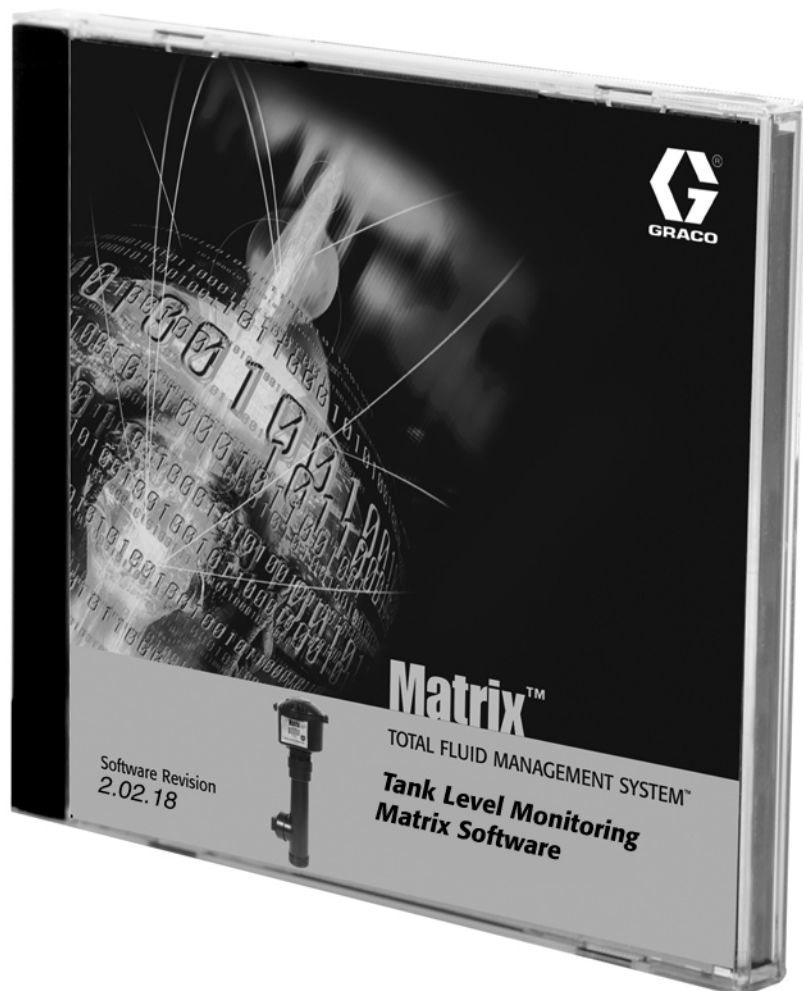


Instruction Manual Tank Level Monitor (TLM) Software

309504 rev.D

For use with Graco Matrix Electronic Meter and Tank Level Monitor Components.

U.S. Patents Pending



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System Requirements

Graco strongly recommends that the end user's IT (Information Technology) representative be involved in the following Matrix installation activities:

- Assist with the selection and/or purchase of the Matrix PC. The PC must meet the performance specifications listed under **PC Hardware Requirements**. If the Matrix PC will be connected to a Network with other PCs, the IT representative should be contacted to properly configure the PC before loading Matrix software.
- The IT representative should be present during Matrix software loading on the day of Matrix installation.
- one available RS232 port
- network card
- uninterruptible power supply (UPS).
- Some means of archiving Matrix production data and backup database files over time is recommended--examples of hardware that can help with this are a CD/RW or DVD-R/W drive, a USB flash drive, or an accessible network drive.



Graco recommends that this PC be dedicated to Matrix--i.e. it is not used for other purposes, like running spreadsheet programs, sending e-mail, etc.

General Matrix System Specifications

Matrix PC software supports systems using a single PC (also referred to as a standalone PC) as well as multiple-PC systems.

Single PC (Standalone) Systems: Intended primarily for applications that do not require interaction with Matrix screens from multiple locations and have few tank level monitors, this type of system provides complete Matrix system functionality at one PC.

Multiple-PC (Networked) Systems: Using an existing network, Matrix deployed in this fashion consists of a single (dedicated) PC functioning as the Matrix Server and one or more PCs functioning as Matrix Clients. The Matrix system's transceiver(s) are always connected to the Matrix Server. This configuration is recommended for applications where Matrix screen access from multiple physical locations is desired or there are large numbers of tank level monitors.



This version of Matrix will support a network of up to 25 Matrix Client PCs; more than 25 are not supported. Please call Graco if you require more than 25 client PCs.

PC Hardware Requirements

Standalone Matrix PC:

- 2 MHz Pentium 4 (or equivalent) processor
- 512 MB RAM, 1024x768 screen resolution
- 1 GB free hard disk space
- CD-ROM drive

Matrix Server PC in a multiple-PC system:



Graco **requires** that this PC be dedicated to Matrix--i.e. it is not used for other purposes, like running spreadsheet programs, sending e-mail, etc.

Matrix Client PC in a multiple-PC system:

2 MHz Pentium 4 (or equivalent) processor, 512 MB RAM, 1024x768 screen resolution, 500 MB free hard disk space, CD-ROM drive, network card.

Serial Port

If the standalone Matrix PC or Matrix Server does not have a physical serial port, a USB-to-serial port converter will be required. The converter selected is based on the number of transceivers used in the system. Graco recommends Edgeport converters, which are available in 1, 4, or 8 port models (Edgeport/1, Edgeport/4, and Edgeport/8, respectively) and can be purchased from B & B Electronics Manufacturing Company (www.bb-elec.com) for North American (N. A.) applications. For Australian applications contact www.tdata.com.au. Each model comes with a 3.3 foot (1 meter) cable.

Uninterruptible Power Supply

An Uninterruptible Power Supply (UPS) is required in all Matrix systems and is available from Graco (part no. 119425 for North American applications or part no. 120104 in Australia). This power supply provides continuous battery power to the PC during power interruption and safely shuts down the PC, securing your Matrix software and preventing data corruption. Be sure the PC and monitor are plugged into the battery back-up side of the UPS during installation.

E-Mail

Matrix can send e-mail to responsible parties based on certain bulk fluid tank conditions. If this feature is to be used, an “always on” Internet connection or network access to an outgoing mail server is required.

PC Software Requirements

- Microsoft XP Professional or Home Edition (no other operating system will work).
- Microsoft Internet Explorer (IE) version 6.0 or higher.
- Java Runtime Environment (JRE) 1.4 or later. Version 1.4.2_04 is included in the Matrix setup; if Matrix finds no JRE installed on the machine or it finds an installed JRE older than 1.4, the user is prompted to install this version. This check occurs when the Matrix Client is started.
- If the installation is a multiple-PC system, the PCs must be configured for the network they’re connected to.
- If the installation will use the e-mail feature of Matrix, the standalone Matrix PC or Matrix Server must have network access to an outgoing mail server.

properly, any pop-up blockers installed on the PC must be configured to allow pop-ups from the Matrix server (or be turned off).

Pop-up blockers come in many forms. The version of IE that comes with Windows XP Service Pack 2, for example, contains a built-in pop-up blocker.

The IE browser’s pop-up blocker can either be turned off or configured to allow pop-ups by adding allowed sites in the pop-up blocker settings of IE. In FIG. 1, if you select “Pop-up Blocker”, the window shown in FIG. 2 appears. This example is taken from a “default” installation of the Matrix software on a standalone PC (the allowed site shown in FIG. 2 was added manually, not by Matrix).

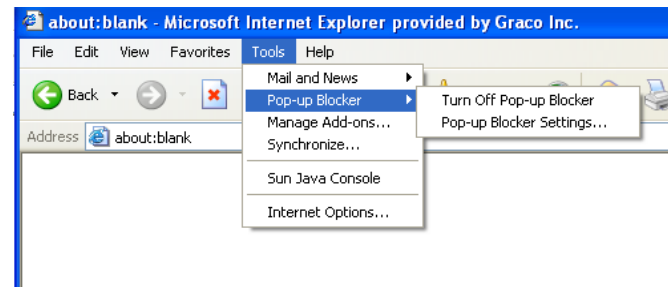


FIG. 1

Pop-Up Blocker

Special Considerations for pop-up blockers

Summary: If a browser pop-up blocker is installed, it must either be disabled or configured to allow pop-ups. If it’s a single-PC system, the pop-up blocker must allow pop-ups from `http://127.0.0.1:8080`. If it’s a multiple-PC system, a pop-up blocker on the Matrix Server must allow pop-ups from `http://127.0.0.1:8080`, while a pop-up blocker on a Matrix Client must allow pop-ups from `http://MatrixServer:8080`, where “Matrix Server” is the computer name or IP address of the Matrix Server PC. Recent versions of Internet Explorer have a built-in pop-up blocker. You may have one or more browser toolbars that have pop-up blocker functionality, such as those from Google and Yahoo. Security software programs, such as those provided by Symantec and McAfee can contain pop-up blockers. It is fairly common for PCs to have multiple pop-up blockers.

Matrix relies on the IE browser for its user interface. In particular, Matrix uses browser pop-up windows extensively. The Matrix server includes a web server that generates the screens viewed within the browser. If the PC has a pop-up blocker present, it can stop Matrix browser windows from appearing. For Matrix windows to appear

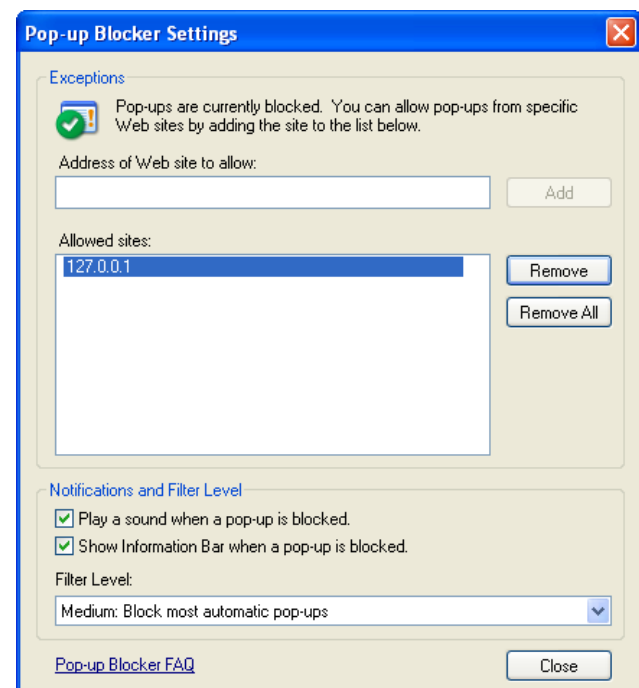


FIG. 2

Many toolbars that integrate with IE also contain pop-up blockers, such as those available from Google and Yahoo. FIG. 3 shows an example of the Google toolbar; others are very similar.

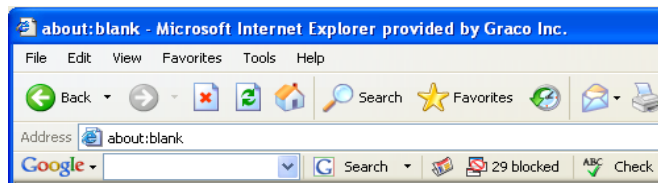


FIG. 3

Typically, when a PC has an active pop-up blocker and the Matrix client is launched, a progress bar appears briefly and disappears without any further visible indication of anything happening. This is usually an indication that the PC has a pop-up blocker that is stopping the Matrix window from appearing.

There are some general guidelines to follow to track down the responsible pop-up blocker (there can easily be multiple pop-up blockers present in any system). The goal is to configure each pop-up blocker by either turning it off or telling it to allow pop-ups generated by the Matrix server (while still blocking pop-ups from all other sites). On a single-PC Matrix system, you should configure the pop-up blocker to allow pop-ups from server address `http://127.0.0.1`. On multiple-PC systems, the address to allow is that of the Matrix server, either its host name or IP address.

Many pop-up blockers recognize the Control key on the keyboard, if pressed while clicking on a link, as a command to temporarily allow pop-ups originating from that link's source. To try this method, hold down the Control key on the keyboard while double-clicking on the Matrix client icon on the desktop. This works only for that particular pop-up instance, so it's not a good long-term solution.

General guidelines to find and configure pop-up blockers:

First, open a blank IE browser window. Click on **Tools** in the menu bar (see FIG. 1). Choose **Turn Off Pop-up Blocker** or configure the pop-up blocker to allow pop-ups from the Matrix server.

If IE has been properly configured and the Matrix windows still do not appear, it's time to look for pop-up blockers from other vendors, starting with toolbars integrated with IE. In IE, click on **View** in the menu bar and choose **Toolbars** (see FIG. 4).

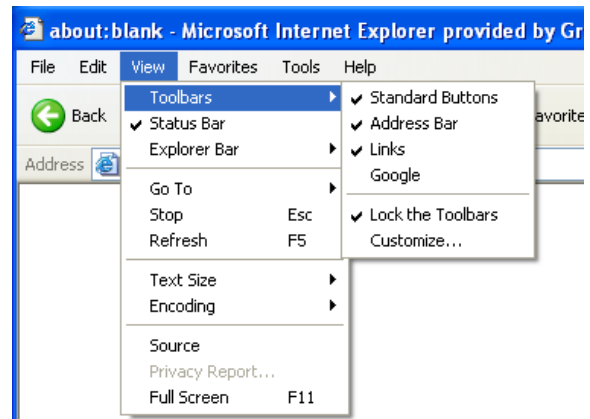


FIG. 4

Toolbars integrated with IE usually show up in the list here. Look for entries like Google, Yahoo, MSN, etc. Make sure each of these is checked (which will cause them to appear, usually underneath the address bar in the browser window) and then confirm with each one that it's allowing pop-ups from the Matrix server.

The following example illustrates the Google toolbar, but the others generally function in a very similar fashion.

Example: Assuming a Google toolbar is installed and the system is a single PC Matrix system. The system has been rebooted since the application was installed. While the Matrix Client is in the Windows Startup folder, no browser window appeared when Windows started.

Open a blank IE window. With the Google toolbar visible, enter `http://127.0.0.1:8080` in the address bar and press **Enter**. If a window like the one shown in FIG. 5 appears, the Matrix server is running, but you have a pop-up blocker.

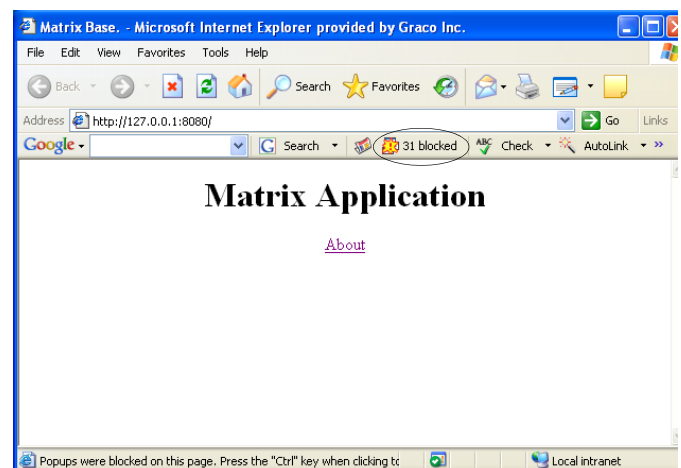


FIG. 5

Note the button in the middle of the Google toolbar that shows **31 blocked** (circled in FIG. 5); this is a count of how many pop-ups the Google toolbar has stopped from appearing. Click this button to make the toolbar allow pop-ups from the address currently in the address bar. Close the browser window and try launching Matrix via the Matrix client desktop icon again.

The same series of steps is performed for multiple-PC systems, only the address used is different--the address of the Matrix server is used instead of 127.0.0.1.

Pop-up blockers are not limited to those included with browser toolbars. Security products such as Norton Internet Security also block pop-ups; refer to the vendor's instructions on how to configure these software programs.

Software Firewalls

Special Considerations for Firewalls

Summary: Any firewalls in use must allow TCP traffic on ports 8080-8082 and 3306 at the Matrix Server and port 8082 at each Matrix Client. Matrix will not function properly if any of these ports are blocked. Windows XP has a built-in firewall, which is turned on by default (meaning that these ports are blocked) in Service Pack 2.

Any firewalls on the Matrix PC must allow network traffic over several ports. PCs communicate with each other via IP addresses and port numbers. An IP address can be compared to the street address of an apartment building, with a port number as a specific apartment number in the building. The Matrix server and Matrix clients require certain ports be available/open in order to communicate properly. These are the default TCP ports required by the server and each client:

Matrix server:

Port 3306 - Matrix Database
Port 8080 - Matrix Web Server
Port 8081 - Matrix Server

Matrix Client:

Port 8082 - Matrix Client

Communication to these ports can be blocked by firewall software installed on your computer. Windows XP contains the Windows Firewall, but there are numerous products provided by third parties such as Symantec and McAfee that also provide firewall functionality. What this means for Matrix is that any Firewalls) on the Matrix PC must be either configured to allow traffic over these ports or turned off altogether.

The Matrix setup program offers to open these ports for you in the Windows Firewall. It does not do this for other firewall products.

Network traffic over these ports can also be blocked by what is called a proxy server. Whether or not a network has a proxy server that stops traffic on these ports, port 8080 in particular, is a question for the facility IT personnel.

The ports listed above are the defaults. If they are changed for any reason, corresponding changes must be made in the firewall settings to allow traffic over the new port numbers. Changing the port numbers may be necessary if, for example, another application is already using these port numbers. Graco strongly recommends that IT personnel familiar with the network are involved with this configuration change.

Windows XP Security

The following security-related configuration settings are not required but are recommended for all Matrix PCs:

1. Be sure a user name and password are required to access the operating system.
2. Ensure the password-protected screensaver is enabled and set to automatically activate after 15-30 minutes of system inactivity.
3. Change user passwords on a regular basis and choose passwords that are difficult to guess.
4. Use anti-virus software to protect against viruses. Some anti-virus programs are bundled with other security software, including other security tools such as pop-up blockers and firewalls. Take note of the recommendations in the sections titled **Special Considerations for Pop-up Blockers** on page 4 and **Special Considerations for Firewalls** on page 6.
5. Be sure the system is kept up to date with Microsoft XP updates and service packs.
6. Use a firewall. As mentioned in the section titled **Special Considerations for Firewalls**, take care to allow for continued operation of Matrix by not blocking the network ports Matrix needs to use.

Installation Instructions

 **Important:** The user must be logged into Windows XP with administrator privileges.

If an older version of Matrix is already installed, the older version must be uninstalled before this one can be installed. See the Matrix Software Instruction Manual that accompanied your current Matrix installation for instructions on how to uninstall Matrix.

Software Installation & Networking

This version of Matrix has two types of installations to choose from in its setup program. One is the *Matrix Server & Client* and the other is the *Matrix Client*. Select *Matrix Server & Client* for single-PC installations and for the one PC in a multiple-PC installation that will perform the role of Matrix Server.

Stand Alone Configuration

This configuration (see FIG. 6) has one PC dedicated to Matrix system operation. The **Matrix Server and Client** version of the software should be loaded to the PC.

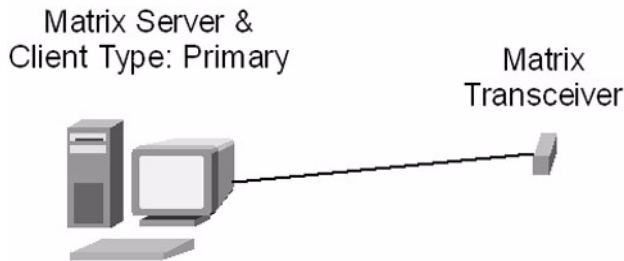


FIG. 6 Stand alone configuration

Follow setup path 1 beginning on page 8.

Networked Configurations

Matrix Full Line Software can be networked in the two configurations shown in FIG. 7 and FIG. 8. In FIG. 7, the server and primary client are shown as one PC. In FIG. 8, the server and primary client are shown as separate pieces of hardware.

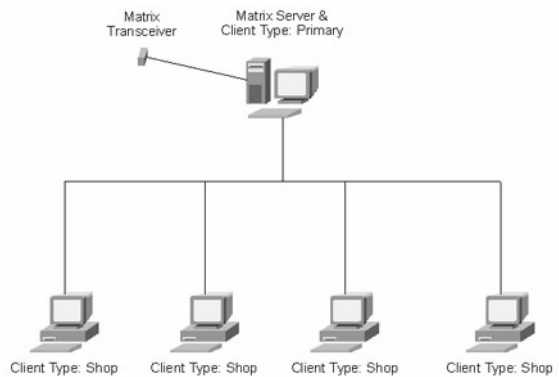


FIG. 7 Server and Primary Client as one PC

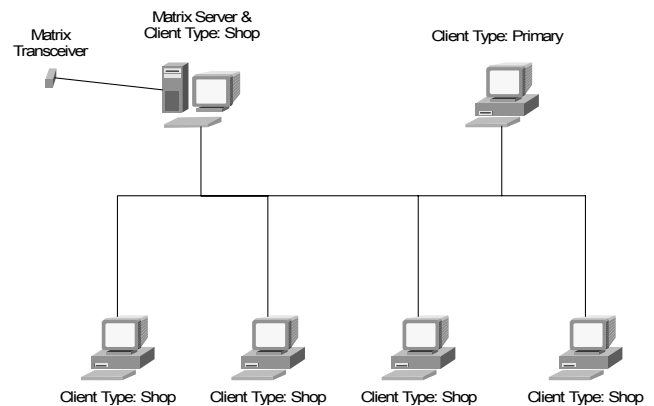


FIG. 8 Server and Primary Client separate

Follow setup path 1, beginning on page 8, on the PC designated as the Matrix Server and setup path 2, beginning on page 11, for all other PCs in the system.

Browser Configuration

Prior to running the setup program, ensure that IE is configured properly.

Open IE and verify that active scripting is enabled. This setting is typically found in **Tools / Internet Options / Security Settings / Custom** selection. See FIG. 9.

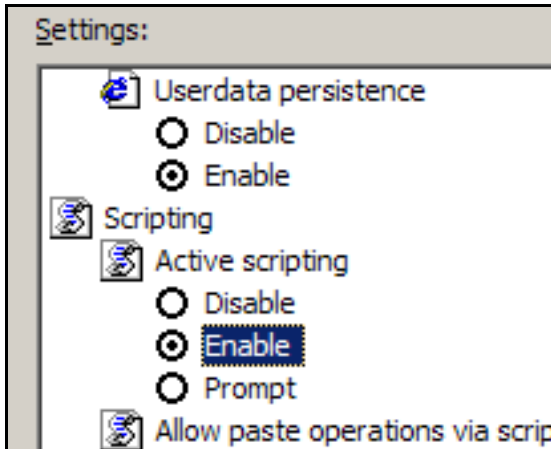


FIG. 9 Internet Java Script Security Settings

1. In the Temporary Internet Files section of the Internet Options box, click **Delete Files**. Select the **Delete All Offline Content** check box. Click **OK**. See FIG. 10.

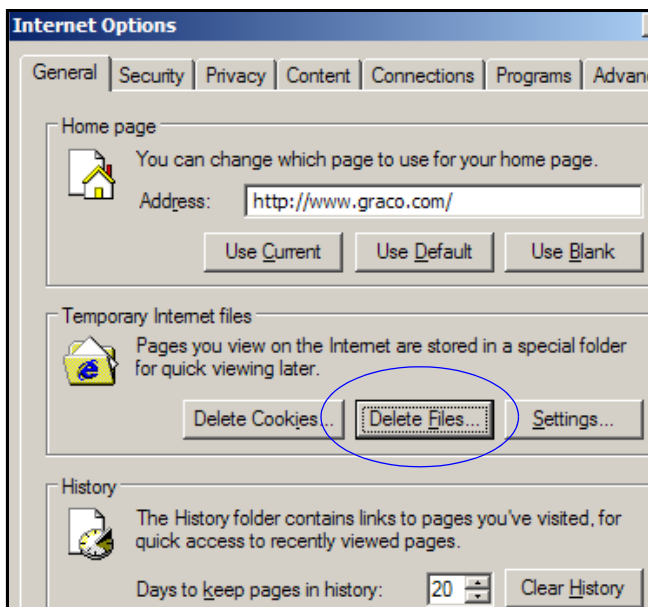


FIG. 10 Internet Options General

2. Click **Settings**. Select **Every visit to the page**. Click **OK**. See FIG. 11.

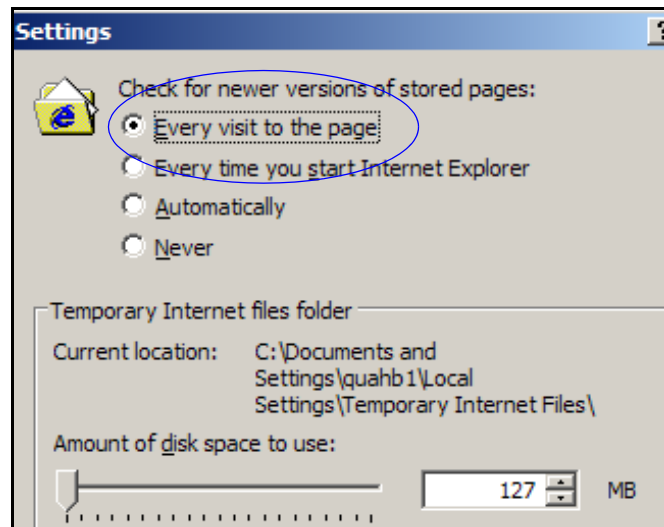


FIG. 11 Internet Page Settings

3. Select the **Content** tab and click the **AutoComplete** button. Clear the check marks from all the boxes. Click the **Clear Forms** button and select **Yes** to any pop-up screens. Click the **Clear Passwords** button and select **Yes** to any pop-up screens. Click **OK**.

Click **OK** to close the Internet Options dialog box.

Setup Path 1- Typical (Matrix Server and Client)

See FIG. 12 through FIG. 21.

1. Log into Windows XP as administrator.
2. Configure IE according to the Browser Configuration section.
3. Insert the Matrix CD in the CD-ROM drive.
4. The setup program should start automatically. If it doesn't, open Windows Explorer (**Start / All Programs / Accessories**). Locate the CD-ROM drive letter under **My Computer** and double-click the setup executable file to see the screen shown in FIG. 12.

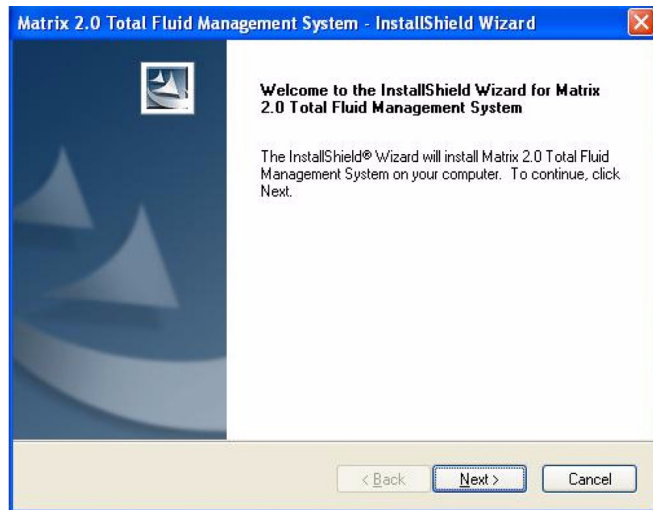


FIG. 12 Setup Path 1 - InstallShield Wizard

5. Click **Next**.

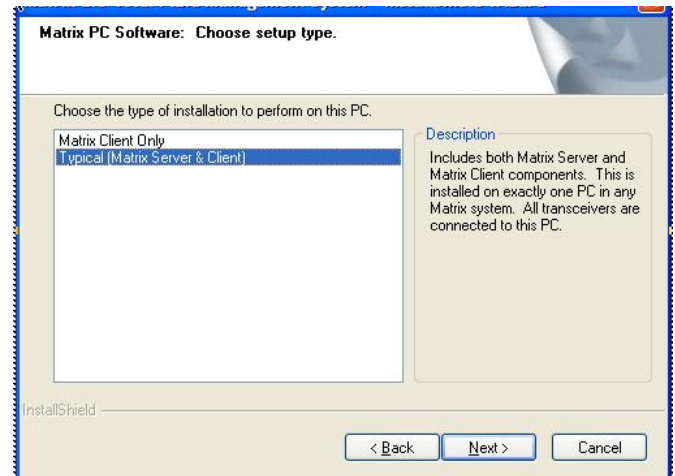


FIG. 14 Setup Path 1 - Choose Setup Type

7. The default setup type is shown selected: **Typical (Matrix Server & Client)**. Chose this setup type for either standalone Matrix PCs or for the Matrix Server in multiple-PC applications. Click **Next**.

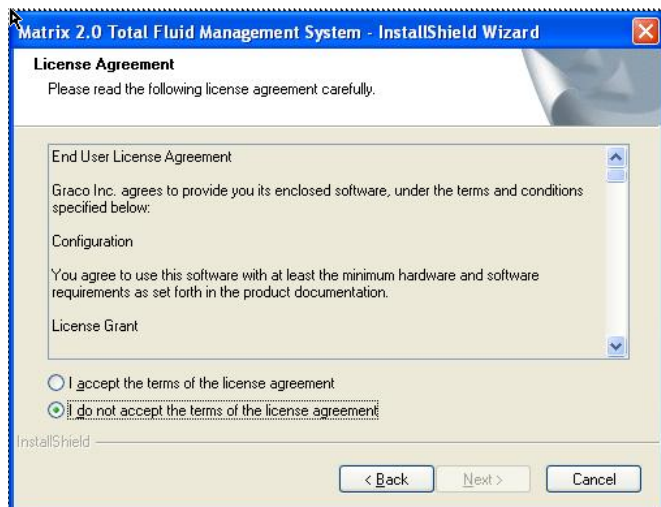


FIG. 13 Setup Path 1 - License Agreement

6. Review the End User License Agreement. If acceptable, select "I accept..." and click **Next**.

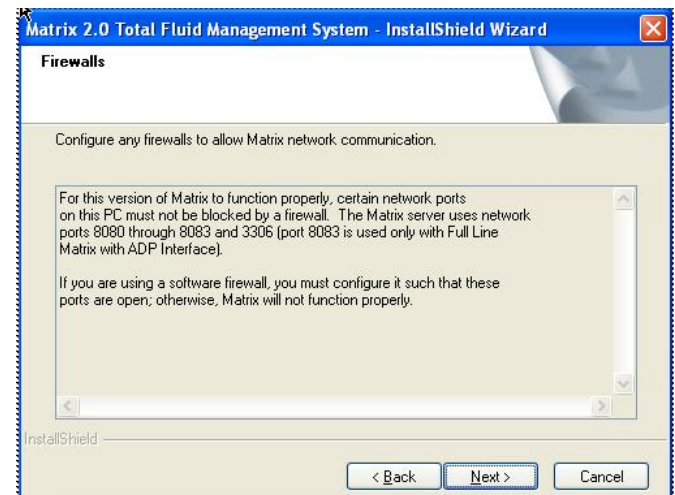


FIG. 15 Setup Path 1 - Firewalls

8. Note firewall configuration settings that may need to be changed for Matrix to function. Click **Next**.

11. Setup is ready to install Matrix application files. Click **Install**.

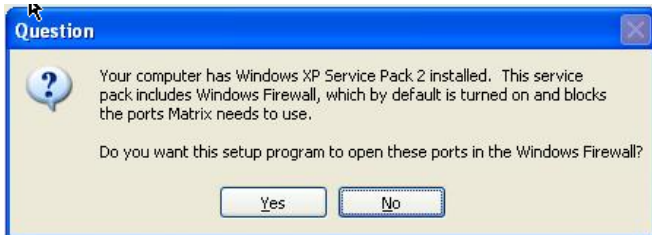


FIG. 16 Setup Path 1 - Firewall Question

9. Setup checks for Windows XP Service Pack 2 installation. If Service Pack 2 is present, the pop-up shown in FIG. 16 appears. Choose **Yes** or **No** to continue.

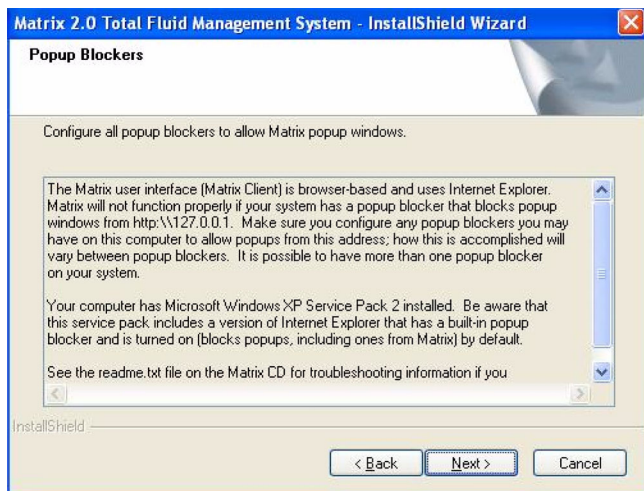


FIG. 17 Setup Path 1 - Pop-up Blockers

10. You may need to make changes to pop-up blockers installed on the PC for Matrix to function properly. Read this information carefully for guidance. Click **Next**.

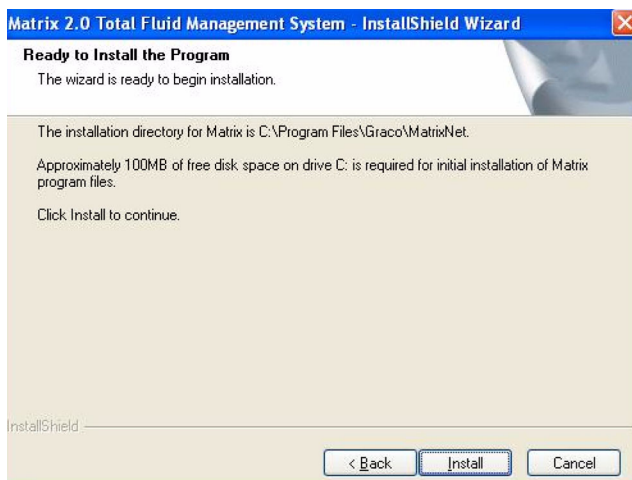


FIG. 18 Setup Path 1 - Ready to Install

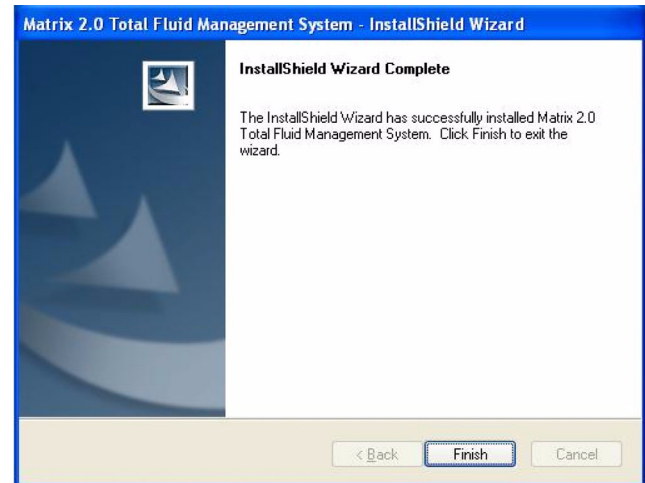


FIG. 19 Setup Path 1 - Install Complete

12. Transfer of application files from the setup program to the hard disk is complete. Click **Finish**.

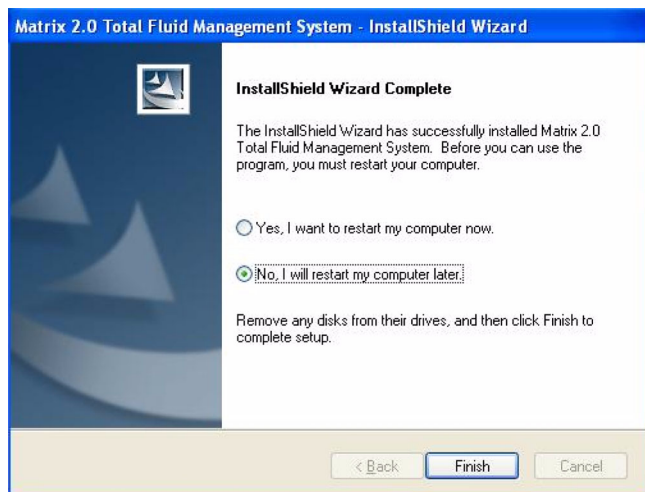


FIG. 20 Setup Path 1 - Setup Complete

13. Setup is complete. You must restart your computer before using Matrix, Graco recommends that you restart now.

The **Typical (Matrix Server and Client)** setup creates the following shortcuts.

In **Start / All Programs / Graco / Matrix:**

- **Matrix Server** - launches the Matrix Server which handles all RF communication to tank level monitors, database storage of tank level data and system configuration and generates system warnings and e-mails. Matrix Server must be running at all times.
- **Matrix Client** - provides the IE browser-based graphical user interface and accompanying screens. Matrix Client must be running to access Matrix Screens.
- **Matrix Reporter** - accessible to Matrix system administrators, Matrix Reporter generates system reports on production and configuration data. Matrix Reporter is used any time a Matrix report needs to be generated, as well as to generate a database backup file.
- **Server Network Settings** - a graphical editing tool used to configure network settings used by the Matrix Server. Typically used only once--when commissioning the Matrix system. In most cases the default server network settings will not need to be edited.
- **Client Network Settings** - a graphical editing tool used to configure network settings used by the Matrix Client. Typically used only once--when commissioning the Matrix system.
- End user license agreement (EULA).

In **Start / All Programs / Startup:**

- Matrix Server
- Matrix Client

On the **Windows Desktop:**

- Matrix Client

Setup Path 2 - Matrix Client Only

See FIG. 22 through FIG. 29.

1. Log into Windows XP as administrator.
2. Configure IE according to the Browser Configuration section.
3. Insert the Matrix CD in the CD-ROM drive.

4. The setup program should start automatically. If it doesn't, open Windows Explorer (**Start / All Programs / Accessories**). Locate the CD-ROM drive letter under **My Computer** and double-click the setup executable file (setup.exe).

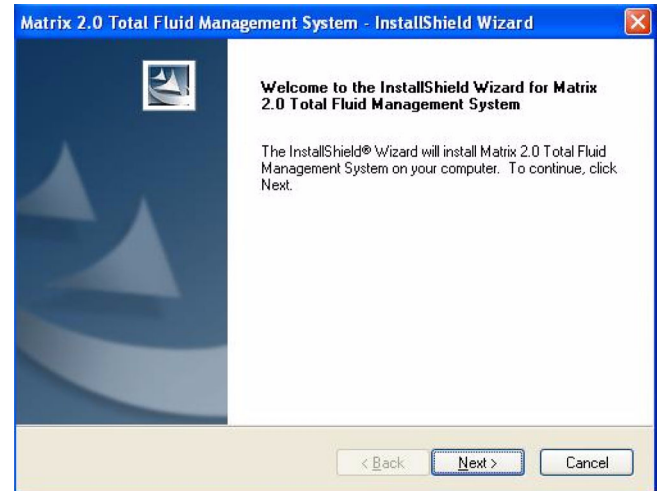


FIG. 21 Setup Path 1 - InstallShield Wizard

5. Click Next.

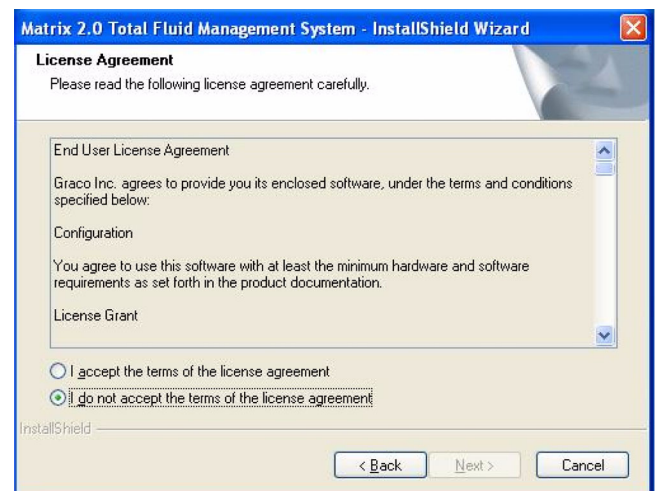


FIG. 22 Setup Path 2 - License Agreement

6. Review the End User License Agreement. If acceptable, select "I accept..." and click **Next**.

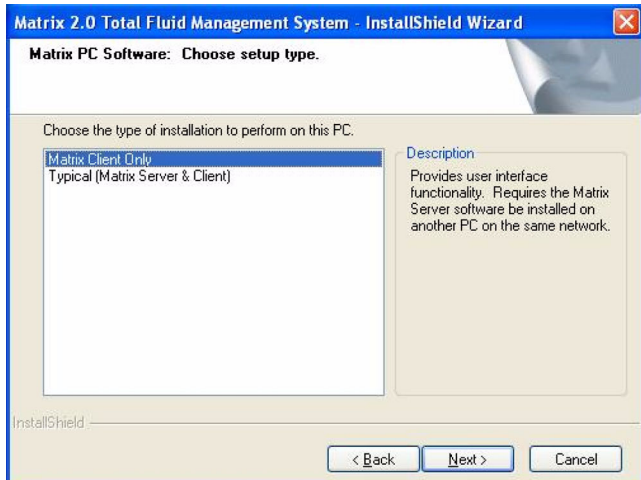


FIG. 23 Setup Path 2 - Choose Setup Type

- The setup type shown selected is **Matrix Client Only**, used for all machines except the Matrix Server in multiple-PC Matrix systems. Click **Next**.

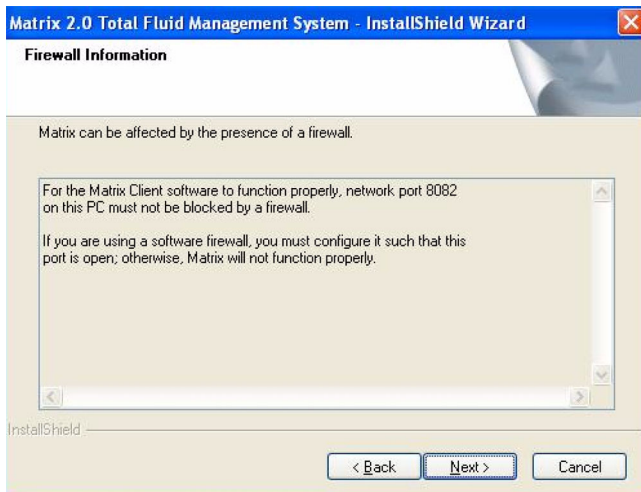


FIG. 24 Setup Path 2 - Firewall Information

- Note firewall configuration settings that may need to be changed for Matrix to function. Click **Next**.

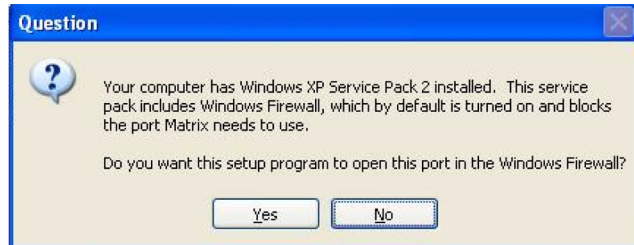


FIG. 25 Setup Path 2 - Firewall Question

- Setup checks for Windows XP Service Pack 2 installation. If Service Pack 2 is present, the pop-up shown in FIG. 25 appears. Choose **Yes** or **No** to continue.

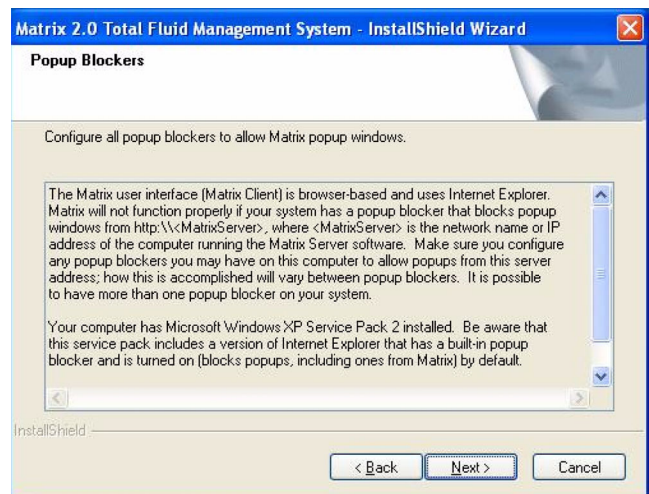
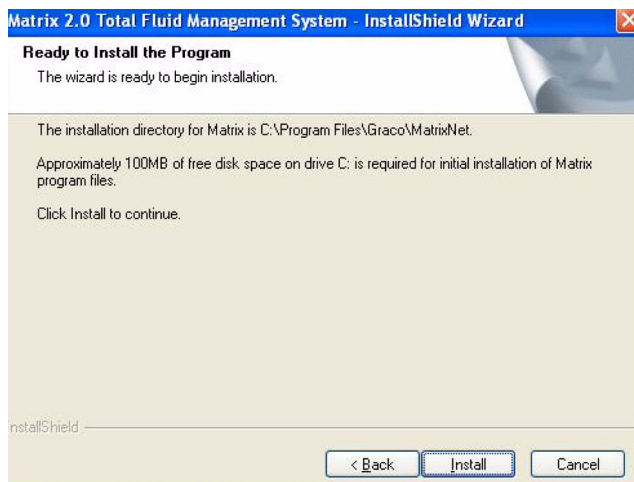


FIG. 26 Setup Path 2 - Pop-up Blockers

- You may need to make changes to pop-up blockers installed on the PC for Matrix to function properly. Read this information carefully for guidance. Click **Next**.



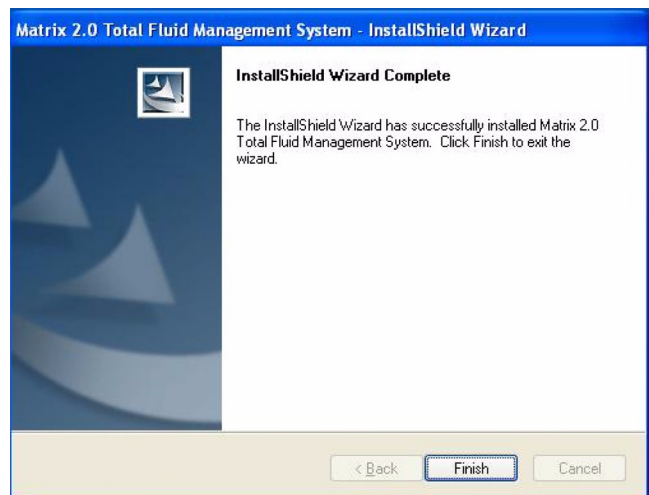


FIG. 28 Setup Path 2 - Install Complete

12. Transfer of application files from the setup program to the hard disk is complete. Click **Finish**.

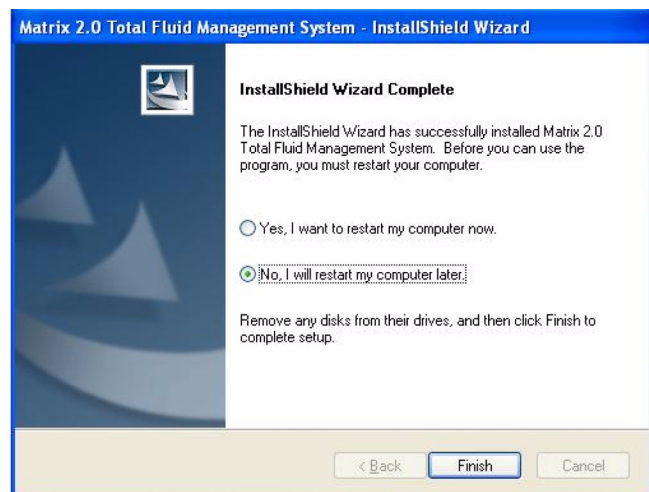


FIG. 29 Setup Path 2 - Setup Complete

13. Matrix software installation is complete. You must restart your computer before using Matrix.

The **Matrix Client Only** setup creates the following shortcuts.

In **Start / All Programs / Graco / Matrix**:

- **Matrix Client** - provides the IE browser-based graphical user interface and accompanying screens. Matrix Client must be running to access Matrix Screens.
- **Matrix Reporter** - accessible to Matrix system administrators, Matrix Reporter generates system reports on production and configuration data. Matrix Reporter is used any time a Matrix report needs to be generated, as well as to generate a database backup file.
- **Client Network Settings** - a graphical editing tool used to configure network settings used by the Matrix Client. Typically used only once--when commissioning the Matrix system.
- End user license agreement (EULA).

In **Start / All Programs / Startup**:

- Matrix Server
- Matrix Client

On the **Windows Desktop**:

- Matrix Client

Sun Java Runtime

Because the startup program places shortcuts to Matrix in the Windows Startup folder, Matrix will launch automatically when you log into Windows. Each time Matrix is launched, it checks for the presence of the Sun Java Runtime Environment (JRE) on the PC. If it is not found, Matrix will launch the setup program for it (JRE version 1.4.2_04 is bundled with the Matrix setup) and then exit. *You must be logged into Windows XP with administrator privileges for the JRE installation to succeed.* Proceed through the JRE installation. When installation is complete, reboot your computer. When logged back into Windows, Graco strongly recommends the following Java Plug-in configuration changes:

Navigate to **Control Panel / Java Plug-in** and double-click **Java Plug-in**. Select the **Cache** tab and deselect the **Enable Caching** feature, then click **Apply**. See FIG. 30.



FIG. 30

Click the **Update** tab and deselect the **Check For Updates Automatically** feature, then click **Apply**. Click the **X** in the top right corner to close the window. See FIG. 31.

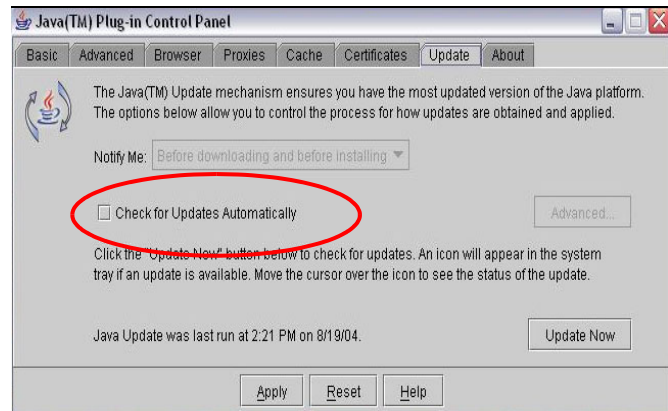


FIG. 31

See **Software Installation Troubleshooting** on page 15 if the Java applets do not display properly.

Clock and Time Zone Settings

Verify that the Microsoft XP clock and time zone settings are correct. When the time is changed by either the PC operator or automatically by Microsoft XP (i.e. daylight savings time automated change), the PC must be restarted.

MatrixLogs Folder

The Matrix setup program creates a folder named c:\MatrixLogs. Various log files generated during Matrix operation stored in this folder, **do not delete it**.

Software Installation Troubleshooting

Problem	Cause/Solution
<p>When Matrix is launched, I see a progress bar for a period of time, but the browser window showing the Matrix application never appears.</p>	<p>There may be a pop-up blocker program running on your PC and preventing the Matrix window from opening. Verify that you do not have a pop-up blocker integrated with your IE browser. Programs such as the Google, Yahoo, and AOL Toolbars—among many others, including IE itself if Service Pack 2 for Windows XP is installed—contain such features. You must configure your pop-up blocker to not block pop-ups from the Matrix Server software. If this is happening at the server PC, the address the pop-up blocker must allow pop-ups from is http://127.0.0.1. If this is happening at a Matrix Client, the pop-up blocker must allow pop-ups from <code>http://<MatrixServer></code>, where <code><MatrixServer></code> is the host name or IP address of the Matrix Server PC. How the pop-up blocker is configured varies depending on the program, so check that program's documentation for instructions on how to do this. Usually, the easiest solution is to disable the pop-up blocker entirely.</p> <p>If a pop-up blocker causes the browser-based user interface to not show, the underlying program that handles system communication, warning pop-ups, sending e-mails, etc., should still function as normal.</p>
<p>When Matrix is launched, I get an error that says a connection could not be made to the Matrix server.</p>	<p>Make sure you do not have a software firewall blocking ports 8080-8083 or 3306 at the Matrix Server and port 8082 at each Matrix Client. Matrix must be able to use these ports for normal operation. By default, Service Pack 2 for Windows XP turns the built-in Windows Firewall on; ensure that these ports are open. The system may have a firewall from another vendor, such as Symantec's Norton Internet Security, installed; this type of security software packages can contain firewalls and pop-up blockers, among other tools.</p>
<p>I'm sure I have no pop-up blockers or firewalls on my Matrix Client, but I still can't access the Matrix screens.</p>	<p>Verify with your IT network administrator that the network has no proxy servers that block traffic on port 8080, the default port used by Matrix for http traffic.</p>
<p>The tank level information screen has a white/gray rectangle where the dispense information should be.</p>	<p>The tank level information is displayed in a table in a Java applet. Verify that you have the Java Plugin (version 1.4.2_04 or later) installed and that it is not disabled in IE (Tools->Internet Options->Advanced tab, the section marked Java (Sun)).</p> <p>Also, in the Windows Control Panel, you should find a Java Plug-in icon. Double-click the icon and verify that IE is set up to use the Sun JRE for viewing applets.</p>
<p>After installing the JRE as described in the installation instructions, There is a coffee cup icon in the system tray and frequent pop-up windows. What is this for, and is there a way to turn off the pop-ups?</p>	<p>This is the Java Update mechanism that is part of the JRE, which, if enabled, allows the JRE to make periodic automatic checks over the Internet for new versions of the JRE. For the purpose of running Matrix this isn't necessary. To turn this off, go to Control Panel, double-click on the Java Plugin icon and choose the Update tab. Clear the Check for Updates Automatically checkbox</p>

Problem	Cause/Solution
I can't access the Matrix setup screens from a Matrix client.	With one exception, this behavior is normal. One Matrix Client PC is chosen to be the system's Primary Client. A Matrix system administrator can access the setup screens from this PC, but from no other Matrix Clients. Note that the Primary Client does not need to be the same machine as the Matrix Server, where a Matrix system administrator can always access the setup screens.
With Matrix installed on single PC in a standalone system configuration, when I launch Matrix while my computer is not attached to my network, the Matrix browser-based screens do not appear. However, if I attach my computer to the network and launch Matrix, they do appear.	<p>This happens most often with laptops that frequently connect to multiple networks using different configurations.</p> <p>First, verify the proxy settings configured in your IE browser. Open a blank IE window, click on Tools->Internet Options, and select the Connections tab. Ensure that 1) Never dial a connection is selected, and 2) Click on LAN Settings and disable automatic proxy configuration.</p> <p>Also, be aware that IE, will always check for an Internet connection before serving local web pages (see article ID 290766 on Microsoft's online support site, support.microsoft.com, for details).</p>
I clicked on a button to get to a different page at a Matrix Client and I got a gray screen that says "Direct access to this Matrix page not allowed."	Usually this means that the Matrix Server was restarted. In the Matrix system, if the Matrix Server is restarted for any reason, all Matrix Clients must also be restarted to reconnect to the screens. This is one reason why it's important that the Matrix Server be dedicated to the Matrix system.

Uninstalling Matrix on Windows XP

Follow this procedure to remove Matrix software and data files stored on your computer. You will lose all Matrix system parameters and all Matrix tank level history using these procedures unless you first use Matrix Reporter to make a back-up of the database by exporting it to a *.sql file.

- You must have Windows XP administrator privileges in order to add or remove Matrix from the computer.
- Any files you have created with Matrix since it was originally installed, such as database export files, reports, and log files will not be removed by the uninstall program. If you wish to also remove these from your hard drive, you will have to do so manually using Windows Explorer after the uninstall program completes.

1. Choose **Start / Control Panel** from the Windows Start menu.
2. In Control Panel, double-click **Add or Remove Programs**.
3. Scroll to **Matrix** in the program listing and click it once to highlight it.
4. Click the **Remove** box.
5. In the dialog box that appears, choose **Remove** from the list of options and click the **Next** button.
6. Click **Yes** in the window that asks you to confirm your selection.
7. The uninstall program runs.
8. Click the **Finish** button.

You may be prompted to reboot as the final step of the uninstall process. Graco recommends that you always reboot when you have uninstalled Matrix software.

Matrix log files found in c:\MatrixLogs, will not be removed by the automated uninstall process. They must be deleted manually.

Operator Screens



FIG. 32 Operating Screens

Tank Level Information

Place the cursor over the Tank Level Information box, causing the text to turn yellow. Left click the box to go to the Tank Setup screen. See FIG. 33.

Date & Time	Tank Name	Fluid Type	Tank Capacity	Current Volume	Battery

FIG. 33 Tank Level Information Screen

This screen provides tank level status activity for all tanks in the system:

Date & Time - displays the day, month, date, time, and year that the dispense took place.

Tank Name - displays each fluid storage tank in use with the Matrix system and the numbers or labels that are assigned to them.

Fluid Type - displays the type of fluid stored in the tank.

Tank Capacity - displays the total gallons of fluid that the tank is capable of holding when full.

Current Volume - displays the tank volume in gallons.

Battery - displays the amount of battery life remaining.

Tank volume, as shown in FIG. 33, changes as a result of several different events:

1. Tank Level Monitor reading – The current tank volume is updated when readings are sent by a tank level monitor mounted on the tank. These readings can be scheduled (programmed) to happen at specific times during the day, or they can be manually generated when the blue button on the tank level monitor is pressed. *The tank level readings sent from the tank level monitor always overwrite whatever Matrix has as the current tank volume.*
2. Manual tank level adjustments – On the tank setup screen, the adjust link allows you to manually increase or decrease the current tank volume. This is commonly done for fresh oil deliveries and waste oil removal.

Battery Level Information

Place the cursor over the Battery Level Information box, causing the text to turn yellow. Left click the box to go to the Battery Level Information screen. See FIG. 34.

Current Battery Status			
Date & Time	Tank Name	Warning Level (%)	Battery Level Status (%)

FIG. 34 Battery Level Information Screen

This screen provides battery charge level for all meters and tank level monitor batteries in the system. Each row corresponds to a meter or tank.

Date & Time - the date and time of the last battery status update

Meter Or Tank Name - the name of the meter or tank, including the fluid name associated with it.

Warning Level - the user-configurable point at which the battery should be replaced for the meter or tank, expressed as a percentage of a fully charged battery and set in the meter or tank's setup configuration.

Battery Level Status - the actual battery status, expressed as a percentage of a fully charged battery.

If a tank level monitor's battery level status drops below its configured warning level, the row corresponding to that tank level monitor in the list will turn red. This highlights the fact that a tank level monitor has a battery level nearing zero and should have a new battery installed. The row will stay red until the battery is changed and Matrix receives a reading from that tank level monitor.

System Administrator Screens

Matrix System Setup

Once the Matrix PC software is installed, it's necessary to synchronize the software with the other hardware components of the Matrix system. This is done through the system administrator portion of the software. This section is password protected and provides access to all Matrix setup screens. Only individuals with system administrator rights have access to this portion of the program.

Move the mouse pointer to the box labeled Matrix System Setup. The text will turn yellow. Left click to bring up the Authenticate User dialog box.

1. Key in your user information and click **Submit**. For initial log on only, type in **matrix** (lowercase) for user name and **graco** (lowercase) for the password. Click **Submit**. Once the initial log on information is authenticated, the System Administration screen appears. See FIG. 35.



Personalized passwords for System Administration, Entering Work Orders, and for Adjusting Tank Levels are entered at the System User Setup screen, see page 23. **Once a new admin user account is created, the default matrix/graco account is disabled.**

The system administrator has access to:

- *System Configuration* - setting global security, measurement system, Transceiver configuration and Matrix PC client information.
- *System User Setup* - add, modify, and remove users.
- *Tank Setup* - add, modify, adjust, remove, and program tank level monitors.
- *E-mail Setup* - configure email to be sent to responsible parties based on various tank conditions.
- *Return to Operating Screens*- returns the user to the operating screens.

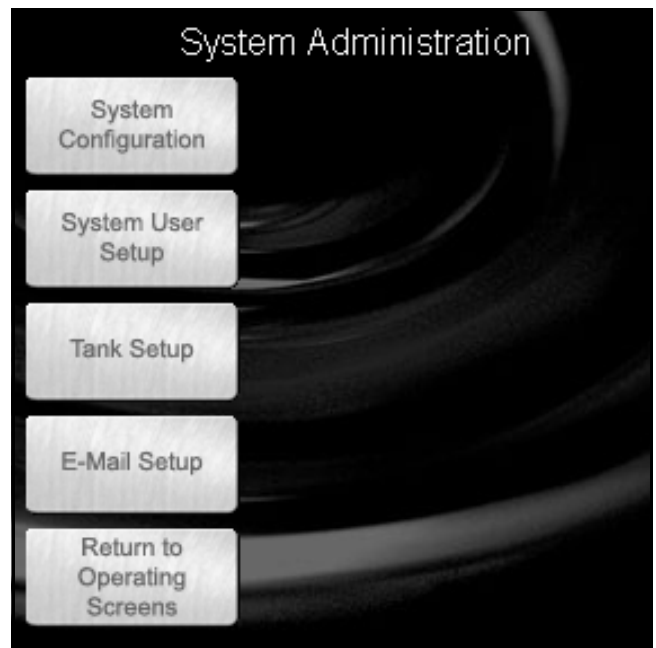


FIG. 35 System Administration Screen

System Configuration

There are three sections of the System Configuration screen: General system-wide default settings, transceiver settings, and PC client settings. See FIG. 36.

The System Configuration setup must be performed prior to defining all other Matrix system setup parameters.

Matrix PC Software Version	Security Level	Measurement System	Action
2.02.15	System Monitoring	English	modify

Transceiver	Network ID	Transceiver ID	Communication Port	Action
-------------	------------	----------------	--------------------	--------

FIG. 36 System Configuration Screen

To change any of the settings listed for system configuration, click **modify**.

Unit of Measure (English or Metric)

Measurement System is the global units of measurement setting. English and Metric are the two options in the pull down menu. This setting can be changed on a tank-to-tank and meter-to-meter basis.

1. In the Measurement System box, select English or Metric.
2. Click **Apply**

FIG. 37 Select settings below

Edit Contact Information

The Edit Contact Information dialog box appears once apply is selected. Fill in the appropriate fields. This information will be placed automatically on all outgoing Matrix e-mail. See FIG. 38.

FIG. 38 Edit Contact Information

Click **Apply** to update contact information and return to the System Configuration screen.

Transceiver Setup

Click the **Add Transceiver** button, then click **Modify**.

1. Enter the area of the shop where the transceiver is located (i.e., Main Shop, Fast Lube Shop, Engine Department) in the **Transceiver Name** field.
2. The Network ID is a letter designation for the Transceiver network identification. The default is (A). There are eight network ID's available designated with the letters A through H. Type in the selected Network ID.



The Network ID letter for a given Transceiver must match that Transceiver's dipswitch settings.

3. Transceiver ID is a letter designation for the Transceiver Identification. The default is (A). There are eight Transceiver ID's available designated with the letters A through H.



The Transceiver ID letter for a given Transceiver must match that Transceivers equivalent dipswitch settings.

4. Serial Port is a pull down menu of all available communication ports on the Matrix PC. COM 1 is the default setting. If COM 1 is not available, select an open port from the pull down list.



Some computers may not have any serial ports. In this case a USB converter will be required to obtain serial ports. Graco recommends Edgeport models from B & B Electronics.

If you attempt to add a Transceiver and the PC has no COM ports available, an error message appears. Contact your IT professional or add serial ports using the USB convertors recommended by Graco. See page 3 for additional information.

Firmware Revision is the Transceiver firmware revision level.

Transceiver Power-up

Graco recommends that when you plug in the power cord to the transceiver, do it with the PC serial cable already plugged in.

Confirm PC/Transceiver Communication

Each time a transceiver is powered up, it reads its dip switch settings for Network ID and Transceiver ID and sends this information to the PC. It also sends the transceiver's firmware revision level. These settings are displayed as "Last Power-up Settings" and "Firmware Revision" on this screen. If these fields are "N/A", it means that the transceiver has never (successfully) communicated with the PC.

One way to confirm that the serial connection between PC and transceiver is functioning properly is to change the transceiver dip switch settings and verify that the PC software reflects the new settings. Refer to the transceiver manual on how to set transceiver dip switches.

Example:

A Matrix system has a single transceiver, the desired settings on the transceiver setup screen (Fig. 18) are Network ID = A, Transceiver ID = A, and Serial Port = COM1 (factory defaults).

Transceiver Parameters	Edit Current Setting
Transceiver Name	New Transceiver
Network ID	A Last Power-up Setting: A
Transceiver ID	A Last Power-up Setting: A
Serial Port	COM1
Firmware Revision	2.01.07

FIG. 39

1. If it's open, close the transceiver setup screen (Fig. 18).
2. Power off the transceiver.
3. Set the transceiver dipswitch settings to:
Network ID = H
Transceiver ID = H
Refer to transceiver manual 309498 for instructions.
4. With one end of the serial cable already plugged into the PC and the other end in the transceiver, power up the transceiver.

5. As the transceiver initializes itself on power-up, watch the LED lights on the side of the transceiver. You should see the lights flicker briefly with a burst of activity. You may see occasional flickering of the lights after this initial burst.
6. After the brief burst of LED activity, open the transceiver setup screen in the PC software and check the “Last Power-up Settings”. If they show the Network ID = H and Transceiver ID = H settings as described above, the serial connection between the PC and the transceiver is functioning properly.
7. Close the transceiver setup screen.
8. Power down the transceiver and restore the dip switch settings to their Network ID = A, Transceiver ID = A settings.
9. Power up the transceiver.
10. After the initialization activity reflected by the lights on the transceiver, open the transceiver setup screen and confirm that the “Last Power-up Settings” read Network ID = A and Transceiver ID = A.

If the “Last Power-up Settings” do not update, one or more things may be happening.

First, the serial port selected on the transceiver setup screen may not be the one the serial cable is plugged into. Many newer computers have only one serial port on the back of the computer; the port may or may not be COM1. It could easily be another COM number, so if other COM ports show up in the transceiver setup screen’s drop down list for Serial Port selection, try using each of those in turn and repeat the above steps. Many new computers have no serial ports at all, in which case a USB to RS232 converter is required to supply at least one serial port. Graco recommends the purchase of Edgeport brand USB to RS232 converters, available from www.bb-elec.com. Follow the installation instructions for the converter carefully and make sure you reboot the computer when complete. Again, don’t assume the COM port number—the documentation with the converter should help explain what COM port number the converter will provide.

When the Matrix PC software starts up, one of the first things it does is check with Windows to find out what serial ports (COM ports) exist in the system. These ports are the ones listed in the Serial Port drop down list on the transceiver setup screen. If a port you expect is not listed there, it is because it is not registered as a valid port with Windows.

Second, the selected COM port may be in use by another program on the PC. In this case, even if the Serial Port selection on the transceiver setup screen matches the port the cable is plugged into, no Matrix communication will happen because a different software program “owns” the port. The only way to get it to work is to either shut down the other program or configure either the other program or Matrix to use a different COM port. Software programs that use serial ports include fax software and PDA software.

Third, the cable between the PC and the transceiver could be either bad or wired improperly. The latter is most likely to occur when an RS422 connection is used; the former could happen with either serial cable choice. Make sure the cables are firmly connected, so that there isn’t a chance the plug or wire is falling out on either end.

Repeat this setup for each Transceiver ensuring that no two Transceivers use the same Network and Transceiver IDs. If you have only one transceiver, Graco recommends using the default Network ID and Transceiver ID settings.

System User Setup

Place the cursor over the System User Setup box causing the text to turn yellow. Left click the box to go to the Systems Users Setup screen. See FIG. 40. Use this screen to add new system administrators and their PIN numbers.



FIG. 40 Systems User Setup Screen

Click on the System User Setup button, then click on Modify for each System Administrator person that will need access to all the screens in the system

Adding a System Administrator User

1. For each new System Administrator User, click **ADD SYSTEM USER**.
2. Click modify and enter the User Name, and Real Name. See FIG. 41. Click Apply,
3. Key in the user's password and then click Apply. See FIG. 42



There can be more than one System Administrator if you wish. The System Administrator has access to all screens in the software. This process disables the default system admin account.

Keep this information in a secure place. Keep this information in a secure place. If you misplace your system administrator password information, call the Graco Lubrication Equipment Support Team at 1-800-533-9655 from 7:30a.m. to 5:00 p.m. CST.

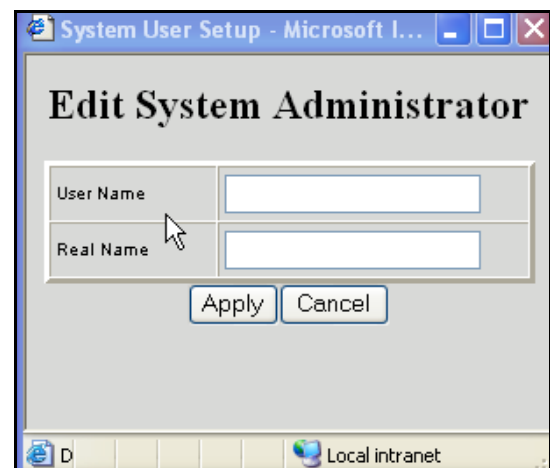


FIG. 41 Select settings below



FIG. 42

Changing User Information.

1. Select the user information to change and click **Modify**.
2. Select and change the information.
3. Click **Apply** to update the record.

Removing a User

In the Action Column of the user record, click remove to remove the user record from the System Users Setup screen.

Modifying User Information

1. In the Action Column of the user record, click modify. The Select settings below dialogue box appears. See FIG. 41.
2. Change the data as needed.



If the Security Status is changed from Basic to either Administrator or Work Orders, new passwords, allowing access, must be entered.

3. Click **Apply**. The changes are made. *If the security level previously selected is for Administrator or Work Orders, either existing passwords or new passwords must be entered to apply the changes.*

Tank Setup

Click **Tank Setup** to go to the Tank Setup screen (FIG. 43). Tanks must be configured before meters can be configured.

Tank Name	Fluid Name	Tank Capacity	Current Tank Volume	Tank Level Monitor	TLM Address	Tank Geometry	Action
Tank 1	5W-30	500 Gallons	452 Gallons	yes	10	Vertical Walls	modify , adjust , program , remove

FIG. 43 Tank Setup Screen

Customized Fluid Setup

To add, edit, or remove a fluid from the Tank setup, click the **Customized Fluid List** button located in the upper left corner of the Tank Setup screen. See FIG. 43. The Fluid Setup dialogue box appears. See FIG. 44.

To Add a new fluid to the entry list

Click **Add**. Type in the new fluid name and a description, and select the type of fluid from the drop down box. Click **Add** to add a fluid to the list. You will need to provide a fluid name, description, and select if it's Oil/ATF, Gear Lube, or Anti-Freeze 50/50. For ease of reading elsewhere in the program and in the reports, a short name is recommended. Click **Apply** to update the record.

To Remove a fluid

Select the fluid to remove, and click **Remove**. The record is deleted from the list and you return to the Tank Setup screen.

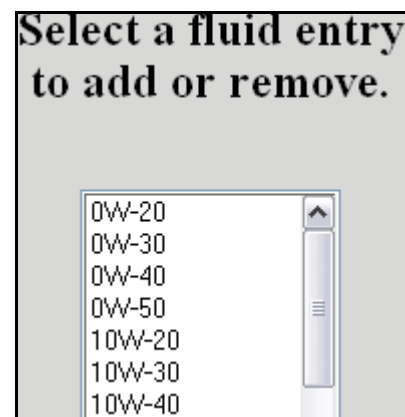



FIG. 44 Select a fluid entry to add or remove

Adding a New Tank using a TLM


1. Click **Add Tank**. A new blank record is added. *Tanks must be setup and programmed prior to meters being setup. See FIG. 45.*
2. Select modify for the newly added tank

3. **Tank Name:** select and name the tank

 This field is alpha/numeric. For 1 - 99 TLMs use the following numbering 01, 02, 03, ... 09. For 100 - 999 TLMs use the following numbering 001, 002, 003, ... 010, 011, 012. This ensures the tanks will be listed in the correct sequence in the Matrix system. To avoid issues with the reporting function, do not use commas in data fields.

4. **Fluid Name:** select any type of service fluid from the drop down list.

5. **Tank Capacity:** fill in the tank capacity and select a measurement (i.e. 500 gallons).


 Vertical wall tanks use this capacity figure to calculate tank volume. Make certain the value is accurate. The tanks of other shapes calculate capacity based on user-entered dimensions.

6. **Tank Level Monitor:** select yes if you plan to use a Tank Level Monitor (TLM) on the tank and No if you don't plan to use one. If yes, you will be prompted for additional information about this tank.

7. **Tank Shape:** select either vertical walls, cylinder, or obround. See page 26 for information regarding tank shape.

8. **Tank Warning Level:** default is 10%, but can be changed as required. The monitor will send a low or high tank level warning screen to the PC when the tank level reaches 10% capacity, alerting the System Administrator that the tank level is low and needs more fluid or high and must be evacuated.

9. **Tank Warning Type:** the Low setting is for new service fluids and the High setting is for used oil tanks.



Complete the information below.

Tank Parameters	Edit Current Setting	Last Programmed Setting
Tank Name	1	N/A
Fluid Name	5W-30	N/A
Tank Capacity	500 Gallons	N/A
Tank Level Monitor	YES	N/A
Tank Shape	Vertical Walls	N/A
Tank Warning Level	10 %	N/A
Tank Warning Type	Low	N/A

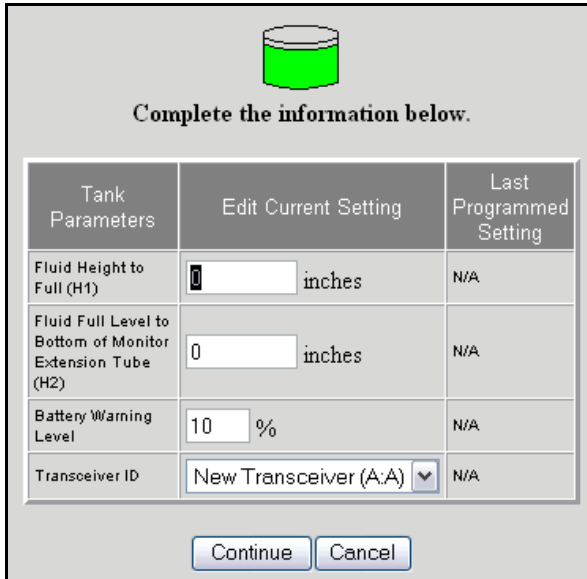
FIG. 45 Edit Tank Setup

Tank Shape Screen

Vertical Tank Geometry

Vertical tanks use the tank capacity to calculate tank volume. Obround and cylindrical tanks use the tank dimensions to calculate tank volume.

Vertical Tank



Complete the information below.

Tank Parameters	Edit Current Setting	Last Programmed Setting
Fluid Height to Full (H1)	<input type="text" value="0"/> inches	N/A
Fluid Full Level to Bottom of Monitor Extension Tube (H2)	<input type="text" value="0"/> inches	N/A
Battery Warning Level	<input type="text" value="10"/> %	N/A
Transceiver ID	New Transceiver (A:A) ▼	N/A

Continue Cancel

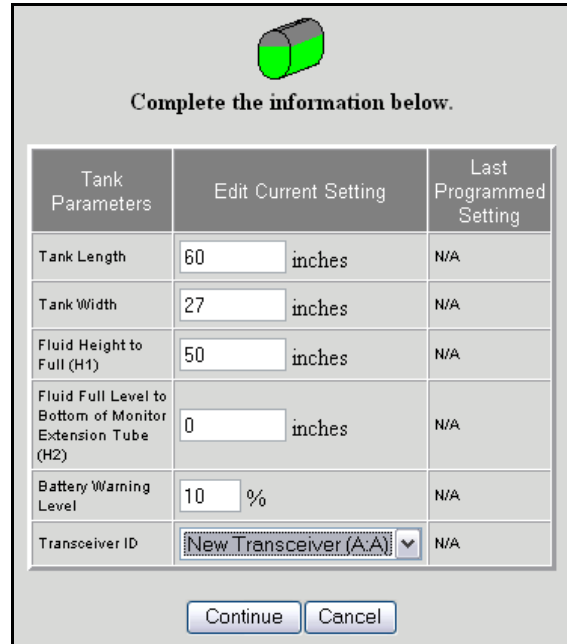
FIG. 46 Vertical Tank

Verifying Capacity for Obround and Cylindrical Tanks

After the obround or cylindrical tank setup information has been completed, it may be necessary to modify the tank manufacturer's published gal/liter capacity that was entered in FIG. 45. *(In some cases the actual volume of the tank may exceed the manufacturer's published capacity.)* To verify this, once the TLM has been programmed:

1. Stand the TLM upright on a flat smooth surface, press the blue button and record the volume. The volume shown on the PC tank setting screen should match the volume initially entered. If it does nothing further needs to be done.
2. If the reading does not match, modify the tank capacity in FIG. 45 to match the TLM reading taken on the flat smooth surface.

Obround Tank



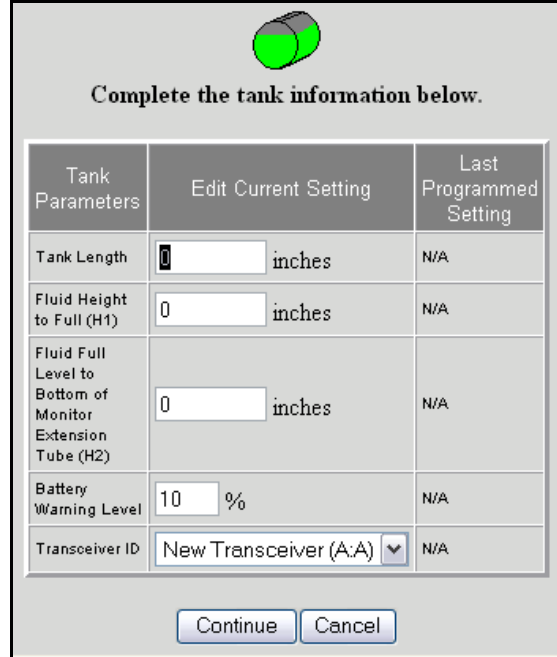
Complete the information below.

Tank Parameters	Edit Current Setting	Last Programmed Setting
Tank Length	<input type="text" value="60"/> inches	N/A
Tank Width	<input type="text" value="27"/> inches	N/A
Fluid Height to Full (H1)	<input type="text" value="50"/> inches	N/A
Fluid Full Level to Bottom of Monitor Extension Tube (H2)	<input type="text" value="0"/> inches	N/A
Battery Warning Level	<input type="text" value="10"/> %	N/A
Transceiver ID	New Transceiver (A:A) ▼	N/A

Continue Cancel

FIG. 47 Obround Tank

Cylindrical Tank




Complete the tank information below.

Tank Parameters	Edit Current Setting	Last Programmed Setting
Tank Length	<input type="text" value="0"/> inches	N/A
Fluid Height to Full (H1)	<input type="text" value="0"/> inches	N/A
Fluid Full Level to Bottom of Monitor Extension Tube (H2)	<input type="text" value="0"/> inches	N/A
Battery Warning Level	<input type="text" value="10"/> %	N/A
Transceiver ID	New Transceiver (A:A) ▼	N/A

Continue Cancel

FIG. 48 Cylindrical Tank



Select a schedule of up to 10 monitor readings per day.
Choose 1 reading per day for maximum battery life.

Edit Current Schedule		Last Programmed Schedule
<input type="checkbox"/> 6 A.M.	<input type="checkbox"/> 6 P.M.	N/A
<input type="checkbox"/> 7 A.M.	<input type="checkbox"/> 7 P.M.	
<input type="checkbox"/> 8 A.M.	<input type="checkbox"/> 8 P.M.	
<input type="checkbox"/> 9 A.M.	<input type="checkbox"/> 9 P.M.	
<input type="checkbox"/> 10 A.M.	<input type="checkbox"/> 10 P.M.	
<input type="checkbox"/> 11 A.M.	<input type="checkbox"/> 11 P.M.	
<input type="checkbox"/> 12 Noon	<input type="checkbox"/> 12 Midnight	
<input type="checkbox"/> 1 P.M.	<input type="checkbox"/> 1 A.M.	
<input type="checkbox"/> 2 P.M.	<input type="checkbox"/> 2 A.M.	
<input type="checkbox"/> 3 P.M.	<input type="checkbox"/> 3 A.M.	
<input type="checkbox"/> 4 P.M.	<input type="checkbox"/> 4 A.M.	
<input type="checkbox"/> 5 P.M.	<input type="checkbox"/> 5 A.M.	

Apply Cancel

FIG. 49 Edit Tank Schedule

1. After making the appropriate tank shape selection click continue for the next screen called the edit tank schedule dialogue box. See FIG. 49.
2. This screen defines the frequency of tank level reports to be sent to the Matrix PC. Click **Apply** to update the record and return to the tank Setup screen.



Up to 10 tank level reports can be selected per day. The frequency of reporting is directly related to the tank level monitor battery life. The more daily reports, the shorter the life of the tank level monitor's batteries.

Manual Tank Adjustment

1. Click adjust. The Tank Levels screen appears. See FIG. 50.



If the tank is full or has oil in it, press the display button to automatically display the amount of oil in the tank.

Adjust Tank Level

Tank Name	Tank 1
Fluid Name	10W-20
Tank Capacity	300 Gallons
Current Volume	0 Gallons
Adjustment Type	Add ▾
Adjustment Amount	0 <input type="text"/> Gallons
Description	Oil Delivery ▾
Comment	<input type="text"/>

Apply Cancel

FIG. 50 Adjust Tank Levels

2. Enter the amount of oil to be added or subtracted to the current amount.
3. Click the description arrow, and choose an appropriate reason for the adjustment.
4. Add any desired comments.
5. Click **Apply** to update the record.
6. The Tank volume updated notice appears. See FIG. 51. Click **Close** to return to the Tank Setup screen.

Tank volume updated!

Close

FIG. 51 Tank Volume Updated

Removing a Tank

In the Action column of the monitor you want to remove, click remove. The record is deleted.

Programming the Tank Level Monitor

1. In the Action column of the tank record you want to program, click **Program**. The Tank Level Monitor setup timeout notice appears. See FIG. 52.

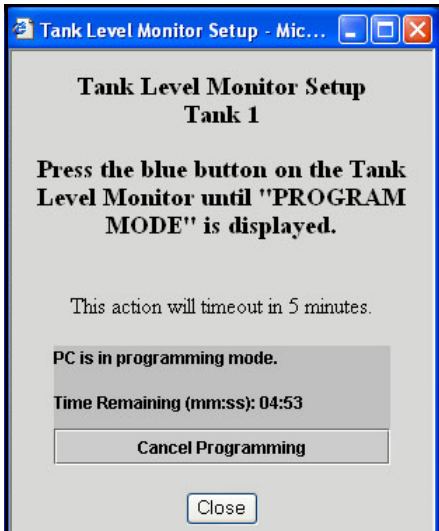




FIG. 52 Tank Level Monitor Setup

2. When the screen appears, you will have up to 5 minutes to program the TLM or you will need to relick on Program. After 5 minutes, this window needs to be manually closed. To stay in program mode at the PC, the program link must be clicked again. Press the blue button on the TLM until Program Mode is displayed on the TLM screen (about 15 seconds). The text on the screen will change from “PC in programming mode” to “Program Complete” indicating the TLM has been programmed. For more information on the TLM see instruction manual 309500.

 Remove the protective plastic covering from the tank level monitor display.

3. Click **Cancel Programming** to return to the Tank Setup Screen and start over.

 After programming is completed, label each monitor with the tank number and fluid name (i.e., Tank 1, 5W30). The label can be removed after the monitor is installed in the tank. See FIG. 53.

If a programmed TLM is moved to another tank location or if the parameters change, it must be re-programmed.



FIG. 53

Recommendations

1. Verify that the serial link between the PC and transceiver is working. See the **Confirm PC/Transceiver Communication** section on how to do this. If this link is not working, nothing else will.
2. Tank level monitors come from the factory with exactly the same factory default configuration—including the RF settings the tank level monitors use to communicate to the PC via the transceiver. Therefore, when trying to program one tank level monitor, another tank level monitor may interfere. Particularly when commissioning a system for the first time, remove the batteries from all tank level monitors except the one you're programming.
3. Do not program another tank level monitor until you get the **Programming complete!** message shown in FIG. 54. If you program a tank level monitor and it appears to be successfully programmed at the tank but you didn't get the programming complete message at the PC, Graco recommends you reprogram the tank level monitor. This ensures that you do not get two tank level monitors programmed with duplicate parameters, which will cause unpredictable system behavior.



FIG. 54 Programming complete screen

E-Mail Setup

Click **E-Mail Setup** to go to the E-Mail Setup screen (FIG. 55).

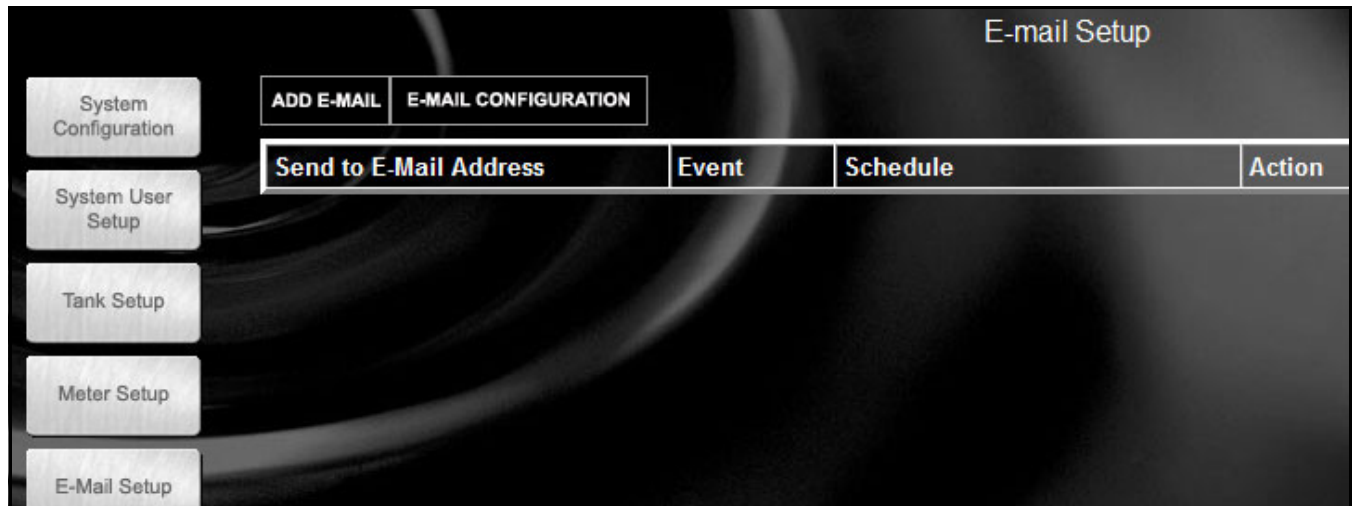


FIG. 55 E-Mail Setup Screen

Matrix can send e-mail notification to responsible parties based on the following tank-related events:

Missed Tank Level Reading – Tank level monitors can be programmed to measure the tank level at predetermined times and report that information to the PC. If the tank level monitor is programmed to report at a specific time, this event is fired if no report is received by the PC within 55 minutes. For example, if the tank level monitor is programmed to report tank level at 2:00 pm and no reading is received by the PC by 2:55pm, the reading is considered missed and an e-mail will be sent. This event is usually sent to the Matrix system administrator.

Tank Low Level or High Level Warnings – If the tank level falls below the Low Level warning threshold or rises above the High Level warning threshold programmed for the tank, an e-mail will be sent. These events are usually sent to the fresh oil supplier, the waste oil recycler, and/or the Matrix system administrator.

Current Tank Volume – The current tank volume can be e-mailed as a scheduled event. This event is usually sent to the fresh oil supplier, the waste oil recycler, and/or the Matrix system administrator.

Tank Volume History – A history of tank volume readings can be e-mailed as a scheduled event. This event is usually sent to the Matrix system administrator.

It is possible for the **Missed Tank Level Reading** and **Low/High Level Warning** events to occur multiple times per day, but an e-mail for that particular event will be sent only once per day. For example, if the tank level

falls below the configured warning level, each successive tank level reading from that tank will generate a pop-up **Low Tank Level** warning. This will continue until the tank is filled above the warning level—but the e-mail notification will happen only the first time it occurs on that day.

Graco strongly recommends that the End User's Information Systems personnel be involved in the following Matrix configuration.

E-mail Configuration

Click **E-MAIL CONFIGURATION** to display the dialog box shown in FIG. 56.

FIG. 56 E-mail Configuration dialog

1. **Your Company Name** – this is the end user’s company name.
2. **“From” E-Mail Address** – recipients of any e-mail sent by Matrix will appear to come from the address entered here. Typically, this is the e-mail address of the person responsible for managing the bulk oil tank deliveries and pick-ups at the Matrix site.
3. **SMTP Server Address for Outgoing Mail** – the address of the mail server to which Matrix transfers outbound e-mail. This address can be obtained from either the Internet service provider or from IT personnel at the site. Some Internet service providers change the SMTP address frequently (eg. AOL). The Matrix e-mail functionality will not work with these Internet service providers.
4. **Use Authentication/User Name/Password** – some mail servers require authentication in the form of a user name and password. If this is the case, check the check box and enter the appropriate user name and password here. Otherwise, leave the check box unchecked and the user name and password fields blank.
5. Click **Apply** close the screen and save changes.


To verify the e-mail configuration settings made above, create a Current Tank Volume e-mail event (as described below) for about 5 minutes in the future, allow the time to expire, and verify with the recipient that the e-mail was received. Once Matrix has created the e-mail and transferred it to the mail server, Matrix cannot confirm that the e-mail actually arrived at the intended recipient. However, Matrix Reporter provides a report that summarizes e-mail events, at least as far as creating the e-mail and getting it as far as the mail server.

Adding an E-Mail Event

Click **Add E-Mail**. A new record is added to the screen.

Modifying E-mail Events

1. Locate the e-mail event you wish to change and select **Modify**.
2. In the new Send to E-mail Address, enter the e-mail address of the person you wish to send notify of this event.

 Only one address can be entered; if the same notification needs to be sent to multiple addresses, a separate e-mail event must be created for each recipient.

3. Click the **Event** drop down list and select event.
4. Assign Tanks to this e-mail Event: Click and highlight the tank(s) that you wish to send, then click the (>>) right arrows. The tank(s) will be moved to the assigned tank column. Click **Apply**. See FIG. 57.

Removing an E-Mail Event

In the Action column of the record you want to change, click remove. The record is removed from the screen.

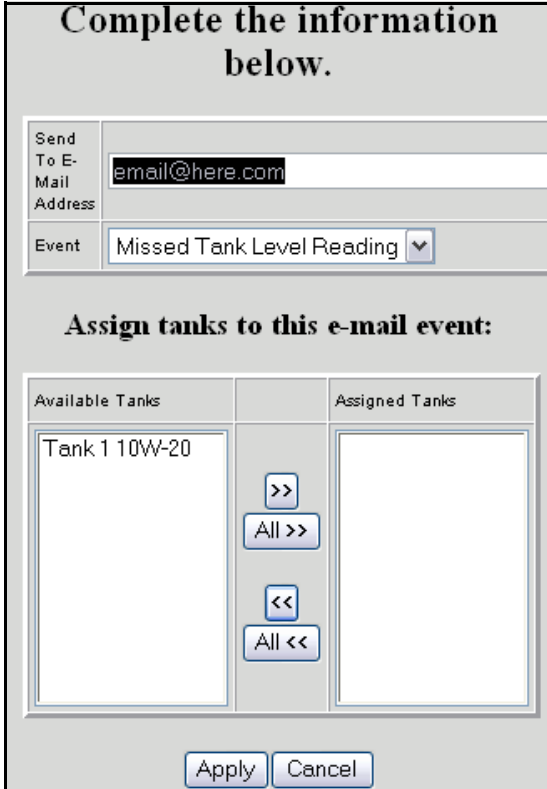


FIG. 57 Modifying E-mail

System Status

Selecting the system status box returns the user to the Operator User System screen.

Matrix Reporter

Matrix Reporter provides all Matrix reports and is used to import and export the Matrix database.

Production Data

Matrix retains production data over a 4 month rolling window. That is, data older than 4 months is automatically deleted on a daily basis. This “purging” action is performed at 3:30 am when the system is idle. This operation keeps the internal Matrix database to a manageable size ensuring that the system performs reliably. If retaining production data beyond the 4 month window is required, the Matrix system administrator should run the desired reports on a regular basis and either save the data to an electronic file or print a hard copy.

Starting Matrix Reporter

Navigate to **Start / All Programs / Graco / Matrix** and select **Matrix Reporter**. You will be prompted for a Matrix user name and password, which must have an Administrator security level.

Creating a Report

When you have successfully logged in, Matrix Reporter opens with a blank report window (FIG. 58).

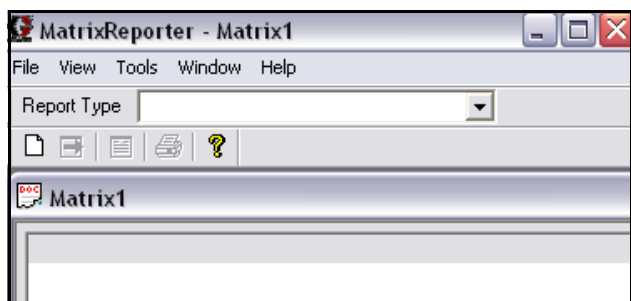



FIG. 58 Matrix Reporting Window

 Do not close the blank report window; a window like this is required to be open in order to display report contents. If for some reason the window is closed, a new one can be created by clicking on **File / New** in the main menu or the “Create a new report” button on the toolbar.

Select a report from the drop down list under the main menu at the top of the screen. See FIG. 59. The data for the report will populate the report window below. At this point the data can be viewed, filtered by date, saved to file, or printed. See FIG. 60.

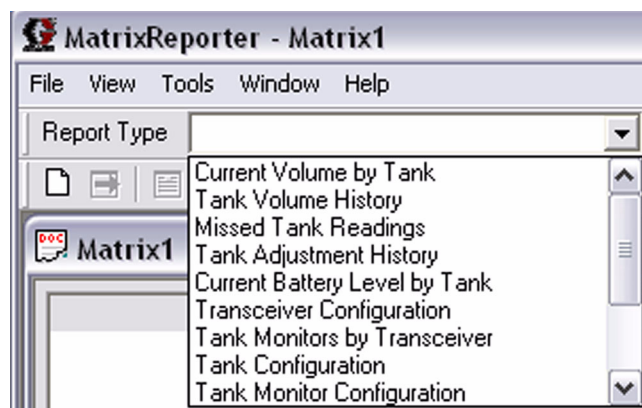


FIG. 59 Reports Type selection



FIG. 60

The following reports are available in Matrix Reporter:

1. Current Volume by Tank
2. Tank Volume History
3. Missed Tank Readings
4. Tank Adjustment History
5. Current Battery Level by Tank
6. Transceiver Configuration
7. Tank Monitors by Transceiver
8. Tank Configuration
9. Tank Monitor Configuration
10. Tank Monitor Schedule
11. E-mail Server Settings
12. E-mail Configuration
13. E-mail History
14. PC Clients

Saving Report Data to File

All Matrix reports can be saved to an electronic file on the hard disk by running the desired report and then selecting **Tools/Save Active Report** from the main menu. The file will be in comma-separated text format and can be saved with a .csv or .txt extension. A spreadsheet software program such as Microsoft Excel can open a file like this for custom data manipulation and reporting.

Printing Report Data

Most, but not all reports can be printed to a file by selecting **File/Print** from the main menu. Some reports have too many columns to format on common paper sizes and therefore will not print with this command. For reports that cannot be printed directly from Matrix Reporter, the print button on the toolbar and the print command in the File menu are disabled.

Filtering Report Data

Reports that contain production data (as opposed to configuration data) can be filtered by running the report and then selecting **Tools/Filter Active Report by Date**. You will be prompted for a start and end dates.

Matrix Database Import and Export

The ability to import and export the Matrix database allows end users to periodically backup their database, something that becomes critically important in the event of a hard disk failure. Graco recommends the database be backed up (exported to a file) after each system configuration change. This file represents a “snapshot” of the system’s configuration (including production data such as tank level readings) at that point in time. In the event of a PC problem, such as a hard disk failure, the system can be restored by replacing the failed hardware, reloading the Matrix application software, and importing the last saved backup database file. This restores the system to the last saved snapshot.

While Matrix Reporter is available on all Matrix PCs, Graco recommends using the database import and export features in Matrix Reporter on the Matrix Server PC, rather than a Matrix Client PC.

Exporting the Matrix Database

The internal Matrix database can be exported to an electronic file by clicking **Tools/Database Utilities/Export Database**. You will be prompted for a file name that by default will have an .sql extension. See FIG. 61. Saving the file to the hard disk is recommended. If you need to transfer the file elsewhere via floppy disk or other means, save the file to the hard disk first and then copy the file to the intended destination.

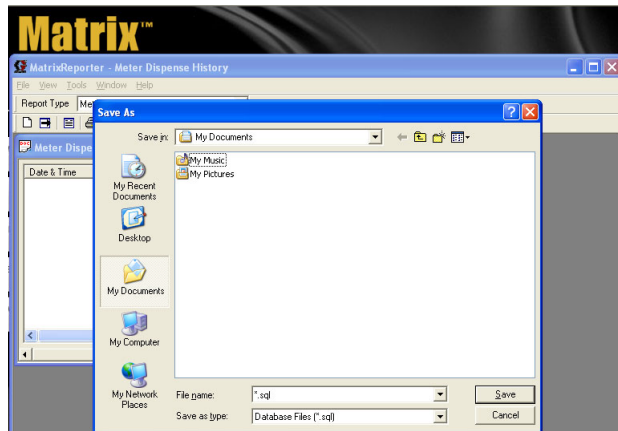


FIG. 61

This export process saves all Matrix data, both configuration and production data, to the file. Graco recommends this export process be done, at minimum, any time the system configuration is changed—a meter’s configuration is changed, a new meter is added, a new user is added, etc. If the PC has a hard disk failure or becomes otherwise unusable, the Matrix application software can be reloaded and the last saved database file can be imported to recover from the event—see **Importing a Matrix Database File** for details. Graco recommends the backup database file be stored somewhere other than the Matrix PC’s hard disk—such as on a network drive, on a CD or DVD, or on an external drive.

This database export process can be done at any time without interfering with normal operation of the Matrix system.

Importing a Matrix Database File

Matrix can import database files created by the export routine described in **Exporting the Matrix Database** in this manual.

The primary purpose of importing a Matrix database file is to allow recovery from a catastrophic PC hardware or software event, such as a hard disk failure or reinstallation of Windows. It is a process that should not be taken lightly. If the import process is not done correctly, Matrix may malfunction or could fail completely and require a manual reconfiguration of the entire system, including reprogramming of all tank level monitors. Read and understand the database import process and its ramifications before importing a database file.

When a database file is imported, the contents of the file completely replace all elements of data that the Matrix system has. This includes system configuration and production data.

Configuration data. Configuration data is all the system setup parameters, such as system, user, tank level monitor, and e-mail event parameters.

Production data. Production data is all data that Matrix generates as part of normal system operation, such as tank level reporting history.

Since the database file's contents replace the corresponding settings and data in Matrix, any configuration changes made and production data generated since the file's creation will be lost.

If there are differences between, for example, tank level monitor parameters in the database file and the actual programmed parameters in the tank level monitor itself, the resulting system behavior is unpredictable. The tank level monitors will have to be reprogrammed to ensure the PC and tank level monitors are match exactly. Therefore, export the database to a backup file whenever the system configuration is changed.



Follow the instructions carefully when importing a database file. If this process is not done correctly, Matrix may malfunction or could fail completely and require a manual reconfiguration of the entire system, including reprogramming of all meters and tank level monitors.

The database file being imported must have been created by the Matrix system you are using. If you're upgrading from an older version of Matrix PC software to this version, you must contact your authorized Graco distributor for assistance.

The contents of the database file being imported will completely replace all elements of data that the existing system has. This includes system configuration and production data.

The import process is not reversible, meaning that you can't "undo" the import. However, there are precautions that you can take to recover an previous database following an import (see step 3 of the import instructions below).

Database file import instructions

1. The import must be done when the Matrix system is idle. Do not attempt to dispense fluid with the Matrix system while doing an import.
2. The database file being imported must have been created by the same version of Matrix it's being imported into. For example, if you've recently upgraded to a new version of Matrix, you cannot import backup database files created by the old version.
3. While not a mandatory step, Graco recommends exporting the existing database to a file before importing the new one. If the import process should not work in any way, this provides a means of getting back to where you started (the database file saved as a precaution in this step could be recovered).
4. Close all Matrix windows.
5. Open Matrix Reporter by clicking on **Start/All Program/Graco/Matrix** and selecting **Matrix Reporter**.
6. In Matrix Reporter, click on **Tools/Database Utilities/Import Database**. You will be prompted for a file name. Navigate to the directory in which the database file resides and select it.
7. Matrix will import the contents of the file.
8. When the import is complete, close Matrix Reporter.
9. Reboot the computer.
10. The Matrix system administrator should review all system configuration settings and verify they are correct. If there is any doubt whether the settings in the Matrix PC software are in synch with those programmed into the tank level monitors, reprogram these devices to make sure the settings are synchronized. Differences between the settings for these devices in the PC software and the way they are programmed will cause unpredictable system behavior.

Troubleshooting

Problem	Cause	Solution
Cannot access System Administration screens.	Incorrect user name or password.	Ensure you are using the correct user name and password. Contact Graco Customer Support Team if a new password must be generated to access your Matrix system.
The information in the different screens does not update.	Java Plugin settings may be incorrect.	Make sure "Enable Caching" box is not checked. Make sure "Check for new version of stored pages" is checked in IE.
Matrix email does not arrive at destination.	A variety of issues may prevent delivery of email.	Review procedures in this manual to ensure correct settings. If necessary contact your IS representative.

See Troubleshooting Section of the Readme file located on the Matrix Installation disk and **Software Installation Troubleshooting** on page 15 for more detailed software troubleshooting information.

Graco Standard Warranty

Graco warrants all equipment manufactured by Graco and bearing its name to be free from defects in material and workmanship on the date of sale to the original purchaser for use. With the exception of any special, extended, or limited warranty published by Graco, Graco will, for a period of twenty-four months from the date of sale, repair or replace any part of the equipment determined by Graco to be defective. This warranty applies only when the equipment is installed, operated and maintained in accordance with Graco's written recommendations.

This warranty does not cover, and Graco shall not be liable for general wear and tear, or any malfunction, damage or wear caused by faulty installation, misapplication, abrasion, corrosion, inadequate or improper maintenance, negligence, accident, tampering, or substitution of non-Graco component parts. Nor shall Graco be liable for malfunction, damage or wear caused by the incompatibility of Graco equipment with structures, accessories, equipment or materials not supplied by Graco, or the improper design, manufacture, installation, operation or maintenance of structures, accessories, equipment or materials not supplied by Graco.

This warranty is conditioned upon the prepaid return of the equipment claimed to be defective to an authorized Graco distributor for verification of the claimed defect. If the claimed defect is verified, Graco will repair or replace free of charge any defective parts. The equipment will be returned to the original purchaser transportation prepaid. If inspection of the equipment does not disclose any defect in material or workmanship, repairs will be made at a reasonable charge, which charges may include the costs of parts, labor, and transportation.

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Phone: 612-623-6928 **or Toll Free** 1-800-533-9655, **Fax** 612-378-3590

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