

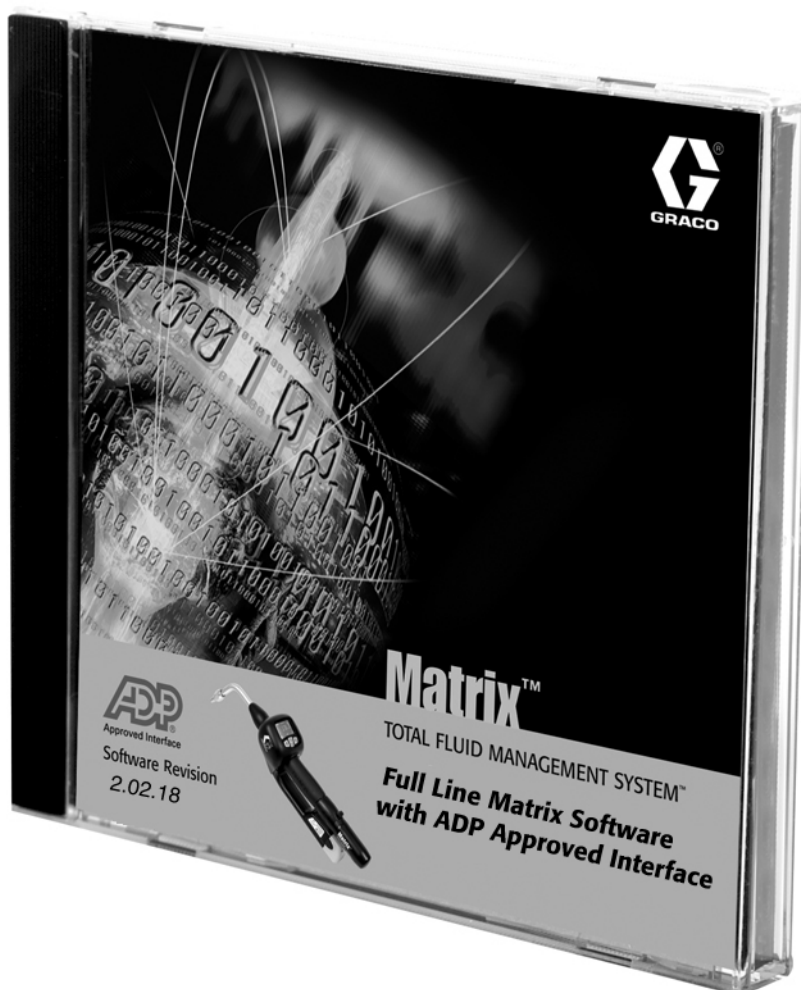
Instruction Manual

Full Line Software with ADP Approved Interface

311427 rev.B

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

U.S. Patents Pending



PROVEN QUALITY. LEADING TECHNOLOGY.

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System Requirements

Matrix PC hardware requirements differ somewhat, depending on how the system is configured. The system might consist of a single PC, as previous versions of Matrix were limited to, or it might consist of multiple PCs. In the multiple-PC configuration, one PC is designated to be the Matrix Server; all the rest are Matrix Clients. The Matrix Server must support the Matrix-related activities of all the clients, and thus has a higher threshold of minimum hardware 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.

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 meters and 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 meters and 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
- one available RS232 port
- one available USB 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.

Matrix Server PC in a multiple-PC system:

The same requirements as for the standalone PC, **except:**

- 3.8 MHz Pentium 4 (or equivalent) processor
- 1 GB RAM



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). 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.

Sound Card

If the Parts Room Authorization feature of Matrix is used, Matrix will generate an audible alert whenever parts room authorization is received. A sound card in the standalone Matrix PC or Matrix Server will allow this to be heard by authorizing personnel.

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.

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 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 Settings”, 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).

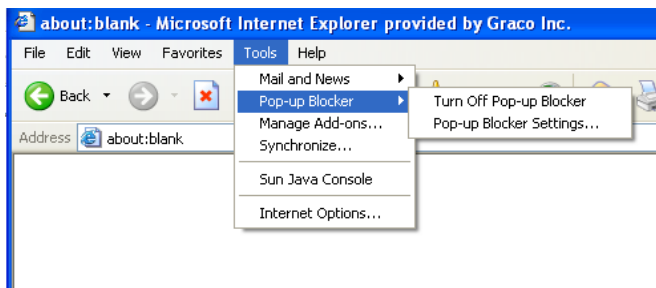


FIG. 1

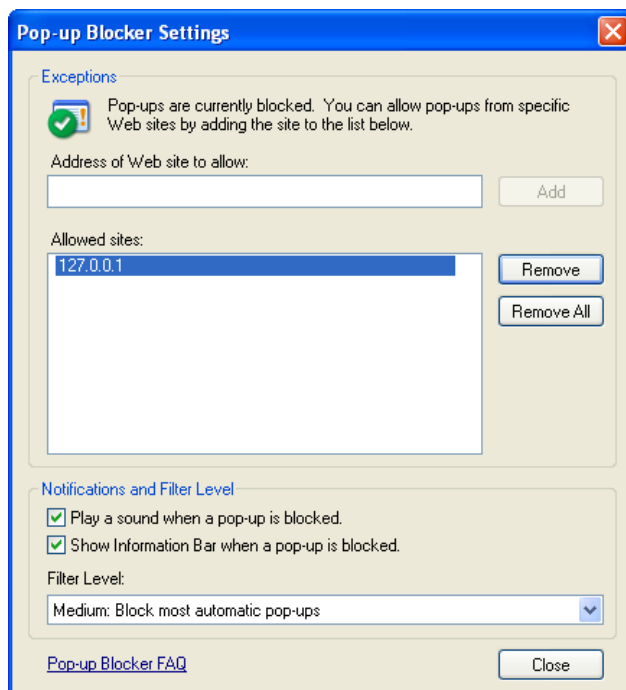


FIG. 2

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.

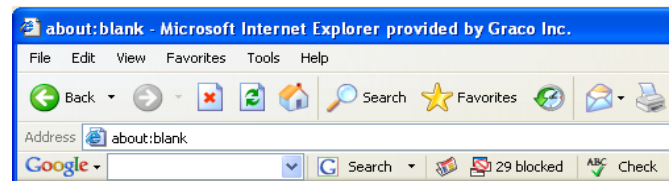


FIG. 3

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).

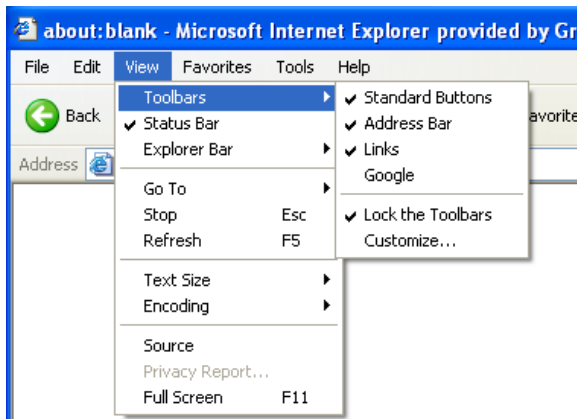


FIG. 4

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.

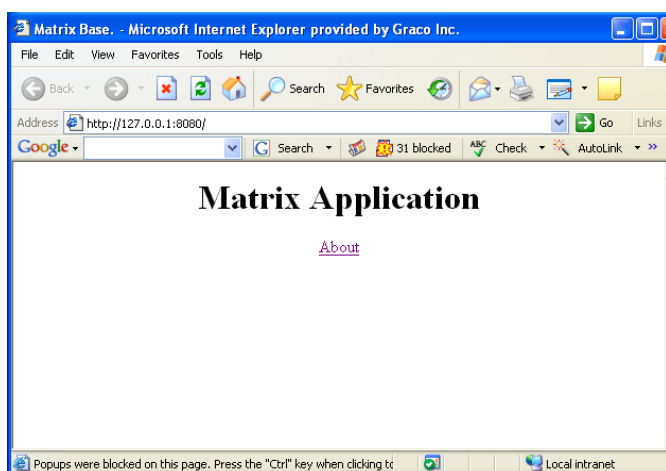


FIG. 5

Note the button in the middle of the Google toolbar that shows **31 blocked**; 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 8080-8083 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
- Port 8083 - Matrix/ADP link

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.

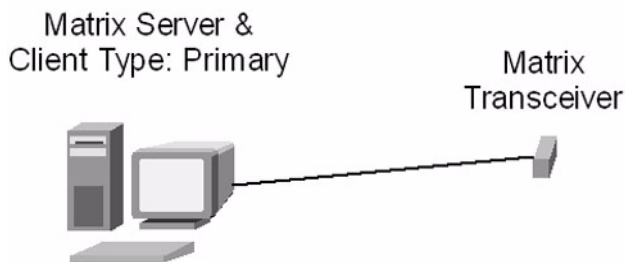


FIG. 6 Stand alone configuration

Follow setup path 1 beginning on page 9.

Networked Configurations

Matrix Full Line Software with ADP Approved Interface 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.

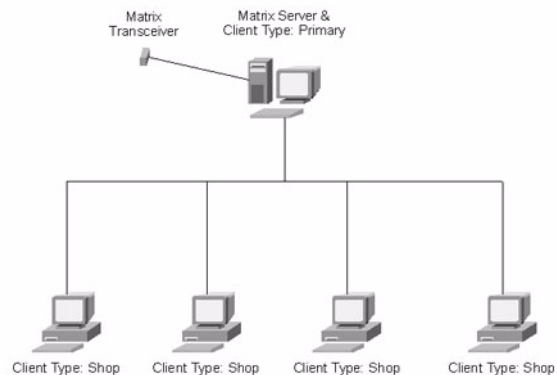


FIG. 7 Server and Primary Client as one PC

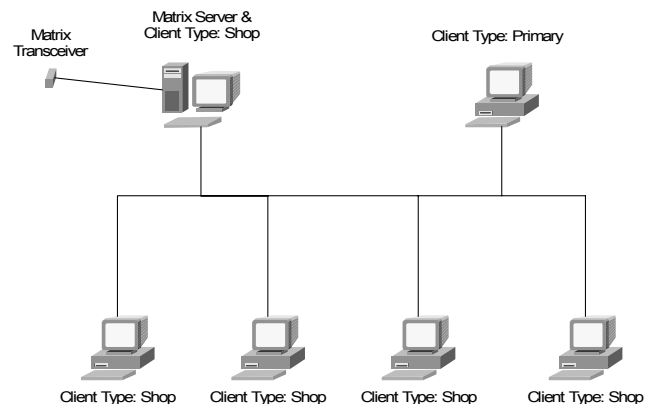


FIG. 8 Server and Primary Client separate

Follow setup path 1, beginning on page 9, on the PC designated as the Matrix Server and setup path 2, beginning on page 13, 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.

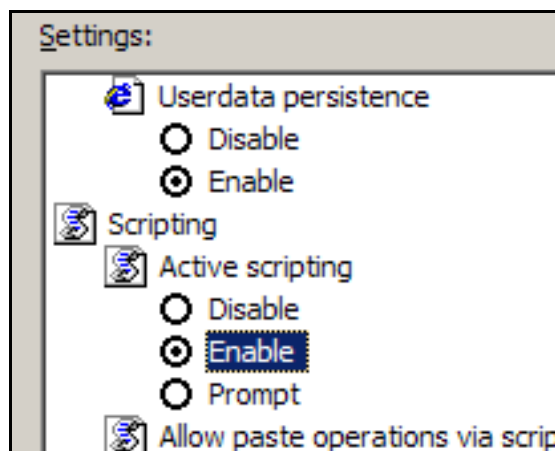


FIG. 9 Internet Java Script Security Settings

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.

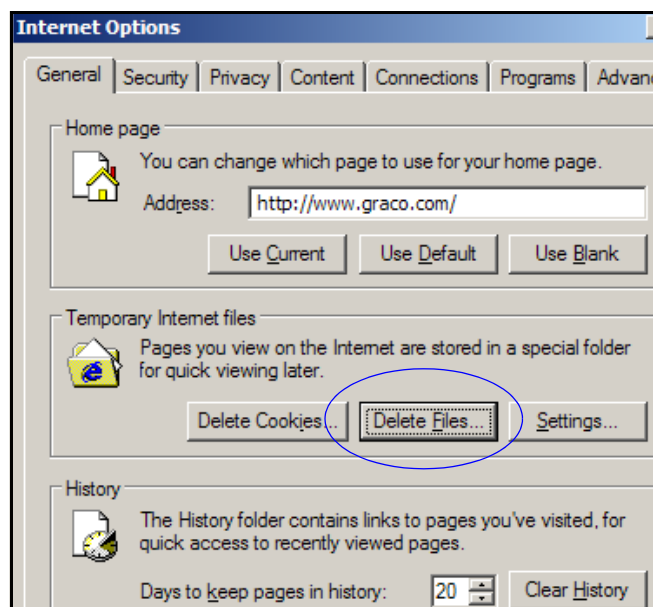


FIG. 10 Internet Options General

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

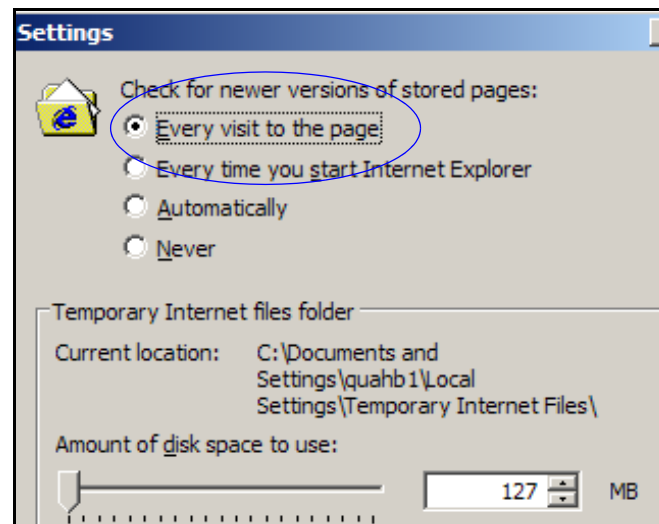


FIG. 11 Internet Page Settings

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. 27.

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.

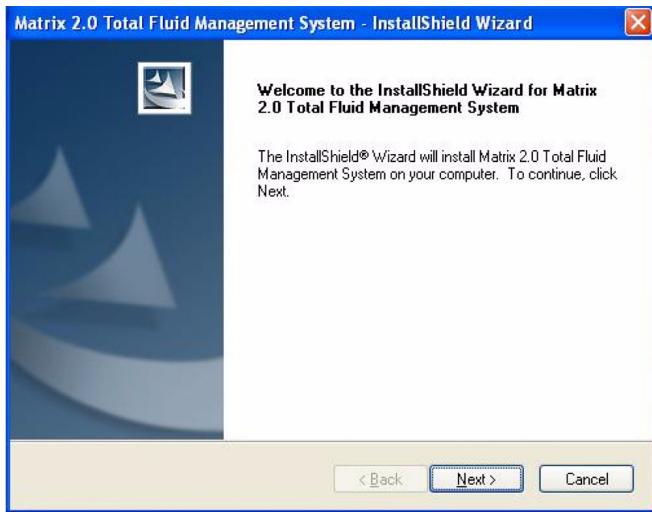


FIG. 12 Setup Path 1 - InstallShield Wizard

5. Click **Next**.

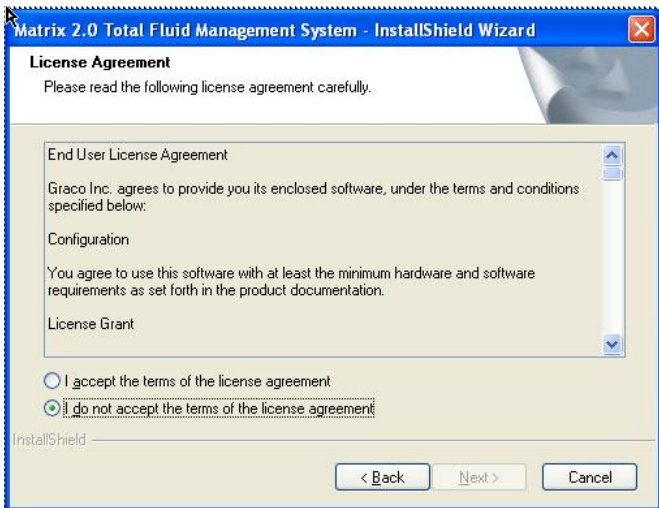


FIG. 13 Setup Path 1 - License Agreement

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

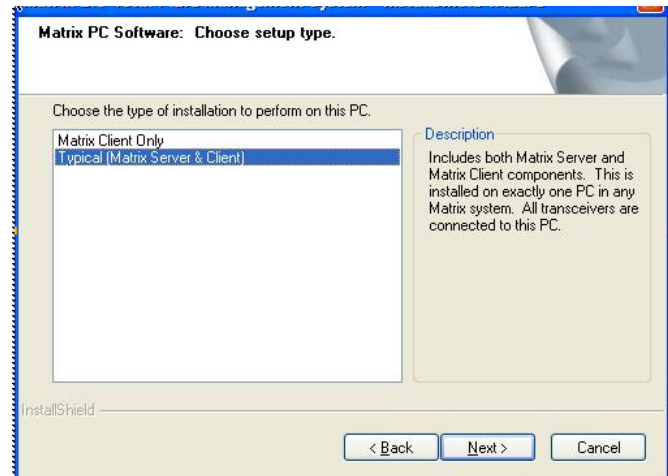


FIG. 14 Setup Path 1 - Choose Setup Type

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**.

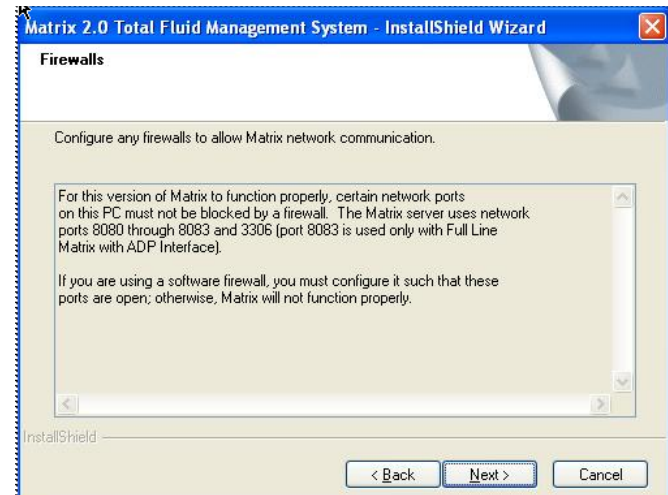


FIG. 15 Setup Path 1 - Firewalls

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

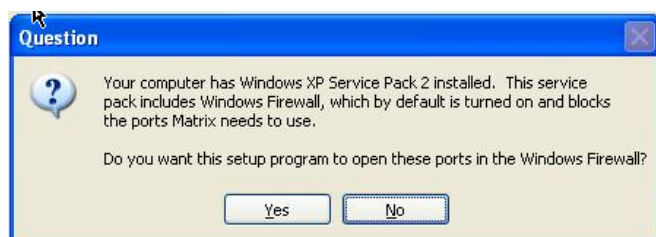


FIG. 16 Setup Path 1 - Firewall Question

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.

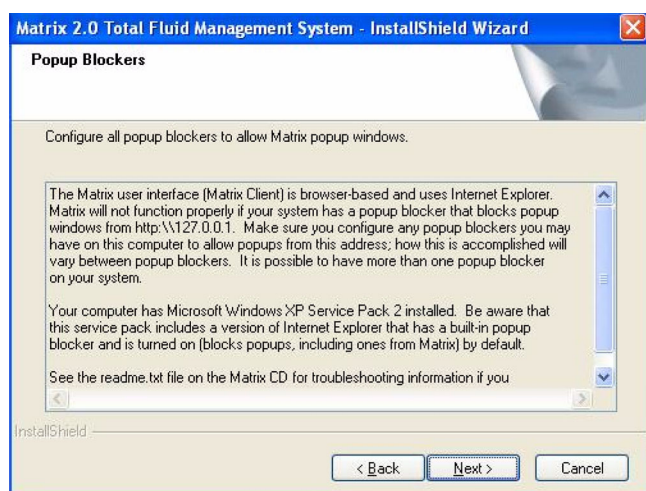


FIG. 17 Setup Path 1 - Pop-up Blockers

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**.

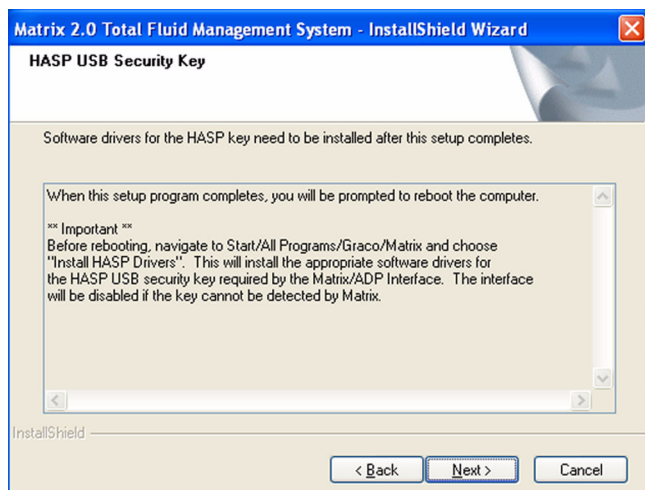


FIG. 18 HASP USP Security Key Install Screen

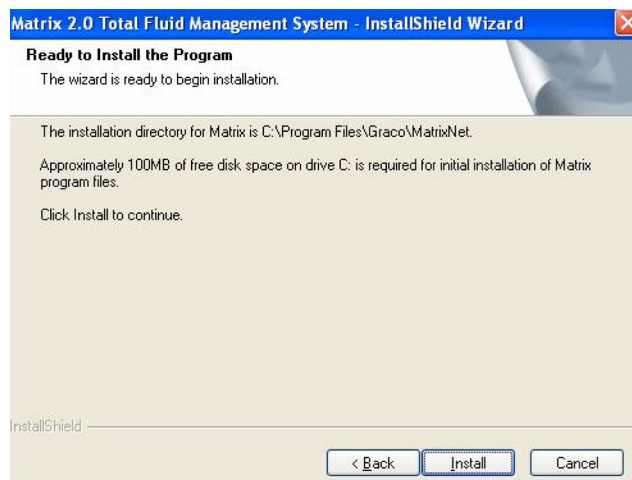


FIG. 19 Setup Path 1 - Ready to Install

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



FIG. 20 Setup Path 1 - Install Complete



FIG. 21 Setup Path 1 - Setup Complete

12. Matrix software setup is complete. Before you restart your computer run the setup program for the HASP key software drivers (see FIG. 18).

HASP key Driver Setup Program



FIG. 22 HASP Setup Welcome Screen

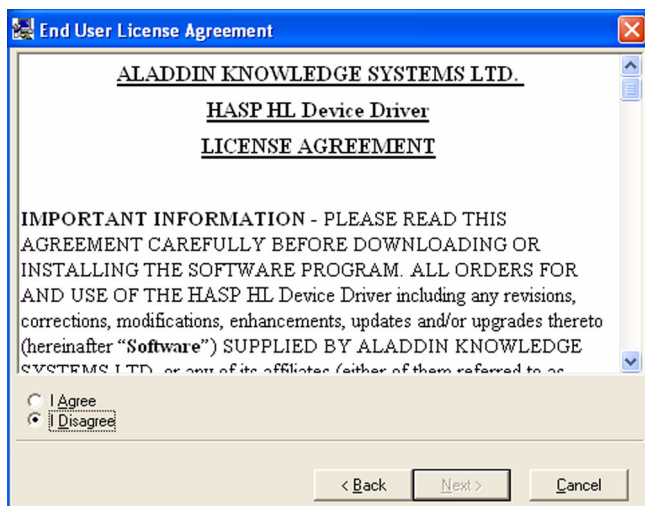


FIG. 23 HASP License Agreement

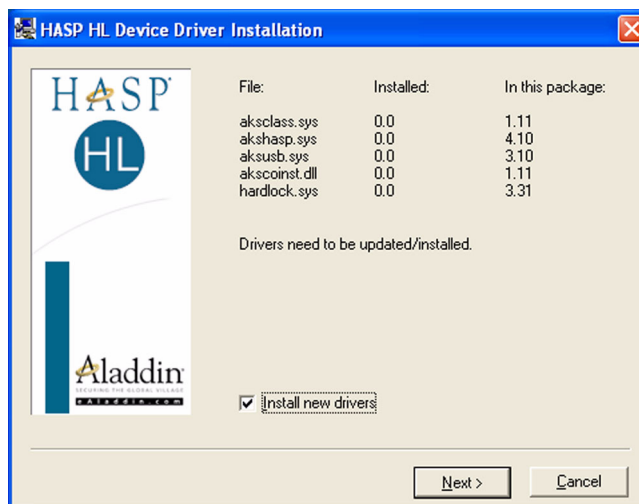


FIG. 24 HASP Driver Files



FIG. 25 HASP Setup Complete

1. When the HASP driver setup program is complete, shut down Windows XP.
2. Plug the HASP key (see FIG. 26) into an available USB port. The HASP key must remain plugged in at all times for the Matrix system to operate correctly.



FIG. 26 HASP Key

3. Restart Windows.

Matrix Server and Client Shortcuts

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 meters, tank level monitors, database storage of dispense 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).
- **Install HASP Drivers** - this is a shortcut to the setup program for the software drivers required for Matrix and Windows XP to communicate with the HASP key. This needs to be run one time only, immediately after installing Matrix software.

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

- Matrix Server
- Matrix Client

On the **Windows Desktop:**

- Matrix Client

Setup Path 2 - Matrix Client Only

See FIG. 28 through FIG. 35.

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).

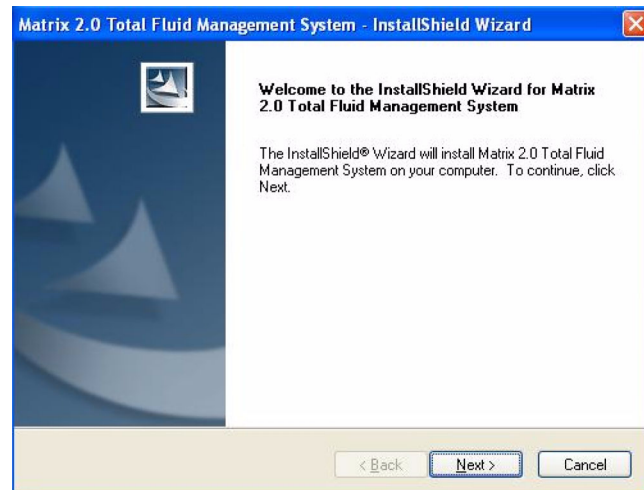


FIG. 27 Setup Path 1 - InstallShield Wizard

5. Click Next.

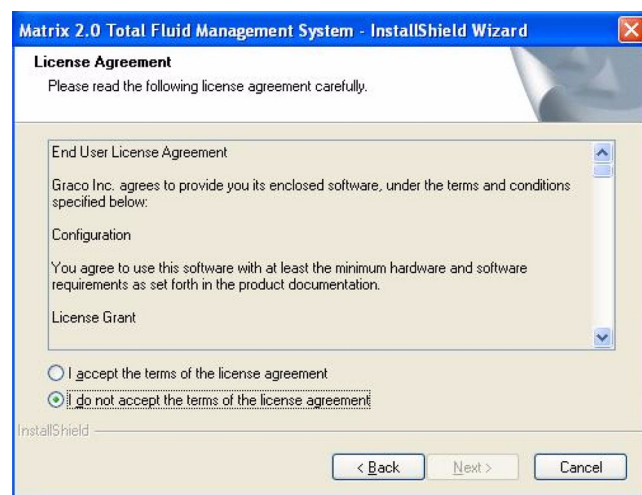


FIG. 28 Setup Path 2 - License Agreement

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

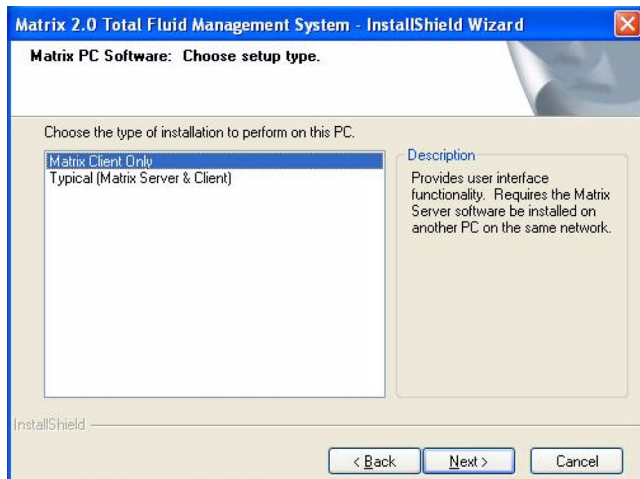


FIG. 29 Setup Path 2 - Choose Setup Type

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

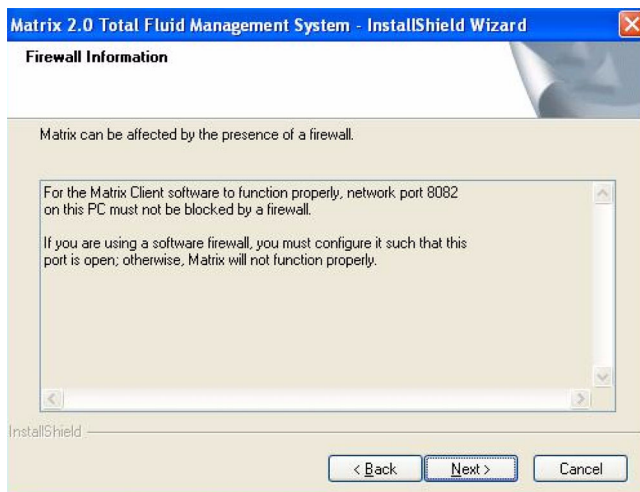


FIG. 30 Setup Path 2 - Firewall Information

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

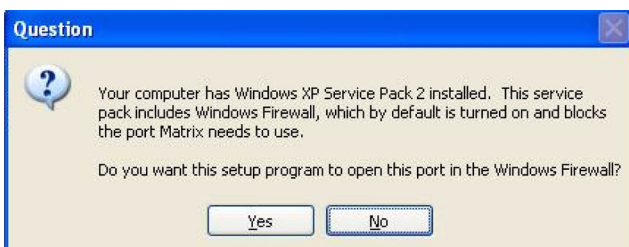


FIG. 31 Setup Path 2 - Firewall Question

9. Setup checks for Windows XP Service Pack 2 installation. If Service Pack 2 is present, the pop-up shown in FIG. 31 appears. Choose **Yes** or **No** to continue.

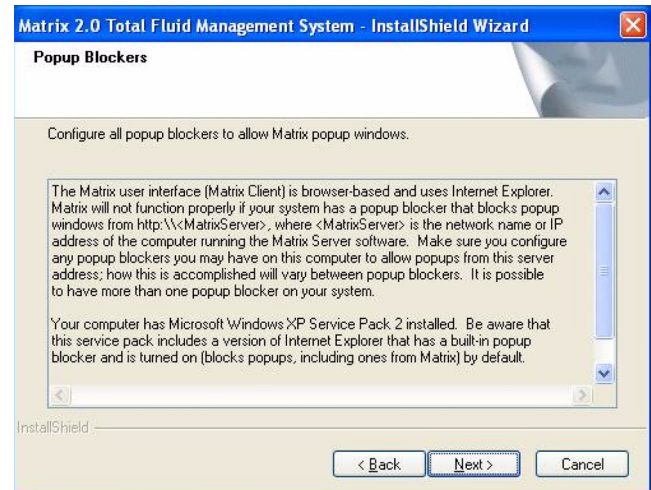


FIG. 32 Setup Path 2 - Pop-up Blockers

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**.

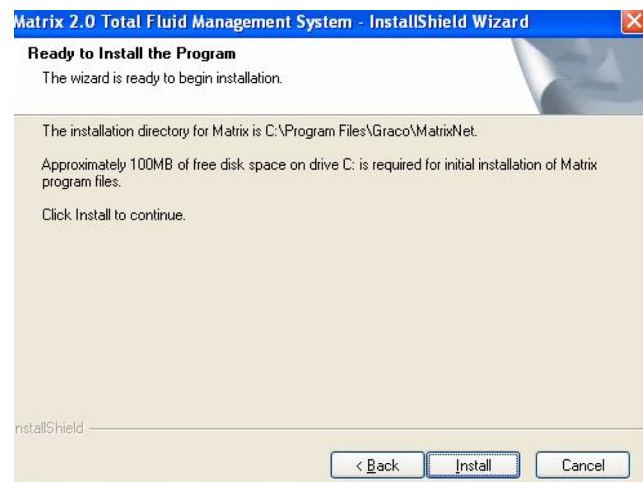


FIG. 33 Setup Path 2 - Ready to Install

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

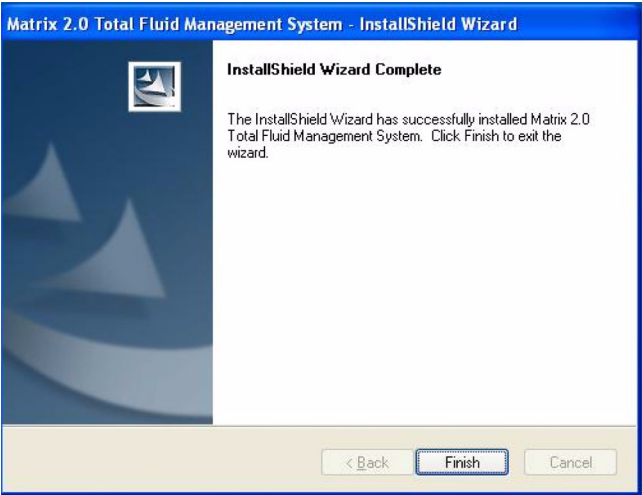


FIG. 34 Setup Path 2 - Install Complete

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

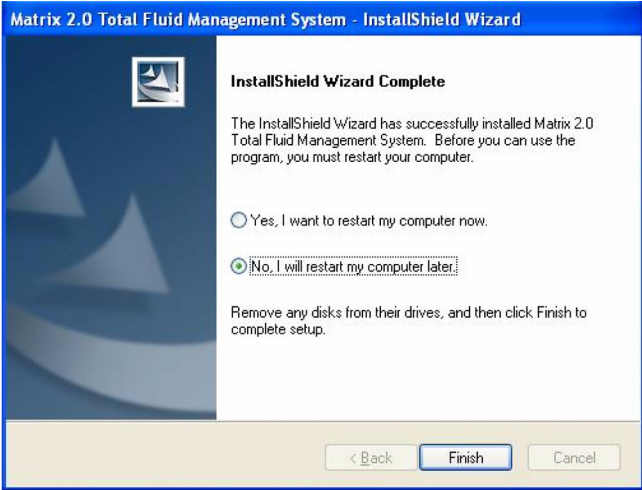


FIG. 35 Setup Path 2 - Setup Complete

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

Matrix Primary and Shop Client PC Software Install

1. Before rebooting, navigate to **Start / All Programs / Graco / Matrix** and select **Edit Matrix Client Network Settings**, where you will specify the Matrix Client PC host name and the Matrix Server host name or IP address (see FIG. 36). This step is done for each client in the system.

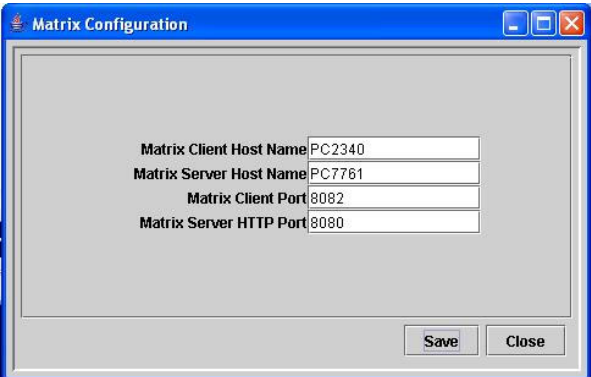


FIG. 36

2. The host names configured at each PC are unique names and the name of the PC must be entered in the system configuration screen as entered at each PC. See FIG. 37 and FIG. 38.

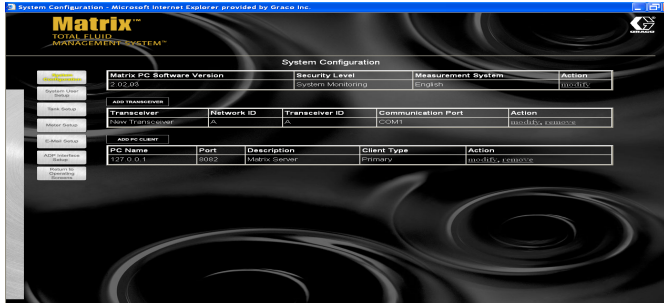


FIG. 37

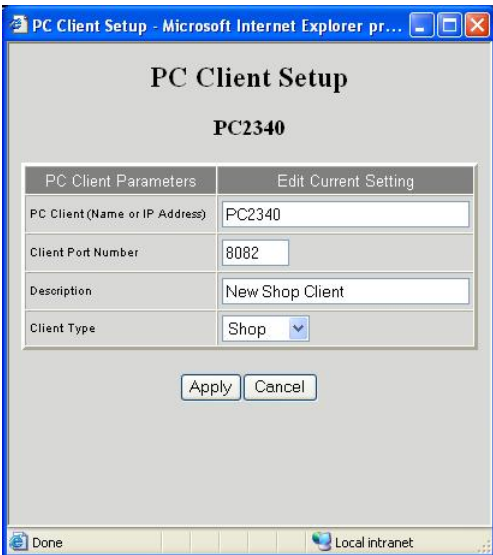


FIG. 38

Naming PCs Consistently

Throughout the networking configuration of Matrix, it is essential that you be consistent when identifying PCs, particularly when editing the network settings of clients. PCs can be identified by their host name or IP address. If you choose to use the host name, do so at both the client and the server. If you choose to use IP addresses directly, do so at both ends. However you choose to identify PCs, Matrix requires you to use the same identifier at both the individual client and the server.



- To find the computer name, double-click the System icon in Control Panel and select the **Computer Name** tab.
- The use of host names relies on the network having a computer called a DNS server. In order for computers to communicate with each other, each needs to know the other's IP address, such as 192.168.0.1. It's easier for humans to remember names instead of addresses like this, so DNS servers provide a mapping function that links host names (same as computer name) to their IP address, thereby allowing people to reference specific computers by this more easily-remembered name. Networks without DNS servers must use IP addresses directly.

Naming example:

You just installed the Matrix client on a PC in the shop; the network has a DNS server. The client's host name (computer name) is PC2340. The Matrix server's host name is PC7761. You would configure the client's network settings as shown in FIG. 36.

This client must be added to the Matrix setup configuration, accessible at the Matrix server or primary client. When finished, the setup screen would look like this:

Alternatively, if the IP addresses of the PCs are fixed--that is, they don't use a different one each time they boot up--you could IP addresses directly, in place of the host names in the example above.

If the port numbers in the two screen shots above are not appropriate in a particular network, they can be changed to another value, as long as the same change is made in both places. In general, Graco recommends these port numbers not be changed unless they interfere with other applications, perhaps because these port numbers are already in use.

Matrix Client Only Shortcuts

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. 39.



FIG. 39

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. 40.

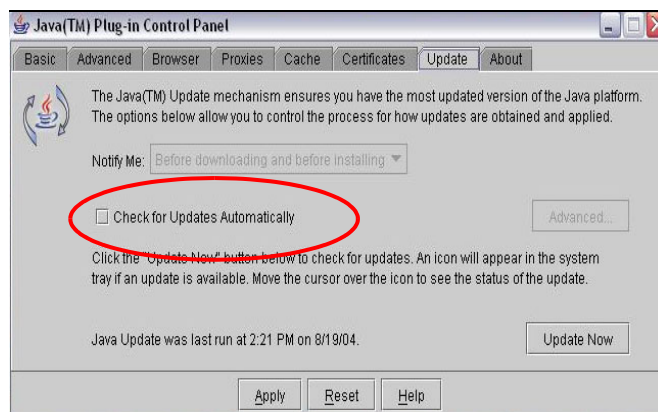


FIG. 40

See **Software Installation Troubleshooting** on page 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
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>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 <a href="http://<MatrixServer>">http://<MatrixServer>, where <MatrixServer> 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>
When Matrix is launched, I get an error that says a connection could not be made to the Matrix server.	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.
I'm sure I have no pop-up blockers or firewalls on my Matrix Client, but I still can't access the Matrix screens.	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.
The meter dispense information screen has a white/gray rectangle where the dispense information should be.	<p>The meter dispense 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>
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?	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

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.
I keep getting a popup window that says "USB security key not found on Matrix server! Matrix/ADP interface is disabled." What's going on?	<p>The HASP security key shipped with this version of Matrix must be plugged into a USB port on the Matrix Server at all times, even if the Matrix/ADP interface is disabled. This message will appear when the Matrix Server software cannot detect the presence of the key. The key could be unplugged. The software drivers for the key may not have been installed; if this is the case, while logged in with Windows administrative rights, navigate to Start/All Programs/Graco/Matrix and choose Install HASP Drivers. Graco recommends the key be plugged into a USB port on the Matrix Server itself, as opposed to being plugged into a USB hub that is in turn plugged into the Server</p> <p>Make sure you reboot the Matrix Server after installing the HASP driver software.</p>
When I enter a work order at a meter, I get a "WO REJECTED" message, even though I know the work order exists in the DMS and is open. Why?	When a work order is sent to the PC from a meter, the PC must validate the work order with the ADP DMS. If, for any reason, the work order cannot be validated (the work order is closed, it has a status that doesn't allow the addition of charges, the network between Matrix and the DMS is down, etc.), the PC returns this message to the meter. You could try adding the work order at the PC for better detail on why the work order isn't being validated.
Within the Matrix/ADP interface setup screens, I've configured a fluid to use part number XYZ. When I dispense this fluid against an open work order, I get a message that says "Sale price of zero calculated; sale price must be supplied." What's going on?	This can happen if the DMS is configured to prompt for a sale price when adding this part number to a work order. You must set a unit sale price in the Matrix/ADP unit pricing screen for this fluid.

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 dispense 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. 41 Operating Screens

Meter Dispense Information

Position the cursor over the Meter Dispense Status box causing the text to turn yellow. Left click the box to go to the Meter Dispense Information screen. See FIG. 42.

Meter Dispense Information						
Meter Dispense Information	Active Work Orders					
	Date & Time	Meter Name	Work Order	Status		
Tank Level Information	Dispense History					
	Date & Time	Meter Name	Amount	Work Order	Posting Status	User Data
	06-02-2006 10:14:06	Meter 1 5W-30	4.402 Quarts	183120 -A1	Complete	
Battery Level Information						
Entering Work Orders						

FIG. 42 Meter Dispense Information Screen

This screen displays the complete dispense history of all meters in the system through two tables of information. The top table lists all the active dispenses in the system and the bottom table displays all completed dispenses.

Active Work Orders

Date & Time - the date and time of the dispense.

Meter Name - the meter and fluid names.

Work Order - the tracking number the facility uses for work orders (if the meter is in work order mode).

Status - the current status of the dispense.

Dispense History

Date & Time - the date and time of the dispense.

Meter Name - the meter and fluid names.

Amount - the exact fluid amount dispensed, with units.

Work Order - the tracking number the facility uses for work orders (if the meter is in work order mode).

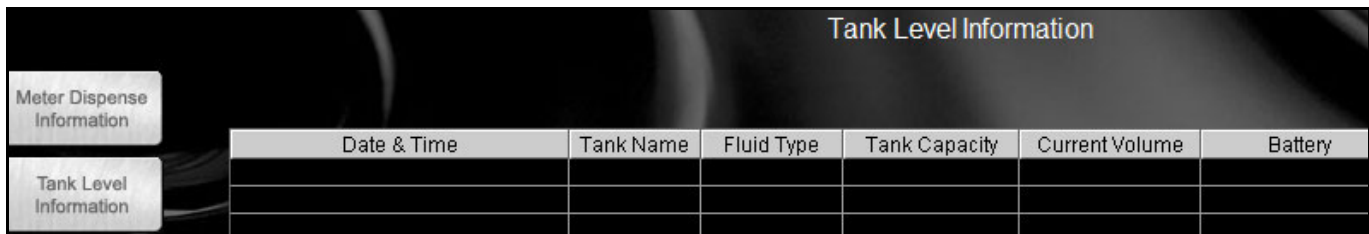
Posting Status - displays the status of the Matrix ADP interface's attempt to add this fluid charge to the RO on the ADP DMS.

User Data - allows the user to add information to the screen

Status - the final status of the dispense.

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. 43.



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

FIG. 43 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. 43, changes as a result of several different events:

1. **Tank Level Monitor reading** – The current tank volume is updated by readings sent by a tank level monitor mounted on the tank. These readings can be both scheduled (programmed) to happen a specific times during the day; they also happen each time the blue button on the tank level monitor is pressed. *The tank level readings sent from the tank level monitor always overwrite whatever Matrix currently has as the current tank volume.*
2. **Meter dispenses** – When a meter dispenses from the tank, Matrix calculates the new current tank volume by subtracting the amount dispensed. For every dispense from the tank, this is repeated.
3. **Manual tank level adjustments** – On the tank setup screen, the adjust link there allows the user 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. 44.

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

FIG. 44 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.

Entering Work Orders

Place the cursor over the Entering Work Orders box, causing the text to turn yellow. Left click the box to go to the Entering Work Orders Status screen. See FIG. 45.



To access this screen, you first need to type in your user name and password when the *authenticate user* screen appears. *User Names and Passwords are initially set up by the System Administrator.*

Meter Name	Status	Slot 1	Slot 2	Slot 3	Slot 4	Slot 5
Meter 1 OW-20	Idle					

FIG. 45 Work Order Information Screen

This screen displays all the meters that are programmed to be in work order mode and their respective work orders. It is a password protected screen that allows users to assign work orders to specific meters.

Meter Name - the meter and fluid names.

Status - indicates meter status when assigning work orders.

Slot 1 through Slot 5 - displays the meter's work order list. Each meter has its own work order list that can contain up to 5 work orders, one per "slot" in the list.

Work Orders and the Matrix/ADP Interface

For meters configured to use the Matrix ADP Interface, dispenses are tracked by work order. This version of Matrix requires that work orders entered at a Matrix PC or at a meter, be validated before fluid can be dispensed. Once the dispense is complete, the appropriate charge for the fluid will be automatically posted (added) to the work order (RO) in ADP.

Matrix/ADP Interface Configured For Parts

1. To add a work order, left click **Add Work Order**, located in the upper left corner of the screen (FIG. 46).

FIG. 46 Add Work Order - Parts

2. Select the desired meter from the drop-down box. This is the meter (fluid) that will dispense the fluid on the work order being entered.
3. Enter a work order number, up to 12 characters. This must exactly match the RO number in ADP.
4. Enter a job code, up to 3 characters in length that must follow a specific format. This field is where the user tells Matrix where on the ADP RO the fluid part must be added.

The job code field is always a letter (or two letters), optionally followed by a number. The information that Matrix needs is the target line code and labor operation under that line code. The line code can range from A-Z and AA-ZZ. The labor operation ranges from 1 to 9. It is acceptable to specify only the line code and omit the labor operation; Matrix will automatically use labor operation 1 if it is not specified. Examples of typical job codes: A1, A, B1, B2, B. The default job code is "A1".

5. Continue with **Add Work Order (Common to Parts & Service)**.

Matrix/ADP Interface Configured For Service

1. To add a work order, left click **Add Work Order**, located in the upper left corner of the screen. See FIG. 47.

FIG. 47 Add Work Order - Service

2. Select the desired meter from the drop-down box. This is the meter (fluid) that will dispense the fluid on the work order being entered.
3. Enter a work order number, up to 12 characters. This must exactly match the RO number in ADP.
4. Enter a job code, up to 3 characters in length that must follow a specific format. This field is where the user tells Matrix where on the ADP RO the fluid part must be added.

Enter the line code to which the lube charge should be applied into the job code field. If the lube charge should be applied to the whole RO instead of a specific line, enter "RO" (default).

5. Optional. Choose the labor type to use for this lube charge from the drop-down list **Labor Type For Lube Charge**. The labor types listed in this drop-down list are those entered on the ADP Interface Setup area. This field appears only when the **Service** side of the interface is selected in **General Settings**, it does not appear when **Parts** is selected. If no labor type is selected the lube charge will use the labor type defined by either the fluid's unit pricing configuration or a menu. Which one is used is determined by whether menu pricing is

enabled and if it is enabled, if any menus' criteria are met. If no menus apply, unit pricing is used.

If the labor type selected here is a warranty labor type (begins with a 'W'), Matrix will prompt for a Failure Code. See FIG. 48. The user can enter a manufacturer-specific failure code here as appropriate. This information is added to the lube charge when it is posted to the RO. If the user does not enter a failure code into this field, the Failure Code field in this lube charge on the RO will be blank (Matrix does not require a failure code be entered).

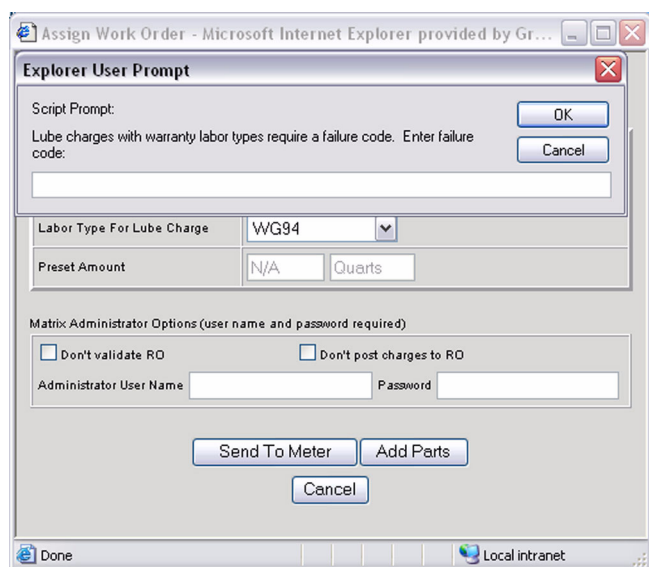



FIG. 48

Add Work Order (Common to Parts and Service)

1. Matrix administrators have the ability to override work order validation and/or posting of Matrix-generated charges to the work order.

 For more information on what validation and posting means, see **Work Order Validation** and **Work Order Posting** below and on page 46.

To override validation, check the **Don't validate RO** checkbox. To override posting of charges, check the **Don't post charges to RO** checkbox. Enter a Matrix administrator's user name and password. If posting charges is overridden, the **Add Parts** button is disabled.

2. At this point you may click, **Send To Meter** or **Add Parts**.

Clicking **Send To Meter** will submit this work order for validation. If successfully validated, the work order will be sent to the meter and appear in the meter's work order list. If the work order is not validated, a popup window similar to FIG. 49 will

appear; you can either retry or cancel. Until the work order is successfully validated, the work order will not appear in the meter's work order list.

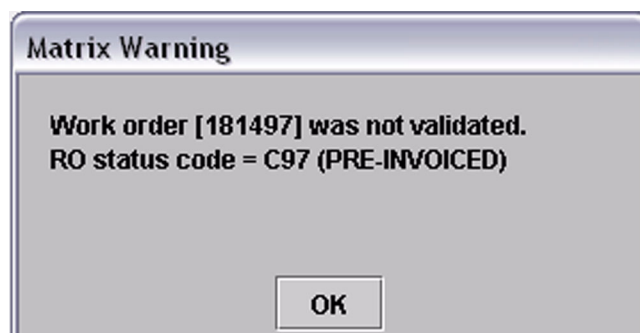


FIG. 49 Validation Failed

Clicking **Add Parts** will allow you to "attach" one or more non-fluid parts to this work order on a screen that looks like FIG. 50.

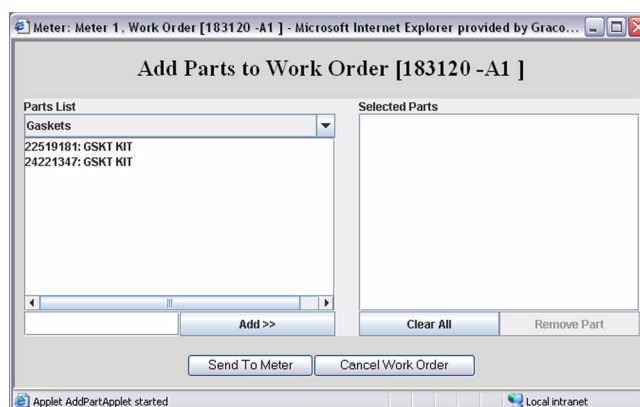


FIG. 50 Add Parts

Add Parts To Work Order

In the drop down list at the top left, select the category of parts you wish to choose from; the parts loaded into Matrix in that category (see section X) appear in the list box on the left. Click **Add>>** to select the part. Selected parts appear in the list box on the right. Clicking the **Clear All** button removes the entire list of selected parts. Individual parts can be removed from the selected list by selecting the part and pressing **Remove Part**.

When finished adding parts, click **Send To Meter**, which submits this work order for validation. If successfully validated, the work order is then sent to the meter and will appear in the meter's work order list. The list of selected parts are not physically sent anywhere; Matrix "remembers" the selected parts list for this work order until the fluid has been dispensed and successfully posted to the RO in ADP; once this has happened, the selected parts list is also posted to the RO.

Work Order Validation

A work order is considered “validated” if within the ADP DMS it meets these criteria:

1. The work order exists.
2. The work order is open; Matrix cannot post charges to work orders that have been closed.
3. The status of the work order must be such that additional parts/charges can be added to the work order (i.e. the ADP RO cannot have status ALL LABOR POSTED, READY TO INVOICE, or PRE-INVOICED).

Depending on the activity level of the network and the ADP DMS, the time it takes to validate a work order can range from a few seconds to 30 seconds.

If the work order is not validated, it will look similar to FIG. 49, which shows the error message received when the work order has a PRE-INVOICED status. Right-click on the work order to try validating it again or remove the work order from the system (see. FIG. 51).

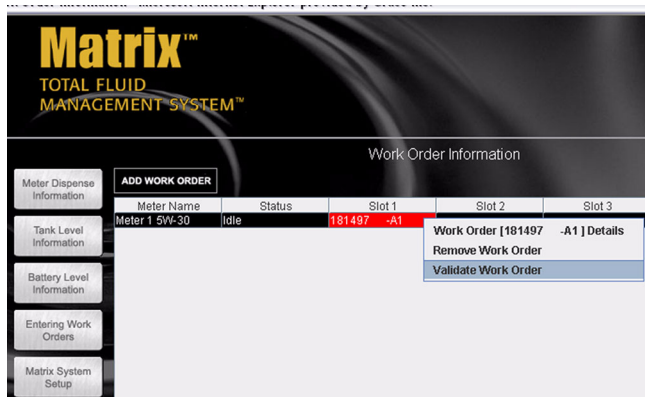


FIG. 51

Work Order Posting

Matrix does not add any parts or other charges to a work order (RO) on the ADP DMS until the Matrix system has dispensed fluid against that work order. Upon completing a fluid dispense, Matrix will do the following:

1. Record the amount dispensed in the meter dispense history.
2. Based on the unit and menu pricing configuration for the fluid dispensed, the appropriate part or service charge is determined.
3. The part or service charge corresponding to the fluid is added to the work order on the DMS.

If the fluid part or service charge was successfully posted to the work order, any non-fluid parts associated with the dispense are then posted. This list of non-fluid parts includes those the user may have selected when the work order was entered into the Matrix system (see Assigning Work Orders at PC), as well as those belonging to a menu (if applicable)

If a posting is successful, the Dispense History will appear similar to the one shown in FIG. 52. To view more detailed posting status, right-click on the work order record and select **View Posting Details** (FIG. 53). Additional posting details will appear in a popup screen (FIG. 54). This information is also available in report format using Matrix Reporter.

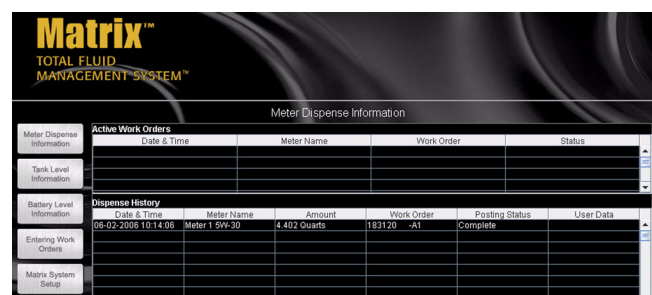


FIG. 52

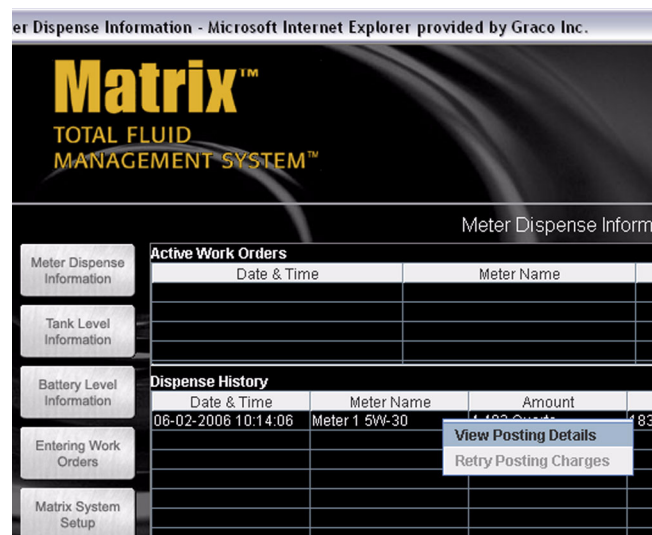


FIG. 53

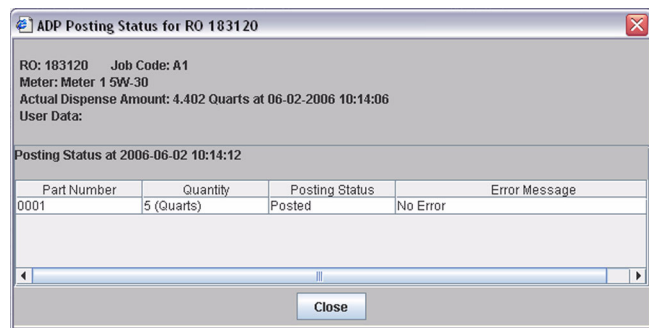


FIG. 54

If you are editing the RO while Matrix is attempting to add parts to it, the Matrix posting attempt will fail, since an ADP RO can only be edited by one person at any time.

In Matrix, when any posting error occurs, the record associated with this work order will turn red in the meter dispense history and Matrix will generate a popup windows explaining the problem. You can manually retry the posting or cancel by right-clicking on the work order in the meter dispense history and selecting **Retry Posting Charges** (see FIG. 55).

If no fluid was dispensed (dispense volume is 0), Matrix will not attempt to post charges of any kind to an ADP RO. An example of how this appears in the meter dispense history is shown in FIG. 55.

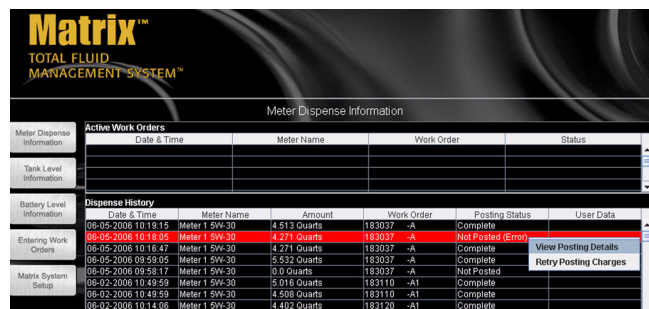


FIG. 55

Sending a Work Order to a Meter

If the PC cannot send a work order to the chosen meter for any reason, a Retry/Cancel pop-up box, as shown in FIG. 59, will be displayed. Clicking Retry will make the PC attempt to send the work order again. Clicking Cancel will do just that, effectively deleting the work order at the PC; no more retries will be attempted.

There are several system conditions that can cause this to happen:

1. The battery in the meter is very low or dead. With a dead battery, the meter cannot communicate to the PC. Replace the battery with a fully charged battery.

2. The meter is already in the process of accepting a work order (possibly from another Matrix PC). Wait ten seconds and try sending it again.
3. A poor RF signal between transceiver and meter can cause the work order to not be successfully delivered to the meter. You may need to move the transceiver closer to the meter.
4. A meter cannot accept work orders while it is dispensing fluid. It is unlikely that the meter and PC will get out of synch for this to happen. At the meter, end the dispense; the meter's end-of-dispense message to the PC will cause the two to get back in synch.

Work Order Pop-up Windows

The system is not always able to send new work orders from the PC. If this is the case, one of the following pop-up windows will appear to inform you that the work order was not received by the meter.

1. **Work Order Limit** See FIG. 56. This message appears when the PC has five open work orders associated with the meter being addressed. No RF communication is attempted when this message appears. At least one work order will need to be processed or removed before a new one can be loaded.

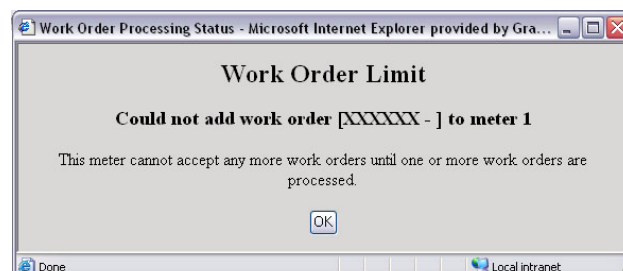


FIG. 56 Work Order Limit

2. **Work Order Already In Process** See FIG. 57. This message appears when the PC is attempting to send another work order. No RF communication is attempted when this screen appears. Attempt to send the work order again.

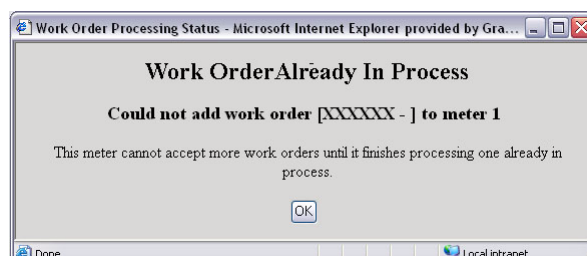


FIG. 57 Work Order Already in Process

3. **Meter is Busy** See FIG. 58. This message appears when the PC has received an Activate message from the meter being addressed. No RF communication is attempted when this screen appears. Attempt to send the work order again when the meter has completed processing the active work order.

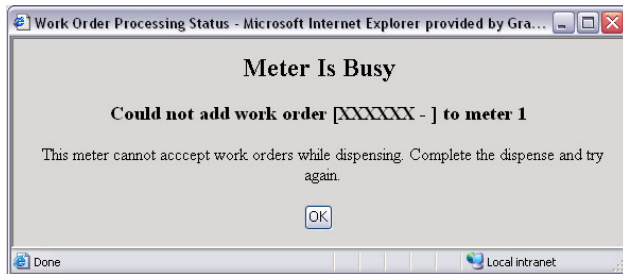


FIG. 58 Meter Is Busy

4. **Couldn't Send Work Order** See FIG. 59. This message appears when the PC tries to communicate with the meter and receives no response. RF communication is attempted when this screen appears. This message indicates the battery in the meter is removed or needs to be recharged, the transceiver is unplugged, or the RF environment has changed. Correct these conditions and attempt to send the work order again.

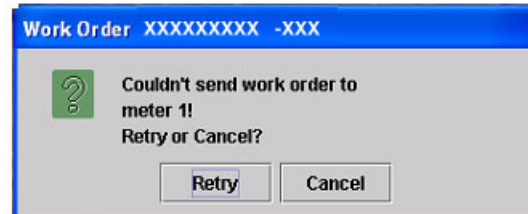


FIG. 59 Couldn't Send Work Order

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 dialogue 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. 60.



Personalized passwords for System Administration, Entering Work Orders, and for Adjusting Tank Levels are entered at the System User Setup screen, see page 34. **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, set security level and PIN information.
- *Tank Setup* - add, modify, adjust, remove, and program tank level monitors.
- *Meter Setup* - add, remove, modify, and program meters.
- *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.

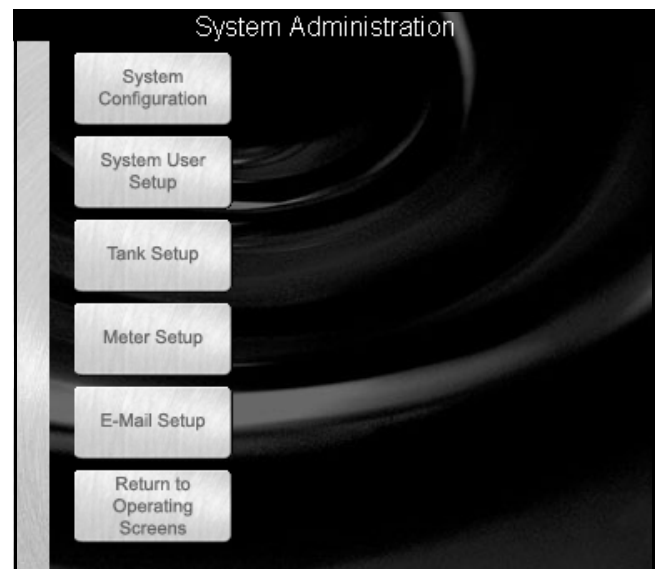


FIG. 60 System Administration Screen

System Configuration

There are three sections of the System Configuration screen: General system-wide default settings, transceiver settings, and PC client settings. See FIG. 61.

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

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

ADD TRANSCIVER

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

FIG. 61 System Configuration Screen

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

Security Level (Global Setting)

The security level is the global security setting for all meters in the system. The default is System Monitoring. PIN code and Parts Room Authorization Security are other options on the pull down menu. This security choice can be changed on a meter-to-meter basis if desired. See FIG. 62.

- Click the Security Level drop down box and select from the list.
 - System Monitoring - anyone can dispense oil, but the dispense information will be communicated to the PC.
 - PIN Code Required - the operator must enter a user-specific 4-digit numeric code into the meter to have authorization to dispense.
 - Parts Room Authorization - the operator selects authorization to dispense at the meter. This requires someone in the Parts Room to authorize the dispense at the Matrix PC.

System Emergency Code

The System Emergency Code is used to bypass PIN Code or Parts Room Authorization security features should the communication link to the Matrix PC stop (i.e. computer failure, power outage).

- Type in a four digit system emergency code number. This number is used at the meter to override all meter programming should there be a loss of RF signal. This allows the operator to continue dispensing fluids even though the meter is not receiving an RF signal.



If the system emergency code is used to override the meter program, the meter **must** be programmed again using the Matrix PC software once the RF signal has been restored.

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**.

Select settings below:

Security Level	System Monitoring ▼
System Emergency Code	4357
Measurement System	English ▼

Apply Cancel

FIG. 62 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. 63.

Edit Contact Information

The information below is placed automatically on all outgoing Matrix e-mail.

Your Company Name	John Doe Dealership
Address	1111 Elm Street Somewhere, TX 12345
Phone Number	111-111-1111
Contact Person	John Doe

Apply Cancel

FIG. 63 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 converters recommended by Graco. See page 4 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

Apply Cancel

FIG. 64

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

Click **System User Setup** to go to the Systems User Setup screen. See FIG. 65. Use this screen to add new users, new system administrators, as well as to set user security PIN numbers.

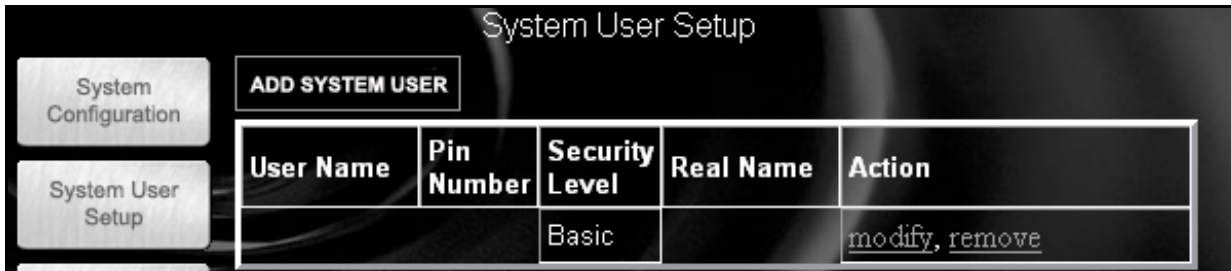


FIG. 65 Systems User Setup Screen

Click **System User Setup**, then **Modify** for each person that will use the Matrix system at the PC or at a meter.

Adding a New User

For each new user, click **ADD SYSTEM USER**. This adds a new row to the bottom of the user list. See **Modify User Settings** for configuring each user profile.

Modify User Profile

Click on the modify link for the user whose profile is to be edited/changed. See Fig. 20.

FIG. 66 Select settings below

1. **User Name** – a system-wide unique user name. If the user will have Work Orders or Administrator security level, it is convenient to have a short, easily remembered user name, since it needs to be typed

in for each access to work orders and system setup screens.

2. **Pin Number** – a system-wide unique 4-digit number between 0000 and 9999. If a meter is configured to use PIN codes, this is the number that allows access to dispense fluid from the meter.
3. **Security Level** – can be one of three possible settings:
 - a. **Basic** – can monitor Matrix status screens and operate meters.
 - b. **Work Orders** – allows all Basic privileges, plus allows work order entry at the PC.
 - c. **Administrator** – has complete access to all components of the software.
4. Click **Apply**.
5. The user password window is displayed, see FIG. 67. This password is used with the user name to access the work order screen (for users who have Work Order security level or higher) and setup screens (for Administrators). Choose a short password, but one that cannot be easily guessed (not found in a dictionary, for example).

FIG. 67

More than one user can have Administrator security access. However, as soon as one administrator user is created, the default matrix/graco user name and password will be disabled. Users with Administrator security level have special responsibility to keep track of their user name and password, as well as keep it secure.

If you misplace your system administrator password, call the Graco Lubrication Equipment Support Team at 1-900-533-9655 from 7:30am to 5:00pm CST.

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.

Tank Setup

Click **Tank Setup** to go to the Tank Setup screen (FIG. 68). Tanks must be configured before meters can be configured.



FIG. 68 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. 68. The Fluid Setup dialogue box appears. See FIG. 69.

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.

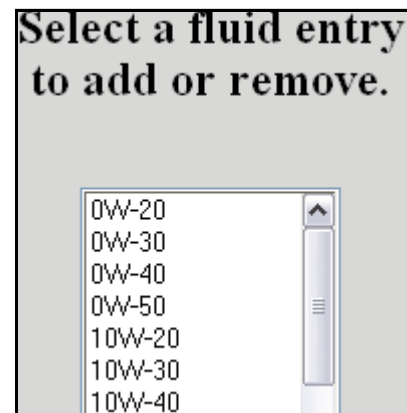




FIG. 69 Select a fluid entry to add or remove

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. 70.*
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.




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

Continue Cancel

FIG. 70 Edit Tank Setup

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 37 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.

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. 71 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 manufacture's published gal/liter capacity that was entered in FIG. 70. *(In some cases the actual volume of the tank may exceed the manufacture'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. 70 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. 72 Obround Tank

Cylindrical Tank

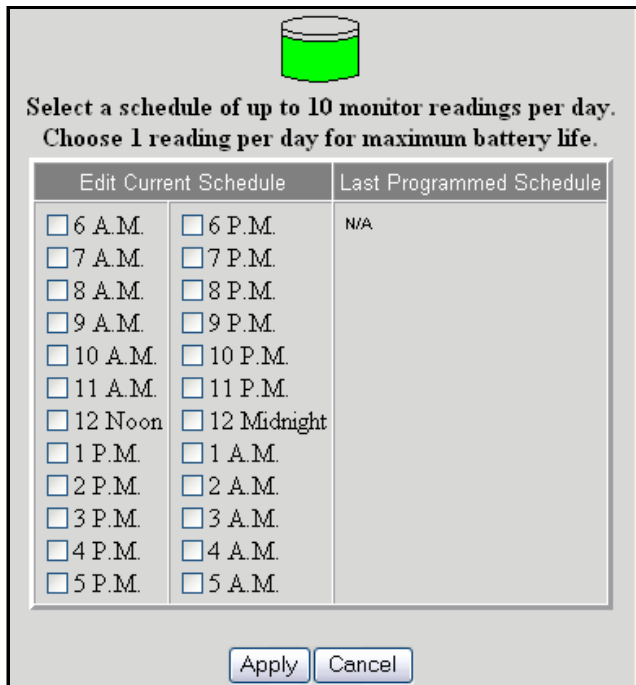


Complete the tank information below.

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. 73 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. 74 Edit Tank Schedule

- After making the appropriate tank shape selection click continue for the next screen called the edit tank schedule dialogue box. See FIG. 74.
- 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

- Click adjust. The Tank Levels screen appears. See FIG. 75.



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 Gallons
Description	Oil Delivery ▼
Comment	

Apply Cancel

FIG. 75 Adjust Tank Levels

- Enter the amount of oil to be added or subtracted to the current amount.
- Click the description arrow, and choose an appropriate reason for the adjustment.
- Add any desired comments.
- Click **Apply** to update the record.
- The Tank volume updated notice appears. See FIG. 76. Click **Close** to return to the Tank Setup screen.



Tank volume updated!

Close

FIG. 76 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. 77.

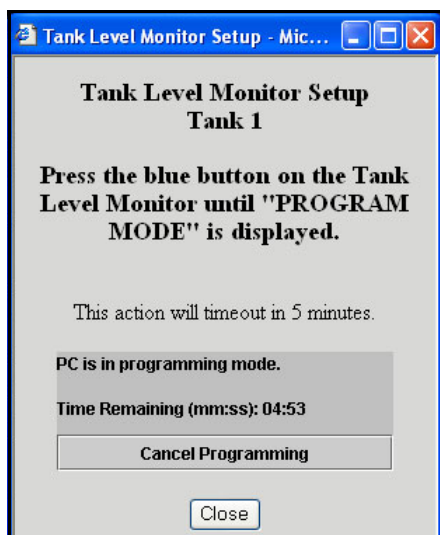


FIG. 77 Tank Level Monitor Setup

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. 78.

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



FIG. 78

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. 79. 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. 79 Programming complete screen

Meter Setup

Click **Meter Setup** to go to the Meter Setup screen (FIG. 80). This screen adds or deletes a meter used in the Matrix system.

Meter Name	Meter Address	Fluid Type	Security Type	Meter Mode	Preset Amount	Work Order	Action
Meter 1	500	5W-30	System Monitoring	Manual	0 Quarts	yes	modify, program, remove

FIG. 80 Meter Setup Screen

Adding a Meter

1. Click **Add Meter**.
2. A new meter record is added to the list. Add information to the record by following the steps for **Modifying Meter Information**.

Modifying Meter Information

1. Locate the blank meter record that was added, or the meter record that needs to have information changed. In the corresponding Action column, click **modify**. The Meter Setup screen appears. See FIG. 81.
2. Type in the name (typically a number) of the meter. This field can be changed without reprogramming the meter.
3. Click the Meter Mode drop down list and select Manual, Preset, or Restricted Preset.
 - **Manual** – the amount dispensed is determined by the operator.
 - **Preset** – the meter is programmed for a default preset volume. The preset volume can be modified on a work order-to-work order basis when sending work orders from the PC. The preset volume can always be increased or decreased by any amount at the meter prior to beginning the dispense. See also the top-off parameter, covered later in this Meter Setup section.
 - **Restricted Preset** – exactly the same as the Preset mode, except the preset volume cannot be increased at the meter.

Meter Parameters	Edit Current Setting	Last Programmed Setting
Meter Name	Meter 1	N/A
Meter Mode	Manual	N/A
Fluid Type	Tank 1 5W-30	N/A
Units	Quarts	N/A
Calibration	368	N/A
Security Type	System Monitoring	N/A
System Emergency Code*	4357	N/A
Use Work Orders	no	N/A
Enable Work Order Entry At Meter	no	N/A
Enable ADP Link For This Meter	no	No
Battery Warning Level	10 %	N/A
Transceiver ID	New Transceiver (A:A)	N/A

* See instruction manual for changing this code.

Apply Cancel

FIG. 81 Meter Setup

4. Select the **Fluid Type** from the tanks loaded. Only fluids that have a tank monitor or a tank entry display.
5. The **Units** setting was a global selection that was set in system configuration. This setting can be changed on a meter to meter basis using this screen if desired.
6. **Meter calibration** is automatically displayed when a fluid is selected in Tank Setup. These values represent a global calibration default setting, meaning that the calibration number appears on all Meter Setup screens. You can change the calibration for an individual meter using this screen. If most meters are gear lube, ATF, or antifreeze, type in the appropriate value from the table.

Fluid	Calibration	
	Quarts	Liters
Oil (10W30)	368	389
Gear Lube	375	396
ATF	368	389
Antifreeze	348	368

7. **Security Type:** A global security setting was made in system configuration. This setting can be changed on a meter to meter basis using this screen if desired. Select System Monitoring, PIN Code Registration, or Parts Room Authorization.



This change only affects this individual meter. Global meter set up for all meters was completed during initial setup in the Operation Type Setup screen.

8. **System Emergency Code** is a four digit number defined in the System Configuration section of the software and is displayed here. This number cannot be altered in the Meter Setup section.

9. Choose **Yes** or **No** on the **Use Work Orders** drop-down list.

Yes – the meter will use work orders. In order to dispense fluid from this meter, the user must enter a work order at the PC and send it to the meter. The meter operator selects the work order and dispenses the fluid. The PC tracks the fluid dispensed with this work order number.

No – the meter will not use work orders. Nothing needs to be sent from the PC in order to dispense fluid at the meter.

Depending on which Security Type was selected, there may still be some meter/PC interaction that happens to be able to dispense fluid; this setting only specifies whether the dispensed fluid is tracked by a work order number.

10. Choose **Yes** or **No** in the **Enable Work Order Entry At Meter** drop-down list.

This parameter is selectable only if **Use Work Orders** is **Yes**.

Yes – enter a work order on the meter keypad. With this setting, work orders can be sent from the PC or entered at the meter.

No – work orders cannot be entered at the meter; they can only be sent from the PC.

Choose Yes or No in the **Enable ADP Link For This Meter** drop-down list. Choosing Yes here is valid only if **Use Work Orders** is Yes. This setting must be set to Yes for Matrix to automatically post fluid charges to the RO on the ADP DMS for this meter's dispenses. Note that the meter can still use work orders if this setting is No; Matrix will not validate this meter's work orders or post fluid charges to ADP for dispenses made by this meter.

This setting can be changed without reprogramming the meter.

11. In **Battery Warn Level** is set at a default level of 10%. If desired, enter at what percentage of remaining battery life you want a warning to display.
12. Select the **Transceiver ID** for the TLM from the list of Transceivers configured during System Configuration.
13. Click **Apply** to update the record.
14. Enter a preset amount of fluid to be dispensed if preset amount was selected as yes. See FIG. 82.
15. If the meter was set to Preset or Restricted Preset mode, the screen shown in FIG. 82 is displayed. Set the default preset volume for this meter in the units previously selected for this meter.
16. **Select a Top-Off Limit.** This is a percentage of the preset volume that can be (at the meter operator's discretion) be dispensed after the preset amount has been reached. The options are: 0, 5, 10, 50, 75, 100, and unlimited. Zero means that no top-off amount is allowed after the preset amount has been dispensed. Unlimited means there is no limit to how much additional fluid can be dispensed after the preset amount has been reached.
17. Click **Apply** to update the record.

Meter Setup		
Meter Parameters	Edit Current Setting	Last Programmed Setting
Meter Preset	4 Quarts	N/A
Top-Off Limit	25 % of Preset	N/A
<div> <input type="button" value="Apply"/> <input type="button" value="Cancel"/> </div>		

FIG. 82 Pre-set amount dialog

Removing a Meter

In the **Action** column of the meter to be removed from the screen, click **remove**. The meter is removed from the Meter Setup screen and you will be prompted with the screen shown in FIG. 83.

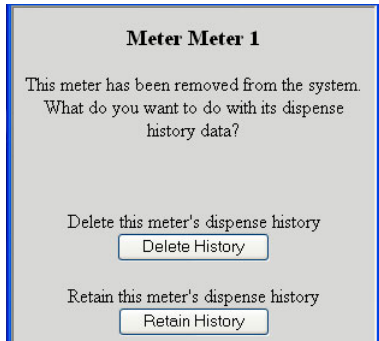


FIG. 83

Click **Delete History** to permanently delete this meter's dispense history from Matrix.

Click **Retain History** to keep this meter's dispense history.

Once a choice is made, there is no means of "undoing" the decision. The data will be either permanently deleted or kept.

Meter Programming

New meters need to be programmed with the meter setup information. However, anytime information is changed in the existing Meter Setup screens (except for the meter name), the corresponding meter must be reprogrammed.



 Graco recommends that the meter be programmed at the same location as the PC. If this is not possible, make sure that the meter is receiving a strong RF signal from the transceiver prior to programming.



FIG. 84

1. On the Meter Setup screen at the PC, locate the meter that is to be programmed. *Note that only one meter or tank level monitor can be programmed at a time.*
2. Click that meter's *program* link. This puts the PC in program mode for that meter. You are prompted with the screen shown in FIG. 85.
3. Program mode at the PC times-out after 5 minutes. If this happens, close the programming window and click on the *program* link for the appropriate meter again.
4. Put the meter into programming mode. While on a screen that shows **ACTIVATE** above the entry buttons, simultaneously press and hold down both right and left buttons until the meter's screen indicates **PROGRAM MODE**. Press the **PROGRAM** button. See instruction manual 309497 for more details.
5. The meter sends a programming request to the PC, which replies with that meter's configuration settings. When complete, the meter restarts itself, and begins using the new settings.
6. If the meter is successfully programmed, you are notified that programming is complete, as shown in FIG. 86. Click **OK**.
 If you do not see the **Programming complete!** message (see FIG. 86), do not continue to the next meter until you complete a programming cycle with the message appearing.
7. Repeat this process for each meter in the system.

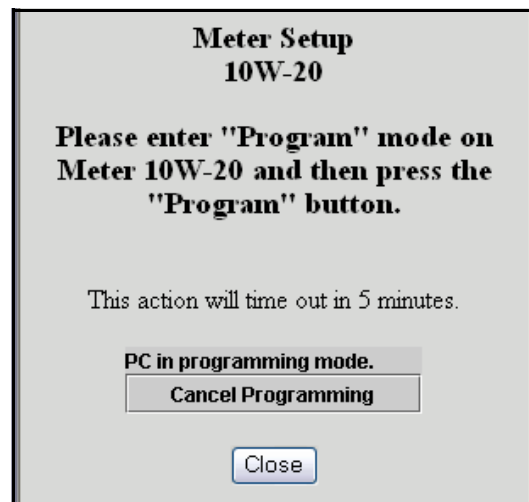


FIG. 85 Meter programming screen



Meter calibration can be done if required. See *Instruction manual 309497* for details.

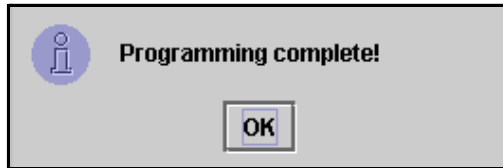


FIG. 86 Programming complete screen

Meter Programming Recommendations

1. Verify that the serial link between the PC and transceiver is working. See the **Confirm PC/Transceiver Communication** section for how to do this. If this link is not working, nothing else will.
2. All meters come from the factory with exactly the same factory default configuration—including the RF settings the meters use to communicate to the PC via the transceiver. Therefore, when programming one meter, another meter may interfere. Particularly when commissioning a system for the first time, remove the batteries from all meters except the one you're programming. This includes any spare replacement meters.
3. Do not program another meter until you get the **Programming complete!** message shown in FIG. 86. If you program a meter and it appears to be successfully programmed at the meter but you didn't get the programming complete message at the PC, Graco recommends you reprogram the meter. This ensures that you do not get two meters programmed with duplicate parameters, which will cause unpredictable system behavior.

E-Mail Setup

Click **E-Mail Setup** to go to the E-Mail Setup screen (FIG. 87).

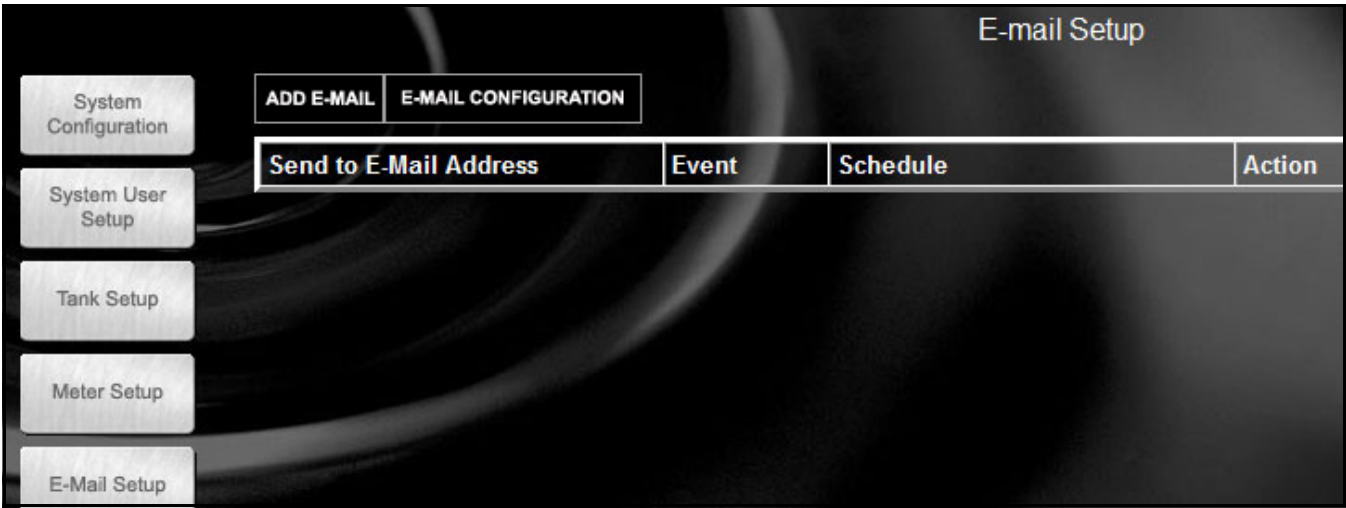


FIG. 87 E-Mail Setup Screen

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 meter dispense from that tank will generate a pop-up **Low Tank Level** warning for that tank. 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. 88.

Complete the information below.

Your Company Name	<input type="text"/>
"From" E-Mail Address	<input type="text"/>
SMTP Server Address For Outgoing Mail	<input type="text"/>
Use Authentication	<input type="checkbox"/> If checked, a valid user name & password for the SMTP server is required (below). Otherwise, the user name & password fields can be left blank.
User Name	<input type="text"/>
Password	<input type="password"/>
<div>ApplyCancel</div>	

FIG. 88 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. 89.

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. 89 Modifying E-mail

ADP Interface

Setup

The ADP Interface Setup screen contains all the setup configuration necessary for Matrix to apply the appropriate fluid charge to an ADP Repair Order (RO).

Note: The term “work order” (or WO), which the Matrix PC software and this manual uses, is synonymous with ADP’s “repair order” (or RO). “Work order” is used when in the context of Matrix software, while “repair order” is used to refer to the same entity, but within the ADP DMS (Dealer Management System).

Matrix / ADP Interface Setup				
Current Status: Enabled				
System Configuration	Dealer Management System (DMS)			Action
	General Settings			modify
	Labor Types for Service Lube Charges			modify
Meter Setup	Fluids	Description	Used by Meters	Action
	5W-30	5W-30 Engine Oil	2 Meter	modify
E-Mail Setup	Non-Fluid Parts			Action
	Part Categories			modify
ADP Interface Setup	Selected Parts by Category			modify

FIG. 90 Matrix / ADP Interface Setup

The Matrix interface to ADP performs two simple functions.

Work Order Validation

The first is to ensure that the work order entered by the user, either at a meter or at a Matrix PC, is a valid work order. Matrix checks with the ADP DMS and confirms that the work order exists, is open, and has a status that allows fluid charges to be added to it. If these three criteria are satisfied, Matrix allows fluid to be dispensed against the work order; otherwise, fluid cannot be dispensed.

Posting Charges

The second and primary function of the interface is to apply the appropriate charge for the fluid dispensed by Matrix on the correct ADP RO. Optionally, the interface can add non-fluid parts to the RO, as described in **Matrix/ADP Interface** beginning on page 24. The process of adding parts or other charges to an ADP RO is referred to as “posting” charges in Matrix.

By default, when Matrix is installed, the ADP interface is disabled. The screen shown in FIG. 90 displays the interface in the enabled state. The Graco Matrix distributor installs and configures the Matrix system with the interface in the default disabled state. A Graco Technical Support person assists the dealer to enable and test the

interface connection between Matrix and the DMS as the last step in commissioning the system.

Dealer Management System (DMS)

General Settings

The **ADP DMS Connection Setup** form shown in FIG. 91 is used to define DMS connection information and testing of the connection between Matrix and the DMS.

ADP DMS Connection Setup	
DMS Connection Parameters	Edit Current Setting
Host (Name or IP Address)	<input type="text"/>
Port Number	10224
Test Connection	
General Settings	Edit Current Setting
Group Name	<input type="text"/>
Bulk Fluids Managed/Sold By	Service <input type="button" value="v"/>
Employee Number	<input type="text"/>
Matrix/ADP Interface State	Enabled <input type="button" value="v"/>
Apply Cancel	

FIG. 91 ADP DMS Connection Setup

Host (name or IP Address) is the DMS host name or IP address. This is provided by the dealer's IS person.

Port Number is always 10224. This is the fixed port number used by the DMS to communicate with Matrix.

Test Connection allows for a simple check of network connectivity to the ADP DMS. It will indicate whether a network connection can be made to the DMS, but it will not indicate whether the DMS is properly configured.

Group Name is defined by Graco and is customer-specific.

Bulk fluids Managed/Sold By is a drop-down list that allows you to choose the method of bulk fluid management--Service or Parts--the dealership will use. Other interface-specific setup screens are defined by the selection made in this field.

Employee Number is required by the interface to post charges to the WO and is required for both Parts and Service. The dealer can use a individuals number or create a dedicated number for Matrix. This is not configurable from WO to WO.

Matrix/ADP Interface State can be either enabled or disabled. This setting is system-wide; the default is disabled.

If disabled, the interface is disabled for all meters; this setting makes the system function like a standard Matrix Full Line system. This setting should stay disabled until Graco, in cooperation with the dealer, configures the interface. This happens after the distributor completes installation of the system.

To activate the interface to ADP, this setting will be set to enabled by the Graco Technical Support person. Note that since each meter has its own interface state setting, it is possible to have some meters using the interface (i.e. the global interface is enabled, the meter-specific interface setting is enabled, and any dispenses by the meter is billed to the correct RO on the DMS) and some meters not using the interface (i.e. the global interface is enabled, the meter-specific interface setting is disabled, and no dispenses by the meter are billed to an RO on the DMS). In all cases, Matrix will record the exact amount dispensed by any meter, independent of interface settings.

Whether this global state setting is enabled or disabled, the HASP key that is included with this software must be plugged in at all times.

Labor Types for Service Lube Charges

This field appears only when the **Bulk Fluids Managed/Sold By** setting on the General Settings screen is set to **Service**. It does not appear when Parts is selected.

The labor types entered here are available for selection by the user when entering a work order into Matrix. This selection specifies the labor type to be used when posting the lube charge to the RO upon completion of the fluid dispense. This list of labor types need not include all the labor types used in the DMS. The labor types screen shown in FIG. 92 allows entry of the customer-specific labor types the user can choose from when adding a WO to Matrix.

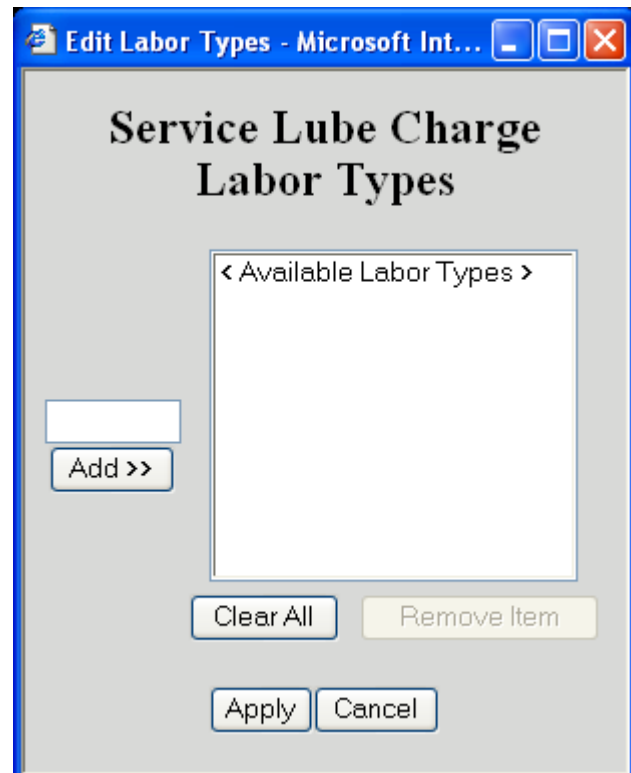


FIG. 92

Fluids Configuration

Fluids	Description	Used by Meters	Action
5W-30	5W-30 Engine Oil	2 Meter	modify

FIG. 93 Fluid Configuration

Each fluid used by a Matrix meter will appear in the center of the Matrix ADP Interface Setup screen (see FIG. 90 and FIG. 93). The interface configuration for each fluid applies to all meters that dispense that fluid and have their interface state setting enabled. Clicking the modify link for a fluid brings up the unit pricing configuration page, whose content varies depending on whether the interface is configured for Parts or Service on the General Settings screen.

The Matrix ADP Interface can calculate a fluid charge based on unit pricing or menu pricing. Unit pricing means that the charge is determined by the number of volumetric units of fluid dispensed. Menu pricing means the charge is based on meeting certain criteria, such as the volume of fluid dispensed and the timing of the dispense event. Menu pricing accommodates “specials”, where the fluid and an oil filter together need to add up to an advertised price, as well as adding other parts to the ADP RO when the dispense completes.

Any parts, fluid or non-fluid, that Matrix adds to and ADP RO are accounted for in the dealership inventory; that is, inventory levels within ADP will be reduced appropriately for each part added to the RO. Matrix will never increase ADP inventory amounts (e.g. a fresh oil shipment is delivered); additions to inventory must be handled manually.

Unit and Menu Pricing - Parts

The following outline of unit and menu pricing setup screens used when managing bulk fluid through Parts applies to each fluid used in the Matrix system. That is, each fluid has its own unit pricing configuration and its own set of menu pricing items.

Unit Pricing (Parts)

- ADP cannot use fractional amounts on the Parts side of the DMS, so the interface allows for rounding the exact dispense amount up or down into a billable whole number amount. Rounding will occur only for the purposes of billing for the fluid. Matrix will always keep track of the exact amount dispensed. Use Matrix Reporter to compare dispense history of dispensed fluid amounts vs. billed fluid amounts.

- The pricing within the DMS for a given fluid part number can be overwritten with pricing entered in the interface.
- Can accommodate unconventional billing units for fluid (i.e., tenths of units instead of pints, quarts, gallons, or liters).

Unit Pricing Example - Parts (FIG. 94):

FIG. 94 Unit Pricing Example - Parts

Part number refers to the ADP part number of a single unit of this fluid “part” (i.e. 1 quart of 5W30 oil). If the Sale Price field is left blank, the pricing structure for this part number on the DMS applies. If a Sale Price is specified, it will override the pricing structure on the DMS. The Part Number field is required and cannot be left blank.

Part comment is an optional field that allows for specifying a comment for this fluid “part” on the ADP RO. If no comment is desired, leave this field blank.

Accounting units refers to the billing units of measure used for the fluid, which does not need to match the units programmed for the meter. The standard Matrix units are part of this list, including pints, quarts, gallons, or liters.

Custom unit multiplier is a number used to convert the dispensed fluid volume from “standard” Matrix volumetric units to some other unit of measure. That is, the ADP part number assigned to this fluid isn’t in units of pints, quarts, gallons, or liters.

For example, if a dealer has a part number for an oil that represents a tenth of a quart; in this case, the accounting units would be quarts and the custom unit multiplier would be 10. If 5 quarts of this oil were dispensed, the Matrix ADP Interface would post a quantity of 50 units of this part number to the ADP RO.

A dealership may want to use a part number that represents multiple units of fluid, where quantity 1 of a part number is, for example, 6 quarts. In that case, the custom unit multiplier would be specified as one-sixth, or 0.167. With this as the unit multiplier, a dispense of anything less than 6.0 quarts would result in Matrix posting a quantity of 1 to the RO. Anything dispensed between 6.0 and 12.0 quarts would have a quantity of 2 posted, and so on.



The Part Number, Accounting Units, and Custom Unit Multiplier fields must be coordinated for the proper fluid charge to be posted on the RO.

Adjusted volume provides the option to always round up or always round down the oil dispense amount.

Enable Menu Pricing is a yes or no answer. If no, the unit pricing on this page will apply to all WOs using this fluid. If yes, the interface searches the menu list for a menu whose criteria is satisfied (i.e., volume, timing constraints are met). If a menu applies, that menu’s configuration is used to apply charges to that WO. If no menu is found, unit pricing applies.

The unit pricing configuration described here is used by the interface as follows:

1. The fluid is dispensed by a meter in the Matrix system. The interface is assumed to be enabled, both globally (General Settings page on ADP Interface Setup screen) and for this particular meter (the meter’s setup page). The meter reports the exact dispense amount to the Matrix PC, which records the dispense activity and triggers the interface to post the appropriate charge to the RO.
2. The interface compares the units of measure programmed into the meter with the accounting units. If they do not match, the actual dispense volume is converted to accounting units.
3. If the custom unit multiplier is not 1.0, the converted dispense volume is multiplied by the custom unit multiplier.

4. The adjusted volume is determined by taking the result from step 2 or 3 (depending on whether a custom unit multiplier was used or not) and rounding up or down to the next whole number.
5. Assuming menu pricing is not enabled, the adjusted volume is the number used for quantity when posting this fluid’s part number to the RO. The sale price for this part number may or may not be specified; if it is, it overrides the pricing structure on the DMS.

Typical Unit Pricing Scenarios in Parts:

Unit Pricing Scenario #1:

Unit Pricing Configuration		Edit Current Setting	
Part Number	1234	Sale Price	\$
Part Comment			
Accounting Units	Quarts		
Custom Unit Multiplier	1.0		
Adjusted Volume	Always Round Up		
Enable Menu Pricing	No	Configure Menu	

OK Cancel

Fig. 95

For every dispense of this fluid, regardless of quantity, Matrix will round up to the next whole number and apply that quantity of part number 1234 to the RO. Part 1234 is a quantity of 1 quart of 5W-30 oil on the ADP DMS. The pricing structure as loaded on the DMS for this part number applies.

Unit Pricing Scenario #2:

Unit Pricing Configuration		Edit Current Setting	
Part Number	1234	Sale Price	\$1.75
Part Comment			
Accounting Units	Quarts		
Custom Unit Multiplier	1.0		
Adjusted Volume	Always Round Up		
Enable Menu Pricing	No	Configure Menu	

OK Cancel

Fig. 96

Same as scenario #1, except that the sale price of \$1.75 is used, overriding whatever pricing structure is loaded on the DMS.

Unit Pricing Scenario #3:

FIG. 97

Same as scenario #1, except that part number 1234 is a tenth of a quart of 5W-30 oil. If the user dispenses, for example, 8.38 quarts of oil, the adjusted volume will be 84 and a quantity of 84 of part number 1234 is put on the RO.

Menu Pricing (Parts)

- Menu pricing allows the dealer to charge a flat rate for dispenses that fall in specified volume ranges and timing constraints.

- As part of this function, the interface can book non-fluid parts (i.e., oil filters, air filters, etc.) with the WO.
- Dealer has the option to either use pricing within the DMS for the oil dispense and non-fluid parts or can specify a special pricing for the dispense and non-fluid parts.
- During normal interface operation, the WO can be sent with parts. With this menu enabled, you can hard-code up to three additional non-fluid parts to all WOs meeting this menu's criteria (i.e., if you sent an oil filter with a dispense, and this menu pricing applied, you might include a free or discounted car wash using this interface feature).
- Menu pricing allows the dealer to charge a specified oil dispense sale amount and oil filter sale amount to total a desired oil/filter packaged price.

FIG. 98 shows the configuration page for menu pricing in Parts, accessed by clicking on the **Configure Menus** button on the unit pricing page for a specific fluid. In the Action column, click **modify** to configure the menu item; click **enable** to make the menu item active; or click **remove** to delete the menu item.



The order of these menus is important. Starting with the top menu and going down the list, the first one found that meets the necessary criteria (i.e., time, date, volume, range, or line labor type) is used.

The order of these menus can be changed by clicking in the # column (circled in FIG. 98) and entering a desired position in the list.

#	Range (Quarts x 1)	Line Labor Type	Start Date	End Date	Start Time	End Time	Schedule	Status	Action
1	0.00 to 0.00		Jan-09-06	Jan-09-06	16:24	16:24	Daily	Disabled	modify, enable, remove

FIG. 98 Menu Pricing Details - Parts

Menu Details Setup (Parts)

See FIG. 99. The top section of this screen defines the criteria that must be met in order to use the menu. The bottom section displays the posting detail if the criteria are met.

Menu Criteria		Edit Current Setting	
Dispense Volume Range	Min: 0.00	Max: 0.00	Quarts (x 1)
Line Labor Type	If blank, line labor type is ignored.		
Start Date	January / 9 / 2006		
End Date	January / 9 / 2006		
Start Time (24-hr)	16 : 24		
End Time (24-hr)	16 : 24		
Menu Schedule	Daily		

Posting Parameters		Edit Current Setting	
Fluid Part Number		Sale Price \$	
Fluid Quantity	1	If blank, adjusted dispense volume is used.	
Fluid Part Comment			
Include Selected Oil Filter(s)	No	Sale Price \$	
Include Additional Parts	#	Part Number	Qty. Sale Price
	1		\$
	2		\$
3		\$	

Apply Cancel

FIG. 99 Menu #1 for 5W30

Menu Item Criteria

Dispense Volume Range is the minimum and maximum limits on the allowable fluid volumes for this menu item in order for it to be selected. The units for these minimum and maximum volume fields are the same as found in this fluid's unit pricing configuration. In the example shown in Fig. 65, the units are quarts with a custom unit multiplier of one (default). The actual dispense amount is used when determining if these range criteria are satisfied.

While Matrix does not prevent it, Graco recommends that the range specified here does not overlap with another menu item's range. If the volume ranges for multiple menu items overlap, the first one in the list (ordered by the # column, as shown in FIG. 98) whose criteria are met will be used.

Line Labor Type refers to the labor type of the line on the ADP RO. When a work order is entered into Matrix, the user also specifies where on the RO the fluid "part" should go--which line and, optionally, which labor operation on that line. The labor type specified in this field must match the labor type of the line on the RO in order for this menu item's posting parameters to be applied.

Start Date, End Date, Start Time, and End Time are fields that define the period of time over which this menu item can be used. If the End Date and/or End Time has passed, or the Start Date and/or Start Time has yet to occur, this menu item's posting parameters will never be used, even if it's enabled. A 24-hour clock is used to specify Start and End Times.

Menu Schedule can be set for Daily, Weekdays, or Weekends and is an additional criterion that must be met, in addition to the start/end dates and times.

Menu Item Posting Parameters

Fluid Part Number is the ADP part number that represents this fluid.

Sale Price is the price at which this fluid part number will be posted to the ADP RO, overriding the pricing structure for this part number on the DMS. If left blank, the default DMS pricing structure will be used.

Fluid Quantity is the quantity of this part number to add to the RO. If the field is left blank, the quantity used is the adjusted dispense amount (the actual dispense amount rounded up or down, according to the Adjusted Volume field on the unit pricing page for this fluid).

Include Selected Oil Filter(s) requires a **Yes** or **No** response.

- If **Yes** is selected, any parts attached to WO from the oil filter category of parts are charged at the sale price listed here instead of the DMS pricing. (See **Matrix/ADP Interface** beginning on page 24.)
- If the sale price is left blank, the DMS price for the filter is used.
- If **No** is selected, the feature is not used and normal DMS pricing is applied to any oil filter.

Include Additional Parts has a list of up to three parts, quantities, and sale prices that can be added to the WO automatically whenever this menu is used.

- If the sale price is left blank, the DMS price is used.
- The sale price cannot be zero.
- Leaving the quantity blank is the same as specifying a zero quantity – the part will not be added to the WO.

Typical Menu Pricing Scenarios:**Menu Pricing Scenario #1:**

Menu #1 for 5W-30

Menu Criteria	Edit Current Setting
Dispense Volume Range	Min: 1.0 Max: 5.0 Quarts (x 1)
Line Labor Type	<input type="text"/> If blank, line labor type is ignored.
Start Date	January / 1 / 2006
End Date	December / 31 / 2006
Start Time (24-h)	7 : 00
End Time (24-h)	11 : 00
Menu Schedule	Weekdays (M-F)

Posting Parameters	Edit Current Setting																
Fluid Part Number	1234 Sale Price Per Unit \$																
Fluid Quantity to Post	4 If blank, adjusted dispense volume is used.																
Fluid Part Comment	<input type="text"/>																
Include Selected Oil Filter(s)	No Sale Price \$																
Include Additional Parts	<table border="1"> <thead> <tr> <th>#</th> <th>Part Number</th> <th>Qty.</th> <th>Sale Price</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><input type="text"/></td> <td>0</td> <td>\$</td> </tr> <tr> <td>2</td> <td><input type="text"/></td> <td>0</td> <td>\$</td> </tr> <tr> <td>3</td> <td><input type="text"/></td> <td>0</td> <td>\$</td> </tr> </tbody> </table>	#	Part Number	Qty.	Sale Price	1	<input type="text"/>	0	\$	2	<input type="text"/>	0	\$	3	<input type="text"/>	0	\$
#	Part Number	Qty.	Sale Price														
1	<input type="text"/>	0	\$														
2	<input type="text"/>	0	\$														
3	<input type="text"/>	0	\$														

Apply Cancel

FIG. 100

A dealership wants all dispenses of this fluid that occur between 7am and 11am, Monday through Friday, and fall into the range 1.0-5.0 quarts to be charged as 4.0 quarts. In FIG. 100, part number 1234 represents 1 quart of 5W-30 oil. The pricing structure loaded for this part number on the DMS will apply.

Menu Pricing Scenario #2:

Menu #1 for 5W-30

Menu Criteria	Edit Current Setting
Dispense Volume Range	Min: 5.50 Max: 7.50 Quarts (x 1)
Line Labor Type	<input type="text"/> If blank, line labor type is ignored.
Start Date	January / 1 / 2006
End Date	December / 31 / 2006
Start Time (24-h)	7 : 00
End Time (24-h)	17 : 00
Menu Schedule	Daily

Posting Parameters	Edit Current Setting																
Fluid Part Number	5678 Sale Price Per Unit \$15.00																
Fluid Quantity to Post	1 If blank, adjusted dispense volume is used.																
Fluid Part Comment	<input type="text"/>																
Include Selected Oil Filter(s)	No Sale Price \$																
Include Additional Parts	<table border="1"> <thead> <tr> <th>#</th> <th>Part Number</th> <th>Qty.</th> <th>Sale Price</th> </tr> </thead> <tbody> <tr> <td>1</td> <td><input type="text"/></td> <td>0</td> <td>\$</td> </tr> <tr> <td>2</td> <td><input type="text"/></td> <td>0</td> <td>\$</td> </tr> <tr> <td>3</td> <td><input type="text"/></td> <td>0</td> <td>\$</td> </tr> </tbody> </table>	#	Part Number	Qty.	Sale Price	1	<input type="text"/>	0	\$	2	<input type="text"/>	0	\$	3	<input type="text"/>	0	\$
#	Part Number	Qty.	Sale Price														
1	<input type="text"/>	0	\$														
2	<input type="text"/>	0	\$														
3	<input type="text"/>	0	\$														

Apply Cancel

FIG. 101

A dealership wants all dispenses of this fluid within the range of 5.5-7.5 quarts to be charged as quantity 1 of part number 5678 at sale price \$15. Part number 5678 represents 6 quarts of 5W-30 oil.

Menu Pricing Scenario #3:

Menu #1 for 5W-30

Menu Criteria	Edit Current Setting
Dispense Volume Range	Min: 5.0 Max: 7.0 Quarts (x 1)
Line Labor Type	CP89 If blank, line labor type is ignored.
Start Date	June / 1 / 2006
End Date	August / 31 / 2006
Start Time (24-h)	7 : 00
End Time (24-h)	11 : 00
Menu Schedule	Weekdays (M-F)

Posting Parameters	Edit Current Setting																
Fluid Part Number	1234 Sale Price Per Unit \$2.00																
Fluid Quantity to Post	6 If blank, adjusted dispense volume is used.																
Fluid Part Comment	<input type="text"/>																
Include Selected Oil Filter(s)	Yes Sale Price \$4.75																
Include Additional Parts	<table border="1"> <thead> <tr> <th>#</th> <th>Part Number</th> <th>Qty.</th> <th>Sale Price</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>GASKET-1</td> <td>1</td> <td>\$0.25</td> </tr> <tr> <td>2</td> <td><input type="text"/></td> <td>0</td> <td>\$</td> </tr> <tr> <td>3</td> <td><input type="text"/></td> <td>0</td> <td>\$</td> </tr> </tbody> </table>	#	Part Number	Qty.	Sale Price	1	GASKET-1	1	\$0.25	2	<input type="text"/>	0	\$	3	<input type="text"/>	0	\$
#	Part Number	Qty.	Sale Price														
1	GASKET-1	1	\$0.25														
2	<input type="text"/>	0	\$														
3	<input type="text"/>	0	\$														

Apply Cancel

FIG. 102

If the destination line on the RO has labor type CP89 and the volume dispensed is between 5.0 and 7.0 quarts, the dealership wants 6 quarts of oil at \$2/quart posted to the RO, along with an oil filter at \$4.75 (any oil filter that the user selects from the list of filters loaded into Matrix) and an oil pan drain plug gasket at \$0.25. With \$12.99 in labor, this matches exactly with the dealership's advertised price of \$29.99 for an oil change. Part number 1234 represents 1 quart of 5W-30 oil.

Menu Pricing Scenario #4:

FIG. 103

Same as scenario #3, except that the amount charged for the fluid is based on the adjusted dispense amount (as calculated from the unit pricing configuration settings), not a flat rate. The sale price used is based on the pricing structure loaded for this part number on the DMS. This configuration will charge for every unit of fluid dispensed (between 5 and 7 quarts), yet keep a flat fee for the oil filter (selected when the work order is entered into Matrix--see **Matrix/ADP Interface** beginning on page 24). The total charge to the customer's RO will vary based on the amount dispensed, but the combination of filter and gasket will always be \$5.00.

Unit and Menu Pricing - Service

Unit Pricing (Service)

The following outline of unit and menu pricing setup screens used when managing bulk fluid through Service applies to each fluid used in the Matrix system. That is, each fluid has its own unit pricing configuration and its own set of menu pricing items.

Lube charge is based on a cost and sale price per unit of fluid within the interface. The interface translates the fluid dispense to a lube charge on the WO based on the actual dispense amount. The dispense amount used to determine the lube charge is based on the actual dispense amount or by rounding up or down to the desired precision (i.e., whole number, tenths, or hundredths).

Unit Pricing - Service (FIG. 104):

FIG. 104 Unit Pricing Example - Service

Unit Cost and Sale refers to cost, sale price, and accounting units for this fluid.

Adjusted volume provides the option for no adjustment, always round up, or always round down the oil dispense amount. The dispense volume can be adjusted to the next whole number (X.0), to tenths (X.X) or to hundredths (X.XX).

Charge type can be identified as Lube, Sublet, or Miscellaneous. In Matrix, charge type is usually Lube.

Default labor type is the labor type most frequently used with this fluid.

Charge description is a field that will appear on all WOs using this fluid. The actual dispense amount and fluid name will automatically be appended to any other description you provide in this space.

Enable Menu Pricing is a yes or no answer. If no, the normal pricing on this page will apply to the work order. If yes, menu pricing will apply after selecting Configure menus.

Typical Unit Pricing Scenarios in Service:

Unit Pricing Scenario #1:

Unit Pricing Configuration		Edit Current Setting	
Unit Cost & Sale	Cost \$ 1.00 Sale \$ 2.00	Units	Quarts
Adjusted Volume	No Adjustment	To Hundredths Place (XX)	
Charge Type	Lube		
Default Labor Type	CP1		
Charge Description	The actual dispense amount & fluid name will be appended to this description when the lube charge is applied to the RO.		
Enable Menu Pricing	No	Configure Menus	

OK Cancel

FIG. 105

For every dispense of this fluid, regardless of quantity, Matrix will apply a lube charge of \$1 per quart cost and \$2 per quart sale price, based on the exact amount dispensed. The labor type of the lube charge will be CP1 and the charge description will include the exact amount dispensed, along with the name of the fluid (eg. 4.56 Quarts 5W-30).

Unit Pricing Scenario #2:

Unit Pricing Configuration		Edit Current Setting	
Unit Cost & Sale	Cost \$ 1.00 Sale \$ 2.00	Units	Quarts
Adjusted Volume	Always Round Up	To Tenths Place (X)	
Charge Type	Lube		
Default Labor Type	CP1		
Charge Description	The actual dispense amount & fluid name will be appended to this description when the lube charge is applied to the RO.		
Enable Menu Pricing	No	Configure Menus	

OK Cancel

FIG. 106

Same as scenario #1, except that the amount charged for will be the actual dispense amount round up to the nearest tenth.

Menu Pricing

- Menu pricing allows the dealer to charge a flat rate for dispenses that fall in specified volume ranges and timing constraints.
- As part of this function, the interface can book non-fluid parts (i.e., oil filters, air filters, etc.) with the WO.
- Dealer can specify a special pricing for the dispense and non-fluid parts. This overrides the loaded unit pricing interface cost and sale price amounts.
- During normal interface operation, the WO can be sent with parts. With this menu enabled, you can hard-code up to three additional non-fluid parts to all WOs meeting this menu's criteria if desired (i.e., if you sent an oil filter with a dispense and this menu pricing applied, you might include a free or discounted car wash using this interface feature).
- Menu pricing allows the dealer to charge a specified oil dispense sale amount and oil filter sale amount to total a desired oil/filter packaged price.

FIG. 107 shows the configuration page for menu pricing in service. In the Action column, click **modify** to configure the desired menus; click **enable** to make the menu active; or click **remove** to remove the menu.

The order of these menus is important. Starting with the top menu and going down the list, the first one found that meets the necessary criteria (i.e., time, date, volume range, line labor type) is used.

The order of these menus can be changed by clicking in the # column (circled in FIG. 107) and entering a desired position in the list.

#	Range (Quarts)	Line Labor Type	Start Date	End Date	Start Time	End Time	Schedule	Status	Action
1	0.00 to 0.00		Jan-26-06	Jan-26-06	9:03	9:03	Daily	Disabled	modify , enable , remove

Close

FIG. 107 Menu Pricing Details - Service

Menu Details Setup (Service)

See FIG. 108. The top section of this screen defines the criteria that must be met in order to use the menu. The bottom section displays the posting detail if the criteria are met.

FIG. 108 Menu #4 for 5W30

Dispense Volume Range is the minimum and maximum limits on the allowable fluid volumes for this menu item in order for it to be selected. The units for these minimum and maximum volume fields are the same as found in this fluid's unit pricing configuration.

While Matrix does not prevent it, Graco recommends that the range specified here does not overlap with another menu item's range. If the volume ranges for multiple menu items overlap, the first one in the list (ordered by the # column, as shown in FIG. 98) whose criteria are met will be used.

Line Labor Type refers to the labor type of the line on the ADP RO. When a work order is entered into Matrix, the user also specifies where on the RO the fluid "part" should go--which line and, optionally, which labor operation on that line. The labor type specified in this field must match the labor type of the line on the RO in order for this menu item's posting parameters to be applied.

Start Date, End Date, Start Time, and End Time are fields that define the period of time over which this menu

item can be used. If the End Date and/or End Time has passed, or the Start Date and/or Start Time has yet to occur, this menu item's posting parameters will never be used, even if it's enabled. A 24-hour clock is used to specify Start and End Times.

Menu Schedule can be set for Daily, Weekdays, or Weekends and is an additional criterion that must be met, in addition to the start/end dates and times.

Fluid cost and sale is the cost and sale price for the oil in this menu item.

Lube charge calculation includes two options, **Use Total Fluid Cost and Sale as Configured Above** or **Multiply Cost and Sale by Quantity Dispense**. Using Cost and Sale as Configured causes the interface to use the cost and sale directly as entered. Using Multiply Cost and Sale by Quantity Dispensed uses the cost and sale entered multiplied by the actual dispense amount. This option is used when the dealer wants to "unit price" the fluid, but charge a flat fee for the filter.

Charge type can be identified as Lube, Sublet, or Miscellaneous. In Matrix, charge type is usually Lube.

Line Labor type for the lube charge can be different than the labor type on the line of the WO where the dispense is posted. The labor type is selectable by the dealer when sending a WO from a PC to the meter. If you chose **RO** as the job code, any menu items that use the Line Labor Type field will not be matched.

Charge description is a field that will appear on all WOs using this fluid. The actual dispense amount and fluid name will automatically be appended to any description you provide in this space.

Include Selected Oil Filter(s) requires a **Yes** or **No** response.

- If **Yes** is selected, any parts attached to the WO from the oil filter category of parts are charged at the sale price listed here instead of the DMS pricing. (See **Matrix/ADP Interface** beginning on page 24.)
- If the sale price is left blank, the DMS price for the filter is used.
- If **No** is selected, the feature is not used and normal DMS pricing is applied to any oil filter.

Include Additional Parts has a list of up to three parts, quantities, and sale prices that can be added to the WO automatically whenever this menu is used.

- If the sale price is left blank, the DMS price is used.
- Sale price cannot be zero.
- Leaving the quantity blank is the same as specifying a zero quantity – the part will not be added to the WO.

Menu Pricing Scenario #1:

Menu #1 for 5W-30			
Menu Criteria		Edit Current Setting	
Dispense Volume Range	Min. 4.10	Max. 6.70	Quarts
Line Labor Type	If blank, line labor type is ignored.		
Start Date	June	1	2006
End Date	August	15	2006
Time Range (24-h)	Start 8 : 00	End 15 : 00	
Menu Schedule	Weekdays (M-F)		

Posting Parameters		Edit Current Setting	
Fluid Cost & Sale	Cost \$10.00	Sale \$15.00	
Lube Charge Calculation	Use Total Fluid Cost & Sale As Configured Above		
Charge Type	Lube		
Labor Type	Also used as menu criteria if user specifies a labor type when sending a work order to a meter.		
Charge Description	The actual dispense amount & fluid name will be appended to this description when the lube charge is applied to the RO.		
Include Selected Oil Filter(s)	No	Sale Price \$	
Include Additional Parts	#	Part Number	Qty. Sale Price
	1		0 \$
	2		0 \$

FIG. 109

A dealership wants all dispenses of this fluid that occur between 8am and 3pm, Monday through Friday, and fall into the range 4.1-6.70 quarts to be charged with a \$10 cost and \$15 sale price. The labor type used for the lube charge will match the labor type of the line.

In this scenario, if the labor type of the line is a warranty labor type and the user did not specify a labor type when entering the work order into Matrix, the Failure Code field for this lube charge in ADP will be blank. In this specific case, Matrix will not prompt for a Failure Code.

Menu Pricing Scenario #2:

Menu #1 for 5W-30			
Menu Criteria		Edit Current Setting	
Dispense Volume Range	Min. 4.10	Max. 6.70	Quarts
Line Labor Type	If blank, line labor type is ignored.		
Start Date	June	1	2006
End Date	August	15	2006
Time Range (24-h)	Start 8 : 00	End 15 : 00	
Menu Schedule	Weekdays (M-F)		

Posting Parameters		Edit Current Setting	
Fluid Cost & Sale	Cost \$10.00	Sale \$15.00	
Lube Charge Calculation	Use Total Fluid Cost & Sale As Configured Above		
Charge Type	Lube		
Labor Type	CB1 Also used as menu criteria if user specifies a labor type when sending a work order to a meter.		
Charge Description	The actual dispense amount & fluid name will be appended to this description when the lube charge is applied to the RO.		
Include Selected Oil Filter(s)	No	Sale Price \$	
Include Additional Parts	#	Part Number	Qty. Sale Price
	1		0 \$
	2		0 \$
	3		0 \$

Apply Cancel

FIG. 110

Same as scenario #1, except when the labor type is CB1. This menu will be used if the dispense amount and timing conditions are met and:

- The user selected a labor type of CB1 when entering the work order
- OR
- The user selected no specific labor type when entering the work order, but the labor type of the line happens to be CB1.

Non-Fluid Parts

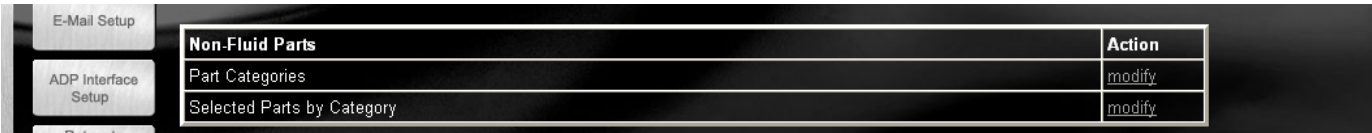


FIG. 111 Non-Fluid Parts

The **Non-Fluid Parts** portion of the Matrix ADP Interface Setup screen (see FIG. 111) allows you to enter a limited number of oil dispense-related non-fluid parts (i.e., oil filters, air filters, drain plugs, gaskets, wiper blades). You may organize these in categories you select that you wish to load into Matrix from ADP's parts database. Non-fluid parts can be added to meter dispense on a WO basis if desired.

Part Categories

Clicking **modify** in the **Action** column displays the screen shown in FIG. 112 where you may add, edit, or remove categories as needed.

Oil Filter Category

There will always be an oil filter category that cannot be changed or removed from the list. This is a "special" category in that it is linked to fields found in the menu configuration screens. All other categories can be specified to meet the customer's application.

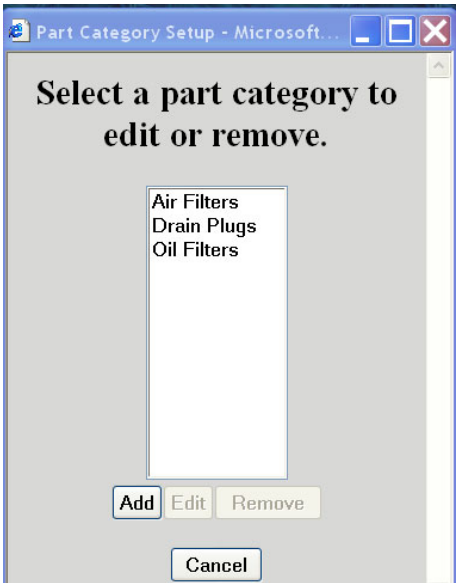


FIG. 112 Part Category Setup

Selected Parts by Category

After you define parts categories, load the desired parts into Matrix using the screens shown in FIG. 113 and FIG. 114. Click **Add Part Number**, the **Add New Non-Fluid Part** screen will appear.

Add the desired part to the list. The interface loads the part number and description from the DMS into the Non-Fluid Parts list.

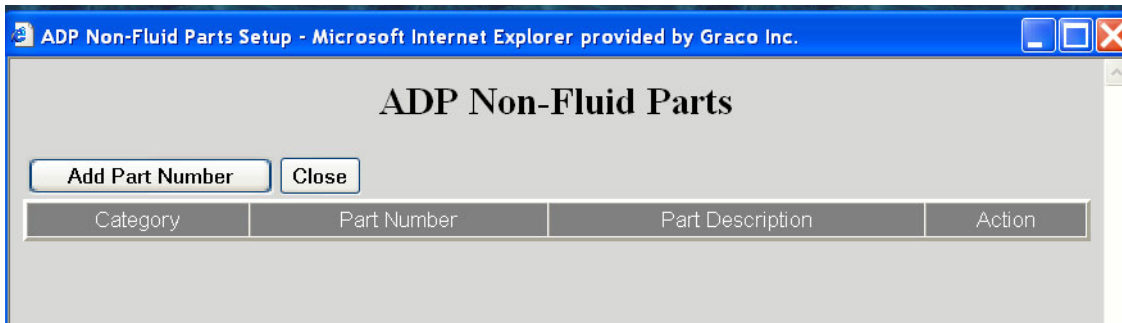


FIG. 113 ADP Non-Fluid Parts Setup

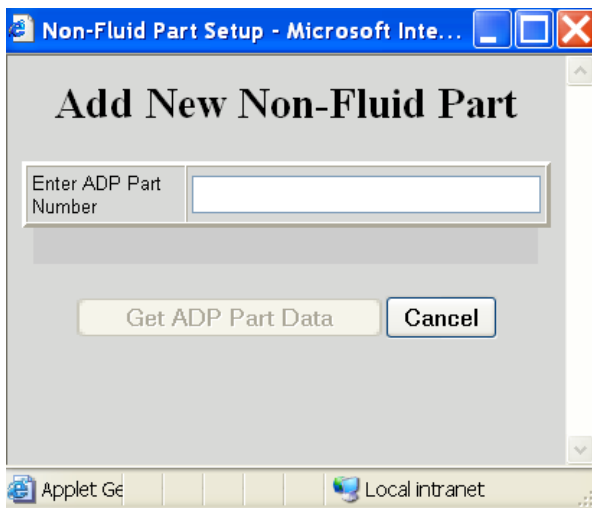


FIG. 114 Add New Non-Fluid Part

System Status

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

Return to Operating Screens

Selecting the Return to Operating Screens box allows the system administrator to return to the monitoring screens.

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. 115).

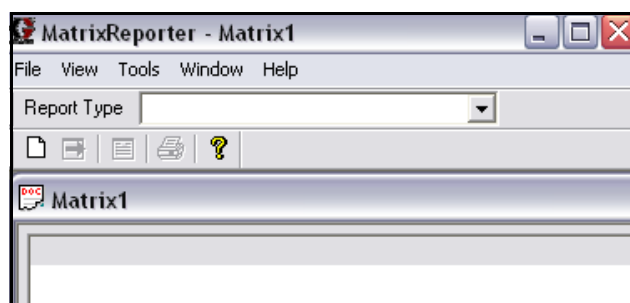


FIG. 115 Matrix Reporting Window



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. 116. 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. 117.

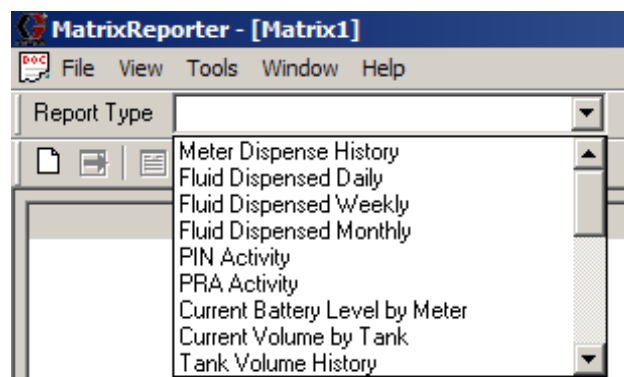


FIG. 116 Reports Type selection

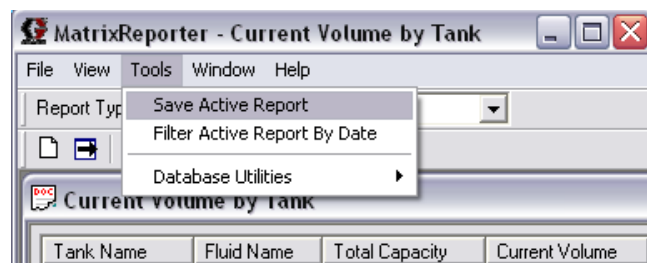


FIG. 117

The following reports are available in Matrix Reporter:

1. Meter Dispense History
2. Fluid Dispensed Daily
3. Fluid Dispensed Weekly
4. Fluid Dispensed Monthly
5. PIN Activity
6. PRA Activity
7. Current Battery Level by Meter
8. Current Volume by Tank
9. Tank Volume History
10. Missed Tank Readings
11. Tank Adjustment History
12. Current Battery Level by Tank
13. Transceiver Configuration
14. Meters by Transceiver
15. Tank Monitors by Transceiver
16. User Configuration
17. Tank Configuration
18. Tank Monitor Configuration

19. Tank Monitor Schedule
20. Meter Configuration
21. E-mail Server Settings
22. E-mail Configuration
23. E-mail History
24. PC Clients
25. (Parts) Posting History
26. (Parts) Unit Settings by Fluid
27. (Parts) Menus by Fluid
28. (Service) MLS Posting History
29. (Service) Unit Settings by Fluid
30. (Service) Menus by Fluid
31. Admin Overrides
32. Validation Failure History
33. General Interface Settings
34. Non-Fluid Parts by Category

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 meter dispense history and 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. 118. 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. 118

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 meters and 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, meter, 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 meter dispense history, tank level reporting history, etc.

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, meter parameters in the database file and the actual programmed parameters in the meter itself, the resulting system behavior is unpredictable. The meters will have to be reprogrammed to ensure the PC and meters are match exactly. This also applies to tank level monitors. 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 meters and 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. It'd be a good idea to do a test dispense on each meter and a test tank level reading.

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.
Meter only displays 5 work orders.	Normal operation. Meter displays up to 5 work orders.	No action necessary.
Work orders not transmitting sequentially to shop.	RF communication response time is faster in some areas versus other areas of shop. This is normal operation in a RF environment. Work orders will not necessarily transmit sequentially.	No action necessary.
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 18 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.

THIS WARRANTY IS EXCLUSIVE, AND IS IN LIEU OF ANY OTHER WARRANTIES, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO WARRANTY OF MERCHANTABILITY OR WARRANTY OF FITNESS FOR A PARTICULAR PURPOSE.

Graco's sole obligation and buyer's sole remedy for any breach of warranty shall be as set forth above. The buyer agrees that no other remedy (including, but not limited to, incidental or consequential damages for lost profits, lost sales, injury to person or property, or any other incidental or consequential loss) shall be available. Any action for breach of warranty must be brought within two (2) years of the date of sale.

Graco makes no warranty, and disclaims all implied warranties of merchantability and fitness for a particular purpose in connection with accessories, equipment, materials or components sold but not manufactured by Graco. These items sold, but not manufactured by Graco (such as electric motors, switches, hose, etc.), are subject to the warranty, if any, of their manufacturer. Graco will provide purchaser with reasonable assistance in making any claim for breach of these warranties.

In no event will Graco be liable for indirect, incidental, special or consequential damages resulting from Graco supplying equipment hereunder, or the furnishing, performance, or use of any products or other goods sold hereto, whether due to a breach of contract, breach of warranty, the negligence of Graco, or otherwise.

FOR GRACO CANADA CUSTOMERS

The parties acknowledge that they have required that the present document, as well as all documents, notices and legal proceedings entered into, given or instituted pursuant hereto or relating directly or indirectly hereto, be drawn up in English. Les parties reconnaissent avoir convenu que la rédaction du présente document sera en Anglais, ainsi que tous documents, avis et procédures judiciaires exécutés, donnés ou intentés à la suite de ou en rapport, directement ou indirectement, avec les procédures concernées.

Graco Phone Numbers

TO PLACE AN ORDER, contact your Graco distributor, or call to identify the nearest distributor.

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

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Graco Headquarters: Minneapolis

International Offices: Belgium, Korea, China, Japan

GRACO INC. P.O. BOX 1441 MINNEAPOLIS, MN 55440-1441

www.graco.com

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