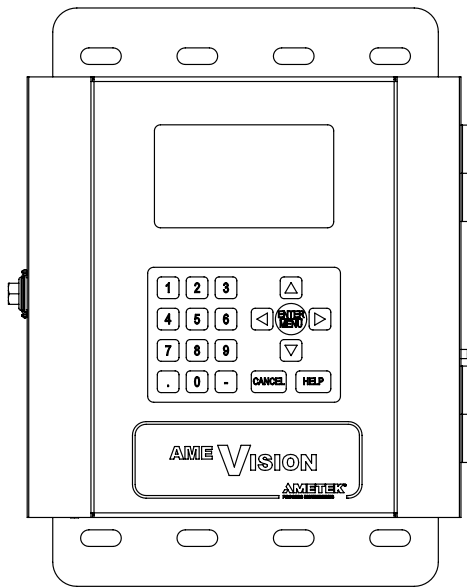


USER MANUAL

AMEVision Display User Interface



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Safety Notes

WARNINGS, CAUTIONS, and NOTES contained in this manual emphasize critical instructions as follows:



An operating procedure which, if not strictly observed, may result in personal injury or environmental contamination.



An operating procedure which, if not strictly observed, may result in damage to the equipment.



Important information that should not be overlooked.



Burn hazard. Hot surface. Do not touch, allow to cool before servicing.

Electrical Safety

Up to 5 kV may be present in the housing. Always shut down power source(s) before performing maintenance or troubleshooting. Only a qualified electrician should make electrical connections and ground checks.

Any use of the equipment in a manner not specified by the manufacturer may impair the safety protection originally provided by the equipment.

Grounding

Instrument grounding is mandatory. Performance specifications and safety protection are void if instrument is operated from an improperly grounded power source.



Verify ground continuity of all equipment before applying power.

Personnel and Equipment Safety Information

This section describes important safety information to avoid personal injury and damage to the equipment while installing, operating, maintaining, or servicing the equipment. All safety regulations, standards, and procedures at the analyzer location must be followed.

All personnel involved with the installation, start-up, operation, maintenance, service, or troubleshooting of the analyzer must review and follow these Warnings and Cautions.



Do Not Operate without Covers

To avoid electric shock or fire hazard, do not operate this product with covers or panels removed.



Use Caution When Lifting

Use caution when lifting the product from its crate.



Do Not Operate in Explosive Atmosphere

To avoid injury or fire hazard, do not operate this product in an explosive atmosphere unless you have purchased options that are specifically designed for these environments.



Use Proper Wiring

To avoid fire hazards, use only the wiring specified in the "Installation and Start-Up" chapter of this manual.



Avoid Electrical Overload

To avoid electrical shock or fire hazard, do not apply a voltage to a terminal that is outside the range specified for that terminal.



Ground the Product

Follow the grounding instructions provided in the "Installation and Start-Up" chapter of this manual. Before making connections to the input or output terminals of this product, ensure that the product is properly grounded.



Use Proper Fuse

To avoid fire hazard, use only the fuse type and rating specified for this product.





Use Proper Power Source

Do not operate this product from a power source that applies more than the voltage specified.



Do Not Operate with Suspected Failures

If you suspect there is damage to this product, have it inspected by qualified service personnel.



Protect From Daylight and Light from Luminaires

Do not install the AMEVision in direct sunlight or light from luminaires as prolonged exposure to these can degrade the sealing properties of the keypad and LCD protective screen.



Integrity of Sealing May Be Impaired by Wear or Deterioration of Keypad Material

Inspect keypad before each use.

Important Notice to Users

The AMEVision Display User Interface is suitable for the following locations:

- Class I, Zone 2, Group IIC
- Class I, Zone 22, Group IIB
- Class I, Division 2, Group A, B, C, D
- Class II, Division 2, Group E, F, G

No operator serviceable components inside any components of the AMEVision. Refer servicing to qualified personnel. Power, input, and output (I/O) wiring must be in accordance with Class I, Division 2 wiring methods [Article 501-4(b) of the National Electric Code, NFPA 70] and in accordance with the authority having jurisdiction.



Explosion hazard – Substitution of components may impair suitability for Class I, Class II, Division 2.



Explosion hazard – When in hazardous locations, turn off power before replacing or wiring modules.



Explosion hazard – Do not disconnect equipment unless power has been switched off or the area is known to be nonhazardous.



This equipment is suitable for use in Class I, Division 2, Groups A, B, C and D, Class II, Division 2, Group E, F and G or Nonhazardous locations only.



Exposure to some chemicals may declare the sealing properties of materials used in the following devices: Power Supply Module.



Explosion Hazard. When in hazardous locations, turn off power before removing or replacing wiring, modules, battery or components unless the area is known to be free of ignitable concentrations of flammable gases or vapors.



Substitution of the following components may impair suitability for Division 2 power supply.



Battery must be replaced with AMETEK part number 1000-652-VE.



The maximum ambient temperature for the unit is 55 °C (131 °F)

The AMEVision Display User Interface is a complex piece of equipment that should only be serviced by a qualified service technician with expertise in instrument technology and electrical systems. AMETEK recommends that all equipment requiring service be sent back to the factory. You should only attempt to repair or service this equipment after receiving training from an AMETEK/P&AI Division training representative. If you decide to service this equipment be aware that high voltages, high temperatures, and other potentially hazardous conditions may arise.

Warning Labels

These symbols may appear on the instrument in order to alert you of existing conditions.



Protective Conductor Terminal
(BORNIER DE L'ECRAN DE PROTECTION)
Schutzerde



Caution – Risk of electric shock
(ATTENTION – RISQUE DE DÉCHARGE ÉLECTRIQUE)
Achtung – Hochspannung Lebensgefahr



Caution – Refer to accompanying documents
(ATTENTION – SE RÉFÉRER AUX DOCUMENTS JOINTS)
Achtung – Beachten Sie beiliegende Dokumente

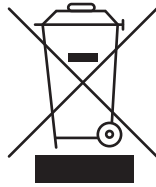


CAUTION – Hot Surface
(ATTENTION – SURFACE CHAUDE)
Achtung – Heiße Oberfläche

Environmental Information (WEEE)

This AMETEK product contains materials that can be reclaimed and recycled. In some cases the product may contain materials known to be hazardous to the environment or human health. In order to prevent the release of harmful substances into the environment and to conserve our natural resources, AMETEK recommends that you arrange to recycle this product when it reaches its “end of life.”

Waste Electrical and Electronic Equipment (WEEE) should never be disposed of in a municipal waste system (residential trash). The Wheelie Bin marking on this product is a reminder to dispose of the product properly after it has completed its useful life and been removed from service. Metals, plastics, and other components are recyclable and you can do your part by doing one of the following steps:



- When the equipment is ready to be disposed of, take it to your local or regional waste collection administration for recycling.
- In some cases, your “end of life” product may be traded in for credit towards the purchase of new AMETEK instruments. Contact your dealer to see if this program is available in your area.
- If you need further assistance in recycling your AMETEK product, contact us through our Customer Support page at <https://www.ametekpi.com/customersupport/requestsupport>.

AMEVision Display User Interface Label

AmeVision DISPLAY USER INTERFACE
FOR HAZARDOUS LOCATION

 **WARNING**

NO USER SERVICEABLE COMPONENTS INSIDE
UNIT. REFER SERVICING TO QUALIFIED PERSONNEL.
USE MIN. 90°C COPPER CONDUCTORS.
DISCONNECT POWER OR ENSURE AREA
IS NON-HAZARDOUS BEFORE OPENING.

WARNING: BATTERY MUST BE REPLACED WITH
AMETEK PART NUMBER 1000-652-VE

OPERATING VOLTAGE	EMC
 115-230 VAC +/- 10% 47-63 Hz. 40 VA max.	Group 1 Class B



PROCESS & ANALYTICAL INSTRUMENTS DIVISION
150 Freepoint Rd., Pittsburgh, PA 15238
ENCLOSURE TYPE 4X



II 3 G

Ex nA nC IIC T6 Gc
-20°C ≤ Ta ≤ 55°C
ITS14ATEX48076X
IECEx ETL 14.0028X

Label P/N: 7000-770-KE

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Overview and Installation

The AMEVision Display User Interface is a graphical user interface and communications suite for the WDG-V Analyzer.

Display and Keypad

The AMEVision consists of a 4.2" color, 1/4 VGA display and a 19-key keypad. It features a web interface, Modbus, trend Data Logging/charting, USB ports for firmware downloads and parameter/trend data uploads. The host can monitor up to four sensors simultaneously.



Figure 1-1.
AMEVision Display.

Wiring

This wiring section shows you how to make the following connections:

- AC mains supply wiring to control unit
- AC mains supply wiring to sensor
- AMEVision Host Display to sensor
- AMEVision Host Display to host computer (RS-485 communications)

In addition, this wiring section provides mandatory EMC grounding, shielding, and noise protection requirements.

General Wiring and Conduit Requirements

This section describes general wiring and conduit requirements.

- All wiring conductor ratings should be for the minimum temperature required for the equipment being connected to the analyzer, but not less than 60 °C.
- Use only the applicable ATEX-Certified cable glands to maintain the ATEX rating for the AMEVision Display User Interface. If not using a conduit entry, leave the factory ATEX/NEMA-approved plugs intact. Never leave any holes unplugged.
- Follow all applicable electrical codes for your location.
- Follow proper grounding, shielding and noise protection practices as described in this section.
- Use twisted-pair cable with an overall braided shield, or twisted-pair cable in rigid metal conduit for all sensor and signal wiring.
- For AC mains supply wiring, use 12 to 14 American Wire Gauge (AWG) (3.3 mm² and 2.1 mm²).
- For all signal wiring, use 18 to 24 AWG (0.82 mm² to 0.33 mm²).
- For sensor connections, Figure 1-2 shows the recommended sensor cable types for various WDG-style sensors.
- Use the conduit entry point closest to the connections you are making.
Do not add any additional conduit entry holes.
- You may use 1" conduit with a 3/4" adapter at the entry to the AMEVision Host Display for signal and sensor wiring.

AMEVision Host Display Mains Supply Connections

The AMEVision Host Display can operate using between 85–250 volts AC, 47–63 Hz. There is no power switch or circuit breaker on the control unit, and it must be protected by installing it on a circuit-protected line, maximum 15 amperes, with a switch or circuit breaker in close proximity to the control unit and within easy reach of an operator. Mark the switch or circuit breaker as the control unit disconnecting device.

Mains supply connections to the control unit are as follows:

- Line – Line connection
- Neutral – Neutral connection (USA)
- Chassis Stud – Equipment ground (protective conductor)

Use the 1/2" conduit entry hole for AC mains supply wiring. Use the chassis stud next to the 1/2" conduit entry hole for equipment ground (protective conductor).

AC (L) and **(N)** markings are provided by the terminal block for connection of AC power. These markings are for reference purposes only, such as for use on system wiring diagrams, etc. The system/product has or needs no specific **LINE** or **NEUTRAL** connection for any function, safety or otherwise. The **(N)** terminal is not internally grounded, nor needs to be. The system will operate normally regardless of what AC input terminal (**L** or **N**) the **AC Line** or **Neutral** is connected to, or, if there is a **Neutral** used at all (i.e., 208 VAC US power connection).



EMC Grounding, Shielding, and Noise Protection



For EMC purposes, under no circumstances should you leave cable shields disconnected at one end or both ends of the cable (sensor or control unit or other device).

You must use twisted-pair cable in rigid metal conduit or use twisted pair cable with an overall braided shield. All cable shields or conduits connecting to the control unit must be chassis grounded.

EMC Grounding Method

- **Shield Ring Method**

Connect all shields for that conduit entry (other than power) to a supplied shield terminal ring (see Figure 1-2). This shield ring is a stainless steel ring with a metal tab. Place the shield ring under the conduit nut. Crimp the shields from all cables for that conduit entry to a 1/4" female quick disconnect, then push it onto the tab that sticks out of the conduit shield ring. Keep shields as short as possible.

- **Ground Stud Method**

Connect all cable shields for that conduit entry to the grounding stud closest to that conduit entry hole.

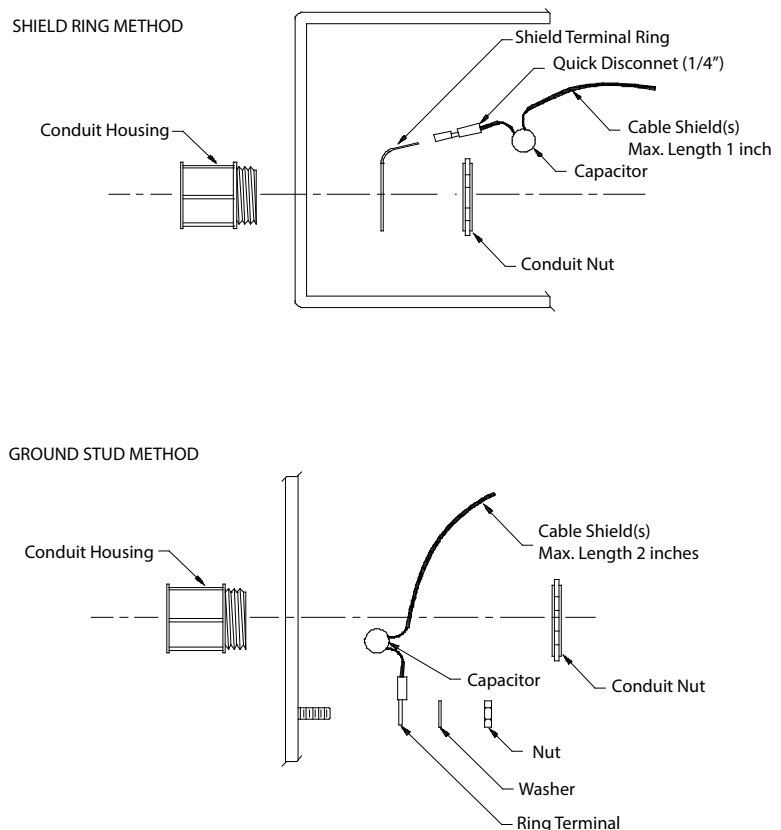


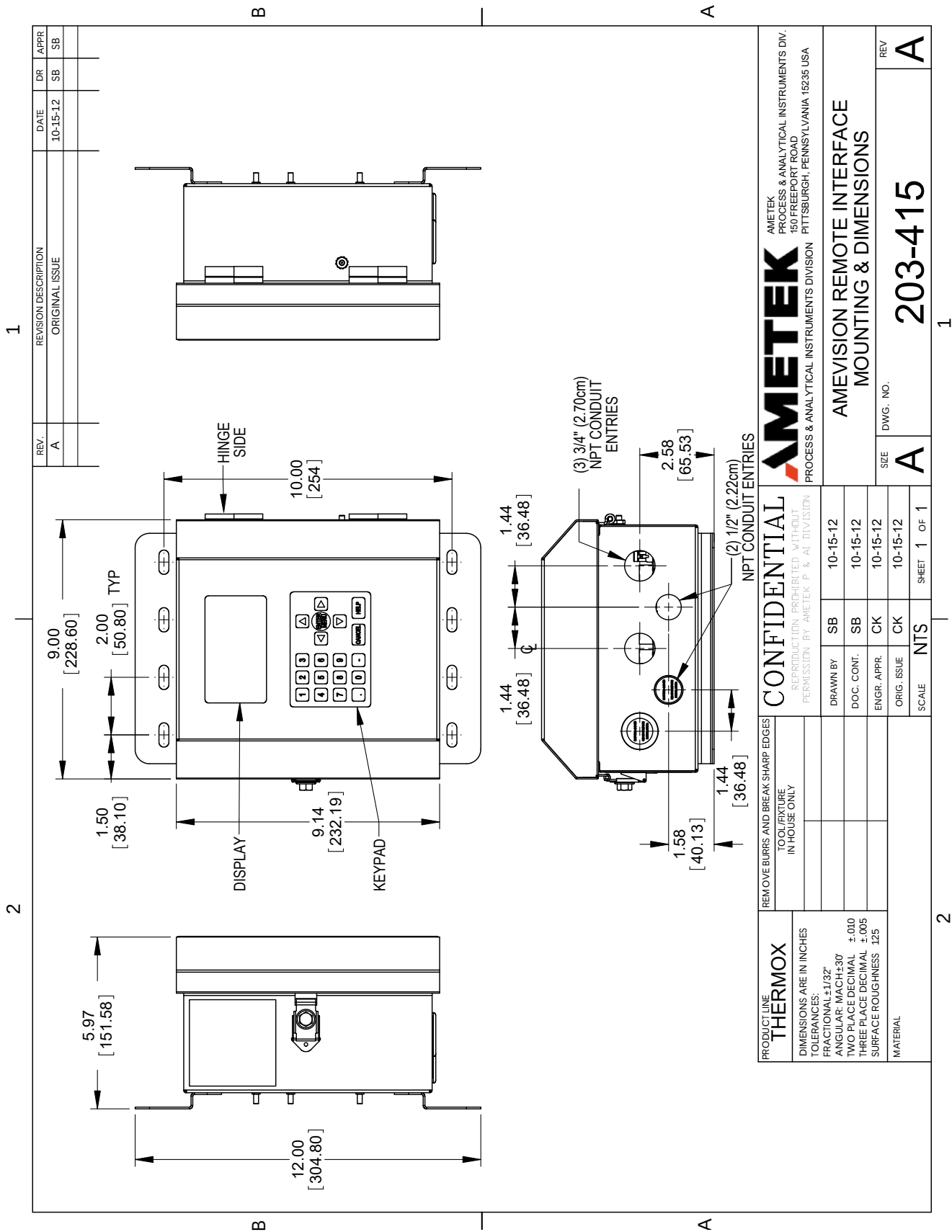
Figure 1-2.
Direct shield grounding
methods.

Transient and RFI interference

This section describes transient and RFI interference precautions:

- Although there are transient and noise protectors on all control unit I/O connections (communications, current outputs, sensor, etc.), this protection is intended to act as a last line of defense against unwanted transient and RFI interference.
- Proper installation practices to prevent the introduction of transients and noise into the system must be followed. Inductive loads connected to the control unit must have transient suppressors installed at the inductive loads. Be sure to place the transient suppressor as close to the load as possible. Examples of transient suppressors include MOVs, TRANSORBs, and RC snubbers.
- AC mains supply wiring should not be run in the same conduit with mains supply wiring that feeds heavy inductive loads.
- Avoid running signal wiring in the same cable or conduit with wires that power inductive loads unless all the cables within the conduit are shielded, the inductive loads are small, and transient suppressors are used at the loads.
- Do not run signal lines in the same cable or conduit with high voltage lines.
- For optimum noise protection, control unit mains supply wiring should be connected to a circuit separate from any circuit that could introduce transients into the system. As an example, do not run motors, blowers, or air conditioners using the same mains supply circuit or conduit as the control unit's mains supply circuit or conduit.



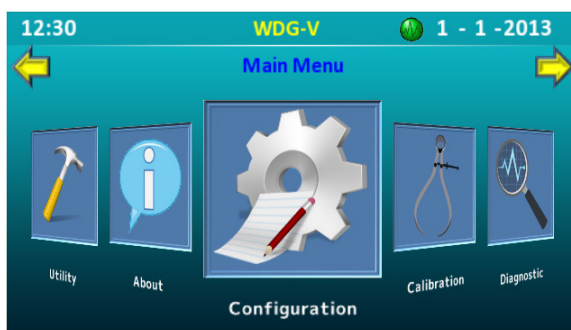


Controller/Interface

The AMEVision Display User Interface provides the capability to easily configure, calibrate, and monitor up to four (4) WDG-V Analyzers. A two-wire Modbus RTU interface connects the AMEVision to each WDG-V Analyzer. The AMEVision provides the following communication interfaces: Modbus RTU, web interface (TCP/IP), and USB flash drive capabilities for uploading/downloading data and firmware upgrades.

AMEVision Software Display and Keypad

- 4.2" color, 1/4 VGA display
- 19-key keypad
- Web interface (TCP/IP) and MODBUS (RTU)
- **Trend Data Logging/Charting** screen
- USB port inside for firmware downloads and data uploads



AMEVision Display Screen

The menu display is a two dimensional graphical user interface accessed using the Navigation Arrows and **ENTER/MENU**. These keys allow you to navigate through the icons and to select the menu option needed.



AMEVision Keypad

The AMEVision is operated by pressing the arrows and buttons on the keypad. **ENTER/MENU** selects the option on the screen and **CANCEL** exits the option. The numeric keypad is used to enter information in the fields. Navigation arrows are used to move throughout the display.

HOME Screen

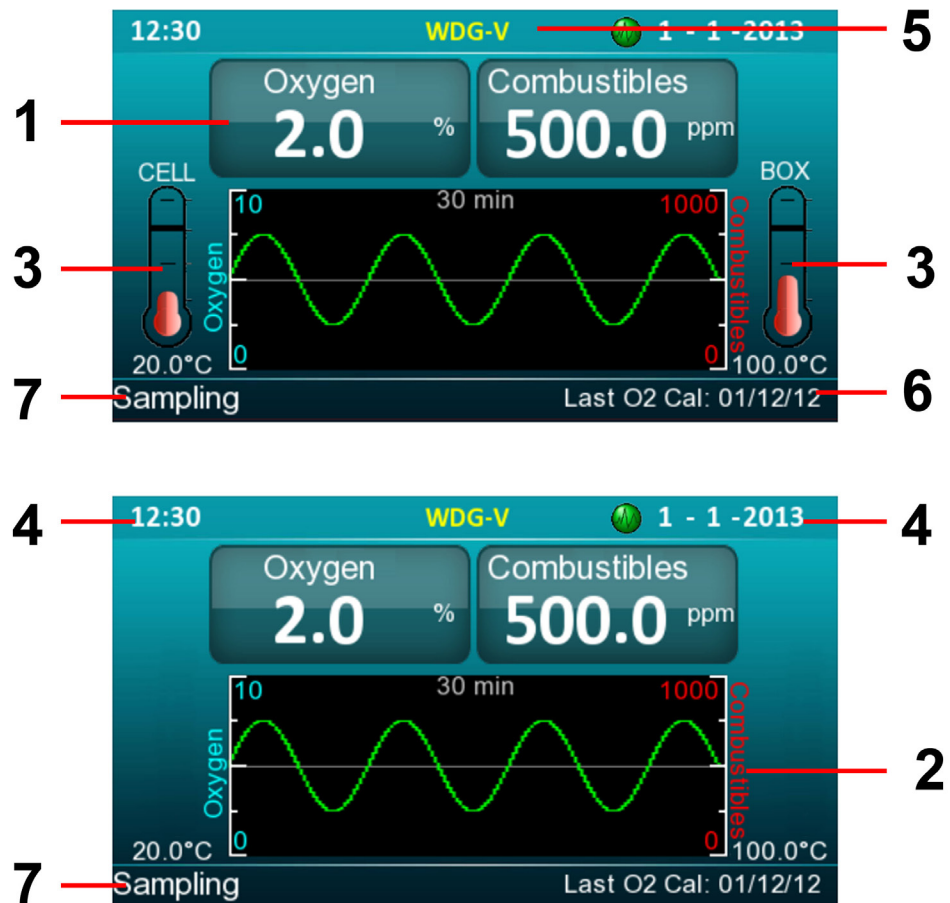


Figure 2-1
HOME screen.

The **HOME** screen displays user-defined information and analyzer status. This is the main source for concentration values, system status, and alarms.

1. Gas Concentration
2. Trend Plot (O₂ and O₂ combustibles only); displays the last 30 minutes.
3. Temperatures (hidden in **Normal** mode) – use Up arrow to display, Down arrow to hide.
4. Time and Date
5. Sensor (Analyzer) Name
6. Last Calibration Date and Time
7. Status Bar – displays analyzer status including Alarms and Warnings



When all gases are selected in the **Sensor Configuration** menu, the **HOME** screen does not display the **Trend** plot.



When there is an alarm condition, alarm information is displayed on the **Status Bar** which turns RED for FAIL and YELLOW for WARNINGS.



On multi-analyzer systems, the Left and Right arrows navigate through the connected analyzers.



The sensor you have selected on the **HOME** screen is the only sensor whose functions and process will display on the AMEVision menus. To configure or view additional sensor setups, you must first select that analyzer on the **HOME** screen using the Left/Right arrows.



Configuration Menu

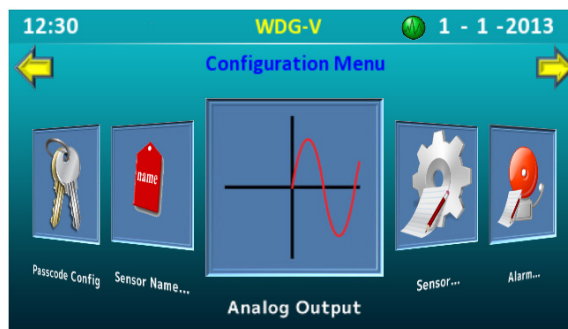


Figure 2-2.
Sensor Configuration menu.

Analog Output	Define parameters that control analog current outputs.
Sensor Configuration	Define the type of sensor you are using and the gases to be measured.
Alarm Configuration	Define parameters that control the alarm relays.
Communications	Define AMEvision communication parameters. Select TC/IP or modbus function.
Process Pressure	Select a positive or negative process pressure. Enter process pressure value.
System Time	Set system and display time in 24-hour format.
Passcode Configuration	Create a system password to limit control unit access.
Sensor Name Configuration	Name sensor and connected sensors in a multiple-analyzer configuration.

Selecting Menu Options

Press **ENTER/MENU** on the AMEvision keypad.

Setting Menu Options

To accept changes you have made press **ENTER/MENU**.

Exiting Menu Options

Press **CANCEL** on the AMEvision keypad.

System Passcode

By default, the system passcode is disabled. This menu allows you to create a new passcode or to disable the passcode requirement.



*If you create and enter a passcode, you will be required to enter that passcode on a lock screen every time you exit the **HOME** screen and before accessing any of the menu options.*

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Configuration Menu**.
2. Press the Left or Right arrows to locate the **Passcode Configuration Screen**.

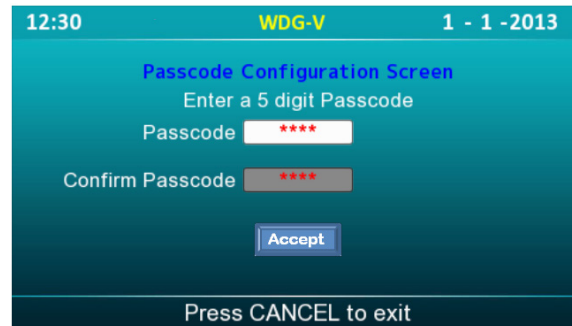


Figure 2-3.
Password Configuration
screen.

3. Enter a 5-digit passcode using the numeric keys on the keypad. Press **ENTER/MENU** and enter the passcode again to confirm.
4. Navigate to the **ACCEPT** button and the press **ENTER/MENU**.



*To clear an existing passcode or if you do not want to set a passcode, enter "00000" in the **Passcode** field.*



Sensor (Analyzer) Name Configuration



The default name of the analyzer is WDG-n, where 'n' is the address of the analyzer. If you have multiple sensors, entering a name for each sensor you want to connect is recommended but not required.



Figure 2-4.
Sensor (Analyzer) Name
Configuration screen.

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Configuration Menu**.
2. Press the Left or Right arrows to locate the **System Name Configuration** menu and press **ENTER/MENU**.
3. Use the keypad to enter the name(s) of your analyzer(s). Enter the name as you would on a mobile phone. The keypad displays the characters as you enter them. For example, to select the letter 'E' press the '3' key twice. To enter the number '2' press the '2' key four times (e.g., 'A-B-C-2.')



Maximum number of characters is 10.

4. Navigate to **ACCEPT** and press **ENTER/MENU** after each name to accept the name of that sensor.

System Time



12:30 WDG-V 1 - 1 - 2013

System Time

Day 01 Month 01 Year 2012

Hour 01 Minutes 30 Seconds 30

Accept

Cancel to Exit

Figure 2-5.
System Time screen.

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Configuration Menu**.
2. Press the Left or Right arrows to locate the System Time menu and press **ENTER/MENU**.
3. Enter the information for your analyzer using a 24-hour time format (i.e., noon is 12:00 and 1 PM is 13:00).
4. Navigate to **ACCEPT** and press **ENTER/MENU** to set the time of that sensor.

Communication

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Configuration Menu**.
2. Press the Left or Right arrows to locate the **Communication** menu and press **ENTER/MENU**.

There are two user communication options available: Web Interface (TCP/IP) and Modbus. Press the Left and Right arrows to navigate between the two.

TCP/IP (Web Interface) Setup

12:30 WDG-V 1 - 1 - 2013

← Modbus TCP/IP Configuration Modbus →

IP Address 192 . 168 . 100 . 5

Subnet Mask 255 . 255 . 255 . 0

Gateway IP 192 . 168 . 100 . 5

DHCP Disabled ▾

Accept

Cancel to Exit, Left/Right to Navigate

Figure 2-6.1.
TCP/IP (Web Interface)
Configuration screen.

Modbus Communication Setup

12:30 WDG-V 1 - 1 - 2013

← TCP/IP Modbus Configuration TCP/IP →

Address 1

Baud Rate 115200 ▾

Parity None ▾

Stop Bits 1 ▾

Timeout 100 sec

Accept

Cancel to Exit, Left/Right to Navigate

Figure 2-6.2.
Modbus Configuration screen.

Sensor Configuration

Select Sensor Options

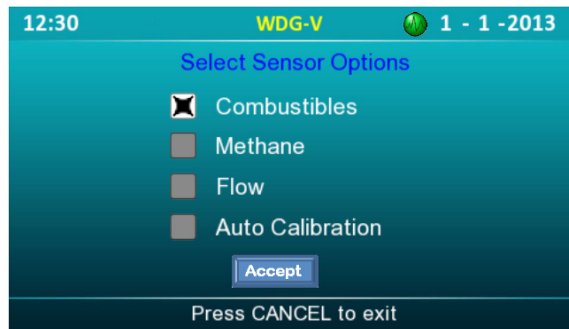


Figure 2-7.1.
Select Sensor Options screen.

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Configuration Menu**.
2. Press the Left or Right arrows to locate the **Sensor Configuration** menu and press **ENTER/MENU**.
3. Options for the various sensor combinations are listed. Select the options you are using: **Combustibles** or **Methane** or both.



*If you have a flow sensor on your analyzer, make sure that **Flow** is selected on this screen.*

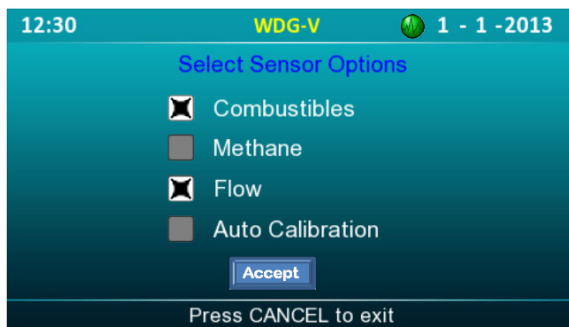


Figure 2-7.2.
Select Sensor Options screen.
Flow Sensor selection.



Auto Calibration is not a standard feature of the WDG-V Analyzer. Do not select Auto Calibration unless your analyzer is equipped with a Remote Calibration Unit (RCU).

4. Press **ENTER/MENU** to select each option. To deselect the option, press **ENTER** again.
5. Use the arrow keys to view the options. When you have made your selections, navigate to **ACCEPT** and press **ENTER/MENU**. Selected options are indicated by an 'X' in the check box.



The sensor you have selected on the **HOME** screen is the only sensor whose functions and process will be displayed on the AME Vision menus. To view additional sensor setups, you must first select that sensor on the **HOME** screen.

Process Pressure

Define your process pressure and whether your process is operating under a positive or negative pressure. Setting this value corrects oxygen measurements for the defined pressure.



Figure 2-8.
Process Pressure screen.

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Configuration Menu**.
2. Press the Left or Right arrows to locate the **Process Pressure** menu and press **ENTER/MENU**.
3. Enter the process pressure.
4. Navigate to the **ACCEPT** button and press **ENTER/MENU** to accept your entry.



To enter a negative process pressure, use the minus ('-') key on the AME Vision keypad before entering the number.

Analog Output

You can direct process readings to any of the three analog output ports.



The sensor you have selected on the **HOME** screen is the only sensor whose functions and process will displayed on this menu. To configure or view any additional sensor, you must select that sensor on the **HOME** screen first.

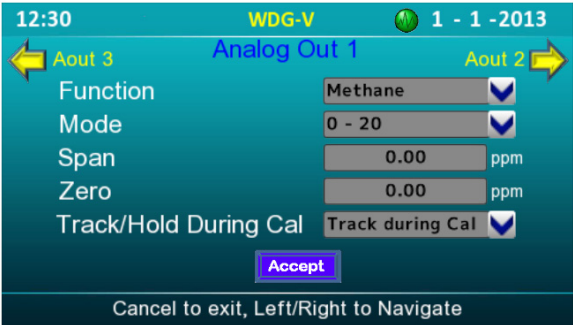


Figure 2-9.
Analog Output configure screen.

Function	% O ₂ Cell mV Combustibles Methane
Mode	0–20 mA 4–20 mA Namur*
Span	Enter reading for 20 mA (%) for O ₂ and methane (ppm) for combustibles (mV) for cell millivolt
Zero	Enter reading for 0/4 mA (%) for O ₂ and methane (ppm) for combustibles (mV) for cell millivolt
Track/Hold during Cal**	Track during Cal Hold during Cal
** Define the signals to send to the selected analog output port during a calibration. You have the option to either hold the last process reading or track calibration readings.	

* The **Namur Standard** is implemented as follows:

4–20 ma Signal	Analyzer Condition
0 mA	Analyzer unpowered, or completely failed
3.5 mA	Critical Alarm – analyzer reading unusable
3.8 mA	Reading Under Range (Example: User sets range to 2–10 %.) Current reading is 1.9 %.
4–20 mA	Normal Operation
20.5 mA	Reading Over Range (Example: Range is 0–10 %.) Current reading is 12 %.

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Configuration Menu**.
2. Press the Left or Right arrows to locate the Analog Output menu and press **ENTER/MENU**.
3. The output that is displayed beneath the sensor name is the active output you are configuring. Use the arrows to access each of the functions. Press **ENTER/MENU** to view the drop down menu and use the arrow keys to make your selection.
4. Enter values using the numeric keypad on the AMEVision enclosure. Use the period for a decimal point.
5. When you have entered the information for each function, navigate to **ACCEPT** and press **ENTER/MENU** after each output has been configured to accept the values. Press the Left and Right arrows to navigate between **Analog Output 1, 2, and 3**.
6. When you have entered the information for each analog output, navigate to **ACCEPT** and press **ENTER/MENU** after each output has been configured to accept the values.
7. Press **CANCEL** to return to the **Sensor Configuration** menu.

Alarm Configuration

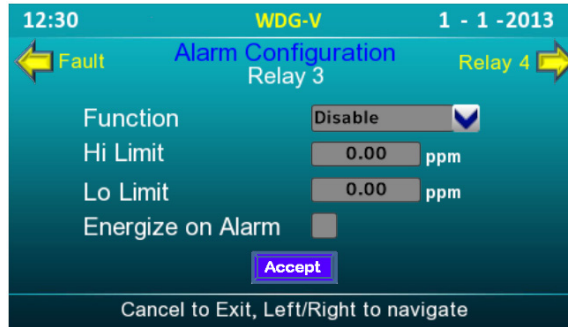


Figure 2-10.1.
Process Alarm Configuration
screen.

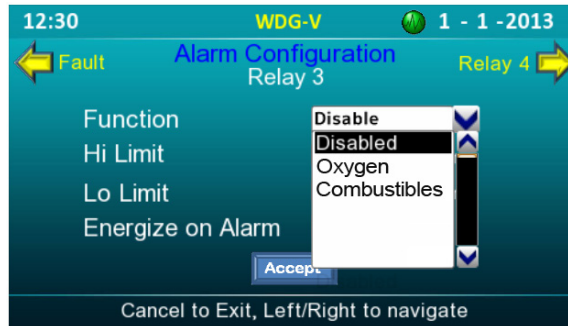


Figure 2-10.2.
Function drop down box for
alarm configuration.

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Configuration Menu**.
2. Press the Left or Right arrows to locate the **Alarm Configuration** menu and press **ENTER/MENU**.

Alarms: Process, Service, Fault and Data Valid

There are three (3) process relay alarms, (1) fault alarm and (1) data alarm.

Process alarms are activated when the process reading levels, based on user-defined settings, have been exceeded.

Service alarms activate when there is a hardware malfunction and the analyzer is not operating correctly.

Data Valid alarms activate when there is a hardware malfunction or when the output may not be reflective of the process, for example during **Warm up**, **Calibration**, or **Diagnostics** modes.



Figure 2-11.
Fault alarm configuration
screen.



If you set the **Alarm Fault** by selecting the check box, it will cause all process alarms (Warnings) to trip the Service alarm.

Calibration

The **Calibration Menu** allows you to configure the sensor for calibration, perform the calibration, and view the last calibration and calibration history.

Start Calibration	Select gases and Cal gas values; start a calibration
Cal Gas Values	Enter Cal gas values
Last Cal Results	Shows results for the last calibration
Cal History	Plots the history of gases calibrated
Auto Cal Config	Set Auto Cal timers
Flow Calibration	Used with flow sensor only

Types of Calibration

AMEVision allows you to perform manual, automatic, or remote calibrations. Automatic and remote calibrations require a factory-provided remote calibration unit (RCU) that automatically switches the calibration gases for you; manual calibrations are performed without an RCU, and gases are switched manually.

Manual Calibration

The user defines the calibration gas values and physically switches the gases.

Automatic Calibration

This is an option that allows the system to calibrate itself. The user defines the calibration gas values, the time each gas will flow through the sensor, and the frequencies at which automatic calibrations will be performed (for example, every four hours, every two days, etc.). The system calibrates itself at those pre-defined times. Do not select Automatic Calibration unless you have a Remote Calibration Unit (RCU).

Remote Calibration

The user defines the calibration gas values, but interactively determines how long each calibration gas should flow from the RCU and into the sensor by pressing **ENTER/MENU** to accept the values when the gas is stable. The gases, however, are automatically switched on/off using the RCU. Do not select Remote Calibration unless you have this option.



*Remote and Automatic Calibrations are only available if your analyzer has an RCU and the '**AutoCal**' option is enabled in the **Sensor Configuration** menu.*



Setting Calibration Gas Values

The **Calibration Gas Values** screen allows you to set and save the calibration gas values for the sensor you have chosen, before calibrating the analyzer. These values will be used when calibrating the sensor. However, if the values are not set here, they can still be set during the calibration process under the **Start Calibration** menu.

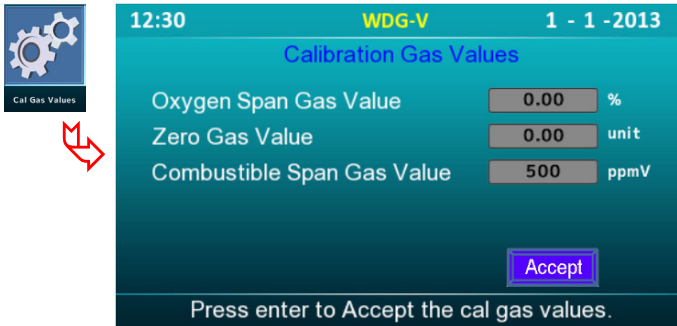


Figure 2-12.1.
Set Calibration Gas Values
screen (via Cal Gas Value menu).

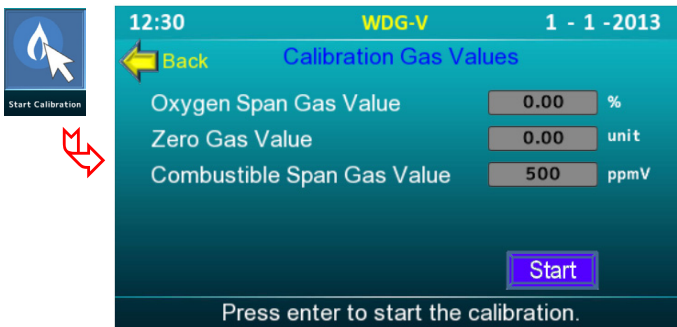


Figure 2-12.2.
Start Calibration screen.

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Calibration Menu**.
2. Press the Left or Right arrows to locate the **Cal Gas Values** menu and press **ENTER/MENU**.
3. Enter the values for the gases available for the sensor you have designated on the **HOME** screen.
4. Press **ENTER/MENU** to accept the values you entered.

Start Calibration Menu

Select Gas to be Calibrated	All, Oxygen, Combustibles, Methane
Recovery Duration	Define a time period for the system to recover from reading calibration gas values to reading process gases.
Calibration Gas Values	Enter the calibration gas values to match the span and zero calibration gas cylinders you will use to calibrate or verify your system.



*A calibration cannot be performed if there is a Fail alarm active except in the case of when the alarm is triggered by low flow. Calibration can start or continue during **Low Sample Flow** alarm status.*



The span gas is the high calibration gas. The zero gas is the low calibration gas.

All gases selected under Sensor Configuration (O₂, combustibles, methane) require calibration but do not have to be calibrated at the same time. However, calibration will always occur in the same sequence.

1. O₂ Span
2. Zero
3. Combustibles Span
4. Methane Span

For example if the sensor is configured for oxygen, combustibles and methane and you are skipping the O₂ calibration, the order would be as follows:

1. Zero Calibration
2. Combustible Span Calibration
3. Methane Span Calibration



*To cancel a calibration at any time, select **Abort** and press **ENTER/MENU**.*





All measurements require a two-point calibration: span and zero, so the zero will always be performed.



*Calibrations are only allowed when the sensor is in **Normal** mode. Check the **Status Bar** at the bottom of the **HOME** screen if you are unsure of the sensor's status.*



*If you do not select a gas to calibrate, a warning displays indicating that no gas was selected. Press **CANCEL** to exit the screen.*



*After a calibration is completed and if you have replaced the analyzer cell since the last calibration, you will see a yellow screen indicating that a cell change has been detected and asking if you would like to reset the Cell Age. If you would, navigate to “**Yes**” and press **ENTER/MENU**. If you would not, navigate to “**No**” and press **ENTER/MENU**.*

Calibrate the Analyzer

Perform a Manual Calibration

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Calibration Menu**.
2. Press the Left or Right arrows to locate the **Start Calibration** menu and press **ENTER/MENU**.
3. You are prompted to select the gases to be calibrated. Select the individual gases or choose **ALL**.
4. Enter the **Recovery Duration** time.
5. Press the Right arrow to advance to the next screen.
6. Enter the calibration gas values for the gases you have selected, press the Up and Down arrows to advance to the fields.



*As a default, any gas values that you entered in the **Cal Gas Values** menu will automatically be entered on this screen. You can edit these values and they will be changed in the **Cal Gas Values** menu as well.*

7. When you have entered all of the values, press **ENTER/MENU** to **START** the calibration.
8. **Inject the Oxygen Span Gas**
You are prompted to inject the O₂ span gas into the calibration gas inlet port on the sensor (tubing must be free of oil and dirt). Press **ENTER/MENU** when you have applied the span gas.
9. The screen displays the status of the O₂ span gas as **"Wait"** or **"Ready."** When the status is **"Ready,"** press **ENTER/MENU** to accept the values.



*If you accept the values before the status is **"Ready"** you will be asked to acknowledge that the reading is not stable before continuing.*

10. Inject Zero Gas

- You are then prompted to apply the O₂ zero gas to the calibration inlet port of the sensor. Press **ENTER/MENU** when you have applied this gas.
11. The system will calibrate the O₂ and combustibles zero gas. When the readings have stabilized (Ready), press **ENTER/MENU** to accept the readings.

12:30		WDG-V		1 - 1 - 2013	
	Value	Cal Gas	Status		
Oxygen	2.00 %	0.00 %	Wait		
Comb	500 ppm	0 ppm	Wait		
		Accept	Abort		
Press enter to start the calibration.					

12:30		WDG-V		1 - 1 - 2013	
	Value	Cal Gas	Status		
Oxygen	2.00 %	0.00 %	Wait		
Comb	500 ppm	0 ppm	Wait		
Methane	1.00 %	0 %	Wait		
		Accept	Abort		
Press enter to start the calibration.					

Figure 2-13.
Calibration screen gas status reading.



12. **If the sensor is configured for combustibles, inject the Combustibles Span Gas.**

You are then prompted to apply the combustibles span gas to the calibration gas inlet port of the sensor (tubing must be free of oil and dirt). Press **ENTER/MENU** when you have applied this calibration gas.

The system will calibrate the combustibles span gas. Press **ENTER/MENU** to accept the gas readings.

13. **If the sensor is configured for methane, inject the Methane Span Gas.**

You are then prompted to apply the methane span gas to the calibration gas inlet port of the sensor (tubing must be free of oil and dirt). Press **ENTER/MENU** when you have applied this calibration gas.

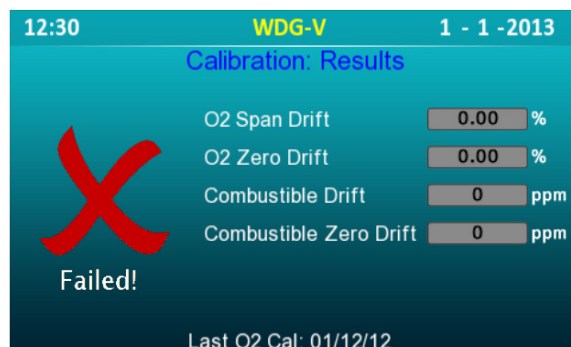
The system will calibrate the methane span gas. Press **ENTER/MENU** to accept the gas readings.

14. When all gases have calibrated, the screen displays the **Calibration Results** that include % **drift** as well as recovery time. If the calibration is successful, a large GREEN check mark will be displayed. If it is not, a large RED 'X' is displayed.

Figure 2-14.1.
Calibration Results screen,
Successful calibration.



Figure 2-14.2.
Calibration Results screen,
Failed calibration.

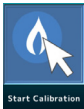
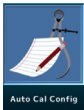


Perform an Automatic Calibration



*The functions for automatic calibration will only be visible if you have an RCU and have configured your sensor for **Automatic Calibration** in the **Sensor Configuration** menu.*

There are two ways to perform an automatic calibration:



- Define the automatic calibration time and date in the Auto-Calibration Configuration (**Auto Cal Config**) menu. This allows the system to perform calibrations at scheduled times and there is no further user interaction.
- Use the **Start Calibration** (or **Set Cal Gas**) menu to define the gases and values and then use the **Start Calibration** menu to perform an immediate calibration. This requires you to program the **Start Calibration** menu and physically press **ENTER/MENU** to start the calibration. The real-time sequence of calibration events is displayed on a series of screens which require user before each step of the calibration continues.

Configuring the Auto Cal Using the Auto-Cal Config Menu

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Calibration Menu**.
2. Press the Left or Right arrows to locate the **Auto Cal Config** menu and press **ENTER/MENU**.
3. Press the Left and Right arrows to navigate to the next screen.

Figure 2-15.
Auto-Calibration
Configuration screen.

Cal Gas Duration in Seconds	Define how long you want each calibration gas to flow through the sensor before switching the gases. The RCU automatically switches the span and zero calibration gases based on the calibration gas duration times you specify.
<i>Be sure to allow enough time for the gases to stabilize when you define these times.</i>	
Calibration Frequency	Days
Start Time	Hours:Minutes
Start Date	Month:Day:Year
Auto-Calibration	Enabled
Next Calibration	Filled Automatically
<i>You must exit this menu and re-enter to view the next calibration date set by the system.</i>	



*You must select the “**Enabled**” check box.*

When you have completed this screen, select **ACCEPT** and press **ENTER/MENU** to continue.

The automatic calibration has now been set and the system will carry out the calibration per the schedule entered.

Auto Cal Using the Calibration Start Menu

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Calibration Menu**.
2. Press the Left or Right arrows to locate the **Start Calibration** menu and press **ENTER/MENU**.
3. Navigate to the drop down list and press **ENTER/MENU**. Select "**Automatic**."

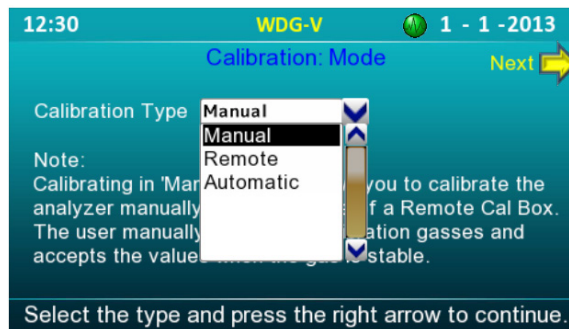


Figure 2-16.
Select calibration type.

4. Press the Right arrow to continue.
5. Select the gas(es) that you want to calibrate.
6. Enter the time for the **Cal Gas Duration** in seconds.
7. Enter the time for the Recovery Duration in minutes.
8. Press the Right arrow to continue.



This is the **Calibration Gas Values** screen. If you have already entered your calibration gas values in the **Cal Gas Menu**, they will be visible in the fields. Any changes that you make to these values will be reflected in the **Cal Gas Menu** as well.

9. When you are satisfied with your values, press **ENTER/MENU** to start the automatic calibration. The screen displays the Gas Value, Cal Gas and Time Remaining. To abort the calibration, navigate to the **ABORT** button and press **ENTER/MENU**.



If O₂ is selected for calibration, it will be the first gas calibrated and the zero gas will be calibrated next, then combustibles and methane. If combustibles is the first gas selected for calibration, zero gas will be calibrated first, then combustibles and methane.



10. The screens will advance upon completion of each calibration to the next gas to be calibrated.
11. When all gases have calibrated, the screen displays the Calibration Results that include **% drift** for gases calibrated as well as recovery time. If the calibration is successful, a large GREEN check mark will be on the screen. If it is not, a large RED 'X' is displayed.

Perform a Remote Calibration



*The functions for remote calibration will only be visible if you have and RCU and you have configured your sensor for **Automatic Calibration** in the **Sensor Configuration** menu.*

Using the Remote Cal Unit (RCU), you can manually accept the gas values when each gas is stable by pressing the **ENTER/MENU** key, but the RCU switches the gases on/off automatically.

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Calibration Menu**.
2. Press the Left or Right arrows to locate the **Start Calibration** menu and press **ENTER/MENU**.
3. Navigate to the drop down box, press **ENTER/MENU** key, and choose **Remote**.
4. Press the Right arrow to continue.
5. Select the gas(es) that you want to calibrate.
6. Enter the time for the Recovery Duration in minutes.
7. Press the Right arrow to continue.



*This is the **Calibration Gas Values** screen. If you have already entered your calibration gas values in the **Cal Gas Menu**, they will be visible in the fields. Any changes that you make to these values will be reflected in the **Cal Gas Menu** as well.*

8. When you are satisfied with your values, press **ENTER/MENU** to start the remote calibration. The screen displays the **Gas Value**, **Cal Gas**, and **Status (Ready/Wait)**. To abort the calibration, select the **ABORT** button and press **ENTER/MENU**.

9. You will be prompted to “**Inject the Zero Gas.**” Press **ENTER/MENU** and the RCU will apply the gas.
10. Calibration gas values and status are displayed. Press **ENTER/MENU** to accept the values.



The status line at the bottom of the screen indicates which gas is being calibrated.

11. You are then prompted to “**Inject the Combustibles Span Gas.**” Press **ENTER/MENU** to have the RCU inject the gas.
12. Calibration gas values and status are displayed. When Ready, press **ENTER/MENU** to accept the values.
13. When all gases have calibrated, the screen displays the Calibration Results that include **% drift** as well as recovery time. If the calibration is successful, a large GREEN check mark will be displayed. If it is not, a large RED 'X' is displayed.



Flow Calibration



The analyzer must have a flow sensor to configure flow calibration.



Flow sensor calibrations should only be performed on new flow sensors or when the electronics have been changed. Use the same gas used for O₂ span when calibrating the flow sensor.



Make sure that **Flow** is checked on the **Select Sensor Options** sub-menu under **Sensor Configuration**.

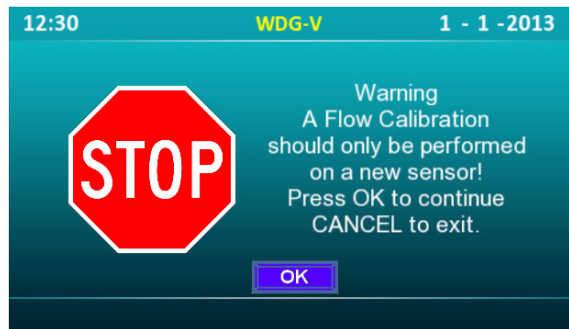


Figure 2-17.1.
Flow Calibration should only be done on a new sensor.

1. From the **Main Menu** screen, press **ENTER/MENU** to access the **Calibration Menu**.
2. Press the Left or Right arrows to locate the **Flow Calibration** menu and press **ENTER/MENU**.
3. Press **ENTER/MENU** to continue with the calibration or press **CANCEL** to exit the screen.
4. Turn off the aspirator and calibration gas flow. Press **ENTER/MENU** to continue or the **CANCEL** to abort the operation.
5. The **Flow Sensor Zero Calibration** screen displays. Press **ENTER/MENU** to start the zero calibration.
6. The analyzer counts down to zero and when the zero calibration has been completed, the analyzer will display the **Flow Sensor Span Calibration** screen.
7. You are prompted to inject the Cal gas. Be sure to use aspirator air or zero gas. Press **ENTER/MENU** to continue and access the **Flow Sensor Span Calibration** screen.

8. Press **ENTER/MENU** to start the span calibration. The analyzer counts down to zero ('0') and when the span calibration has been completed, the analyzer will display a results page that will show a **RED X** if the calibration has failed or a Green check mark if it has passed. Recovery timer counts down to zero ('0'). Press **CANCEL** to exit.

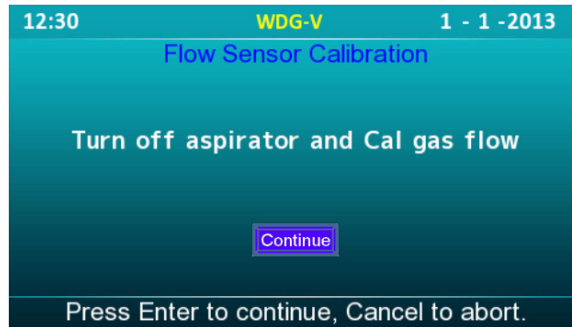


Figure 2-17.2.
Flow Sensor Calibration.



Figure 2-17.3.
Flow Sensor Zero Calibration.

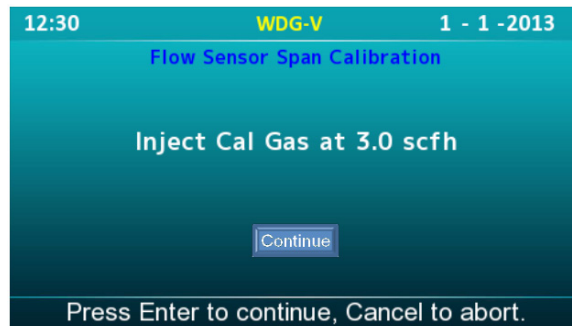


Figure 2-17.4.
Flow Sensor Span Calibration.

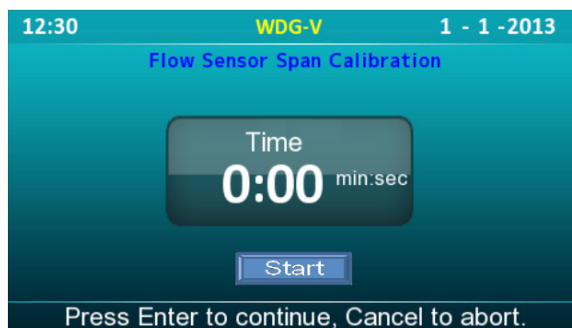


Figure 2-17.5.
Flow Sensor Span Calibration.

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Alarms and Warnings

Alarms

Use this menu to view alarms that are currently active and also to view a history of alarms.



*Alarm parameters are set during the configuration process under the **Alarm Configuration** menu.*

1. From the **Main Menu** screen, press **ENTER/MENU** to access the Menus.
2. Press the Left or Right arrows to locate the **Alarms** menu and press **ENTER/MENU**.
3. Two menu options are visible:

1. Currently Active	List of all current alarms
2. Alarm History Green Red Yellow Blue	List of status and information changes Cleared alarms Fail Status Warning Normal
Up to 1000 past events under Alarm History can be viewed with 11 events per page.	



For a complete listing of possible alarms, descriptions, and possible causes, see "Alarm and Status Definitions" later in this chapter.

Diagnostics

Diagnostics are used to help determine the overall health of the sensor as well as for basic troubleshooting in the unlikely event that there is a problem with the analyzer. These screens display important information about how the analyzer is running and where problems may occur. Diagnostics also provide the ability to test customer I/O such as analog outputs and relay outputs providing information that is useful when troubleshooting the interface to the distributed control system (DCS).

1. From the **Main Menu** screen, press **ENTER/MENU** to access the Menu.
2. Press the Left and/or Right arrows to locate the Diagnostics menu and press **ENTER/MENU**.

There are seven Diagnostic menus:

- Sensor Diagnostics
- Control Diagnostics
- Inject Gas
- Trend Logging
- Cell Diagnostics
- Combustible Detector
- CH4 Detector

Sensor Diagnostics

1. Press the Left or Right arrow to locate the **Sensor Diagnostics** menu, then press **ENTER/MENU** to view the **Sensor Diagnostics Screen 1**. The following information is displayed.

Cell Temperature	degrees Celsius
Box Temperature	degrees Celsius
Cell HDC	%
Box HDC	%
On Time	days, hours
Total on Time	days, hours

2. Press the Right arrow to view the **Sensor Diagnostics Screen 2**. The following information is displayed.

Cell Millivolts	Millivolts
Cell T/C Millivolts	Millivolts
Box RTD Resistance	Ohms
Electronics Temperature	degrees Celsius
Analog Out 1 Measured	mA
Flow	Counts

3. Press **CANCEL** to exit either screen and return to the **Diagnostics** menu.



Control Diagnostics



Diagnostics Mode is turned on when changes are made on this menu so that the system does not accidentally trigger an auto calibration while troubleshooting.

1. Press the Left or Right arrows to locate the **Control Diagnostics** menu and press **ENTER/MENU**.



When you press **ENTER/MENU** key, the message "**Diagnostics Mode: Off**" appears on the **Status Bar** at the bottom of the screen. This changes to "**Diagnostics Mode: On**" if you make any changes. Press **CANCEL** to exit and turn off **Diagnostics Mode**.

2. There are three screens that make up the **Control Diagnostics** menu: **Analog I/O**, **Relays**, and **Close Contact**.

This screen displays the three **Outputs** available, the **Set Values**, and the **Actual Values**. Use the arrows to access the **Set Value** fields and the numeric keypad to change the values.

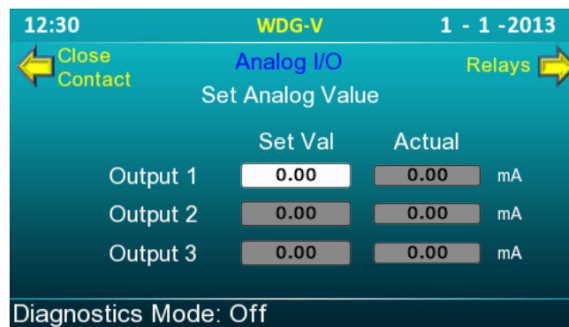


Figure 3-1.
Set Analog Value screen
(Diagnostics Mode).



Making a change to any of these fields will turn on the **Diagnostics Mode**. Press **CANCEL** to exit **Diagnostics Mode**.

3. Press the Right arrow to move to the **Relays** screen.

This screen displays the **Set Values** and **Actual Values** for the five **Outputs** and allows you to **Open** or **Close** the output relay.

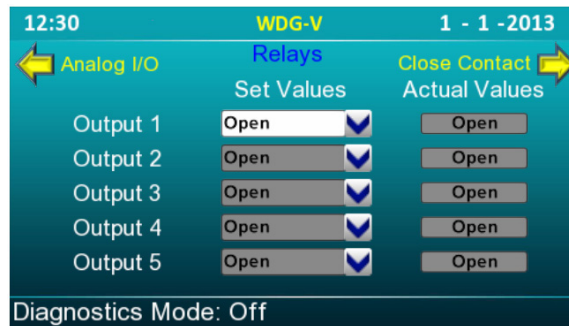


Figure 3-2.
Set Relay Values screen
(Diagnostics Mode).

4. Press the Right arrow to move to the **Close Contact** screen.

This screen reflects the status of the contact input on the sensor board interface. The user provides the physical connection to the appropriate terminal block (Contact In) that allows them to access the switch electronically (open/close) to trigger a calibration. When **Diagnostics Mode** is On, the close contact switch is open, preventing the analyzer from accidentally triggering an auto calibration.

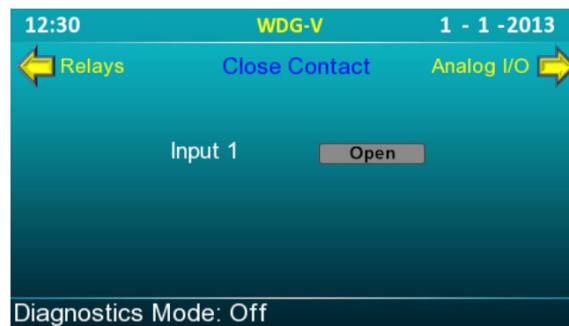


Figure 3-3.
Configure Close Contact
screen (Diagnostics Mode).

5. When you press **CANCEL** to exit this menu, a message displays indicating that you are exiting **Diagnostics Mode**.

Inject Gas

Press the Left or Right arrows to locate the **Inject Gas** menu and press **ENTER/MENU**. Use this menu to test the flow of gas to the analyzer.

1. Use the arrows to select the gas to inject and press **ENTER/MENU**. An "X" appears in the check box of the option selected.
2. Select the **START** button and press **ENTER/MENU** to inject the gas.

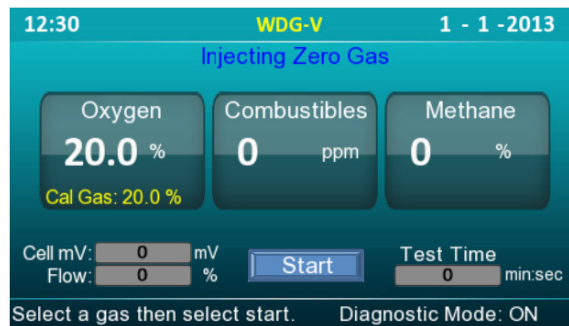


Figure 3-4.
Inject Zero Gas screen
(Diagnostics Mode).



Pressing **ENTER/MENU** to start the test will turn on the **Diagnostics Mode**.

3. Press **ENTER/MENU** to end the test and return to the **Inject Gas** screen. It will also turn **Diagnostics Mode** Off.
4. Press **CANCEL** to exit from the menu.

Trend Logging

Plotting Data Using the Candlestick Format

When plotting the data for trend logging, the AME Vision software uses a “candlestick” method to format the trending. This method allows more data to be plotted than there is space available on your display giving you more insight into how your analyzer is operating. It is also a useful tool for the technician who can see weeks and months of data to determine more easily at what point a problem occurred or to use the data to head off a potential problem. The candlestick method takes the minimum and maximum of each range of sample data and produces a vertical yellow line – called a candlestick – to represent the sample range’s minimum and maximum data sets.

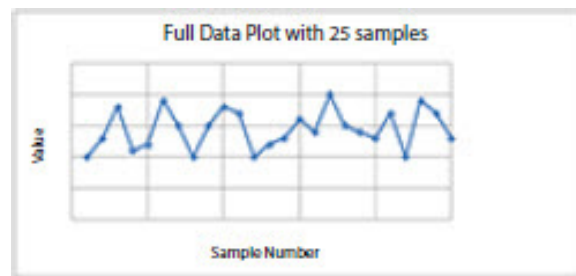


Figure 3-5.1.
Trend data for 25 samples.

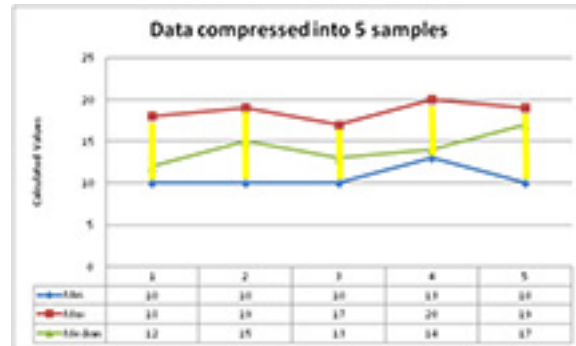


Figure 3-5.2.
Trend data compiled with
minimum and maximum data
sets.

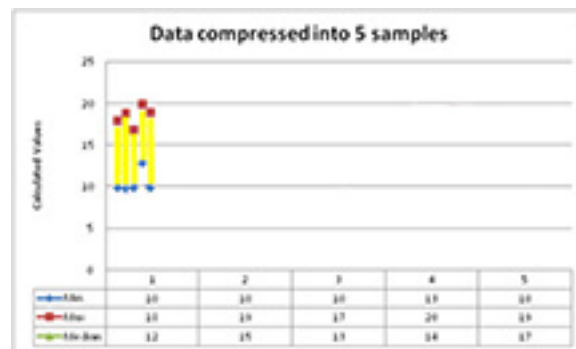


Figure 3-5.3.
Candlestick data for the same
time period.

The **Trend Logging** menu allows you to select a gas and a period of time to plot and log how the selected gas is trending.

1. Press the Left or Right arrows to locate the **Trend Logging** menu and press **ENTER/MENU**.
2. Select the gas to log and press **ENTER/MENU**. An "X" appears in the check box.



Figure 3-6.1.
Trend Options Setup menu.

3. Press the Right arrow to move to the time period and press **ENTER/MENU** to select the time period option.
4. Select **ACCEPT** and press **ENTER/MENU** to start plotting data.

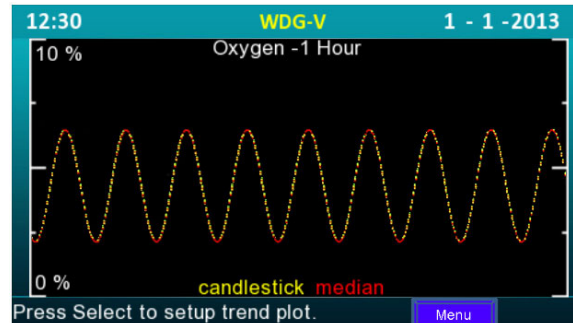


Figure 3-6.2.
Trend data plot in
candlestick format.

5. The data is plotted on the screen.
6. Press **CANCEL** to exit the screen.

Cell Diagnostics

This menu displays the information you need to determine the health of the cell and to determine if and when it needs to be replaced.

1. Press the Left or Right arrows to locate the **Cell Diagnostics** menu and press **ENTER/MENU**.
2. Cell diagnostics are displayed as in the chart below.

Cell Age		in days
Estimated Cell Life		in months
AT Value		
Cell Resistance		Ohms
Cell mV		mV
Calculated Cell Temp		°C

3. Press **CANCEL** to exit this screen.

Combustibles Detector

This menu displays the information you need to determine the health of the combustibles detector and to determine if and when it needs to be replaced.

1. Press the Left or Right arrows to locate the **Combustibles Detector** menu and press **ENTER/MENU**.
2. **Combustibles Detector** diagnostics are displayed as in the chart below.

Combustibles Detector Age		in days
Estimated Comb Detector Life		in months
Sensitivity		cnts/ppm
Comb Active Voltage		volts
Comb Reference Voltage		volts

3. Press **CANCEL** to exit this screen.



CH₄ Detector

This menu displays the information you need to determine the health of the methane detector and to determine if and when it needs to be replaced.

- 1. Press the Left or Right arrows to locate the **CH₄ Detector** menu and press **ENTER/MENU**.
- 2. Methane Detector diagnostics are displayed as in the chart below.

CH ₄ Detector Age		in days
Sensitivity		cnts/%
CH ₄ Actual Voltage		volts
CH ₄ Reference Voltage		volts

- 3. Press **CANCEL** to exit this screen.

Utility

Utility Menu

1. From the **Main Menu** screen, press **ENTER/MENU** to access the menus.
2. Press the Left or Right arrows to locate the **Utility** menu and press **ENTER/MENU**.

There are five utility menus, each described in the following pages:

Detect Sensor Utility

The **Detect Sensor** screen lists the currently connected sensors, and provides the ability to scan the network in search of sensors.

1. Press the Left or Right arrows to locate the **Detect Sensor** menu and press **ENTER/MENU**.
2. Press **ENTER/MENU** to access the **Detect Sensor** screen.
3. The sensors that are connected are automatically displayed on the **Detect Sensor** screen. When more than one sensor is connected to the analyzer, a GREEN indicator designates the enabled sensor and RED indicators designate disabled sensors.



*If a sensor is connected but not displayed on the screen, navigate to the **SEARCH** button and press **ENTER/MENU** to search for the sensor.*

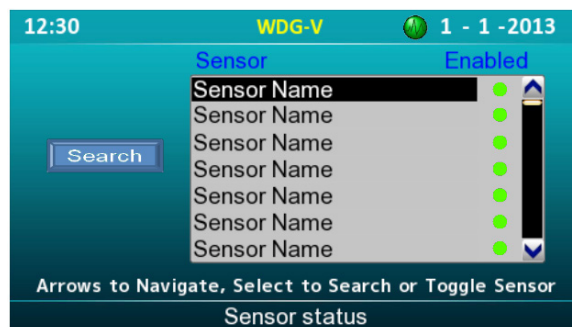


Figure 3-7.
Detect Sensor Utility screen.

4. Use the navigation arrows to toggle sensors On/Off.
5. Press **CANCEL** to exit the screen.

Parameter Management Utility

This menu is used to save or restore sensor user parameters or revert the sensor parameters to factory default.

1. Press the Left or Right arrows to locate the **Parameter Management** menu.
2. Press **ENTER/MENU** to access the **Sensor Parameters Management** menu. The **Sensor Parameter Management** screen displays.
3. Use the navigation arrows to select the function:
 - **SAVE** sensor's current parameters
 - **RESTORE** previously user-saved sensor parameters or
 - **REVERT** to the factory default parameters.
4. Press **ENTER/MENU** to save the parameters.
5. Press **CANCEL** to exit the screen.

Firmware Upgrade Utility

This menu displays the currently installed versions of the Sensor and Host firmware. Use this menu to:

- Verify the installed **Sensor Firmware** version or download upgraded or new firmware
- Verify the installed **Host Firmware** version or download upgraded or new firmware



Firmware upgrades are carried out using a USB flash drive. It is necessary to plug the USB flash drive into the USB port inside the AME Vision enclosure to download the software.

1. Press the Left or Right arrows to locate the **Firmware Upgrade** menu and press **ENTER/MENU**.
2. Press **ENTER/MENU** to access the Firmware Upgrade screen.
3. Use the navigation arrows to select the option to upgrade and press **ENTER/MENU**.

4. You will be prompted to “**Insert the USB drive**” containing the option’s firmware. This requires that you open the AMEvision enclosure door and physically connect the USB drive.
5. Using a standard 7/16" wrench loosen and remove the nut of the left side of the AMEvision enclosure and open the AMEvision enclosure door.
6. Locate the plug-in port for the USB flash drive and plug the drive with the upgrade software into the USB port inside the AMEvision enclosure. Press **ENTER/MENU** to continue or **CANCEL** to exit.



Figure 3-8.
Inside AMEvision enclosure –
USB download port.

7. The new updated firmware will download and the message “**Flashing Sensor (Host) Firmware**” will be displayed.
8. The upgrade is successful when the next screen displays a large GREEN check mark indicating the upgrade was installed.



*If the upgrade was not successful, a large RED 'X' will appear on the display with the message “**Failed**.” You will be asked if the USB contains the correct firmware and if the correct USB was plugged in. Check the USB drive to make sure it is connected and try again. If you continue to fail to upgrade the firmware, contact AMETEK customer service.*

9. Press **CANCEL** to exit the menu.

USB Transfer Utility

Use this menu to upload data to a USB flash drive for use on a computer.



Uploads are carried out using a USB flash drive. It is necessary to plug the USB flash drive into the USB port inside the AMEVision enclosure to upload the data.

1. Press the Left or Right arrows to locate the **USB Transfer** menu and press **ENTER/MENU**.
2. Press **ENTER/MENU** to access the **USB Transfer** screen.
3. From the **USB Transfer** screen, you can transfer **Sensor Parameters** and **Trend Data**, as described in the following pages.

Transfer Sensor Parameters

1. Using a standard 7/16" wrench, loosen and remove the nut on the left side of the AMEVision enclosure to open the AMEVision enclosure door.
2. Locate the USB port inside the AMEVision enclosure (Figure 3-8) and insert the USB flash drive into the port.
3. Select the **Transfer Sensor Parameters** button and press **ENTER/MENU**. A screen will display asking if you have plugged in the USB drive. Select **OK** and press **ENTER/MENU**.
4. The message "**Transferring Data to USB**" is displayed.
5. The upload is successful when the next screen displays a large GREEN check mark indicating the **Parameter Transfer** was successful.

File Name Format for Uploaded Files

Analyzer Name	Month (2)	Day (2)	Year (4)	Hour (24)	Minute (2)	Second (2)	_Interval 1,2,3 (.csv)
WDG1	August	21st	2012	1 PM	27 min	41 sec	Interval 1
WDG1	08	21	2012	13	27	41	_Int1.csv
WDG108212012132741_Int1.csv							



Interval (1,2,3)

Three (3) files are stored on the flash drive when you upload files, one for each interval. The filenames end with the specific interval (i.e., **Int1**, **Int2**, **Int3**).

The extension for uploaded Sensor Parameter files is .csv.



If the upload was not successful, a large RED 'X' will appear on the display with the message "**Failed.**" You will be asked if the USB was plugged in. Check the USB drive to make sure it is connected and try again. If you continue to fail to upload the Sensor parameters, contact AMETEK customer service.

6. Press **CANCEL** to exit the menu.



Transfer Trend Data

1. Using a standard 7/16" wrench, loosen and remove the nut on the left side of the AMEVision enclosure to open the AMEVision enclosure door.
2. Locate the plug-in port for the USB flash drive and plug the drive into the port on the AMEVision enclosure.
3. Navigate to the **Transfer Trend Data** button and press **ENTER/MENU**. A screen will display asking if you have plugged in the USB drive. Select **OK** and press **ENTER/MENU**.
4. The message "**Transferring Data to USB**" is displayed.
5. The upload is successful when the next screen displays a large GREEN check mark indicating the **Trend Transfer** was successful.

File Name Format for Uploaded Files

Analyzer Name	Month (2)	Day (2)	Year (4)	Hour (24)	Minute (2)	Second (2)	_Plog 1,2,3 (
WDG1	August	21st	2012	1 PM	27 min	41 sec	plog 1
WDG1	08	21	2012	13	27	41	_plog1.txt
WDG108212012132741_plog1.txt							



plog (1,2, 3)

Three (3) files are stored on the flash drive when you upload trend data files. The filenames end with the specific sequential file (i.e., **plog1**, **plog2**, **plog3**).

The extension for uploaded Trend Data files is .txt.



If the upload was not successful, a large RED 'X' will appear on the display with the message "**Failed.**" You will be asked if the USB was plugged in. Check the USB drive to make sure it is connected and try again. If you continue to fail to upload the trend data, contact AMETEK customer service.

6. Press **CANCEL** to exit the menu.

Reset Age Utility

This menu allows you to reset the age of the **Cell**, the **Combustibles Detector**, and the **CH₄ Detector**.



This should only be done when the device you have selected has changed.

1. Press the Left or Right arrows to locate the **Reset Age** menu and press **ENTER/MENU**.
2. Press **ENTER/MENU** to access the **Reset Age** screen.
3. Press the Up and Down arrows to navigate to the option whose age you want to reset and press **ENTER/MENU**.



*This will reset the age of your (**Cell**, **Combustibles Detector**, **CH₄ Detector**). You will be prompted "**Do you wish to continue?**"*

4. Select **OK** and press **ENTER/MENU** to continue, or select **CANCEL** and press **ENTER/MENU** to cancel the operation.

About

This menu option provides you with information about the Host and Sensors.

1. Press the Left or Right arrows to locate the **About menu** and press **ENTER/MENU**.
2. Two menus display:
 - About Host
 - About Sensor

About Host

1. Select **About Host** and press **ENTER/MENU**. The information screen for the Host displays.
 - Host Serial Number
 - Host Firmware Revision
2. Press **CANCEL** to exit the menu.

About Sensor

1. Select **About Sensor** and press **ENTER/MENU**. The information screen for the Sensor displays.
 - Sensor Serial Number
 - Sensor Hardware Revision
 - Sensor Firmware Revision
2. Press **CANCEL** to exit the menu.

Alarm and Status Definitions

ALARM	DESCRIPTION	TYPE	NOTES
Cell T/C Failure	T/C is not connected or is open	Alarm	
Cell Temperature Control	A critical over temperature condition has occurred	Alarm	Unit must be reset to clear
Cell Over Temp	Cell temperature is 4 degrees above the setpoint		
Cell Under Temp	Cell temperature is 4 degrees below the setpoint	Alarm	Only after warm-up is complete
Cell Temp Rise Failure	Cell heater failed to heat the cell	Alarm	
Over Temp Relay Tripped	The cell over-temperature relay tripped	Alarm	Unit must be reset to clear
RTD Failure	The Box Temp RTD failed	Alarm	
Box Temp High	Box temperature is 4 degrees C above the setpoint	Alarm	
Box Temp Low	Box temperature is 4 degrees C below the setpoint	Alarm	Only after warm-up time expires
Box Temp Rise Failure	Box temperature failed to heat	Alarm	
Low Sample Flow	Low sample flow detected	Alarm	Only after warm-up time expires
Cell Failure (open)	Cell is no longer functional	Alarm	
Combustible Detector Open	Combustible detector is open or not connected	Alarm	Only when configured as WDG-VC
Methane Detector Open	CH ₄ detector is open or not connected	Alarm	Only when configured as WDG-VCM
Cell mV Mismatch	The cell mV measurement does not match the real time cell measurement	Alarm	
Analog Output 1 Error	The analog output measurement does not match the setting	Alarm	
Flow Sensor Failure	The flow sensor failed	Alarm	
Cell T/C Measurement Mismatch	The redundant temperature measurement does not match the real time measurement	Alarm	



WARNINGS			
Cell Life nearing End	The ZrO ₂ cell is nearing its end of life	Warning	
Comb Detector Life nearing End	The combustible detector sensitivity is near its end of life	Warning	
Methane Detector Life nearing End	The methane detector sensitivity is near its end of life	Warning	
High Cell mV	The combustible measurement is no longer valid (set to full scale)	Warning	
Analog Output1 Out of Range	The analog output value is saturated (high or low)	Warning	
Analog Ouptut2 Out of Range	The analog output value is saturated (high or low)	Warning	
Analog Output3 Out of Range	The analog output value is saturated (high or low)	Warning	
Last O ₂ Span Calibration Failed	The oxygen span calibration failed	Warning	
Last O ₂ Zero Calibration Failed	The oxygen zero calibration failed	Warning	
Last Comb Calibration Failed	The combustible calibration failed	Warning	
Last CH ₄ Calibration Failed	The methane calibration failed	Warning	
Last Flow Calibration Failed	The last flow sensor calibration failed	Warning	
Oxygen Calibration Required	O ₂ Calibration is required	Warning	
Combustible Calibration Required	O ₂ Calibration is required	Warning	
Methane Calibration Required	O ₂ Calibration is required	Warning	

Replacement Parts

Aftermarket Excellence and Long-Term Commitment to Safety and Quality

Safety is a core value at AMETEK Process Instruments and is our primary consideration in every decision. We believe all accidents, injuries, and occupational illnesses are preventable. We adhere to the highest design and safety standards with a full understanding of the process and site installation so that our customers, channel partners, employees, and communities are safe from potential hazards. AMETEK Process Instruments designs, tests, and selects components that are meant to work safely and properly together. Sourcing substitute parts from unauthorized dealers carries significant risk, especially in safety sensitive environments.

We understand the importance of maintaining your budget and keeping costs low. At AMETEK Process Instruments, we pride ourselves in the value we add to your organization by providing you with Best in Class analyzers, genuine parts, engineered solutions, and World Class global support that provide valuable OPEX cost savings by maximizing uptime. Safety incidents, unplanned releases, unplanned down situations, and running analyzers to failure come at a much higher cost.

Our customer commitment continues well beyond the start-up and commissioning of analyzers. Together with our channel partners, WE ARE ONE Aftermarket team of factory-trained personnel here to support our customers' needs globally, onsite, or remotely with virtual tools – for the entire product lifecycle. Moreover, we offer a wide variety of customizable services and service plans to meet their needs.

From pre-commissioning to end-user handoff, service training, pre-RATA checks, turnaround support, in-house repair, expedited support, web-to-case support, and extended remote support sessions we are here to support. Please contact us if you need help identifying your local channel partner for support.

Our Aftermarket team also offers consultative service plans which are fully customized for the process needs of the individual site. Service plans establish a preventative maintenance routine and/or training program that is designed to deliver optimal results by maximizing analyzer uptime and controlling maintenance costs. We are fully committed to being our customers' preferred partner in helping them achieve their goals.

Requesting Technical Support

To request service support, a call back, or product information we encourage you to use our Web-to-Case online tool, so we are instantly aware of your request no matter the time zone or day of the week. To do this, follow the link below.

<https://www.ametekpi.com/customersupport/requestsupport>

To request training, visit our main **Customer Support** page and choose **Analyzer Training**.

Requesting Authorization to Return Equipment

Before returning equipment for repair, please obtain a Return Material Authorization. To do this, follow the link below or click the **Return Authorization** link on our main **Customer Support** page. Complete the form and click **Submit**.

<https://www.ametekpi.com/customersupport/return-authorization>

AMEVision HMI Host Spare Parts



When ordering parts, provide the serial number of your analyzer to ensure proper parts are ordered.

Description	AMETEK Part No.
Assembly, LCD HOST Interface PCB and Guard	7000-330-SE*
Overlay, Keypad, HOST Interface	7000-351-KE
HOST Power Supply, AC/DC, 12V, 40W, Switchmode	1000-616-JE
PCB, Assy, HOST Display, Customer Connection Board	8000-123-SE

* Assembly includes LCD display, display MCU board, battery, and protective cover



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Optional Blowback Configuration

The **Blowback Configuration** screen can be accessed from the **Configuration** menu on the AME Vision controller. For this menu to appear, **Blowback** must first be enabled on the **Sensor Configuration** screen.

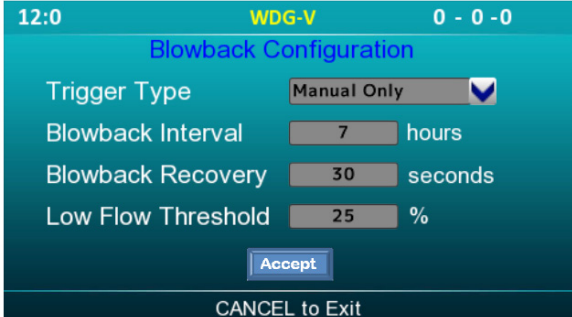


Figure 5-1.
Blowback Configuration
screen.

The WDG-V allows you to choose from four Blowback trigger types:

- **Manual Only** – You must initiate the Blowback manually from the **Utility Menu**. See below.
- **Timed** – Blowback will occur continuously at a predetermined time interval (i.e. every 2 hours). It is recommended that the time interval be at least 1 hour to prevent valve coil overheating.
- **Flow** – Blowback will automatically be triggered if the flow reading from the flow sensor drops below a user-defined threshold.
- **Timed and Flow** – Blowback will occur at the predetermined time interval unless flow drops below the user-defined threshold in which case the Blowback will trigger due to low flow.



Low Flow triggered Blowback will only occur once per hour.

Blowback Interval – Time in hours between automatic timed Blowback triggers.

Blowback Recovery – Time in seconds when the oxygen and combustible readings are frozen after a Blowback has been triggered to allow the system to return to equilibrium.

Low Flow Threshold – Flow reading in % at which a Blowback is triggered.

Manual Blowback Trigger

To manually initiate a Blowback,

Utility Menu → Blowback → Trigger A Blowback



Figure 5-2.
Initiate Blowback screen.

Blowback History

To view the previous five (5) Blowback events and flow readings, go to Diagnostics Menu → Blowback History

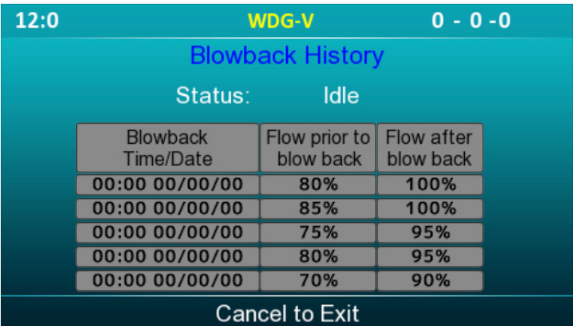


Figure 5-3.
Blowback History screen.

NOTES SUR LA SECURITE

LES AVERTISSEMENTS, LES PRÉCAUTIONS ET LES NOTES CONTENUS DANS CE MANUEL ATTIRENT L'ATTENTION SUR DES INSTRUCTIONS CRITIQUES COMME SUIV:



Une procédure de fonctionnement qui n'est pas strictement suivie peut engendrer une blessure de personne ou une contamination de l'environnement.



Une procédure de fonctionnement qui n'est pas strictement suivie peut endommager l'équipement.



Informations importantes à ne pas laisser passer :

Sécurité électrique

Une tension jusqu'à **5 kV** peut être présente dans le boîtier. Coupez toujours les alimentations électriques avant d'effectuer une maintenance ou un dépannage. Seuls des techniciens qualifiés électriquement doivent effectuer les connexions électriques et les vérifications de terres.

Une utilisation quelconque de l'équipement de manière non spécifiée par le constructeur peut compromettre la protection de la sécurité d'origine fournie par l'équipement.

Mise à la terre

La mise à la terre de l'instrument est obligatoire. Les spécifications de performance et la protection de sécurité sont invalides si le fonctionnement de l'instrument est effectué depuis une alimentation électrique à la terre impropre.



Vérifiez la continuité de la terre de tout équipement avant d'alimenter électriquement.

Note importante aux utilisateurs

Il n'y a pas de composant à maintenir à l'intérieur même des composants de l'analyseur WDG-V. Ne pas retirer le capot d'un analyseur WDG-V. Se référer à du personnel qualifié pour la maintenance.

Les instructions suivantes s'appliquent à l'unité d'affichage hôte AMEvision :

L'alimentation électrique, les entrées et sorties (E/S) doivent être en accord avec les méthodes de câblage en zone Class I, Class II Division 2 (se référer au code électrique national) et en accord avec l'autorité locale ayant juridiction.



AVERTISSEMENT – RISQUE D'EXPLOSION – LA SUBSTITUTION DE COMPOSANTS PEUT COMPROMETTRE LA CONFORMITE DE ZONE CLASS I, CLASS II DIVISION 2.



AVERTISSEMENT – RISQUE D'EXPLOSION – EN ZONE EXPLOSIBLE, COUPEZ L'ALIMENTATION ELECTRIQUE AVANT DE REMPLACER OU CABLER UN MODULE.



AVERTISSEMENT – RISQUE D'EXPLOSION – NE DECONNECTEZ PAS L'EQUIPEMENT SAUF SI L'ALIMENTATION ELECTRIQUE A ETE COUPEE OU SI LA ZONE EST SANS RISQUE.



CET EQUIPEMENT EST CONFORME A UNE UTILISATION EN ZONE CLASS I, DIVISION 2, GROUPES A, B, C ET D, CLASS II, DIVISION 2 GROUP E, F, ET G OU HORS ZONE EXPLOSIBLE SEULEMENT.



AVERTISSEMENT : L'EXPOSITION A DES PRODUITS CHIMIQUES PEUT DEGRADER LES PROPRIETES DES JOINTS DES MATERIAUX UTILISES DU MODULE SUIVANT : MODULE D'ALIMENTATION ELECTRIQUE.



AVERTISSEMENT : RISQUE D'EXPLOSION. EN ZONE A RISQUE, COUPEZ L'ALIMENTATION ELECTRIQUE AVANT DE RETIRER OU DE REMPLACER UN CABLAGE, UN MODULE, LA BATTERIE OU UN COMPOSANT SAUF S'IL EST CERTAIN QUE LA ZONE NE CONTIENT PAS DE CONCENTRATIONS DE GAZ OU VAPEUR INFLAMMABLE.



AVERTISSEMENT : LA SUBSTITUTION DES COMPOSANTS SUIVANTS PEUT COMPROMETTRE LA CONFORMITE DE ZONE DIVISION 2 DE L'ALIMENTATION ELECTRIQUE.



AVERTISSEMENT : LA BATTERIE DOIT ETRE REMPLACEE AVEC LA REFERENCE AMETEK 1000-652-VE.

La température ambiante maximum de cet analyseur est de 55 °C (131°F).

L'afficheur hôte AMEvision est un élément complexe de l'analyseur qui doit être maintenu par un technicien qualifié ayant une expertise en technologie de l'instrument et en systèmes électriques. AMETEK recommande que tout équipement nécessitant une maintenance soit renvoyé à l'usine. Vous devriez seulement essayer de réparer ou maintenir cet équipement après avoir reçu une formation d'un représentant AMETEK / Division P&AI. Si vous décidez d'effectuer la maintenance de cet analyseur, ayez conscience que des hautes tensions, des hautes températures et d'autres conditions potentiellement à risque peuvent surgir.

Sommaire de Sécurité Générale

Lisez attentivement les précautions de sécurité suivantes pour éviter de se blesser et d'endommager l'équipement ou tout produit connecté à ce dernier.

Utilisez un câblage adéquat

Pour éviter les risques de feu, utilisez seulement le câblage spécifié dans le chapitre Installation de ce manuel de l'utilisateur.

Evitez les surcharges électriques

Pour éviter une électrocution ou un risque de feu, n'alimentez pas électriquement des bornes qui sont hors de la gamme spécifiée pour ces bornes.



Mettez à la terre l'analyseur

Suivez les instructions de mise à la terre fournies dans le chapitre Installation de ce manuel de l'utilisateur. Avant de connecter aux bornes d'entrée ou de sortie de l'analyseur, assurez-vous que l'analyseur est correctement mis à la terre.

Ne pas faire fonctionner sans capot

Pour éviter une électrocution ou un risque de feu, ne faites pas fonctionner l'analyseur sans capot ou avec un panneau retiré.

Utilisez des fusibles adéquats

Pour éviter tout risque de feu, utilisez des fusibles de types et classes spécifiés pour cet analyseur.

Ne faites pas fonctionner en atmosphère explosible

Pour éviter toute blessure ou risque de feu, ne faites pas fonctionner l'analyseur dans une atmosphère explosible, sauf si vous avez acheté les options spécifiquement conçues pour ces environnements.

PRECAUTIONS AUX DOMMAGES DE L'ANALYSEUR

Utilisez une alimentation électrique adéquate

Ne faites pas fonctionner l'analyseur avec une alimentation électrique qui fournit plus que la tension électrique spécifiée.

Ne faites pas fonctionner avec les défaillances suspectes

Si vous suspectez que l'analyseur est endommagé, demandez à un technicien qualifié de l'inspecter.

Mise à la terre CEM (EMC), blindage et protection contre le bruit



Dans un but de compatibilité électromagnétique, en aucune circonstance vous ne devez laisser l'écran d'un câble déconnecté en une ou deux extrémités (unité de contrôle ou de terrain ou autre appareil).

Appendix A – AMEVision Modbus Information



The AMEVision supports Holding Registers. Holding Registers start at 0X40000. For example, the Modbus map defines Oxygen at Register 3. The “Real” modbus address to a modbus master is 0X40003.

WDG-V AMEVision Modbus Map

Sensor at address 1

Register	Name	Description	Data Type	Access	Notes
0	System Alarm	System alarms reported by the AME/Vision Software	INT32	RO	
2	Oxygen	Oxygen concentration in percentage	Float	RO	
4	Combustibles	Combustible concentration in ppm	Float	RO	
6	Methane	Methane concentration in percentage	Float	RO	
8	Cell Temperature	Cell temperature in degree C	Float	RO	
10	Box Temperature	Box temperature in degree C	Float	RO	
12	Cell mV	Oxygen cell voltage in millivolts	Float	RO	
14	CJ Temperature	Electronics Temperature in deg C	Float	RO	
16	Status Mask	Status Mask	UINT32	RO	See StatusMask Tab for bit information
18	Process Alarm Mask	Process alarm bit mask	UINT32	RO	See <i>Process Alarm</i> Tab for bit information
20	Command	Command to the analyzer	UINT16	W	See <i>Command</i> Tab for command information
21	Command Response	Response to a command	UINT16	RO	Future
22	Oxygen Span Gas	Oxygen span gas value in percent	Float	R/W	
24	Oxygen Zero Gas	Oxygen Zero gas value in percent	Float	R/W	
26	Combustible Span Gas	Combustible span gas value in PPM	Float	R/W	
28	Methane Span Gas	Methane span gas value in Percent	Float	R/W	
29	Data Valid	Data valid (1 if valid, 0 if not)	UINT16	RO	
30	State	Current state of the analyzer	UINT16	RO	0-Startup, 1-Warmup, 2-Normal, 3-Diagnostics, 4-Calibration, 5-Recovery, 6-Fail
32	Event Mask 1	Event Mask 1	UINT32	RO	See <i>Event Mask 1</i> Tab for bit information
34	Event Mask 2	Event Mask 2	UINT32	RO	See <i>Event Mask 2</i> Tab for bit information
36	Process Pressure	Process Pressure in kPa	Float	R/W	

Sensor at address 2

Register	Name	Description	Data Type	Access	Notes
38	Oxygen	Oxygen concentration in percentage	Float	RO	
40	Combustibles	Combustible concentration in ppm	Float	RO	
42	Methane	Methane concentration in percentage	Float	RO	
44	Cell Temperature	Cell temperature in degree C	Float	RO	
46	Box Temperature	Box temperature in degree C	Float	RO	
48	Cell mV	Oxygen cell voltage in millivolts	Float	RO	
50	CJ Temperature	Electronics Temperature in deg C	Float	RO	
52	Status Mask	Status Mask	UINT32	RO	See StatusMask Tab for bit information
54	Process Alarm Mask	Process alarm bit mask	UINT32	RO	See <i>Process Alarm</i> Tab for bit information
56	Command	Command to the analyzer	UINT16	W	See <i>Command</i> Tab for command information
57	Command Response	Response to a command	UINT16	RO	Future
58	Oxygen Span Gas	Oxygen span gas value in percent	Float	R/W	
60	Oxygen Zero Gas	Oxygen Zero gas value in percent	Float	R/W	
62	Combustible Span Gas	Combustible span gas value in PPM	Float	R/W	
64	Methane Span Gas	Methane span gas value in Percent	Float	R/W	
65	Data Valid	Data valid (1 if valid, 0 if not)	UINT16	RO	
66	State	Current state of the analyzer	UINT16	RO	0-Startup, 1-Warmup, 2-Normal, 3-Diagnostics, 4-Calibration, 5-Recovery, 6-Fail
68	Event Mask 1	Event Mask 1	UINT32	RO	See <i>Event Mask 1</i> Tab for bit information
70	Event Mask 2	Event Mask 2	UINT32	RO	See <i>Event Mask 2</i> Tab for bit information
72	Process Pressure	Process Pressure in kPa	Float	R/W	

Continue for each additional sensor.....

EventMask #1 Bit definitions

(1) indicates alarm is active

Bit Num	Alarm	Description	Type
0			Fault
1	Cell T/C Failure	Thermocouple is not connected or is open	Fault
2	Cold Junction Compensator Failure	The PCB temperature sensor has failed	Fault
3	Cell Temperature Control	A critical overtemperature condition has occurred	Fault
4	Cell Over Temp	Cell temperature is 5 degrees above the setpoint	Fault
5	Cell Under Temp	Cell temperature is 5 degrees above the setpoint	Fault
6	Cell Temp Rise failure	Cell heater failed to heat the cell	Fault
7	Over Temp Relay tripped	The cell over-temperature relay has tripped	Fault
8	RTD Failure	The Box Temp RTD failed	Fault
9	Box Temp High	Box temperature is 5 degrees above the setpoint	Fault
10	Box Temp Low	Box temperature is 5 degrees below the setpoint	Fault
11	Box Temp Rise Failure	Box temperature failed to heat	Fault
12	Low Sample Flow	Low sample flow detected	Fault
13	Cell Failure (open)	Cell output is not valid	Fault
14	Combustible Detector Open	Comb detector is open or not connected	Fault
15	Methane Detector Open	CH4 detector is open or not connected	Fault
16	Cell Mv Mismatch	The SIL cell mv measurement does not match the real time cell meas	Fault
17	Analog Output 1 error	The SIL about measurement does not match the output setting	Fault
18	Flow Sensor Failure	The flow sensor failed	Fault
19	Cell T/C measurement Mismatch	The Redundant temperature measurement does not match the real time measurement	Fault
20	Cell life nearing its end	The ZrO2 cell is nearing its end of life	Warning
21	Comb Detector life nearing its end	The combustible detector sensitivity is near its end of life	Warning
22	Methane Detector life nearing its end	The methane detector sensitivity is near its end of life	Warning
23	High Cell Mv	The combustible measurement is no longer valid (set to full scale)	Warning
24	Analog Output1 out of range	The analog output value is saturated (high or low)	Warning
25	Analog Output2 out of range	The analog output value is saturated (high or low)	Warning
26	Analog Output3 out of range	The analog output value is saturated (high or low)	Warning
27	Last O2 Span Calibration Failed	The oxygen span calibration failed	Warning
28	Last O2 Zero Calibration Failed	The Oxygen zero calibration failed	Warning
29	Last Comb Calibration Failed	The combustible calibration failed	Warning
30	Last CH4 Calibration Failed	The methane calibration failed	Warning
31	Last Flow Calibration failed	The last flow sensor calibration failed	Warning
	Oxygen Calibration Required	O2 Calibration is required	Warning

WDG-5 Command Definitions

COMMAND ID	Name	Description	Conditions
0x00	No command	Clears the command for the next command - use if sending the same command multiple times	
0x01	Start Manual Cal	Starts a manual calibration	Only if the STATE parameter is "NORMAL"
0x02	Start Remote Cal	Starts a remote calibration	Only if the STATE parameter is "NORMAL"
0x03	Start Auto Cal	Starts an auto calibration	Only if the STATE parameter is "NORMAL"
0x04	Accept O2 Span Gas	Accepts the current reading as the O2 Span Gas reading	
0x05	Accept Zero Gas	Accepts the current reading as the O2, Comb, and Methane zero readings	
0x06	Accept Comb Span Gas	Accepts the current reading as the Comb span gas reading	
0x07	Accept CH4 Span Gas	Accepts the current reading as the CH4 span gas reading	
0x08	Complete Cal	Computes the calibration constants	
0x09	Abort Cal	Aborts the current calibration	
0x0A	Complete Primary Cal	Not used	
0x0B	Complete Verify	Not used	
0x0C	Calibrate Flow Sensor Zero	Accepts the Flow sensor zero value (assumes no flow for 3 minutes at time of accepting)	
0x0D	Calibrate Flow Sensor Span	Accepts the Flow sensor span value (assumes 3scfh for 3 minutes at time of accepting)	
0x10	Enter Diagnostics Mode	Enables diagnostic mode	
0x11	Exit Diagnostic Mode	Exits diagnostic mode	
0x20	Disable temp control	Disables the cell and box heaters	
0x21	Enable Temp control	Enables the cell and box heaters	
0x30	Save User params	Stores the user parameters	
0x31	Restore User Params	Restores the user parameters	
0x32	Save Factory params	Saves the factory parameters	
0x33	Restore Factory params	Restores the factory parameters	
0x34	Erase EEPROM	Erases EEPROM and sets all values back to defaults	
0x40	Calculate Cell Resistance	Instructs the sensor to calculate the cell resistance	
0x50	Clear O2 Cal History	Clears the O2 Calibration history	
0x51	Clear Comb Det Cal History	Clears the Combustible Calibration history	
0x52	Clear CH4 Cal History	Clears the CH4 Calibration History	
0x53	Reset Cell Age	Resets the cell life clock	
0x54	Reset Comb Detector Age	Resets the cmb detector life clock	
0x55	Reset CH4 Detector Age	Resets the ch4 detector life clock	
0x56	Clear Cell Changed Flag	Clears the cell has been changed flag	
0x57	Clear CMBDET Changed Flag	Clears the combustible detector has been changed flag	
0x58	Clear CH4 Det Changed Flag	Clears the CH4 detector has been changed flag	
0x59	Clear Cal State	Manually clears the cal state parameter	
0x5A	Clear On Times	Clears the On Time and Total On Time parameters to zero	
0x70	Inject O2 Span gas	Turns on the O2 span gas solenoid	
0x71	Inject Zero gas	Turns on the Zero gas solenoid	
0x72	Inject Comb Span gas	Turns on the Comb Span gas solenoid	
0x73	Inject CH4 Span gas	Turns on the CH4 Span gas solenoid	
0x74	Aspirator Off	Turns off the Aspirator solenoid	
0x75	Aspirator On	Turns on the Aspirator solenoid	
0x76	All valves off	Turns all valves off	
0x80	Zero Combustibles	Sets the current comb value as the zero for combustibles	
0x81	Zero CH4	Sets the current CH4 value as the zero for CH4	

Status Mask Bit definitions

(1) indicates status is active

Bit Num	Alarm	Description
0	Cell temperature is stable	This bit indicates the cell temperature is stable
1	Box/Combustible temperature is stable	This bit indicates the box/combustible temperature is stable
2	Oxygen calibration gas is stable	This bit is set during calibration when the Oxygen calibration gas is stable and ready to be accepted
3	Combustible calibration gas is stable	This bit is set during calibration when the Combustible calibration gas is stable and ready to be accepted
4	Methane Calibration gas is stable	This bit is set during calibration when the Methane calibration gas is stable and ready to be accepted
5	Calibration is allowed	This bit indicates if a calibration is allowed at the present time
6	ZrO2 cell may have been replaced	This bit is set when the system detects a possible change of the Oxygen cell (used for tracking the age of the cell)
7	Combustible Detector may have been replaced	This bit is set when the system detects a possible change of the Combustible detector (used for tracking the age of the detector)
8	Methane Detector may have been replaced	This bit is set when the system detects a possible change of the Methane detector (used for tracking the age of the detector)
9	Future	
10	Future	
11	Future	
12	Future	
13	Future	
14	Future	
15	Future	
16	Future	
17	Future	
18	Future	
19	Future	
20	Future	
21	Future	
22	Future	
23	Future	
24	Future	
25	Future	
26	Future	
27	Future	
28	Future	
29	Future	
30	Future	
31	Future	

Process Alarm Bit Definitions

Bit Num	Alarm	Description
0	Oxygen Concentration High	(1) indicates alarm active
1	Oxygen Concentration Low	(1) indicates alarm active
2	Combustibles Concentration High	(1) indicates alarm active
3	Combustibles Concentration Low	(1) indicates alarm active
4	Methane Concentration High	(1) indicates alarm active
5	Methane Concentration Low	(1) indicates alarm active

EventMask #2 Bit definitions

(1) Indicates alarm is active

Bit Num	Alarm	Description	Type
0	Comb Calibration Required	Comb Calibration is required	Warning
1	CH4 Calibration Required	CH4 Calibration is required	Warning
2	Flow Sensor Calibration Required	Flow Sensor calibration is required (using defaults)	Warning
3	Oxygen Hi	O2 value exceeded the customer configurable limit	Process Alarm
4	Oxygen Low	Oxygen value exceeded the customer configurable limit	Process Alarm
5	Combustibles Hi	Comb value exceeded the customer configurable limit	Process Alarm
6	Combustibles Lo	Comb value exceeded the customer configurable limit	Process Alarm
7	Methane Hi	Methane value exceeded the customer configurable limit	Process Alarm
8	Methane Lo	Methane value exceeded the customer configurable limit	Process Alarm
9	Cell Mv Hi	Cell mv value exceeded the customer configurable limit	Process Alarm

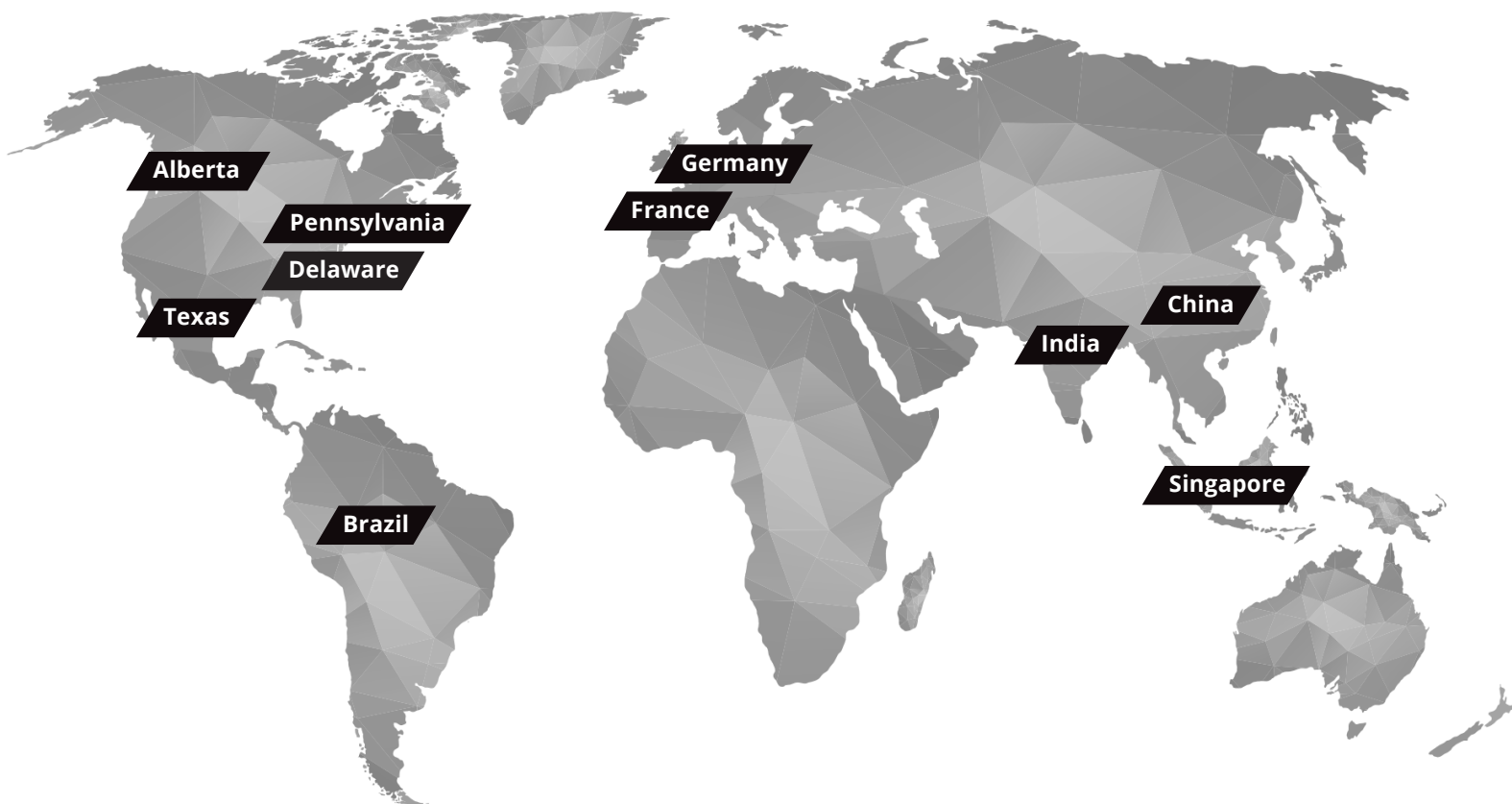
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