GF Piping Systems

# Effortlessly connected

## FlowtraMag 2581

Product Introduction

+ **Full-Bore plastic PVC in line style magnetic flowmeter**

+ **PVC body with Titanium grade 2 or *Hastelloy*® C 276 electrodes with no moving parts**

+ **FKM or EPDM seals are available**

+ **Two to three times lighter in weight compared to traditional metal magmeters on the market**

+ **Factory calibrated with certificate ± 1% of reading accuracy**

+ **Reduced straight run requirements, ideal for final effluent lines, wellheads, and skids manufacture**

+ **Available for DN25 (1"), DN40 (1.5"), DN50 (2"), DN80 (3"), and DN100 (4") ASTM / Metric pipe sizes**

+ **Bluetooth® 4.2 capable, support iOS and Android for simple user configuration**

+ **Partially filled pipe detection status indicators**

+ No pressure drop

+ Reverse flow direction configuration with 0252 Configuration Tool or GF Config Tool Bluetooth® App

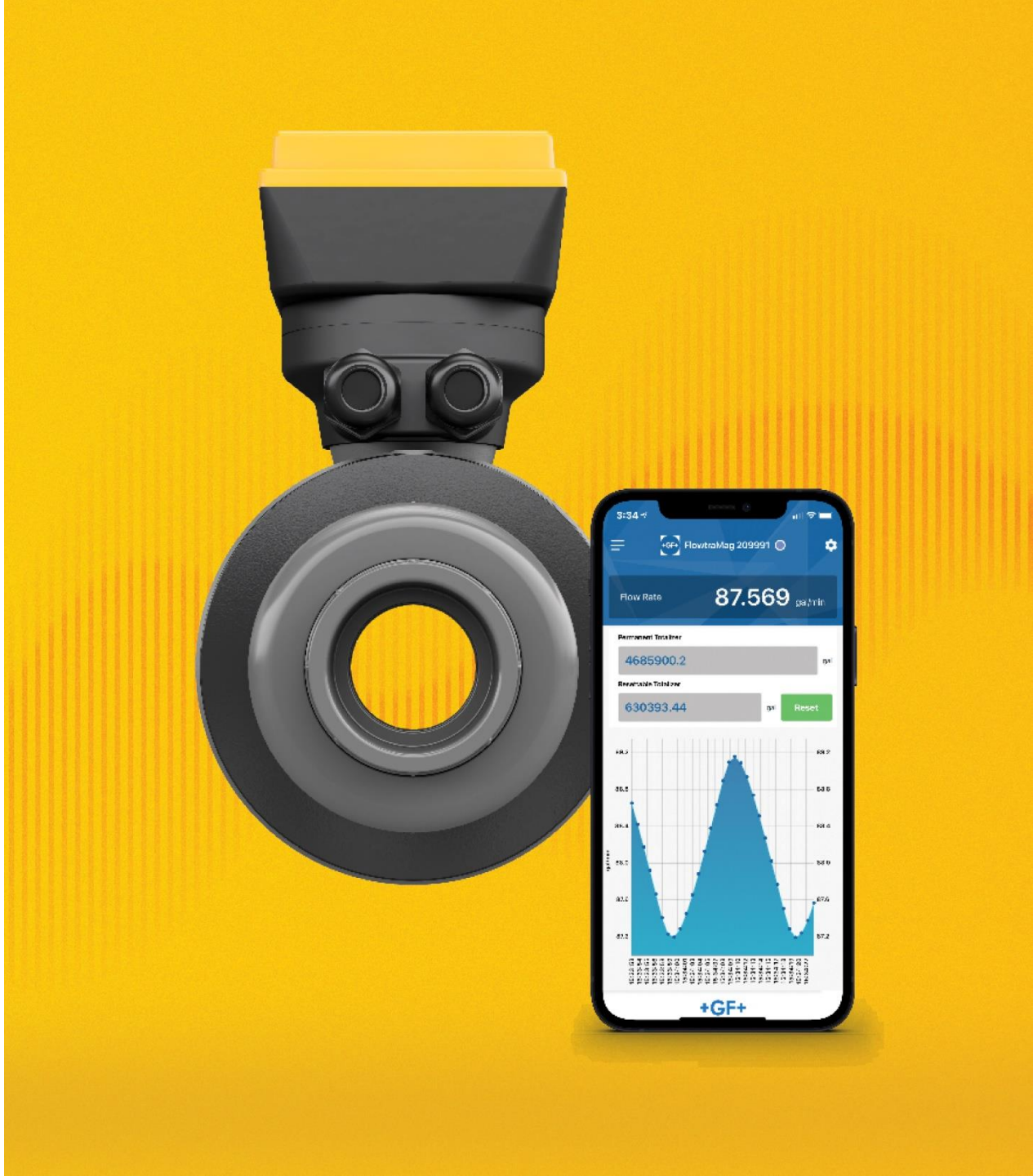
+ One device with three different outputs: field selectable Frequency or Digital (S³L), and Analog 4 to 20 mA (passive or active)

+ Uniquely suited for use in water treatment skids, chemical dosing units and general chemical processing applications

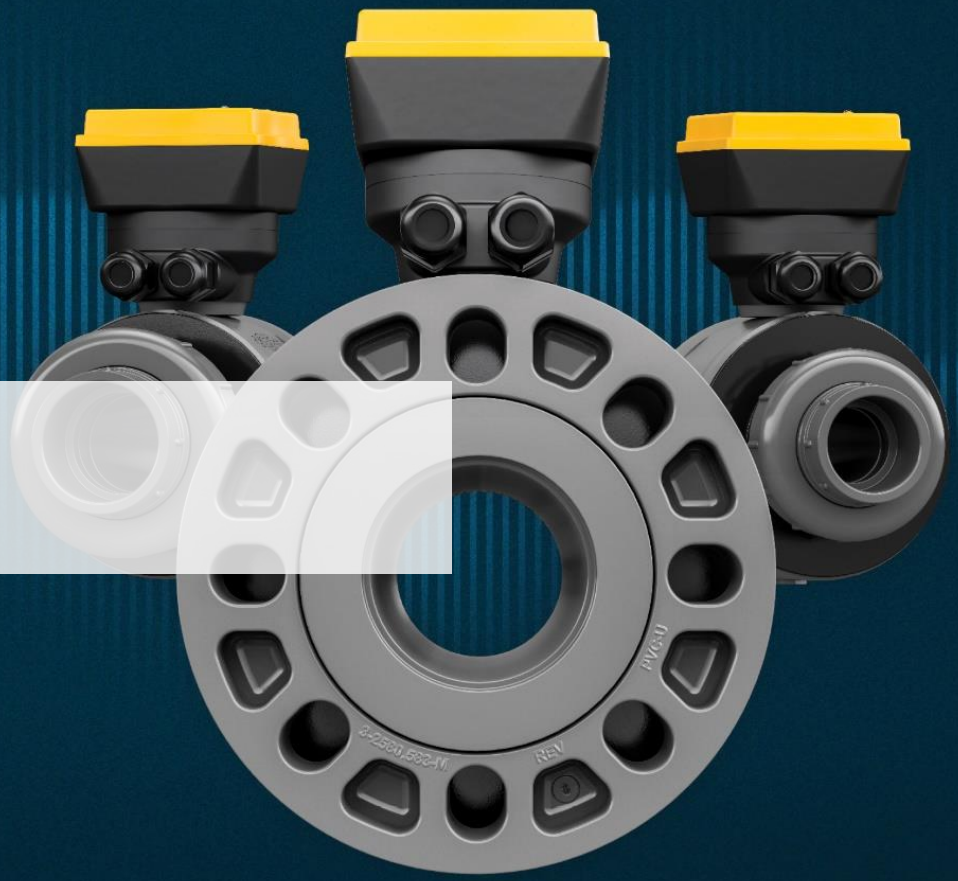
+ Digital (S³L) and Frequency output selectable via 0252 Configuration Tool or GF Config Tool Bluetooth® App: factory default at Frequency

+ Active and Passive output selectable via 0252 Configuration Tool or GF Config Tool Bluetooth® App: factory default at Passive

+ Each flow body pre-calibrated with K-Factor and Traceable Certificate

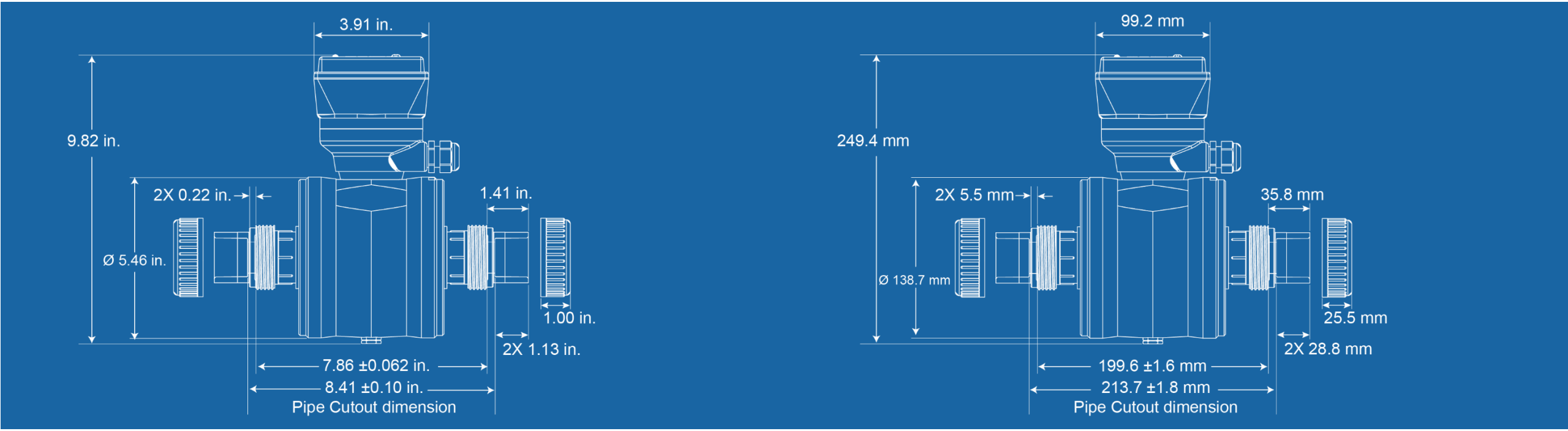


# Overview



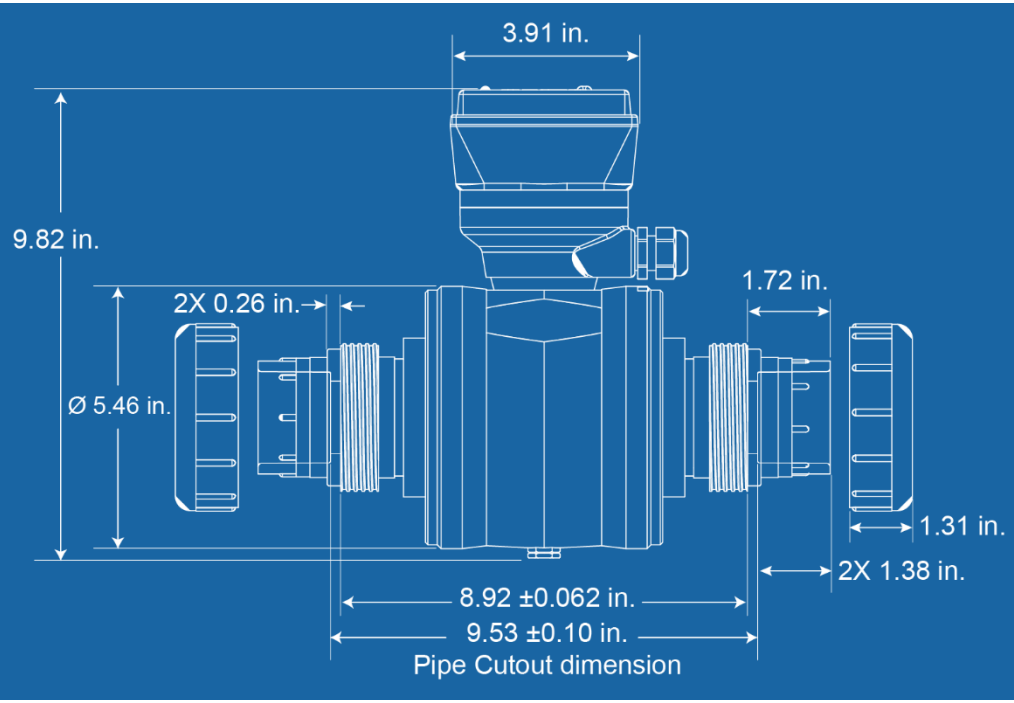
# Overview FlowtraMag Body ASTM

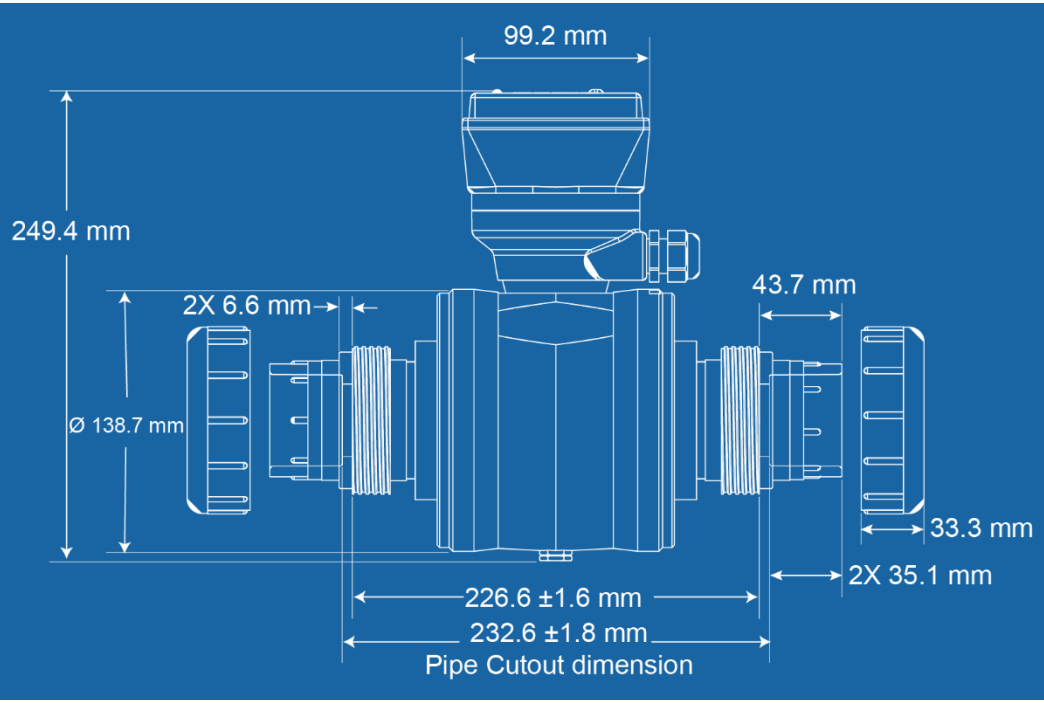
**DN25 (1") schedule 80, Titanium or *Hastelloy*® C electrodes, Union fittings, FKM or EPDM seal**



# Overview FlowtraMag Body ASTM

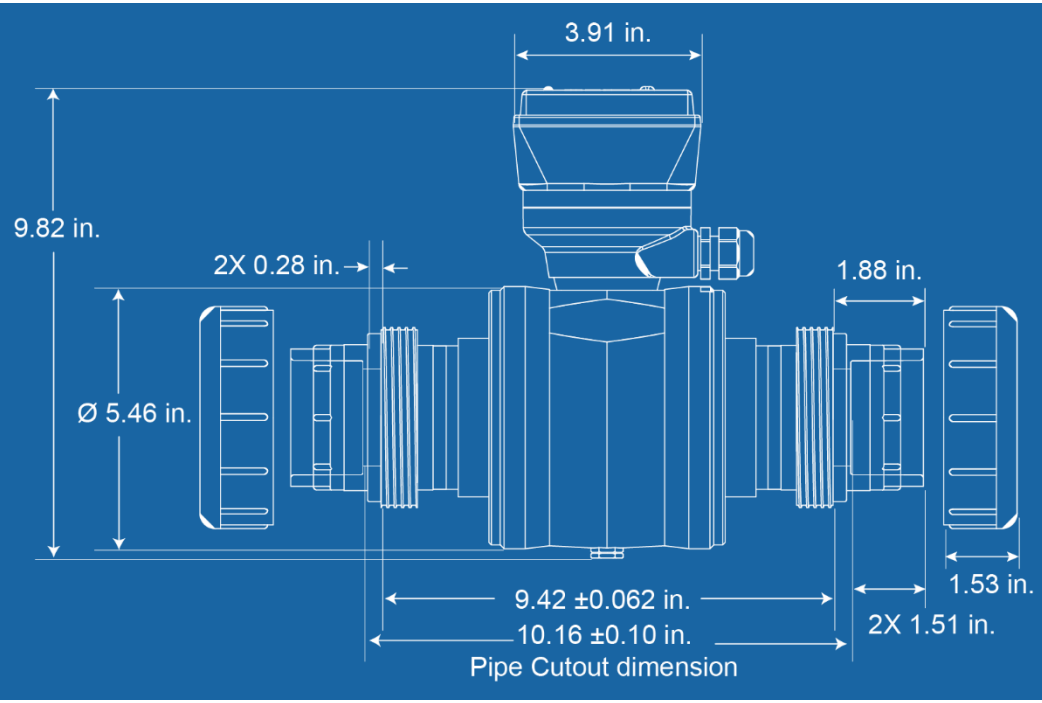
**DN40 (1.5") schedule 80, Titanium or *Hastelloy*® C electrodes, Union fittings, FKM or EPDM seal**

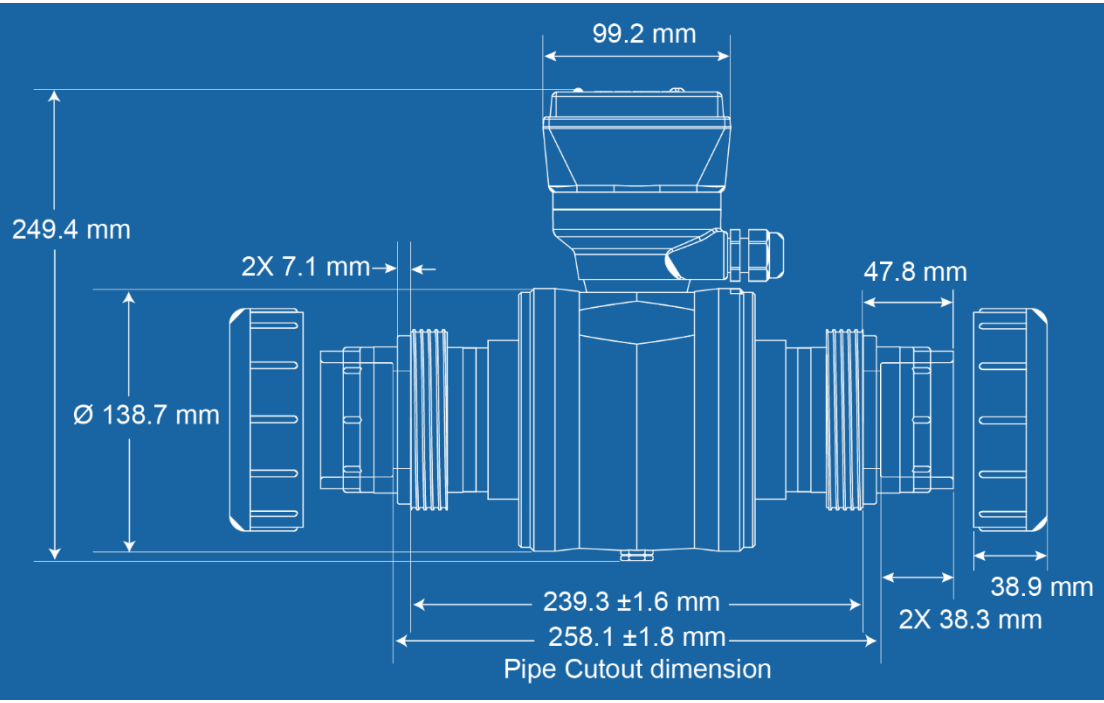


# Overview FlowtraMag Body ASTM

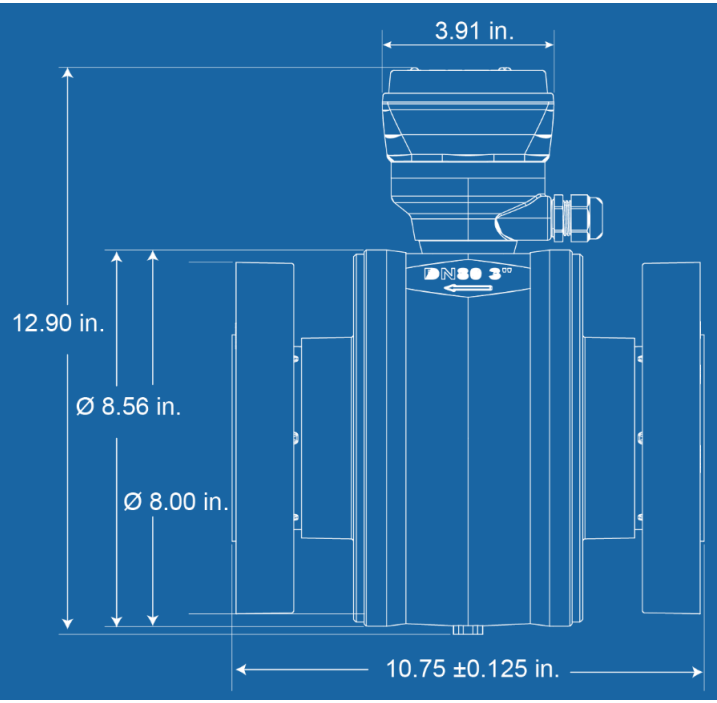
**DN50 (2") schedule 80, Titanium or *Hastelloy*® C electrodes, Union fittings, FKM or EPDM seal**

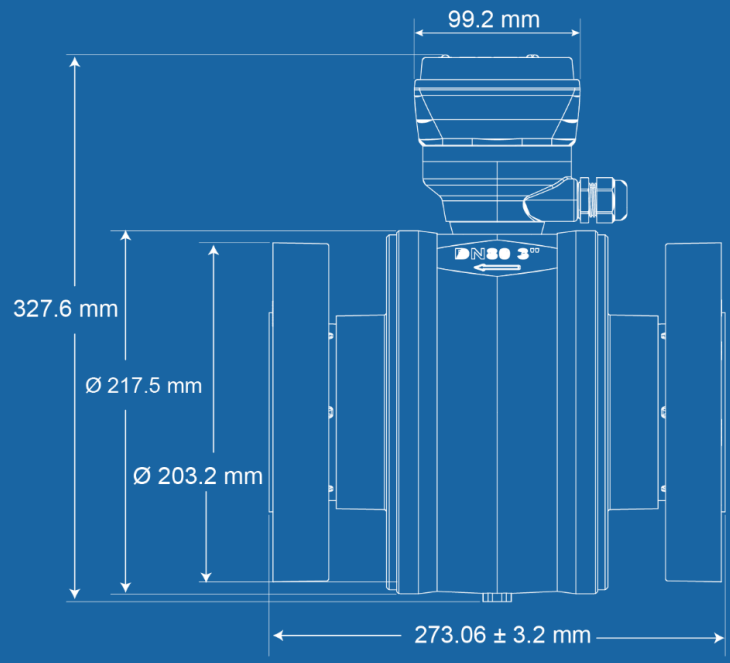


# Overview FlowtraMag Body ASTM

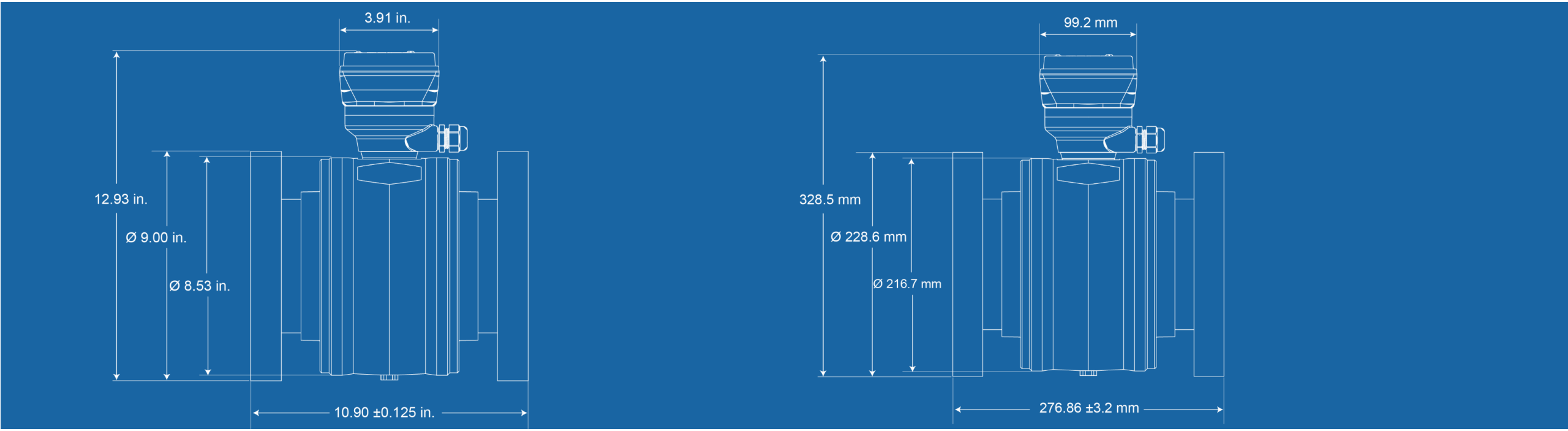
**DN80 (3") schedule 80, Titanium or *Hastelloy*® C electrodes, Van Stone flanges, FKM or EPDM seal**



# Overview FlowtraMag Body ASTM

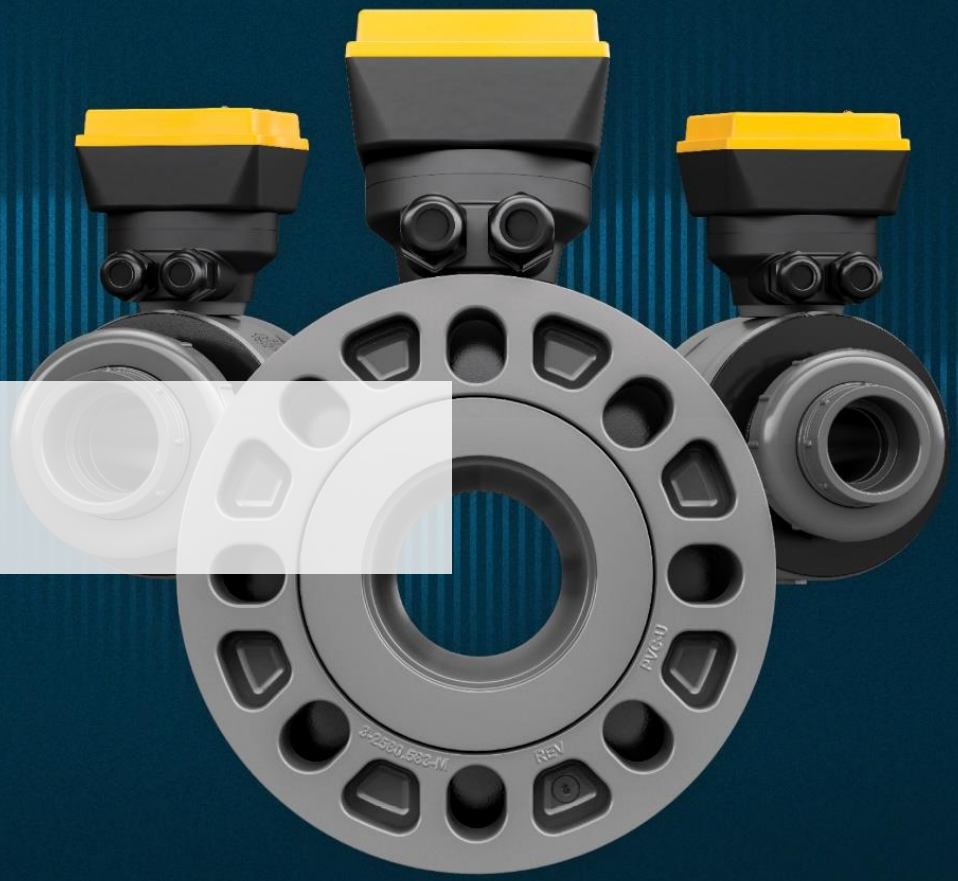
**DN100 (4") schedule 80, Titanium or *Hastelloy*® C electrodes, Van Stone flanges, FKM or EPDM seal**



# Overview FlowtraMag Body and Home Screen App

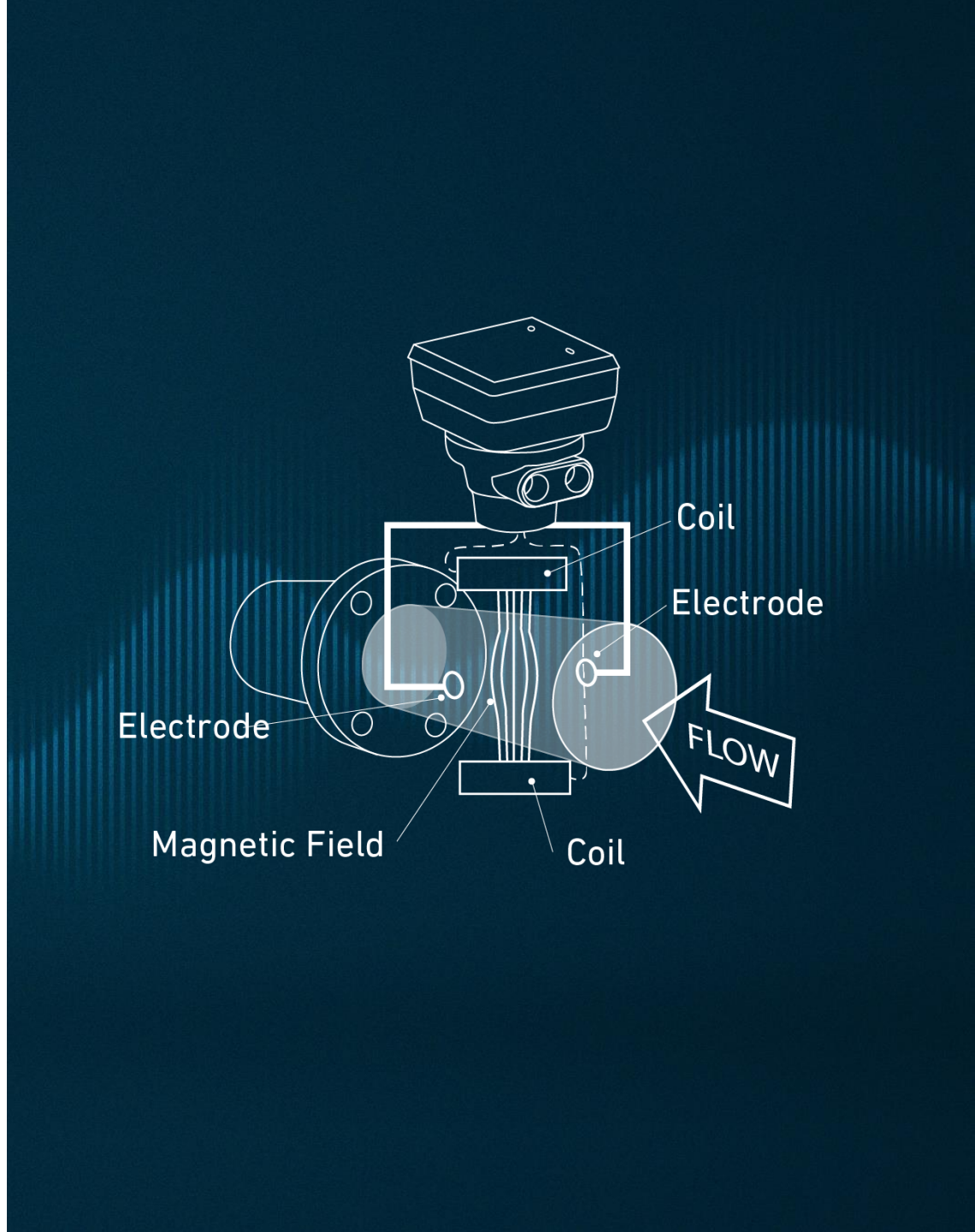
- Blind electronic housing is the same for all models
- Send Digital (S³L) or Frequency signal to transmitter / indicators
- Active or Passive 4 to 20 mA to PLC or Chart Recorder
- Read locally via Bluetooth® App, support iOS and Android devices


# Theory of Operation

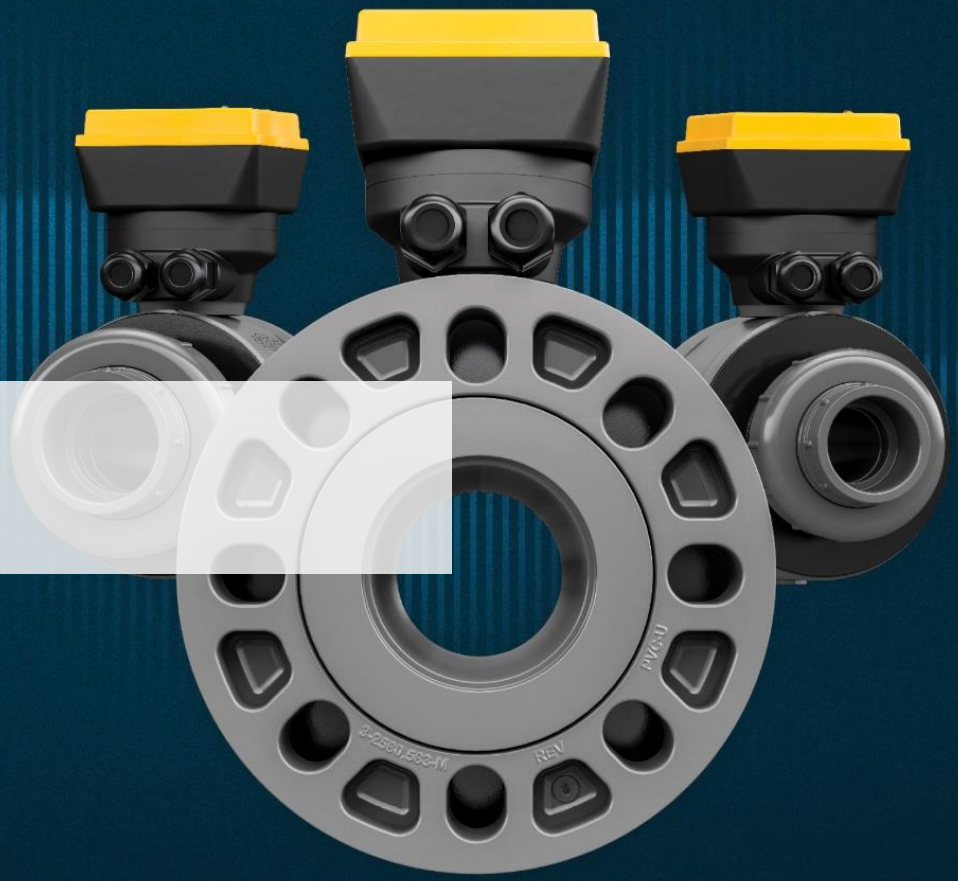


# Theory of Operation

- Traditional magnetic flow meters operate under the principle of Faraday's Law of electromagnetic induction to determine the flow of liquid in a pipe. The voltage generated is proportional to the movement of the flowing liquid, the electronic transmitter processes the voltage signal to determine liquid flow
- The FlowtraMag 2581 operate under the principle of Faraday-Lorentz Law which in-line with the pipe flow is deemed to measure
- The FlowtraMag 2581 uses a magnetic field directed perpendicular to the flow lines and the voltage generated by the vectorial product of the two vectors is proportional to the flow through the pipe. The higher the magnetic field value, the better sensitivity to detect flow



# Target Applications



# Target Applications FlowtraMag 2581

- Market potential are Industrial Wastewater, Municipal Water Treatment, Landfill, Chemical Processing Industry, Energy, and OEM
  - Plastic body will offer the unique selling benefits
  - Applications that currently use metal FBM with plastic pipes
  - Weights of metal full-bore magmeters need to be supported

**Internal use only**

**Internal use only**

**Internal use only**

# Target Applications FlowtraMag 2581

- OEM water treatment skids, pipe sizes vary and space constraints can cause installers to ignore pipe run requirements

**Internal use only**

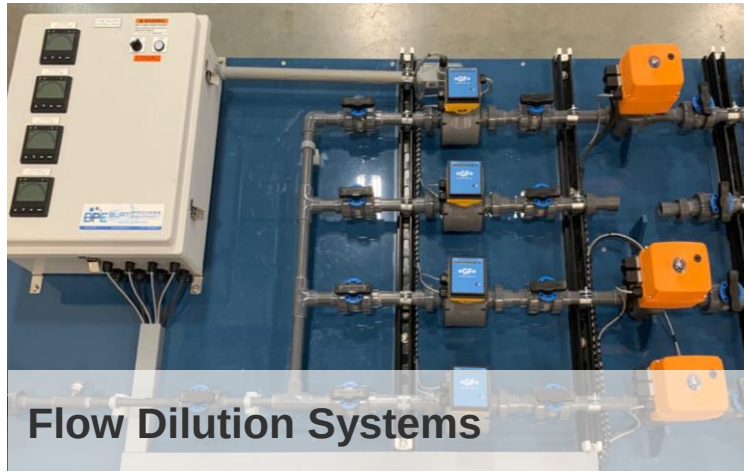
**Internal use only**

**Internal use only**

# For water and wastewater treatment applications


Flow Control / Chemical Dosing


Chemical Blending & Batching

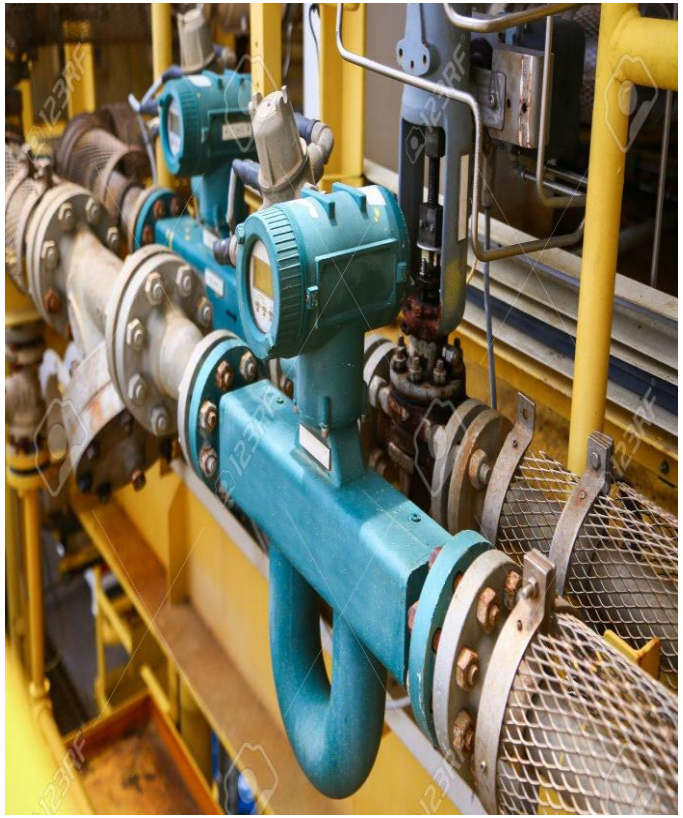

Flow Dilution Systems

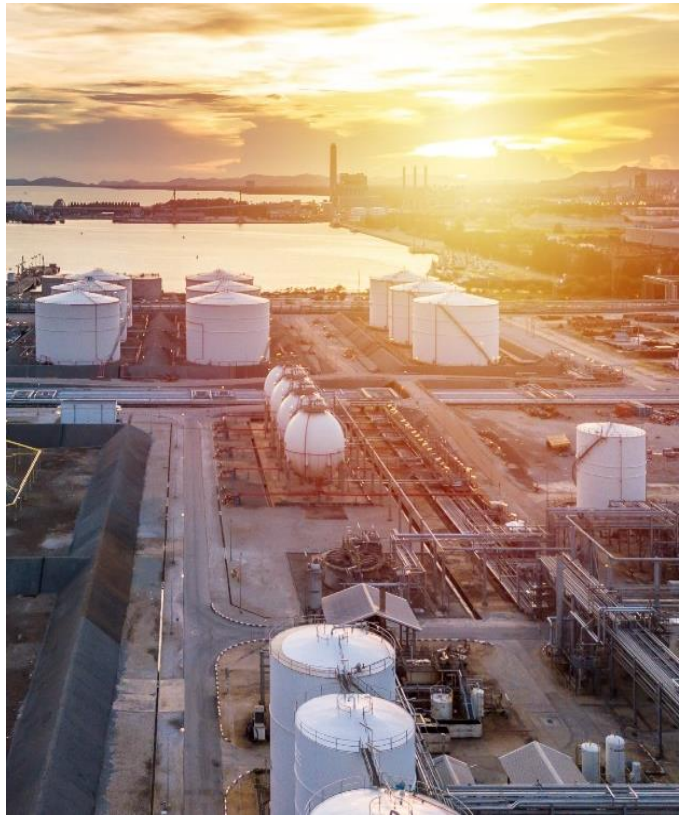

Industrial Effluent


Wastewater Treatment Plant


Printed Circuit Board Plant

# Not suitable for high pressure / temperature, high concentrated chemical processes

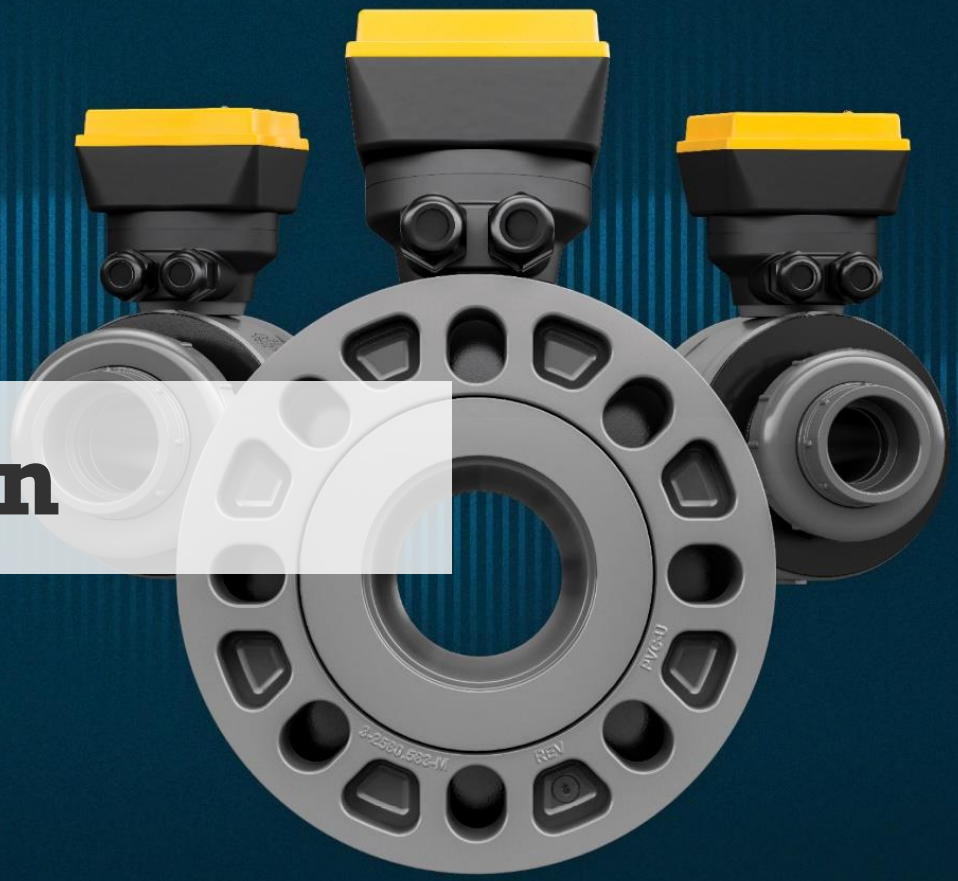




**Things to Consider:**

- *Metal bodies can handle higher pressures*
- *ATEX not supported*

# Ordering Information



# Ordering Information

| Mfr. Part Number | 9 Digit Code | Description |
|---|---|---|
| 3-2581PT01-101 | 159 001 970 | FBM PVC Ti, FKM Union DN25 (1") |
| 3-2581PT15-101 | 159 001 971 | FBM PVC Ti, FKM Union DN40 (1.5") |
| 3-2581PT02-101 | 159 001 972 | FBM PVC Ti, FKM Union DN50 (2") |
| 3-2581PT03-101 | 159 001 973 | FBM PVC Ti, FKM Flange DN80 (3") |
| 3-2581PT04-101 | 159 001 974 | FBM PVC Ti, FKM Flange DN100 (4") |
| 3-2581PH01-101 | 159 001 975 | FBM PVC Hc, FKM Union DN25 (1") |
| 3-2581PH15-101 | 159 001 976 | FBM PVC Hc, FKM Union DN40 (1.5") |
| 3-2581PH02-101 | 159 001 977 | FBM PVC Hc, FKM Union DN50 (2") |
| 3-2581PH03-101 | 159 001 978 | FBM PVC Hc, FKM Flange DN80 (3") |
| 3-2581PH04-101 | 159 001 979 | FBM PVC Hc, FKM Flange DN100 (4") |

# Ordering Information

| Mfr. Part Number | 9 Digit Code | Description |
|---|---|---|
| 3-2581PT01-102 | 159 001 980 | FBM PVC Ti, EPDM, Union DN25 (1") |
| 3-2581PT15-102 | 159 001 981 | FBM PVC Ti, EPDM, Union DN40 (1.5") |
| 3-2581PT02-102 | 159 001 982 | FBM PVC Ti, EPDM, Union DN50 (2") |
| 3-2581PT03-102 | 159 001 983 | FBM PVC Ti, EPDM, Flange DN80 (3") |
| 3-2581PT04-102 | 159 001 984 | FBM PVC Ti, EPDM, Flange DN100 (4") |
| 3-2581PH01-102 | 159 001 985 | FBM PVC Hc, EPDM, Union DN25 (1") |
| 3-2581PH15-102 | 159 001 986 | FBM PVC Hc, EPDM, Union DN40 (1.5") |
| 3-2581PH02-102 | 159 001 987 | FBM PVC Hc, EPDM, Union DN50 (2") |
| 3-2581PH03-102 | 159 001 988 | FBM PVC Hc, EPDM, Flange, DN80 (3") |
| 3-2581PH04-102 | 159 001 989 | FBM PVC Hc, EPDM, Flange, DN100 (4") |

# Ordering Information

| Mfr. Part Number | 9 Digit Code | Description |
|---|---|---|
| 3-0252 | 159 001 808 | 0252 Configuration Tool |
| 3-2581-PX01-10X Accessories | | |
| 857 375 010 | 857 375 010 | PVC 80 Type 375 Union FKM (SxS) 1 in. (ASTM) |
| 749 418 026 | 749 418 026 | 1.234IDX.139 FKM O-RING RMS1071 (1 in.) |
| 897 375 010 | 897 375 010 | PVC 80 Type 375 Union EPDM (SxS) 1 in. (ASTM) |
| 748 419 026 | 748 419 026 | NSF 1.234IDX.139 EPDM O-RING (1 in.) |
| 161 375 904C | 161 375 904C | Union End, PVC, PN16, d32DN25 (Metric) |
| 3-2581-PX15-10X Accessories | | |
| 857 375 015 | 857 375 015 | PVC 80 Type 375 Union FKM (SxS) 1.5 in. (ASTM) |
| 748 419 003 | 748 419 003 | 1.725IDX.210 FKM O-RING RMS1071 (1.5 in.) |
| 897 375 015 | 897 375 015 | PVC 80 Type 375 Union EPDM (SxS) 1.5 in. (ASTM) |
| 749 418 003 | 749 418 003 | NSF 1.725IDX.210 EPDM O-RING (1.5 in.) |
| 161 375 906C | 161 375 906C | Union End, PVC, PN16, d50DN40 (Metric) |

# Ordering Information

| Mfr. Part Number | 9 Digit Code | Description |
|---|---|---|
| 3-2581-PX02-10X Accessories | | |
| 857 375 020 | 857 375 020 | PVC 80 Type 375 Union FKM (SxS) 2 in. (ASTM) |
| 749 418 231 | 749 418 231 | 2.225X.210 FKM O-RING RMS1071 (2 in.) |
| 897 375 020 | 897 375 020 | PVC 80 Type 375 Union EPDM (SxS) 2 in. (ASTM) |
| 748 419 231 | 748 419 231 | NSF 2.225X.210 EPDM O-RING (2 in.) |
| 161 375 907C | 161 375 907C | Union End, PVC, PN16, d63DN50 (Metric) |
| 3-2581-PX03-10X Accessories | | |
| 854-030 | 854-030 | 3 in. PVC80 Van-Stone Flange (S) |
| 37X 002 117 | 37X 002 117 | FKM Full Face Flange Gasket - 150# ANSI Bolt Pattern - 3 in. |
| 37X 002 008 | 37X 002 008 | EPDM Full Face Flange Gasket - 150# ANSI Bolt Pattern - 3 in. |
| 37Z 000 068 | 37Z 000 068 | Van Stone Flange 316SS Bolt Kit, 4-hole, 3 in. ASTM |
| 721 790 113 | 721 790 113 | DN80 Flange Adapter, PVC-U, Metric (Use with backing flange 721 700 013) |
| 721 700 013 | 721 700 013 | DN80 Backing Flange, PVC-U, Metric |
| 749 440 713 | 749 440 713 | DN80 FKM Profile Flange Gasket, Metric |
| 748 440 713 | 748 440 713 | DN80 EPDM Profile Flange Gasket, Metric |

# Ordering Information

| Mfr. Part Number | 9 Digit Code | Description |
|---|---|---|
| 3-2581-PX04-10X Accessories | | |
| 854-040 | 854-040 | 4 in. PVC80 Van-Stone Flange (S) |
| 37X 002 118 | 37X 002 118 | FKM Full Face Flange Gasket - 150# ANSI Bolt Pattern - 4 in. |
| 37X 002 009 | 37X 002 009 | EPDM Full Face Flange Gasket - 150# ANSI Bolt Pattern - 4 in. |
| 37Z 000 069 | 37Z 000 069 | Van Stone Flange 316SS Bolt Kit, 8-hole, 4 in. ASTM |
| 721 790 114 | 721 790 114 | DN100 Flange Adapter, PVC-U, Metric (Use with backing flange 721 700 014) |
| 721 700 014 | 721 700 014 | DN100 V-Flange Ring PVC-U, Metric |
| 749 440 714 | 749 440 714 | DN100 FKM Profile Flange Gasket, Metric |
| 748 440 714 | 748 440 714 | DN100 EPDM Profile Flange Gasket, Metric |

# 2581 Setup with Config Tool Bluetooth® App

# FlowtraMag Bluetooth® iOS App available on App Store – GF Configuration Tool

## App Configuration - App Set Up

### Bluetooth® App Setup Steps - iOS version

Search for **GF Configuration Tool** in the App store. Download the **GF Config Tool**.

1. Press **GET.** App will install on phone or other wireless device.
2. Return to home screen and look for App icon, click the blue **GF Config Tool** icon
3. Continue to Sensor Setup Section (next page)

Download on the App Store

# FlowtraMag Bluetooth® Android App available on Google Store – GF Configuration Tool

## Bluetooth® App Setup Steps - Android version

Download the **GF Configuration Tool** App by scanning the QR code or searching in Google Play directly.

1. When prompted press **Install**
2. Return to home screen and look for App icon, click the blue **GF Config Tool** icon
3. Continue to Sensor Setup section (next page.)

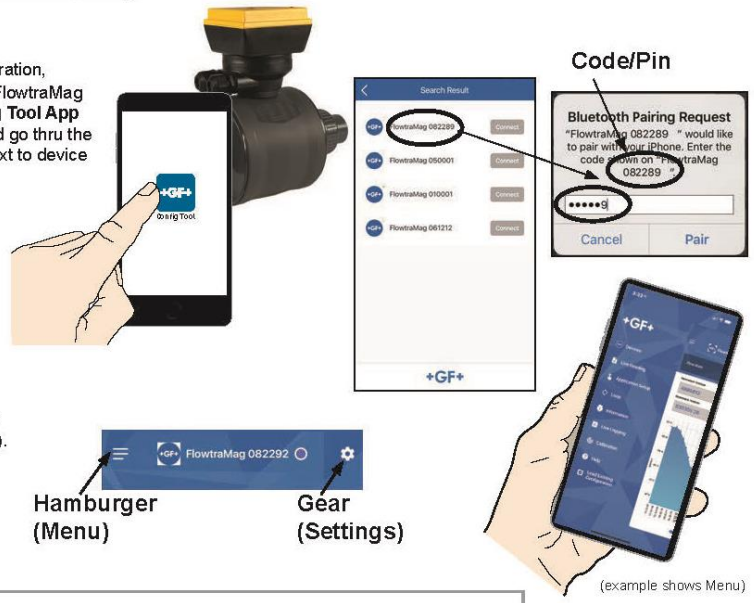
# FlowtraMag Bluetooth® App Sensor Setup

## App Configuration - Sensor Setup

### iOS version

When the 2581 FlowtraMag is in operation, when in close proximity to the 2581 FlowtraMag (less than 20 ft), open the **GF Config Tool App** to begin a search nearby devices and go thru the pairing process. Click on connect next to device you are pairing to.

1. Pair the device by entering the device Code/Pin. The default Passkey is the last 6 digits of the product serial number.
2. Click **Pair/OK**
3. Make any adjustments to the 2581 FlowtraMag, if necessary, by tapping the Hamburger Menu (menu list) or Gear (edit settings).

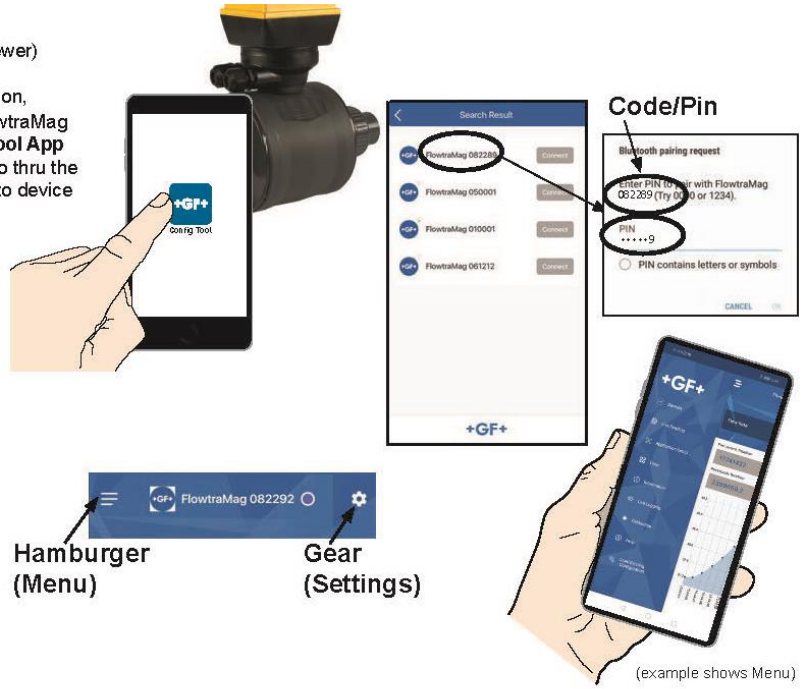



**Note:**
If the GF Config Tool password has been lost or forgotten, connect blue wire to white wire while unit is powered (for 2 to 5 seconds.) Password will reset to factory original (last 6 digits of serial number.)

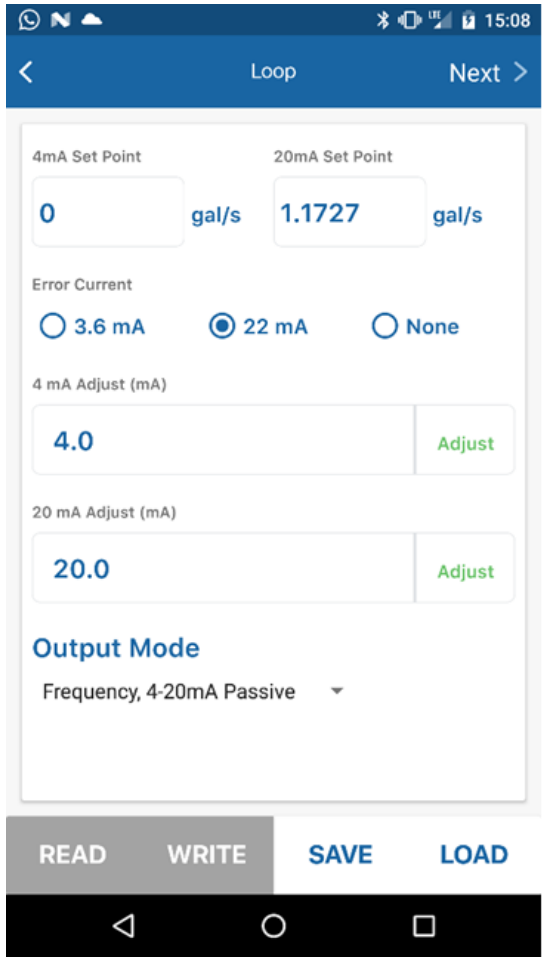
### Android version (Version 8 or newer)

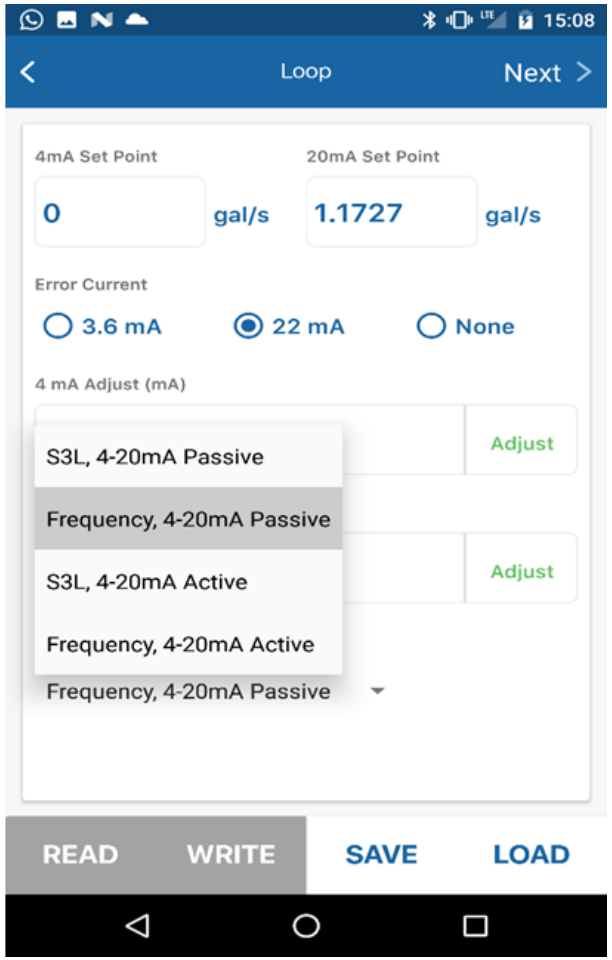
When the 2581 FlowtraMag is in operation, when in close proximity to the 2581 FlowtraMag (less than 20 ft), open the **GF Config Tool App** to begin a search nearby devices and go thru the pairing process. Click on connect next to device you are pairing to.

1. Pair the device by entering the device Code/Pin. The default Passkey is the last 6 digits of the product serial number.
2. Click **Pair/OK**
3. Make any adjustments to the 2581 FlowtraMag, if necessary, by tapping the Hamburger Menu (menu list) or Gear (edit settings).



# FlowtraMag Bluetooth® App Sensor Setup



# FlowtraMag Bluetooth® App Sensor Setup

**Read** Loads the data from the connected device (sensor or transmitter) and updates the software's display.
**NOTE:** This will overwrite any changes made in the GF Config Tool App since the last **Write**.

**Write** Applies the data entered in the GF Config Tool App to the connected device. Once you have entered the desired setting changes in the software screens, press **Write** to load your new settings onto the connected device.

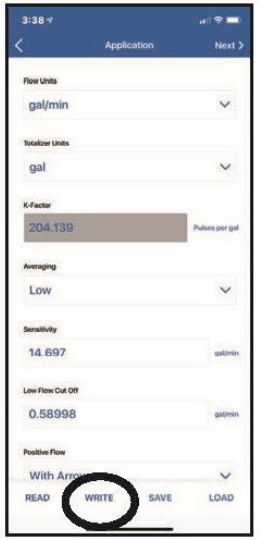
**Save** Stores the entire GF Config Tool App settings configuration, as currently displayed in the application, to your mobile device. (You will be asked to provide a configuration file name)

**Load** Loads a default configuration file from the factory.
Opens a previously saved settings configuration file. See **Save** function above.
**NOTE:** The file must be a GF Config Tool App settings configuration file.
The software will verify whether the user-selected file is the correct type.
There are configuration files available for specific body sizes containing default values from the factory.
Carefully review the **Device Tag** and **Passkey** configuration in the Information screen.
**Device Tag** identifies the sensor you are connecting to. Device Tag maximum length 20 characters.
**Device Passkey** is needed for connecting to the sensor. Device Passkey is a 6 digit number.

# FlowtraMag Bluetooth® App Sensor Setup

## App Configuration - Sensor Setup Continued

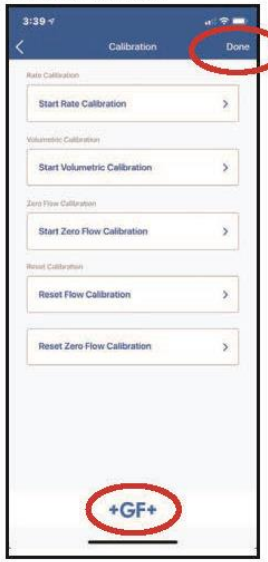
**Application Setup**
To set Averaging, Sensitivity, Low Flow Cut Off, Position of Flow, Flow Units and Totalizer Unit.




**Loop**
Set 4 mA, 20 mA, Error condition of the current output alarm (3.6 or 22 mA), adjust your 4 to 20 mA setting and select output mode.

**Loop adjustment is a live update.**

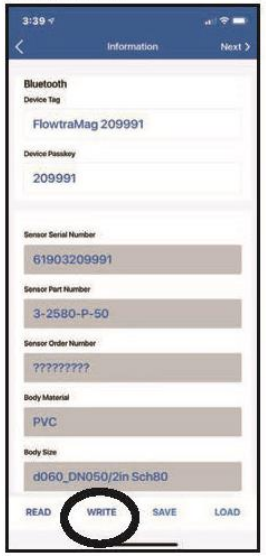

**Calibration**
Custom Calibration of Rate, Volumetric, Zero Flow Calibration.



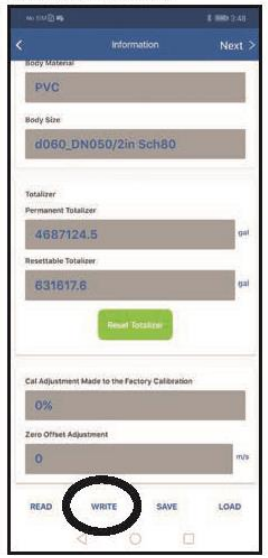

Then press **DONE** or press on **GF logo** to get back to re-connect screen.

**Information**
Sensor information, Bluetooth Device Tag, Permanent Totalizer, Resettable Totalizer, Calibration Adjustment Factor, Zero Offset Adjustment

**iOS version**




**Android version**




**Note: You must press WRITE to save your changes to the sensor.**
Otherwise it saves to your phone only.

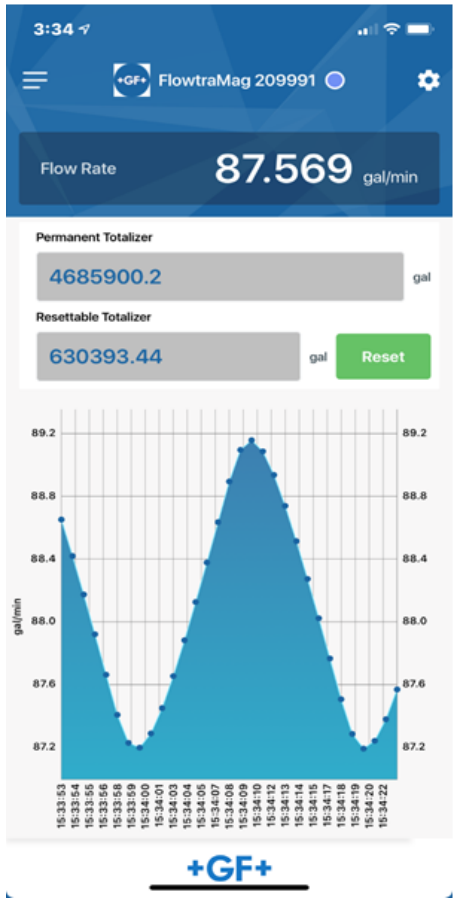
To switch between digital ($S^3L$) and Frequency and/or 4 to 20 Active or Passive, use the GF Config Tool App. On the loop screen, use the drop down to select digital ($S^3L$) or Freq and/or Active or Passive 4 to 20 mA. Press WRITE after making selection.

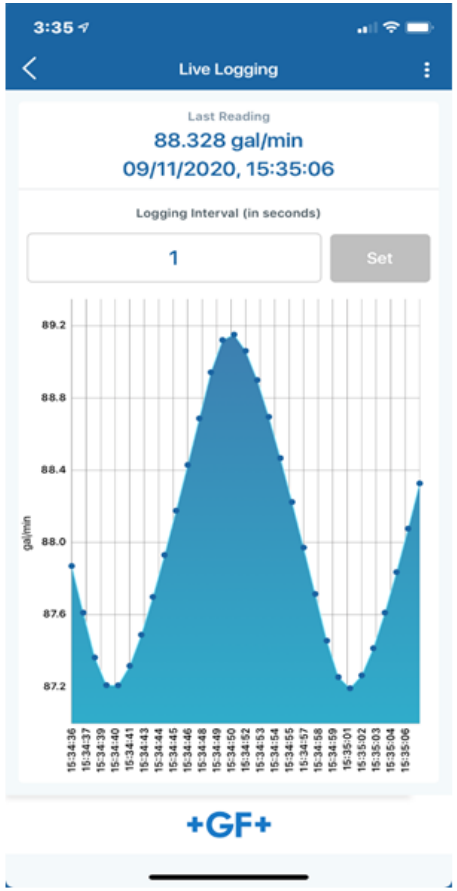
If the GF Config Tool password has been lost or forgotten, connect blue wire to white wire of the sensor output cable while unit is powered (for 2 to 5 seconds.) Disconnect blue wire from white wire after 5 seconds. Password will reset to factory original (last 6 digits of serial number.)

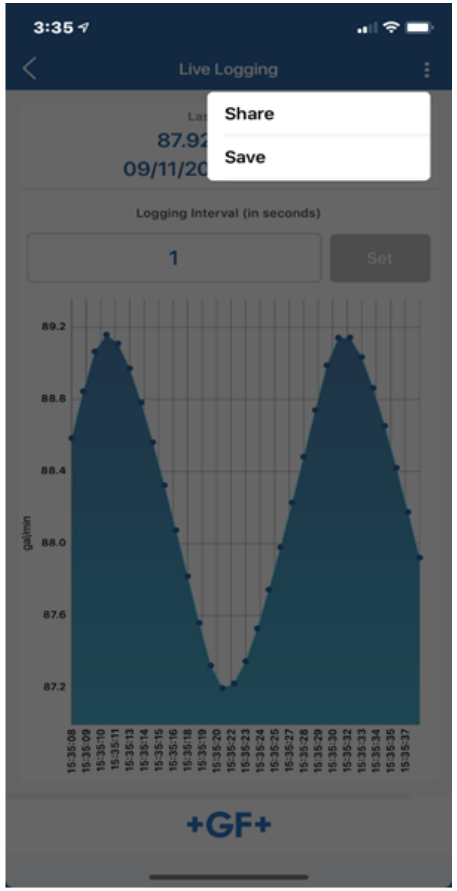
To delete saved 2581 FlowtraMag in iOS:
Swipe right and select the trash can icon.
To delete saved 2581 FlowtraMag in Android:
Swipe right, "Are you sure you want to delete this device?", choose Yes or No.

**Technical Note**
The totalizer in the 2581 FlowtraMag is independent from the totalizer in the 9900/9950 transmitters. If the totalizer is reset on the 2581 FlowtraMag, it does not reset the totalizer on the 9900 or 9950.

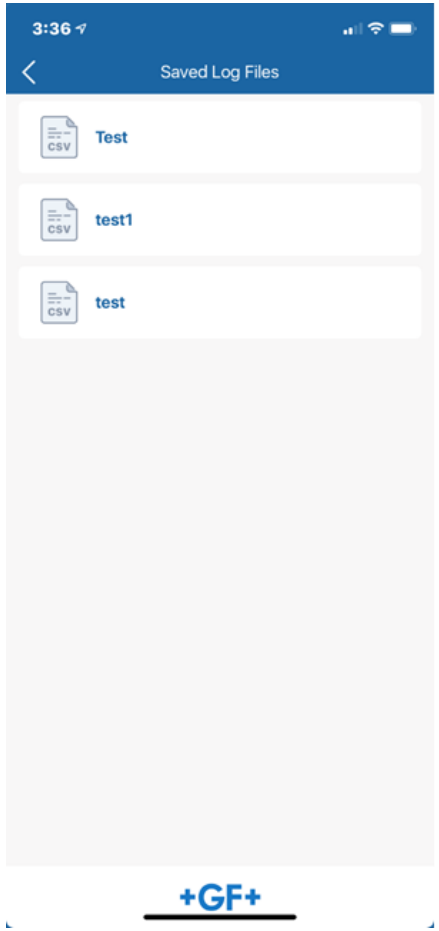
# FlowtraMag Bluetooth® App Sensor Setup

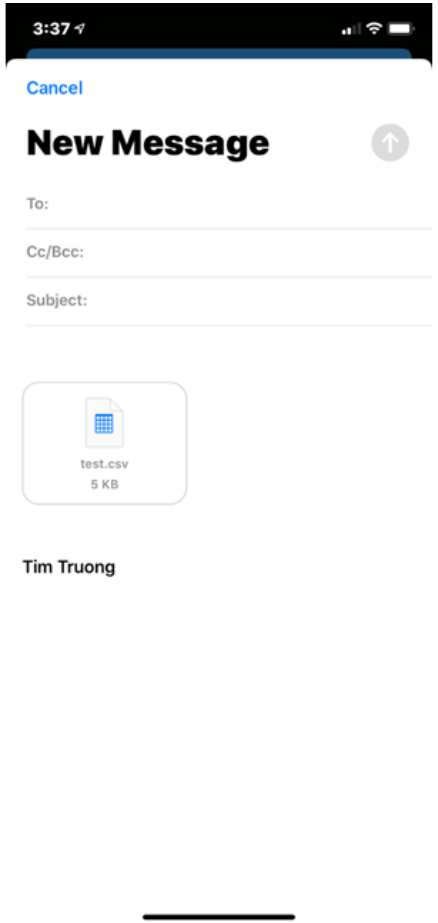


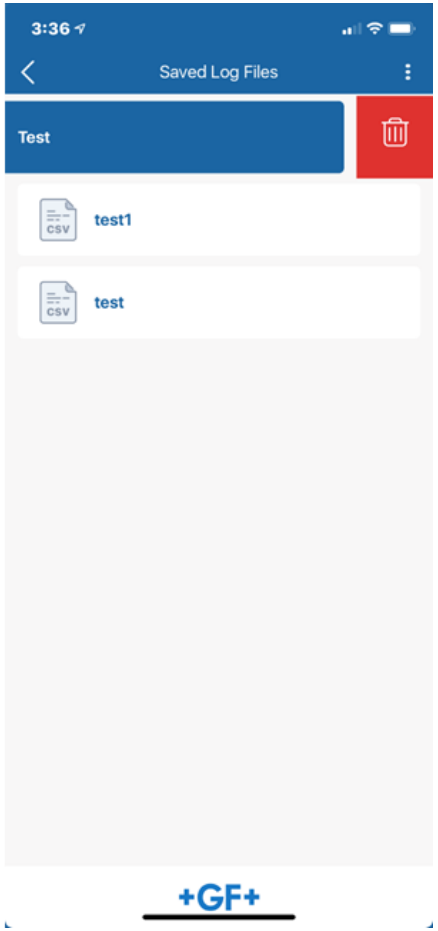



# FlowtraMag Bluetooth® App Sensor Setup

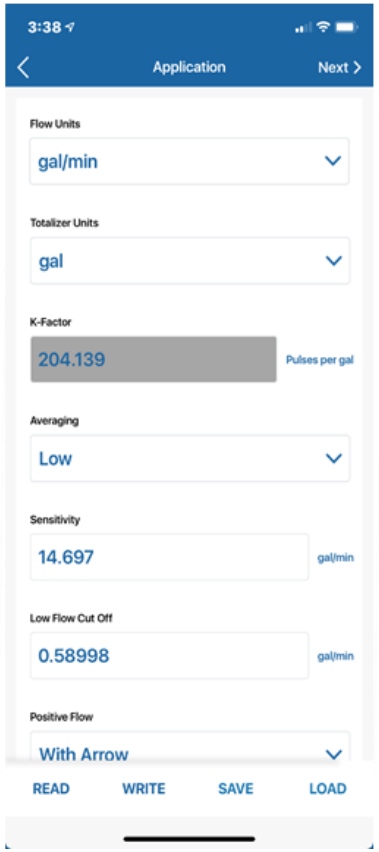


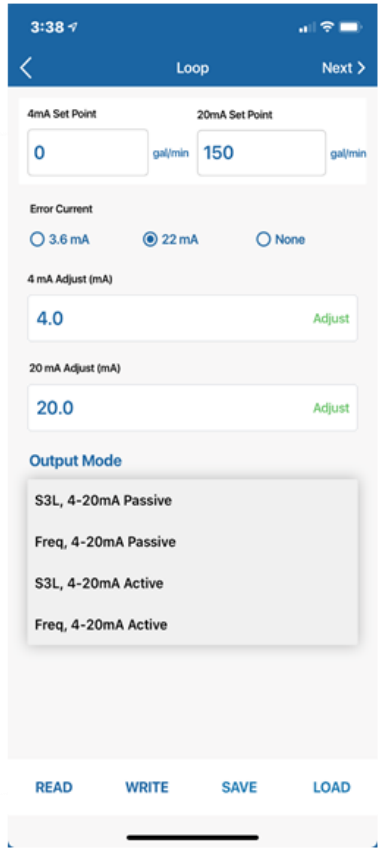



# FlowtraMag Bluetooth® App Sensor Setup

## Configure Sensor

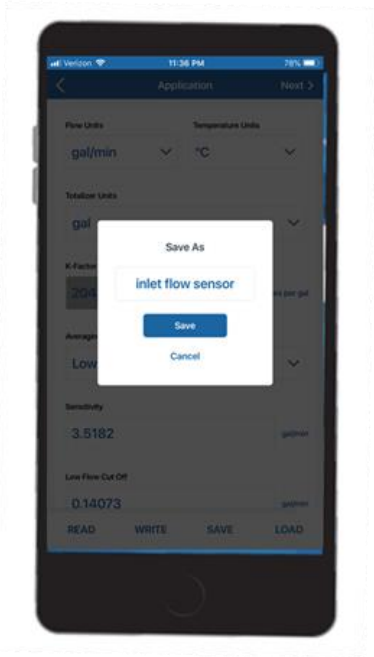



- Change settings directly via App
- Drop downs for many of the settings
- Adjust 4 to 20 mA outputs

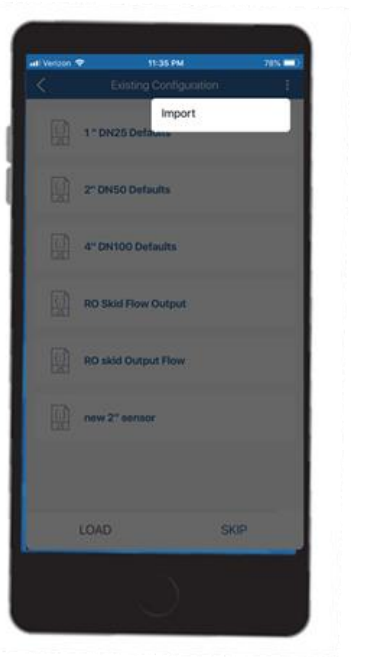


# FlowtraMag Bluetooth® App Sensor Setup

## Clone Sensor Settings

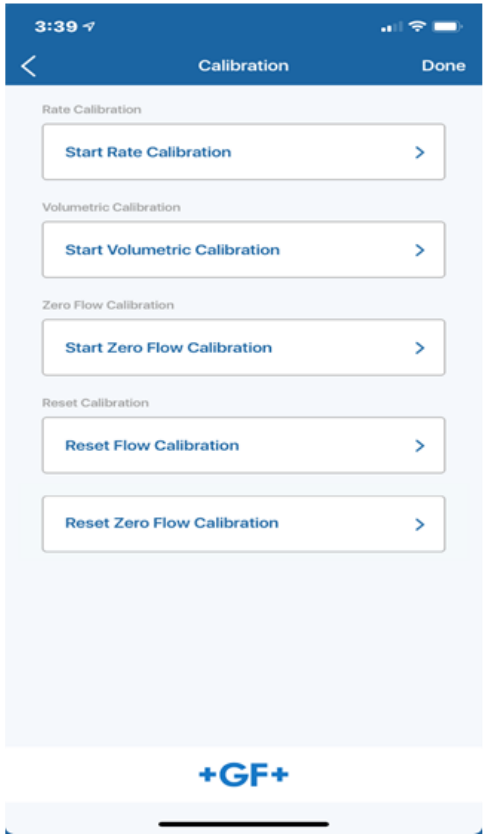



- Save configuration files to smart device and/or write to sensors
- Import previously saved configurations

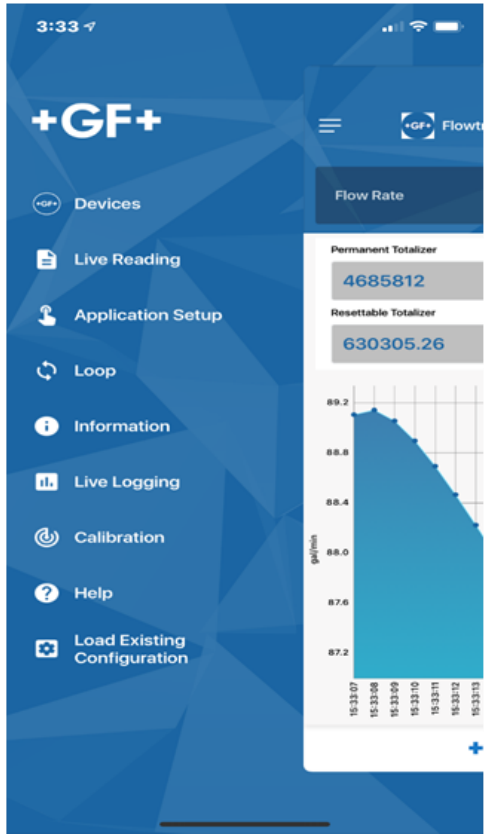


# FlowtraMag Bluetooth® App Sensor Setup

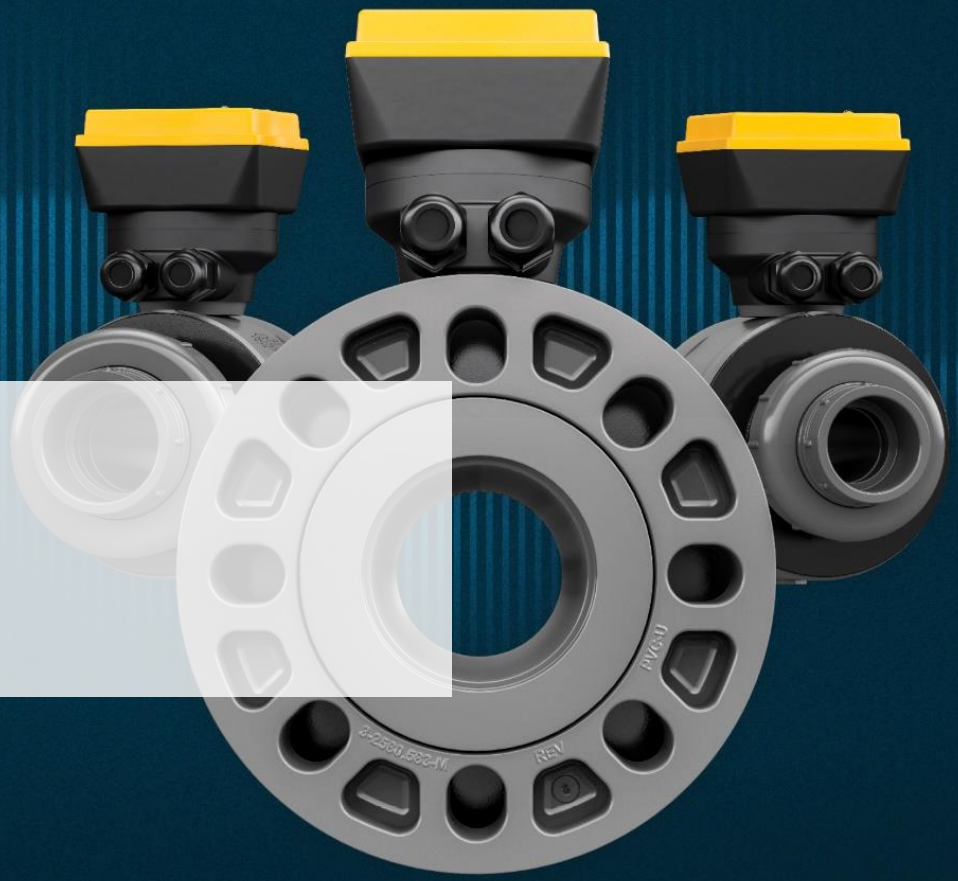
## Calibrate




- Sensors are factory calibrated
- Perform calibrations directly via the App
- Rate, Volume and Factory

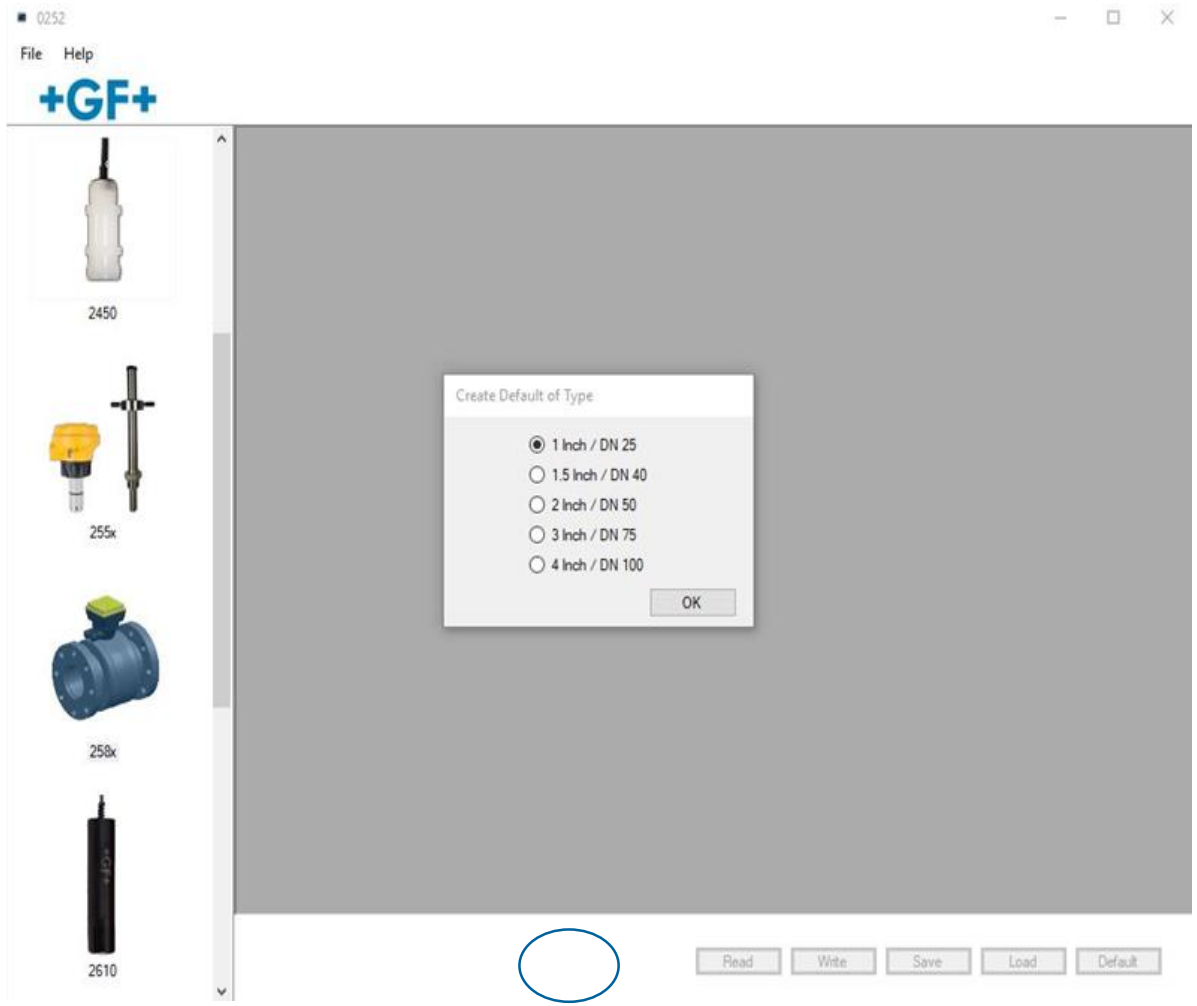


# 2581 Setup with 0252 Configuration Tool



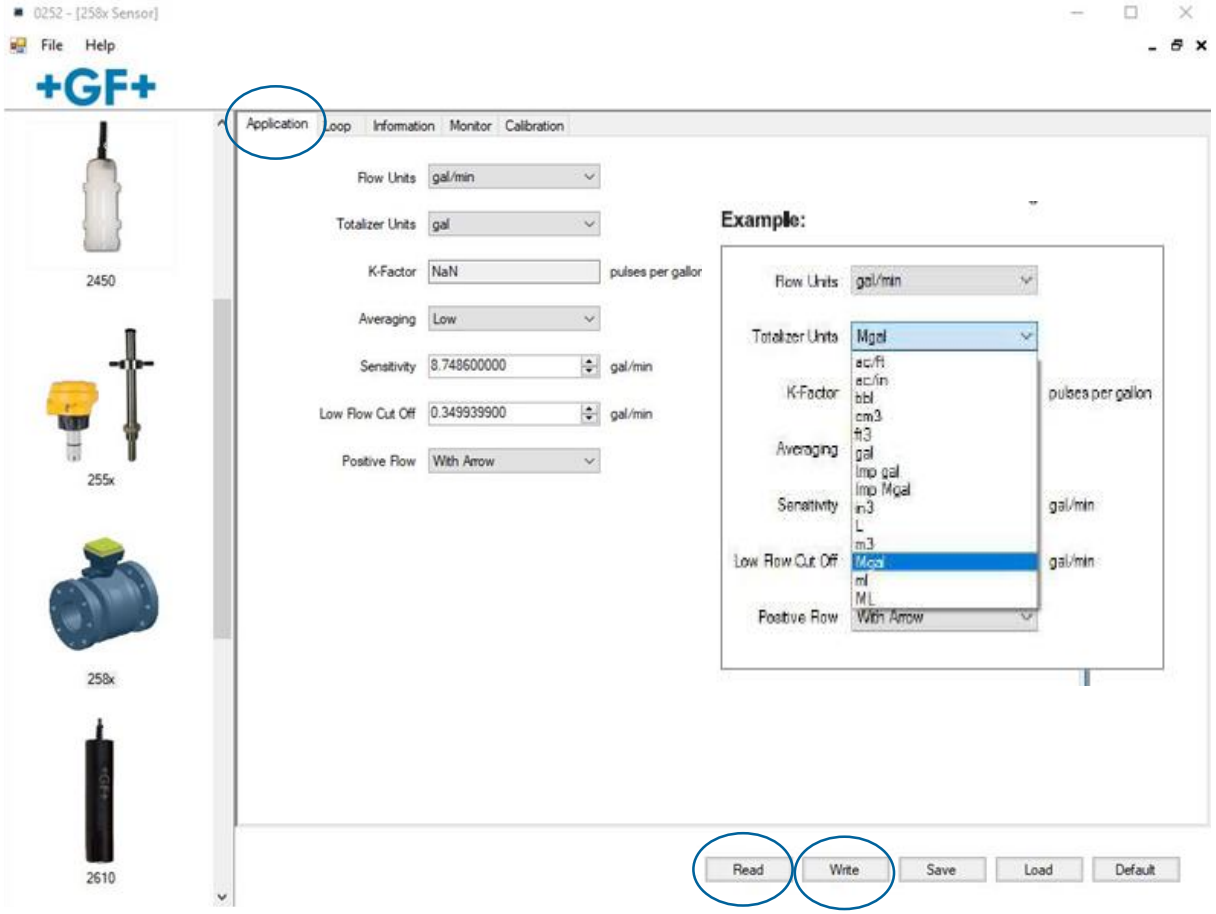
# FlowtraMag – 0252 Configuration Tool

- Select default unit by type, then click OK
- Then click on READ from the device



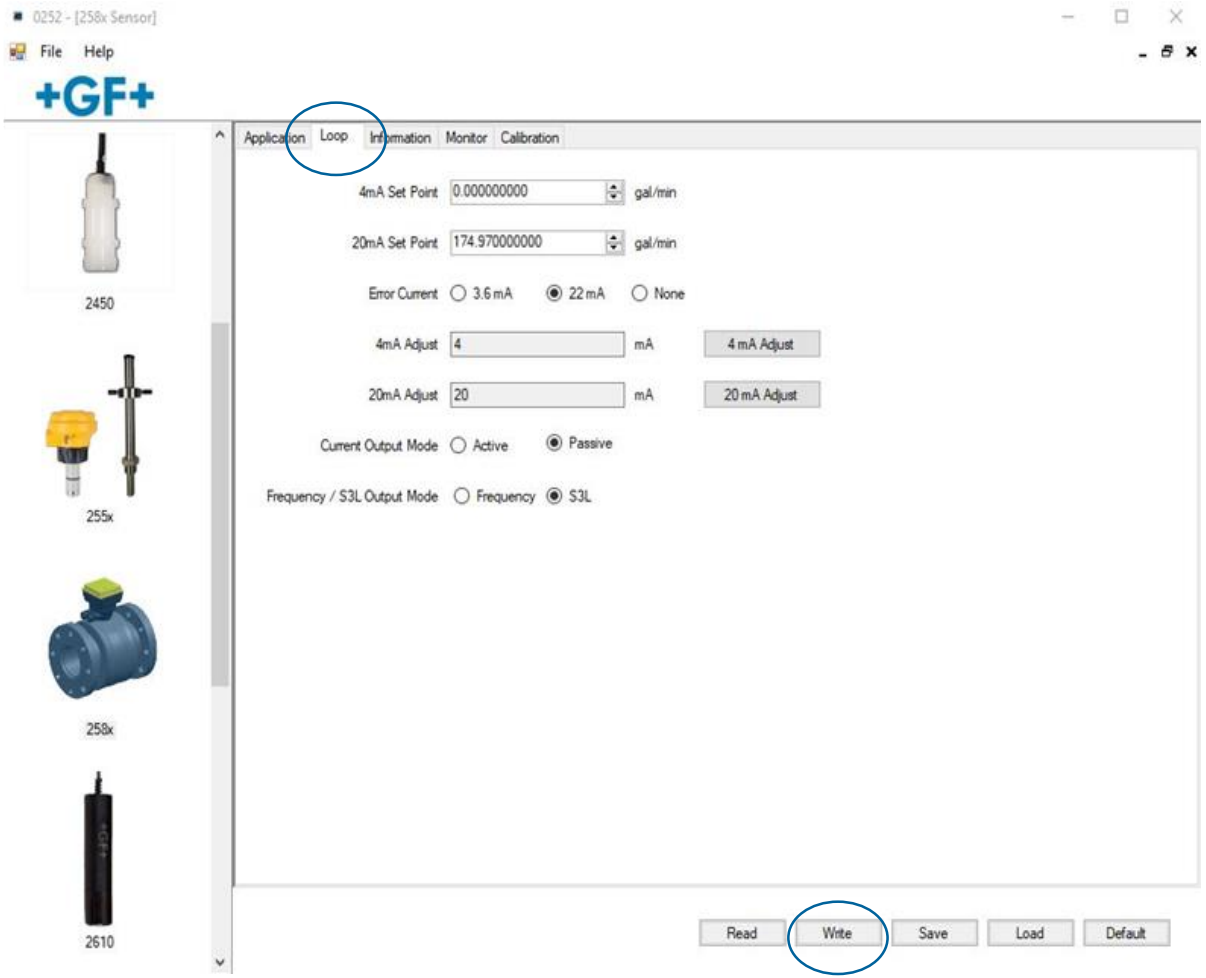
# FlowtraMag – 0252 Configuration Tool

- Application tab, select flow unit (drop down unit), totalizer unit (drop down menu), averaging (drop down menu), sensitivity, low flow cut off, and direction of the flow
- If user has any correction or change, user must Write information to device, then click Read device again



# FlowtraMag – 0252 Configuration Tool

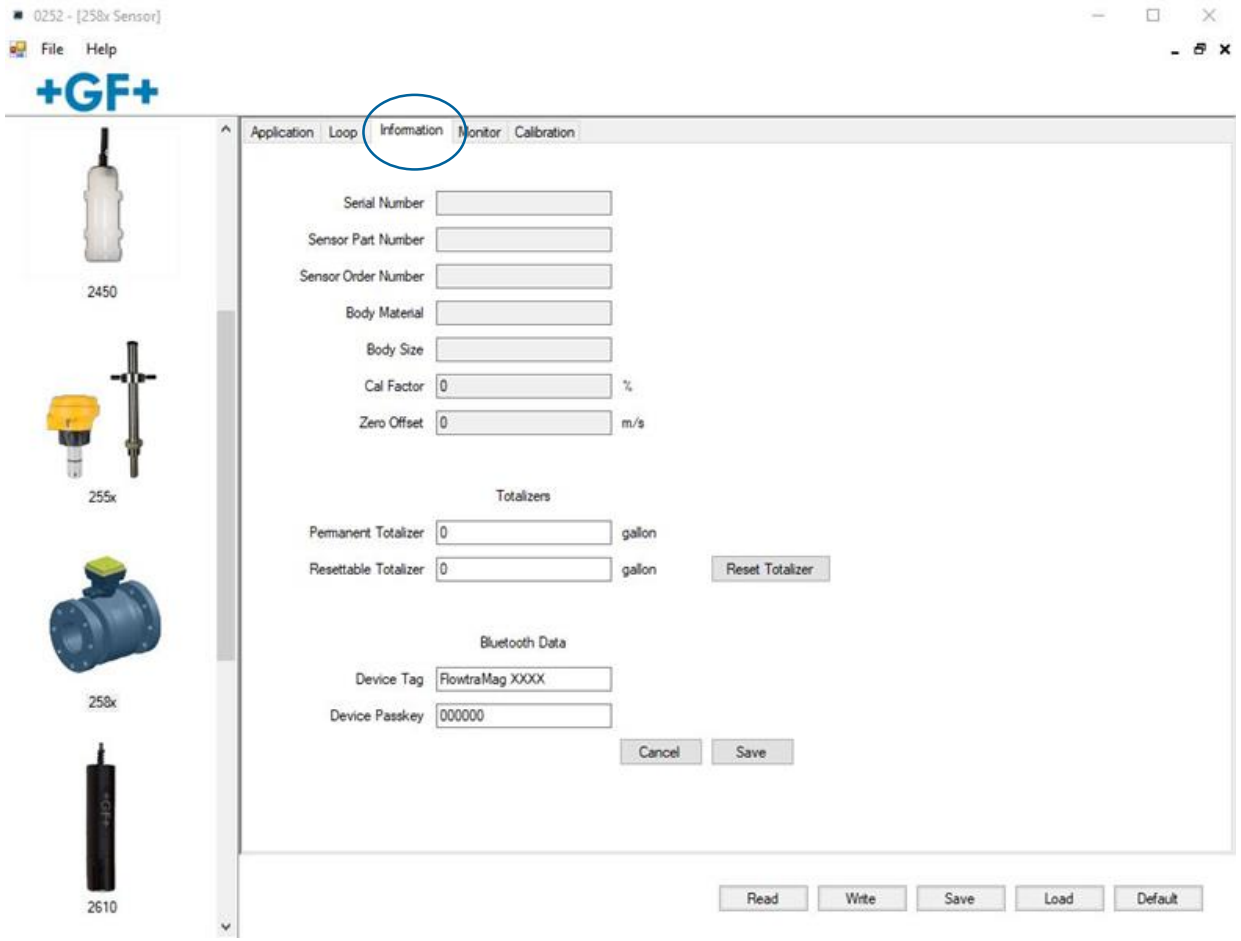
- Loop tab, select or confirm your 4 to 20 mA set point, set your current alarm condition and type of output mode
- If user has any changes, make sure click on Write information back to the sensor




**Note:**
The 0252 Configuration Tool will be unable to connect to sensor when set to frequency.

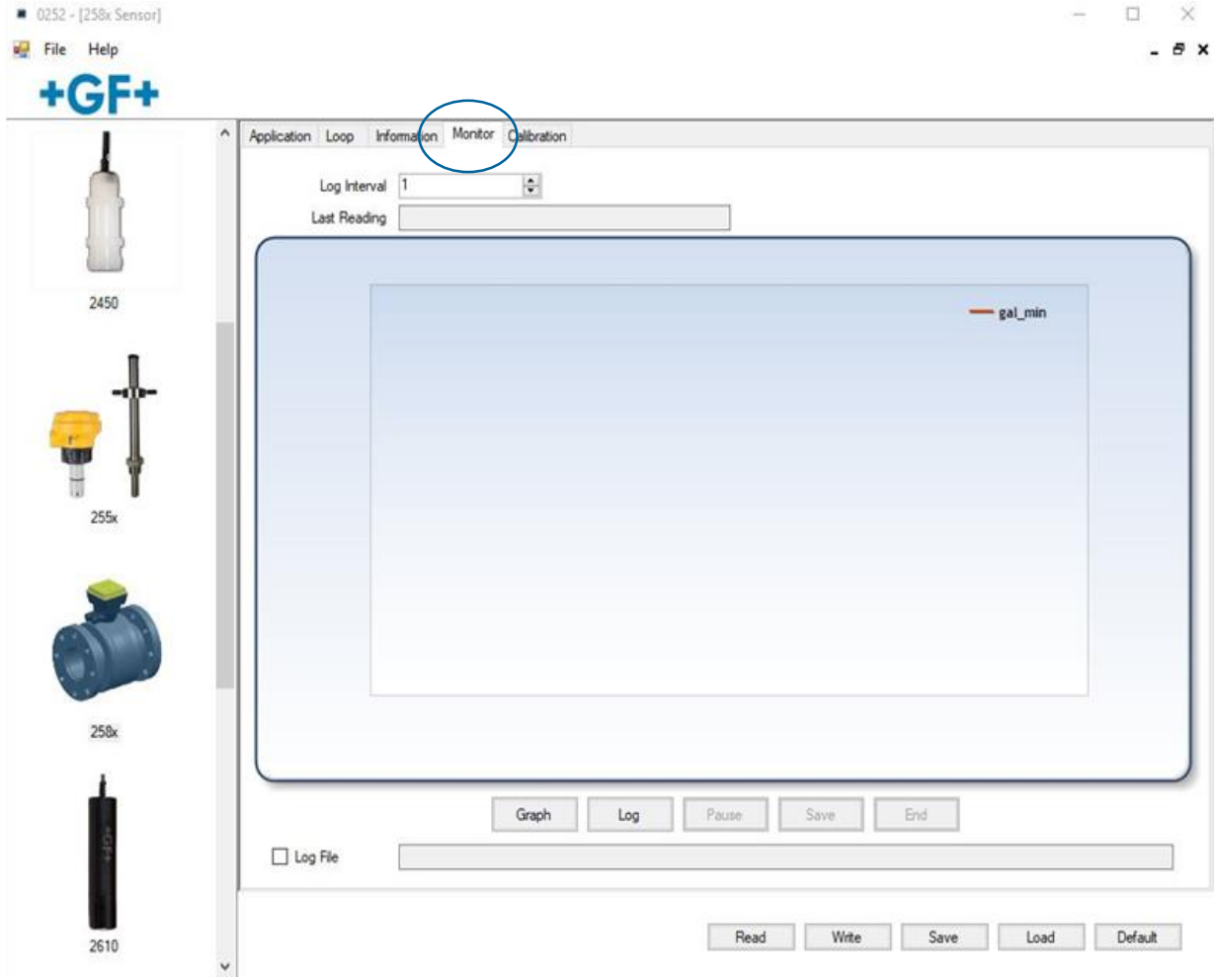
# FlowtraMag – 0252 Configuration Tool

- Information tab, displays product information, calibration adjustment information totalizer information and Bluetooth® data



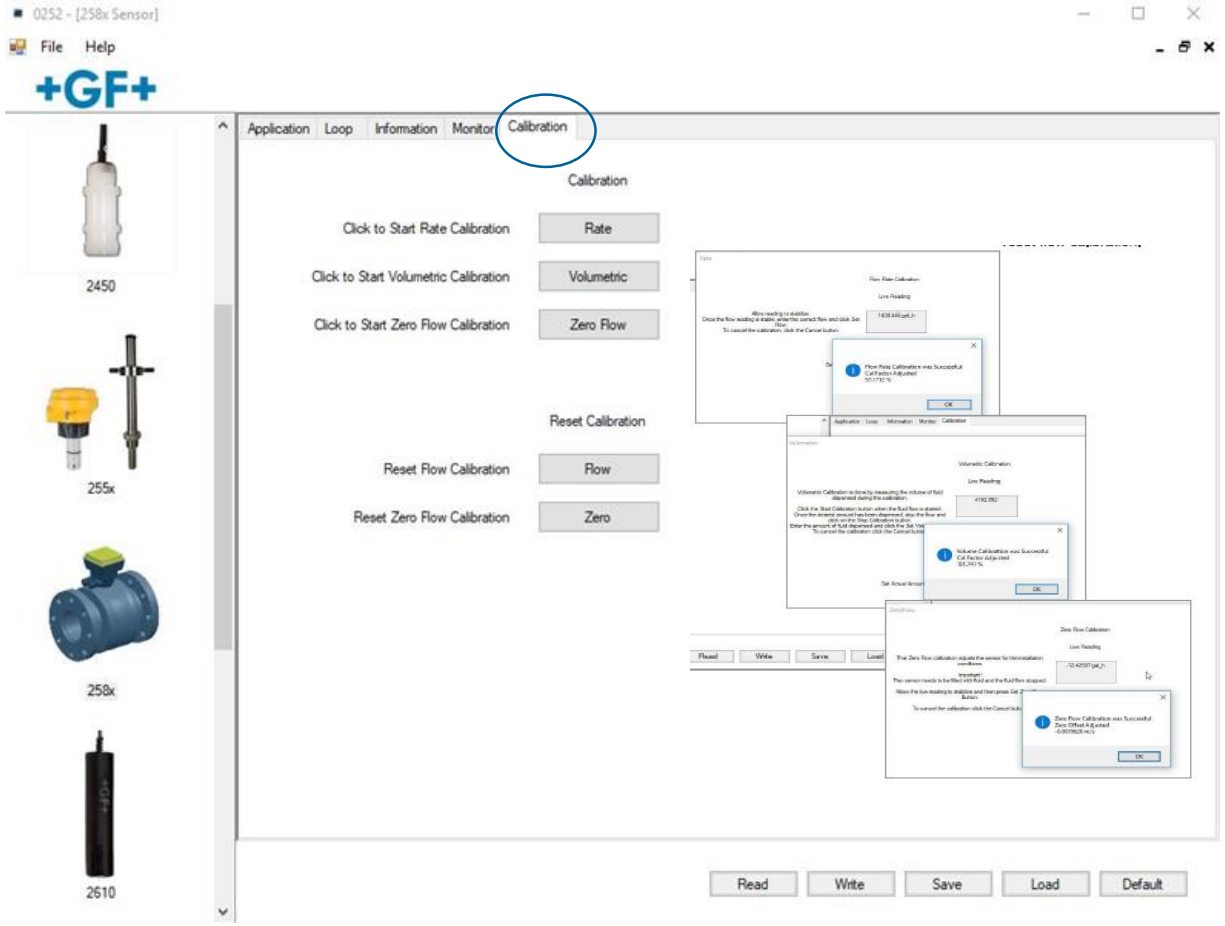
# FlowtraMag – 0252 Configuration Tool

- Monitor tab can be graph or user can log the information to your local drive via file type .CSV

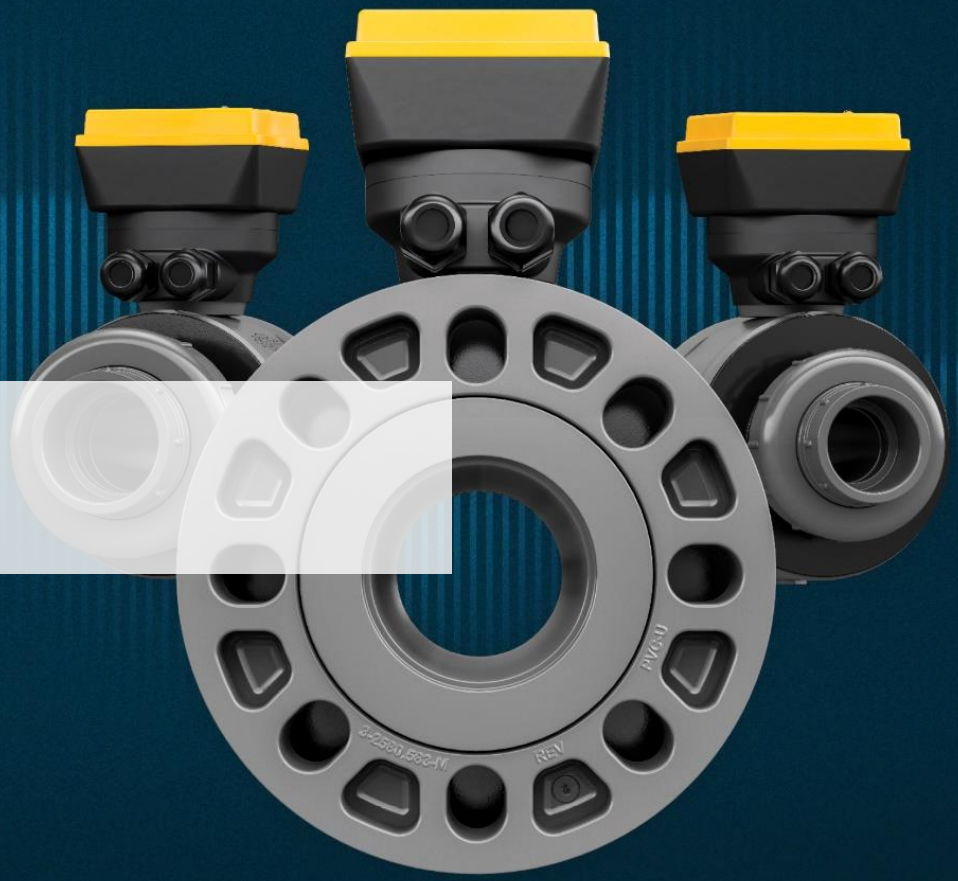


# FlowtraMag – 0252 Configuration Tool

- Calibration tab allows custom calibration via method of rate, volumetric and zero flow calibration
- Or reset flow and zero flow calibration



# Specifications



# Technical Specifications

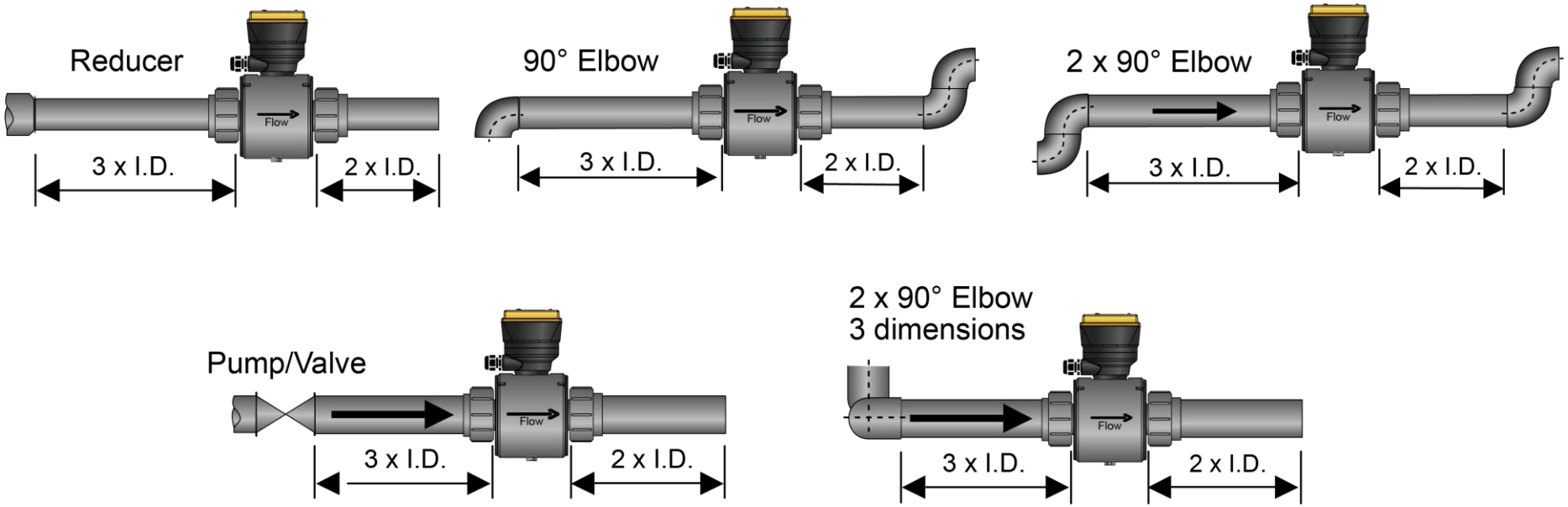
| | |
|---|---|
| **Wetted Materials** | PVC<br>Titanium, grade 2 or Hastelloy® C 276 electrodes<br>FKM or EPDM seals<br>PVC Schedule 80 union nut union end<br>PVC Schedule 80 Van Stone Flange |
| **Pipe Size Range** | DN25 (1"), DN40 (1.5"), DN50 (2") with union and DN80 (3"), DN100 (4") with Van Stone Flange |
| **Flow Range** | 0.02 m/s (0.07 ft/s) to 10 m/s (30 ft/s) |
| **Accuracy** | ±1% +0.01 m/s (reference condition 50 µS and water based) |
| **Repeatability** | ±0.5% of reading @ 25 °C (77° F) |
| **Power Requirement** | DC Power: 24 VDC, max 24W (12 to 32 VDC) regulated<br>Reverse polarity protection: up to 35 VDC<br>Over voltage maximum rating: 35 VDC<br>Frequency: 5 to 24 VDC, 50 mA max<br>Digital ($S^3L$): 4.5 to 5.5 VDC<br>Current: 12 to 32 VDC |
| **Operating Temperature and Pressure** | Ambient: -10° C to 60 °C (14° F to 140°F)<br>Media: 0 °C to 60 °C (32 °F to 140 °F) |
| **Maximum Operating Pressure** | 10 bar @ 23 °C (145 psi @ 73 °F)<br>DN25 (1"), DN40 (1.5") and DN (2"): 3.5 bar @ 60 °C (51 psi @ 140 °F)<br>DN80 (3") and DN100 (4"): 2.27 bar @60 °C (33 psi @ 140 °F) |

# Technical Specifications

| | DN25 (1") | DN40 (1.5") | DN50 (2") | DN80 (3") | DN100 (4") |
|---|---|---|---|---|---|
| **Flow Units** | GPM | GPM | GPM | GPM | GPM |
| **Totalizer Units** | Gallons | Gallons | Gallons | Gallons | Gallons |
| **K-Factor** | 852.716 | 342.912 | 204.139 | 91.077 | 52.119 |
| **Averaging** | Low | Low | Low | Low | Low |
| **Sensitivity** | 3.518 | 8.749 | 14.696 | 32.939 | 57.561 |
| **Low Flow Cutoff** | 0.141 | 0.350 | 0.588 | 1.318 | 2.302 |
| **4 mA Setpoint** | 0 | 0 | 0 | 0 | 0 |
| **20 mA Setpoint** | 70.363 | 174.972 | 293.920 | 658.782 | 1151.215 |
| **Error Current** | 22 | 22 | 22 | 22 | 22 |
| **Passive/Active use Bluetooth App adjustment if needed** | Passive | Passive | Passive | Passive | Passive |
| **S3L/Freq use Bluetooth App adjustment if needed** | Freq | Freq | Freq | Freq | Freq |

# FlowtraMag – Technical Specifications

- The 2581 requires a minimum of 3 x ID upstream and 2 x ID downstream of the sensor for best performance

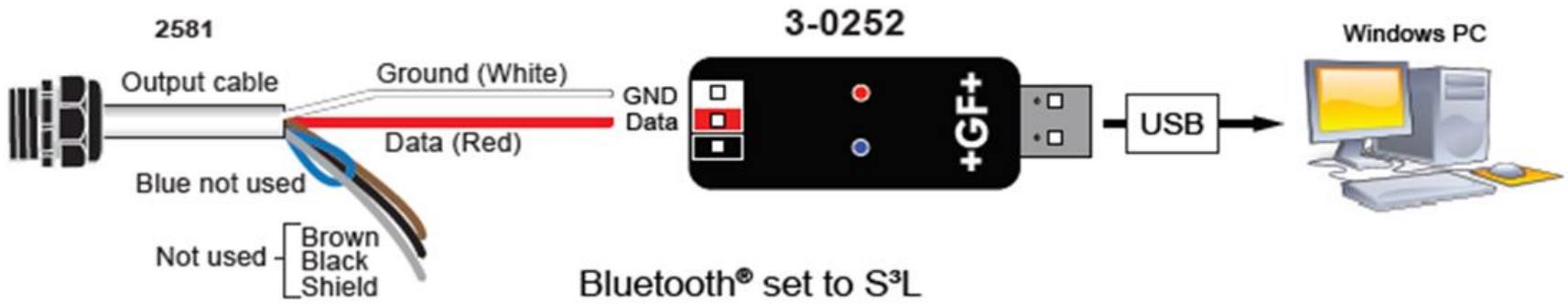


# Technical Specifications

## Customization and Performance Settings

For customization and performance settings, use the GF Config Tool App or the Signet 0252 Configuration Tool and software. Refer to the Signet 0252 Configuration Tool manual for details to adjust the following parameters:

| | |
|---|---|
| **4 to 20 mA span**: | Factory setting is 4 mA = 0 and 20 mA = 10 m/s (32.8 ft/sec) equivalent flow rate, refer to the calibration table, and can also be customized to any range. |
| **Low Flow Cutoff**: | Factory setting is 0.02 m/s (0.07 ft/s) equivalent flow rate, and can be customized to any user preferences. |
| **Averaging Time**: | Factory setting is Low. Can be customized: Off, Low, Med, High. |
| **Sensitivity**: | Factory setting is 0.5 m/s (1.64 ft/s) equivalent flow rate, and can be customized to user preferences. |



# Technical Specifications

## LED Status Indicators

LEDs on the 2581 FlowtraMag circuit board are useful to identify problems with the meter and the flow conditions.

| LED Condition | Indication |
|---|---|
| All Off | The power is off or the sensor is not connected |
| Solid Blue | Normal operation, full pipe, no flow |
| Blinking Blue | Normal operation, blink rate is proportional to flow rate |
| Solid Purple | Partially filled pipe, flow rate is zero |
| Blinking Purple | Partially filled pipe, blink rate is proportional to flow rate |
| Blinking Red | Measurement out of range. If condition persists, will turn to solid red after 1 minute |
| Solid Red | Instrument error, defective electronic component. Contact Technical Support |
| Green | - Connected device |
| White | - No connections |

# Thank you