



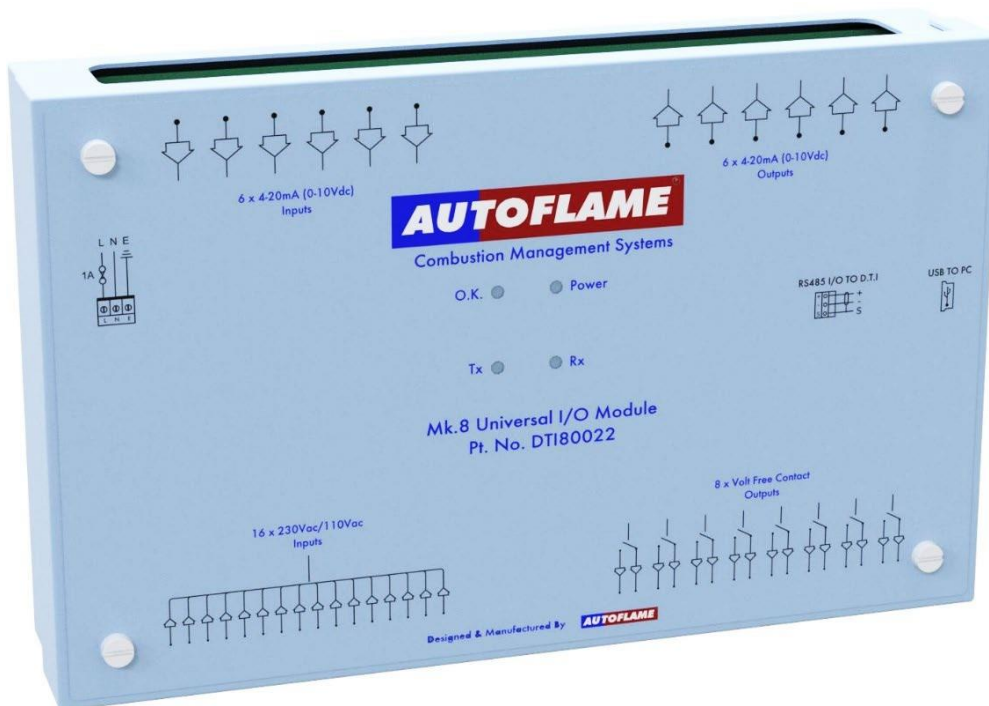
AUTOFLAME MODULES GUIDE

- Analogue-Digital I/O Module
- O₂ Interface Module
- Bottom Blowdown Module

1. **MK8 UNIVERSAL INPUT / OUTPUT MODULE – DTI80022**

1.1. **Overview & Compatibility**

The Mk8 Universal Input / Output Module enables the connection of 3rd party equipment in the boiler plant to the MK8 DTI for the purpose of monitoring and data logging. It also enables the use of analogue servomotors to with the Mk8 MM. This module also allows the connection of third party analogue sensors to the Mk8 MM for heat flow metering purpose.



Each MK8 I/O module has the following terminals:

- 16 digital line inputs
- 8 volt-free contacts
- 6 analogue inputs
- 6 analogue outputs

Specifications	
Supply Voltage	120V / 230V AC
Communication	RS485
IP Rating	IP20
NEMA Rating	1
Max. Operating Temperature	60°C (140°F)
Min. Operating Temperature	0°C (23°F)
Warranty	2 years limited warranty

The Mk8 IO Module is compatible with the Mk8 DTI and the Mk8 MM only.

1.2. Applications

1.2.1. Using Analogue Servomotors with the Mk8 MM

Third party analogue servomotors (4-20mA, 0-20mA, 0-10V) can be used with the Mk8 MM in conjunction with an Autoflame universal Mk8 IO Module. The IO module acts as an interface between the MM and the analogue servomotors. The MM will send an analogue signal out from the IO module for the position of the servomotor for it to move according to the commissioned fuel-air curve and receives an analogue signal back to the IO module to indicate where the servomotor position is currently.

Please refer to the Mk8 MM Manual for full details.

1.2.2. Using Analogue Temperature Sensors with the Mk8 MM

The Mk8 IO module enables the connection of third party analogue temperature sensors (4-20mA, 0-20mA, 0-10V) to the Mk8 MM for the purpose of heat flow metering (steam flow metering / hot water flow metering).

Please refer to the Mk8 MM Manual for full details.

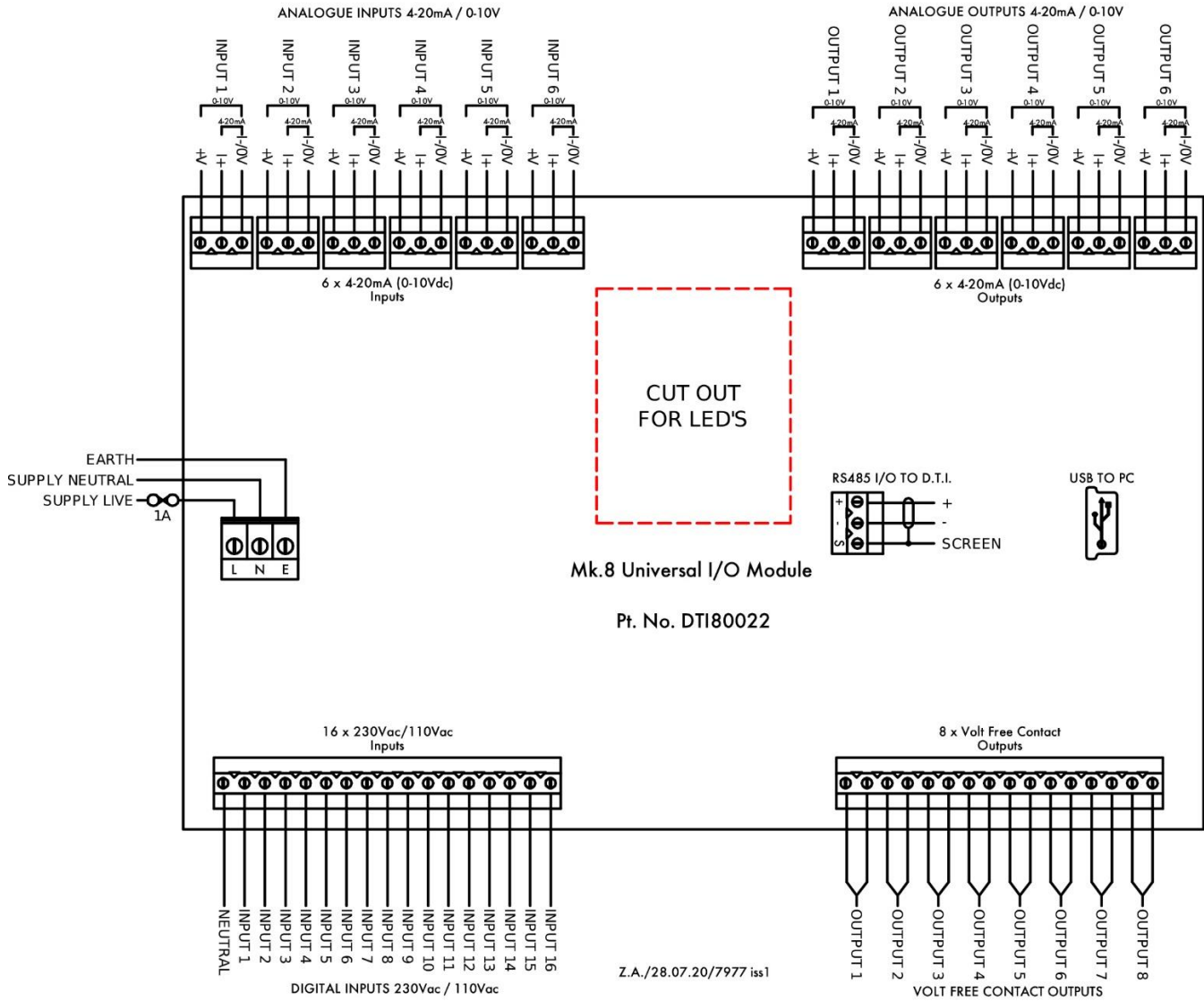
1.2.3. Use with the Mk8 DTI

The Mk8 Universal Input / Output Module enables the connection of 3rd party equipment in the boiler plant to the MK8 DTI for the purpose of monitoring and data logging.

The Mk8 I/O module is capable of totalising the input data internally, allowing the unit to run as a standalone unit. Coupled together with the Mk8 DTI, the Mk8 Universal I/O module gives detailed logging of the inputs and outputs. The Mk8 DTI can control the analogue and digital outputs, for a maximum of 10 Mk8 I/O modules. The data gathered by the Autoflame Mk8 DTI for the Mk8 I/O modules is logged for 3 years.

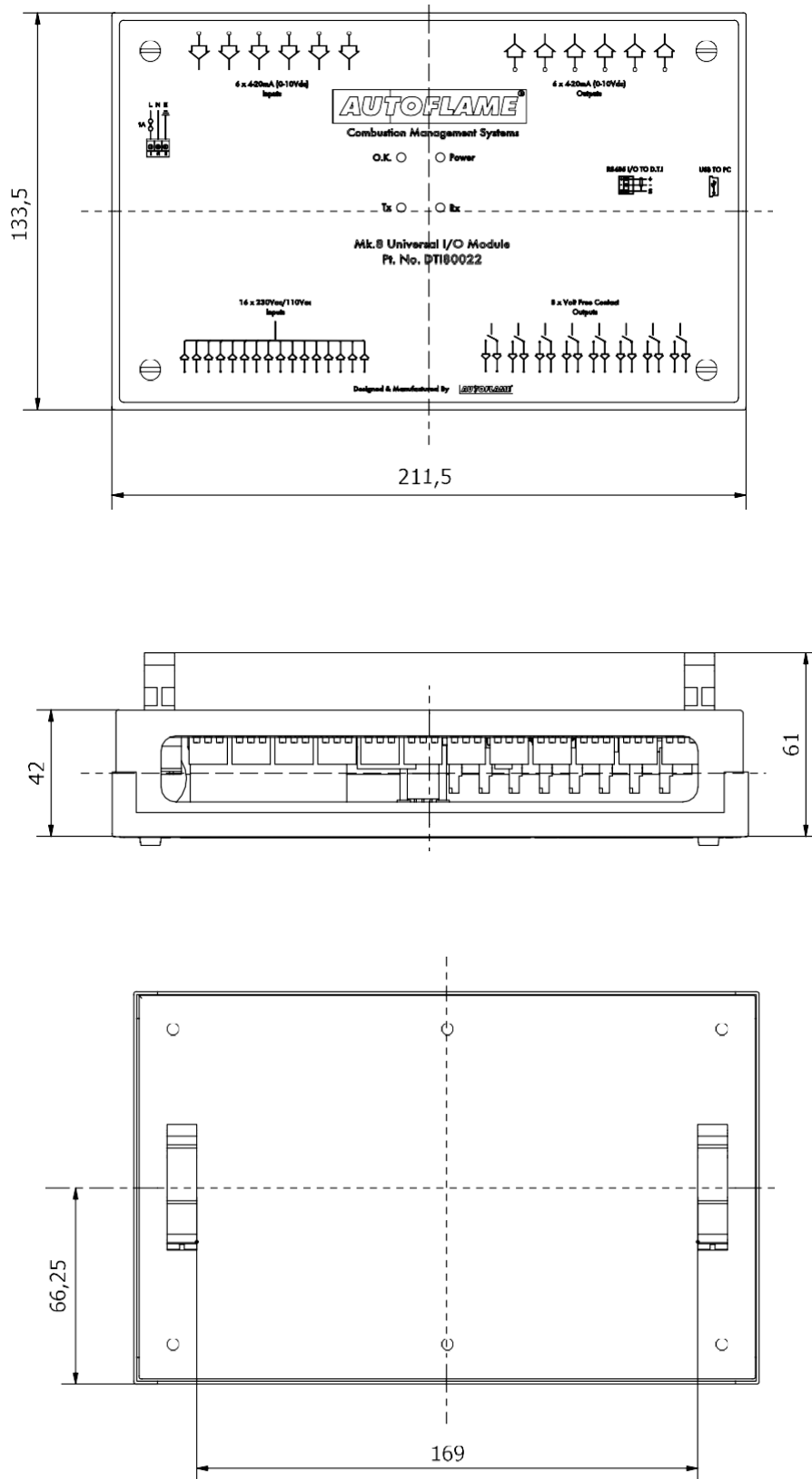
It is also possible to set rules using the DTI Rules System for an IO module output to react in a desired way in response to a certain event triggered by an input or by an MM event. Please refer to the Mk8 DTI manual for full details

1.3. Wiring



1.4. Dimensions & Fixing

The IO Module has 2x DIN mounting clips and can be mounted directly to a standard DIN rail.



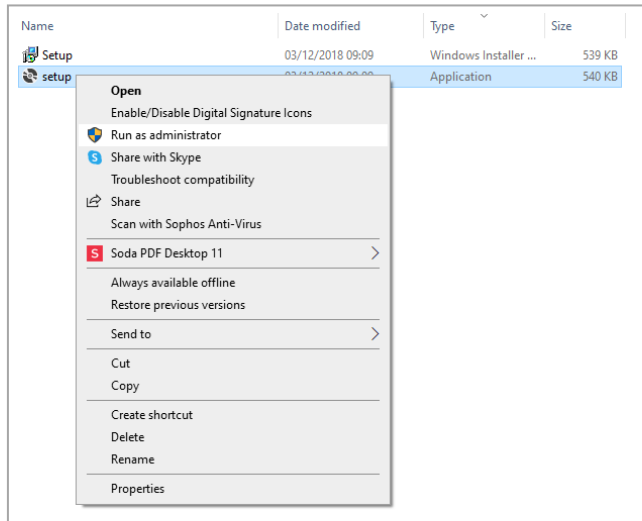
1.5. IO Board Configurator Software

The IO Module must be configured using the IO Configurator software before it can be used. The IO Board Configurator is compatible with any PC running Windows 7, 8 or 10, both 32 and 64 bit OS versions are supported.

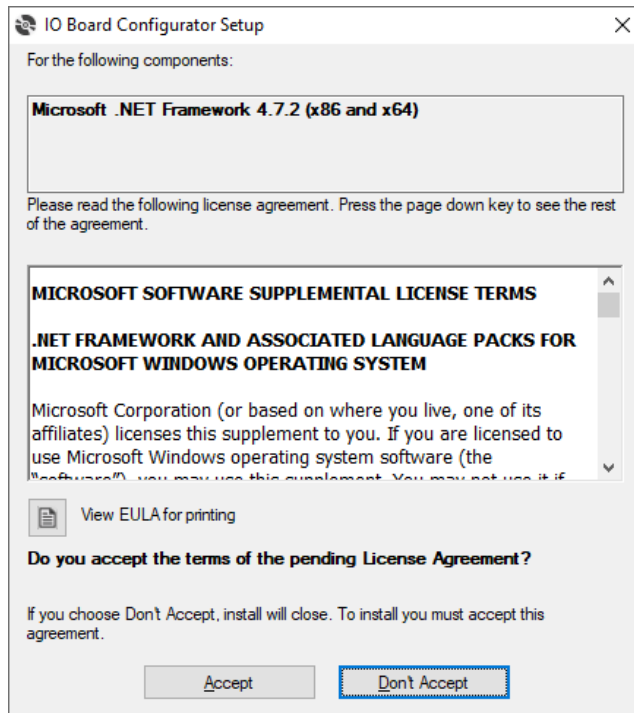
The configurator software is included on the USB stick that is provided with the purchase of the IO module. The software can also be downloaded from our tech site tech.autoflame.org/software/

Software Installation

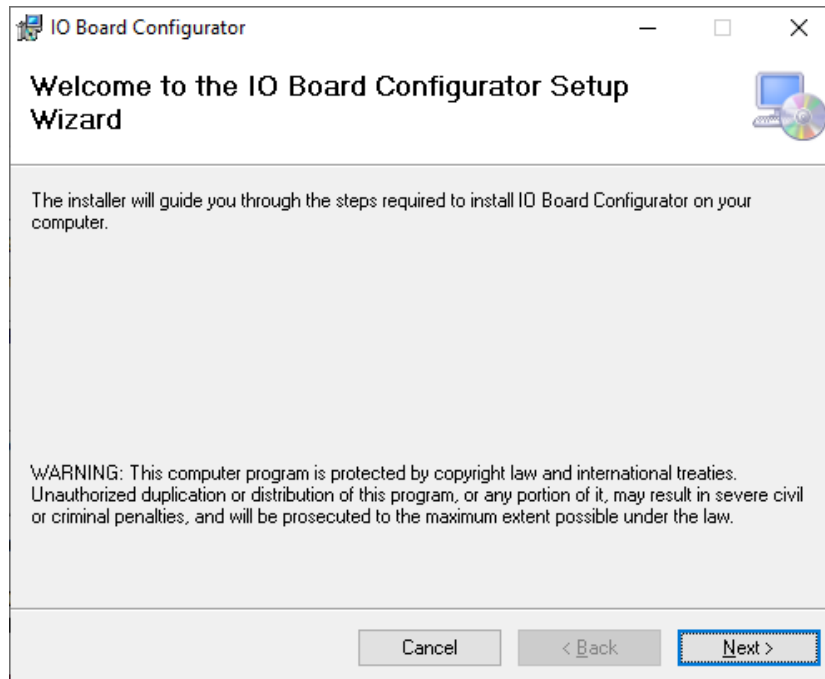
Right click on the 'setup' file and click 'Run as Administrator' to launch the installation process.



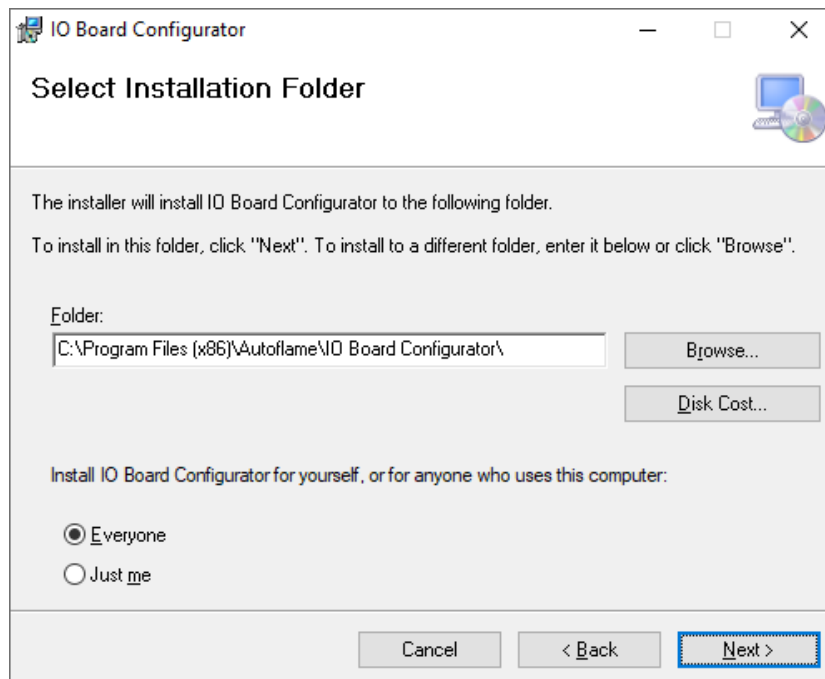
Review the license terms, if happy with the terms click 'Accept' to install the software.



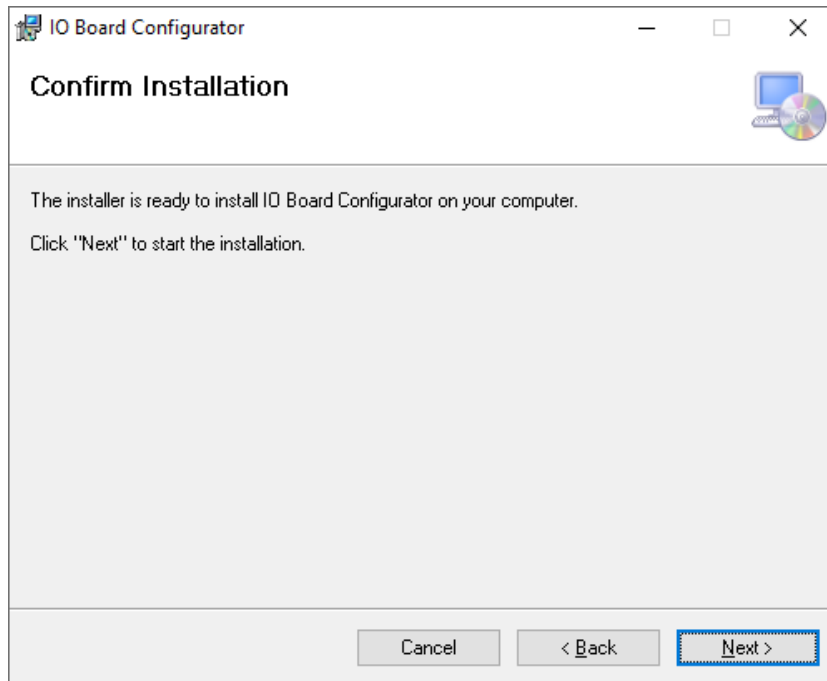
The IO Board Configurator setup wizard box will appear. Click 'Next' to begin the installation.



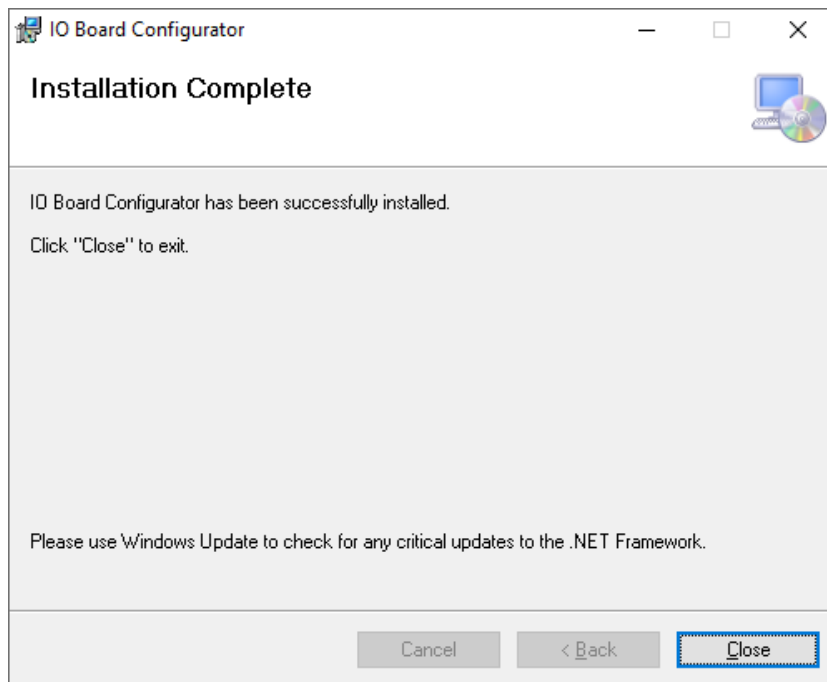
The default installation location is: C:\Program Files (x86)\Autoflame\IO Board Configurator\
Click 'Browse' if you wish to change this location.
Click 'Next' to start the installation.



Now the installer is ready to install the software, click 'Next' to confirm.



Now the software installation has been completed. Click 'Close' to exit the installer.



1.6. Configuring the IO Module

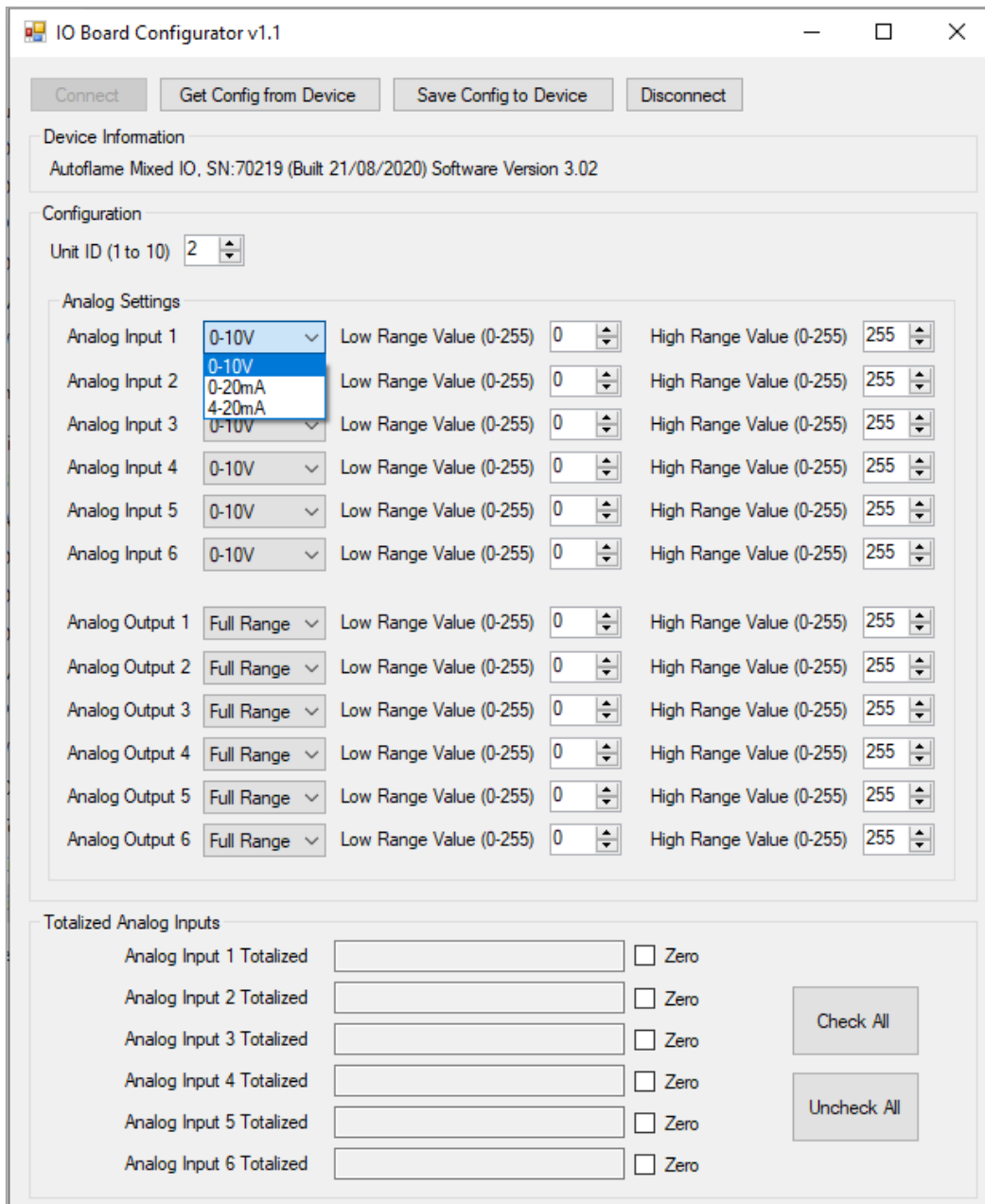
The IO module must be connected to the PC, to do so follow these steps:

1. Power off the IO Module.
2. Connect the IO module to the PC using the supplied USB to mini-USB lead.
3. Power on the IO module.
4. Open the IO Board Configurator and click 'Connect' to establish connection with the I/O module.

The IO board configurator can be used to setup the following on the IO module:

- Module's ID number (from 1 to 10)
- Analogue input type (0-10V, 0-20mA, or 4-20mA)
- Analogue input/output ranges.
- View and reset totalised input values.

If the board has been previously configured, click 'Get Config from Device' to view and change the setup that is already stored on the IO module.



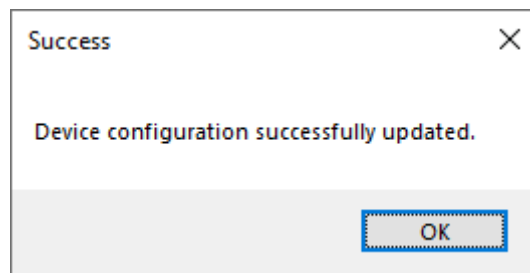
Totalised Values

The Mk8 IO Module can totalise the analogue inputs over time. The totalised values stored on-board the IO Module can be viewed by clicking 'Get Config from Device'.

To zero the totalised values of each analogue input, make sure the relevant 'Zero' checkbox is ticked or click 'Check All' to reset all the inputs, click 'Save Config to Device.' The counter be zeroed.

To confirm that the value has been zeroed, click on 'Get Config from Device', the field should display zero value.

Once the IO module has been configured, click on 'Save Config to Device' to save the setup to the module.



Click 'Disconnect' to disconnect the IO module from the PC.

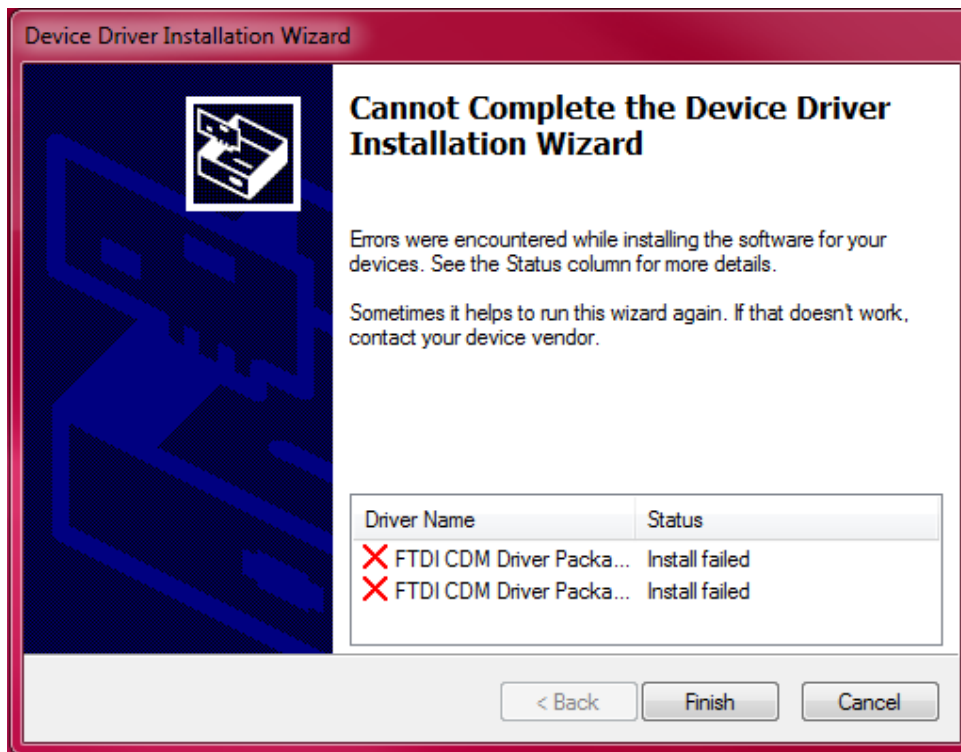
1.7. Troubleshooting

1.7.1. Driver Install Failed

The driver software that connects the IO Module to the PC should automatically install during the configurator software installation process. However if the driver fail to install, try the following:

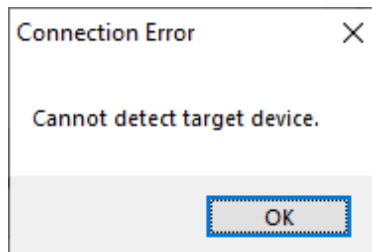
- Restart your PC.
- Power down the IO Module and power it back up.
- Unplug the USB connection and plug it back in to the PC, this will re-initiate the driver installation process.

If the issue persists, please contact Autoflame technical support to request a copy of the driver for manual installation.



1.7.2. Connection Error

When connecting the IO module to the PC, if a Connection Error appears, check that the device is powered on and that the unit has been detected by the PC. Also try to reboot the IO module and PC. If the error persists please contact Autoflame Technical Support for further troubleshooting advice.



2. **MK8 O₂ INTERFACE MODULE – MM88002**

2.1. Overview

The Mk8 O₂ Interface Module is intended for use with the Mk8 MM and Mini MK8 MM. This module allows the use of an analogue O₂ sensor and in-situ probe in conjunction with the MM for the purpose of:

- Combustion trim (on O₂ only).
- Setting up combustion limits.
- Exhaust gas temperature monitoring.
- Boiler efficiency.

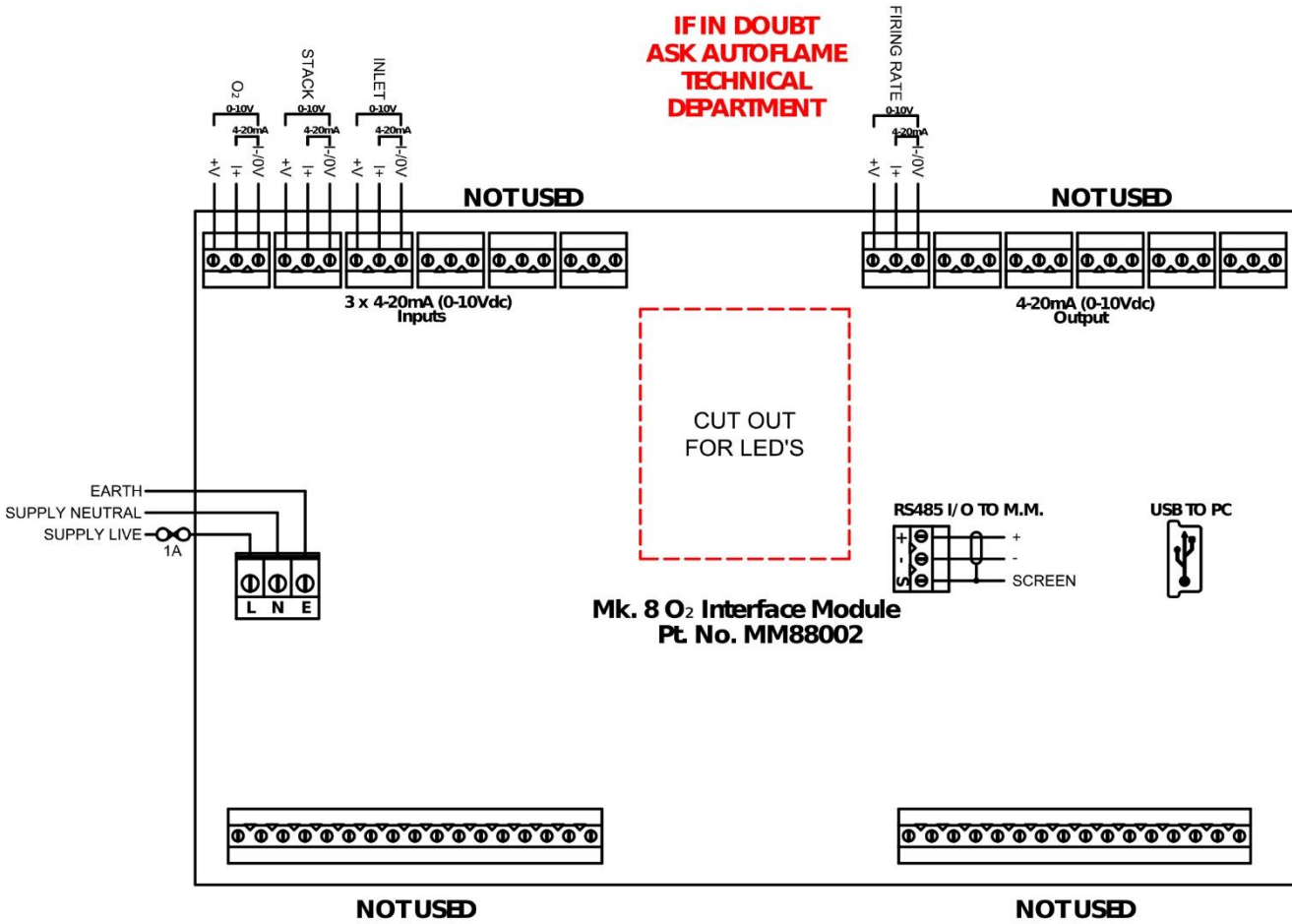


The O₂ Interface Module can only measure the O₂ reading from the stack, the module is also capable of extrapolating CO₂ value from the O₂ sensor reading.

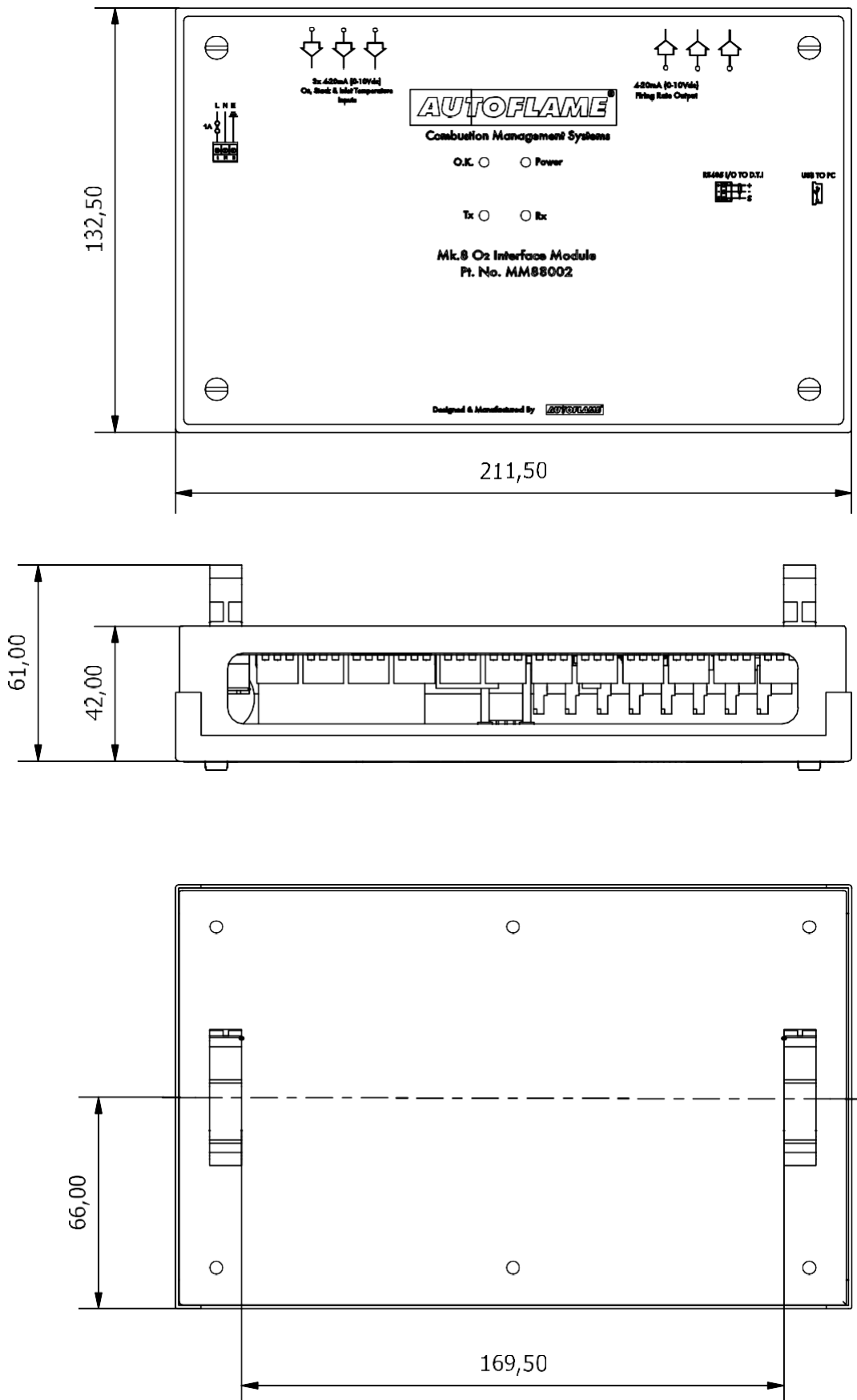
The Mk8 O₂ Interface Module is not compatible with the Mk8 DTI so the emission data cannot be logged using the DTI. The O₂ interface module provides basic functionality, for advanced exhaust gas monitoring and trim solution it is recommended to use Autoflame Mk8 EGA Evo.

Specifications	
Supply Voltage	120V/ 230V AC
Communication	RS485
IP Rating	IP20
NEMA Rating	1
Max. Operating Temperature	60°C (140°F)
Min. Operating Temperature	0°C (23°F)
Warranty	2 years limited warranty

2.2. Wiring



2.3. Dimensions and Fixing



2.4. O₂ Interface Module Inputs & Outputs

2.4.1. Analogue Input 1 – O₂ Signal Input

Analogue input 1 is dedicated to reading the O₂ input signal. The input can be configured for 4-20mA current input or 0-10V voltage input. This is configured via a PC and O₂ interface software. As shown below. The maximum signal that is generated will be shown as 20.9% O₂, with the lowest input value showing 0% O₂. The default configuration is 4-20mA input for Analogue Input 1.

2.4.2. Analogue Input 2 – Stack Temperature Input

Analogue input 2 is dedicated to the stack temperature input signal. The channel may be configured for 4-20mA current input or 0-10V voltage input via the USB interface. The temperatures represented by the high and low value input can be configured using the PC software. Alternatively a fixed temperature value can be configured when a temperature signal is not available. The units of temperature can be changed on the PC program, °C or °F. The default configuration is to use a 4-20mA input for Analogue Input 2, with 4mA representing a temperature of 50°C, and 20mA represents 400°C.

2.4.3. Analogue Input 3 – Inlet Temperature Input

Analogue input 2 is dedicated to the inlet temperature to the burner. The channel may be configured for 4-20mA current input or 0-10V voltage. The temperatures represented by the high and low value input values may also be configured via the PC. The units of temperature can be changed on the PC program, °C or °F. Alternatively a fixed temperature value can be configured when a temperature signal is not available. The default temperature value is set to 20°C.

2.4.4. Analogue Output 1 – Firing Rate output

Analogue output 1 provides a signal that represents the firing rate of the connected MM. The channel may be configured for 4-20mA current output or 0-10V voltage output via the USB interface. When configured for 4-20mA operation the unit outputs 4mA for 0% firing rate and 20mA for 100% firing rate.

When configured for 0-10V operation the unit outputs 0V for 0% firing rate and 10V for 100% firing rate. The default configuration provides a 4-20mA output.

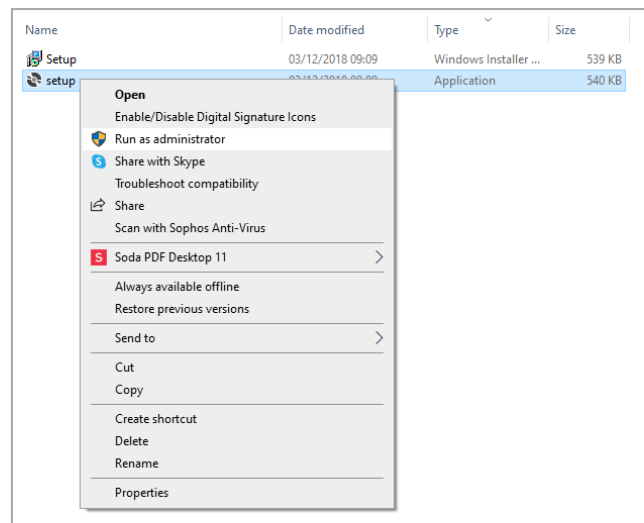
2.5. O₂ Interface Configurator Software

The O₂ Interface Module must be configured using the O₂ Interface Configurator software before it can be used. The O₂ Interface Configurator software is compatible with any PC running Windows 7, 8 or 10. Both 32 and 64 bit OS versions are supported.

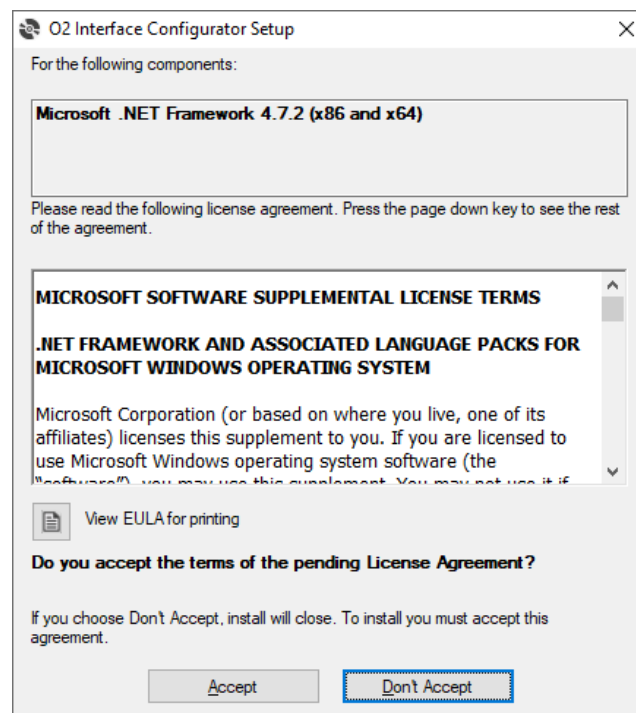
The configurator software is included on the USB stick that is provided with the purchase of the O₂ Interface Module. The software can also be downloaded from Autoflame Tech Site: tech.autoflame.org/software/

O₂ Interface Configurator Software Installation

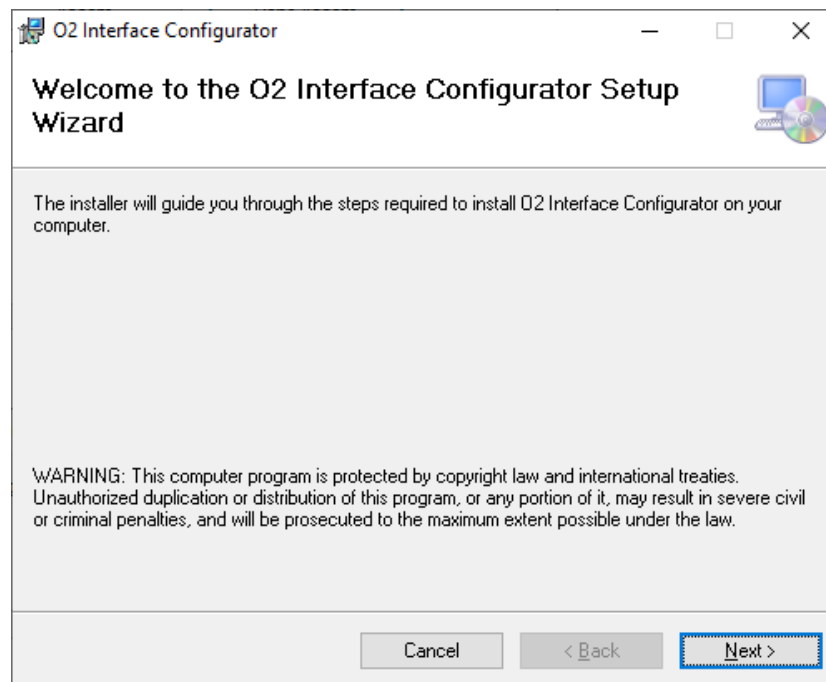
Right click on the 'setup' file and click 'Run as Administrator' to launch the installation process.



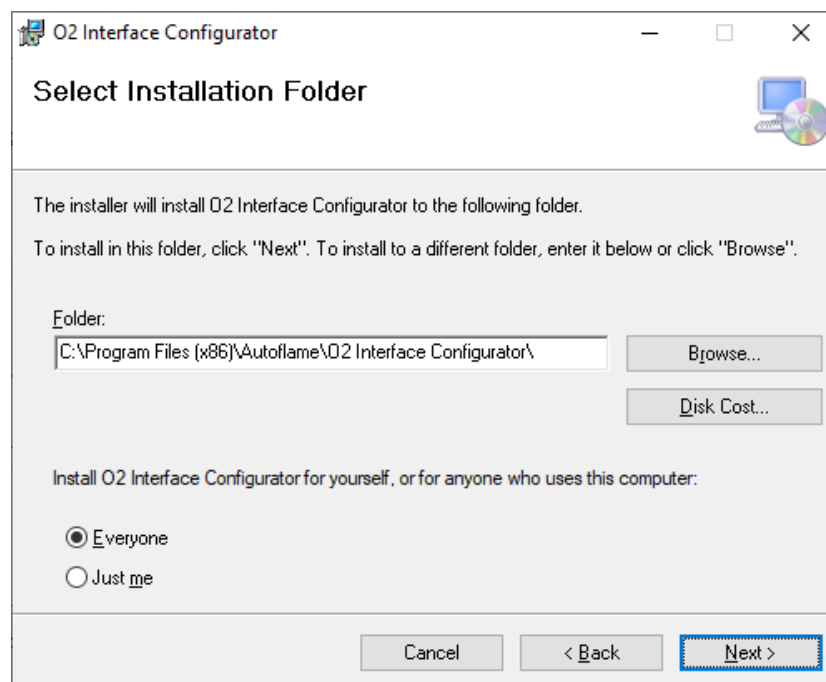
Review the license terms, if happy with the terms click 'Accept'



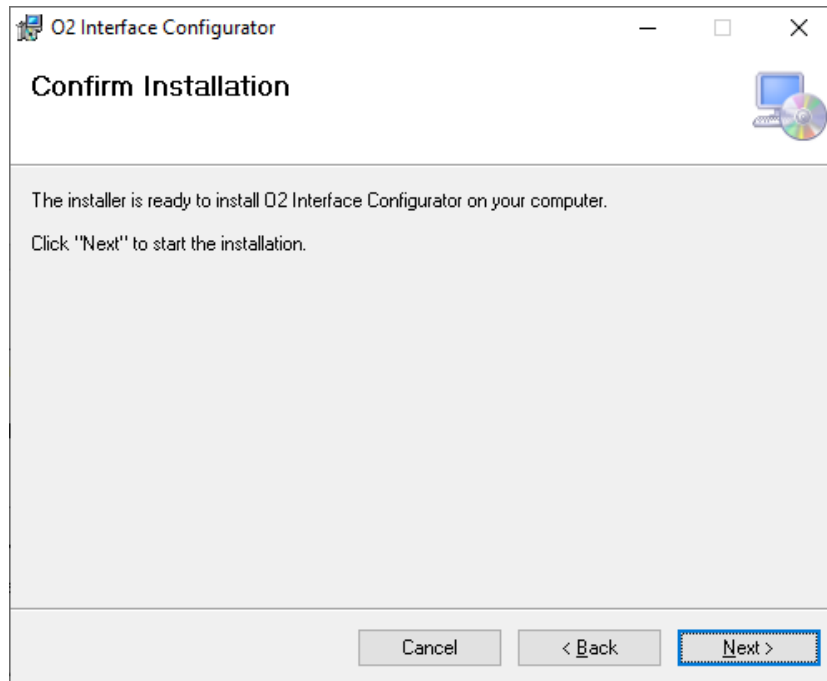
The O₂ Interface Configurator software setup wizard box will appear. Click 'Next' to begin the installation.



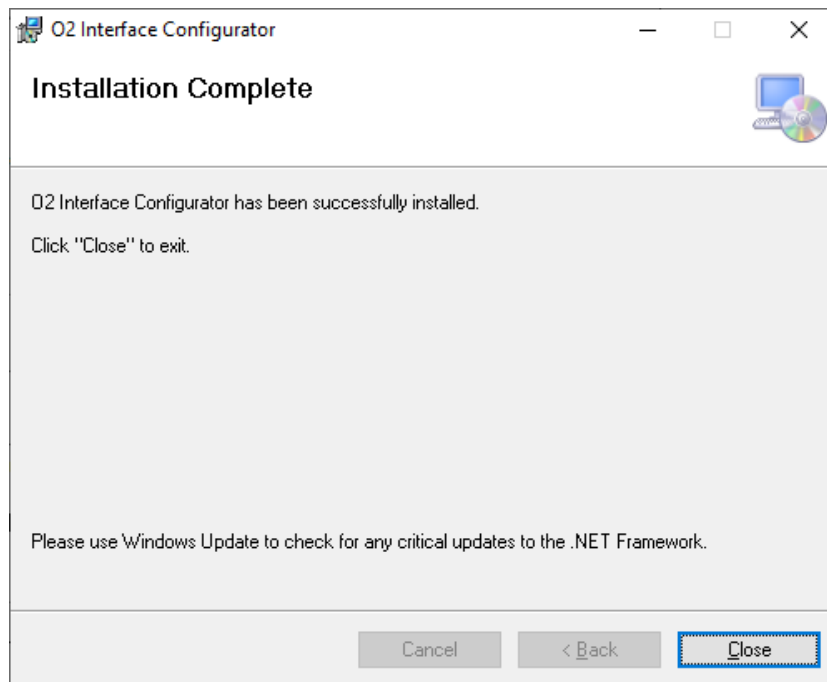
The default installation location is: C:\Program Files (x86)\Autoflame\O2 Interface Configurator\
Click 'Browse' if you wish to change this location.
Click 'Next' to start the installation.



Now the installer is ready to install the software, click 'Next' to confirm.



Now the software installation has been completed. Click 'Close' to exit the installer.



2.6. Configuring the O₂ Interface Module

The O₂ interface module must be configured using the O₂ Interface Configurator. For this the module must be connected to the PC, to do so follow these steps:

1. Power off the O₂ Interface Module.
2. Connect the O₂ Interface Module to the PC using the supplied USB to mini-USB lead.
3. Power on the O₂ Interface Module.
4. Start the O₂ Interface Configurator software and click 'Connect' to establish connection with the module.

If the board has been previously configured, click 'Get Config from Device' to view and change the setup that is already stored on the O₂ Interface Module.

2.6.1. Error Status

The module will display any error conditions found in the Error Status box. This will include a warning about the analogue input channels having low signal if they are configured as 4-20mA inputs but no connection is currently made. Note that if an error condition exists the Error Status box will not be updated until the Refresh button is clicked.

2.6.2. O₂ Configuration

The O₂ box selects the O₂ input configuration (analogue input 1). The valid selections are to configure the input as 4-20mA or 0-10V. The minimum and maximum O₂ concentrations that these limits represent can also be configured.

The screenshot shows the 'Configuration' window for O₂. It features a dropdown menu for 'Input Mode (Analogue Input 1)' set to '4-20mA input'. Below this are two input fields: 'Minimum O2 Concentration (%)' with a value of 0.00 and 'Maximum O2 Concentration (%)' with a value of 20.95. Each field is followed by a small 'at' label and a current mode indicator: 'at 4mA' for the minimum and 'at 20mA' for the maximum.

2.6.3. CO₂ Configuration

The CO₂ box describes the percentage of CO₂ reported by the O₂ interface when the O₂ reading is 0%. This is scaled linearly such that 0% CO₂ is reported at 20.9% O₂.

The screenshot shows the 'CO2' configuration window. It contains four rows, each with a label and a numerical input field followed by a percentage sign: 'Fuel 1 - Maximum CO2' (11.80%), 'Fuel 2 - Maximum CO2' (15.00%), 'Fuel 3 - Maximum CO2' (15.00%), and 'Fuel 4 - Maximum CO2' (11.80%).

2.6.4. Stack Temperature

The Stack Temperature box configures Analog Input 2 as a stack (exhaust) temperature input, or allows a default stack temperature to be defined by selecting "Default Value" and entering the desired value. The minimum and maximum temperature can also be configured.

The screenshot shows the 'Stack Temperature' configuration window. It features a dropdown menu for 'Input Mode (Analogue Input 2)' set to '4-20mA input'. Below this are two input fields: 'Minimum Temperature (°C)' with a value of 50 and 'Maximum Temperature (°C)' with a value of 400. Each field is followed by a small 'at' label and a current mode indicator: 'at 4mA' for the minimum and 'at 20mA' for the maximum.

2.6.5. Temperature Units

The temperature unit can be configured to Celsius or Fahrenheit

The screenshot shows the 'Temperature Units' configuration window. It contains a single dropdown menu set to 'Fahrenheit'.

2.6.6. Inlet Temperature

The Inlet Temperature box configures Analog Input 3 as an inlet temperature input, or allows a default inlet temperature to be defined by selecting “Default Value” and entering the desired value.

Inlet Temperature

Input Mode (Analogue Input 3) 4-20mA input

Minimum Temperature (°C) 50 at 4mA

Maximum Temperature (°C) 400 at 20mA

2.6.7. Efficiency Calculation

The Efficiency Calculation box allows selection of the method used to calculate burner efficiency. The “English” option includes moisture less in the calculation, while the “European” calculation does not.

Efficiency Calculation

Efficiency Calculation Type English

2.6.8. Firing Rate % Output

The Analogue Output box configures the analogue output of firing rate as a 4-20mA or 0-10V signal. Note that the hardware will output both current and voltage signals at all times, but that this option controls the value at the low end of the signal. i.e. in 4-20mA mode the output will be 4mA or 2V at 0% firing rate, while in 0-10V mode the output will be 0V or 0mA at 0% firing rate.

Analogue Output

Firing Rate Analogue Output Mode 4-20mA

Finally, once configuration options have been entered the user should click the “Save Config to Device” button to store the new configuration in the O₂ Interface Module. If this is not performed then any changes made will be lost. The application should then show a message box declaring success. The ‘Disconnect’ button should then be used, and the configuration process is complete.

Success

Device configuration successfully updated.

OK

2.7. MM Setup

The Mk8 O₂ Interface uses the same configuration setup as though a Mk8 EGA is optioned.

- Parameter 10 to 2 (Mk8 Protocol RS485)
- Option 12 setup for how the O₂ Interface is to be used; monitoring, trim or trim with limits.
- Option 13 is set for when the alarms are active and if the burner runs on the EGA error.

Online Changes

Options Parameters

Option 12
EGA Functionality

0. Not optioned

0. Not optioned

1. Monitoring only

2. Applies trim

3. Applies trim, combustion limits tested

Default

↑
↓
Exit

Monday, 13 July 2015 03:56:41

Online Changes

Options Parameters

Option 13
EGA Error Response

2. On error burner runs, alarm active

0. On error burner stops, alarm active

1. On error burner runs, alarm not active

2. On error burner runs, alarm active

Default

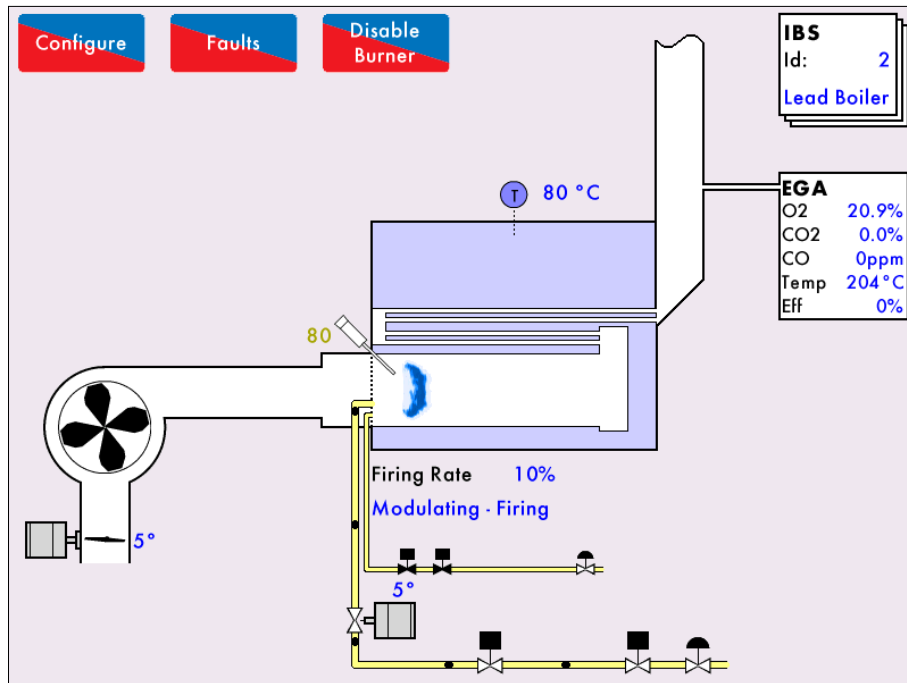
↑
↓
Exit

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If Option 12 is set to 3 (combustion limits tested), options 19-26 must be set accordingly.

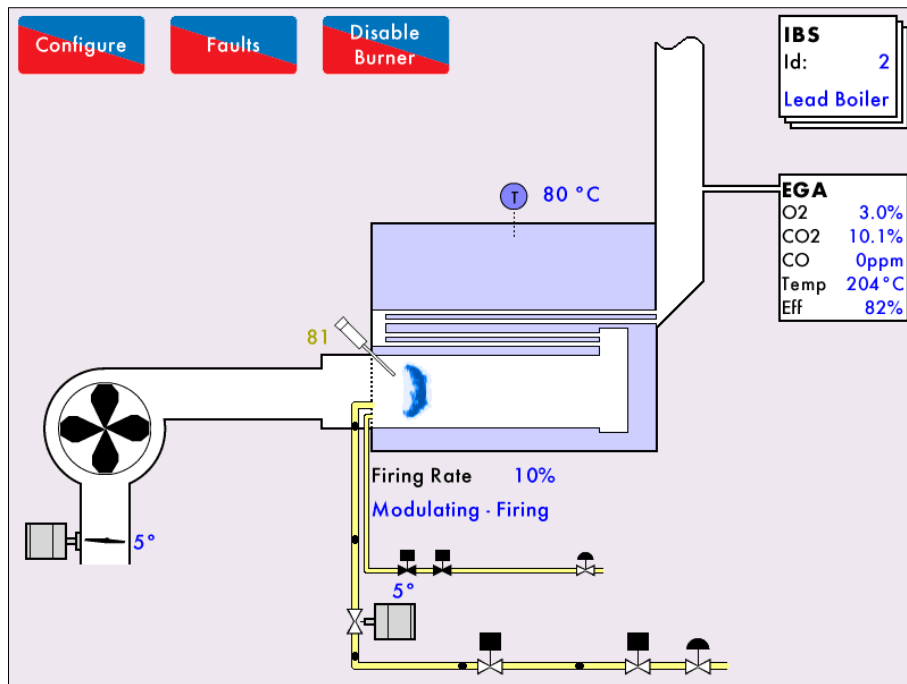
Note: Option 21 is not used with an O₂ interface.

2.8. Mk8 O₂ Interface Screens

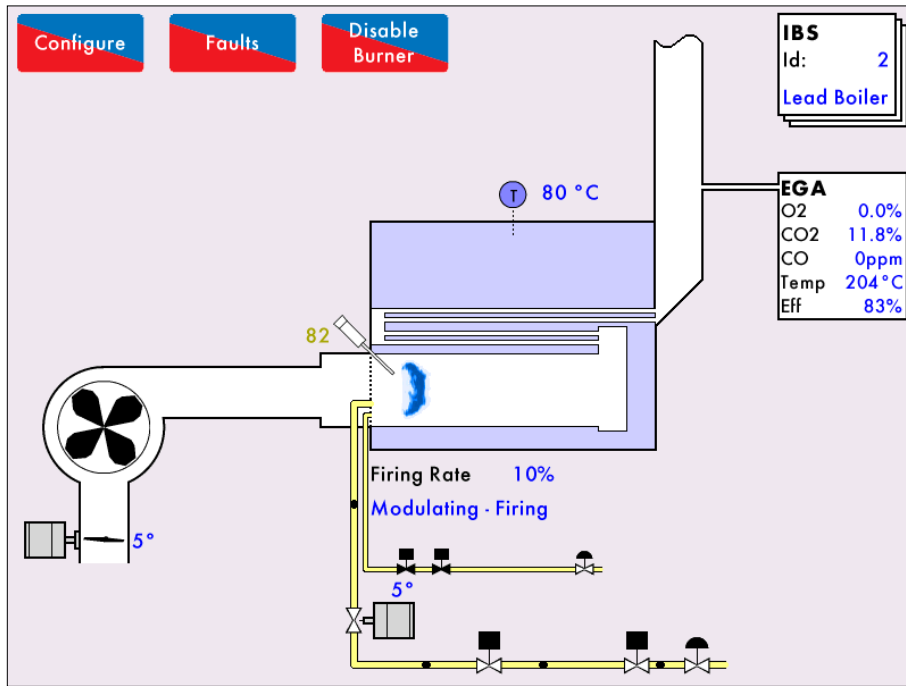


O₂ reading shows 20.9% when the 4-20mA or 0-10v signal is maximum (20mA or 10v). The efficiency reading will remain 0% until the O₂ reading is below 19%.

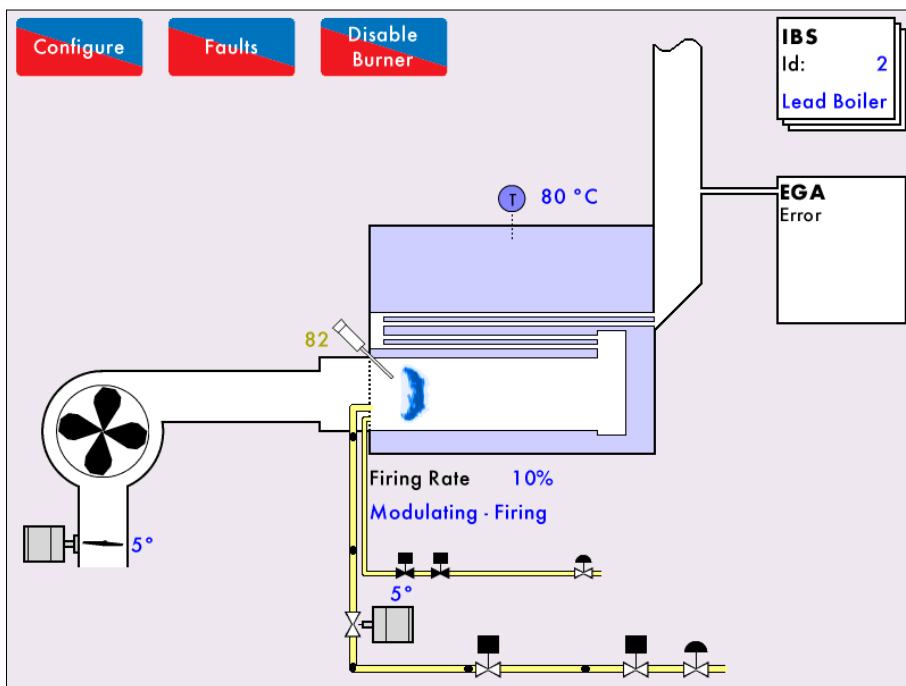
Note: CO reading is shown on the home screen as 0ppm; the reading is not calculated or measured.



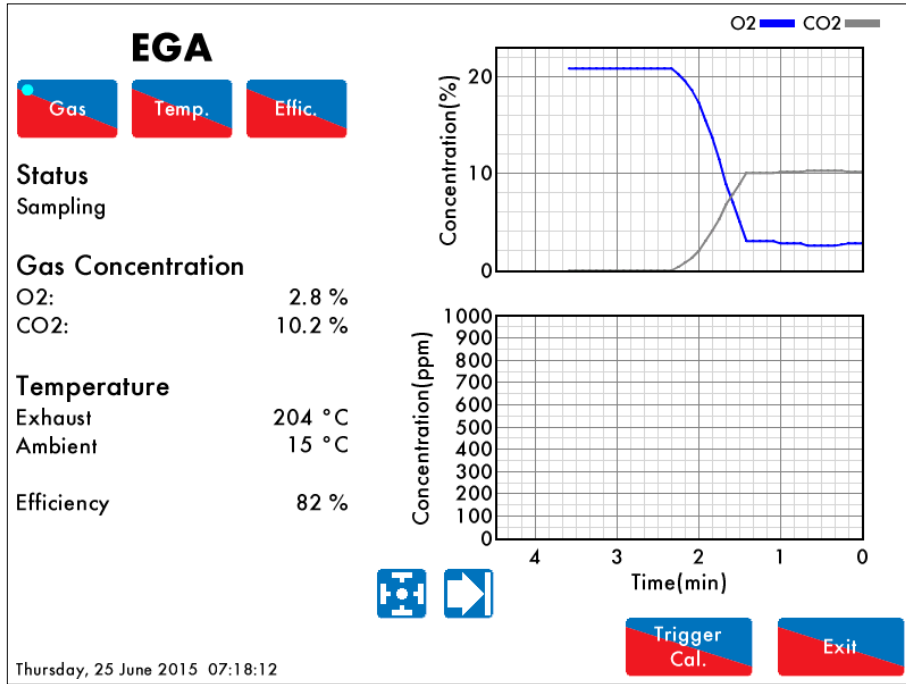
When burning natural gas, the CO₂ value is calculated to be approximately 10% when the O₂ is 3%.



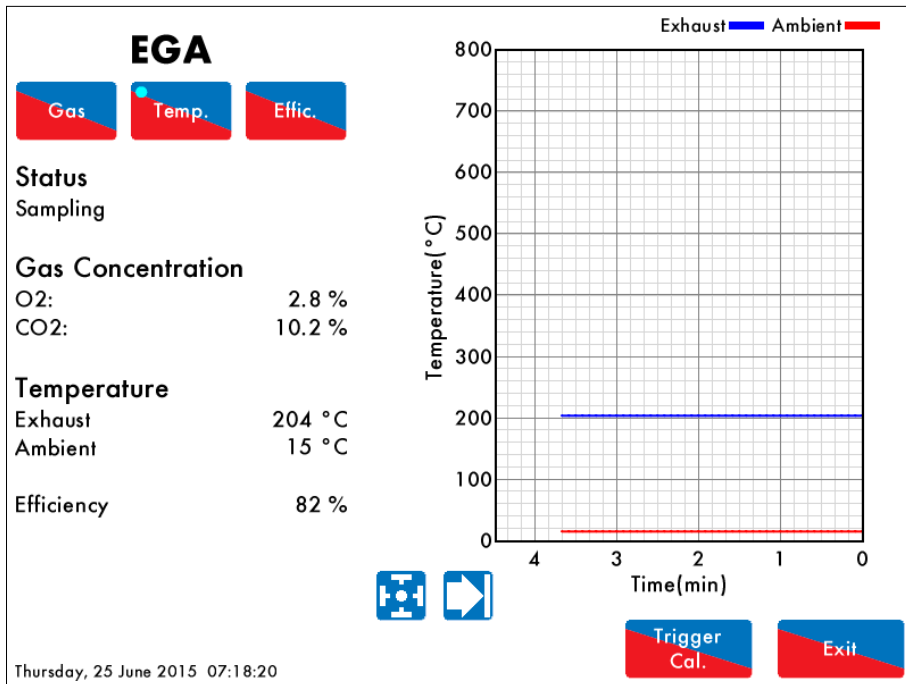
At the minimum reading (4mA or 0v) the maximum CO₂ value will be shown (for 0% O₂). This is the value that is set using the PC program as shown in the previous pages.



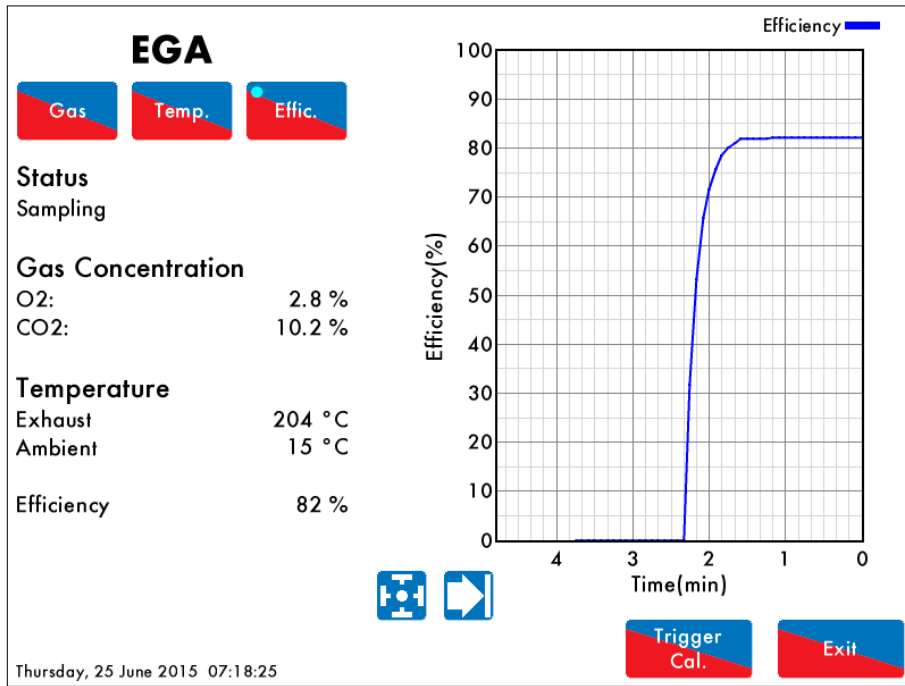
If the input range drops below 4mA or 0V an error will be displayed on the EGA screen.



Only the O₂ and CO₂ will be shown and recorded on the Gas history graph. CO is not measured.



The exhaust gas temperature is related to input 2 on the interface, using a 4-20mA or 0-10V signal. The ambient temperature is taken from input 3 or the default value that is entered when setting up the interface on the PC.



The efficiency can be changed between European and English calculation using the O₂ Interface Configurator software as explained previously.

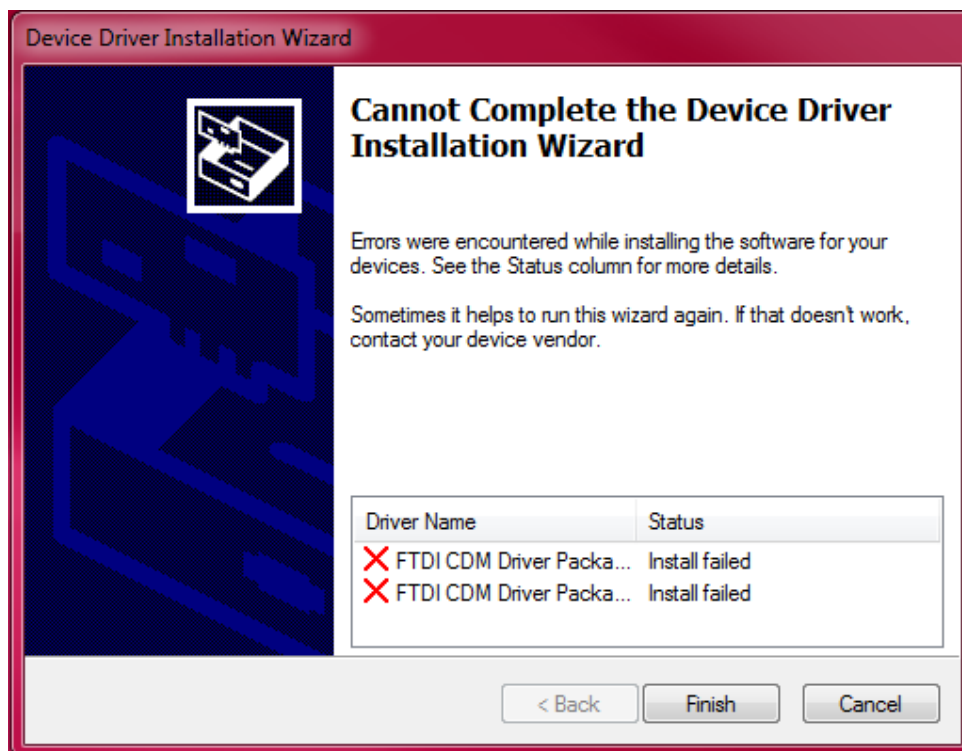
2.9. Troubleshooting

2.9.1. Driver Install Failed

The driver software that connects the O₂ Interface Module to the PC should automatically install during the configurator software installation process. However if the driver fails to install, please try the following:

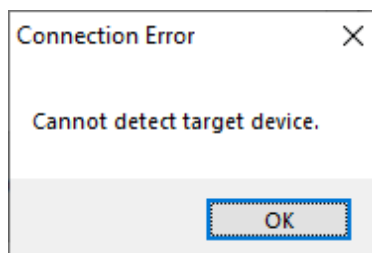
- Restart your PC.
- Power down the O₂ Interface Module and power it back up.
- Unplug the USB connection and plug it back in to the PC, this will re-initiate the driver installation process.

If the issue persists, please contact Autoflame technical support to request a copy of the driver for manual installation.



2.9.2. Connection Error

When connecting the O₂ Interface Module to the PC, if a Connection Error appears, check that the device is powered on and that the unit has been detected by the PC. Also try to reboot the IO module and PC. If the error persists please contact Autoflame Technical Support for further troubleshooting advice.



3. **BOTTOM BLOWDOWN MODULE – BBC70004**

3.1. Overview

The Bottom Blowdown Module can be used with the Mk8 MM for the purpose of controlling the boiler's bottom blowdown process. Although the blowdown can be done using solenoid, using the Bottom Blowdown Module offers many benefits, including:

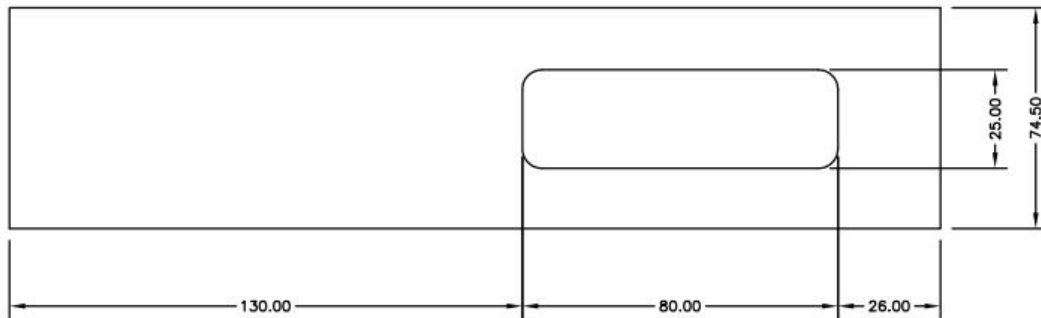
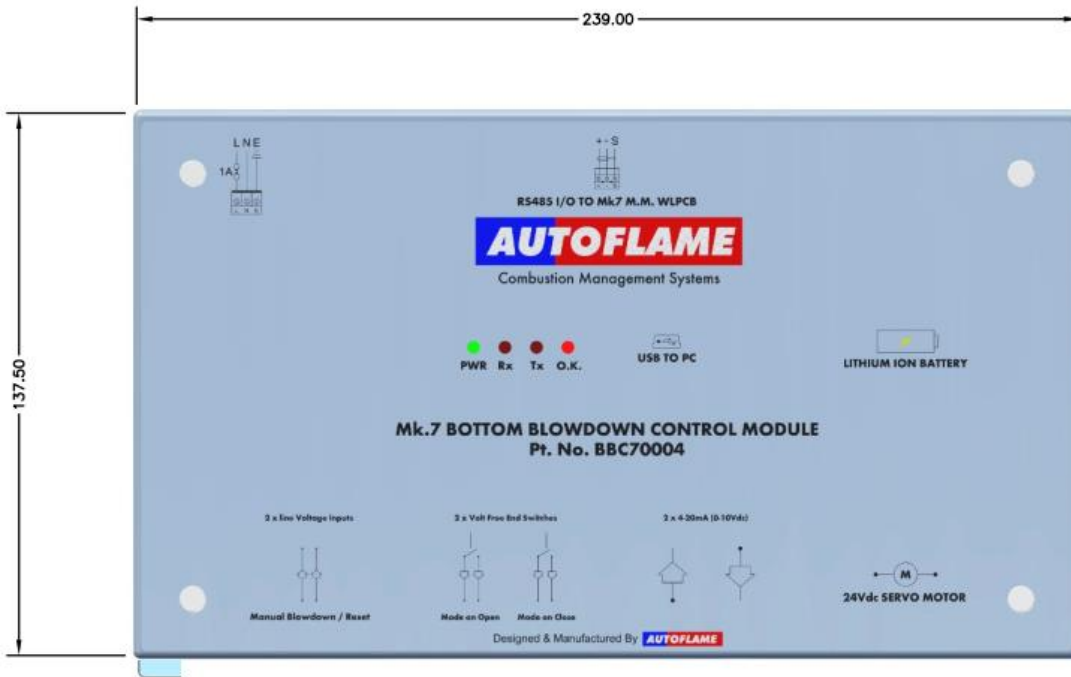
- Fully modulating / automated blowdown process
- 24V DC Autoflame industrial type servomotors for control and repeatability
- Electronic proof of open/close end switches
- Lithium-Ion battery technology ensures guaranteed closure on power failure
- Total electronic operation – no compressed air supply required
- Timed blowdown with manual/automatic operation
- Bottom blowdown sequence logging
- Up to 10 timed blowdowns over a 24-hour period are possible
- Repeatable up to 10 times from 1 to 60 seconds for each blowdown cycle
- 'Parked' position to reduce valve opening time
- Quick servomotor disconnect facility for manual actuation

please check the Mk8 MM Manual for full details about Bottom Blowdown configuration.



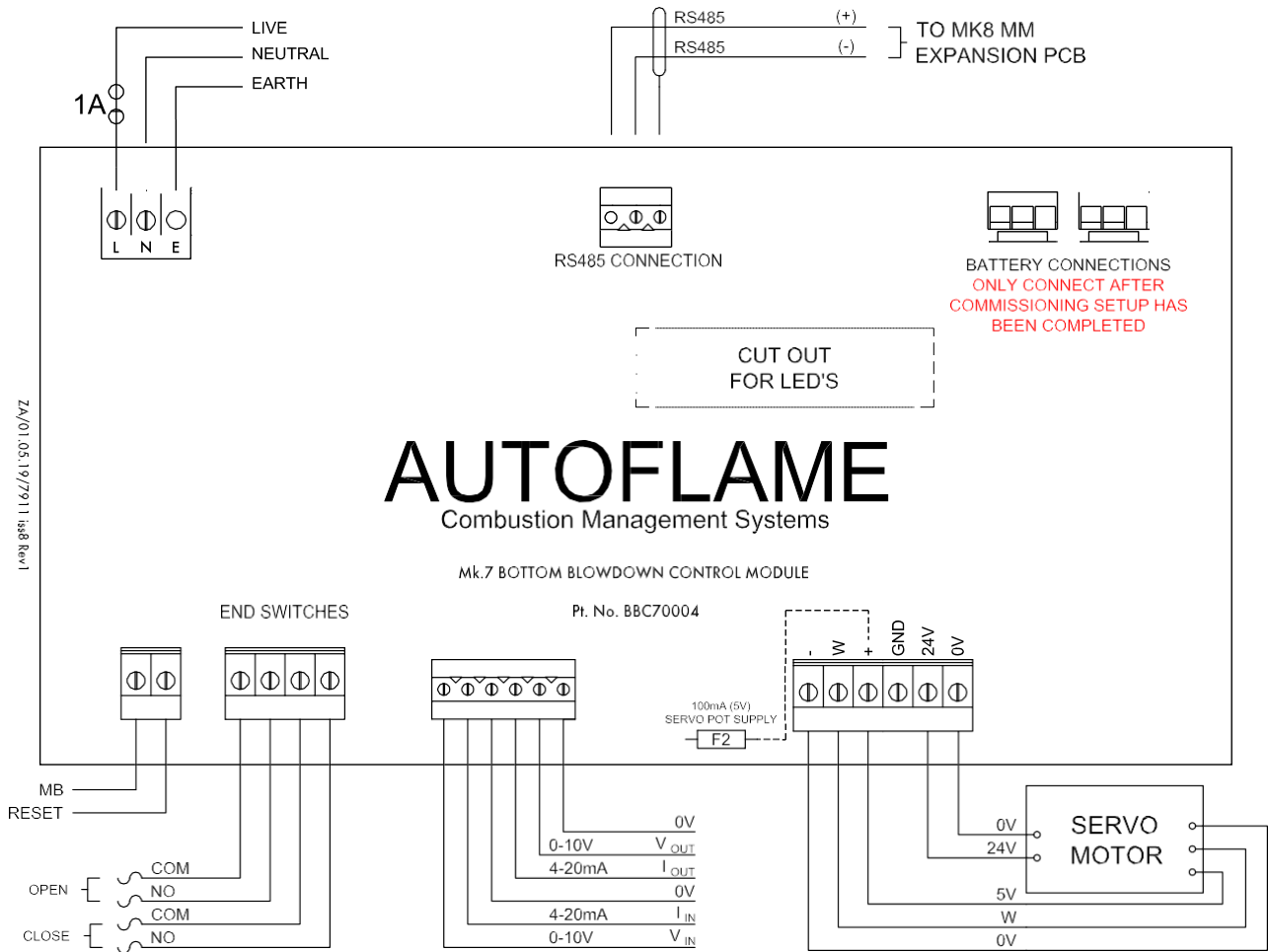
Specifications	
Supply Voltage	120V/ 230V AC
Communication	RS485
IP Rating	IP20
NEMA Rating	1
Max. Operating Temperature	60°C (140°F)
Min. Operating Temperature	0°C (23°F)
Warranty	2 years limited warranty

3.2. Dimensions and Fixing



The module features DIN rail clips so it can be mounted to any standard DIN rail without any need for fixings.

3.3. Wiring



Terminal	Description
L	Live
N	Neutral
E	Earth
RS485 +	Connection MM terminal 5T+
RS485 -	Connection MM terminal 5T-
S	Screen at module
MB	Manual Blowdown
RESET	Reset bottom blowdown module error
OPEN COM/NO	Volt-free connection for open position
CLOSE COM/NO	Volt-free connection for closed position
V _{IN}	Voltage 0-10V input for steam production rating (standalone use)
I _{IN}	Current 4-20mA input for steam production rating (standalone use)
0V	Common for terminals V _{IN} or I _{IN}
V _{OUT}	Voltage 0-10V output for bottom blowdown valve position
0V	Common for terminals V _{OUT} or I _{OUT}
-	0V supply to servomotor from MM
W	Signal from servomotor indicating position
+	+5V supply to servomotor from MM
GND	Ground/Earth
24	+24V supply to servomotor from battery
0	+0V supply to servomotor from battery

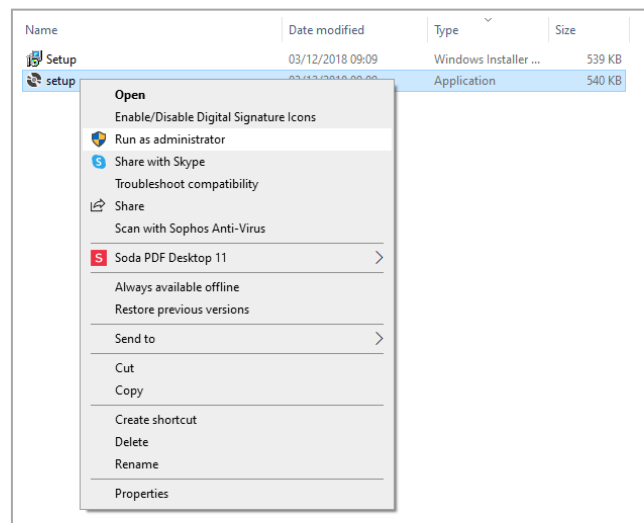
3.4. Bottom Blowdown Board Configurator Software

The Bottom Blowdown Module must be configured using the Bottom Blowdown Board Configurator Software. This software is compatible with any PC running Windows 7, 8 or 10. Both 32 and 64 bit OS versions are supported.

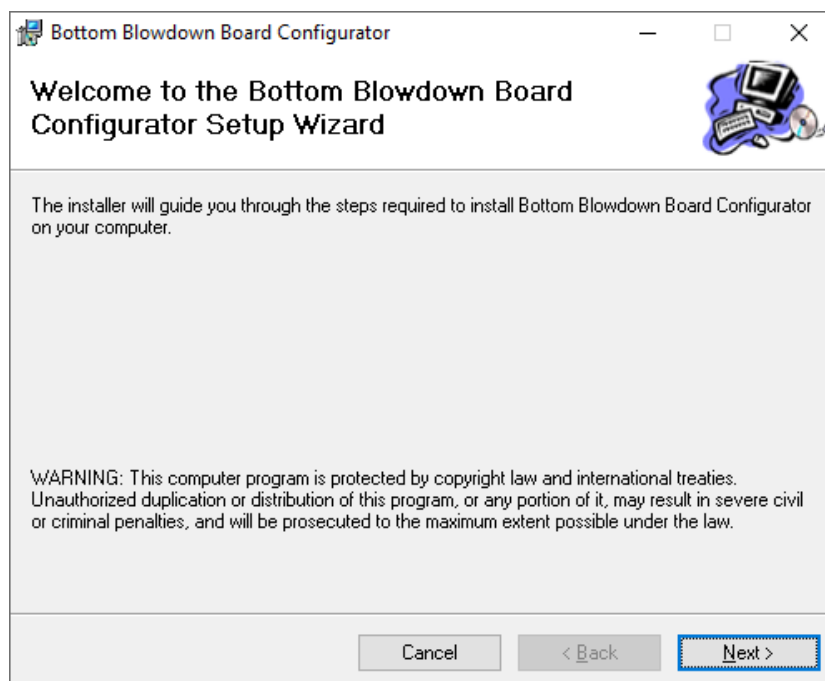
The configurator software is included on the USB stick that is provided with the purchase of the Bottom Blowdown module. The software can also be downloaded from Autoflame Tech Site: tech.autoflame.org/software/

Software Installation

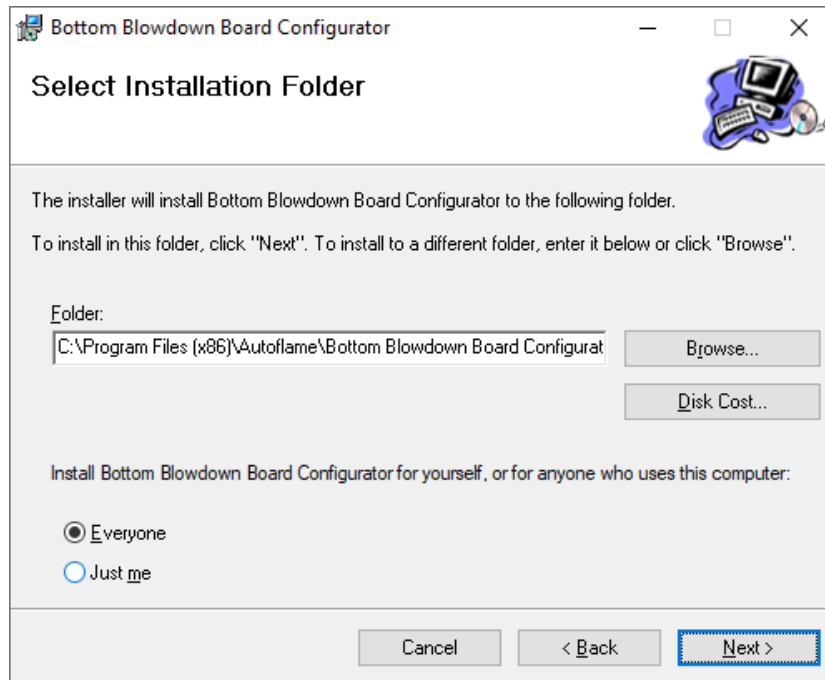
Right click on the 'setup' file and click 'Run as Administrator' to launch the installation process.



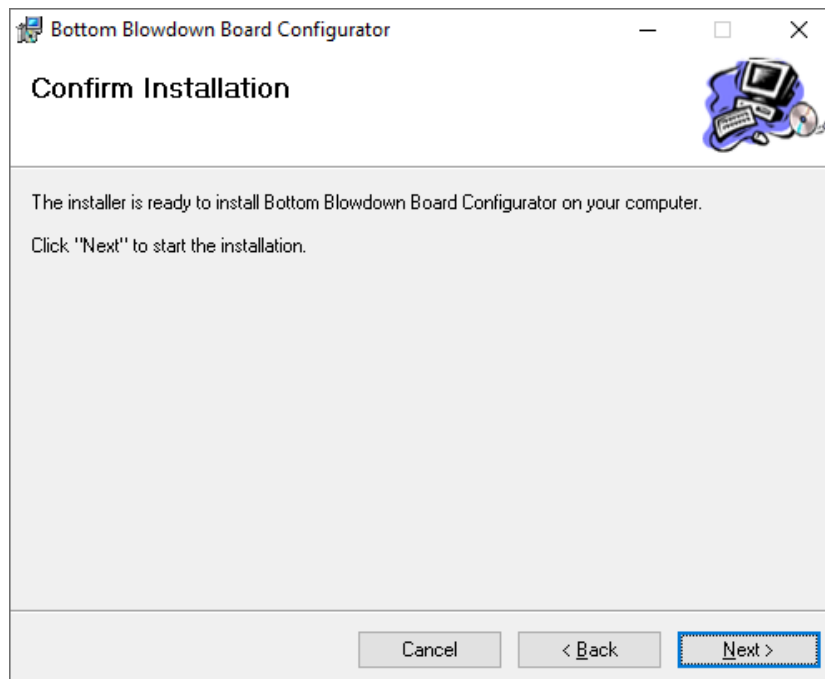
The Bottom Blowdown Board Configurator setup wizard box will appear. Click 'Next' to begin the installation.



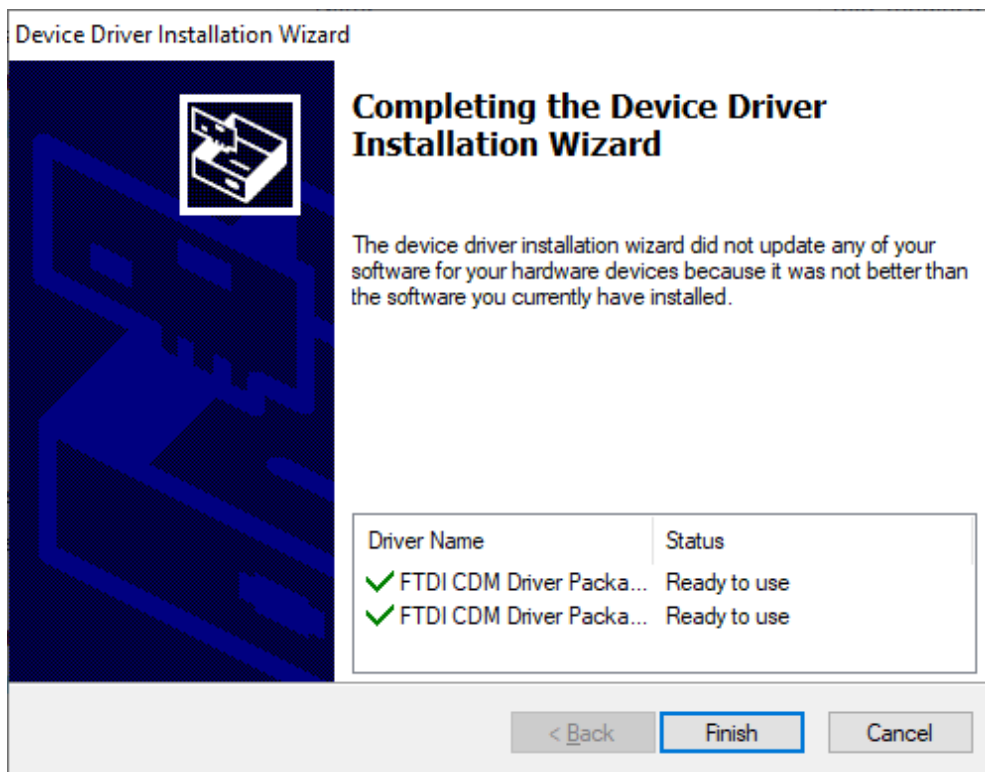
The default installation location is: C:\Program Files (x86)\Autoflame\ Bottom Blowdown Board Configurator \
Click 'Browse' if you wish to change this location.
Click 'Next' to start the installation.



Now the installer is ready to install the software, click 'Next' to confirm.



Once the installer completes the driver installation, click 'Close' to exit the installer.



3.5. Configuring the Bottom Blowdown Module

The Bottom Blowdown module can be used either with the Mk8 MM or as standalone. When used with a Mk8 MM, the Bottom Blowdown module must be checked via the Bottom Blowdown Board Configurator prior to connecting to the MM. Before commissioning the module with the MM the battery test and parked position must be tested with the Bottom Blowdown Board Configurator.

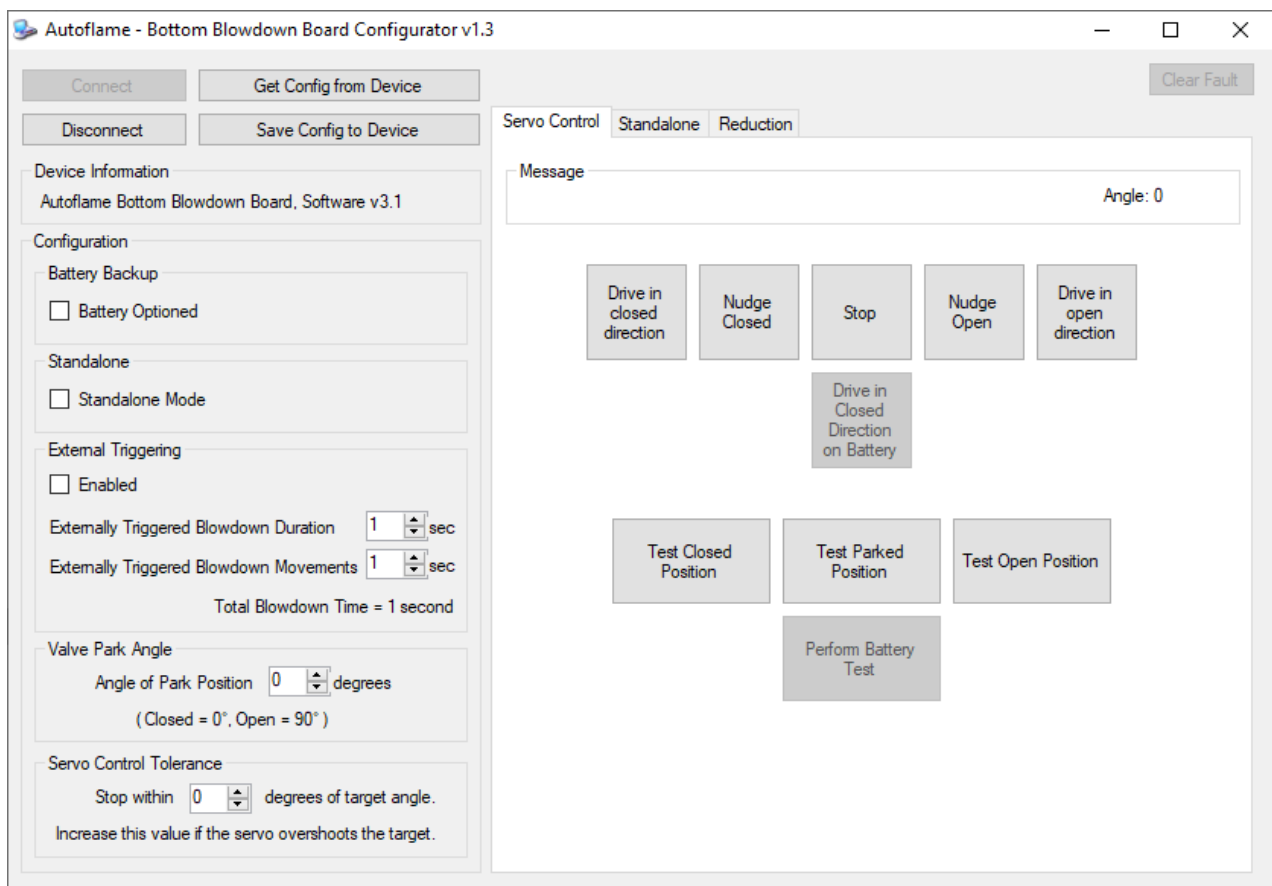
For standalone mode, the Bottom Blowdown module must be used in conjunction with an Autoflame 24V DC servomotor controlling the bottom blowdown valve.

Please check the Mk8 MM Manual for full details about setting up bottom blowdown.

The Bottom Blowdown Module must be configured using the Bottom Blowdown Board Configurator software. For this the module must be connected to the PC, to do so follow these steps:

1. Power off the Bottom Blowdown Module.
2. Connect the Bottom Blowdown Module to the PC using the supplied USB to mini-USB lead.
3. Make sure the Bottom Blowdown Module is disconnected from the Mk8 MM.
4. Power on the Bottom Blowdown Module.
5. Start the Bottom Blowdown Board Configurator software and click 'Connect' to establish connection with the module.

If the board has been previously configured, click 'Get Config from Device' to view and change the setup that is already stored on the Bottom Blowdown Module.



Check the tick boxes for 'Battery Backup', 'Standalone' and 'External Triggering' as required. External Triggering is used for when there is an external switch for the timed bottom blowdown trigger (see section 5.3.2). Please set the Valve Park Angle according to the bottom blowdown valve being used. For the Autoflame valves, this should be set at zero degrees.

Battery Backup

Battery Optioned

If the valve in use has a closed position between 0° and 90° the valve park angle can be set to reduce the total time between blowdown repeats.

Valve Park Angle

Angle of Park Position degrees
(Closed = 0°, Open = 90°)

Servo Control Tolerance

Stop within degrees of target angle.
Increase this value if the servo overshoots the target.

The Servo Control tab is used to set the closed and open positions. The valve can be driven continuously to the closed position or open positions, or nudged in small movements. Click and hold 'Drive in closed direction' and 'Drive in open direction' to drive the valve to the closed and open positions, respectively. Please check the Mk8 MM manual for further details.

Servo Control Standalone Reduction

Message Angle: 0

Drive in closed direction Nudge Closed Stop Nudge Open Drive in open direction

Drive in Closed Direction on Battery

Test Closed Position Test Parked Position Test Open Position

Perform Battery Test

Once the open and closed positions have been set, these must be tested individually, by clicking 'Test Open Position', 'Test Closed Position', and 'Test Parked Position.'

If the Battery Back-up has been enabled, click on 'Drive in Closed Direction on Battery' to check the battery voltage. The valve is then opened to the parked position using mains power, and then it is driven to the closed position using the battery power to test the battery. If the battery cannot drive the valve to the closed position, a 24V fault will appear. A working battery will have 13V + in the cells, if this falls below 12.4V, there will not be enough voltage in the battery to drive the valve to the closed position should a power failure occur.

Click 'Save Config to Device' to store these positions.

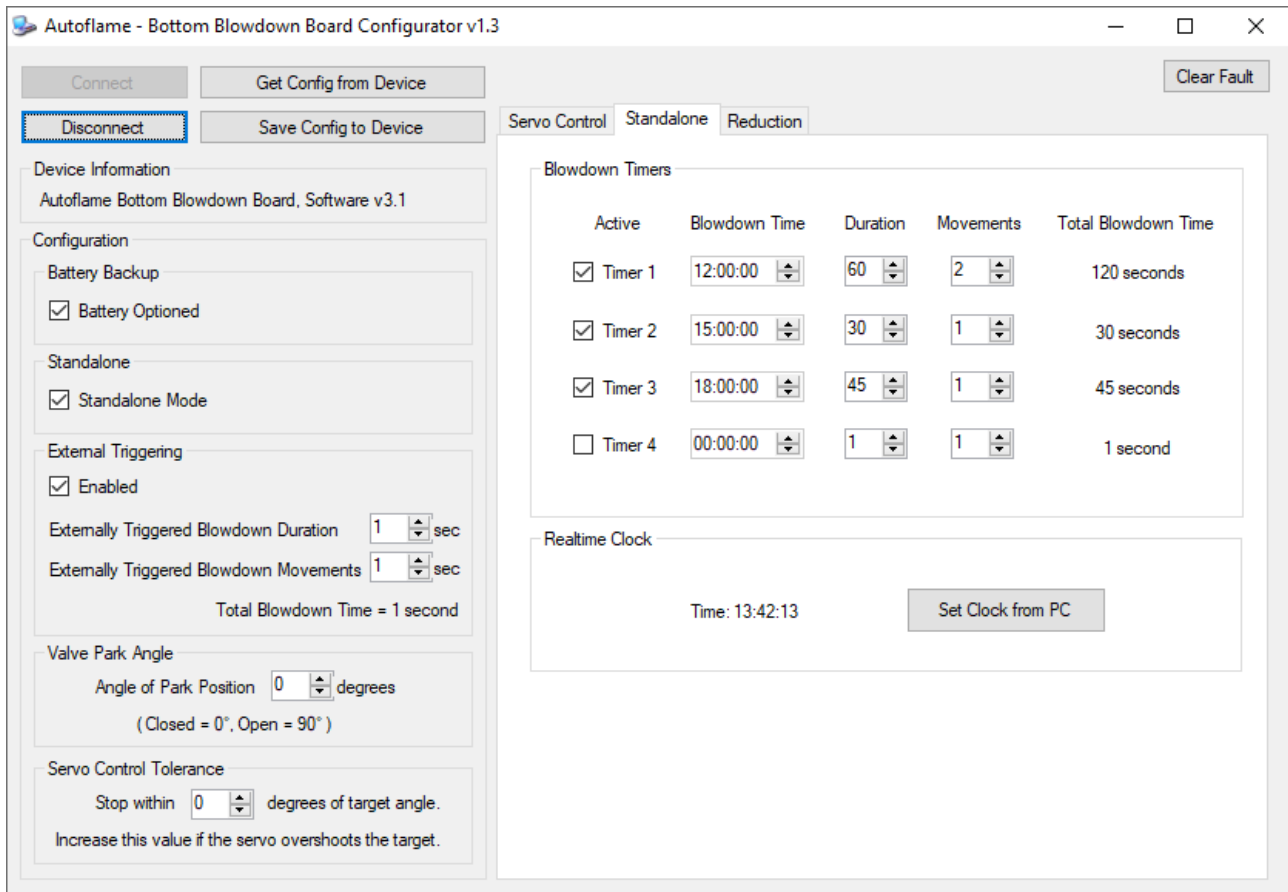
For bottom blowdown with an MM, connect to the MM and follow the steps found in the Mk8 MM Manual.

3.6. Standalone Mode

3.6.1. Standalone Blowdown Timings

When using the Bottom Blowdown module for standalone operation, ensure Standalone Mode is ticked. Click on the Standalone tab. Choose how many timed blowdowns, and their durations and movements are required. There can be a maximum of 4 timed blowdowns, each with maximum duration of 60s, and maximum movements (repeats) of 10.

Click 'Set Clock from PC', the module will update its clock from the PC.



Click 'Save Config to Device' to store these timed blowdowns.

3.6.2. External Triggering

1. If External Triggering has been enabled, set the duration and repeats of the externally triggered blowdown.
2. Click 'Save Config to Device' to store the external triggering settings.

3.6.3. Standalone Automatic Reduction of Bottom Blowdown Duration

Go to the Reduction tab to set the time reduced bottom blowdown in standalone operation (see Expansion Board Set-Up Guide for more information on savings from time reduced bottom blowdown). A minimum blowdown time can also be set to that if time reduced bottom blowdown is set, and then the time of the blowdown will never go below this value.

Choose how the steam production is fed through to the Bottom Blowdown module, either via a 4-20mA or 0-10V input.

Configure the calibration for the zero and maximum steam production input values.

Click on 'Reset Reduction Total' to reset the totalised analogue input reading.

The screenshot shows the 'Autoflame - Bottom Blowdown Board Configurator v1.3' software interface. The 'Reduction' tab is selected, displaying the following settings:

- Operation:**
 - Automatic Reduction of Bottom Blowdown Duration
 - Always perform minimum blowdown of sec
- Input Selection:**
 - Use 4-20mA Input
 - Use 0-10V Input
- Calibration:**
 - Zero Steam Production Input Value: mA
 - Maximum Steam Production Input Value: mA
 - Input Reading: mA
- Reset:**
 - Reset the totalized analog input used for bottom blowdown reduction.

Other tabs visible include 'Servo Control' and 'Standalone'. The 'Standalone' tab is also active, showing 'Standalone Mode' checked. The 'External Triggering' section shows 'Enabled' checked, with 'Externally Triggered Blowdown Duration' and 'Externally Triggered Blowdown Movements' both set to 1 second, resulting in a 'Total Blowdown Time = 1 second'. The 'Valve Park Angle' section shows 'Angle of Park Position' set to 0 degrees. The 'Servo Control Tolerance' section shows 'Stop within' set to 0 degrees.

Click 'Save Config to Device' to store the time reduced bottom blowdown settings.

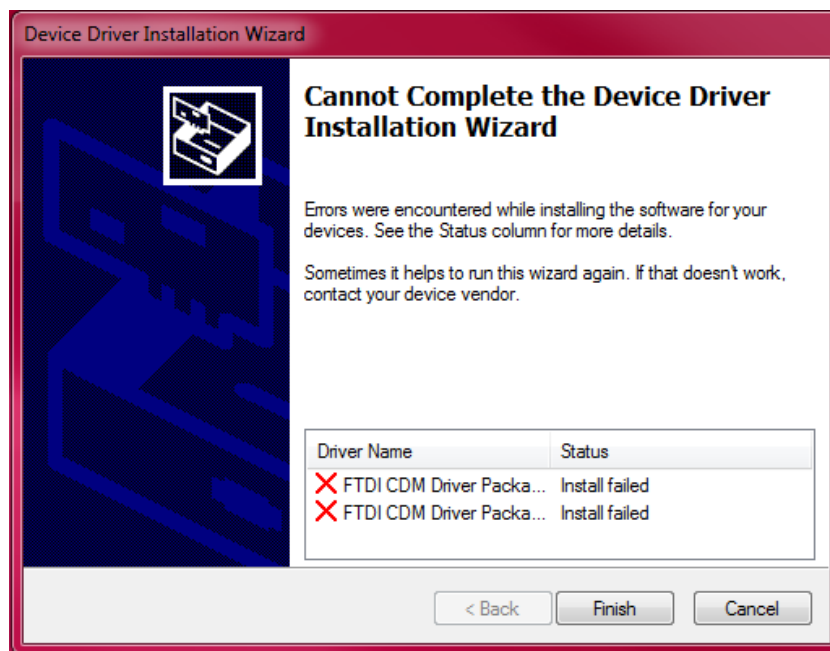
3.7. Troubleshooting

3.7.1. Driver Install Failed

The driver software that connects the Bottom Blowdown Module to the PC should automatically install during the configurator software installation process. However if the driver fails to install, please try the following:

- Restart your PC.
- Power down the IO Module and power it back up.
- Unplug the USB connection and plug it back in to the PC, this will re-initiate the driver installation process.

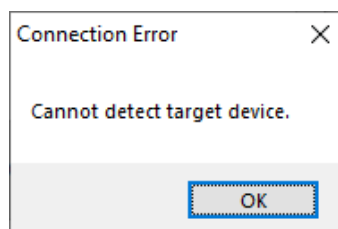
If the issue persists, please contact Autoflame technical support to request a copy of the driver for manual installation.



3.7.2. Connection Error

When connecting the Bottom Blowdown module to the PC, if the connection error appears, check that the device is powered on and that the unit has been detected by the PC. Also make sure that the Bottom Blowdown Module is not connected to the MM at the same time.

Please contact Autoflame Technical Support if the error persists.



3.7.3. Movement Fail

If during testing the positions or battery test any error appears such as 'Movement FAIL', or 'Close FAIL', check the wiring to the servomotor and the bottom blowdown valve. Power down the unit and check the valve rotation with the motor hand rotation key provided with the servomotor. UNIC10's only have 110° of movement; ensure that the movement is in the reading range. If not, please check the servomotor zeroing steps found in Autoflame Servomotors Guide.

AUTOFLAME
MODULES GUIDE
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