ABB MEASUREMENT & ANALYTICS | OPERATING INSTRUCTION | OI/AUV301-EN REV. A

UviTec™ Controller

Sensor controller and monitor



Measurement made easy

UviTec Controller

Introduction

The plug-and-play UviTec Controller provides full control and configuration of multiple sensors and accessories from one location.

The 4 × 20 character LCD display and 5-button control offer a simple, user-friendly interface.

For more information

Further publications for UviTec products are available for free download from:
abb.com/wateranalysis
or by scanning this code:

Links and reference numbers for related documents:

	Search for/click:
UviTec Controller – Data sheet	DS/AUV301
UviTec Controller – Commissioning instruction	CI/AUV301

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1 Health and safety

1.1 Document symbols

Symbols that appear in this document are explained below:

⚠ WARNING

WARNING indicates a hazardous situation which, if not avoided, could result in death or serious injury.

⚠ CAUTION

CAUTION indicates a hazardous situation which, if not avoided, could result in minor or moderate injury.

NOTICE

NOTICE is used to address practices not related to physical injury.

Note:
Indicates operator tips or important information about the product.

1.2 Safety precautions

⚠ WARNING

Electricity hazard

The UviTec Controller operates with power up to 24 V DC.

⚠ CAUTION

Improper use of the UviTec Controller may cause injury.

Visually examine the UviTec Controller before operation. If it seems broken or damaged in any way, do not use it. Contact ABB for a replacement.

Make sure that all responsible personnel carefully read this manual before installing or servicing the device.

Failure to properly install and maintain this device may impact its effectiveness and warranty.

1.3 Product recycling and disposal (Europe only)



ABB is committed to ensuring that the risk of any environmental damage or pollution caused by any of its products is minimized as far as possible. The European Waste Electrical and Electronic Equipment (WEEE) Directive that initially came into force on August 13 2005 aims to reduce the waste arising from electrical and electronic equipment, and improve the environmental performance of all those involved in the life cycle of electrical and electronic equipment. In conformity with European local and national regulations, electrical equipment marked with the above symbol may not be disposed of in European public disposal systems after 12 August 2005.

NOTICE

For return for recycling, please contact the equipment manufacturer or supplier for instructions on how to return end-of-life equipment for proper disposal.

1.4 Information on RoHS Directive 2011/65/EU (RoHS II)



ABB, Process Automation, Measurement & Analytics, fully supports the objectives of the RoHS II directive. All in-scope products placed on the market by PAMA on and following the 22nd of July 2017, will be compliant to the RoHS directive, 2011/65/EU.

2 UviTec Controller overview

The UviTec Controller is designed as a master controller for ABB sensors and devices. Up to six sensors and devices can be connected to the UviTec Controller at the same time.
The UviTec Controller also logs and displays all measured data.

The UviTec Controller has a 4x20 character LCD display and five button control. Configuration information and settings are displayed in a hierarchical drop-down menu which provides easy access to all data and functions.

2.1 Interface buttons

There are five push buttons on the front of the controller for operation.

Table 1 Button descriptions

Button caption	Action
Menu	Switch between two display modes: menu screen and summary screen. When entering a value into the menu, the Menu button also moves the cursor to the previous digit or character or cancels the entry.
Enter	Expand/collapse submenu or apply changes. When entering a value, the Enter button also moves the cursor to the next digit or character.
▲	Move up the cursor up the menu or increase entered value
▼	Move the cursor down the menu or decrease entered value.
Zero	Brings up submenu for zeroing of certain ABB sensors such as the ML Series and Nitrate Sensor.

2.2 Display – summary screen

After power is supplied to the UviTec Controller the display defaults to the Summary Screen. This screen shows water quality parameters such as BOD, COD, UVT, and others. The total number of water quality parameters that can be displayed is four.

Note:
More than one water quality parameters can be configured from a single ABB sensor e.g. pH and ORP parameters from the pH/ORP probe sensor.

Parameters are displayed on the screen in the format [label] [value] [units] e.g. NO3 0.867 mg/L (Figure 1).

Note:
A parameter must first be enabled in the Water Parameters submenu to be displayed/logged/output from the UviTec Controller. Expand the Water Parameter menu (Figure 2) and then check Enable for P1 (Figure 3).



Figure 1 Parameter display



Figure 2 Water parameter drop-down list



Figure 3 Enable water parameter (P1)

All four lines of the display will show configured water quality parameters, except when:

- There are any errors or warnings, in which case, the fourth line shows the given error or warning. In this case, the down arrow button would have to pressed to view the fourth parameter.
- Messages related to the status of a Cleaning system or Dual Feed from Table 9 are displayed. For systems with Dual Feed, the stream in use would be displayed continuously, or if in a Purge condition.

3 UviTec Controller menu settings

3.1 Add a sensor or device

1 Go to the menu -System settings > Devices.

2 Put a check mark next to the device name.
The device will be added to the system, and its menu will show on the upper menu level.

Note:
If the sensor or device is not physically connected to the UviTec Controller via the Data Port terminals in the UviTec Controller, or if the sensor or device does not have power, a communication error will be displayed on the main screen (Refer to section "2.3 Electrical and communication connections" on page 4 for wiring and connections).

3.2 Remove a sensor or device

1 Go to the menu - System settings > Devices.

2 Remove the check mark from the device name.

3.3 Set sensor and device IDs

Usually, there is no need to change device IDs because they are set by the manufacturer. To change device IDs, go to the menu -System settings > -Device IDs.

Contact ABB if you think you may need to change a sensor or device ID.

3.4 Set the date and time

The UviTec Controller has a built-in real-time clock. The time is set at manufacture to EST. Therefore, it might be necessary to set the data and time during installation and setup of the UviTec Controller.

Note:
The UviTec Controller does not automatically change to daylight savings time.

1 Go to the menu -System settings > -Date & Time.

The format is YYYY/MM/DD in 24 h.

3.5 Controller firmware

The current version number of the firmware associated with the UviTec Controller in use will be displayed under:

```
-System settings > -Firmware vers
       FW1: xx
       FW2: xx
```

FW1 is the firmware for the main circuit board.
FW2 is the firmware for the display board.

4 Set water quality parameters

Water quality parameters are the primary output of the UviTec Controller to be displayed, logged and output.

To set water quality parameters for the UviTec Controller, go to the menu `Water Parameter`.

There are four available water quality parameters (P1 through P4) that can be configured to represent measured and correlated data. The sub-menu for each water quality parameter has the same structure.

Refer to Table 2 for a description of each item in the Water Parameter sub-menu.

4.1 Water parameter sub-menus

Table 2 Water parameter sub-menu descriptions

Menu	Selection	Item type	Description
`Enable`		Check mark	If “Enable” is checked, the parameter is displayed on the Summary Screen, and can be logged and output from the UviTec Controller
`-Label`		Drop list	The name of the water quality parameter to be displayed on the Summary Screen (e.g. COD, UVT, etc.). There are several predefined labels as well as a custom option. The length is four characters for the custom label.
`-Unit`	mg/L ppm custom	Drop list	The units for the water quality parameter to be displayed (e.g. mg/L, ppm, etc.). There are several predefined units as well as a custom option. The length is four characters for the custom units. Select a blank string to remove the units.
`-Device:`		Drop list	A device that is used as a source of data for water parameter calculation e.g., ML2000
`-Source:`	UVA UVT	Drop list	Source data from a device that is used as the base information for water quality parameter. The source data list is not available if a Device has not been selected above. A device might have multiple possible data sources (e.g., absorbance data at different wavelengths).
`-Stream:`	both 1 2	Drop list	If there are two streams of process water connected to the system, the user must specify the stream the device is plumbed to “1” or “2”. For single stream i.e., no Dual Feed, select “both”. (Refer to Section 10 ABB Accessories for more information about the optional Dual Feed module)
`-OnClean`	hold update	Drop list	During cleaning process, measurements could be invalid due to the presence of cleaning fluid in the flow cell. If this is the case, the “Hold” option should be selected which forces the UviTec Controller to display the last valid value of a water quality parameter until the cleaning cycle is complete.
`Span`		Number	Span is a multiplier in calculation of a water quality parameter. This allows adjustment to be made to the resulting output of the water quality parameter compared with the original Source data set above.
`Offset`		Number	Offset is an additive in calculation of a water quality parameter. This allows adjustment to be made to the resulting output of the water quality parameter compared with the original Source data set above.
`Result`		Number	It is a result of Water Parameter calculation. The same value is shown on the summary screen. Calculation formula: $[\text{Source} \times \text{Span} + \text{Offset}] \times \text{Dilution} = \text{Result}$
`Alarm Hi, Lo` `Warn Hi, Lo`		Number	User-configured thresholds for water parameter. When a water parameter exceeds any threshold, a message can be sent, for example, “Warning: Parameter 1 low”. This message is sent in addition to any existing alarm or warning messages (if SMS report is enabled).

5 Data logging

All enabled water quality parameters and most of the data that is read from the sensors and devices are logged into the flash memory of UviTec Controller automatically. Alarms and warnings for ABB devices are also logged automatically.

5.1 Format the USB stick

Before storing data on a USB stick, it must be formatted to FAT32. Most often, sticks are formatted to FAT32 as the default, but yours may be formatted to another format, such as NFTS. To identify the existing file format for your USB, plug the stick into the drive.

Note:
FAT32 has a maximum partition size of 32 GB.

1 Right-click on the USB drive label. In this case, it is identified as Kingston (E:).

2 Left-click on **Format**.
A pop-up appears with the file system identified as FAT32.

3 Make sure you record the letter associated with the USB drive, in this case, the letter E.

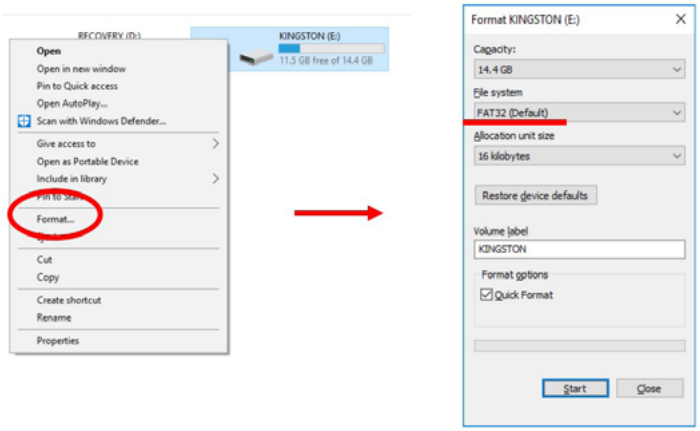


Figure 4 Format the USB stick

If the file system is not formatted to FAT32, transfer all the data that you want to keep from the stick to another location before you do this procedure.

Note:
After a disk is formatted, all data is erased.

1 Press the ⊞ + **R** keys on your keyboard.
The Run window will open.

2 Type **cmd** then press **OK**.

3 After the > prompt, type:
format e: /fs:fat32
then press Enter.

Note:
The letter **e** in the string must correspond to the drive associated with the label of the USB stick.

4 Press Enter.
The USB stick is now formatted to FAT32.

6 Export logged data

1 Insert the stick into USB slot located on the main control circuit board inside the UviTec Controller. See Figure 5.



Figure 5 Insert the USB stick

2 Go to the menu Export log.

3 Set time and date for the period to export.

a From main menu, scroll down to +Export Log, and click **Enter** to expand the menu. See Figure 6.

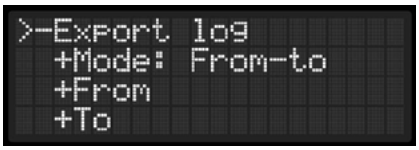


Figure 6 Expanded Export log

b Declare a specific from-to time period to capture data for export. The year format is YYYY/MM/DD and time is on the 24-hour clock. An example of a -From date and time range is shown in Figure 7, OR:



Figure 7 From date and time menu

c Select the All mode, which captures all data logged on to the stick until it is removed (Figure 8). Select Start export.



Figure 8 Data collection mode: All

A message Exporting... shows on the screen.

Note:
It can take up to 10 minutes to copy the data to the USB flash stick. The estimated export time is displayed.

The message disappears when the exporting is done.

4 Remove the USB flash stick from the USB slot.

The data structure of the exported log file consists of headers, values, and date and time of when a value was logged. To view the data in the file it is recommended to open it with MS Excel or Open Office Calc.

The format of the file name for all log files is “Log_[year].csv”.

Where [year] is a year taken from the start date of the exported log period. Figure 9 shows an example of a log file.

Date	Time	Par1	Par2	Par3	Stream	M3000_UVA	M3000_UVT
2017-03-29	18:24:02	0.067	0.072	84.803	2	0.0717	84.803
2017-03-29	18:24:12	0.067	0.063	86.448	2	0.0634	86.448
2017-03-29	18:24:22	0.067	0.065	86.122	2	0.065	86.122

Figure 9 Example log file

7 Optional I/O modules for UviTec Controller

7.1 Digital I/O module

The Digital I/O module is an optional internal module of the UviTec Controller that provides extra I/O functionality. The module provides four digital inputs and four digital outputs.

7.2 Digital inputs

The standard configuration for inputs are two 5 to 24 V DC input signals and two dry contact outputs from a customer device. Any variation to this configuration may be specified at the time of order or changed in the field.

For example, either of the two 5 to 24 V DC input signals can be changed to a dry contact, or similarly, either of the two dry contacts can be changed to a 5 to 24 V DC signal input.

The length of the input signals must be at least 20 seconds to ensure successful triggering of configured events. Each input provides several configurable functions or events:

- Start cleaning on an external signal.
  - This is useful when the process water source is intermittent due to batch treatment for example, and it is desirable to trigger a clean event when a treatment cycle begins, as controlled by an external PLC.
- Control alternation of the Dual Feed streams with external signal(s).
  - This is useful to allow control over which stream currently needs to be measured. To be used with the optional Dual Feed module.
- Enable or disable measurement sensors with an external signal.
  - Shuts off lamp in UIV254 analyzers and stops measurements. The UviTec Controller holds the last valid measurement value until measurement is enabled again. Again, this is useful for installations with intermittent process water flow.

7.3 Digital outputs

The standard configuration for outputs are two power switches providing 24 V DC for external devices and two dry contacts. Any variation to this configuration may be specified at the time of order or changed in the field. For example, either of the two 24 V DC power switches can be changed to a dry contact, and either of the two dry contacts can be changed to a 24 V DC power switch.

If the Dual Feed module is included as part of any ABB system, digital output 1 (Sw1) is specifically assigned to run the Dual Feed module. Sw1 is configured as 24 V DC and is designed to support the amperage needed to operate the Dual Feed module. Refer to Section 10 ABB Accessories for more information.

All four digital outputs can be configured to trigger on various errors, alarms or warnings that occur in the UviTec Controller or sensors and devices.

The items available to trigger a digital output can change depending on the enabled sensors and devices. Table 3 shows an example of how the menu would look if a UV254 bypass sensor, UviTec Clean System and a Flow Detector were connected to the UviTec Controller.

…7 Optional I/O modules for UviTec Controller

7.3 Digital outputs

Table 3 Digital I/O module menu descriptions

Menu	Menu type	Description
Digital I/O		
Out1 mode: [text]	Drop list	Submenu that defines mode for output 1
Disabled	Drop list	Output is disabled
Dual Feed	Drop list	Output controls Dual Feed module
Events	Drop list	Output triggers on event (errors, alarms, warnings)
Out1 events	Check box	Events that could trigger the output 1. The list of events varies depending on devices enabled in the system.
ClnSysWLeak	Check box	Output triggers if Cleaning System has a water leak
ClnSysALeak	Check box	Output triggers if Cleaning System has an air leak
ClnSysNoFlow	Check box	Output triggers if Cleaning System has no flow of process water
DilutWLeak	Check box	Output triggers if Dilution System has a water leak
DilutALeak	Check box	Output triggers if Dilution System has an air leak
DilutNoFlow	Check box	Output triggers if Dilution System has no flow of process water
ML3000 Leak : v	Check box	Output triggers if ML3000 detects leak
ML3000 LmpHi : v	Check box	Output triggers if ML3000 detects high value for UV lamp
ML3000 LmpFlt : v	Check box	Output triggers if ML3000 detects fault of the UV lamp
ML3000 SysFlt : v	Check box	Output triggers if system fault occurs in ML3000
ML3000 ArmRef : v	Check box	Output triggers if ML3000 can't reference its arm properly
ML3000 RefSw : v	Check box	Output triggers if ML3000 can't reference switch broken
ML3000 Sensor : v	Check box	Output triggers if ML3000 has sensor problems
ML3000 UVT : v	Check box	Output triggers if UVT value of ML3000 is incorrect
ML3000 UVA : v	Check box	Output triggers if UVA value of ML3000 is incorrect
ML3000 comm : v	Check box	Output triggers if UviTec Controller cannot communicate with ML3000
FLDet NoFlow : v	Check box	Output triggers if Flow Detector reports about no flow
FLDet comm : v	Check box	Output triggers if UviTec Controller cannot communicate with Flow Detector
ClnSys Clog : v	Check box	Output triggers if cleaning system detects clogging
ClnSys comm : v	Check box	Output triggers if UviTec Controller cannot communicate with the cleaning system
4-20mA comm : v	Check box	Output triggers if UviTec Controller cannot communicate with 4-20 mA module
Out2 events	Check box	Same as Output 1
Out3 events	Check box	Same as Output 1
Out4 events	Check box	Same as Output 1
In1 action: [text]	Drop list	
None	Drop list	No action
Clean	Drop list	Trigger cleaning on "high" state
Str1	Drop list	Dual Feed control
Str2	Drop list	Dual Feed control
Measur	Drop list	"High" state enables measuring. Applicable to ML2000 or ML3000 devices. "Low" state causes idling of the device. This option saves lifetime of a UV lamp.
In2 action: [text]	Drop list	Same as In1 action
In3 action: [text]	Drop list	Same as In1 action
In4 action: [text]	Drop list	Same as In1 action

7.3.1 Standard connections for digital inputs and outputs

Standard connections for digital inputs and outputs on the UviTec Controller are copied from Table 4, and presented here for reference:

Table 4 Standard connections for digital I/O

Digital	Terminal	Digital	Terminal
In 1	11, 12	Out 1	7, 8
In 2	13, 14	Out 2	9, 10
In 3	15, 16	Out 3	35, 36
In 4	17, 18	Out 4	37, 38

7.4 4-20 mA output module

The 4-20 mA output module provides 4-20 mA outputs to communicate configured water quality parameters to a PLC or SCADA system.

The 4-20 mA output module comes standard with one channel output. Additional 2-channel, and 4-channel 4-20 mA output ports can be ordered respectively. Each 4-20 mA port sources its own current (self-powered).

Each 4-20 mA port can be configured via the UviTec Controller menu to represent one water quality parameter as configured in Section "4 Set water quality parameters" on page 6.

In addition to communication water quality parameters, each 4-20 mA port can be configured to source either 2 or 22 mA to indicate an error or alarm condition occurred in the system. This option is configurable through the menu (Refer to Table 10.).

Maximal resistive load that can be connected to each output is 240 Ω.

The structure and description of the 4-20 mA menu is shown in Table 5. The sub-menu for each of the four possible outputs (depending on the 4-20 mA output module version) are identical.

Table 5 4-20 mA output module menus

Menu	Menu type	Description
4-20mA out		
Channel1		
Source: [text]	Drop list	The source of the data which value is represented by the output current. (One of the Water Parameters)
None	Drop list	No data source
Param1	Drop list	Water parameter 1
…		…
Param4	Drop list	Water parameter 4
Min:	Number	Minimum value of a Water Parameter for the low end of output current range (4 mA). Any value that is equal or lower than “Min” is represented as current 4 mA
Max:	Number	Maximum value of a Water Parameter for the high end of output current range(20 mA). Any value that is equal or higher than “Max” is represented as current 20 mA
AlarmMode: [text]	Drop list	The value of the output current in the alarm mode
None	Drop list	
22mA	Drop list	
2mA	Drop list	
ErrorSource		Sub-menu allows to choose alarms and errors that can turn 4-20 mA output into alarm mode. Number of menu items varies depending on the devices enabled in the system
ML3000 Leak: v	Check box	Leak detected in ML3000
ML3000 LmpHi: v	Check box	Too high value of the UV-lamp UV254
Channel2		Same as Channel1 menu
Enable WDT: v	Check box	Enable watchdog timer. If enabled, outputs are turned into alarm mode automatically if there was no communication with the 4-20 mA module within predefined time (default: 30 s)
Period WDT:	Number	Watchdog timer period (default: 30 s)

Trademarks

- UviTec is a trademark of ABB Limited.

Notes

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For more product information, visit:
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