Critical Environment Technologies™

Operation Manual

Rev. D | 2015.03

YES IMS 9-Channel IAQ Monitor

www.critical-environment.com

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1 POLICIES

1.1 Important Note

Read and understand this manual prior to using this instrument. Carefully read the warranty policy, service policy, notices, disclaimers and revisions on the following pages.

This instrument should be inspected and calibrated regularly by a qualified and factory trained technician. For more information, refer to *Maintenance & Calibration* sections of this manual.

This instrument has not been designed to be intrinsically safe. For your safety, **do not** use it in classified hazardous areas (explosion-rated environments).

INSTRUMENT SERIAL NUMBER:

_____

PURCHASE DATE:

_____

PURCHASED FROM:

_____

1.2 Warranty Policy

Critical Environment Technologies Canada Inc. (CETCI), also referred to as the manufacturer, warrants this instrument, (excluding sensors, battery packs, batteries, pumps and filters) to be free from **defects in materials and workmanship for a period of two years from the date of purchase from our facility.** The **sensors have a warranty period of one year on a pro-rated basis from the date of purchase from our facility**. If the product should become defective within this warranty period, we will repair or replace it at our discretion.

The warranty status may be affected if the instrument has not been used and maintained as per the instructions in this manual or has been abused, damaged, or modified in any way. This instrument is only to be used for the purposes stated herein. The manufacturer is not liable for auxiliary interfaced equipment or consequential damage.

Due to ongoing research, development, and product testing, the manufacturer reserves the right to change specifications without notice. The information contained herein is based on data considered accurate. However, no warranty is expressed or implied regarding the accuracy of this data.

All goods must be shipped to the manufacturer by prepaid freight. All returned goods must be pre-authorized by obtaining a Returned Merchandise Authorization (RMA) number. Contact the manufacturer for an RMA number and the procedures required for product transport.

1.3 Service Policy

CETCI maintains an instrument service facility at the factory. Some CETCI distributors / agents may also have repair facilities; however, CETCI assumes no liability for service performed by anyone other than CETCI personnel.

Repairs are warranted for 90 days after date of shipment (sensors have individual warranties).

Should your instrument require non-warranty repair, you may contact the distributor from whom it was purchased or you may contact CETCI directly.

Prior to shipping equipment to CETCI, contact our office for a Returned Merchandise Authorization (RMA) number. All returned goods must be accompanied with an RMA number.

If CETCI is to do the repair work, you may send the instrument, prepaid, to:

Attention: Service Department
Critical Environment Technologies Canada Inc.
Unit 145, 7391 Vantage Way
Delta, BC, V4G 1M3

Always include your Returned Merchandise Authorization (RMA) number, address, telephone number, contact name, shipping / billing information, and a description of the defect as you perceive it. You will be contacted with a cost estimate for expected repairs, prior to the performance of any service work.

For liability reasons, CETCI has a policy of performing all needed repairs to restore the instrument to full operating condition.

Pack the equipment well (in its original packing if possible), as we cannot be held responsible for any damage incurred during shipping to our facility.

1.4 Copyrights

This manual is subject to copyright protection; all rights are reserved. Under international and domestic copyright laws, this manual may not be copied or translated, in whole or in part, in any manner or format, without the written permission of CETCI.

All software which CETCI utilizes and / or distributes holds a proprietary interest and is also subject to copyright protection and all rights are reserved. No party may use or copy such software in any manner or format, except to the extent that CETCI grants them a license to do so. IF THIS SOFTWARE IS BEING LOADED ONTO MORE THAN ONE COMPUTER, EXTRA SOFTWARE LICENSES MUST BE PURCHASED.

1.5 Disclaimer

Under no circumstances will CETCI be liable for any claims, losses or damages resulting from or arising out of the repair or modification of this equipment by a party other than CETCI service technicians, or by operation or use of the equipment other than in accordance with the printed instructions contained within this manual or if the equipment has been improperly maintained or subjected to neglect or accident. Any of the forgoing will void the warranty.

1.6 Revisions

This manual was written and published by CETCI. The manufacturer makes no warranty or representation, expressed or implied including any warranty of merchantability or fitness for purpose, with respect to this manual.

All information contained in this manual is believed to be true and accurate at the time of printing. However, as part of its continuing efforts to improve its products and their documentation, the manufacturer reserves the right to make changes at any time without notice. Revised copies of this manual can be obtained by contacting CETCI or visiting www.critical-environment.com.

Should you detect any error or omission in this manual, please contact CETCI at the following address:

Critical Environment Technologies Canada Inc.
Unit 145, 7391 Vantage Way, Delta, BC, V4G 1M3, Canada
Toll Free: +1.877.940.8741
Telephone: +1.604.940.8741
Fax: +1.604.940.8745
Email: marketing@cetci.com
Website: www.critical-environment.com

In no event will CETCI, its officers or employees be liable for any direct, special, incidental or consequential damages resulting from any defect in any manual, even if advised of the possibility of such damages.

2 INTRODUCTION

2.1 General Description

Thank you for purchasing our YES IMS multi-sensor, indoor air quality monitor (IAQ) and recording instrument.

The YES IMS is a self-contained, IAQ Intelligent Monitoring System (IMS) with a nine channel sensor capacity, two dedicated to one internal relative humidity (RH) and one temperature sensor and the remaining configurable up to seven gas sensors.

Options include a fixed wall mount model or a desktop model with a wide range of sensors to choose from, including particulate, electrochemical, solid state combustible, infrared, and TVOCs (solid state and PID). The fixed wall mount model can be permanently wired with 24 VAC or DC and the desktop model comes with a 12 VDC wall adapter. Both models allow for around the clock continuous monitoring and data logging and have one relay output and one buzzer output for alarm signaling.

YES IMS has an internal logging memory that will store over two month's worth of readings when logging once per minute. Data is saved in a Microsoft® Excel friendly CSV format and can be extracted from the unit with a standard USB connection or Wi-Fi interface. Users can then analyze and graph data using CETCI's proprietary data logging software, IMS Viewer.

An example of a common IAQ package would be temperature, RH, CO, CO_2, particulates and TVOCs.

If after reading through the manual, you have any questions, please do not hesitate to contact our Service Department for technical support.

2.2 Key Features

- 9 channel capacity
- Standard LCD display
- Wide range of sensors available to choose from, including particulate, electrochemical, solid state, infrared & TVOCs
- Light weight desktop model or fixed wall mount model
- High capacity data logging capability
- Proprietary IMS Viewer data logging software included
- Optional Wi-Fi module
- RoHS compliant circuit boards

3 INSTRUMENT SPECIFICATIONS

3.1 Technical Specifications

GAS TYPE
Electrochemical Ammonia (NH_3), Carbon Monoxide (CO), Chlorine (Cl_2), Ethylene (C_2H_4), Ethylene Oxide (C_2H_4O), Formaldehyde (CH_2O), Nitrogen Dioxide (NO_2), Oxygen (O_2), Ozone (O_3), Sulphur Dioxide (SO_2)
Infrared Carbon Dioxide (CO_2)
Combustible Gas (solid state) Hydrogen (H_2), Methane (CH_4), Propane (C_3H_8), etc.
Particulates (convection)
TVOCs (solid state & PID)

MECHANICAL	
Enclosure	General Purpose PVC / ABS
Weight	600 g (1.4 lb)
Size	9.2″ x 5.3″ x 2.4″ (233 mm x 133 mm x 60 mm)

ELECTRICAL

Power Requirement	
Desktop Model	Plug-in, 12 VDC, Class III, 2 A DC max. wall adapter
Wall Mount Model	24 VAC or DC, 500 mA max. capacity
Sampling	Diffusion
Memory	8 MB
Calibration	Using the PC application software available only to authorized distributors
Information Recording	User configurable through PC application software
Circuit	Microprocessor
Communication	Miniature USB port

USER INTERFACE

Display	Full Color LCD display
Audible Alarm	Internal 80 Db @ 4 ft

ENVIRONMENTAL *(sensor dependent)*

Operating Temperature	5°C to 50°C (41°F to 122°F)
Operating Humidity	5 - 95% RH non-condensing
Storage Temperature	-20°C to 60°C (-4°F to 140°F)
Storage Humidity	0 - 99% RH non-condensing

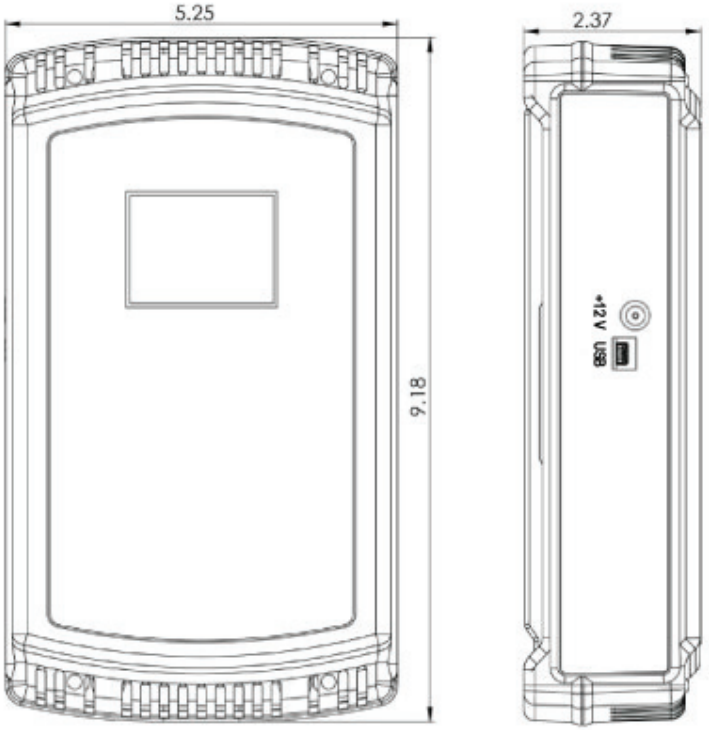
CERTIFICATION

CE	Pending

Minimum System Requirements to Operate Datalog Recording Software:

- Personal computer with Pentium III class processor or better
- 512 MB RAM (minimum), VISTA compatible
- A hard disk with at least 10 MB of available disk space.
- Additional space is required to store logger files and graph files
- An available USB port

3.2 Enclosure Dimensions



4 SENSOR SPECIFICATIONS

4.1 Sensor Configuration Notes

It is important to note the following sensor configurations:

- Temperature & RH sensors are fixed locations
- Particulate will take one fixed sensor location
- Solid state sensors, such as TVOC (0 - 500 ppm), refrigerant or combustible, will take one fixed sensor location
- CO_2 infrared sensor will take one fixed sensor location
- TVOC PID sensor will take one fixed sensor location
- Electrochemical sensors will take three fixed sensor locations

4.2 Sensor Specifications

Relative Humidity (RH)	
Type	Thin film capacitive
Range	0 - 100% RH
Sensor Response Time (T_{90})	< 10 seconds
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	5 - 95% non-condensing
Resolution	2% RH
Accuracy	No data available
Long Term Drift	2% (±)
Expected Life Span	3 years +
Calibration	Once a year (depending on application)
Cross Sensitivity	N/A

Temperature	
Type	Negative Coefficient Thermistor
Range	-5°C to 55°C (23°F to 131°F)
Sensor Response Time (T_{90})	< 10 seconds
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	5 - 95% non-condensing
Resolution	0.1°C @ 25°C
Accuracy	No data available
Long Term Drift	0.5°C (±)
Expected Life Span	3 years +
Calibration	Once a year (depending on application)
Cross Sensitivity	N/A

Ammonia (NH_3)	
Type	Electrochemical
Range	0 - 50 ppm
Sensor Response Time (T_{90})	< 60 sec calculated from 5 minute exposure
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	15 - 90% non-condensing
Resolution	1 ppm
Accuracy	No data available
Long Term Drift	< 5% / 6 months
Expected Life Span	2 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	Alcohols @ 1,000 ppm = 0 ppm CO_2 @ 5,000 ppm = 0 ppm CO @100 ppm = 0 ppm Hydrocarbons @ % range = 0 ppm H_2 @ 10,000 ppm = 0 ppm H_2S @ 20 ppm = 2 ppm Cross sensitivity list not fully completed. Sensor maybe sensitive to other gases.

Dust / Particulate

Type	Convection
Range	1 - 10 micro meters
Sensor Response Time (T_{90})	< 30 seconds
Operating Temperature	0°C to 45°C (32°F to 113°F)
Operating Humidity	5 - 95% non-condensing
Resolution	250 particulates / cubic foot
Accuracy	No data available
Long Term Drift	N/A
Expected Life Span	7 years
Calibration	N/A
Cross Sensitivity	N/A

Carbon Dioxide (CO_2)

Type	Infrared
Range	0 - 5,000 ppm
Sensor Response Time (T_{90})	> 30 seconds @ 20°C (68°F)
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	5 - 95% non-condensing
Resolution	50 ppm from 0 - 2,500 ppm, then 100 ppm up to FSD
Accuracy	± 2% full scale @ 20°C (68°F), 1 bar pressure, applied gas 2.5% volume CO_2
Long Term Drift	± 50 ppm / month @ 20°C (68°F) ambient, (max ± 150 ppm / yr)
Expected Life Span	5 - 10 years
Calibration	2 years or once a year for best accuracy
Cross Sensitivity	None

Carbon Monoxide (CO)

Type	Electrochemical
Range	0 - 200 ppm
Sensor Response Time (T_{90})	60 seconds
Operating Temperature	-10°C to 60°C (14°F to 140°F)
Operating Humidity	5 - 95% RH non-condensing
Operating Pressure	80 - 120 kPa
Resolution	0.5 ppm
Accuracy	No data available
Repeatability	< 2% of signal
Maximum Zero Shift	N/A
Clean Air Output Drift	< 10 ppm equivalent per year
Expected Life Span	6 - 7 years in air (under normal conditions)
Calibration	Every 6 months or once a year (depending on application)
Cross Sensitivity	H_2S @ 20 ppm = < 0.1 ppm NO_2 @ 10 ppm = < 0.1 ppm Cl_2 @ 10 ppm = < 0.1 ppm NO @ 50 ppm = < 5 ppm SO_2 @ 20 ppm = < 0.1 ppm H_2 @ 20°C (68°F) @ 400 ppm = < 60 ppm C_2H_4 @ 400 ppm = < 25 ppm NH_3 @ 20 ppm = < 0.01 ppm

Chlorine (Cl_2)

Type	Electrochemical
Range	0 - 5 ppm
Sensor Response Time (T_{90})	< 40 seconds fr 0 - 5ppm
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	15 - 90% non-condensing
Resolution	0.02 ppm
Accuracy	No data available

Long Term Drift	zero: < 0.2 ppm equivalent change / yr in clean air with monthly test. Sensitivity: < 0.4 ppm change / month in clean air with twice monthly test
Expected Life Span	2 - 2.5 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	H_2S @ 20 ppm= < -40 ppm NO_2 @ 10ppm= 100 ppm NO @ 50 ppm = < 0.5 ppm SO_2 @ 20 ppm = < -2.5 ppm CO @ 400 ppm = < 0.1 ppm H_2 @ 400 ppm = < 0.1 ppm C_2H_4 @ 400 ppm = < 0.1 ppm

Combustibles (e.g. CH_4, H_2, C_3H_8)

Type	Solid State
Range	0 - 50% LEL
Sensor Response Time (T_{90})	< 12 seconds from 0 - 50% LEL
Operating Temperature	-10°C to 40°C (-14°F to 104°F)
Operating Humidity	20 - 90% non- condensing
Resolution	1% LEL
Accuracy	No data available
Long Term Drift	N/A
Expected Life Span	6 - 8 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	Any combustible gas

Ethylene (C_2H_4)

Type	Electrochemical
Range	0 - 500 ppm
Sensor Response Time (T_{90})	< 100 seconds
Operating Temperature	0°C to 50°C (32°F to 122°F)

Operating Humidity	15 - 90% non- condensing
Resolution	1 ppm
Accuracy	No data available
Long Term Drift	< 5% / month
Expected Life Span	2 - 3 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	CO = < 60%

Ethylene Oxide (C_2H_4O)

Type	Electrochemical
Range	0 - 20 ppm
Sensor Response Time (T_{90})	< 120 seconds
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non- condensing
Resolution	0.1 ppm
Accuracy	No data available
Long Term Drift	< 5% signal loss / yr
Expected Life Span	2 - 3 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	Ethanol ≈ 55% Toluene ≈ 20% Methyl-ethyl-ketone ≈ 10% CO ≈ 40%

Formaldehyde (CH_2O)

Type	Electrochemical
Range	0 - 10 ppm
Sensor Response Time (T_{90})	< 80 seconds
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non- condensing
Resolution	0.01 ppm

Accuracy	No data available
Long Term Drift	< 2% signal loss / month
Expected Life Span	2 - 3 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	H_2 = 1 - 3% CO = 10 - 18% Interference from other reducing gases such as alcohol.

Hydrogen Sulphide (H_2S)

Type	Electrochemical
Range	0 - 50 ppm
Sensor Response Time (T_{90})	< 25 seconds from 0 - 20 ppm
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non- condensing
Resolution	< 0.05 ppm
Accuracy	No data available
Long Term Drift	Zero: < 0.1 ppm equivalent change / yr in clean air Sensitivity: < 4% change / yr in clean air w monthly test
Expected Life Span	2 - 3 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	NO_2 @ 10 ppm = < -20 ppm Cl_2 @ 10 ppm = -25 ppm NO @ 50 ppm = < 4 ppm SO_2 @ 20 ppm = < 10 ppm CO @ 400 ppm = < 1.5 ppm H_2 @ 400 ppm = < 0.2 ppm C_2H_4 @ 400 ppm = < 0.5ppm NH_3 @ 20 ppm = < 0.1 ppm

Nitrogen Dioxide (NO_2)

Type	Electrochemical
Range	0 - 10 ppm

Sensor Response Time (T_{90})	< 25 seconds
Operating Temperature	0°C to 50°C (32°F to 122°F)
Operating Humidity	15 - 90% non- condensing
Resolution	0.1 ppm
Accuracy	No data available
Long Term Drift	< 2% signal loss / month
Expected Life Span	2 - 3 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	H_2S @ 20 ppm = < -40 ppm Cl_2 @ 10 ppm = 100 ppm NO @ 50 ppm = < 0.5 ppm SO_2 @ 20 ppm = < -2.5 ppm CO @ 400 ppm = < 0.1 ppm H_2 @ 400 ppm = < 0.1 ppm C_2H_4 @ 50 ppm = < 0.1 ppm NH_3 @ 20 ppm = < 0.1 ppm CO_2 @ 5% volume = < 0.1 ppm

Oxygen (O_2)

Type	Electrochemical
Range	0 - 25% volume
Sensor Response Time (T_{90})	< 15 seconds fr 0 - 20.9%
Operating Temperature	0°C to 55°C (32°F to 131°F)
Operating Humidity	15 - 90% non-condensing
Resolution	0.1% volume
Accuracy	No data available
Long Term Drift	< 1% change in output over 3 months
Expected Life Span	2 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	CO_2 sensitivity: 0.1% change in O_2 reading per % CO_2 in 5% CO_2

Ozone (O_3)	
Type	Electrochemical
Range	0 - 1 ppm
Sensor Response Time (T_{90})	< 60 seconds calc from 3 min exposure @ 30 cc / min flow
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	15 - 90% non-condensing
Resolution	< 0.02 ppm @ 20°C (68°F)
Accuracy	No data available
Long Term Drift	< 10% / 6 months @ 20°C (68°F) and 30 - 50% RH
Expected Life Span	1.5 - 2 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	Br, I_2 = yes; n/d CO_2 @ 5,000 ppm = 0 ppm CO @ 100 ppm = 0 ppm Cl_2 @ 1 ppm = 1.2 ppm N_2H_4 @ 3 ppm = -3 ppm H_2 @ 3,000 ppm = 0 ppm H_2S @ 20 ppm = -1.6 ppm N_2 @ 100% = 0 ppm NO_2 @ 10ppm = 6 ppm

Sulphur Dioxide (SO_2)	
Type	Electrochemical
Range	0 - 20 ppm
Sensor Response Time (T_{90})	< 25 seconds fr 0 - 10 ppm
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	15 - 90% non-condensing
Resolution	< 0.1 ppm
Accuracy	No data available
Long Term Drift	< 2% change / month in clean air

Expected Life Span	2 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	H_2S @ 20 ppm = < 0.1 NO_2 @ 10 ppm = < -130 ppm Cl_2 @ 10 ppm = < -40 ppm NO @ 50 ppm = < ±2 ppm CO @ 400 ppm = < 1.6 ppm H_2 @ 400 ppm = < 0.3 ppm C_2H_4 @ 400 ppm = < 40 ppm NH_3 @ 20 ppm = < 0.1 ppm

TVOCs

Type	Solid State
Range	0 - 500 ppm
Sensor Response Time (T_{90})	N/A
Operating Temperature	-20°C to 40°C (-4°F to 104°F)
Operating Humidity	20 - 90% non- condensing
Resolution	1 ppm
Accuracy	No data available
Long Term Drift	N/A
Expected Life Span	6 - 8 years
Calibration	Every 6 months (depending on application)
Cross Sensitivity	Any combustible gas

TVOCs	
Type	Photo-Ionization Detector
Range	0 - 30 ppm
Sensor Response Time (T_{90})	< 3 seconds
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	5 - 95% non-condensing
Resolution	0.02 ppm
Accuracy	No data available
Long Term Drift	< 2% change / month in clean air
Expected Life Span	5 years (excluding replaceable lamp & electrode stack)
Calibration	Every month to 4 months (depending on application)
Cross Sensitivity	Calibrated with isobutylene (10 ppm)

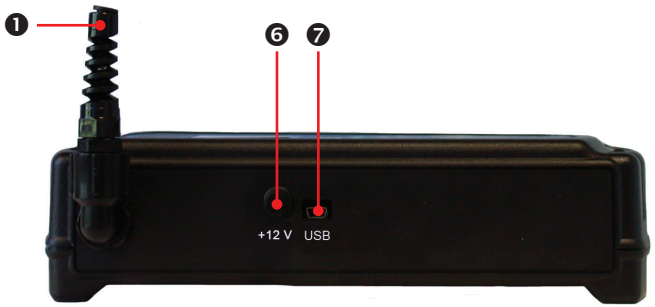
TVOCs	
Type	Photo-Ionization Detector
Range	0 - 300 ppm
Sensor Response Time (T_{90})	< 3 seconds
Operating Temperature	0°C to 40°C (32°F to 104°F)
Operating Humidity	5 - 95% non-condensing
Resolution	0.1 ppm (100 ppb)
Accuracy	No data available
Long Term Drift	< 2% change / month in clean air
Expected Life Span	5 years (excluding replaceable lamp & electrode stack)
Calibration	Every month to 4 months (depending on application)
Cross Sensitivity	Calibrated with isobutylene (100 ppm)

NOTES:

- Not all of the above sensors are available from stock. Delivery time for sensors ordered will vary depending on which sensors are ordered, how many are ordered and measurement range desired.
- Other measurement ranges are available for some sensors. Contact factory with desired range to confirm availability.
- Some of these sensors must be calibrated with correlation gases because they are more readily available. If the customer wishes them to be calibrated with the exact target gas, extra charges will apply to acquire the specific gas if and when available. In these cases, customer will have the option to take the remaining gas. There are extra costs for delivery of the special cylinder of span gas and dangerous goods and shipping costs will apply.
- Some of the above sensors have cross sensitivities to other gases (interfering gases). Please refer to the sensor specification chart before ordering a specific sensor if your application may have some of the interfering gases present.

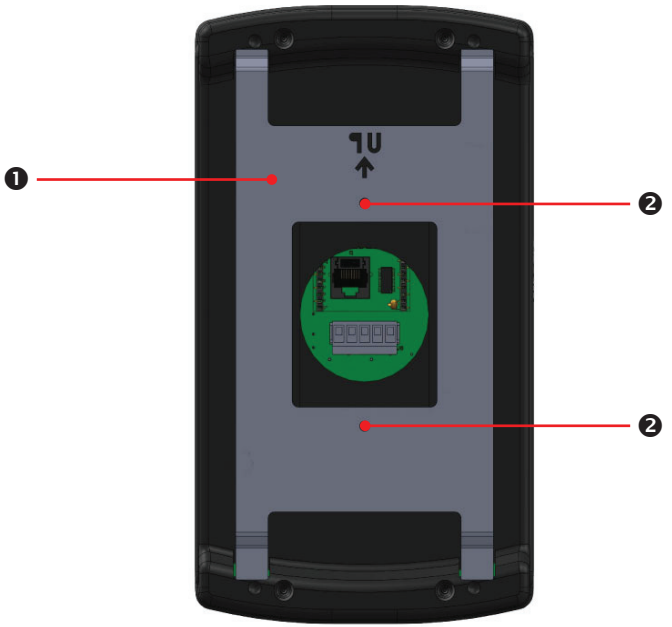
5 FEATURES

5.1 Front & Side Exterior Enclosure



NUMBER	FEATURE	FUNCTION
❶	Temperature & RH Sensor	To detect temperature and humidity ranges.
❷	Full Color LCD Display	Multi-line, colored LCD, alphanumeric display.
❸	Lexan Label	Protects LCD screen and identifies product.
❹	Wi-Fi Antenna	Detects Wi-Fi signal communication.
❺	Air Vents	For gas sampling through diffusion to the sensors.
❻	Plug-in Wall Adapter Slot	For continuous operation. 12VDC only.
❼	USB Port	For retrieving data, configuring logging settings and calibration of sensors.

5.3 Rear View (Wall Mount Version)



NUMBER	FEATURE	FUNCTION
❶	Wall Mount Bracket	For hanging instrument on wall.
❷	Mounting Holes	For mounting instrument into electrical box.

6 OPERATION

6.1 Overview

The YES IMS is a self-contained device that can measure temperature, RH, particulates, and various gases. The instrument will log sensor readings with a time and date stamp. The data log will be stored in the internal flash memory of the device. The format of the data is a comma separated variable (CSV) file for easy importing into the IMS Viewer or Microsoft® Excel. An integral USB port will allow access to retrieve the data log, configure various settings. The optional Wi-Fi module allows for a user to wirelessly connect to the YES IMS using a web browser. The YES IMS configuration and log settings as well as log retrieval can then be done through the web browser.

6.2 Switching Instrument On & Off

Applying power to the instrument will automatically turn the instrument ON and by removing the power will automatically turn the instrument OFF.

6.2.1 Sensor Warm-Up

When the YES IMS is powered up, the sensors must go through a warm-up phase. During the warm-up phase, the device waits for the sensors to stabilize so that the readings will be accurate. The warm-up phase typically lasts for 2 minutes.

6.3 Understanding the LCD Display

6.3.1 Sensor Displays

The LCD display will have a field for each sensor that is connected to the YES IMS. The name, units, and value of the each sensor are shown.

6.3.2 Orange Warning Levels

If the sensors measure values that fall into the warning limits then the blue background of the sensor display will change to orange to indicate the warning condition. These warning levels are factory set and do not control any actions.

6.3.3 Red Alarm Levels

If the sensors measure values that are outside the pre-determined accepted limits then the background of the sensor display will change to red indicating the alarm condition. The audible alarm and relay can be configured to activate at this level.

6.3.4 Date / Time Display

The YES IMS displays the current date and time at the bottom of the sensor display area. The device can be synchronized to the time of a computer using the IMS Viewer software or using a browser over the wireless connection if Wi-Fi module installed.

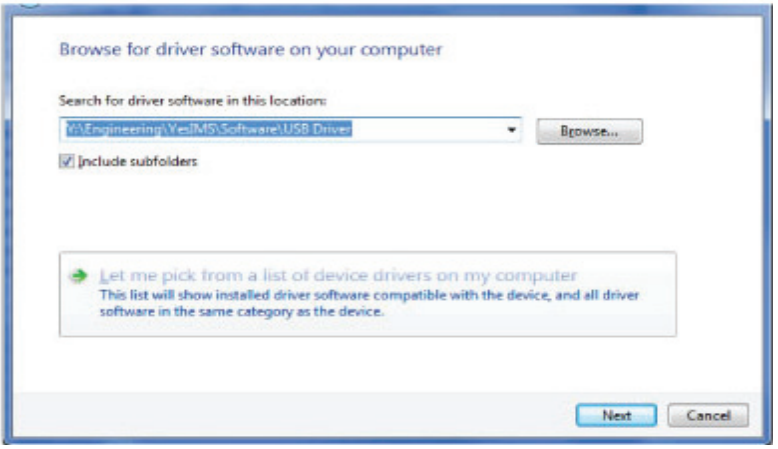
6.3.5 Status Message Display

The bottom 1/3 of the display is the status area. This area displays the status of the device during key events such as sensor warm up, log download, wireless network connection, etc.

6.4 Installing the USB Driver

6.4.1 Windows XP and Windows 7

1. Connect the power adapter to the YES IMS device to turn it on.
2. Connect the USB cable between the YES IMS and the computer.
3. The computer may install a generic driver for the YES IMS USB.
4. A newer driver is required to connect to the YES IMS.
5. Navigate to Start » Control Panel » Device Manager.
6. In the device manager, locate the YES IMS device. It may be shown as an unknown device.
7. Right click on the YES IMS device and select update driver.
8. Select **browse my computer for drivers**.
9. Select **Let me pick from a list of device drivers on my computer**.



10. Click the **Have Disk** button and locate the USB driver folder on the installation CD. If the **Have Disk** button is not visible on this screen, click the **next** button to find it on the next one.

11. Click next. Windows will prompt telling you the driver is unsigned, choose install this driver anyway.
12. Reboot your computer and power cycle the YES IMS device to complete the installation process.

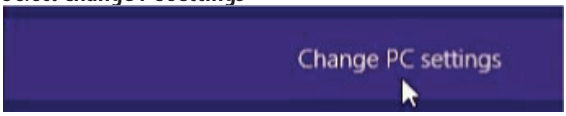
6.4.2 Windows 8

To install the USB driver on Windows 8 it is first necessary to temporarily disable driver signature enforcement.

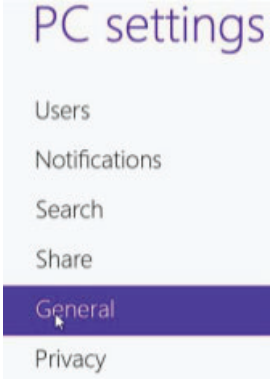
To disable driver signature enforcement:

1. Open the **Windows Charms** sidebar on the right side of the screen by swiping the lower right corner or dragging the mouse to the lower right corner.
2. Select **Settings** (gear icon) on the lower right.

3. Select **Change PC settings**

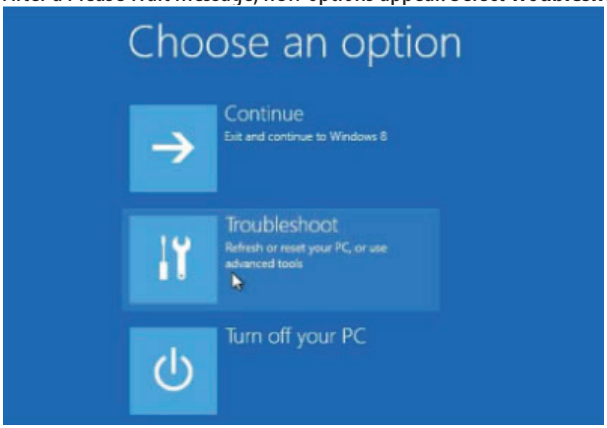


4. Select **General** on the PC settings list

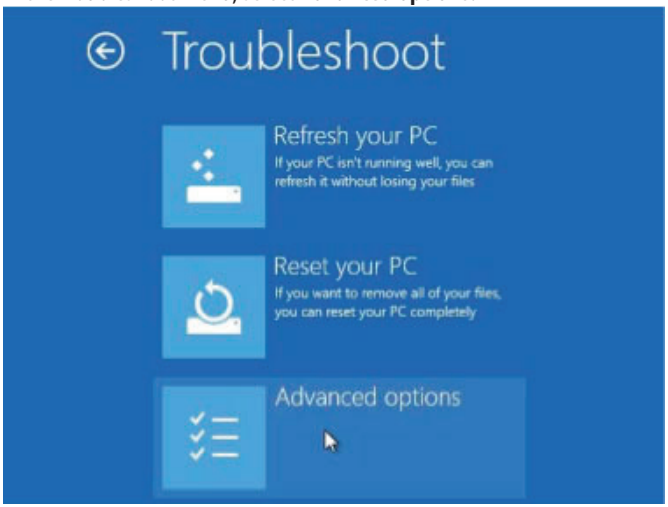


5. Scroll to the bottom of the General settings to find advanced startup and select **Restart now**.

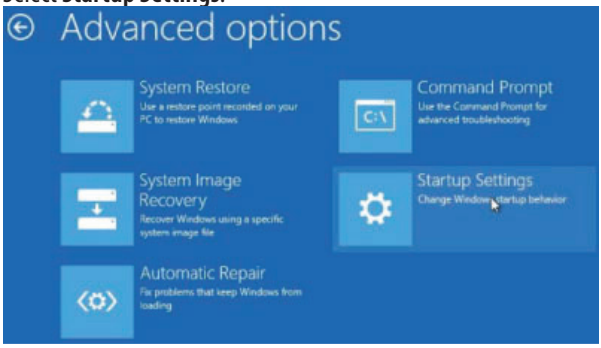
6. After a Please Wait message, new options appear. Select **Troubleshoot**.



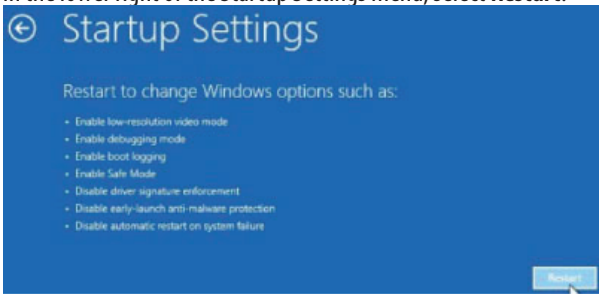
7. In the Troubleshoot menu, select **Advanced options**.



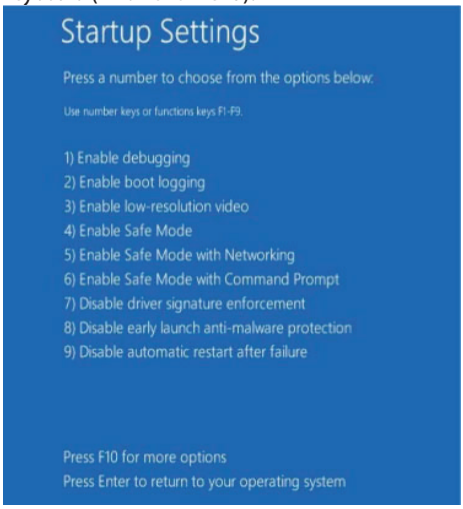
8. Select **Startup Settings**.



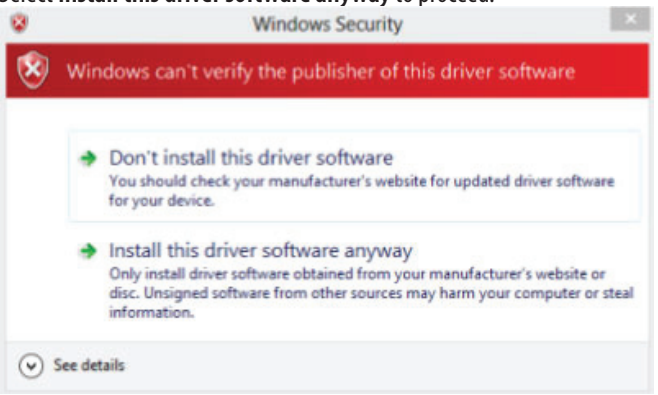
9. In the lower right of the Startup Settings menu, select **Restart**.



10. The computer will reboot. During startup the following screen will be displayed. Select **Disable driver signature enforcement** by pressing the appropriate **number key** on the keyboard (#7 on this menu).

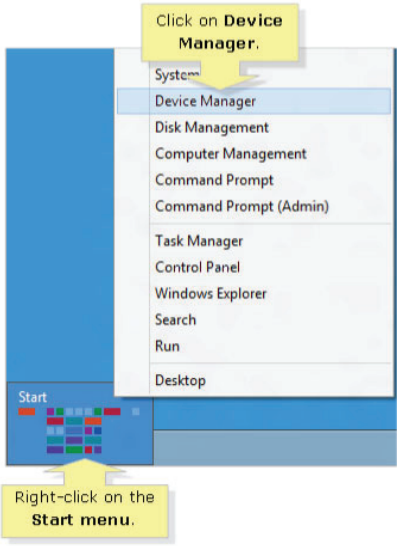


11. The computer will continue into normal startup. You may now proceed with the USB driver installation. During the driver install process you will be prompted to verify the installation. Select **Install this driver software anyway** to proceed.



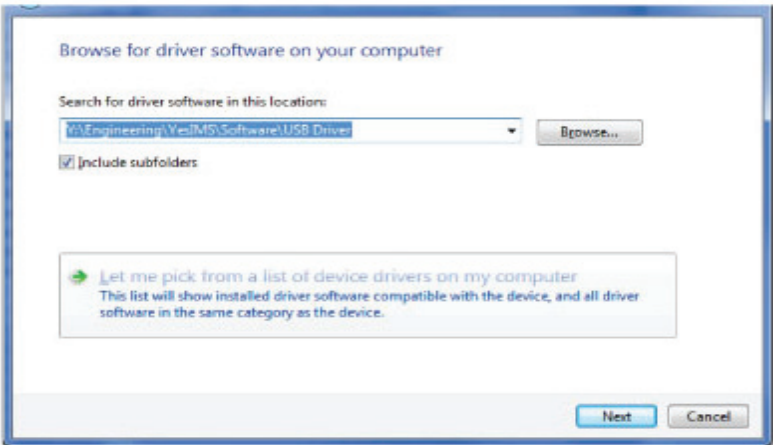
Please note that this is a one-boot option. When the PC is rebooted, enforcement will be in effect again. This will not affect the driver once it is installed.

12. Hover your cursor over the bottom-left corner of your screen, the start icon will appear. Right click this icon and select **Device Manager**.



13. Connect the power adapter to the YES IMS device to turn it on.

14. Connect the USB cable between the YES IMS and the computer.
15. The computer may install a generic driver for the YES IMS USB.
16. A newer driver is required to connect to the YES IMS.
17. Navigate to Start » Control Panel » Device Manager.
18. In the device manager, locate the YES IMS device. It may be shown as an unknown device.
19. Right click on the YES IMS device and select update driver.
20. Select **browse my computer for drivers**.
21. Select **Let me pick from a list of device drivers on my computer**.



22. Click the **Have Disk** button and locate the USB driver folder on the installation CD. If the **Have Disk** button is not visible on this screen, click the **next** button to find it on the next one.

23. Click next. Windows will prompt telling you the driver is unsigned, choose install this driver anyway.
24. Reboot your computer and power cycle the YES IMS device to complete the installation process.

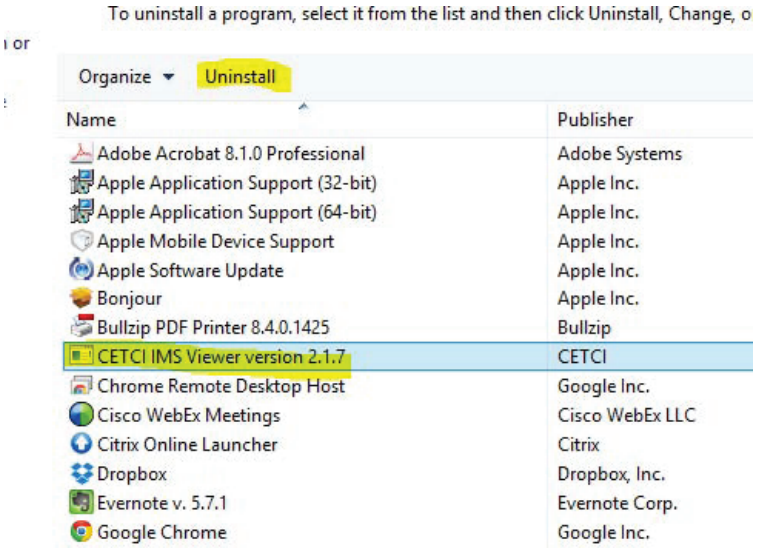
6.4.3 Windows 8.1

To install the USB driver on Windows 8.1 it is first necessary to temporarily disable driver signature enforcement. If you have previously attempted to install the USB drivers and/or the IMS Viewer, you must unistall those first by following Steps A to D below. If this is your first time installing the USB drivers and/or the IMS Viewer, proceed directly to *To disable driver signature enforcement*.

To unistall the current version of IMS Viewer:

Step A

Use the Windows Key or click on the bottom left Start button and in the search field type '**Uninstall a Program**'. Open the window and look for **CETCI IMS Viewer**. Click to highlight it and then click the **Uninstall** button.



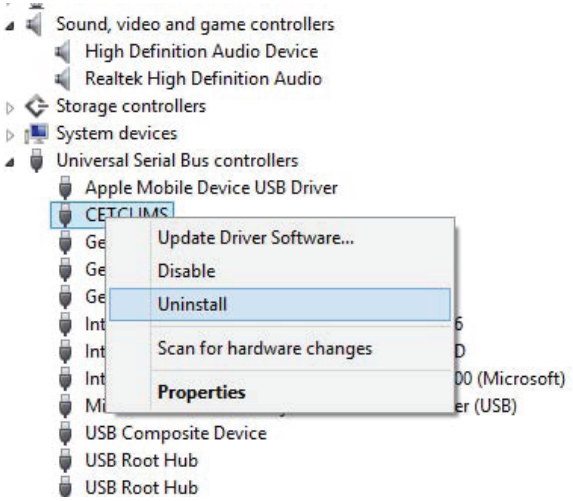
Step B

Plug in the powered up YES IMS using the USB cord.

Step C

Use the Windows Key or click on the bottom left Start button and in the search field type '**Device Manager**'. Click on it. In the Device Manager screen lok for **CETCI IMS**. It should be located under Universal Serial Bus Controller and will probably have a yellow exclamation point beside it. Right

click on it and choose **Uninstall**.

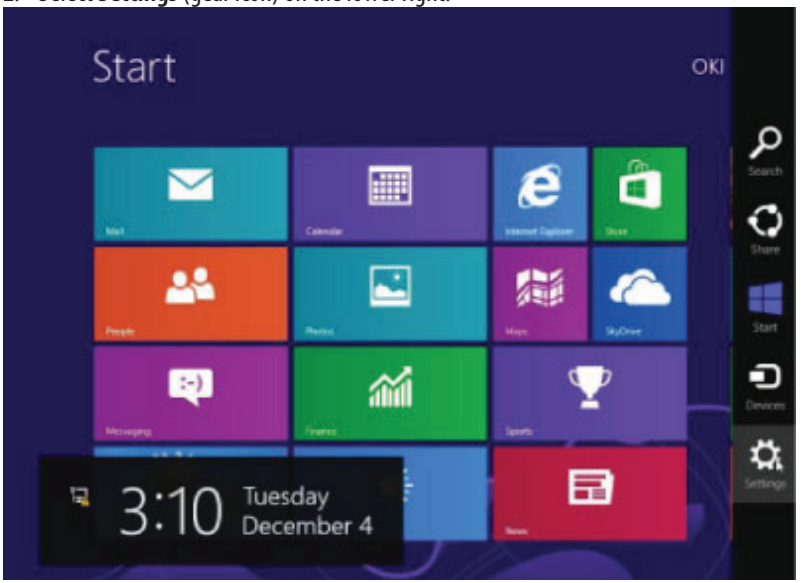


Step D

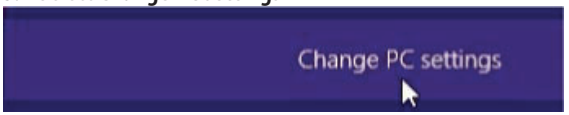
Check the box that says '**Delete the driver software for this device**' and then click **OK**.

To disable driver signature enforcement:

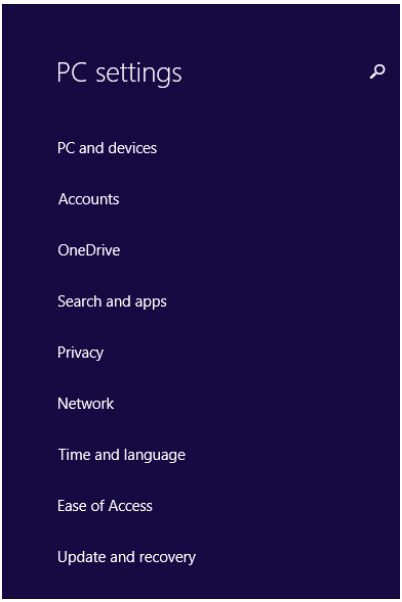
1. Open the **Windows Charms** sidebar on the right side of the screen by swiping the lower right corner or dragging the mouse to the lower right corner.
2. Select **Settings** (gear icon) on the lower right.



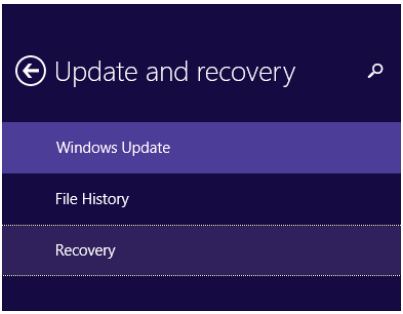
3. Select **Change PC settings**



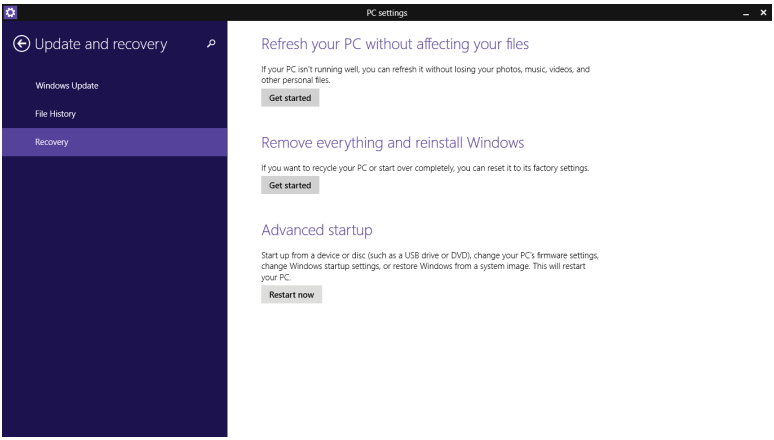
4. Select **Update and Recovery** on the PC settings list.



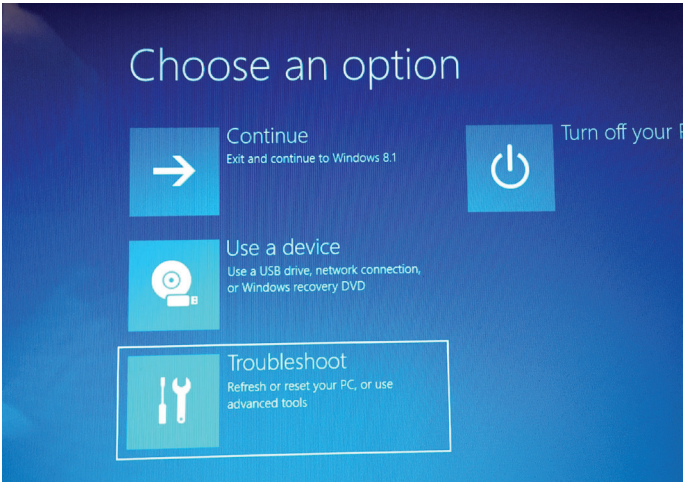
5. Select **Recovery** from the Update and Recovery List.



6. Select **Restart Now** (under Advanced Settings) from the next window.

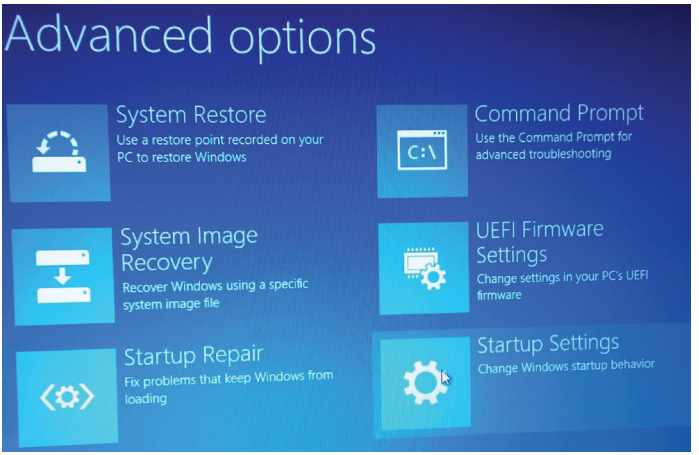


7. After a Please Wait message, new options appear. Select **Troubleshoot**.

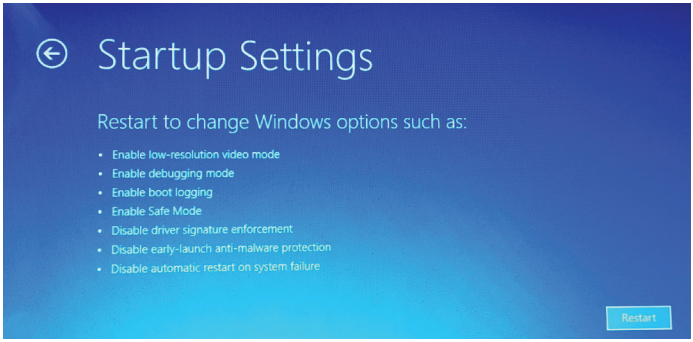


8. In the Troubleshoot menus, select **Advanced Options**.

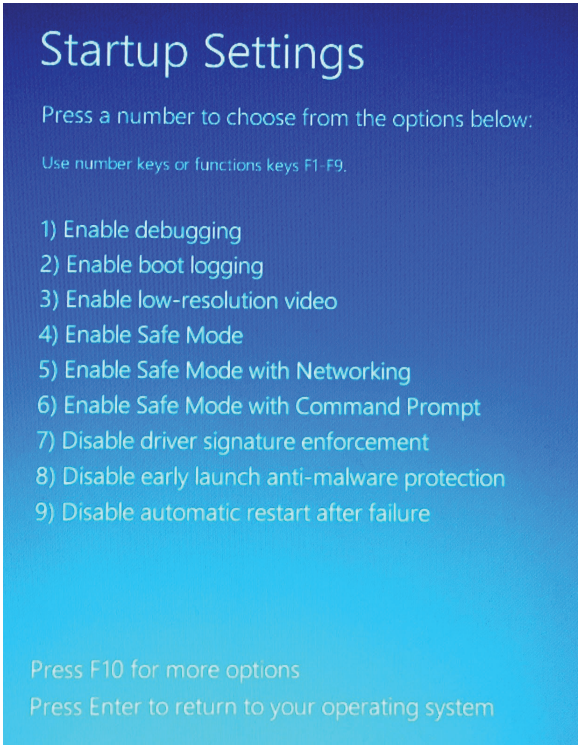
9. Select **Startup Settings**.



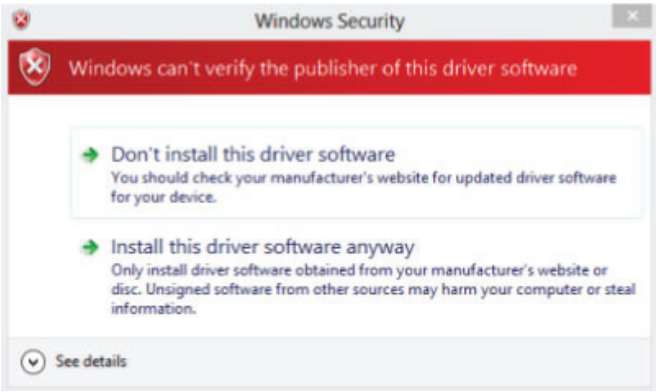
10. In the lower right side of the Startup Settings menu, select **Restart**.



11. The computer will reboot. During startup the following screen will be displayed. Select **Disable driver signature enforcement** by pressing the appropriate **number key** on the keyboard (#7 on this menu).

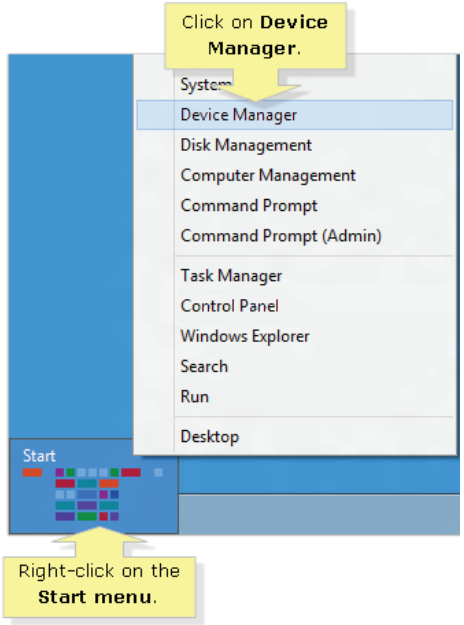


12. The computer will continue into normal startup. You may now proceed with the USB driver installation. During the driver install process, you will be prompted to verify the installation. Select **Install this driver software anyway** to proceed.

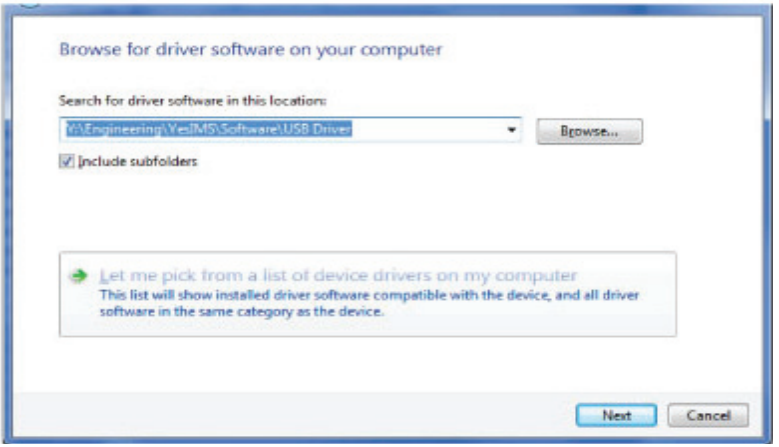


Please note that this is a one-boot option. When the PC is rebooted, enforcement will be in effect again. This will not affect the driver once it is installed.

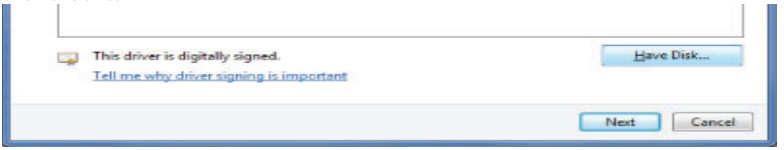
13. Hover your cursor over the bottom left corner of your screen. The start icon will appear. Right click this icon and select **Device Manager**.



14. Connect the power adapter to the YES IMS device to turn it on.
15. Connect the USB cable between the YES IMS and the computer.
16. The computer may install a generic driver for the YES IMS USB.
17. A newer driver is required to connect to the YES IMS.
18. Navigate to Start » Control Panel » Device Manager.
19. In the device manager, locate the **YES IMS** device. It may be shown as an unknown device.
20. Right click on the YES IMS device and select **update driver**.
21. Select **browse my computer for drivers**.
22. Select **Let me pick from a list of device drivers on my computer**.

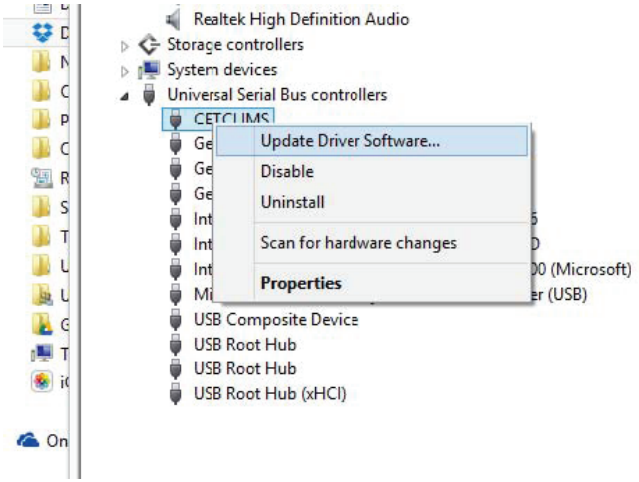


23. Click the **Have Disk** button and locate the USB driver folder on the CETCI Installation USB stick. If the **Have Disk** button is not visible on this screen, click the **next** button to find it on the next one.



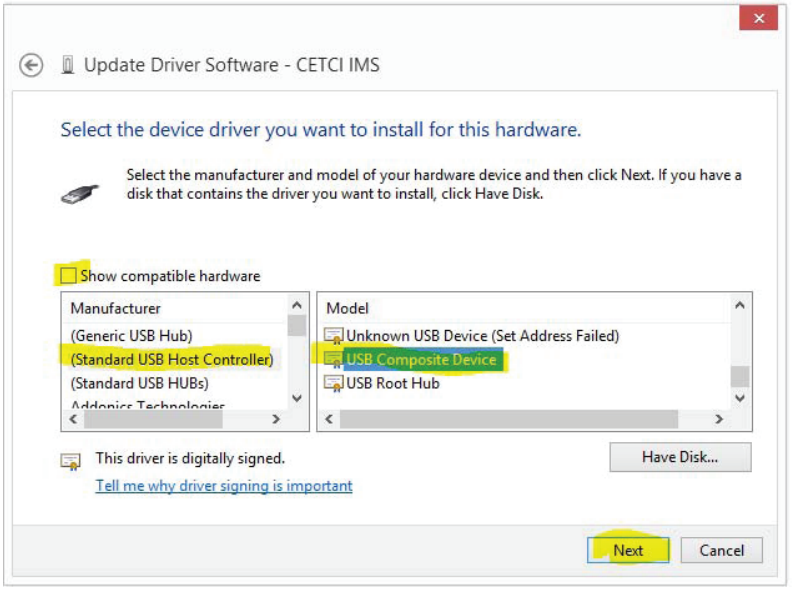
24. Click next. Windows will prompt telling you the driver is unsigned, choose **Install this driver anyway**.
25. Reboot your computer and power cycle the YES IMS device to complete the installation process.

26. Next install the IMS Viewer application by double clicking on the **setup-ims-viewer-2.1.7.exe** file located on the USB stick that came with the YES IMS device.
27. Run the CETCI IMS Viewer program and click on **Connect to IMS**. You should now see the same readout as on your monitor and be able to cilck on the **Datalog** tab to download information for your report. If you do not see this, proceed to Step 28.
28. If your IMS Viewer still does not connect, go back to the **Device Manager**.
29. Right click on the **CETCI IMS** device under **Universal Serial Bus Controllers** and choose **Update Driver Software**.



30. Choose **Browse my computer...**, then choose **Let me pick from a list...**
31. Make sure the **Show compatible hardware** box is **UNCHECKED**.

32. In the left box choose from the dropdown **Standard USB Host Controller** and then on the right choose **USB Composite Device**. Click **Next**.



33. An **Update Driver Warning** will popup. Click on **Yes**.
34. A **Windows Security Warning** may popup as well. If it does, click on **Install Anyways**.
35. Now when you install and open the IMS Viewer you will see the realtime sensor data and the Datalog tab.

6.5 IMS Viewer Application

6.5.1 Overview

The IMS Viewer application allows the user to set various configuration options, synchronize the time and date, download the log file, and enter wireless network settings as well as graph the downloaded data.

6.5.2 Sensors Tab

The sensors tab displays the sensor readings and allows a user to synchronize the time and date with the computer.

6.5.3 Data Log Tab

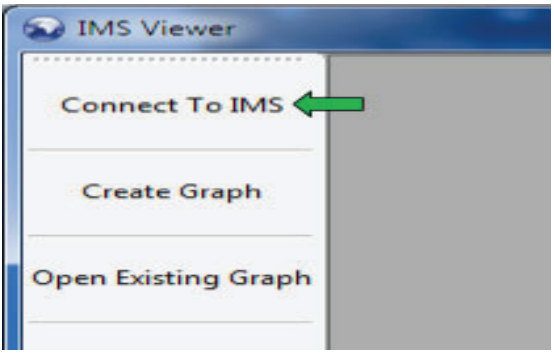
The data log tab allows a user to retrieve the data log from the YES IMS device. The data will be downloaded as a CSV file and can be viewed using the IMS Viewer or Microsoft® Excel.

6.5.4 Wi-Fi Settings Tab

The Wi-Fi settings tab allows a user to configure the Wi-Fi and network settings of the device. The YES IMS can be configured to act as a isolated wireless access point or it can join an existing wireless network.

6.5.5 Connecting to the YES IMS

To connect to the YES IMS the USB driver must be installed. Start YES IMS Viewer by clicking on the desktop shortcut. Once the application is open, click on the connect button to establish a connection to the device.

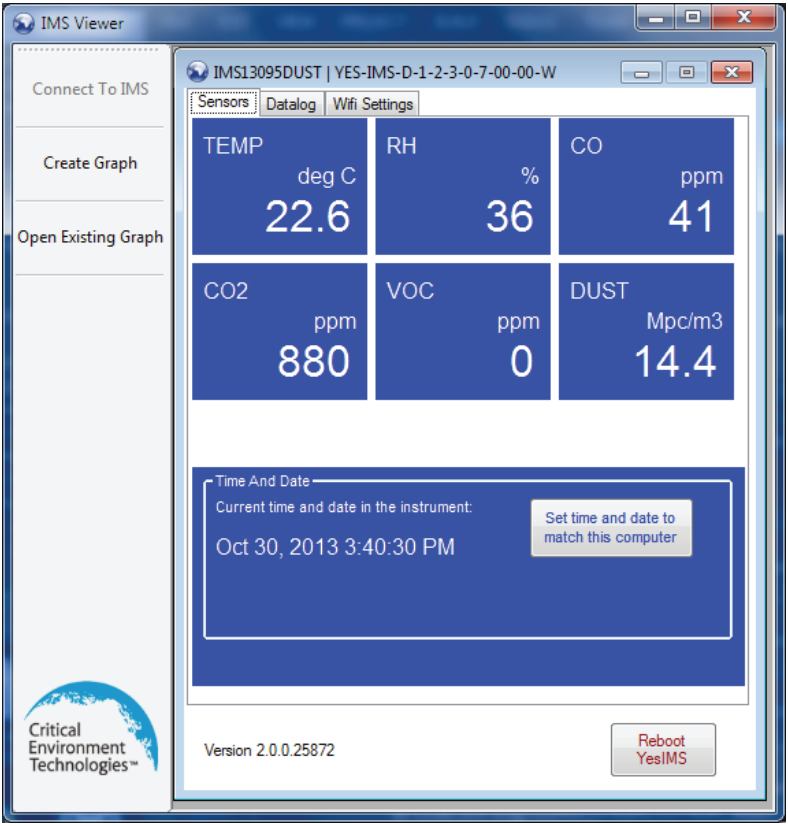


Sensors Display

The sensors will we displayed in the Sensors Tab in the same manner as the LCD display on the YES IMS.

Synchronize Time to Computer

Clicking the Set time and date to match this computer button will synchronize the time between the instrument and the host computer. If the YES IMS is to be used in a different time zone, the computer clock can be changed temporarily prior to synchronizing with the YES IMS.



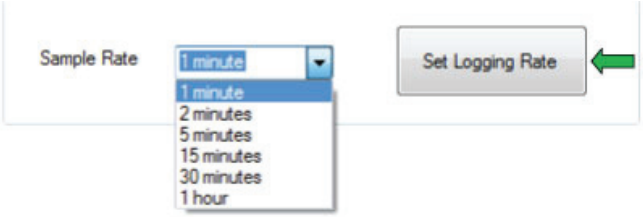
6.5.6 Data log Settings

Several parameters related to the data log can be configured by navigating to the data log tab in the YES IMS Viewer application.

Setting the Logging Interval

The logging interval can be set to the following values 1, 2, 5, 15, 30, and 60 minutes. To set the log interval select the desired interval from the drop down menu and then press the **Set**

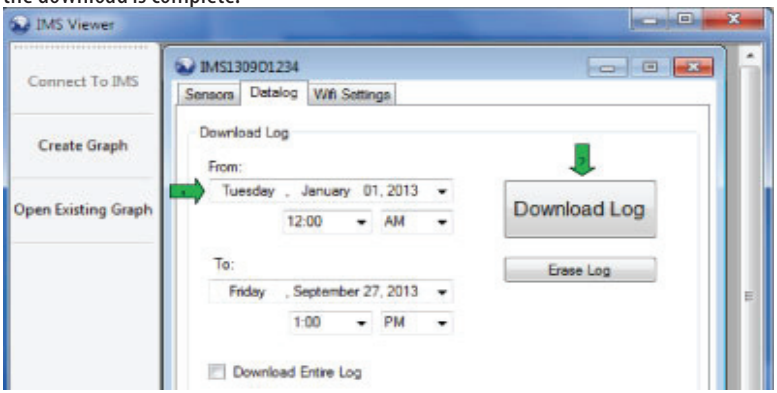
Logging Rate button.



Downloading the Data Log

The data log can be downloaded through the IMS Viewer application:

1. Select the range of data that you would like to download using the drop down date menus or, to download the entire log, select the download entire log checkbox.
2. Click the **Download Log** button to start the download. A message will be displayed when the download is complete.



NOTE: the device will not log data while the USB is connected.

Erasing the Data Log

To erase the data log, click the Erase Log button. A message will be displayed when the erasing is complete. **IMPORTANT: Do not unplug the power or disconnect the device from the USB for a minimum of 10 to 15 minutes.** Then power cycle and disconnect the device from the USB to restart data logging.

6.5.7 Wi-Fi Settings

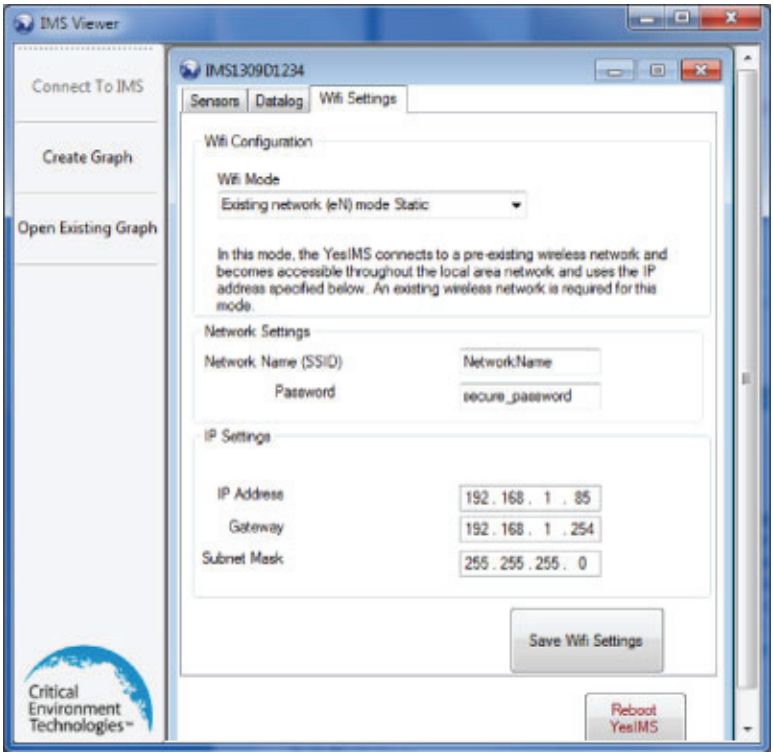
The Wi-Fi settings of the device can be configured by IMS Viewer. The Wi-Fi mode, IP address, gateway, and subnet mask can be configured. The device can be configured as a stand-alone wireless access point or it can be configured to join an existing wireless network. See section 6.6 for more information about the wireless functionality of the YES IMS.

When the YES IMS successfully joins a wireless network or creates a network using access point mode, the IP address of the instrument is displayed in the status message area of the LCD screen for convenience. The user can then navigate to the YES IMS web page by typing the IP address into the URL bar of the browser.

Setting the Wi-Fi Mode

This dropdown selection can be used to configure the Wi-Fi module on the YES IMS for the desired mode of operation.

Wi-Fi MODE	DESCRIPTION
Access Point	In this mode the YES IMS acts as a stand-alone wireless access point. The user will be able to connect to the instrument using their computer, tablet, or mobile device. Once connected, the user will be able to configure settings, view the live measurement feed, and download the data log. No pre-existing wireless networks are required for operation in this mode.
Existing Network Automatic	In this mode the YES IMS joins a pre-existing wireless network. The user must provide the wireless network name (SSID) and the password so that the YES IMS can attempt to join the network. In this mode the YES IMS will attempt to automatically configure itself based on your networks settings. DHCP needs to be enabled on your router for this option to work.
Existing Network Static	In this mode the YES IMS joins a pre-existing wireless network. The user must provide the wireless network name (SSID), password, IP address subnet mask, and default gateway so that the YES IMS can attempt to join the network.



6.5.8 Graphing Data Logs

If the CSV file is opened and saved, by programs like Microsoft® Excel, it will no longer be usable in the YES IMS Viewer.

Graphing Log Files

The data log files that the YES IMS creates are of the CSV format and can be graphed using any type of spreadsheet software. The data logs can also be graphed automatically using IMS Viewer by clicking on the **Create Graph** button and loading a data log that has been previously saved.

Saving a Graph

The graphs created using IMS Viewer can be saved as a graph file so that it can be reopened later. To save a graph, click the **save graph** button and give it a file name ending in the .YVG extension.

Loading a Graph

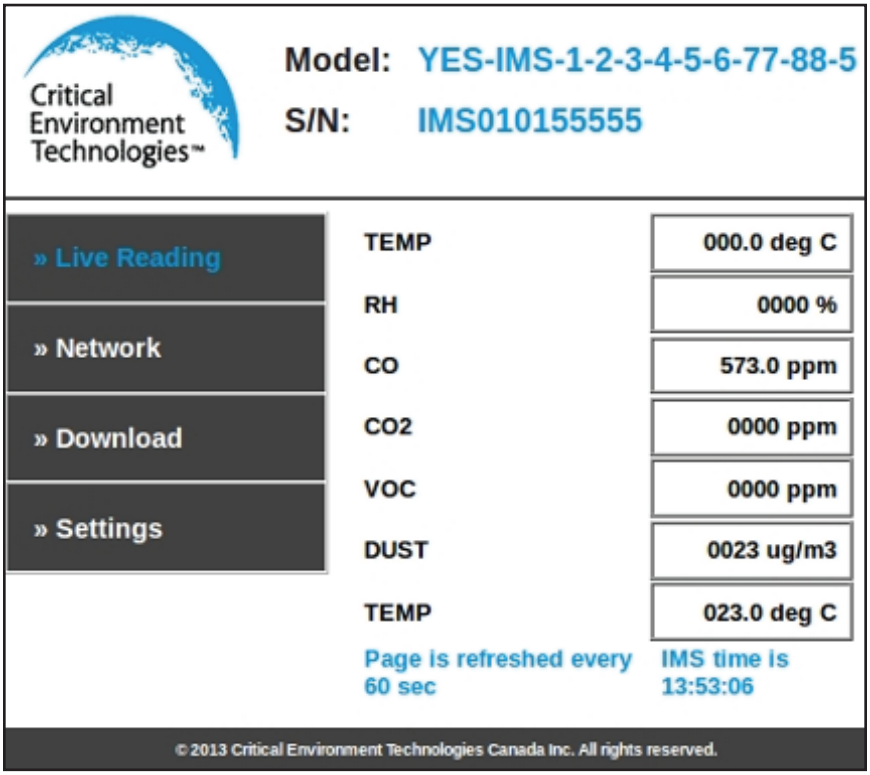
To load a graph that has been previously saved using IMS Viewer, click the **load graph** button on the left pane.

6.6 Wi-Fi Web Interface

The web interface connects the YES IMS via Wi-Fi to the customer's web browsing device, such as, a computer, laptop, smart phone, or tablet.

6.6.1 Getting Started

1. Connect the YES IMS (equipped with a Wi-Fi module) to a power supply.
2. Turn on the (Wi-Fi supporting) web browsing device.
3. At the bottom of the YES IMS screen, **Connecting to Network** message should appear.
4. Wait until the message at the bottom of the YES IMS screen changes to **IP:192.168.5.5**. This indicates that the YES IMS has made its own network using the YES IMS serial number as the network name.
5. On the web browsing device, open the **Network Manager** or other application that shows the Wi-Fi networks available. There should be list of network names that the web browsing device can connect to.
6. Find the network name beginning with "IMS" followed by nine numeric digits. The network name should be the YES IMS serial number which can be found on the back of the YES IMS.
7. Select the YES IMS network to connect.
8. Enter the twelve alphanumeric character of the YES IMS serial number as a password. Password is case sensitive.
9. On the web browsing device, the **Network Manager** should show a confirmation message indicating that it is connected.
10. With a browser (such as, Internet Explorer, Firefox, Chrome, or Opera). Type in the URL address: **http://192.168.5.5**
11. The Live Reading page (see image below) will appear in the web browser.



NOTES:

- The wireless request needs time to process. If a request has been initiated, do not attempt to reload or request a new action until the existing action has completed. YES IMS could become unresponsive to repeated clicks and will automatically reset the network.
- If the YES IMS does not respond for a prolonged period of time, disconnect from the YES IMS network by accessing the **Network Manager** and reconnect. Normally, the YES IMS should respond in a few seconds EXCEPT when downloading or erasing log operations which can take some time.
- If reconnecting does not help, disconnect the YES IMS unit from the power supply for a short time and connect it to the power supply again. Repeat all the steps above.

6.6.2 Wireless Connection Methods and Modes

YES IMS has two connection methods and three modes of wireless communication:
AP - Access Point (standalone)
Method Automatic (DHCP)
SA - Server (LAN HTTP Server)
CA - Client (WAN HTTP Client)
Method Static
SS - Server (LAN HTTP Server)
CS - Client (WAN HTTP Client)

Communication Mode: Access Point (AP) Mode
In the Access Point (AP) mode, the YES IMS generates its own Wi-Fi network, similar to a Wi-Fi hotspot. It generates its own network name (SSID), checks passwords and assigns IP addresses (192.168.5.5) for the customer's browsing device. The network name is fixed and can't be changed by the customer. The name is embedded into the YES IMS and is the same as the YES IMS serial number.

YES IMS can handle up to four Wi-Fi devices simultaneously. For efficiency and stability, it is recommended to connect only one Wi-Fi device at a time. YES IMS is typically used as an **independent monitoring station** when in AP mode.

Once installed or placed in a permanent location and connected to a power supply, the YES IMS will keep its own permanent network and will run for an indefinite time. Customers can periodically check or download log file via Wi-Fi by connecting to it from a stable communication distance (≤ 300 ft). AP mode does not require internet access. The communication method used is Static IP.

For the other two Modes of communications they can be connected using two Methods either Automatic (DHCP) IP or static IP. **The method for Client Mode should be configured first. See Client Mode section.**

Communication Server (SA or SS) Mode (Automatic or Static)
In Server Automatic mode (SA), the YES IMS works similar to a regular web server. It accepts requests from the web browser, then generates and sends the information as web pages. Additionally, the YES IMS executes commands to perform operations such as, download log file, erase log file, set network parameters, synchronize internal YES IMS time with customer's browsing device, set logging interval, and set live page refreshing interval. the YES IMS will need to join a pre-existing network. Customers will need to know the existing network name

(SSID) and password. After entering the existing network name and password into YES IMS, it will automatically switched to Server mode.

YES IMS is typically used as an automatic monitoring station when in Server mode. YES IMS constantly connects to the existing Wi-Fi network, which in its turn provides connection to other devices on the network. To access YES IMS through the network, a wireless connection need to be set up.

Server Static Mode (SS) has the same function as the Automatic except the Customer needs to supply the Network Addressing (IP, Subnet Mask, Gateway addresses) .

Finding YES IMS IP Address
In both modes, YES IMS IP address is shown at bottom right corner of the LCD screen. This is the address that is entered into the Browser to access the web page.

Communication Client (CA or CS) Mode (Automatic or Static)
NOTE: This mode is intended ONLY for customers that provide web service for subscribers.

In Client Automatic Mode (CA), The YES IMS works similar to a web browser. It forms HTTP requests and send them to an external web server which is maintained by the subscribe service provider. YES IMS sends initial requests periodically in 10 minute intervals. If YES IMS does not get web page responses from the web server, it stays inactive for another 10 minutes, then will try to make a new connection to the web server and sends a new request.

Client Static Mode (SS) has the same function as the Automatic except the Customer needs to supply the Network Addressing (IP, Subnet Mask , Gateway addresses)

6.6.3 Detailed Description of Wi-Fi Operation

Refer to the **YES IMS Programming Manual** for a detailed description of operations:

- Configuring the YES IMS Wi-Fi
- Downloading Log
- Erasing Log
- Setting the logging parameters
- Setting the YES IMS internal time

7 FUNCTION

7.1 Calibration

Calibration can only be performed by using CETCI Utility software which is only available to authorized distributors.

CALIBRATION FREQUENCY

The frequency of calibration for Temperature and Relative humidity sensors should be once per year. All other toxic and combustible gas sensors should be calibrated once every six months for best performance and to meet published specifications.

7.2 Datalog

Data logging configuration can be performed by using the PC application software or via a web browser by connecting to the device's Wi-Fi network.

- Logging rate can be set from any interval between 1 minute and 1 hour.
- The instrument logs the instantaneous sensor readings (the sensor readings are not averaged over the sampling period). This is the factory default logging method.

There are two other options for the logging method that can be requested at purchase time:

- The instrument can be configure to log the average value over the sample time (e.g. with a 5 minute logging rate the average of all the readings during the last 5 minutes is saved).
- The instrument can be configured to log the peak value recorded during the sample window.

8 INFORMATION RECORDING OPERATIONS

Installation of YES IMS Viewer software:

1. Insert supplied CD in CD / DVD rom drive.
2. Accept the terms and conditions.
3. Follow the instructions.
4. Finally complete the installation by clicking on Finish tab.
5. After Installation the YES IMS Viewer icon will appear automatically on your computer desktop. Double click on YES IMS Viewer icon on your Desktop.

9 MAINTENANCE

Externally, the YES IMS requires only cleaning with a damp cloth, wiping off the exterior surface and basic inspection for obvious damage or problems. There are no user serviceable parts inside. The YES IMS should be returned to an authorized service facility where the Internal sensors should be maintained because they have a specific life span. As they age, they must be calibrated (null and span adjusted) for accuracy. If one or more sensors do not respond to span gas, check the age of the sensor as they may have expired.

Contact your local authorized service provider or the factory for service to replace expired sensors or any other parts that are required.

10 TROUBLE SHOOTING

YES IMS will not connect to a pre-existing Wi-Fi network.

Cause: Wi-Fi settings may be incorrect

Solution: Power cycle the IMS. The YES IMS will go into AP mode for 5 minutes. During this time, use a Wi-Fi enabled computer to connect to the YES IMS generated Wi-Fi as stated in the section 6.6. Ensure correct network name and password. If using a static IP mode, ensure the IP address is valid and that gateway and Subnet mask are correct. Contact your network administrator to get these values. If using automatic DHCP, ensure password and network name are correct. Contact your network administrator if the YES IMS will still not join the network.

11 ACCESSORIES

11.1 Hard Shell Carrying Case

This cases provides the ultimate protection for your equipment. It is light weight, water-proof, dust-proof, crush-proof, and floats in water.

Product Code: 6010.20

NOTES

NOTES

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