

Fluenta Flarecal™

User Manual

62.400.027.C | EN





- **This user guide enables routine on-site calibration of Fluenta ultrasonic flow sensors using the FlareCal™ calibration box.**
- **This product is designed to be used in designated non-hazardous areas only. It is not designed or certified to be operated or taken into hazardous locations. Ensure that appropriate work permits have been issued by the site to designate the necessary non-hazardous areas before undertaking the calibration process.**
- **The calibration procedure is intended to be performed by site personnel who have been certified in the calibration process by Fluenta.**
- **The calibration procedure will require a PC with an installation of Fluenta UFM Manager software which includes a valid license for the FlareCal module add-in.**
- **Exercise extreme caution when handling the transducers during the calibration procedure to avoid any damage caused by accidental contact or dropping.**
- **Read this user guide carefully before starting any work to familiarise yourself with the product and its function.**
- **Failure to follow the procedure in this user guide could result in damage to the calibration equipment or equipment under test.**

Contents

Document Information.....	1	Setting up the laptop	10
Described product	1	Download FGM 160 data.....	11
Manufacturer	1	Firmware update	12
Legal information.....	1	Transducer removal and cleaning.....	14
Cautions.....	1	Transducer transportation	15
Operational.....	1	Calibration procedure.....	16
Environmental	1	Location	16
Introduction.....	2	Mounting the transducers.....	16
Original document.....	2	Setting the depth of lateral 45 transducers	17
The function of this document	2	Setting the depth of bias 90 transducers.....	17
Symbols Used	2	Connecting the laptop	18
Warning symbols	2	Calibration menu	19
Information symbols.....	2	Re-fit the transducers.....	22
Transport	2	Upload calibration data	23
Product description	3	Upload new parameters to the FGM 160.....	23
Intended use.....	3	Confirm final FGM 160 parameters	23
Location for calibration.....	3	Completion of calibration.....	24
What’s in the box	3	Reporting.....	24
Supplied with Flarecal	3	Validation.....	24
You will also need	3	Disconnect the FGM 160	24
Product overview	4	Close work permits.....	24
Flarecal calibration box.....	4	Storage	25
Calibration flow	5	Replacement parts	25
Calibration software	6	Technical specifications	26
UFM Manager software	6	Recycling and disposal	27
Installing UFM Manager	6	Warranty statement	27
Running UFM Manager	6	Product certification	28
UFM Manager user interface.....	7	CE EU declaration of conformity.....	28
Precalibration procedure	8	UKCA UK conformity assessed	29
Permit	8	Further information	30
USB/RS-485 Modbus converter	8	Definitions	30
Locate the RS-485/Modbus connections.....	8	References	30
Connect the converter to FGM 160.....	8	Contact	31
Setting up the laptop.....	9		
Post connection steps.....	9		

Document Information

Described product

Fluenta **Flarecal**[™] (version 1.1)

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Legal information

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Cautions

Operational



Pay attention to sections in this manual marked with a warning triangle which contain information about potential hazards and any precautions necessary to avoid them. If these instructions are not followed, the protection provided by the equipment may be impaired.

Before each use, the operator should inspect the Fluenta **Flarecal**[™] calibration box, cables and accessories for any signs of wear or damage. Do not use the **Flarecal** unit if you believe it is damaged or defective in any way. Contact Fluenta technical support for advice before use.

Ensure the system is in the appropriate condition before removing or disconnecting the transducers or their cables. (failure to do so could damage the transducers or the unit).

You should always use the Fluenta **Flarecal**[™] calibration box while still inside the protective bag. The bag contains several openings, pockets, and accessible flaps for easy transport and access.

This product is only to be operated by certified personnel. For the appropriate training talk to your local Fluenta representative.

Care should be taken whilst transporting and handling the unit. Whilst every precaution is taken to protect the unit, rough handling may result in damage which may not be covered by the warranty.

Other than removing the blanking plates for access to transducer fixings, do not attempt to dismantle the calibration box in any way. There are no user-serviceable parts inside.

Environmental

Flarecal[™] is intended for indoor use. It can be used outdoors in dry conditions. The instrument is designed for use in the following conditions:

- Temperature range -40°C to +60°C.
- Maximum altitude 1000m above sea-level.
- Max RH (relative humidity) 90% non-condensing.
- Pollution degree 2.

Introduction

Thank you for purchasing the Fluenta **Flarecal™** calibration box, offering the most rigorous way to verify your ultrasonic transducers.

Original document

This document is an original document for Fluenta. We reserve the right to make technical changes to the documentation and the products, at any time.

Please review this document carefully before working with the Fluenta **Flarecal™** instrument.

The function of this document




This manual overviews the Fluenta **Flarecal™** calibration box and describes the device's configuration, installation, operation and maintenance.

Read this user guide carefully before starting any work to familiarise yourself with the product and its function.




A digital version of this user manual can be obtained by visiting the Fluenta website: <https://www.fluenta.com/downloads/product-information/>.

Symbols Used

Warning symbols

-  Hazard (general)
-  Hazard in potentially explosive atmospheres
-  Hazard by toxic substances

Information symbols

-  Important technical information
-  Supplementary information
-  Recycling and disposal information

Transport

The calibration box must always be transported and used in the protective carry bag provided.



When moving transducers to and from the service area to the test area during the calibration process, the transducers must be retracted into their packing boxes as advised in this user guide, and carried in the transducer carry bags provided with the calibration box. The carry bags are designed in such a way that weight can be distributed equally between the handles.

If the transducer carry bags are lost or damaged, replacements can be ordered as spare parts.

Product description

The Fluenta **Flarecal™** is a rigorous self-calibration solution to verify all Fluenta transducers in Lateral 45 and Bias-90 configurations without requiring a certified engineer to be on-site.

Fluenta recommends carrying out at least an annual verification of ultrasonic transducers to ensure full compliance with regulations and global IECEx explosion-proofing standards.

Parameters such as gas composition, temperature, and pressure are constantly changing in flare lines, and fouling deposits, including wax, tar, carbon, and sand, can also be present on the transducers. All these factors can lead a flare gas meter to misreport flow leading to direct financial consequences and potential enforcement from regulatory bodies. Regular meter verification can help mitigate these issues, reducing the risk of misreported measurements.

Intended use

The Fluenta **Flarecal™** is intended for use to verify and re-calibrate your flare meter as needed, without requiring a certified engineer to be present.

Location for calibration

Calibration takes place in a designated non-hazardous area where a PC or laptop can have wired access to the FGM 160 controller for the system.

The calibration box will also be located in this non-hazardous area and the transducers will be moved to the area for the duration of the calibration procedure.

Before commencing calibration, ensure that work permits are in place at the site to designate the above non-hazardous areas for the calibration procedure and to permit safe access to remove the transducers.

What's in the box

Supplied with Flarecal

Fluenta **Flarecal™** Product n° 2000592 comes with

- Fluenta **Flarecal™** calibration box
- Carry bag for the calibration box
- 2 x Calibration cables, 2m
- USB 2.0 Cable Type A/B, 3m
- 2 x Transducer carry bag

Make sure that all items in the list are available and in good condition before starting a transducer calibration procedure.

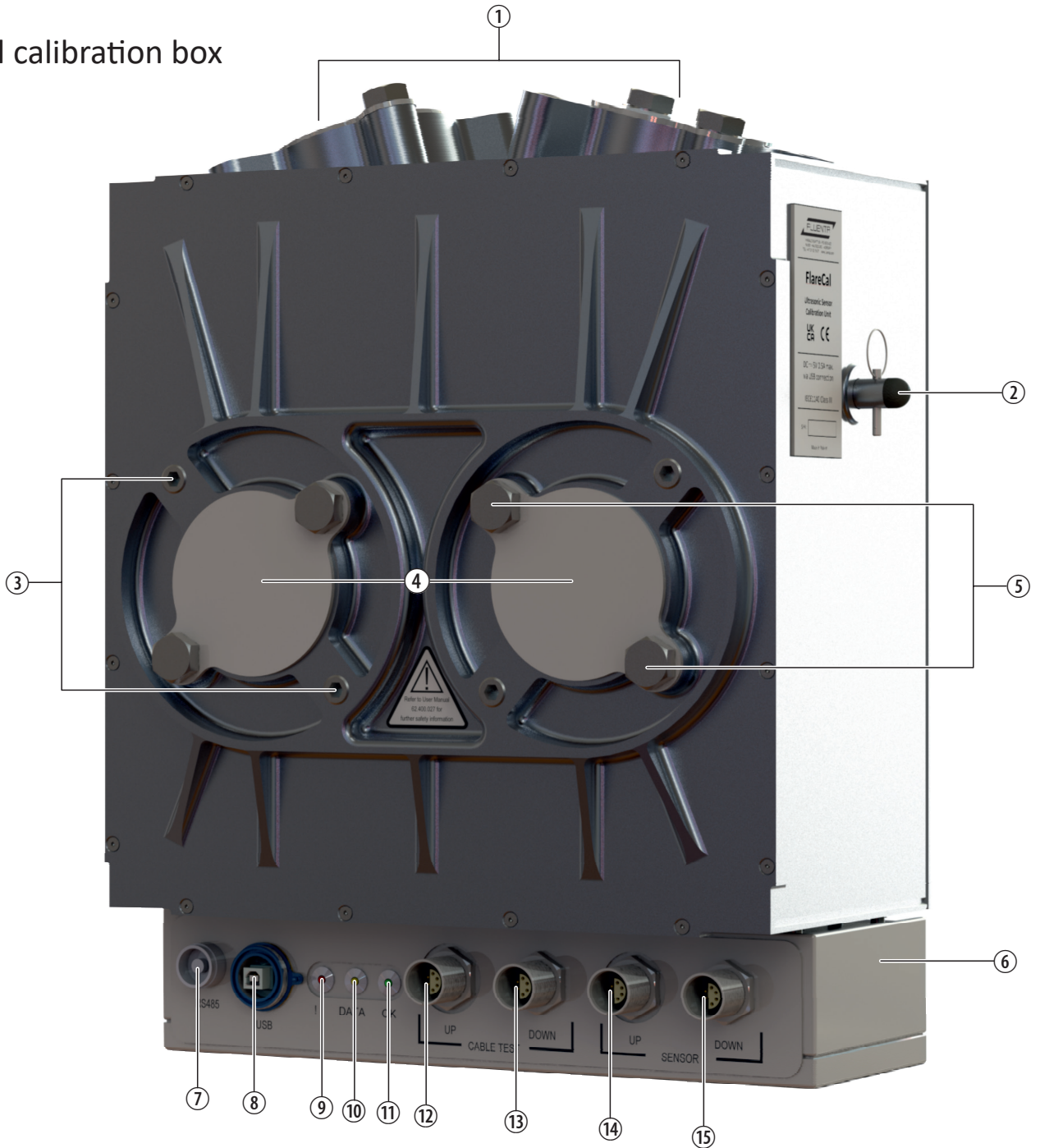
You will also need

To calibrate a pair of transducers you will also need the following-

- Windows laptop or PC with an installation of Fluenta UFM Manager software, version 5.0.6 or later, and a valid user licence for both UFM Manager and the **Flarecal** module add-in.
- A USB/RS-485 Modbus converter (see page ?? for more information).
- Connection to the internet from the non-hazardous area is advisable to upload reports etc.
- 5mm hex allen key.
- Hand tools for wiring.
- Wrenches to remove the transducers.
- Allen key for 16mm grub screws.

Product overview

Flarecal calibration box

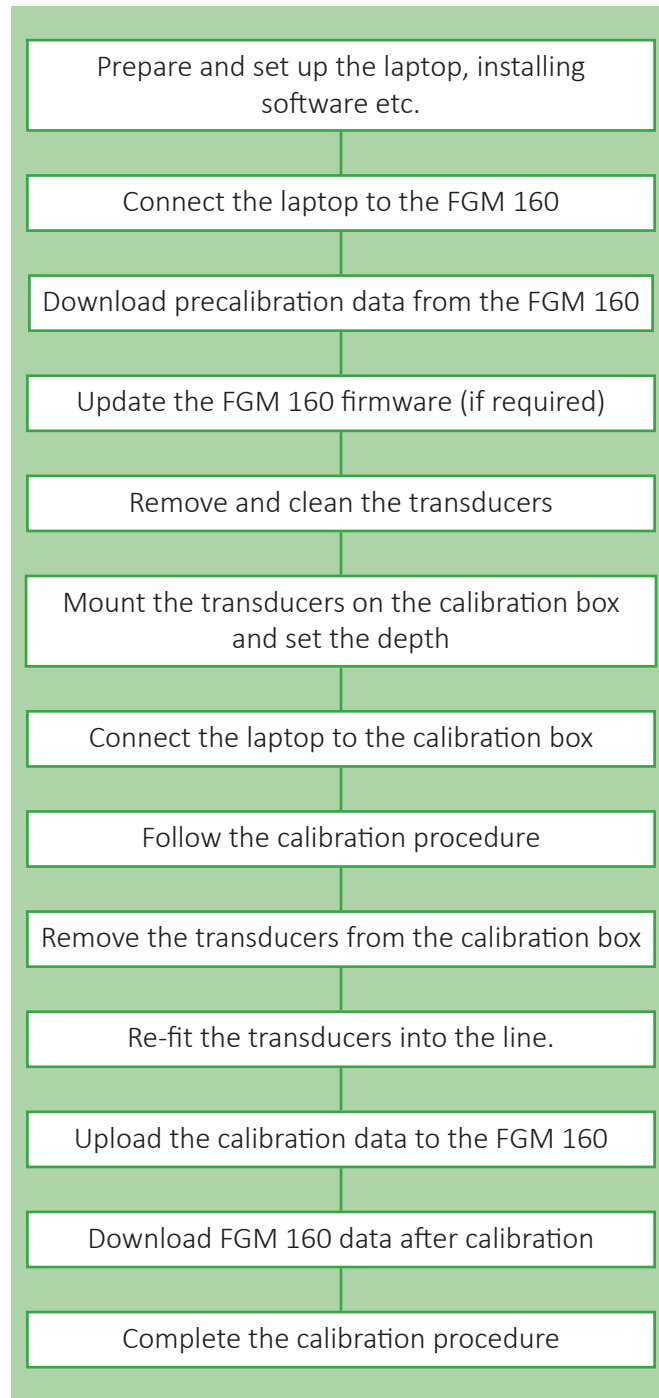


- | | |
|--|--|
| <ol style="list-style-type: none"> 1. Flange connections for transducers in lateral 45 configuration with blanking plates 2. Transducer depth stop rod 3. 3" Packing box fixings 4. Flange connections for transducers in Bias-90 configuration with blanking plates 5. 2" Packing box fixings 6. Electronic enclosure 7. RS485 Socket (not used currently) | <ol style="list-style-type: none"> 8. USB socket 9. Error indicator 10. Data indicator 11. Power indicator 12. Cable test "UP" socket 13. Cable test "DOWN" socket 14. Transducer "UP" socket 15. Transducer "DOWN" socket |
|--|--|

Calibration flow

The flowchart below lists the major steps in the calibration process. Each step of the full calibration process is described in this document, starting on the next page.

Follow all steps to complete the full calibration procedure.



Calibration software

UFM Manager software

Before you start to use **Flarecal**, ensure you have the Fluenta UFM Manager software, version 5.0.6 or later, installed on a laptop and a valid user licence for both UFM Manager and the **Flarecal** module add-in. You can request a licence from your local Fluenta representative or by contacting Fluenta customer support at support@fluenta.com.

The Fluenta UFM Manager software is compatible with Windows 8.0 or later.

You can download the latest version of the UFM Manager for Fluenta **Flarecal**™ from the Fluenta website here: <https://www.fluenta.com/products/flarecal/>.


The standard UFM Manager can be downloaded from this page: <https://www.fluenta.com/products/ufm-manager/>.


 Request a Fluenta **Flarecal**™ enabled software licence by emailing support@fluenta.com.

Installing UFM Manager

To install the software, extract the downloaded file, run “Setup.exe” and follow the instructions on the screen.

A software licence is required for the UFM Manager to be able to perform its transducer calibration functions.

 During the UFM Manager installation, you may be prompted to download a newer version of “Microsoft .Net components” than currently installed on your computer. If that’s the case, follow the on-screen instructions.

 Access to internet connection is required to update the “Microsoft .Net components”.

Running UFM Manager

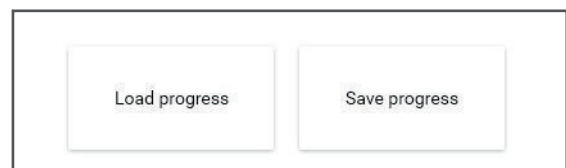
To perform a re-calibration of your Fluenta transducers, the UFM Manager will run through seven steps. These steps appear as a row of buttons at the top of the “Calibration with FlareCal” screen.

The steps are:

- Precalibration procedure
- Download FGM 160 data
- Firmware update
- Calibration
- Upload new FGM 160 parameters
- Download final FGM 160 data
- Report

To perform the calibration, the user follows these steps. Each button will be enabled when the preceding step has been completed.

The user can save their progress through the calibration process by selecting the “Save progress” button. Calibration can be resumed by selecting a pre-saved progress file using the “Load progress” button.



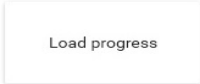
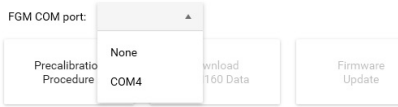

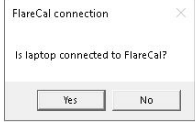

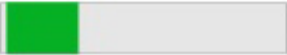



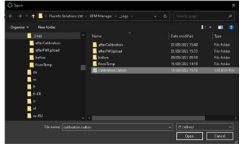
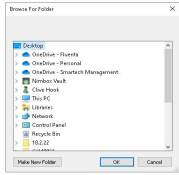
This feature is particularly useful when moving from the FGM 160 to the non-hazardous test area and vice versa.

It can also be used if the laptop battery power runs low or if the laptop requires a re-boot.

Calibration software



UFM Manager user interface

The UFM Manager software is a typical Windows application with indicators, buttons, toggle buttons, progress bars, and information displays. The table below indicates their use.

<p>Button</p> <p>Selects an operation. Buttons may change colour to indicate status. (green: Pass/Complete, red: Fail).</p>	
<p>Drop down box</p> <p>Used to select an item from a drop down list.</p>	
<p>Toggle Button</p> <p>Used to select from two options. Click the button once for the right option and twice for the left option.</p>	
<p>Information/Instruction Box</p> <p>Used to prompt the user. A selection of feedback buttons may be available including Yes, No, OK and Cancel.</p>	
<p>Help/Information Indicator</p> <p>Click on this icon to display a relevant help topic.</p>	
<p>Progress Indicator</p> <p>Indicates a test/process is in progress. Once a solid stationary colour is displayed the test/process is complete.</p>	
<p>In Progress/Incomplete Indicator</p> <p>This icon indicates a test/process has not been started or is in progress</p>	
<p>Complete Pass Indicator</p> <p>This icon indicates a test/process has completed or passed successfully</p>	
<p>Complete Fail Indicator</p> <p>This icon indicates a test/process has completed unsuccessfully or failed</p>	
<p>File Open/Close Panel</p> <p>Used to select a file name and folder to open or save a file.</p>	
<p>Folder Selection Panel</p> <p>Used to select a folder in which to store data.</p>	


Precalibration procedure

Permit

-   Ensure that all relevant site-specific permits are in place before the commencement of any work.

USB/RS-485 Modbus converter


A converter is required to enable connection between a USB port of the laptop and the Modbus RS-485 port of the FGM 160.

-  Fluenta recommends using either the Moxa 1130 or Moxa 1250 converter which must be available before calibration can commence.

For this stage you will also require-

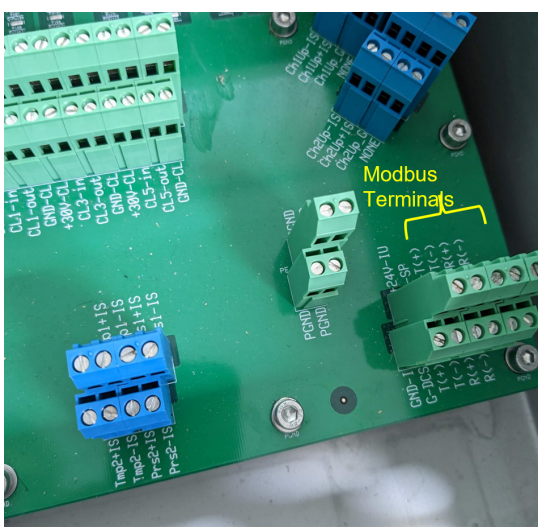
- A 5mm Allen hex wrench.

Locate the RS-485/Modbus connections

-  Opening the FGM 160 front cover will change its compliance status.

- Open the FGM 160 front cover using the 5mm hex wrench to undo the two securing screws.

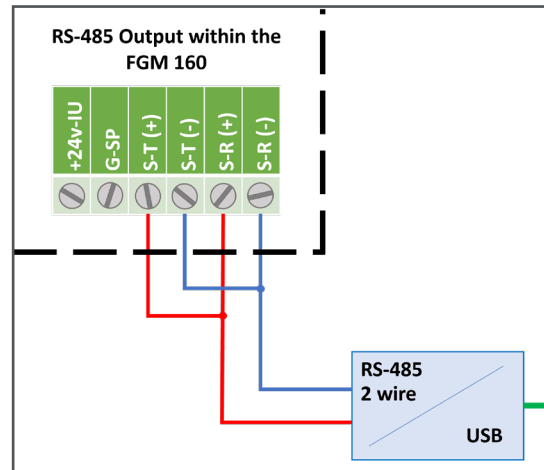
This image shows the location of the RS-485 Modbus terminals on the FGM 160 terminal PCB.



Connect the converter to FGM 160

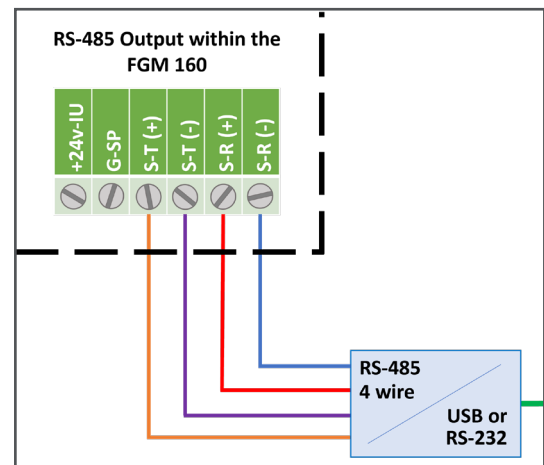
- Check if the converter you are using requires 2 wire or 4 wire connection.

For two wire converter connection refer to the diagram below.



- Link the terminals as shown and connect the wires from the converter to the FGM 160 RS-485 Modbus terminals.

For four wire converter connection refer to the diagram below.

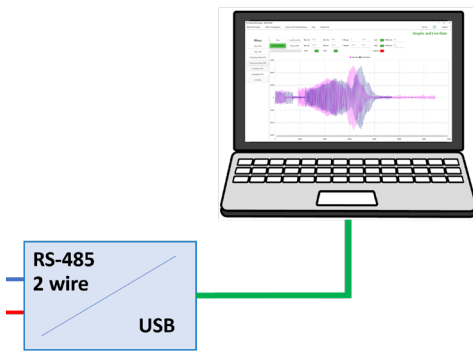


- Connect the wires from the converter to the FGM 160 RS-485 Modbus terminals.

Precalibration procedure

Setting up the laptop

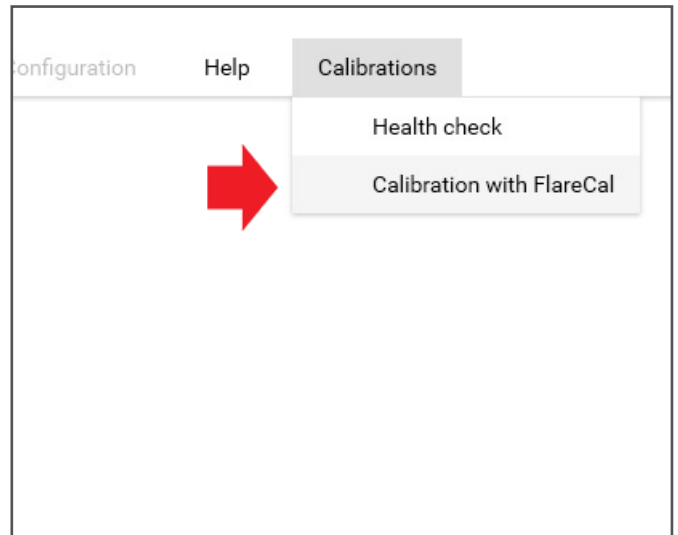
- Connect the USB cable between a USB port of the USB/Modbus RS-485 converter and a USB port of the laptop as shown below.



- Refer to the user manual for the USB/Modbus RS-485 converter and follow the instructions to configure it for 2 or 4 wire connection, and to set up the COM port on the laptop.
- Make a note of the COM port number for use in the next step.

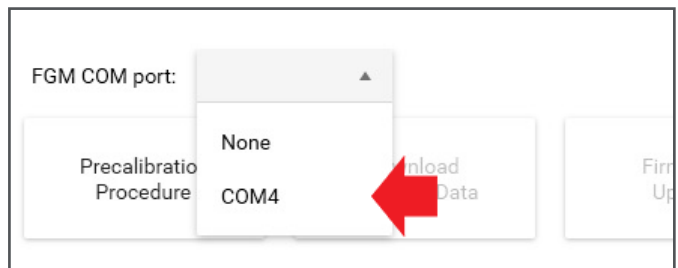
Post connection steps

- Run the UFM Manager software on the laptop.
- Select the 'Calibration with Fluenta FlareCal' option from the calibrations menu as shown below.



- Select the COM port for the connected FGM 160 from the drop down list.

COM4 is shown in the example below.



Precalibration procedure

Setting up the laptop

- Select the “Precalibration Procedure” button and progress down the page shown below, checking the listed items.





Guidelines on the inspection criteria can be viewed by selecting the **i** help/information buttons adjacent items as indicated by the red arrow.

Many of the inspection points allow entry of a comment in the relevant box which will appear on the final report. Examples of three typical comments are indicated by the green arrows.

- On completion of each step within the calibration process, select the “Save progress” button located at the bottom of the screen.

This allows you to continue the calibration process from the current stage even if operation of the UFM Manager software is interrupted.

- When all steps are completed, click the ‘Confirm and save’ button.

Precalibration checks		
 i Visual inspection	No <input type="checkbox"/> Yes <input type="checkbox"/>	<input type="text" value="Comment?"/>
Sensors fitted to pipe	No <input type="checkbox"/> Yes <input type="checkbox"/>	Securely fitted 
FGM 160 Powered on	No <input type="checkbox"/> Yes <input type="checkbox"/>	<input type="text" value="Comment?"/>
FGM 160 condition	No <input type="checkbox"/> Yes <input type="checkbox"/>	Scratch on Door paintwork 
Cable condition	No <input type="checkbox"/> Yes <input type="checkbox"/>	<input type="text" value="Comment?"/>
Cables connected securely	No <input type="checkbox"/> Yes <input type="checkbox"/>	<input type="text" value="Comment?"/>
Connections		
i Laptop Power	No <input type="checkbox"/> Yes <input type="checkbox"/>	On Battery 98% 
i MOXA connection	No <input type="checkbox"/> Yes <input type="checkbox"/>	<input type="text" value="Comment?"/>
i <input type="button" value="Check communication"/>	No <input type="checkbox"/> Yes <input type="checkbox"/>	<input type="text" value="Comment?"/>
i <input type="button" value="Choose directory"/>	No <input type="checkbox"/> Yes <input type="checkbox"/>	<input type="text" value="Comment?"/>
<input type="button" value="Confirm and save"/>		

Precalibration procedure

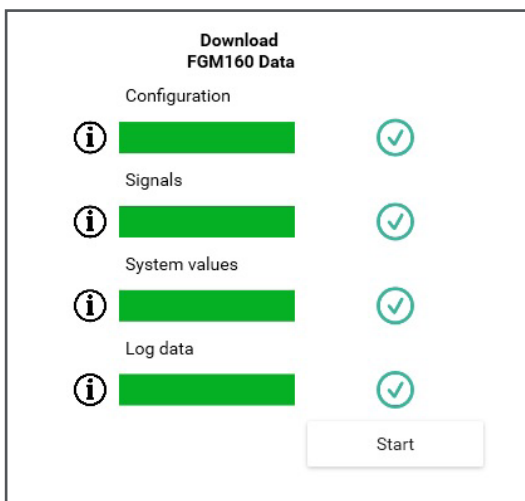
Download FGM 160 data

Once the Precalibration Procedure is completed successfully, then the “Download FGM 160 Data” button will be enabled.

- Save progress before proceeding.
- Select the “Download FGM 160 Data” button, followed by the “Start” button.

This prompts the download of the pre-calibration setup and configuration data from the FGM 160 including signal waveform captures and a data log which can take up to 20 minutes.

On completion of a successful download the download table shown below will be displayed and the “Firmware Update” button will be enabled.




If the download is not successful, one or more operations in the download table may have failed. If the cause of the failed operation is obvious, rectify the problem and repeat the download procedure. If not, Contact Fluenta technical support with details of these results for help.

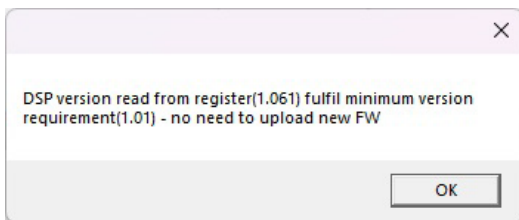
Precalibration procedure

Firmware update

- Press the “Firmware Update” button to check if the FGM 160 requires a firmware update.

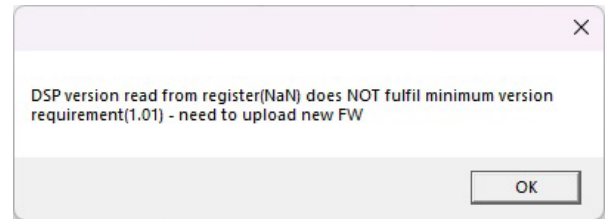
 The “Refresh” button can be selected at any time to check the current version of FGM 160 firmware.

If the message below is displayed, firmware update will not be required.



- Close the message and skip now to the next page.

If the message below is displayed, a firmware update will be required.



- Close the message.
- Contact your local Fluenta representative to obtain the latest version of the FGM 160 firmware, or request it from support@fluenta.com.

The firmware file will have the format XXX.XXXX.LDR.

- Press the “Start” button to begin the update.

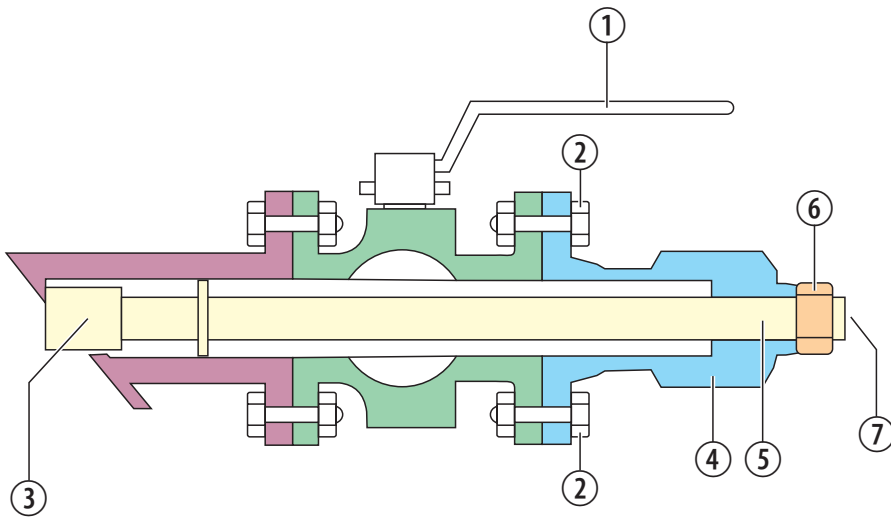


UFM Manager will prompt for the folder location of the firmware update file.

- Follow the screen prompts to select the file and complete the update.

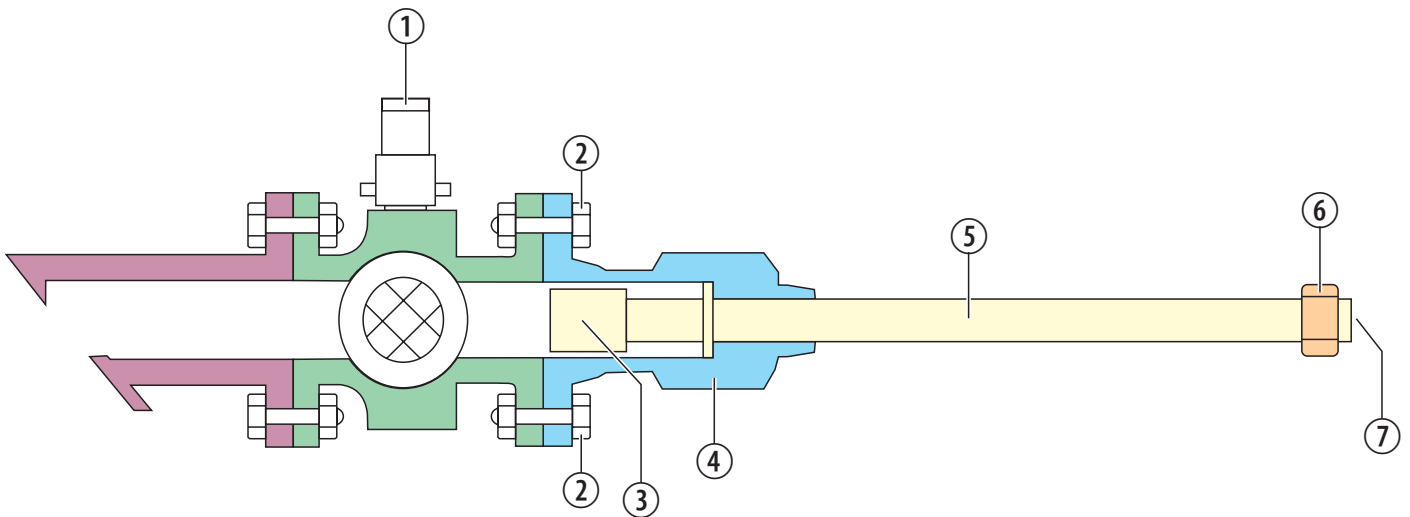
Precalibration procedure

Transducer components



This reference image shows a cross-section of the main components of the transducer assembly with the ball valve open and the transducer installed in its working position.

- | | |
|---------------------------------|---------------------|
| 1. Ball valve control handle | 5. Transducer shaft |
| 2. Fixing bolts for packing box | 6. DK Lok olive nut |
| 3. Transducer head | 7. Cable connection |
| 4. Packing box | |



This reference image shows the transducer assembly with the ball valve closed and the transducer retracted into the packing box, ready to be removed for calibration.

Precalibration procedure

Transducer removal and cleaning



Ensure that all relevant site-specific permits are in place before the commencement of this operation.

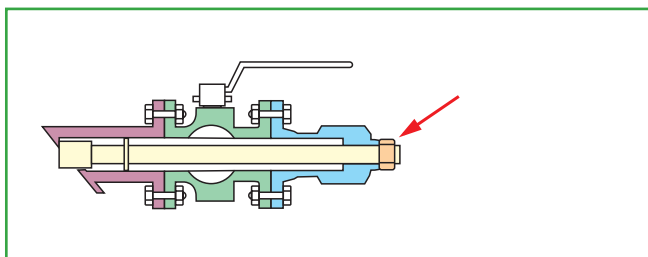


Exercise caution when handling the transducers to avoid any damage caused by accidental contact with the transducer surface or by dropping.

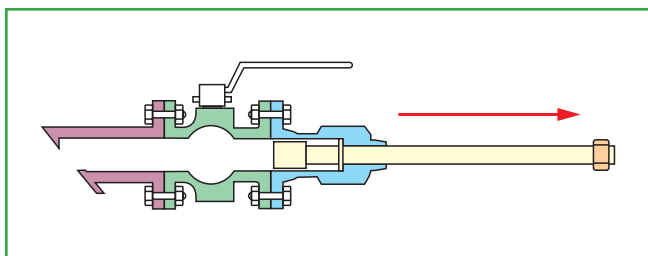
Refer also to the reference images on the previous page.

- Unscrew the cable connectors from both transducers and disconnect the cables.
- For both transducers, loosen the DK Lok olive nuts that lock the transducers in place (arrowed below).

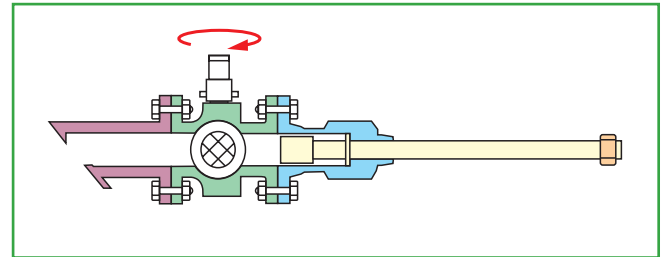
When loosening the DK Lok olive nuts, use a second wrench on the DK Lok bodies to ensure that the DK Loks are not removed from the packing box.



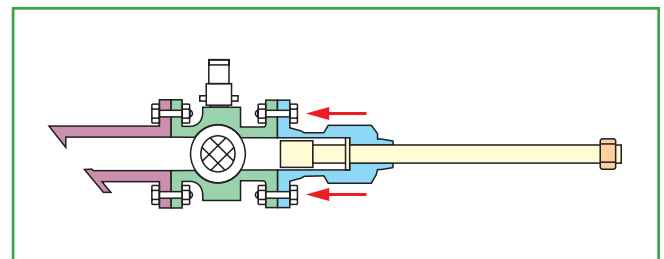
- Retract the transducer into the body of the packing box.



- Close the ball valve.



- Undo the four bolts (arrowed) to remove the packing box and transducer from the ball valve flange.



- Once removed, move the transducers to a non-hazardous place, then clean the transducer heads using a soft rag and an alcohol based cleaner to remove any fouling deposits.
- Visually inspect each transducer face for scratches or dents.
- Photograph any observed damage and append the photos to the service and calibration data sent to Fluenta.

Precalibration procedure

Transducer transportation

Transducer carry bags are provided with the Fluenta **Flarecal™** calibration system and should be used to protect the ultrasonic transducers whenever they are moved from one location to another.

- Following the instructions on the previous page, check that the transducer heads are fully retracted into their protective packing boxes.
- Hand-tighten the DK Lok olive nuts to lock the transducers in place in their packing boxes during transportation to the calibration site.
- Each transducer with packing box should be carefully placed in a carry bag with the packing box (arrowed) facing down.

Transducers can be hand or shoulder carried safely when in a carry bag.



The 2" packing box and transducer weigh 6.7kg each.

The 3" packing box and transducer weigh 12.8 kg each.

Calibration procedure

Location



Calibration of transducers using Fluenta Flarecal™ must be carried out in a designated non-hazardous area.

Mounting the transducers



Before mounting the transducers to the calibration box, ensure that the calibration box is fully supported, laid flat on its back on a stable surface, or is strapped to a secure structure so that the weight of the transducers and packing boxes does not cause it to tip over.



The transducer fixings bolts are intended to be hand-tight only during the calibration process. Over-tightening the fixings may damage the calibration box mounting threads.

- Remove the blanking plates for either lateral 45 or bias-90 transducer mounting as appropriate.



- Remove the transducers from their carry-bags.
- Determine whether the transducers fix with two-inch or three-inch mounting hole pitch.
- If the packing boxes have a 3" fixing pitch, remove the M16 grub screws from the 3" pitch threads and refit them to the unused 2" pitch threads.

- With the transducers still retracted into the packing boxes, line up the packing boxes with the appropriate mounting points.



- Fit the bolts loosely to locate the packing box and ensure that the packing box sealing face is in full contact with the mounting point surface before tightening the bolts firmly with fingers.



The bolts must only be tightened finger-tight. Do not use hand-tools to tighten the fixings.

Calibration procedure

Setting the depth of lateral 45 transducers

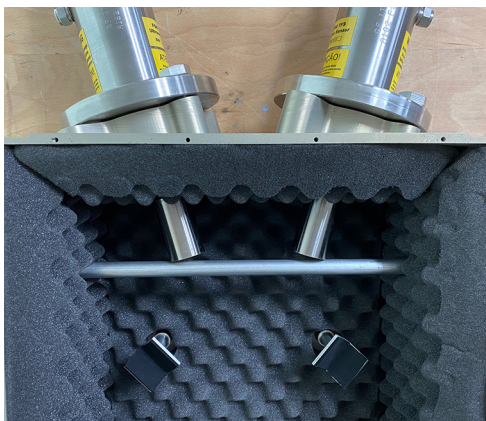
- Ensure that the depth-stop rod is in place inside the calibration box.
- Slacken the DK Lok olive nuts to allow the transducers to slide freely in the packing boxes.



- Push both transducers into the calibration box until they reach the depth-stop rod.

The image below shows a reference internal view of two lateral 45 transducers aligned correctly in contact with the depth-stop rod.

NOTE: In this image the cover of the calibration box has been removed for illustration purposes only. The cover must never be removed by the user or the warranty will be void.



- Ensuring that the transducers remain in contact with the depth-stop rod, hand-tighten the DK Lok olive nuts on each of the packing boxes.

Setting the depth of bias 90 transducers

There are internal cradles opposite each transducer mounting that locate the transducer heads. The depth stop rod is not used to set the depth for bias 90 transducers, but should be left in place during bias 90 transducer calibration.

- Slacken the DK Lok olive nuts to allow the transducers to slide freely in the packing boxes.
- Rotate the transducer shafts until the two sensor heads are facing each other.
- Push both transducers into the box as far as possible.
- Continue to push the transducers into the box while rotating the transducers slightly until each transducer head is settled fully into its cradle.
- Once the transducers have both reached their cradles, the tip-to-tip transducer distance will be set.

Calibration procedure

Connecting the laptop



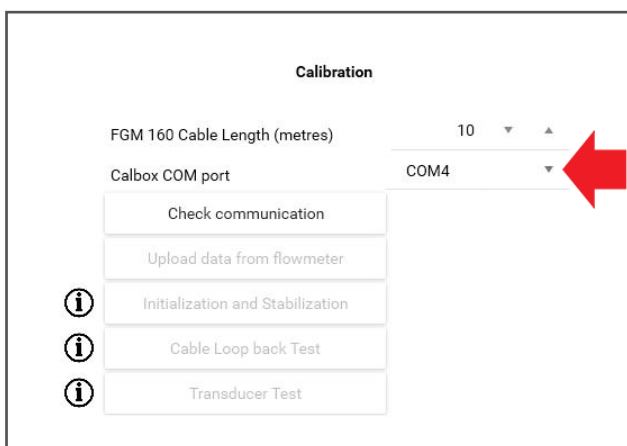
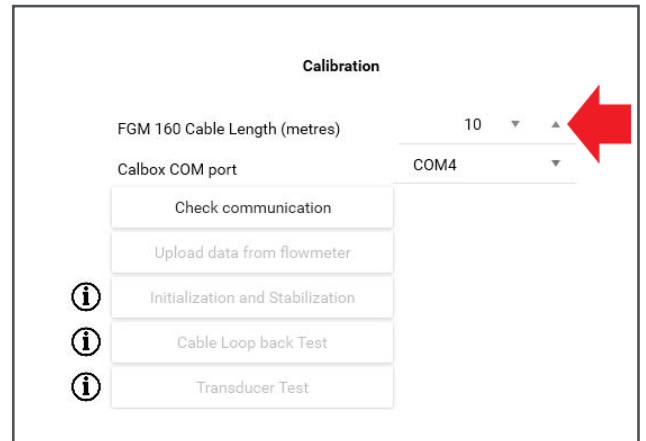
USB connector OK indicator

- Connect the USB cable from the laptop to the calibration box USB connector.
- The green “OK” indicator on the calibration box will flash approximately every second to indicate when the calibration box is powered from the laptop.

The calibration box should now show up as a virtual COM port on the laptop.

- Select the COM port from the “Calbox COM port” drop down list on the UFM Manager calibration page.

- Use the up/down nudge controls to set the FGM 160 cable length in metres.

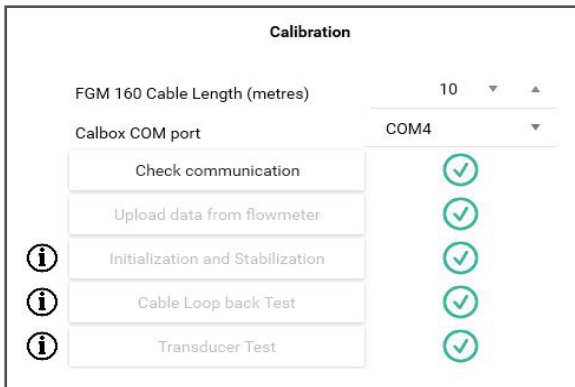


Calibration procedure

Calibration menu

The calibration menu is shown below.

- Select each of the actions in sequence to run the calibration process.



Check communication

- Select the check communication button.

This will establish communication with the calibration box and should confirm with a tick.

The process should take about 10 seconds.

In the event of failure, check the USB cable connection and that the correct COM port is selected.

If communication cannot be established contact support@fluenta.com.

Update data from flow meter

This option is available once communication has been successfully established in the previous step.

- Select the “Update data from flow meter” option.

This procedure will copy the configuration previously downloaded from the FGM 160 into the calibration box.

Initialisation and stabilisation

During this stage the calibration box will initialise, monitoring its internal temperature, pressure and humidity.

- Select this option to begin the initialisation process.

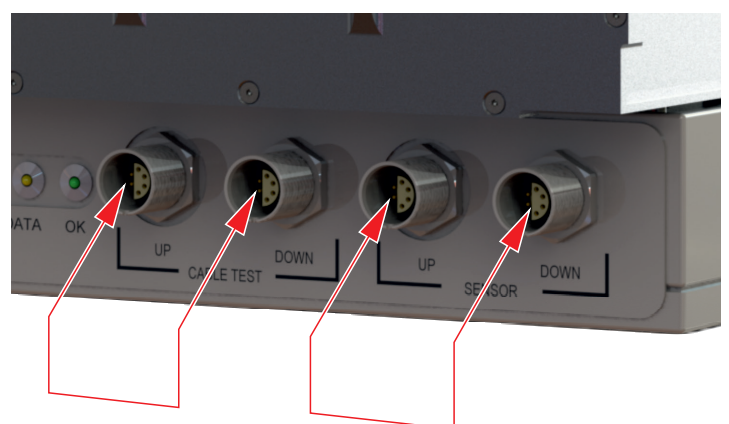
Once stability has been achieved the calibration process can continue. This should take approximately 45 seconds to achieve.

Contact support@fluenta.com if stable values cannot be achieved within this time frame.

Cable loop back test

During this stage the calibration box performs an internal calibration to correct for delays in cabling and the internal electronics. These delays will vary over time and changes in ambient conditions.

- Connect the 2m calibration cable between the Cable Test Up and Cable Test Down connectors on the calibration box.
- Connect a 2m calibration cable between the Sensor Up and Sensor Down connectors on the calibration box.



- Select the “Cable loop back test” option.

This will measure the delays and should confirm with a tick within approximately 45 seconds.

If an error is reported, the operator will be prompted to correctly connect the signal cables for this test.

Calibration procedure

Transducer test

During this stage the Fluenta **Flarecal**[™] calibration box performs a transducer test and calibration, correcting for the previously measured delays in cabling and internal electronics.

- Save progress before proceeding.

The operator will be prompted to correctly connect the signal cables to the transducers.

- Connect the two **Flarecal**[™] transducers to the “Sensor Up” and “Sensor Down” connectors on the calibration box using the 2m signal cables provided.
- After connecting the cables check that both transducers are still fully inserted and in full contact with the depth-stop rod (lateral 45 transducers) or cradles (bias 90 transducers).
- When calibrating lateral 45 transducers, remove the depth stop rod before proceeding.

Care should be taken not to move the transducers during the calibration process as any change in tip-to-tip distance will result in erroneous calibration.

- Select the “Transducer test” option.

The calibration process will run. This will take approximately 2 minutes.



If calibration is unsuccessful, check that the cables are correctly connected and that the depth-stop rod was removed (lateral 45 transducers only).

Repeat this stage of the procedure to check correct insertion of the transducers and to verify that the cabling connections are correct and secure. If failure persists contact support@fluenta.com.

After calibration

If the calibration result is successful then calibration data will have been acquired and testing in the designated non-hazardous area is now complete.

The calibration system can now be dismantled, the calibration box packed up and the transducers returned to the site.

- Disconnect the laptop from the calibration box.
- Disconnect the cables at both ends.
- Retract the transducers into their packing boxes and hand-tighten the DK Lok olive nuts to lock the transducers into the packing boxes.
- Unscrew the packing box fixings and remove the transducers from the calibration box.
- Place the transducers in carry bags for return to the site.
- Refit the blanking plates to the calibration box, tightening the fixing bolts to finger pressure.
- Re-fit the depth-stop rod to the calibration box.

Re-fit the transducers



Ensure that all relevant site-specific permits are in place before the commencement of this operation.

- Refit the transducers into the line, which is the reverse of the removal procedure.

Ensure that the upstream transducer is in the upstream path and the downstream transducer is in the downstream path.

- Fix the packing boxes in place and tighten the fixing bolts.



- Slacken the DK Lok olive nuts and slide each transducer inwards until it reaches its end stop.
- Tighten the DK Lok olive nuts finger tight initially,

and then 1¼ further turns with a wrench to ensure a gas tight seal.



- Confirm all fixing bolts are tightly secured.
- Re-connect the cables to the transducers.



Upload calibration data



Return to the non-hazardous area for the final stages of calibration.

The calibration data will now be uploaded to the FGM 160.

Upload new parameters to the FGM 160

- Reconnect the laptop to the FGM 160 via the RS485/Modbus converter.
- Once connected, select the “Upload New FGM 160 Parameters” button.
- Navigate to and select the results file stored by the calibration box. (where??)

The calibration values will be transferred from the laptop to the FGM 160. This should take approximately 30 seconds to complete.

If the upload is not successful, check the connections to the FGM 160. If failure persists contact support@fluenta.com.

Confirm final FGM 160 parameters

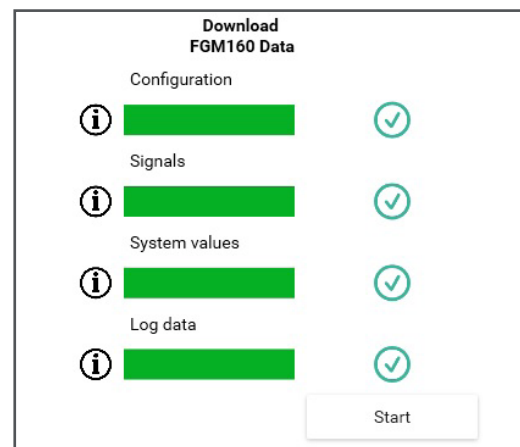
This stage will download the completed configuration from the FGM 160 and validate the results.

- Select the “Download Final FGM 160 Data” button.
- Press the “Start” button.

The post calibration setup and configuration of the FGM 160 will download to the laptop.

The data includes signal waveform captures and a data log which can take up to 20 minutes to complete.

The confirmation below should be displayed when the download and checks are completed.



- Save progress before proceeding.

Completion of calibration

Reporting


- Select the “Report” button to open a folder selection panel on the screen.
- Select a new folder to store the results files.

Once a folder is selected a file will be produced with the naming format “XXXXXXXX_YYYYYY_output.zip”, where XXXXXXXX is the current date and YYYYYY is the current time.

Send the .zip file to support@fluenta.com as indicated in the screen prompt.



Validation

-  Fluenta must validate all transducer calibrations.

The calibration results will be checked by Fluenta and, if the calibration has been successful, a calibration certificate will be issued.

Disconnect the FGM 160

- Disconnect the USB cable from the laptop to the USB/RS-485 Modbus converter.
- Disconnect the wires from the converter to the FGM 160 RS-485 Modbus terminals.
- Close and securely fasten the door of the FGM 160 using the 5mm Allen key.

Work is now finished at the FGM 160.


Close work permits



Any open work permits can now be closed in accordance with site working requirements.

Storage

- When not in use the Fluenta **Flarecal**[™] instrument should be stored in a location that will not experience extremes of temperature or humidity.
- When the calibration box is not in use, all four blanking plates must be fitted and the depth-stop rod secured in place.
- All accessories and cables can be safely stored in the carry bag’s lid.
- Keep the transducer carry bags stored in the side pockets of the main carry bag.

 Total weight of the Fluenta **Flarecal**[™] calibration box and its accessories is over 17.5Kg

Replacement parts

Contact your Fluenta distributor if you require spare parts for the calibration box system.

Part Number	Description
200595	Signal cables 2m
2000620	Blanking Plates
2000621	Depth Stop Rod

Technical specifications

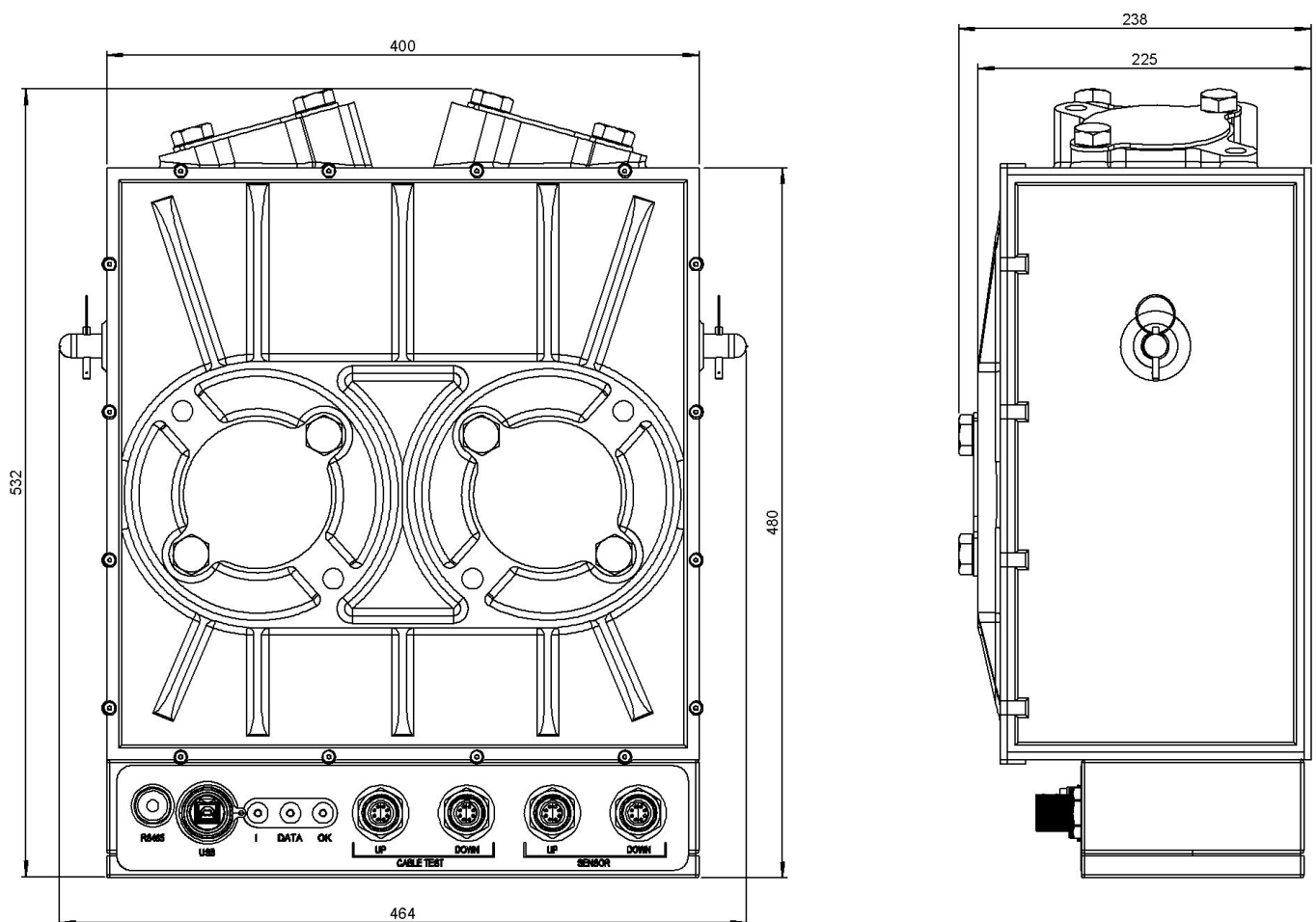
Power supply..... 5.0 V (+0.25V,-0.6V), 0.5 A
(via USB connection)

Weight.....17.6 kg
(including all accessories)

Dimensions 600 x 475 x 200 mm
(in carry bag) (23⁵/₈ x 18³/₄ x 7⁷/₈ inches)

Power is supplied to the calibration box via the USB 2.0 port (or later) of a laptop or PC.

The **Flarecal™** calibration box is intended for indoor use. It can also be used outdoors in dry conditions. The instrument is designed for use in the following conditions: temperature range -40°C to +60°C, maximum altitude 1000m above sea-level, max RH 90% non-condensing, and pollution degree 2.



Dimensions of the calibration box (without carry bag)

Recycling and disposal



The materials used in the manufacturing of the Fluenta **Flarecal**[™] instrument comply with all EU material directives and do not pose a particular danger to life, human health and the environment.

At end of life, The Fluenta **Flarecal**[™] instrument should be disposed of according to local legislation by an organisation licensed to work with electrical and electronic equipment waste.

Self-disposal of the Fluenta **Flarecal**[™] instrument is prohibited.

For territories outside the EU, follow local guidelines and legislations.

Warranty statement

The Fluenta **Flarecal**[™] is covered by the Fluenta Standard Warranty Statement (71.000.014).

The warranty covers the **Flarecal**[™] instrument for 18 months after delivery or 12 months after first use, whichever comes first.

Note that the warranty will be deemed void if the **Flarecal**[™] instrument is subject to voltage other than those specified in the manual.

Product certification

CE | EU declaration of conformity

The manufacturer hereby declares that: Fluenta **Flarecal™** fulfils all the relevant provisions of the following Directives:

- 2014/30/EU – Electromagnetic Compatibility Directive
- 2014/35/EU – Low Voltage Directive

And is in conformity with the applicable requirements of the following standards:

Standard	Description
EN61326-1:2013	Group 1, Class A equipment (emissions)
EN55011:20016 (+A1/A11)	Group 1, Class A equipment
EN55032:2015 (+A11)	Electromagnetic compatibility of multimedia equipment – Emission requirements, Class A Emissions
EN 61000-3-2:2014	Limits for harmonic current emissions
EN 61000-3-3:2013	Limits for voltage changes, fluctuations and flicker
EN61326-1:2013	Group 1, Class A equipment (immunity)
IEC61010-1 ed 3.1	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements

Technical documentation required to demonstrate that the product meets the requirements of the above directives is available for inspection by the relevant enforcement authorities.

Product certification

UKCA | UK conformity assessed

The manufacturer hereby declares that: Fluenta **Flarecal™** fulfils all the relevant provisions of the following Directives:

- 2014/30/EU – Electromagnetic Compatibility Directive
- 2014/35/EU – Low Voltage Directive

And is in conformity with the applicable requirements of the following standards:

Standard	Description
EN61326-1:2013	Group 1, Class A equipment (emissions)
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EN 61000-3-3:2013	Limits for voltage changes, fluctuations and flicker
EN61326-1:2013	Group 1, Class A equipment (immunity)
IEC61010-1 ed 3.1	Safety requirements for electrical equipment for measurement, control, and laboratory use - Part 1: General requirements

Technical documentation required to demonstrate that the product meets the requirements of the above directives is available for inspection by the relevant enforcement authorities.

Further information

Definitions

- FGM 160: Fluenta Flare Gas Meter 160
- UKCA: UK Conformity Assessed
- CE: Conformité Européenne
- EMCD: Electromagnetic Compatibility Directive
- RED: Radio Equipment Directive
- LVD: Low Voltage Directive (safety)

References

All references are available upon request.

For copy of available references, please email support@fluenta.com and quote the document number and title as show in the table below.

Ref	Document Number	Title
[1]	62.120.001	FGM 160 Installation and Hook-up Instructions
[2]	62.120.006	FGM 160 Hazardous Area Installation Guidelines
[3]	64.120.001	FGM 160 Maintenance Procedure
[4]	72.120.308	FGM 160 Data Sheet
[5]	72.120.601	FGM 160 Operating Instructions
[6]	61.310.100	UFM Manager User Manual
[7]	75.400.001	FLUENTA Flarecal ™ EU Declaration of Conformity
[8]	75.400.002	FLUENTA Flarecal ™ UK Conformity Assessed declaration
[9]	71.000.014	Warranty Statement

Contact

WE'RE FLUENT. WE'RE FLUENTA.

With over 3,000 installs across 6 continents, Fluenta has the experience to help you more accurately measure flare gas, to make better business decisions and meet the most stringent regulations.

Contact details may be subject to change. Check the fluenta website www.fluenta.com for up to date contact details.

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