

**G3000**  
**Medical Gas**  
**Outlet**  
**Analyzer**

**User's  
Guide**

**Testing Made Easy.**

**Safety Made Simple.**

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## **Introduction**

Welcome to the G3000 Medical Gas Outlet Analyzer from National Safety Technologies. The G3000 was specifically developed to meet all of your medical gas outlet testing needs. No longer will you have to juggle pressure gauges, flow meters, gas concentration analyzers, pens and paper. Everything is integrated into the G3000! The G3000 automatically performs a complete analysis of all of your medical gas outlets, including oxygen, medical air, nitrous oxide, nitrogen and vacuum. Test results are instantly evaluated based upon the criteria that you set, so you will know in seconds whether an outlet is 'OK' or 'BAD'. Test data and notes are stored on your computer, and customized reports can be created and printed in minutes!

The NST G3000 is designed to interface through a laptop computer running Windows®. Our exclusive MedGas Manager™ software controls all of the outlet testing. The supplied custom-designed carrying harness permits hands-free carrying of the laptop, the G3000 interface and all of your gas outlet adapters. Simply strap on the harness and test.

Outlet information can be loaded before you test, entered as you are testing or even inserted once testing has been completed. Ten columns are available to enter information! They include outlet location information (floor, area, room number and outlet number), a column for comments and 3 customizable columns that can be configured with any headings that you need. A specialized column, *Tester's Note*, is available to document common conditions that affect the safe operation of medical gas and vacuum outlets. This makes it easy to identify problems that need immediate attention. There is a column to record the name of the person testing and a time and date stamp is entered for every outlet tested.

Creating medical gas outlet testing reports has never been easier than with the G3000. Outlets are color coded for easy identification – green for oxygen, yellow for air, blue for nitrous oxide, black for nitrogen and white for vacuum. To further facilitate your medical gas outlet maintenance, test results can be sorted in a variety of ways to group data in the way that is most efficient for your needs. Preconfigured sorting options allow you to sort by location, outlet type, tester's notes and even outlet status. You can also apply filters to reports so that only the data you want to see is displayed – very helpful for creating smaller reports of outlets needing repairs or further testing!

The new G3000 with MedGas Manager™ is your complete solution to managing your medical gas outlets. Automated testing and outlet evaluation eliminate the guesswork. Program versatility allows for data collection that is customized to your facility's requirements and preformatted reports greatly simplify documentation.

### Capabilities and Tests Performed

#### Expected Gas

The G3000 uses two test probes – one for positive pressure gases (O<sub>2</sub>, AIR, N<sub>2</sub>O and N<sub>2</sub>) and one for vacuum. During testing, either adapter may be used. **They may not be used simultaneously.** Expected gas is determined by the adapter that is plugged into one of the two test probes. Once an adapter is plugged into one of the two test probes, a message will appear indicating which gas is to be tested.

Note: If a positive pressure adapter is plugged into the vacuum test probe or a vacuum adapter is plugged into the positive pressure test probe, an error will occur.

#### Detected Gas

Detected gas is determined from a combination of pressure and gas concentration readings. The parameters for determining which gas is flowing from the outlet are as follows:

| Detected Gas  | Pressure                                        | % Oxygen | % Nitrous Oxide |
|---------------|-------------------------------------------------|----------|-----------------|
| Oxygen        | Over 4 psig                                     | 70 -100  | 0 - 30          |
| Medical Air   | Over 4 psig                                     | 10 - 30  | 0 – 30          |
| Nitrous Oxide | Over 4 psig                                     | 0 - 10   | 70 – 100        |
| Nitrogen      | Over 4 psig                                     | 0 - 10   | 0 - 30          |
| Vacuum        | Negative Pressure over 1 inHg                   |          |                 |
| Unknown       | Any gas not falling within above limits.        |          |                 |
| None          | Any gas falling below the above pressure limits |          |                 |

#### Oxygen Concentration

The G3000 uses an electrochemical oxygen sensor to detect the oxygen concentration for all positive pressure gases. There is no pass or fail criteria for oxygen concentration. The program will record the actual percent of oxygen measured in the gas.

#### Static Pressure

Static pressure is the pressure at the outlet when there is no flow. Pass/fail limits are adjusted by the operator at the start of a new data file.

| Outlet Type   | Pass/Fail Limit               |
|---------------|-------------------------------|
| Oxygen        | Adjustable from 0 to 99 PSIG  |
| Medical Air   | Adjustable from 0 to 99 PSIG  |
| Nitrous Oxide | Adjustable from 0 to 99 PSIG  |
| Nitrogen      | Adjustable from 0 to 200 PSIG |
| Vacuum        | Adjustable from 0 to 31 in Hg |

#### Dynamic Pressure

Dynamic Pressure is pressure during flow. The G3000 draws gas from the outlet at an increasing rate until the specified test flow rate is reached **or** the pressure drops below the minimum value listed below. Flow and pressure are then both recorded. If the test flow rate

cannot be achieved, the outlet will fail and the G3000 will display both flow and pressure readings.

| Outlet Type   | Test Flow Range              | Pass/Fail Pressure Limit      |
|---------------|------------------------------|-------------------------------|
| Oxygen        | Adjustable from 0 to 160 lpm | Adjustable from 0 to 99 PSIG  |
| Medical Air   | Adjustable from 0 to 160 lpm | Adjustable from 0 to 99 PSIG  |
| Nitrous Oxide | Adjustable from 0 to 160 lpm | Adjustable from 0 to 99 PSIG  |
| Nitrogen      | Adjustable from 0 to 160 lpm | Adjustable from 0 to 200 PSIG |
| Vacuum        | Adjustable from 0 to 160 lpm | Adjustable from 0 to 31 in Hg |

#### Vacuum Maximum Flow

The G3000 measures maximum flow for vacuum outlets only. The valve in the test probe is fully opened and the flow is measured. The outlet fails if the measured flow is below the programmed pass/fail limit.

| Outlet Type | Pass/Fail Limit              |
|-------------|------------------------------|
| Vacuum      | Adjustable from 0 to 160 lpm |

#### Pressure Drop:

Pressure drop is calculated as static pressure minus dynamic pressure at the specified test flow rate.

| Outlet Type   | Pass/Fail Limit               |
|---------------|-------------------------------|
| Oxygen        | Adjustable from 0 to 15 PSI   |
| Medical Air   | Adjustable from 0 to 15 PSI   |
| Nitrous Oxide | Adjustable from 0 to 15 PSI   |
| Nitrogen      | Adjustable from 0 to 60 PSI   |
| Vacuum        | Adjustable from 0 to 31 in Hg |

### Environmental Operation Specifications

| Condition                                | Specification |
|------------------------------------------|---------------|
| TMRA (Temperature Maximum Rated Ambient) | 40°C          |
| Temperature Range                        | 0-40°C        |
| Humidity Range                           | 30-90%        |

*Use the G3000 analyzer only as specified in this manual. Using the G3000 analyzer in a manner other than specified in this manual may result in an unsafe or hazardous condition.*

**Included with your G3000 Medical Gas Outlet Analyzer**

1. The G3000 Interface Box with two permanently attached test probes
  - ♦ One test probe for testing positive pressure outlets
  - ♦ One test probe for testing vacuum inlets.
2. Five outlet adapters for oxygen, medical air, nitrous oxide, nitrogen and vacuum.
3. A notebook computer running Windows® loaded with
  - ♦ MedGas Manager™ Medical Gas Outlet Testing and Report Generation Software
  - ♦ OxyCal™ Oxygen Calibration Software.
4. One installation disk for emergency recovery of either the MedGas Manager™ or OxyCal™ programs.

**Software Installation**

The G3000 Medical Gas Outlet Analyzer comes with all of the necessary software preloaded on the notebook computer supplied with the device. A software disc is included to recover any of these files, if necessary. See *Software Recovery* in *Appendix C: Troubleshooting* for more information.

**Contact Information**

For assistance, please contact National Safety Technologies at the following locations:

|                                                                                                                                                                              |                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><u>Sales Office</u></b><br>5154 Enterprise Blvd.<br>Toledo, OH 43612<br><br>Toll Free Phone: 800-678-7072<br>Toll Free Fax: 800-455-5678<br><br>e-mail: sales@nst-usa.com | <b><u>Technical Support Office</u></b><br>Station Square Two, Suite 107<br>Paoli, PA 19301<br><br>Toll Free Phone: 800-678-7074<br>Toll Free Fax: 800-539-9319<br><br>e-mail: techservices@nst-usa.com |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Or check out our web site at [www.nst-usa.com](http://www.nst-usa.com) for technical support or product information.

# **Care of the G3000 Medical Gas Outlet Analyzer**

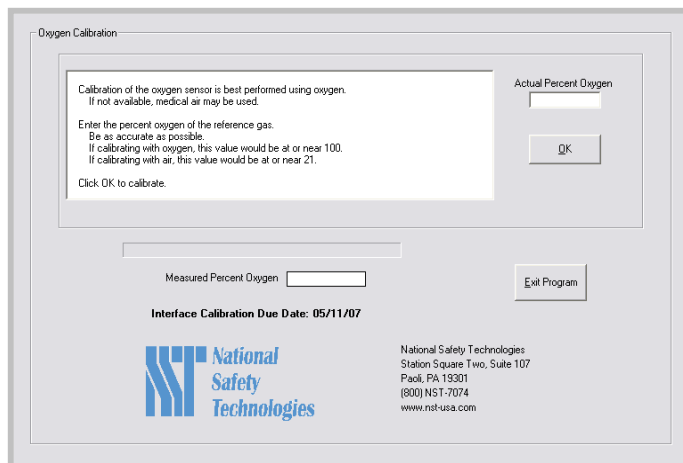
## **OxyCal™ Oxygen Sensor Calibration Program**

The G3000 Medical Gas Outlet Analyzer uses a proprietary galvanic oxygen sensor to detect oxygen concentration in all of the positive pressure gases tested. This sensor will measure oxygen concentrations from 0 to 100%. To insure accuracy, we recommend calibrating the oxygen sensor before each test session.

Installed on the computer included with the G3000 is a program called, *G3000 OxyCal*. This program performs a quick calibration of the G3000 oxygen sensor. Double-click on the icon on your desktop to launch this application.

To proceed with the calibration of the oxygen sensor, unplug both test probes and follow the instructions on the screen. **For most accurate results, we recommend calibration with oxygen; however, if oxygen is not available, medical air may be used.**

1. Enter the known percent of oxygen in the box, 'Actual Percent Oxygen.'
2. Click **OK**.
3. Connect the Positive Pressure Test Probe to the outlet containing the reference gas and follow the instructions.
4. Click 'Exit Program' to close program.



The screenshot shows the 'Oxygen Calibration' window. It contains a text box with instructions: 'Calibration of the oxygen sensor is best performed using oxygen. If not available, medical air may be used. Enter the percent oxygen of the reference gas. Be as accurate as possible. If calibrating with oxygen, this value would be at or near 100. If calibrating with air, this value would be at or near 21. Click OK to calibrate.' To the right of this text is a field labeled 'Actual Percent Oxygen' with an 'OK' button. Below the text box is a field labeled 'Measured Percent Oxygen' and an 'Exit Program' button. At the bottom, it says 'Interface Calibration Due Date: 05/11/07' and includes the National Safety Technologies logo and contact information.

## **System Check**

We recommend that you perform a System Check before and after each test session and after exposure to contamination or pressures over 200 psig. Using this feature, you can check the accuracy of the analyzer by testing positive-pressure outlets with accurately known pressure and flow characteristics.

To perform a System Check, plug the appropriate adapter into a positive-pressure gas outlet with known pressure and flow characteristics. Once the test is complete, select the note "System Check." Also check the analyzer with each gas type. Examine the test results. If the results seem incorrect, discontinue testing and call NST.

### **Annual Calibration**

Your new G3000 analyzer will arrive ready for use. To insure proper operation, we strongly recommend that the interface and adapters be returned to NST for yearly replacement of consumable components, cleaning and calibration.

To send your analyzer to NST for calibration:

1. Place the interface and all 5 gas adapters in a box with ample padding.
2. Include the name and phone number of the person who should be contacted if there are any questions regarding the calibration of the unit.
3. Ship to the NST Technical Services office:

National Safety Technologies  
Technical Support Office  
Station Square Two, Suite 107  
Paoli, PA 19301

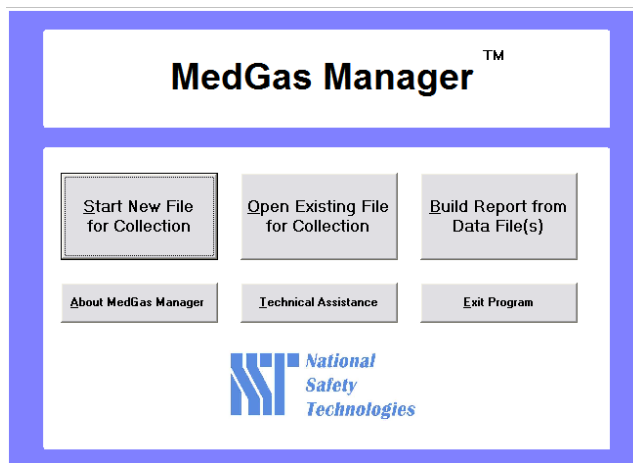
(610)408-0555 phone  
(610)408-9594 fax  
(800)678-7074 toll free

4. We recommend insuring the unit for the full purchase price.
5. Allow 2-3 weeks for calibration and return of the unit.

### **Technical Support**

If you encounter any difficulty with the G3000, please do not hesitate to call the NST Technical Services office at 1-800-NST-7074.

## **Getting Started with MedGas Manager™ Outlet Testing & Reporting Software**



This is the screen that appears when you start MedGas Manager. It is the main menu – the navigational screen that allows you to access all of the various functions of the program. From the main menu, you have the following options:

**Start New File for Collection****ALT +S**

Choose this option to begin a new file for outlet testing or to preload data for later testing.

**Open Existing File for Collection****ALT +O**

Choose this option to open an existing file for continued data loading or outlet testing.

**Build Report from Data File(s)****ALT +B**

Choose this option to create a report from one or more data files. Select this option to filter and/or sort data. This option cannot be used to collect data.

**About MedGas Manager****ALT +A**

This option will display general information about the version of MedGas Manager you are using.

**Technical Assistance****ALT +T**

This option provides contact information for any assistance you may need.

**Exit Program****ALT +E**

Choose this option to exit the program.

## Starting a New File

### Step by Step Instructions

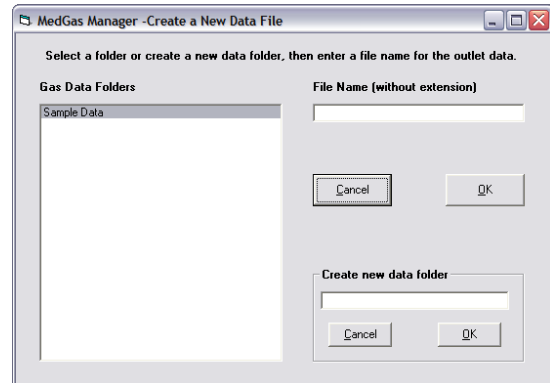
1. To select this option, click button or select ALT +S.

2. Choose File Folder and Name

*A window like the one shown will appear for you to choose a name for your data file and a folder where the data file will be stored.*

a. Select a folder to store your data file using the box on the left.

\* If desired, you may create a new folder to store your data file by using the box entitled **Create new data folder** in the lower right corner. To create a new folder, type the new folder name in the proper box and click **OK**. The newly created folder will then appear in the box on the left.



b. Once you have selected a folder to store your data file, type a name for your file in the box marked "File Name".

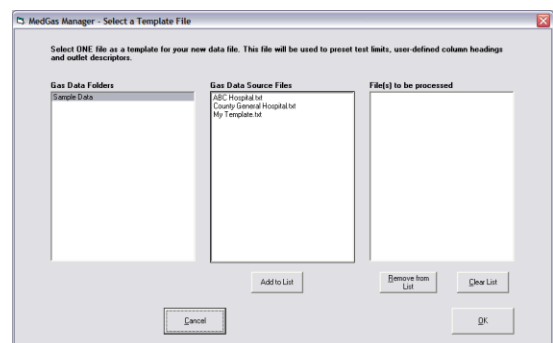
#### When choosing a file name:

- ✓ Do not use any Windows® prohibited file name characters such as \ / : \* ? " < > | .
- ✓ Do not include any file extensions.  
(MedGas Manager will automatically assign your file the extension \*.txt.)
- ✓ We recommend choosing file names that incorporate the date.  
e.g. West Wing 2005-12-20

c. Choose **OK**

3. Select a Template

*For every new data file, there are settings that must be established. These include pass/fail limits for the outlet tests, outlet descriptor information and column headings. MedGas Manager uses an existing file as a guide for these settings. You do not have to use all of the settings in the template file; you may adjust them as needed in the following screens. To begin, a window will open like the one shown.*



- a. Select the folder that contains desired template file.
- b. Select one file with desired test limits.

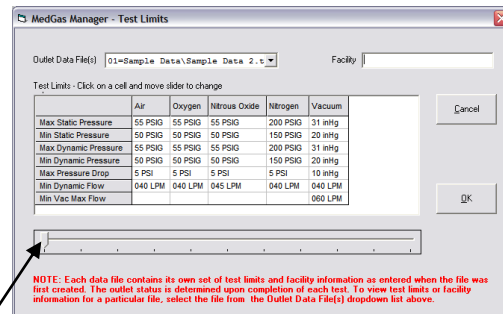
*We recommend making a custom template for your facility. If a custom template does not exist, you may use the Sample Template that is included with the program or another data file.*

- c. Click **Add to List** to place file in box called "Files to be Processed"
- d. Choose **OK**.
- e. The file you selected will appear in the right-hand column, it will be displayed as "01=your file name.txt"

If you accidentally choose the wrong file, highlight the incorrect file and select **Remove from List** or choose **Clear List** and reselect a new file.

#### 4. Set Pass/Fail Limits for Each Outlet Test

- a. Type a facility name in the appropriate box.
- b. To adjust a pass/fail test limit, click on the cell of test limit to adjust and then click and hold the pointer on the slider bar at the bottom of the grid to adjust the value up or down.
- c. Once all limits have been set to the desired values, select **OK**.



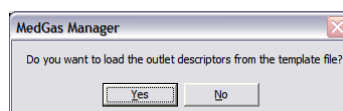
Click and hold pointer on slider bar to adjust limits up or down as needed.

**NOTE: ONCE TEST LIMITS ARE SET FOR A FILE, THEY CANNOT BE CHANGED.**

#### 5. Load Outlet Descriptors, if Desired

*The first 8 columns of MedGas Manager are for entering information about the outlets. This includes location information and any other information that may be warranted. To facilitate regular testing of your medical gas outlets and insure consistency in referencing your outlets, this feature will preload a new file with all of the descriptor information from the template file.*

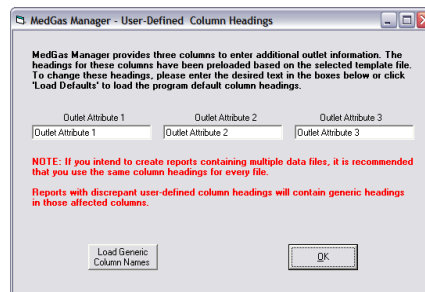
*Once you set the Pass/Fail Limits, you will be prompted whether these columns should be filled in with the information from the template file or left blank.*



### 6. Label User-Defined Column Headings (Outlet Attribute Columns)

*MedGas Manager contains 3 columns with customizable column headings. These columns can be used to enter any additional information about the outlets that may be necessary (e.g. outlet type, outlet labeling, outlet condition, mounting, etc.).*

*MedGas Manager will automatically load the column headings used in the template file. You may use these heading, the generic (program default) column headings or enter in your own column headings. The generic column names are Outlet Attribute 1, Outlet Attribute 2 and Outlet Attribute 3.*



**NOTE: ONCE A FILE IS CREATED, THE USER-DEFINED (CUSTOMIZABLE) COLUMN HEADINGS CAN NOT BE CHANGED.**

You are now ready to enter the test mode.

The program will prompt you, “Unplug both probes, then click OK”  
Insure that both test probes are disconnected and click **OK**.

You may now start collecting data.

### **Creating Your Own Template**

For every new file, MedGas Manager will ask you to specify:

- Pass/fail limits for each outlet test
- Column headings for each of the 3 customizable column headings

**To maintain consistency between testing and to facilitate starting new files, it is recommended that you create one template specially configured for your facility.**

Provided with your MedGas Manager is a file called, “Sample Template” that can be used as a model for creating your own sample template.

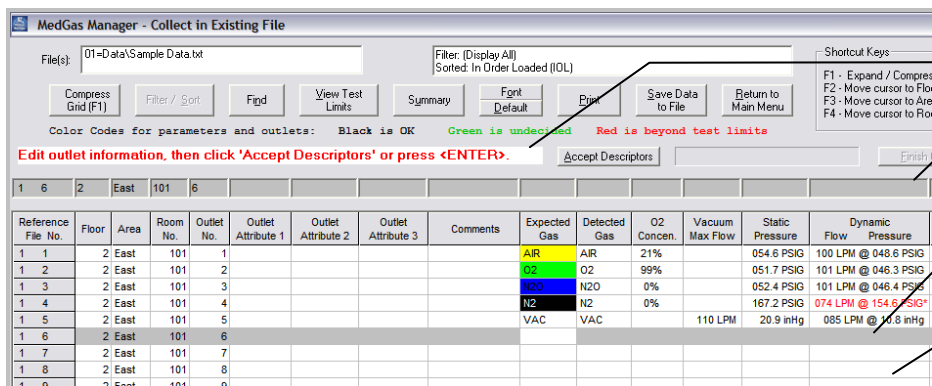
To create your own template from the Sample Template:

1. Choose **Start New File for Collection**
2. Choose an appropriate file name for your new template file  
(e.g. Your Hospital Template) and click **OK**.
3. Choose Sample Template as the template for the new file.
4. Adjust the test limits based upon the standards set by your facility and click **OK**.

- Load descriptors, if desired.
- Enter your desired user-defined column headings and click **OK**.
- Once in the outlet testing screen, click on Return to Main Menu. Your file will be saved and can now be used as a template for future testing.

### Collecting Data

Testing instructions will appear on the display screen, located below the option buttons. MedGas Manager uses a split screen to differentiate between data that is in-process and data that has previously been collected. All data entry (preloaded data and test data retrieved from the interface box) enters MedGas Manager in the *Data Entry Row* located at the top of your screen. Once outlet descriptors have been entered and you select Finish Outlet, the data will move down to the *Display Grid*. See illustration below.



Testing Instructions

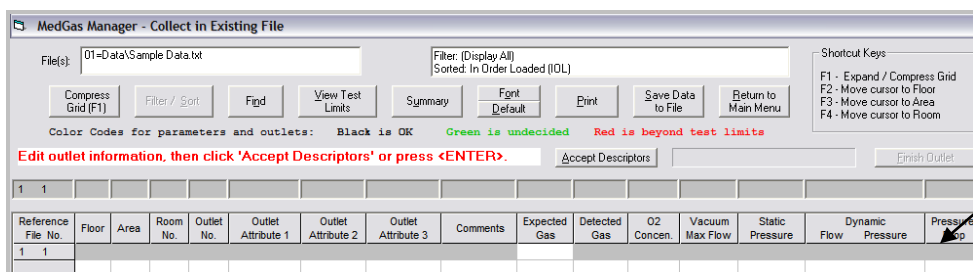
Data Entry Row

Highlighted Row (this is the row to which data from above will be entered).

Display Grid

### Step by Step Instructions

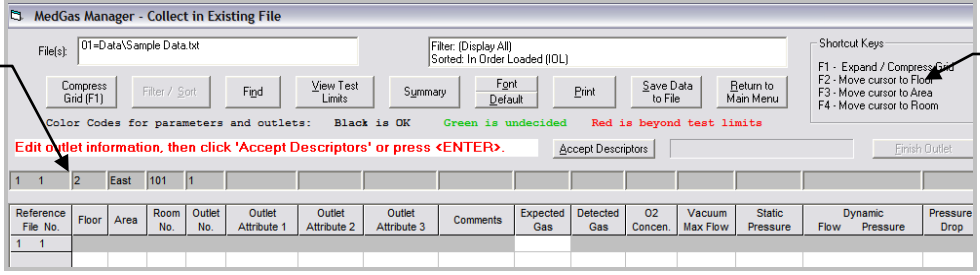
- Highlight the row in the display grid at which you would like to start testing. See the section, *Short-Cut Keys and Quick Tips for Data Entry* for more information.



Highlight is on first row. Once outlet is tested, the data will be stored here.

- Use the mouse or function keys to position cursor in desired column of Data Entry Row and type in outlet information (i.e. floor, area, room, outlet no., outlet attributes and comments).

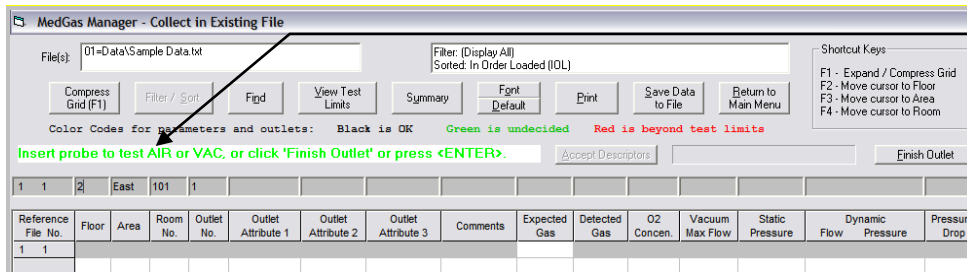
Outlet information is entered into Data Entry Row



Function Keys place the cursor in position for data entry.

Shortcut Keys:  
 F1 - Expand / Compress Grid  
 F2 - Move cursor to Floor  
 F3 - Move cursor to Area  
 F4 - Move cursor to Room

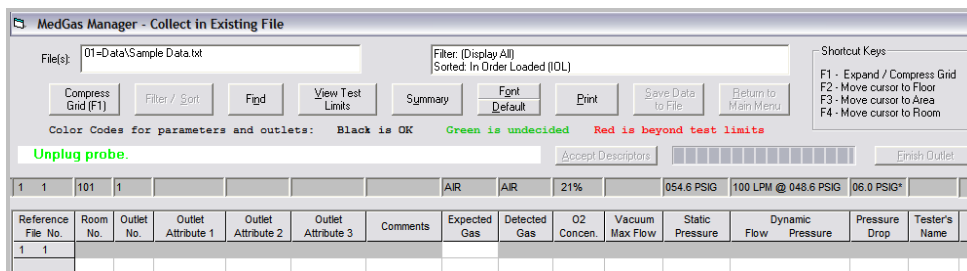
- Click **Accept Descriptors** or Press **Enter**. Display will change as shown below.



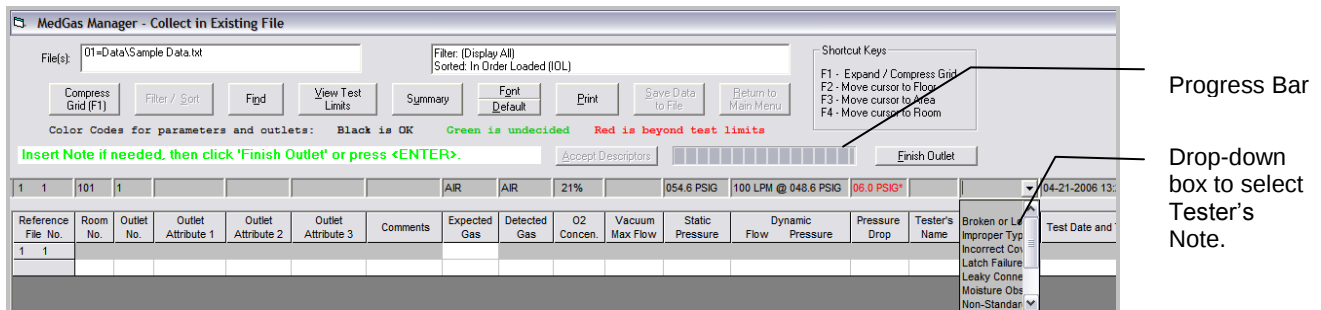
Depending upon which adapters are connected to the two test probes, the display may read:

- Insert probe to test AIR or VAC...
- Insert probe to test O2 or VAC...
- Insert probe to test N2O or VAC...
- Insert probe to test N2 or VAC...

- Attach the desired adapter to the appropriate test probe.  
i.e. Connect O2, AIR, N2O or N2 to the positive pressure test probe (black hose).  
or connect the VAC adapter to the vacuum test probe (white hose).
- Insert the desired test probe into an outlet and follow the on-screen instructions. A progress bar will appear and test results will be displayed as they are collected. **Do not remove the test probe until instructed. Do not modify or add any information to data entry grid until testing is complete.**
- Once testing is complete, the analyzer will beep once and the instructions will change to, "Unplug probe."



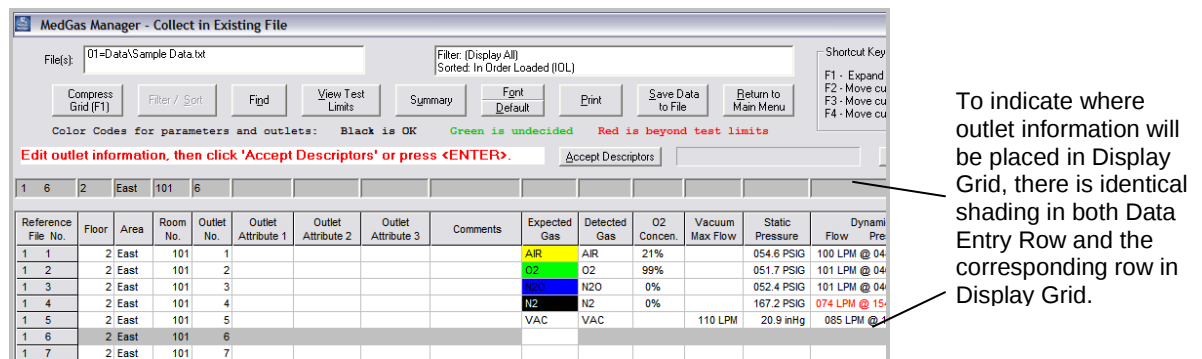
- Remove the test probe from the outlet. If necessary, insert one of the preset Tester's Notes (see *Entering Tester's Notes* for a table of the notes available and their descriptions.)



- Click **Finish Outlet** or Press **Enter** to complete the outlet test. MedGas Manager will place all of the information from the Data Entry Row into the Display Grid below. The highlight will automatically advance to the next row for continued testing.

All data in the test grid is on a white background except for the following:

- \* Expected Gas is color-coded (green for oxygen, blue for nitrous oxide, yellow for medical air, black for nitrogen and white for vacuum).
- \* The corresponding row in the display grid (the row which will receive the entered/collected data) is shaded gray like the Data Entry row.



### Short-Cut Keys and Quick Tips for Data Entry

Following are short-cut keys to minimize the need to use a mouse or touch pad:

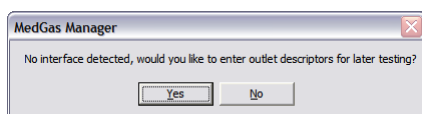
|     |                                                                                                                                                                                                                                     |
|-----|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| F1  | Toggles Screen View between Expanded Mode and Compressed Mode.<br>Expanded Mode displays all columns; Compressed Mode displays outlet location information and test results only.                                                   |
| F2  | Returns cursor to data entry row in <i>Floor</i> column. Maintains current view.                                                                                                                                                    |
| F3  | Returns cursor to data entry row in <i>Area</i> column. Maintains current view.                                                                                                                                                     |
| F4  | Returns cursor to data entry row in <i>Room No.</i> Column. Maintains current view.                                                                                                                                                 |
| TAB | Advances cursor through various on-screen options. Works in most menu screens and on grids.<br>If you TAB to a cell with information. The information in the cell will be highlighted so that you may retype over that information. |

### TIPS FOR OUTLET TESTING

- MedGas Manager will copy all descriptor information to the next empty row. You may type over any information. See *Preloading Data, Auto-Fill and Auto-Numbering* for more information.
- MedGas Manager will automatically number outlets if a starting value is entered into the Outlet No. column. See *Preloading Data, Auto-Fill and Auto-Numbering* for more information.
- Use the Function Keys (F2-F4) to quickly move the cursor to the desired column for data entry.
- Most buttons can be activated using keystrokes **or** point-and-click operation.  
For keyboard entry, the buttons may have a function key assignment (F1, F2, F3, etc.) or they may be activated using the ALT key.  
For ALT key activation, press and hold the ALT button and then press X, where X is the underlined letter on the button.

### **Preloading Data, Auto-Fill & Auto-Numbering**

For your convenience, you have the option to enter outlet descriptors prior to testing. You do not need the interface in order to preload outlet information. If you start a new file or open an existing file with no interface unit attached to the computer, you will be prompted:



1. Click **Yes** to open the file and enter descriptor information
2. Highlight the row in the display grid in which you would like to enter data.
3. Type the desired information into the appropriate cells of the Data Entry Row
4. Click **Accept Descriptors** or **ENTER** to transfer the information from Data Entry Row to Display Grid.
5. Click **Finish Outlet** or **ENTER** to proceed to the next row.

The information you entered will now appear in the test grid and MedGas Manager will automatically advance to the next row. Follow the above instructions to pre-enter outlet descriptors for as many outlets as desired.

#### **Tips for quick data entry:**

- Use the function keys to position cursor in desired column.
- Use the Tab to advance to the next column.
- Hit ENTER twice to accept descriptors and finish outlet.

### **Auto-Fill**

Once information is typed into any of the descriptor columns (this includes all columns except test data and status columns), this information is automatically entered into the data-entry row so that it can be entered for subsequent outlets. Click **Accept Descriptors** to accept this information for the current outlet.

To change any of the automatically entered information, tab over to the desired column or use one of the function keys (F2, F3 or F4) and retype the new information. You may also erase the information to clear the column for future testing.

### **Auto-Numbering**

The *Outlet No* column is configured to perform automatic numbering of test data.

To use this feature:

1. Type a starting number into the Outlet No. column.
2. Test an outlet or Press **Enter** or click **Finish Outlet**.
3. MedGas Manager will count up from the starting number by 1 (i.e. 1000, 1001, 1002, etc).
4. To stop this feature, clear the Outlet No. column.
5. To begin counting from a different starting point, overwrite the Outlet No. information in the Data Entry Row.

### Retesting an Outlet

To retest an outlet, highlight the desired row in the test grid and proceed with outlet testing. The old test data will be overwritten with the new test results.

### Entering Tester's Notes

Tester's Notes can be selected to record critical information observed while testing an outlet. Since many of these notes refer to conditions that can make an outlet unsafe, entering these notes will change the status of the outlet as necessary. Tester's Notes can be entered before or after an outlet is tested. Below is a list of the available Tester's Notes and the result entering one of these notes will have on an outlet's status:

| Tester's Note      | Description                                                                          | Result    |
|--------------------|--------------------------------------------------------------------------------------|-----------|
| Broken or Loose    | Outlet or mounting plate is loose, broken or cracked and requires repair.            | BAD       |
| Improper Type      | Outlet is the wrong type.                                                            | BAD       |
| Incorrect Cover    | Cover plate for the outlet is incorrect.                                             | BAD       |
| Latch Failure      | Outlet fails to latch securely.                                                      | BAD       |
| Leaky Connector    | Outlet leaks before or during insertion of the adapter.                              | BAD       |
| Moisture Observed  | Moisture is observed while testing.                                                  | BAD       |
| Non-Standard       | Outlet type is acceptable for the location, but can't be tested by analyzer.         | OK        |
| Not Accessible     | Outlet cannot be reached, or critical patient support device is plugged into outlet. | Undecided |
| Not In Use         | Outlet is no longer in service.                                                      | OK        |
| Particulates Found | Particulates observed.                                                               | BAD       |
| System Check       | Test performed to verify operation of the G3000 or for practice.                     | OK        |

## Opening an Existing File for Continued Data Entry or Outlet Testing

- To select this option, click button or select ALT +O.
- Choose Existing File Folder and Name:
  - A window will open entitled "MedGas Manager – Select Data Files"
  - Select an existing folder that contains the desired file.
  - Select a file and click **Add to list** to place file in box called "Files to be processed"
  - Choose **OK**.

If you choose the wrong file or if there are already files present in the "Files to be processed" box, these can be cleared by selecting **Clear List**.

- MedGas Manager will prompt you to "Unplug both probes, then click OK"  
**Please make sure both probes are disconnected and click OK.**
- You will then enter test mode, labeled "MedGas Manager – Collect in Existing File". The data from the existing file will appear.
- Highlight the row at which you would like to start testing. You may now continue testing from your existing file.

MedGas Manager - Collect in Existing File

File(s): 01>Data\Sample Data.bit Filter: (Display All) Sorted: In Order Loaded (IOL)

Compress Grid (F1) Filter / Sort Find View Test Limits Summary Font Default Print Save Data to File Return to Main Menu

Color Codes for parameters and outlets: Black is OK Green is undecided Red is beyond test limits

Edit outlet information, then click 'Accept Descriptors' or press <ENTER> Accept Descriptors Finish

| Reference File No. | Floor | Area | Room No. | Outlet No. | Outlet Attribute 1 | Outlet Attribute 2 | Outlet Attribute 3 | Comments | Expected Gas | Detected Gas | O2 Concen. | Vacuum Max Flow | Static Pressure | Dynamic Flow          |
|--------------------|-------|------|----------|------------|--------------------|--------------------|--------------------|----------|--------------|--------------|------------|-----------------|-----------------|-----------------------|
| 1 1                | 2     | East | 101      | 1          |                    |                    |                    |          | AIR          | AIR          | 21%        |                 | 054.6 PSIG      | 100 LPM @ 048.6 PSIG  |
| 1 2                | 2     | East | 101      | 2          |                    |                    |                    |          | O2           | O2           | 99%        |                 | 051.7 PSIG      | 101 LPM @ 048.3 PSIG  |
| 1 3                | 2     | East | 101      | 3          |                    |                    |                    |          | N2O          | N2O          | 0%         |                 | 052.4 PSIG      | 101 LPM @ 048.4 PSIG  |
| 1 4                | 2     | East | 101      | 4          |                    |                    |                    |          | N2           | N2           | 0%         |                 | 167.2 PSIG      | 074 LPM @ 154.6 PSIG* |
| 1 5                | 2     | East | 101      | 5          |                    |                    |                    |          | VAC          | VAC          |            | 110 LPM         | 20.9 inHg       | 085 LPM @ 10.8 inHg   |
| 1 6                | 2     | East | 101      | 6          |                    |                    |                    |          |              |              |            |                 |                 |                       |
| 1 7                | 2     | East | 101      | 7          |                    |                    |                    |          |              |              |            |                 |                 |                       |
| 1 8                | 2     | East | 101      | 8          |                    |                    |                    |          |              |              |            |                 |                 |                       |
| 1 9                | 2     | East | 101      | 9          |                    |                    |                    |          |              |              |            |                 |                 |                       |
| 1 10               | 2     | East | 101      | 10         |                    |                    |                    |          |              |              |            |                 |                 |                       |

Testing will start here.

Refer to section *Collecting Data* for instructions to test outlets.

## **Building Customized Reports**

This option enables you to create reports using one or multiple data files.

There is no limit to the number of data files that can be included in a report.

Reporting features include a variety of ways to organize data for on screen and printed reports.

### **Step by Step Instructions**

1. To create a report from previously collected test data, click **Build Report** or select ALT +B.
2. A window will open entitled "MedGas Manager – Select Data Files". Select an existing folder that contains the desired file(s).
3. Select one or more source files and click **Add to list** to place the file(s) in the box called "Files to be processed". There is no limit to the number of data files that can be combined into a report.
4. Choose **OK**.
5. A window will open entitled "MedGas Manager – View Report"

### **Option Buttons (for BOTH collecting data and building reports)**

*Option Buttons appear along the top of the screen in both the test modes and the view report mode for your convenience. Not every option is available in each mode. The following is a description of each option button and instructions for its use.*

#### **Compress Grid / Expand Grid**

To facilitate viewing of test results, especially during outlet testing, the compress grid option allows you to compress the grid to display only the columns containing test data and certain outlet descriptors.

The expand grid option allows you to expand the grid back to its original layout. You have the ability to scroll back and forth from the first column to the last column in both screen modes.

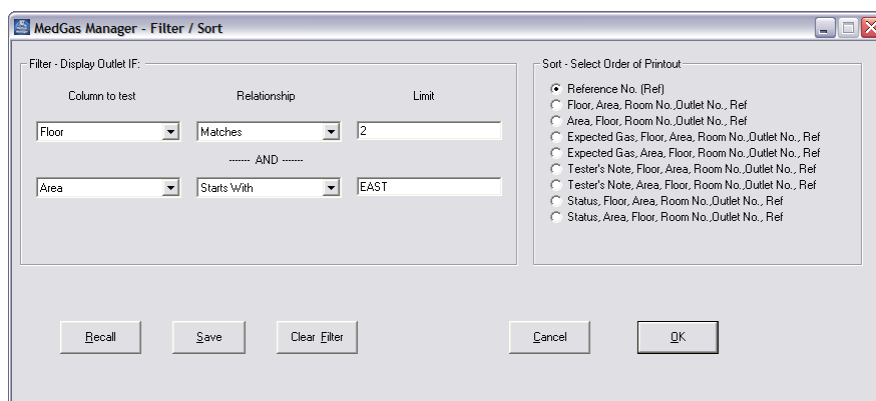
This is a toggle button; pressing the button will change the display from one view to the other. This feature can also be activated using the function key, **F1**.

### Filter/Sort

Filter/Sort provides many options for customizing your MedGas Manager reports.

This feature is disabled when you are in the data collection modes (either Start New Data File or Open Existing Data File).

- ♦ **Filter** will remove selected test results from a report. You may choose one or two criteria for filtering test data.
- ♦ **Sort** will not remove any test results but will rearrange test results into a particular order. You may select any one of the nine options for sorting test data.



### Filtering Outlet Test Results:

1. To Select Filter/Sort, click the button or press ALT +S. A window will open entitled "MedGas Manager – Filter/Sort"
2. Choose Column to Test.
3. Choose Relationship.
4. Choose Limit.
5. Select **OK** to view the filtered report.
6. To restore a report to its original un-filtered form, select **Filter/Sort** and click **Clear Filter**.

In the above example, MedGas Manager will change the display of the report so that the only test results displayed will be those results in which the data in the *Floor* column is "2" and the data in the *Area* column starts with "EAST" (e.g. East A, East B etc). All other test results will be excluded from the report.

Some examples of how you may want to use Filter:

- \* Filter out all the OK outlets in order to print a report of all of the BAD outlets that need to be repaired.
- \* Filter the oxygen outlets in a certain area to troubleshoot a suspected problem.

**PLEASE NOTE: The Filter option does not remove test data from data files; it only alters the way the test data is displayed.**

#### Saving Filters to be Recalled Later

Once a filter criteria is loaded, it may be saved for future use – simply click **Save**. An unlimited number of filters can be saved. To recall a saved filter, click **Recall**. If there are multiple filters saved, continue to click Recall until the desired filter is displayed.

#### Sorting Outlet Test Results

1. From the **MedGas Manager – Filter/Sort** window, choose the desired sort option.
2. Select **OK** to view the sorted report.  
*In the above example, the test data is sorted by Reference No. (Ref). This is the order that the outlet information was loaded into the file.*

#### Find

The Find option allows you to locate a character or string of characters in a data file.

1. Click **Find** or select ALT +N.
2. A window will open entitled “MedGas Manager – Find.”
3. In the box labeled “Find What:” type in the desired characters you want to locate.
4. Select **Find Next** or ALT +N.
5. You may continue to search for the same characters by again clicking **Find Next** or ALT +N to find the next cell containing those same characters.
6. Choose **Cancel** or ALT +C to exit the find option.

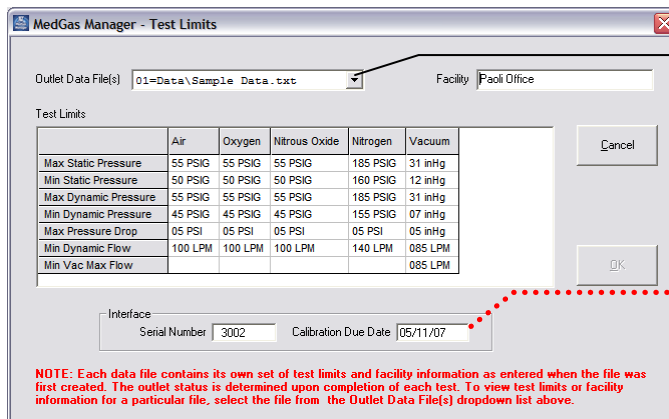
#### View Test Limits (and Calibration Due Date)

The View Test Limits option displays the test limits set for each data file. The test limits cannot be edited in test mode nor in view report mode. To see more information about setting test limits, see the section, *Starting a New File*.

View Test Limits is only used for reference, to recall the following information:

- Test Limits for each test on positive pressure outlets and vacuum inlets.
- Facility Name – The facility where the data was collected.
- Serial Number – The serial number of the interface used to collect the data.
- Calibration Due Date – The date the specified interface is due for its next calibration.

1. Click on the **View Test Limits** button or type ALT +V.
2. A window like the one shown to the right will open.
3. If you are in ‘Report’ mode, there may be more than one data file in the report. To view the limits for all of the data files shown in the report, click the down arrow for Outlet Data File(s).
4. Select **Cancel** or ALT +C to exit.



MedGas Manager - Test Limits

Outlet Data File(s) 01=Data\Sample Data.txt Facility Paoli Office

| Test Limits          | Air     | Oxygen  | Nitrous Oxide | Nitrogen | Vacuum  |
|----------------------|---------|---------|---------------|----------|---------|
| Max Static Pressure  | 55 PSIG | 55 PSIG | 55 PSIG       | 185 PSIG | 31 inHg |
| Min Static Pressure  | 50 PSIG | 50 PSIG | 50 PSIG       | 160 PSIG | 12 inHg |
| Max Dynamic Pressure | 55 PSIG | 55 PSIG | 55 PSIG       | 185 PSIG | 31 inHg |
| Min Dynamic Pressure | 45 PSIG | 45 PSIG | 45 PSIG       | 155 PSIG | 07 inHg |
| Max Pressure Drop    | 05 PSI  | 05 PSI  | 05 PSI        | 05 PSI   | 05 inHg |
| Min Dynamic Flow     | 100 LPM | 100 LPM | 100 LPM       | 140 LPM  | 085 LPM |
| Min Vac Max Flow     |         |         |               |          | 085 LPM |

Interface: Serial Number 3002 Calibration Due Date 05/11/07

NOTE: Each data file contains its own set of test limits and facility information as entered when the file was first created. The outlet status is determined upon completion of each test. To view test limits or facility information for a particular file, select the file from the Outlet Data File(s) dropdown list above.

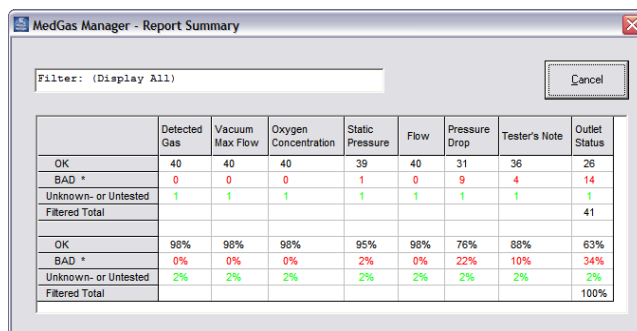
Click for multiple data files.

Check your calibration due date here!

### Summary

This option displays a summary report of the number of outlets that passed and failed for each category and the percentage of the passed and failed outlets.

1. Click **Summary** or select ALT +U.
2. A window will open as shown.  
This information can only be viewed, it cannot be edited.
3. Select **Cancel** or ALT +C to exit.



Filter: (Display All) [Cancel]

|                      | Detected Gas | Vacuum Max Flow | Oxygen Concentration | Static Pressure | Flow | Pressure Drop | Tester's Note | Outlet Status |
|----------------------|--------------|-----------------|----------------------|-----------------|------|---------------|---------------|---------------|
| OK                   | 40           | 40              | 40                   | 39              | 40   | 31            | 36            | 26            |
| BAD *                | 0            | 0               | 0                    | 1               | 0    | 9             | 4             | 14            |
| Unknown- or Untested | 1            | 1               | 1                    | 1               | 1    | 1             | 1             | 1             |
| Filtered Total       |              |                 |                      |                 |      |               |               | 41            |
| OK                   | 98%          | 98%             | 98%                  | 95%             | 98%  | 76%           | 88%           | 63%           |
| BAD *                | 0%           | 0%              | 0%                   | 2%              | 0%   | 22%           | 10%           | 34%           |
| Unknown- or Untested | 2%           | 2%              | 2%                   | 2%              | 2%   | 2%            | 2%            | 2%            |
| Filtered Total       |              |                 |                      |                 |      |               |               | 100%          |

### Font & Default

The Font option allows you to change the font of the report. You may change the font type, font style, font size, and script type. Once the desired font has been chosen, a sample of the font will appear in the sample box. The font chosen will appear both on the screen and on the printed report.

To change the font of a report:

1. Select the **Font** button or type ALT +O.
2. A window will open entitled "Font".
3. Choose the Font Type, Font Style and/or Font Size.
4. Select **OK**. The collected data will appear in the chosen font.

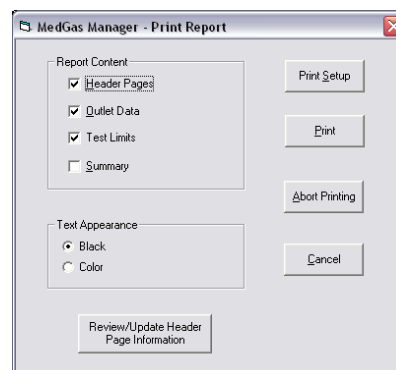
To return an altered font back to the program's default settings:

Select **Default**, click button or select ALT +D. The Default Font is Arial 8-point.

### Printing Reports

The Print option allows you to set up the print layout and print the report. Click the **Print** button or type ALT +P. A window will open entitled "MedGas Manager – Print Report"

1. Check the boxes under Report Content for the components you wish to include in the report.
2. Choose whether you want the report to be printed in color or black and white.
3. To add information to the header page, click the Review/Update Header Page Information. This will show a box with 4 blank lines to which any special instructions or other notations may be entered to appear on the Report Header Page. This information will appear under the filter/sort instructions.



Report Content:

- ☒ Header Pages
- ☒ Outlet Data
- ☒ Test Limits
- ☐ Summary

Text Appearance:

- ☒ Black
- ☐ Color

Buttons: Print Setup, Print, Abort Printing, Cancel, Review/Update Header Page Information



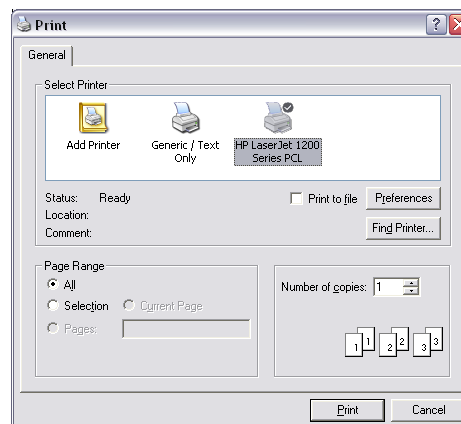
Additional Title Page Information:

National Safety Technologies

Quarterly Report

Ok

4. To select a printer and additional printing preferences, click **Print Setup** or ALT +S.
5. For more options, click Preferences or ALT +R.  
This will open the Printing Preferences window that will have 2 or 3 tabs (depending upon your version of Windows®) containing a variety of options. Typically page layout (portrait or landscape) and print quality can be selected in one of these tabs. Once you have selected your print options, click Print and you will be returned back to the initial print window.



6. Once all printing options have been selected, click **Print** or ALT +P to print the report.  
If you make an error in the print setup, Abort Printing or ALT +A will halt printing.
7. A new window will open and display "Data has been sent to printer". Click **OK** to proceed with printing.

For detailed reports with information in the descriptor and comment columns, printing on legal size paper (8 ½ x 14) can provide more legible reports.

### Save Data and Auto Save Features

The Save Data option will save test results to the designated data. This option is not available in report mode (*Build Report for Data Files*). You may click **Save Data** or type ALT +S at anytime during testing. A window will appear to confirm that the data has been saved and to display the file in which the test results have been stored. Choose **OK** to close the window and continue testing.

MedGas Manager has two Auto Save features to protect against data loss. The first Auto-Save feature occurs regularly during testing. After every 20 outlets tested, MedGas Manager will save the test results to the designated data file. After the twenty-first test has been completed, a message will appear stating that the data has been saved. Click **OK** to continue testing.

The second Auto-Save feature occurs upon exiting test mode. Once you click Return to Main Menu or ALT +R and confirm that you want to exit the program, MedGas Manager will save your test results to the data file.

### Return to Main Menu

To properly exit the program and insure that your data gets saved, please use this button to return to the main menu and to exit the program.

## **Warranty**

National Safety Technologies warrants the Model G3000 Medical Gas Outlet Analyzer to be free from defects in material and workmanship under normal use and service for a period of one year from date of purchase. This warranty shall not apply to any unit or parts subject to alteration, misuse, neglect, accident, or abnormal conditions of operation. In addition, this warranty does not apply to any parts subject to normal wear during operation.

This warranty is limited to repair or replacement by NST of any parts found by NST to be defective. Such repair or replacement will be made without charge, provided the analyzer is returned within one year of the original date of purchase. If the failure is found to be caused by alteration, misuse, neglect, accident, or abnormal conditions of operation, parts and repairs will be billed at the prevailing charges.

NST's liability for damages from any cause whatsoever will be limited to the payment actually received by NST.

IN NO EVENT WILL NST BE LIABLE FOR ANY LOST PROFITS, INCIDENTAL DAMAGES, SPECIAL DAMAGES, OR CONSEQUENTIAL DAMAGES, EVEN IF NST HAS BEEN ADVISED OF THE POSSIBILITY OF SUCH DAMAGES.

IN ADDITION, NST WILL NOT BE LIABLE FOR ANY DAMAGES OF THE CUSTOMER BASED UPON A THIRD PARTY CLAIM.

THE FOREGOING WARRANTIES ARE IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS OF A PARTICULAR PURPOSE.

## **Appendix A: Sample Report**

| Medical Gas Outlet Survey Report                                                                                                |                       |                             |                                                              |
|---------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------------|--------------------------------------------------------------|
| File No.<br>01                                                                                                                  | File Date<br>6/6/2006 | Facility<br>Sample Facility | File Name<br>C:\Program Files\NST G3000\Data\Sample Data.txt |
| Filter: (Display All)<br>Sorted: In Order Loaded (IOL)                                                                          |                       |                             |                                                              |
| Quarterly Outlet Check - 1st Quarter 2006<br>Medical Gas System<br>Patient Maintenance Department<br>General Hospital           |                       |                             |                                                              |
| Data Collected and Processed using the NST Medical Gas Outlet Analyzer                                                          |                       |                             |                                                              |
|  <b>National<br/>Safety<br/>Technologies</b> |                       |                             |                                                              |

### EXPLANATION OF CODES

This report contains test results of a survey of medical gas outlets at the facility(s) listed above. Gas outlets were tested for gas type, oxygen concentration, static pressure, pressure during flow and pressure drop. Vacuum inlets were tested for pressure during flow and maximum flow. Notes may have been added by test personnel when appropriate.

The significance of the data in each test result column are as follows:

**Expected Gas** - The gas type as determined by the adapter connected to the positive pressure test probe if it is inserted in the outlet OR Vacuum if the vacuum test probe is inserted in the outlet.  
**Expected gasses** include Air, Oxygen, Nitrous Oxide, Nitrogen, and Vacuum.

**Detected Gas** - The gas type actually flowing from the outlet as determined by the concentrations of oxygen and nitrous oxide detected in the gas. If a negative pressure is measured, no concentration tests are performed and the Detected Gas is shown as Vacuum. The parameters used to determine the Detected Gas are:  
If the Detected Gas pressure is positive and:  
if percent O<sub>2</sub> is 10-30 and percent N<sub>2</sub>O is less than 30, then Detected Gas is AIR.  
if percent O<sub>2</sub> is over 70 and percent N<sub>2</sub>O is less than 30, then Detected Gas is O<sub>2</sub>.  
if percent O<sub>2</sub> is less than 10 and percent N<sub>2</sub>O is over 70, then Detected Gas is N<sub>2</sub>O.

If the detected gas pressure is negative, Detected Gas is Vacuum.

A "" indicates that a different gas was flowing from the outlet than was expected.

**Oxygen Concentration** - The percentage of oxygen in the detected gas.

**Static Pressure** - The pressure at the outlet with no flow.

A "" indicates pressure above or below test limits.

**Dynamic Flow and Pressure** - The pressure at the Inlet/Outlet with flow. A valve is slowly opened until flow reaches the flow test value or pressure drops below the minimum pressure limit, whichever occurs first. Flow and pressure are then recorded.

A "" indicates pressure above or below limits.

**Pressure Drop** - Static pressure minus dynamic pressure, a computed value in MedGas Manager.

A "" indicates a pressure drop above the test limit.

**Vacuum Max Flow** - The flow rate when the valve in the vacuum test probe is fully opened.

A "" indicates that the maximum flow is below the test limit.

**Tester's Note** - Preloaded notes listed in a dropdown box that can be entered by test personnel to add comments or observations to the automatically performed tests.

A "" indicates an unacceptable condition.

### OUTLET STATUS - The outlet is:

OK if all test results and the Tester's Note are OK (not flagged with a "").  
BAD if all test results and the Tester's Note are unacceptable (flagged with a "").  
UNTESTED - If the outlet was not tested and the Tester's Note is acceptable (i.e. not a note that would cause an automatic failure).

# G3000 Medical Gas Outlet Analyzer

## User's Guide

| Reference File No. | Floor  | Area      | Room No. | Outlet No. | Outlet Loc/Outlet Type | Outlet Condition | Comments | Expected Gas | Detected Gas | O2 Conc. | Vacuum Max Flow | Static Pressure | Dynamic Flow         | Pressure  | Pressure Drop | Tester's Name | Tester's Note | Test Date & Time | Interface Serial No. | Outlet Status |
|--------------------|--------|-----------|----------|------------|------------------------|------------------|----------|--------------|--------------|----------|-----------------|-----------------|----------------------|-----------|---------------|---------------|---------------|------------------|----------------------|---------------|
| 1                  | Ground | East Wing | 1        | 1          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     |                 | 053.5 PSIG      | 102 LPM @ 049.8 PSIG | 03.7 PSIG | 03.7 PSIG     | John Smith    |               | 2/23/2006 13:59  | 5011                 | OK            |
| 1                  | Ground | East Wing | 1        | 2          | Wall                   | Chemtron         | Good     | AIR          | AIR          | 21%      |                 | 053.5 PSIG      | 101 LPM @ 048.7 PSIG | 04.3 PSIG | 04.3 PSIG     | John Smith    |               | 2/23/2006 14:01  | 5011                 | OK            |
| 1                  | Ground | East Wing | 1        | 3          | Wall                   | Chemtron         | Good     | VAC          | VAC          | 0%       | 101 LPM         | 16.0 inHg       | 087 LPM @ 08.1 inHg  | 08.0 inHg | 08.0 inHg     | John Smith    |               | 2/23/2006 14:01  | 5011                 | OK            |
| 1                  | Ground | East Wing | 2        | 1          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     |                 | 053.6 PSIG      | 101 LPM @ 049.9 PSIG | 03.7 PSIG | 03.7 PSIG     | John Smith    |               | 2/23/2006 14:02  | 5011                 | OK            |
| 1                  | Ground | East Wing | 2        | 2          | Wall                   | Chemtron         | Good     | AIR          | AIR          | 21%      |                 | 053.1 PSIG      | 100 LPM @ 048.1 PSIG | 05.0 PSIG | 05.0 PSIG     | John Smith    |               | 2/23/2006 14:02  | 5011                 | OK            |
| 1                  | Ground | East Wing | 2        | 3          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     |                 | 053.5 PSIG      | 101 LPM @ 048.8 PSIG | 03.7 PSIG | 03.7 PSIG     | John Smith    |               | 2/23/2006 14:03  | 5011                 | OK            |
| 1                  | Ground | East Wing | 2        | 4          | Wall                   | Chemtron         | Good     | AIR          | AIR          | 21%      |                 | 053.3 PSIG      | 101 LPM @ 048.1 PSIG | 05.1 PSIG | 05.1 PSIG     | John Smith    |               | 2/23/2006 14:03  | 5011                 | BAD *         |
| 1                  | Ground | East Wing | 3        | 1          | Ceiling                | DISS             | Good     | N2O          | N2O          | 0%       |                 | 053.7 PSIG      | 101 LPM @ 049.8 PSIG | 03.8 PSIG | 03.8 PSIG     | John Smith    |               | 2/23/2006 14:03  | 5011                 | OK            |
| 1                  | Ground | East Wing | 3        | 2          | Ceiling                | DISS             | Good     | O2           | O2           | 100%     |                 | 053.7 PSIG      | 101 LPM @ 049.8 PSIG | 03.8 PSIG | 03.8 PSIG     | John Smith    |               | 2/23/2006 14:03  | 5011                 | OK            |
| 1                  | Ground | East Wing | 3        | 3          | Ceiling                | DISS             | Good     | O2           | O2           | 100%     |                 | 053.5 PSIG      | 101 LPM @ 049.8 PSIG | 03.7 PSIG | 03.7 PSIG     | John Smith    |               | 2/23/2006 14:06  | 5011                 | OK            |
| 1                  | Ground | East Wing | 3        | 4          | Ceiling                | DISS             | Good     | O2           | O2           | 100%     |                 | 15.2 inHg       | 086 LPM @ 09.4 inHg  | 05.8 inHg | 05.8 inHg     | John Smith    |               | 2/23/2006 14:07  | 5011                 | OK            |
| 1                  | Ground | East Wing | 305      | 1          | Wall                   | Chemtron         | Good     | VAC          | VAC          | 0%       | 103 LPM         | 14.5 inHg       | 086 LPM @ 08.8 inHg  | 05.7 inHg | 05.7 inHg     | John Smith    |               | 2/23/2006 14:07  | 5011                 | OK            |
| 1                  | Ground | East Wing | 305      | 2          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     | 102 LPM         | 053.6 PSIG      | 101 LPM @ 049.9 PSIG | 03.7 PSIG | 03.7 PSIG     | John Smith    |               | 2/23/2006 14:08  | 5011                 | OK            |
| 1                  | Ground | East Wing | 305      | 3          | Wall                   | Chemtron         | Good     | AIR          | AIR          | 21%      |                 | 053.2 PSIG      | 100 LPM @ 049.1 PSIG | 04.1 PSIG | 04.1 PSIG     | John Smith    |               | 2/23/2006 14:08  | 5011                 | OK            |
| 1                  | Ground | East Wing | 305      | 4          | Wall                   | Chemtron         | Good     | N2O          | N2O          | 0%       |                 | 053.9 PSIG      | 102 LPM @ 048.6 PSIG | 04.3 PSIG | 04.3 PSIG     | John Smith    |               | 2/23/2006 14:09  | 5011                 | OK            |
| 1                  | Ground | East Wing | 307      | 1          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     |                 | 053.3 PSIG      | 102 LPM @ 049.0 PSIG | 04.3 PSIG | 04.3 PSIG     | John Smith    |               | 2/23/2006 14:09  | 5011                 | OK            |
| 1                  | Ground | East Wing | 307      | 2          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     |                 | 053.6 PSIG      | 101 LPM @ 047.8 PSIG | 05.9 PSIG | 05.9 PSIG     | John Smith    |               | 2/23/2006 14:10  | 5011                 | OK            |
| 1                  | Ground | East Wing | 307      | 3          | Wall                   | Chemtron         | Good     | AIR          | AIR          | 21%      |                 | 053.2 PSIG      | 100 LPM @ 048.1 PSIG | 04.1 PSIG | 04.1 PSIG     | John Smith    |               | 2/23/2006 14:12  | 5011                 | BAD *         |
| 1                  | Ground | East Wing | 307      | 4          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     |                 | 053.6 PSIG      | 101 LPM @ 049.8 PSIG | 03.8 PSIG | 03.8 PSIG     | John Smith    |               | 2/23/2006 14:13  | 5011                 | OK            |
| 1                  | Ground | East Wing | 307      | 5          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     |                 | 053.3 PSIG      | 101 LPM @ 048.1 PSIG | 04.2 PSIG | 04.2 PSIG     | John Smith    |               | 2/23/2006 14:13  | 5011                 | OK            |
| 1                  | Ground | East Wing | 309      | 1          | Wall                   | Chemtron         | Good     | AIR          | AIR          | 21%      |                 | 053.3 PSIG      | 101 LPM @ 048.1 PSIG | 04.2 PSIG | 04.2 PSIG     | John Smith    |               | 2/23/2006 14:14  | 5011                 | OK            |
| 1                  | Ground | East Wing | 515      | 1          | Ceiling                | DISS             | Good     | N2O          | N2O          | 0%       | 100 LPM         | 053.9 PSIG      | 101 LPM @ 048.7 PSIG | 04.2 PSIG | 04.2 PSIG     | John Smith    |               | 2/23/2006 14:15  | 5011                 | OK            |
| 1                  | Ground | East Wing | 515      | 2          | Ceiling                | DISS             | Good     | VAC          | VAC          | 0%       |                 | 053.5 PSIG      | 102 LPM @ 049.8 PSIG | 03.7 PSIG | 03.7 PSIG     | John Smith    |               | 2/23/2006 14:15  | 5011                 | OK            |
| 1                  | Ground | East Wing | 515      | 3          | Ceiling                | DISS             | Good     | O2           | O2           | 100%     |                 | 053.5 PSIG      | 102 LPM @ 049.8 PSIG | 03.7 PSIG | 03.7 PSIG     | John Smith    |               | 2/23/2006 14:15  | 5011                 | OK            |
| 1                  | Ground | East Wing | 517      | 1          | Ceiling                | DISS             | Good     | AIR          | AIR          | 21%      |                 | 053.0 PSIG      | 100 LPM @ 048.1 PSIG | 05.0 PSIG | 05.0 PSIG     | John Smith    |               | 2/23/2006 15:00  | 5011                 | OK            |
| 1                  | Ground | East Wing | 517      | 2          | Ceiling                | DISS             | Good     | N2O          | N2O          | 0%       |                 | 052.9 PSIG      | 101 LPM @ 048.1 PSIG | 04.2 PSIG | 04.2 PSIG     | John Smith    |               | 2/23/2006 15:00  | 5011                 | OK            |
| 1                  | Ground | East Wing | 517      | 3          | Ceiling                | DISS             | Good     | VAC          | VAC          | 0%       | 101 LPM         | 053.6 PSIG      | 087 LPM @ 08.1 inHg  | 08.0 inHg | 08.0 inHg     | John Smith    |               | 2/23/2006 15:01  | 5011                 | OK            |
| 1                  | Ground | East Wing | 517      | 4          | Ceiling                | DISS             | Good     | O2           | O2           | 100%     |                 | 053.6 PSIG      | 101 LPM @ 049.9 PSIG | 03.7 PSIG | 03.7 PSIG     | John Smith    |               | 2/23/2006 15:02  | 5011                 | OK            |
| 1                  | Ground | East Wing | 517      | 5          | Ceiling                | DISS             | Good     | O2           | O2           | 22%      |                 | 053.6 PSIG      | 100 LPM @ 046.9 PSIG | 03.7 PSIG | 03.7 PSIG     | John Smith    |               | 2/23/2006 15:07  | 5011                 | BAD *         |
| 1                  | Ground | East Wing | 213      | 1          | Wall                   | Chemtron         | Good     | N2           | N2           | 0%       | 101 LPM         | 165.3 PSIG      | 142 LPM @ 164.9 PSIG | 00.4 PSIG | 00.4 PSIG     | John Smith    |               | 2/23/2006 15:08  | 5011                 | OK            |
| 1                  | Ground | East Wing | 201      | 1          | Ceiling                | DISS             | Good     | VAC          | VAC          | 0%       |                 | 051.7 PSIG      | 103 LPM @ 08.7 inHg  | 04.6 PSIG | 04.6 PSIG     | Jane Moore    |               | 2/24/2006 10:04  | 5011                 | OK            |
| 1                  | Ground | East Wing | 203      | 1          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     | 90 LPM          | 051.6 PSIG      | 086 LPM @ 08.7 inHg  | 04.4 PSIG | 04.4 PSIG     | Jane Moore    |               | 2/24/2006 10:06  | 5011                 | OK            |
| 1                  | Ground | East Wing | 203      | 2          | Ceiling                | DISS             | Good     | AIR          | AIR          | 21%      |                 | 051.6 PSIG      | 101 LPM @ 047.2 PSIG | 04.4 PSIG | 04.4 PSIG     | Jane Moore    |               | 2/24/2006 10:10  | 5011                 | OK            |
| 1                  | Ground | East Wing | 202      | 1          | Ceiling                | DISS             | Good     | N2O          | N2O          | 0%       |                 | 053.9 PSIG      | 102 LPM @ 050.2 PSIG | 03.7 PSIG | 03.7 PSIG     | Jane Moore    |               | 2/24/2006 10:10  | 5011                 | OK            |
| 1                  | Ground | East Wing | 202      | 2          | Ceiling                | DISS             | Good     | N2           | N2           | 0%       |                 | 170.8 PSIG      | 140 LPM @ 166.9 PSIG | 03.9 PSIG | 03.9 PSIG     | Jane Moore    |               | 2/24/2006 10:11  | 5011                 | BAD *         |
| 1                  | Ground | East Wing | 202      | 3          | Ceiling                | DISS             | Good     | O2           | O2           | 0%       |                 | 051.5 PSIG      | 101 LPM @ 051.5 PSIG | 00.3 PSIG | 00.3 PSIG     | Jane Moore    |               | 2/24/2006 10:11  | 5011                 | BAD *         |
| 1                  | Ground | East Wing | 202      | 4          | Ceiling                | DISS             | Good     | VAC          | VAC          | 21%      | 92 LPM          | 21.6 inHg       | 087 LPM @ 08.3 inHg  | 13.3 inHg | 13.3 inHg     | Jane Moore    |               | 2/24/2006 10:14  | 5011                 | BAD *         |
| 1                  | Ground | East Wing | 202      | 5          | Ceiling                | DISS             | Good     | VAC          | VAC          | 0%       |                 | 051.5 PSIG      | 102 LPM @ 050.8 PSIG | 00.7 PSIG | 00.7 PSIG     | Jane Moore    |               | 2/25/2006 14:15  | 5011                 | Undecided     |
| 1                  | Ground | East Wing | 200      | 1          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     |                 | 051.0 PSIG      | 86 LPM @ 049.1 PSIG  | 04.0 PSIG | 04.0 PSIG     | John Smith    |               | 2/25/2006 14:16  | 5011                 | BAD *         |
| 1                  | Ground | East Wing | 200      | 2          | Wall                   | Chemtron         | Good     | AIR          | AIR          | 21%      |                 | 051.9 PSIG      | 101 LPM @ 048.2 PSIG | 04.3 PSIG | 04.3 PSIG     | John Smith    |               | 2/25/2006 14:19  | 5011                 | OK            |
| 1                  | Ground | East Wing | 200      | 3          | Wall                   | Chemtron         | Good     | VAC          | VAC          | 0%       | 102 LPM         | 16.0 inHg       | 087 LPM @ 08.1 inHg  | 03.9 inHg | 03.9 inHg     | John Smith    |               | 2/25/2006 14:23  | 3681                 | OK            |
| 1                  | Ground | East Wing | 200      | 4          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     |                 | 051.5 PSIG      | 102 LPM @ 050.8 PSIG | 00.7 PSIG | 00.7 PSIG     | John Smith    |               | 2/25/2006 14:23  | 3681                 | OK            |
| 1                  | Ground | East Wing | 211      | 1          | Wall                   | Chemtron         | Good     | N2O          | N2O          | 0%       | 101 LPM         | 051.7 PSIG      | 101 LPM @ 048.4 PSIG | 03.9 PSIG | 03.9 PSIG     | John Smith    |               | 2/26/2006 14:25  | 3681                 | OK            |
| 1                  | Ground | East Wing | 211      | 2          | Wall                   | Chemtron         | Good     | VAC          | VAC          | 0%       |                 | 17.1 inHg       | 087 LPM @ 08.6 inHg  | 08.5 inHg | 08.5 inHg     | John Smith    |               | 2/26/2006 14:25  | 3681                 | OK            |
| 1                  | Ground | East Wing | 211      | 3          | Wall                   | Chemtron         | Good     | N2           | N2           | 0%       |                 | 170.1 PSIG      | 142 LPM @ 168.9 PSIG | 01.2 PSIG | 01.2 PSIG     | John Smith    |               | 2/27/2006 14:25  | 3681                 | OK            |
| 1                  | Ground | East Wing | 211      | 4          | Wall                   | Chemtron         | Good     | O2           | O2           | 100%     |                 | 054.5 PSIG      | 102 LPM @ 050.8 PSIG | 03.7 PSIG | 03.7 PSIG     | John Smith    |               | 2/27/2006 14:25  | 3681                 | OK            |
| 1                  | Ground | East Wing | 207      | 1          | Ceiling                | DISS             | Good     | AIR          | AIR          | 21%      |                 | 054.5 PSIG      | 100 LPM @ 049.1 PSIG | 04.3 PSIG | 04.3 PSIG     | John Smith    |               | 2/27/2006 14:25  | 3681                 | OK            |
| 1                  | Ground | East Wing | 207      | 2          | Ceiling                | DISS             | Good     | N2O          | N2O          | 0%       |                 | 20.5 inHg       | 087 LPM @ 14.2 inHg  | 06.3 inHg | 06.3 inHg     | John Smith    |               | 2/27/2006 14:25  | 3681                 | OK            |
| 1                  | Ground | East Wing | 207      | 3          | Ceiling                | DISS             | Good     | VAC          | VAC          | 0%       | 103 LPM         | 20.5 inHg       | 087 LPM @ 14.2 inHg  | 06.3 inHg | 06.3 inHg     | John Smith    |               | 2/27/2006 14:25  | 3681                 | OK            |
| 1                  | Ground | East Wing | 221      | 1          | Ceiling                | DISS             | Good     | AIR          | AIR          | 21%      |                 | 053.0 PSIG      | 100 LPM @ 046.8 PSIG | 04.2 PSIG | 04.2 PSIG     | John Smith    |               | 2/26/2006 14:29  | 3681                 | OK            |
| 1                  | Ground | East Wing | 221      | 2          | Ceiling                | DISS             | Good     | N2           | N2           | 0%       |                 | 172.0 PSIG      | 142 LPM @ 168.9 PSIG | 03.1 PSIG | 03.1 PSIG     | John Smith    |               | 3/1/2006 14:26   | 3681                 | OK            |
| 1                  | Ground | East Wing | 221      | 3          | Ceiling                | DISS             | Good     | VAC          | VAC          | 0%       | 100 LPM         | 16.0 inHg       | 087 LPM @ 08.1 inHg  | 08.0 inHg | 08.0 inHg     | John Smith    |               | 2/26/2006 14:32  | 3681                 | OK            |
| 1                  | Ground | East Wing | 221      | 4          | Wall                   | Chemtron         | Good     | AIR          | AIR          | 21%      |                 | 053.0 PSIG      | 100 LPM @ 049.1 PSIG | 04.0 PSIG | 04.0 PSIG     | John Smith    |               | 2/26/2006 14:32  | 3681                 | BAD *         |
| 1                  | Ground | East Wing | 221      | 5          | Wall                   | Chemtron         | Good     | N2           | N2           | 0%       |                 | 22.3 PSIG       | 087 LPM @ 25.0 inHg  | 04.7 inHg | 04.7 inHg     | John Smith    |               | 2/26/2006 14:32  | 3681                 | OK            |
| 1                  | Ground | East Wing | 221      | 6          | Wall                   | Chemtron         | Good     | VAC          | VAC          | 0%       | 100 LPM         | 23.1 inHg       | 087 LPM @ 25.0 inHg  | 04.1 inHg | 04.1 inHg     | John Smith    |               | 2/26/2006 14:32  | 3681                 | OK            |

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### MEDICAL GAS OUTLET SUMMARY REPORT

File No. 01      File Date 6/6/2006      Facility Sample Facility      File Name C:\Program Files\NST G3000\Data\Sample Data.txt

Filter: (Display All)

|                                     | Detected Gas | Vacuum Max Flow | Oxygen Concentration | Static Pressure | Flow | Pressure Drop | Tester's Note | Outlet Status |
|-------------------------------------|--------------|-----------------|----------------------|-----------------|------|---------------|---------------|---------------|
| OK                                  | 56           | 58              | 58                   | 57              | 57   | 53            | 51            | 44            |
| OK                                  | 2            | 2               | 2                    | 2               | 2    | 2             | 2             | 2             |
| OK                                  | 2            | 2               | 2                    | 2               | 2    | 2             | 2             | 2             |
| Unknown or Unlabeled Filtered Total | 33%          | 0%              | 0%                   | 95%             | 95%  | 88%           | 85%           | 73%           |
| OK                                  | 93%          | 97%             | 97%                  | 95%             | 95%  | 88%           | 85%           | 73%           |
| OK                                  | 33%          | 0%              | 0%                   | 95%             | 95%  | 88%           | 85%           | 73%           |
| Unknown or Unlabeled Filtered Total | 33%          | 0%              | 0%                   | 95%             | 95%  | 88%           | 85%           | 73%           |

## **Appendix B: Suggested Room Abbreviations**

| Room                            | Abbrev. |
|---------------------------------|---------|
| Administrative Offices          | ADMIN   |
| Animal Laboratory               | ANIM    |
| Audiology                       | AUD     |
| Autopsy and Morgue              | AUT     |
| Blood Bank                      | BBNK    |
| Blood Gas Lab                   | BGAS    |
| Cardiac Cath Lab                | CATH    |
| Cast Room                       | CAST    |
| Central Supply                  | CEN     |
| Chemistry                       | CHEM    |
| Chemistry, Automated            | CHEMA   |
| Clinic                          | CLIN    |
| Clinic, Dental                  | CDEN    |
| Clinic, Ear, Nose, & Throat     | CENT    |
| Clinic, Endoscopy               | CEND    |
| Clinic, Eye                     | CEYE    |
| Clinic, Medicine                | CMED    |
| Clinic, Pediatric               | CPED    |
| Clinic, Surgery                 | CSRU    |
| Clinic, Urology                 | CURO    |
| Clinical Laboratory             | CL      |
| Clinical Laboratory, Cyst       | CLCYS   |
| Clinical Laboratory, Hemo       | CLHEM   |
| Clinical Laboratory, Micro      | CIMIC   |
| Clinical Laboratory, Sero       | CLSER   |
| Clinical Laboratory, Urin       | CLURI   |
| Clinical Laboratory, Viro       | CLVIR   |
| Coronary Care Unit              | CCU     |
| Coronary Care Unit, Progressive | CCUP    |
| Cystoscopy                      | CYS     |
| Dark room                       | DKRM    |
| Delivery Room                   | DELR    |
| Delivery Suite                  | DELS    |
| Dialysis Unit, In-Patient       | DIALI   |
| Dialysis Unit, Out-Patient      | DIALO   |
| Dietary                         | DIE     |
| Electrocardiography             | ECG     |
| Electroencephalography          | EEG     |
| Electromicroscopy               | EMIC    |
| Electromyography                | EMG     |
| Emergency Care Facility         | ECF     |
| Emergency Room                  | ER      |

| Room                             | Abbrev. |
|----------------------------------|---------|
| Emergency Vehicle                | EV      |
| Examination Room                 | EXAM    |
| Fluorescent Microscopy           | FMIC    |
| Fluoroscopy                      | FLO     |
| Fracture Room                    | FRAC    |
| General Office Area              | GO      |
| Heart Station                    | HS      |
| Histology                        | HISTO   |
| Housekeeping                     | HK      |
| Immunology                       | IMM     |
| Industrial Medical Facility      | IMF     |
| Intensive Care Unit, Burn        | ICUB    |
| Intensive Care Unit, General     | ICUG    |
| Intensive Care Unit, Infant      | ICUI    |
| Intensive Care Unit, Medical     | ICUM    |
| Intensive Care Unit, Neo         | ICUNN   |
| Intensive Care Unit, Neur        | ICUN    |
| Intensive Care Unit, Pediatric   | ICUP    |
| Intensive Care Unit, Progressive | ICUPRG  |
| Intensive Care Unit, Respiratory | ICUR    |
| Intensive Care Unit, Surgical    | ICUS    |
| Labor Room                       | LABOR   |
| Laundry                          | LAU     |
| Library                          | LIB     |
| Medical Records                  | MEDR    |
| Multiphasic Screening            | MULTI   |
| Nuclear Medicine                 | NUC     |
| Nursery                          | NUR     |
| Nursery, Intensive Care          | NURI    |
| Nursery, Premature               | NURP    |
| Nurses Station                   | NS      |
| Occupational Therapy             | OCC     |
| Operating Room                   | OR      |
| Operating Suite                  | OS      |
| Out-Patient Department           | OUTP    |
| Pathology                        | PATH    |
| Patient Room, Isolation          | PRI     |
| Patient Room, Pediatric          | PRP     |
| Patient Room, Private            | PRPR    |
| Patient Room, Semi-Private       | PRSP    |
| Patient Room, Ward               | PRW     |
| Pharmacy                         | PHAR    |

| Room                     | Abbrev. |
|--------------------------|---------|
| Physical Therapy         | PT      |
| Plant Support Area       | PLANT   |
| Post-Anesthesia Recovery | PAR     |
| Psychiatric Unit         | PSY     |
| Pulmonary Function Lab   | PULF    |
| Radio-Isotope            | RISO    |
| Radiology Suite          | RAD     |
| Recovery Room            | RR      |
| Research Lab             | RLAB    |
| Respiratory Therapy      | RT      |
| Special Studies Room     | SSR     |
| Speech and Hearing Lab   | SPECH   |
| Student Laboratory       | STU     |
| Treatment Room           | TRE     |
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## **Appendix C: Troubleshooting**

### **Interface Communication Error**

For proper performance, you may have to check your port settings and insure that "Prolific USB to Serial Port" is assigned to COM3. This can be confirmed by viewing *Ports (COM & LPT)* in **Device Manager**. To verify the port setting, the G3000 interface must be plugged into your computer.

If you are having communication problems, please contact your IT department or call NST for assistance.

### **Software Recovery**

The G3000 Medical Gas Outlet Analyzer comes with all of the necessary software preloaded on the laptop computer supplied with the device. A software disc is included to recover any of these files, if necessary.

Included on the software recovery disk:

- MedGas Manager™
- Sample Data and Sample Template files
- OxyCal™
- USBtoSerial Installer
- G3000 User's Guide.

To reinstall the G3000 software:

1. Back up all test data.
2. Insert disk into drive. Installation will begin automatically.
3. Follow the onscreen instructions.
4. If a previous version of the G3000 software is present, please remove these files.

**Returning an Analyzer to NST**

**Please Note:** Analyzers suspected of having a problem should be returned to NST only after discussing the problem with an NST technician. Problems can often be solved over the telephone or visit our website at [www.nst-usa.com](http://www.nst-usa.com) for Technical Support.

1. Place the G3000 interface and all adapters in a shipping carton with adequate protection.
2. If there are any questions regarding the operation of the analyzer, include a brief description of the issue along with the name of a contact person to discuss the question.
3. Ship to the NST Technical Support Office address below using one of the recognized carriers (UPS, FedEx, etc.). Please insure the analyzer for the full purchase price.

National Safety Technologies - Technical Services  
Station Square Two, Suite 107  
Paoli, PA 19301

Toll Free: 800-678-7074  
Phone: 610-408-0555  
Fax: 610-408-9594

4. Call NST at 800-678-7074 to let us know the analyzer is on the way.

[illegible]

[illegible]



**National Safety Technologies**

Station Square Two, Suite 107  
Paoli, PA 19301, U.S.A.  
Phone: 610-408-0555  
Fax: 610-408-9594  
[www.NST-USA.com](http://www.NST-USA.com)

**Obelis s.a.**

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B-1030 Brussels, Belgium  
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Fax: + ( 32) 2. 732.60.03  
Email: [mail@obelis.com](mailto:mail@obelis.com)

Explanation of symbols used:



Manufactured Representative

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