! **AKBC** - returns 4 values for the D0 command.

A = Raw Concentration Output K = Sample Temperature °C
B = Base Concentration Typrophan C = Temperature Corrected Tryptophan

aM!aD1! Command - returns 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 sensors have a factory set serial number.

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 for which the calibration operations for the sensor were carried out. Under ideal conditions the calibration temperature should be close to the deployment temperature for the chosen water source.

Units: Degrees Celsius
Calibration temperature : 18.850 Deg Celsius

Calibraton temperature	18.850	Tool	Set

Figure 35 Calibration Temperature Setting - Tryptophan Sensor Configuration

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

Manufactures Probe Type ID

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

Caring for the ARGES Fluorometer

The ARGES fluorometers 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 optics 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.

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 36

Figure 37

Figure 36 shows the 5-Pin connector fitted onto the fluorometers.

Figure 37 shows the Window fitted onto the front of the fluorometers.

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

Use deionised water when possible. Dry with a soft cloth

Remove any contamination and detritus before redeployment.

Figure 38 - 3 x Fluorometers inside a multiparameter housing.

Sensor Deployment

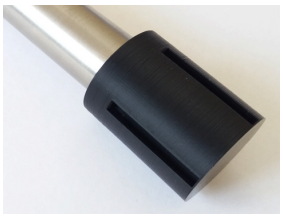


Figure 39 - Shade Cap

Fit the shade cap supplied with the sensor when deploying as a single sensor into a water source in order to protect the window from damage and excess background light.

Keynes recommends a minimum operating depth of 1 m. Under ideal conditions keep the sensor in shade. The shade can be from a tree or simply in the shadow of a bridge.

Clean with deionised water after use and dry with a soft cloth.

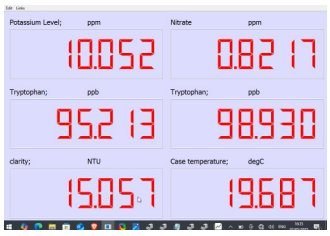
When fitted into a multiparameter housing ensure that the shade cap for the complete unit is installed.

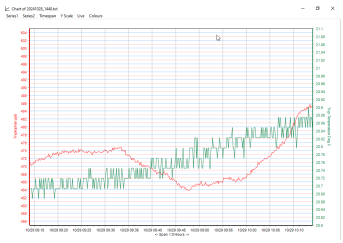
The images below show the different multiparameter housing configurations with the shade cap attached.

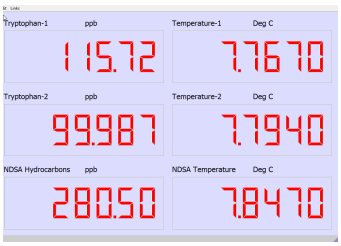
Charts and Panel Meters

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 Tryptophan and temperature values can be shown on the same plot.

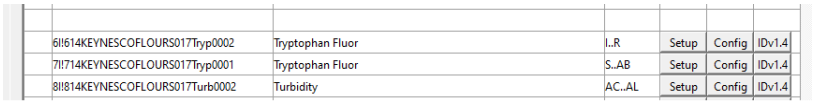






SDI12 V 1.4 Features

In order to use the SDI12 V1.4 for any sensor they have to be already identified on the network and setup. See Figure 32 above.



6!614KEYNESCOFLOURS017Tryp0002	Tryptophan Fluor	I..R	Setup	Config	IDv1.4
7!714KEYNESCOFLOURS017Tryp0001	Tryptophan Fluor	S..AB	Setup	Config	IDv1.4
8!814KEYNESCOFLOURS017Turb0002	Turbidity	AC..AL	Setup	Config	IDv1.4

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.

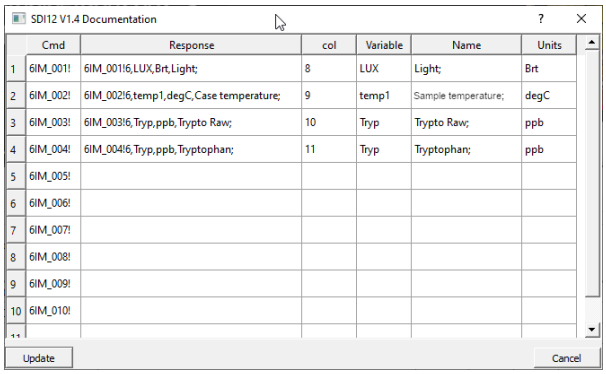
Please refer to "SDI12 V1.4 Automatic Engineering Unit Assignment" on page ?? for details on using SDI12.

SDI12 V1.4 assigned SI Units

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

The SI units for Tryptophan sensor are shown in Figure 48 opposite.

To store any changes into the sensor select and press the 'Update' button.



	Cmd	Response	col	Variable	Name	Units
1	6IM_001!	6IM_001!6,LUX,Brt,Light;	8	LUX	Light;	Brt
2	6IM_002!	6IM_002!6,temp1,degC,Case temperature;	9	temp1	Sample temperature;	degC
3	6IM_003!	6IM_003!6,Tryp,ppb,Trypto Raw;	10	Tryp	Trypto Raw;	ppb
4	6IM_004!	6IM_004!6,Tryp,ppb,Tryptophan;	11	Tryp	Tryptophan;	ppb
5	6IM_005!					
6	6IM_006!					
7	6IM_007!					
8	6IM_008!					
9	6IM_009!					
10	6IM_010!					

Figure 48

Figure 48 is the SDI12 V1.4 configuration for the tryptophan sensor.

Supported Commands

Table 22 below lists the commands supported by the Tryptophan Sensor

Start measurement	**aM!**	a05\r\n where 05 = time delay before measurement sent
Send ID	**aI!**	a14KEYNESCOFLOURS017Tryp000n Part description assigned by Keynes
Address Query	?!	Where a = ID number - 0 - 9 (standard) / (a..z) Enhanced SDI-12 0 - 9 / a - z for RS485
Change Address	**a**A**b**!	where **a** = Initial address and **b** = Final address
Start Measurement	**aM!**	Make a measurement - **a** = address of sensor Example 1M! starts a measurement for sensor with ID=1
Set Output Variables	**XCSTR0!**	Sets the parameter order for measurements sent from the sensor - factory set **BCKL**
Read Serial Number	**aXSN!**	Instrument Response **a+Serial-number**
Calibration Date	**aXCD!**	Instrument Response **a+date**
		Calibration Commands
First Calibration point (ppb)	XCA0	Typical value = 1000 (ppb) - High value
First Calibration -uncompensated (ppb)	XCA1	Typical Value = 1000 as prepared from calibration standard
Second Calibration point (ppb)	XCA0	Typical value = 20 (ppb)
Second Calibration -uncompensated (ppb)	XCA1	Typical Value = 20 as prepared from calibration standard

Device List

Figure 49 shows the ‘Device List’ Tab.

All sensors identified on a network are listed here.

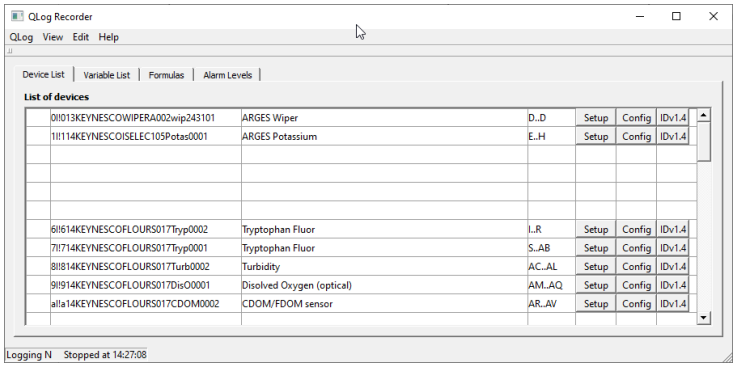


Figure 49

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.

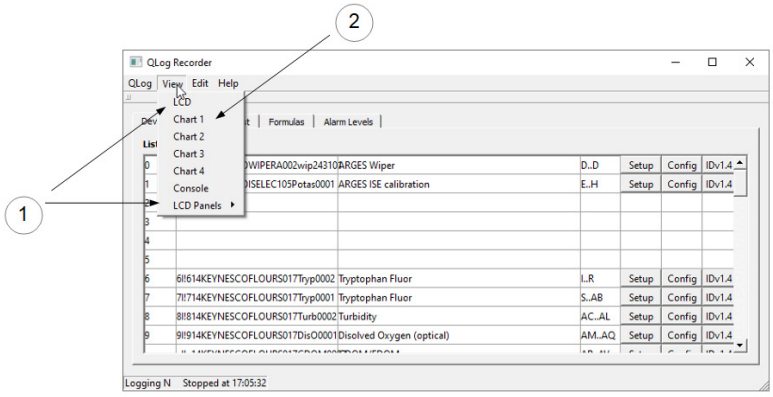
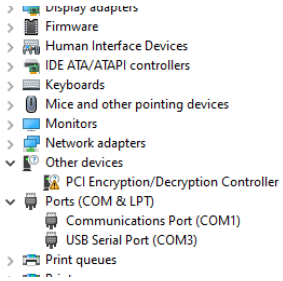


Figure 50

1 = Panel Meter Selection
2 = Charts Selection

Windows 10 Device Manager Window



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

USB Serial Port (COM 3)

as shown in the image opposite.