TURNKEY ® iGAS® OPERATING INSTRUCTIONS

The following associated documentation is available from www.iGASES.uk

- ***iGAS Installation Instructions***
- ***Installing the Power Portal***
- ***Connecting iGAS to AirQWeb***

BEFORE YOU START

iGAS® is supplied with its air filters removed. It is important these are refitted before you start to use the instrument. Please refer to Figure 7 of the iGAS Installation Instructions. The larger Zero Filter screws into the adaptor on the left, the twin o-rings of the smaller PTFE sample filter push into the adaptor on the right. Before you begin, please make sure both filters are installed correctly.

IMPORTANT: REMOVE THE END CAPS FROM A NEW ZERO FILTER AND IT ALLOW TO VENT FOR 24 HOURS BEFORE FITTING. OTHERWISE, WHEN A NEW ZERO FILTER IS FITTED, IT CAN TAKE SEVERAL HOURS FOR THE READINGS TO STABILIZE, ESPECIALLY CO, H_2S and SO_2

It is recommended that the filters are changed at 3-monthly intervals, however, filter life may vary depending on local ambient conditions. iGAS is supplied with one spare set of filters. It good practice to mark the filters with their installation date.

A Filter Shield is provided with the instrument and this should be fitted when the instrument is installed. It prevents the filters rapidly heating-up in direct sunshine and provides some additional anti-tamper security. Please refer to the installation guide for more information.

iGAS is supplied in a weather proof case and, providing the Manifold temperature does not exceed 45° C, will operate unshielded in most temperate climates. However, if the instrument is to be installed in tropical locations, a full Sun Shield is available. This prevents the instrument case overheating by reflecting away direct sunlight and is fitted in place of the standard Filter Shield. Please contact Turnkey for more information

PREAMBLE

iGAS® operates automatically under the control of AirQWeb and associated programs and Apps. The instrument is supplied pre-configured so that it will start operating automatically as soon as it is connected to AirQWeb.

iGAS is factory set to measure the following

- Measurements are in SI units
- Reporting interval is 1 minute
- Viewing interval is 2 seconds
- Zero phase length is 1 minute
- Continuous zero correction is enabled

Visit www.iGASES.uk to download more information.

The rest of this document gives deeper knowledge of the instrument to allow the operator to change its operating mode to suit their application. These changes can be made using AirQWeb or other programs and Apps. All sampling measurements must be stopped before any of the instrument's settings can be changed.

Operation of the instrument is controlled by the state of its **Feature Flags** and its **Instrument Settings**. Its operational state is indicated by the **Instrument Information** table, **Fault Flag** states and **Diagnostic & Housekeeping Readings.**

Please see Appendix of this document for full lists of the Feature Flags, Instrument Settings, Fault Flags and Diagnostic readings.

The electrochemical cells used in iGAS need to be held under a constant bias voltage even when the instrument is not being used. With 8 cells connected, this draws a current of about 10 mA from the battery, WHICH MEANS THE BATTERY WILL BECOME EXHAUSTED AFTER ABOUT 10 DAYS.

If you intend not to use the iGAS instrument for several days, disconnect the battery by setting the **Power Isolator Switch** to O. Return the switch to 1 when you wish to start using the instrument again. Note that the electrochemical cells may take several hours to recover after powering down. Wait until their readings stabilize. You may also momentarily click the isolator switch if, for whatever reason, you need to reboot the instrument.

AIR QUALITY INDEX

The Air Quality Index (AQI) is based on the concentration of various gaseous and particulate pollutants. Current values for the UK and USA are listed in the following tables: but be aware, the UK index runs from 0 to 10, the USA one 0 to 500!

EU and UK DEFRA

Index	Ozone, Running 8 hourly mean ($\mu g/m^3$)	Nitrogen Dioxide, Hourly mean ($\mu g/m^3$)	Sulphur Dioxide, 15 minute mean ($\mu g/m^3$)	PM2.5 Particles, 24 hour mean ($\mu g/m^3$)	PM10 Particles, 24 hour mean ($\mu g/m^3$)
1	0-33	0-67	0-88	0-11	0-16
2	34-66	68-134	89-177	12-23	17-33
3	67-100	135-200	178-266	24-35	34-50
4	101-120	201-267	267-354	36-41	51-58
5	121-140	268-334	355-443	42-47	59-66
6	141-160	335-400	444-532	48-53	67-75
7	161-187	401-467	533-710	54-58	76-83
8	188-213	468-534	711-887	59-64	84-91
9	214-240	535-600	888-1064	65-70	92-100
10	≥ 241	≥ 601	≥ 1065	≥ 71	≥ 101

The Daily Air Quality Index (DAQI) in the leftmost column tells you about levels of air pollution and provides recommended actions and health advice. The index is numbered 1-10 and divided into four bands, low (1) to very high (10), to provide detail about air pollution levels in a simple way, similar to the sun index or pollen index.

USA EPA

O_3 (ppb)	O_3 (ppb)	$PM_{2.5}$ ($\mu g/m^3$)	PM_{10} ($\mu g/m^3$)	CO (ppm)	SO_2 (ppb)	NO_2 (ppb)	AQI	AQI
C_{low} - C_{high} (avg)	C_{low} - C_{high} (avg)	C_{low}- C_{high} (avg)	C_{low} - C_{high} (avg)	C_{low} - C_{high} (avg)	C_{low} - C_{high} (avg)	C_{low} - C_{high} (avg)	I_{low} - I_{high}	Category
0-54 (8-hr)	-	0.0-12.0 (24-hr)	0-54 (24-hr)	0.0-4.4 (8-hr)	0-35 (1-hr)	0-53 (1-hr)	0-50	Good
55-70 (8-hr)	-	12.1-35.4 (24-hr)	55-154 (24-hr)	4.5-9.4 (8-hr)	36-75 (1-hr)	54-100 (1-hr)	51-100	Moderate
71-85 (8-hr)	125-164 (1-hr)	35.5-55.4 (24-hr)	155-254 (24-hr)	9.5-12.4 (8-hr)	76-185 (1-hr)	101-360 (1-hr)	101-150	Unhealthy for Sensitive Groups
86-105 (8-hr)	165-204 (1-hr)	55.5-150.4 (24-hr)	255-354 (24-hr)	12.5-15.4 (8-hr)	186-304 (1-hr)	361-649 (1-hr)	151-200	Unhealthy
106-200 (8-hr)	205-404 (1-hr)	150.5-250.4 (24-hr)	355-424 (24-hr)	15.5-30.4 (8-hr)	305-604 (24-hr)	650-1249 (1-hr)	201-300	Very Unhealthy
-	405-504 (1-hr)	250.5-350.4 (24-hr)	425-504 (24-hr)	30.5-40.4 (8-hr)	605-804 (24-hr)	1250-1649 (1-hr)	301-400	Hazardous
-	505-604 (1-hr)	350.5-500.4 (24-hr)	505-604 (24-hr)	40.5-50.4 (8-hr)	805-1004 (24-hr)	1650-2049 (1-hr)	401-500	

The carbon monoxide (CO) readings are in ppm (parts per million). The UK readings are given in $\mu g/m^3$, the USA EPA in ppb (parts per billion). The conversion between the two is given by the following table, iGAS can record results either in ppb or $\mu g/m^3$ (see Feature Flags)

1 ppb	$\mu g/m^3$
SO_2	2.62
NO_2	1.88
NO	1.25
O_3	2.0
CO	1.15
H_2S	1.47
VOC	2.29
CO_2	1.80

ZERO GAS AND SAMPLE FILTERS

iGAS is fitted with a pair of air filters, one of which is used to generate a zero gas. The air sample is selectively drawn through these filters by a pair of ultra-quiet pumps. The humidity and temperature in both air sample streams is equalized using Nafion drier tubes. Looking at the instrument door, the larger Zero Filter is on the left, the Sample Filter on the right.

The Zero Filter uses a standard AXP3 respirator filter with Rd40 thread.

For iGAS we specify AXP3 Rd40 respirator cartridges. These contain a P3 particle filter and AX micro-porous activated coconut charcoal only. They contain no impregnated charcoal. There is some evidence that metal impregnated charcoal may increase the catalytic reduction of water vapour to H_2 and CO by the charcoal.

All charcoal filters will catalytically reduce water vapour to create ppb levels of hydrogen and carbon monoxide. The activity increases with increasing temperature and the Filter Shield protects the Zero Filter from sudden temperature changes. Since hydrogen can have a significant effect on electrochemical cells, especially SO2 and H2S, iGAS incorporates special sensors to compensate for the effect.

The Sample Filter is a 1 micron PTFE membrane filter which is used simply to prevent ambient dust particles being drawn into the instrument when sampling. A PTFE membrane is used to minimize absorption of sample gases, especially ozone. Note that most P3 respirator filters absorb ozone and acidic gases, especially SO_2, and are not suitable.

The AXP3 Zero Filter contains about 300g of pure activated charcoal which absorbs most polluting gas species. Note that this Zero Filter will not absorb carbon monoxide and iGAS is factory configured to exclude CO from the zero correction scheme. This is feasible because the CO sensor is stable at ppm levels of pollution and, therefore, does not need zero correction.

It is recommended that the filters are changed at 3 monthly intervals but the actual lifetime of the Zero Filter will depend on the level of ambient pollution, humidity, and the zeroing scheme used. The Continuous Zeroing scheme (see below) uses the Zero Filter most and draws about 10 litres of air per hour through it. Filter breakthrough is unlikely to occur before 1 gram of pollutant gas has been absorbed, equivalent to about 10^6 ppm litres of flow if 1ppb=1µg/m^3. This corresponds to < 1% of the weight of the activated charcoal.

ZEROING SCHEMES

There are three zeroing schemes which may be selected to compensate for temperature and humidity drift in the sensors. Use the Feature Flags to set the zeroing scheme you require. The Continuous Zero is the factory default. Any of the sensors in the Manifold may be excluded from the zeroing process by setting the SEDs accordingly.

Continuous Zeroing: Air is alternatively drawn through the Zero Filter and then the Sample Filter, the actual reading is the difference between the two measurements. The length of the Zero Phase determines how long the air is drawn through each filter and measurements are taken for 10 seconds at the end of each phase. The shortest (default) phase time is 1 minute, meaning the air is alternatively drawn through the Zero Filter for 1 minute and then through the Sample Filter for 1 minute. If *Use Rise Time* is selected, the 90% response time (T90) of the cell is taken into account when the results are calculated.

Continuous Zeroing overrides all other zeroing schemes and is the recommended mode of operation. Use to acclimatize a new Zero Filter.

Periodic Zeroing: Measures the sensor offsets at the Zeroing Interval specified in the Instrument Settings. If the Zeroing Interval is zero, the offsets are just measured at the start of the sample. Each offset measurement takes three Zero Phases, make sure you select the feature *Use Periodic Zeros* to actually apply those offsets. The advantage of this method is the zeroing takes place only infrequently allowing a faster reporting interval to be used. It also maximizes the lifetime of the Zero Filter but may give rise to more offset drift between successive zeros. However, unless there are significant changes in temperature or humidity, this will be small on the AQI scale.

Temperature Zeroing: If neither of the above Feature Flags are set, the instrument will measure the sensor offsets whenever the Manifold Temperature has changed by the amount specified by the **Zero Trigger** temperature specified in the Instrument Settings. Again, select *Use Periodic Zeros* to apply the measured offsets.

In all cases the default zero phase length is 1 minute.

SAMPLING

Sampling is the process by which the instrument measures and stores readings from its gas specific sensors. Each **sample** consists of a series reports measured over successive time intervals, this is the **Reporting Interval**. The series of reports which make up the sample is known as the time series. The reported readings will be the average (or sometimes the peak) value over the reporting interval. Average (or peak) readings are also recorded over the duration of the sample.

Sampling may be started and stopped automatically as defined by the Feature Flags. Automatic samples are generally aligned with 1 minute boundaries.

The shortest reporting interval is one second, the longest 50 minutes. The recommended reporting intervals are between 1 minute and 15 minutes, these give the best compromise between memory use and time resolution. The shortest sampling period is one report interval, the maximum many days.

For those instruments with a display output, analogue output or micro-website, the Viewing Interval specifies how often the output is updated. The output is the average (or peak) over the specified viewing interval. The viewing interval can be in the range 1 second to 30 minutes and is independent of the reporting interval.

The instrument's memory can hold up to 100 samples each consisting of many reports. A sample is identified by its **Sample Number**. When the memory is cleared the sample number is reset. The total number of samples measured by the instrument over its life is the **Sample Total**.

SAMPLE CONTROL FEATURE FLAGS

If *Automatic Start* is set, sampling will automatically start on the next 1 minute boundary after the instrument is switched on. If *Timed Sample* is set the sample will last for the **Duration** number of reports (specified in the Instrument Settings) and, if *Automatic Start* is set too, another sample of the same duration will start immediately. This process will carry on till the memory fills when a *Memory Full* Fault Flag will end the current sample and prevent another restarting.

If *Circular Buffer* is set, the last sample (i.e. the one just finished) will be overwritten if the Instrument Settings **Sample Stack** value equals 0, if it equals 1 the last but 1 will be overwritten and so on. Hence it is possible to create a stack of N samples that will overwrite forever.

If *New Sample Daily* is set a new sample will start at precisely midnight but only if *Automatic Start* is set. This can be combined with the *Circular Buffer* flag and the value of the **Sample Stack** to create a rotating, N-day, sample block.

POWER MANAGEMENT AND SLEEPING

The instrument is fitted with a 6 Volt, 5 cell NiMH battery.

If the battery voltage drops below 5.5 Volts, measurements will stop and the current sample will be terminated and the ***Dead battery*** Fault Flag will be set. If the battery drops below 5.2 Volts the instrument will go into a low power sleep to conserve energy (regardless of the state of the *AllowToSleep* flag). The ***Dead Battery*** flag will only be cleared when the battery voltage has recovered to > 5.8 Volt

The ***Low Battery*** Fault Flag is set when the battery voltage drops below 5.8 Volt. An existing sample will continue but a new sample cannot start while that flag is set.

When the instrument is on-charge the green light is always on.

The iGAS internal battery capacity is 2000 mAH. The battery is intended to keep the instrument operating if the external +12 Volt power disappears. Assuming a full charge, iGAS will continue to operate without external power for about 10 hours.

If the battery is discharged, a full recharge will take about 12 to 14 hours with the instrument automatically switching on before then when the battery reaches 6.5 Volt.

The battery is not required for data storage and the instrument uses flash memory to store the results. Data retention is more than 100 years.

When you have finished using the instrument, it is good practice to clear the *Automatic Start* flag, stop the instrument sampling, and set the *Allow To Sleep* flag. This will allow the instrument to sleep until next required while only slowly discharging its battery. You can do this by clicking *Hibernate* in AirQWeb. Remember, if you wish to turn off for several days, you must isolate the battery by clicking the isolator switch to 0 when sampling has finished.

GETTING STARTED WITH iGAS®

Please refer to the latest versions of the associated documentation for instructions on how to install iGAS, the Power Portal, and connect to AirQWeb. All the latest documentation can be found at www.iGASES.uk .

To turn the instrument on, switch the **Power Isolator Switch** to 1. The instrument will only start if the battery voltage is greater than 5.8 Volts. If it isn't you must connect the +12 Volt power supply from the Power Portal and wait until the battery is sufficiently charged. The red light will appear when external 12Volt power is connected.

If a 12 Volt power supply is connected, the instrument will automatically turn-on if the supply voltage is > 9 Volts and the battery voltage is > 6.5Volts.

The instrument can also be turned on remotely by sending a 1 second RS485 BREAK command from the WS3 web server in the Power Portal. Please refer to your AirQWeb documentation.

If the *Allow to Sleep* Feature Flag is set and

1. there is no communications activity
2. the instrument is not measuring a sample

the instrument will automatically fall asleep after about 5 minutes. The instrument can be awoken again by toggling to Power Isolator Switch, sending a BREAK command or simply connecting the +12 Volt supply. The instrument will not fall asleep if the +12 Volt supply is connected and the battery voltage is > 6.5 Volt.

Applying mains power to the Power Portal should automatically establish an internet connection between iGAS and AirQWeb. Please refer to ***Connecting iGAS to AirQWeb*** from www.iGASES.uk for more instructions.

POWER ISOLATOR SWITCH

The **Power Isolator Switch** is intended to isolate the battery if the iGAS is not to be used for a long period of time. Only turn the switch to 0 when sampling has FINISHED and results have been stored. Operating the switch when sampling will lose the current sample results and may corrupt previous samples too. Wait till the iGAS has finished sampling, and preferably, gone to sleep before operating the switch.

Please contact techsupport@tunkey-instruments.com if you experience any difficulties.

APPENDIX

FEATURE FLAGS

(shown as *underlined italics* in the text)

The operation of iGAS is controlled by Feature Flags which may be set or cleared by the operator. They are normally set automatically by AirQWeb. The basic set of Feature Flags is as follows, preset factory defaults are shown ticked:

Feature Flag Name		Explanation/Description
iGAS	√	Measure gas concentrations
iEXTRA	√	Measure extras such as NOX, ambient CO2, manifold T, sample T
iDUST		Measure particle concentrations, iDUST module required
iMET		Measure meteorological conditions, iMET module required
US units		SI units by default
IGAS mass/volume		Express gas concentrations as µg/m^3 instead of ppb
Auto Start		Automatically start sampling whenever power is on and battery condition is OK
Daily sample		New sample starts at midnight each day, the Auto Start feature must be on. Will terminate active sample at midnight.
Timed sample		Each sampling period terminates after a set number of reports, specified in the Instrument Settings table (IS)
Stop if fault	√	Stops sampling if a fatal fault occurs
Continuous Zero	√	Continually determine sensor zero gas offset. Overrides Periodic Zero flag. Takes two Zero phases to complete (2 minutes by default).
Periodic Zero		Measure sensor zero gas offset at start of sampling and thence at the Zeroing interval specified in the instrument Settings. Takes three Zero phases to complete
Use Period Zero		Apply the zero offset readings determined by the Periodic Zero above. Over-ridden by the Continuous Zero Flag
Apply offsets	√	Apply the systemic zero offsets, manually entered into SEDs
Use rise times	√	Correct for T90 response time
iDUST Auto Zero		Only If the iDUST module is fitted, measures the zero dust particle count.
Continuous PID lamp		Power the PID lamp continuously
Circular Buffer		Use circular buffers to record stacked samples, number of stacked samples saved before overwrite is specified in the Instrument Settings Table (IS)
Calculate NOX		Calculate NOX=NO2+NO. Sensors must be fitted
Swap Air Filters		Electronically interchanges the chemical air filters, so the sample filter becomes the zero gas filter and vice-versa
Use iGAS Matrix	√	Correct for gas species interferences. Gas matrix elements must be defined in SEDs
Age correction		Apply the sensor cell ageing characteristic from SEDs. Typically -2% per month
Disable CCC		Turn off Carbon Catalysis Compensation measurement
No CCC		Don’t apply Carbon Catalysis Compensation

Save iGAS	√	Save the iGAS readings in the dataset
Save iEXTRA	√	Save iEXTRA readings in the dataset
Save iDUST		Save the iDUST readings in the dataset
Save iMET		Save the iMET readings in the dataset
Save housekeep.		Save the Housekeeping readings in the dataset
Save diagnostic		Save the Diagnostic readings in the dataset
Save GPS		Save the GPS co-ordinates if GPS module is fitted
Allow to sleep	√	Allow to fall asleep after about 5 minutes if not sampling and no communications. Toggle switch or send break to command from WS3 to awaken. Will automatically awaken and not fall asleep if +12V connected and battery > 6.5V
Dummy readings		For test purposes only
Calibrate iGAS		Use default 1000nA/ppm sensitivity
Calibrate iDUST		Apply calibration to iDUST module
Use time server		Use internet time server to set time, requires WiFi module
Use WiFI		Use WiFi, requires WiFi module
Measure manifold pressure		Measure manifold flow pressure
Sample T&RH		Sample temperature and humidity sensor is fitted
Power photoionization detector		Supply power to PID, sensor must be fitted Lamp can be operated intermittently to save power
Measure atmospheric pressure		Sensor is fitted by default. Measures enclosure T too
Measure ambient T & RH		External T & RH sensor must be fitted
Measure ambient CO2		Measure ambient CO2, sensor must be fitted
Measure iDUST sample flow		Measure iDUST sample flow, sensor must be fitted
Measure wind speed & direction		Requires iMET with anemometer module
Measure insolation		Requires iMET with solar module fitted, measures intensity of sunlight in W/m^2
Measure rainfall		Requires iMET with tipping bucket rain gauge.

INSTRUMENT INFORMATION

(show in **bold font** in the text)

The Instrument Information table (II) provides additional information about the instrument. It is read only and cannot be modified by the user. Some of the values (SEDs) are automatically uploaded from the Manifold. Not all of the Instrument Information is listed below.

Information Table (II)	Explanation/Description
Serial Number	Instrument serial number
Instrument type	iGAS Monitor
Manufacturer	Turnkey UK
Software Version	Software version programmed into instrument
Gas Manifold	iGAS Manifold serial number
Cal. Due by	Date next instrument re-calibration is due.
CH0 to CH7 names	Names of the primary measurements
CH0 to CH7 units	Measurement units for the primary measurements
Gas-A to Gas-H cal. dates	Calibration dates of the individual gas sensors
Gas-A to Gas-H type	Species and type of the individual gas sensors. For example, NO-B4 is a 4 -electrode electrochemical nitric oxide sensor

Gas-A to H GasCode & SN	The two character GasCode and serial number of the individual gas sensors
Gas-A to H elect. offset	Intrinsic zero electrical offset of the gas sensors
Gas-A to H syst. offset	The systemic zero offset determined for the manifold
Gas-A to H signal/ppm	The sensitivity of the gas sensors, typically in nA/ppm for electrochemical cells
Gas-A to H periodic zero	The cell zero offset as determined by the latest periodic zero.
Gas A to H CC Comp %	The Carbon Catalysis Compensation in %
Gas A to H vol. to mass	The volume to mass conversion factor of each gas species used to convert, for example, ppb to µg/m^3
Gas-A to H ageing %/month	The sensitivity ageing characteristic for the individual gas sensors in % per month, negative values means sensitivity is lost
Gas-A to H 90% rise time	The 90% response time (in seconds) to a step function change in gas concentration, aka T90

INSTRUMENT SETTINGS

(show in **bold font** in the text)

These settings control the instrument's reporting and sampling. They are normally controlled automatically by AirQWeb. Not all of the Instrument Settings are listed below.

Instrument Setting	Explanation/Description
Sample Total	Running count of total number of samples taken by the instrument over its life. Never normally reset.
Sample Number	Next sample number, is reset to 0 when memory is cleared. Increments by 1 every time a sample is completed. Range is 0 to 99. Sample 0 is always the first sample.
Reporting interval (sec)	Time interval when new results are reported. AirQWeb normally sets this to 5 minutes (300 secs)
Flow (scc/min)	The set point sample flow for iDUST
Zeroing (sec)	The interval in seconds between iGAS and iDUST periodic zeros, if 0 will just do zero at start of sampling
Viewing (sec)	The display refresh rate for those instruments with a display or micro website
Start time	If sampling, start timestamp of current sample. If not, start timestamp of last sample
Stop time	If sampling, timestamp of latest report. If not, stop timestamp of last sample

Sample Stack	Number of samples in the stack before loopback if ***Circular Buffer*** Feature Flag is selected
Zero phase (min)	The length, in minutess, of each iGAS zero phase, either continuous of periodic.
Zero trigger dT	The temperature change dT in ^{o}C of the gas sensor manifold since the last periodic zero to trigger another.
Report Number	Number of reports in the current sample, or last sample if not sampling.
Duration (rpt)	Number of reports in a sample before it auto-stops, only if ***Timed Sample*** Feature Flag is selected. If *AutoStart* is set, will restart a new sample. If *Circular Buffer* is set will accumulate a circular buffer of samples. *Sample Stack* sets the number of contiguous samples in the buffer.
Company	Company name string, up to 16 bytes
Location	Location name string up to 16 bytes
Gas Sensor Mask	Mask showing which sensors are fitted in the iGAS manifold
Zeroable Mask	Mask showing which of those sensors are suitable for continuous or periodic zeroing
Manifold hours	Hours the gas sensor manifold has been used.
Diffometer	
iGAS filter (h)	
iDUST filter (mg)	
Last AZ Temp.	Temperature of manifold during last periodic zero
Last AZ humidity	Humidity of sample gas flow during last periodic zero, only if sample flow T &RH sensor fitted
Last AZ at	Time and date of last none-continuous autozero
Manifold at	Time and date iGAS Manifold fitted
Diffometer at	Time and date iDUST Diffractometer fitted
iGAS filter at	Time and date iGAS filters change
iDUST filter at	Time and date iDUST filter changed

FAULT FLAGS

(shown as *underlined italics* in the text)

These flags indicate the faults or errors the instrument has encountered. Many of these are managed automatically by AirQWeb.

FAULT FLAG	Explanation/Description
Directory FULL	100 samples have been stored. Sampling is stopped and canniot restart. Upload and clear memory
Memory FULL	The IvIbe memory is full. Sampling has stopped. Upload and clear memory. Depending on length of samples, may occur before 100 samples have been saved.
Dead battery	Battery voltage < 5.5Volts. Sampling will have been stopped and cannot re-start until battery voltage . 5.8 Volts.
I'm too hot!	The case temperature is >60C. Sampling is stopped
Fatal Error	One of the above faults has occurred, sampling is stopped until fault condition clears.
Memory 90% full	Memory is at 90 % capacity, stop sampling and clear memory.
Low battery	The battery voltage is < 5.8 Volts. Recharge battery. New sample cannot be started.
Cal. < 50 day	Calibration is due in less than 50 days. Have instrument recalibrated.
Cal. OVERDUE	Calibration is now overdue. Soon the instrument will be disconnected from AirQWeb server. Have instrument recalibrated as soon as possible..
PID warning	The PID lamp has failed or needs cleaning

NOTES

Please visit www.iGASES.uk to access other iGAS and iDUST documentation

If you need assistance, please contact:

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Revision History

- Original, 7 May 2017
- 18 April 2017, issue 6, for iGAS HashCode 64, G1.90mjl
- 13 Feb 2019, issue 7, note about Power Isolator switch, G1.95mjl

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