

METROLOGY XPLOER™

Operation and Setup Manual

Revision 1.2

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Section 1 - Introduction

METROLOGY XPLOER Overview

METROLOGY XPLOER™ allows you to provide access to your MET/CAL Plus Database (7.x) using most popular web browsers such as Mozilla Firefox® and Internet Explorer®.

There are many immediate benefits to providing access to MET/CAL through a web-browsing interface:

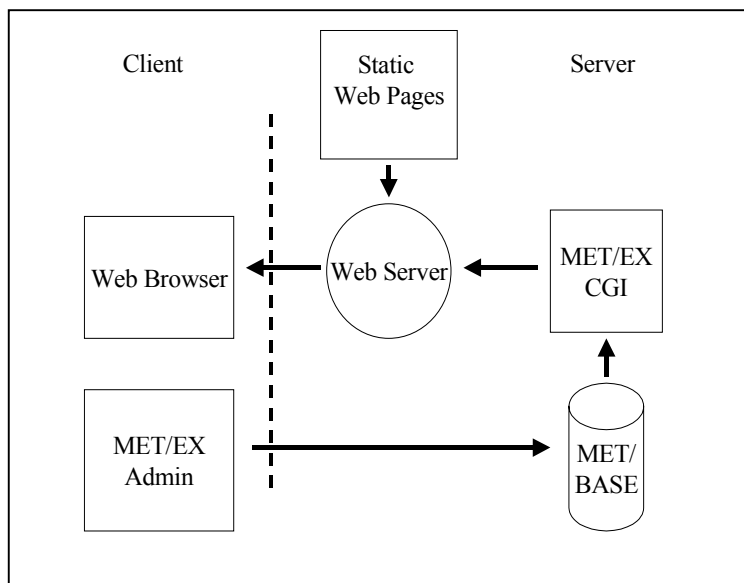
1. No on-site installation of Sybase client and MET/CAL applications, thus simplifying the addition of view-only workstations to your network.
2. Simplification of training for users who do not use MET/CAL as a data entry point.
3. Provides greater security for off-site users.
4. There is less workload on calibration lab personnel. Facility personnel can perform searches and run reports without asking the lab for assistance.

METROLOGY XPLOER (METEX), is a set of software programs that allow a web server to access the MET/CAL database and provide information to web browsers. At this time, METEX is a view-only system and cannot write or modify instrument information in the database.

The METEX system includes:

1. A common gateway interface (CGI) application for interfacing with popular web servers
2. Instructions for installing the web server
3. An administration utility to configure the METEX system

The METEX system works as follows:



On the client side, the user starts a web browser and uses it to retrieve the metrology lab's web page just as they would browse the internet/intranet. On this page, a link exists that when selected, tells the web server program to start the CGI. The CGI starts and connects to the MET/CAL database, retrieves the requested information (report or MET/CAL screen), and presents it to the web server program that passes this information on to the web browser. The METEX administration program is designed for operation on a MET/CAL administrator's workstation, communicates directly with the database, and does not involve a web browser or web server.

METROLOGY XPLOER Operation – Block Diagram

New Features for Metrology Xplorer 1.2

Several new features have been added for version 1.2. Please note that version 1.2 only supports MET/CAL and MET/TRACK 7.0 and higher. Here is a list of the new features:

- Updated the "Treeview Display" to include Inventory, Customers and the New Full Calibration Results. Is easy to configure the "Treeview" which is a list of links to various web pages. By making the links descriptive, you will save time looking for information.
- There is an enhanced results header for the Full Results calibration data. It is easy to adjust the form to match your results data format.
- Added standards so they can now be displayed in the calibration screen for each calibration record.
- Added new style sheets and "Themes" to present a pleasing and interesting display. Six different themes are available. If you want a custom background, let us know and we may be able to create it for you. Below are the example background themes that come with Metrology Xplorer 1.2.
- A major improvement is the use of Crystal Reports 10. It is now much easier to configure a Crystal Report for Metrology Xplorer 1.2. In fact, you can take the default Fluke Results Certificate and load the report without modifications and the data will be displayed very nicely.
- You can now select from a list of calibration histories after you have selected a calibration certificate. Several customers have asked for this feature. This means your customer can print separate AS-FOUND and AS-LEFT certificates.
- The installation procedure is a little easier when setting up ODBC on the server for Metrology Xplorer to use.

NOTE: You must use Crystal Reports version 10 to create reports that will run on Metrology Xplorer 1.2. Reports created in earlier versions of Crystal Reports may not operate correctly.

FAQs about METEX:

1. Do I need a connection to the Internet to use METEX?

No. METEX only requires that your local area network (LAN) be running the TCP/IP protocol for proper operation.

2. Can I use METEX anywhere on any operating system I want?

METEX can be displayed to any user that has access to a web browser, regardless of the operating system. At this time, with the exception of the web server software, the server software must be installed on a server that is running Windows 2000/NT. It is highly recommended that the web server be installed on the same server where the MET/CAL database is installed.

3. Do I need to know how to create web pages in order to use METEX?

A basic understanding of web page creation is helpful to customize METEX, but is not a requirement. If you have an existing metrology lab web site, a simple link can be added to call METEX. A simple metrology lab web page is included with METEX, and is easily customized for your use.

4. Can I use METEX even though there are reports that I don't want others to see?

Yes. Reports for METEX are fully customizable, and you may select what fields/forms/reports your users may see.

5. What report types are available for METEX?

METEX supports two types of reports, Crystal Reports and SQL Quick Reports that are unique to METEX. You can run a Crystal Report from your Web Browser, but the server converts the report to text. It will take extra time to run a Crystal Report. Special graphics will not be displayed. The SQL Quick Reports are created with a single SQL statement. The system automatically formats the report and displays the data on the screen. There is less control of the format of the SQL Quick Report. However, they are very simple, very fast, and very easy to create. It is recommended the SQL Quick Reports be used for the majority of the reporting process.

6. How much can METEX be customized?

Besides being able to customize what data is available, the system can have themes or background pages configured to provide a more interesting display for the user. For example, a car company might want to have their new hot car displayed as wallpaper behind the screens.

7. How do I keep up with changes and application notes for METROLOGY XPLOER?

Important Note: Be sure to check the ON TIME SUPPORT web site at www.ontimesupport.com. Updates and application notes will be updated as they become available.

METROLOGY XPLOER is here, what do I do now?

Congratulations! You now are about to install and configure a unique Internet/Intranet product for your Fluke MET/CAL system. At this point, we would like to discuss the implications of allowing your data to be shared over the Web. First, let's define both terms.

An **Intranet** is usually the internal networking of a company. This usually encompasses other Sites in the same company connected by a WAN (Wide Area Network).

An **Internet** is usually external customers and Sites that are connected to your company or organization. Usually a company will have some kind of firewall that keeps unauthorized users from accessing the company's files.

Your MET/TRACK database may be available to several customers, maybe internal and external to your organization. Up to this point, you probably have a small group of users that understand and access the database. You should probably consider how much information to share with the users accessing the data through the web. Here are some things to consider:

Do you want to give access to all the screens and data (i.e. technician time)?

Do you limit the amount of history displayed, or do you show all the history?

Do you need reports and no historical screens?

The following table can be used to help the administrator plan what the users are going to see. When first installed, METROLOGY XPLOER will display all the data. The administrator can limit information displayed on a user or group of users basis. Let's take a look at the following table for our example:

Question to Ask	Yes	No
Do you allow the user to access the data Screens?	*	
Inventory Screens	*	
Allow all the Inventory Data to be displayed?	*	
Do you need to limit the data fields on the form?	*	
Calibration Screens	*	
Allow all the Calibration Data to be displayed?	*	
Do you need to limit the data fields on the form?	*	
Location Screens	*	
Allow all the Location Data to be displayed?	*	
Do you need to limit the data fields on the form?	*	
Maintenance Screens	*	
Allow all the Maintenance Data to be displayed?	*	
Do you need to limit the data fields on the form?	*	
Allow the Results Data to be displayed?		*
Allow the Merge Data to be displayed?		*
Allow the Customer Form to be displayed?		*
Do you want the users to be limited when then can log in?		*
Do you want the users to have access to reports?	*	

If you make reports available, we recommend using the SQL Quick Reports. They are not as formatted as Crystal Reports, but they are simple and fast. Use Crystal Reports when you need to display groups of data in the same report. Please understand that the Crystal Reports run time engine uses a large amount of server resources. If several users run reports at the same time, the system will become extremely sluggish. By managing which reports are available and who has access to the reports, you can tune the system for optimum performance.

You may want to consider setting a time period when users can access the system. Many users may turn on their browser and not turn them off. Web servers have no way of knowing when a user has moved on to another page. If the user stays logged on, and leaves his or her computer, someone else can use that terminal without logging on. This method does not work within the web applications. METROLOGY XPLOER is properly licensed for unlimited users for Internet/Intranet applications. If security is enabled, the system will prompt the user for a login and password after the browser is started. If you stop the browser and start it again, it will prompt for a login. Security is of a major concern for most companies and you may want to review your company's policies regarding web-based access.

METROLOGY XPLOER does not differentiate between the Internet and your Intranet. It is up to your computer department to limit access of an internal server to the outside world, or to give only partial access.

To Segregate or not to Segregate

Segregation is a powerful feature and you may want to consider adding this feature to your database. Chances are that you have not implemented segregation, but it may be a good idea. Let's look at an example. Suppose that you manage an independent calibration laboratory with several customers. Some of these customers depend on your lab to manage their assets, but they want access to the data. METROLOGY XPLOER allows them to have access and everyone else with a password to the database to have access. You might even manage the assets for two companies who are competitors, but they could see each other's data.

METROLOGY XPLOER supports the rules of segregation within MET/TRACK. You can assign the users to a segregate so that when they log in, they can only see the data they are associated with. In our example, the two companies will be able to log in and see their own data only. If you do utilize segregation and want to re-configure your database, you will probably have to do this with the SQL editor. It is advised to seek help before making a major change like this.

Section 2 - Installation

METEX Installation

NOTE: Metrology Xplorer 1.2 only supports MET/TRACK 7.x and higher. Do not install this version on a MET/TRACK 5.x or 6.x system. Metrology Xplorer 1.2 only supports Crystal Reports 10. If you are using MET/TRACK 7.0x, then you will need to purchase the Crystal Reports 10 package separately.

Installation of METEX requires several steps that must be followed COMPLETELY and IN ORDER for the installation to be a success. Before starting the installation process, identify the following items:

1. The Network Address (TCP/IP) address of your MET/CAL server.
2. Which web server package has been installed, if any?
3. The path to your METCAL share.
4. The name of the MET/CAL database engine.

The following is an outline for installing METEX. These instructions tell you what you need to do to get the system up and running in a short time. When the outline tells you to refer to a specific package to install, refer to it and then come back to where you left off in the outline.

1. Install a web server software package on the MET/CAL server. Refer to the section titled "choosing a web server" if you would like an overview of the supported web servers. If a web server has already been installed on the server, then proceed to the next step.
2. Configure the web server software for use with METEX. Please note that basic instructions are provided for setting up your web server. Security and fine-tuning is not detailed in this manual. However, there are many books that are specific to each web server that go into more detail than described here.
3. Install the METEX software on the MET/CAL Database server.
4. Configure the 32-Bit Open Database Connectivity (ODBC) on the MET/CAL Database server.
5. Copy the default HTML (web) page to the proper directory on the MET/CAL Database server. This directory varies between web server software packages. Refer to the section in this manual regarding the specific web server package for the location of this directory.
6. Install the METEX Administrator Program on one or more computers typically used by the MET/CAL system administrator(s).
7. Run the registration program.
8. Test the operation of METEX.

Choosing a web server

If a web server software package has not been installed yet, then you need to make a choice regarding which web server to install. At this point in time, METEX has been tested for proper operation with two web server software packages:

- Apache
- Microsoft Internet Information server (IIS)

To help you make a decision regarding which web server to use, each web server is listed below along with its strengths and weaknesses. After reading the descriptions, you should have a good idea about which to install.

Apache

This is the most popular web server in use on the Internet with over 60% market share. This server is fast, efficient, and uses less memory than Microsoft IIS. It doesn't have the easy to use graphical interface for managing it, and does require the modification of text-based configuration files for some applications. There is no phone support for Apache, but its mature code-base and high number of sites using it make it a reliable choice. Apache is an excellent choice for labs supporting an Intranet web site. The version of Apache for Win32 (98/NT/2000) has proven to be dependable for this application. Apache can be obtained from apache.org. If you are using Windows NT/2000 Workstation as your web server platform, Apache is a good choice and can be installed as a service, allowing the web server to operate without having a user logged in. It will take much less time to install and configure Apache than it will to configure IIS.

Microsoft Internet Information Server

Microsoft IIS is included with the Windows NT/2000 CD-ROM, and is the second most popular web server on the Internet. It is fairly reliable, and has a good set of administration functions. It will easily handle Intranet and Internet hosting of METEX, and is recommended if you are going to provide access to METEX from the Internet. If you have a Windows NT/2000 based METEX server, it is recommended to use Microsoft IIS if it is available to you.

This document support three versions of IIS:

- **Microsoft Internet Information Server Version 2** – This product was distributed with early version of Windows NT4.
- **Microsoft Internet Information Server Version 4** – This web server has been upgraded from IIS version 2 for Windows NT4. At the time of publication of this document, Microsoft is making modifications to their web server. If directions and screen shots do not match up to your system, please contact ON TIME SUPPORT for additional information.
- **Microsoft Internet Information Server Version 5/6** – This web server is included with Windows 2000 and Server 2003. At the time of publication of this document, Microsoft is making modifications to there web server. If directions and screen shots do not match up to your system, please contact ON TIME SUPPORT for additional information. Metrology Xplorer has not been formally tested on Server 2003, although some customers are using it with IIS 6.

Installation – Apache

The latest version of Apache available at the time of development is included on the METEX installation CD-ROM. If you would like to obtain the very latest version of Apache, visit apache.org and download the version for Win32.

Installation of Apache is very straightforward. If you are installing Apache from the METEX CD-ROM, then click on **Start**, followed by **Run**, and **Browse** the CD until you locate the Apache directory. Run the executable in the Apache directory and follow the instructions. If you have downloaded a later version from the Apache web site, then use that version instead of the version on the CD.

The Apache installation program will now start. When prompted to select the destination directory, the default is normally acceptable. **If you choose to use a different directory, make sure to remember where you are installing to, so that this directory can be selected later for METEX installation.** When prompted for installation type, choose TYPICAL.

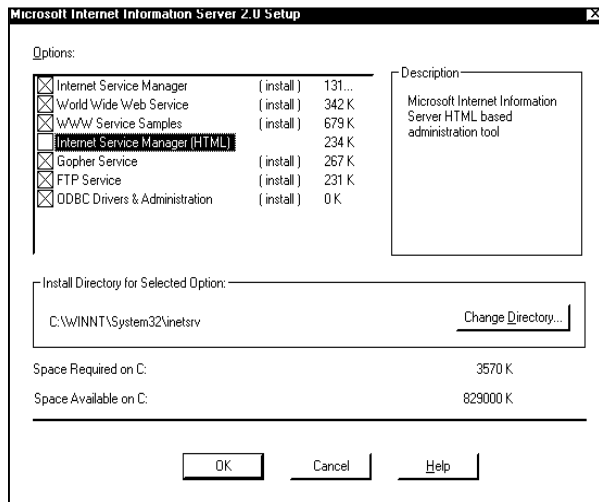
Next you will be prompted for the program folder. If you choose to use a different folder, remember what it is for future operation. The installation will finish after this step. The Apache installation creates the proper directories and permissions required for operation, and does not require further configuration. If you are using NT/2000 you should set up apache as a service. Usually the installation will prompt for this.

Installation – Microsoft Internet Information Server Version 2

For this section of the manual, we are going to refer to the Microsoft Internet Information Services Version-2 as **IIS 2**.

This installation process assumes that you are copying files to the C: drive. If you are not, then replace C: in the steps that follow with your actual target drive.

This software **MUST** be installed on the MET/CAL database server. If you wish to install METEX on a computer other than the MET/CAL Database server, please refer to Appendix A. Microsoft IIS is contained on the Microsoft Windows NT server CD-ROM. Please insert this CD-ROM into the drive at this time.



You may have an icon on the desktop labeled "Install Internet Information server". If you do, double-click on this icon to install IIS, otherwise, click on Start, followed by Run, and enter D:\I386\INETSrv\inetstp.exe, where D: is the drive letter of your CD-ROM. Click on **OK** to start.

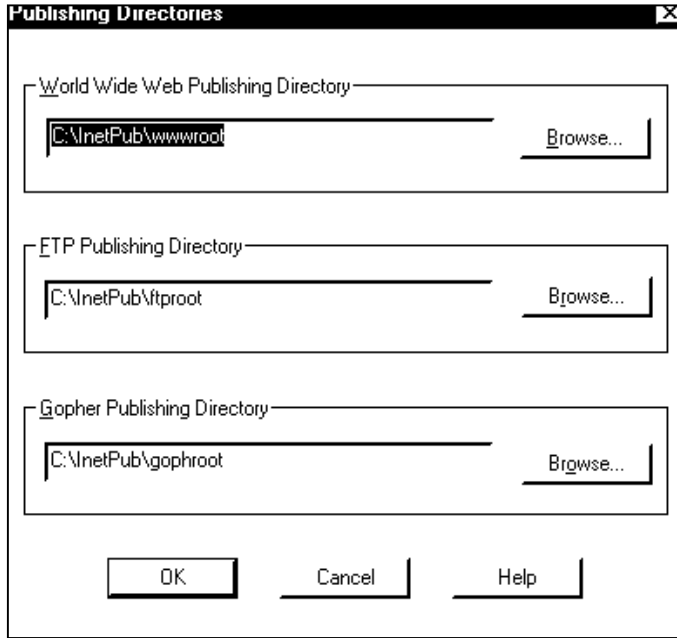
After clicking **OK** at the opening welcome screen, you will get a display similar to the one on the left:

Make sure the options displayed at left are selected. If you do not have a need for FTP Services or Gopher Services, then you may de-select them. If you change the installation directory, make sure to remember what it is for the following steps.

IIS-2 Installation

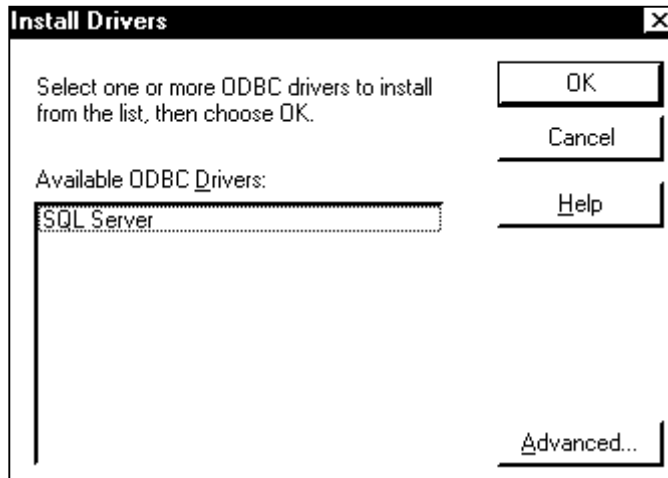
When you click **OK** to advance, you will be prompted to create the target directory. This is normal.

The next screen shown will prompt you for the installation directories of the various published services. Normally the defaults are acceptable. If you decide to change any of them, make note of the changes for later use. Normally this screen will look as follows:



After clicking **OK** to continue, you will be prompted to create the listed directories. This is normal if they do not already exist. If you have decided to not host FTP or Gopher services, then the screen displayed at left may differ slightly.

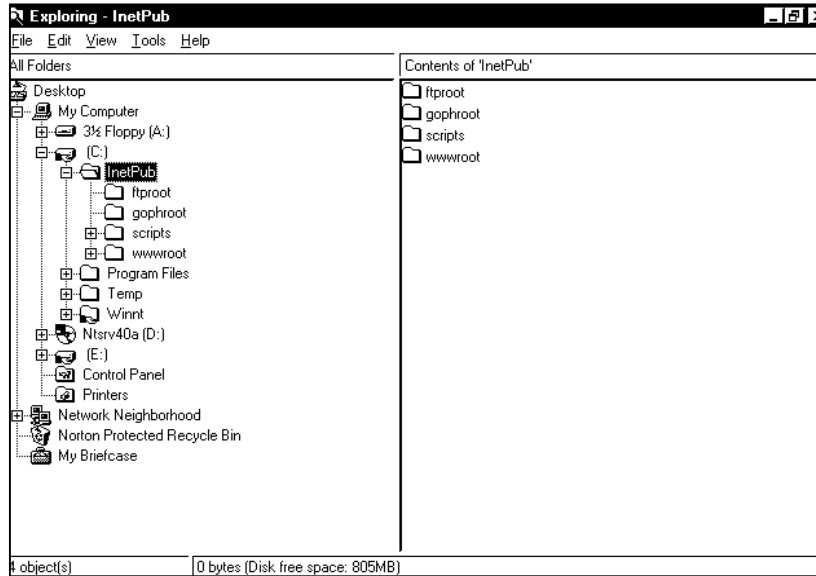
IIS-2 Directory Configuration



At this point, Microsoft IIS will be installed. At one point the following screen will be shown prompting for the installation of ODBC drivers. This screen looks as follows:

IIS-2 ODBC Driver Installation

You may click **OK** to advance. The Sybase 32-Bit drivers have already been installed. After choosing the defaults for the ODBC driver installation, the Microsoft IIS installation process will be complete.

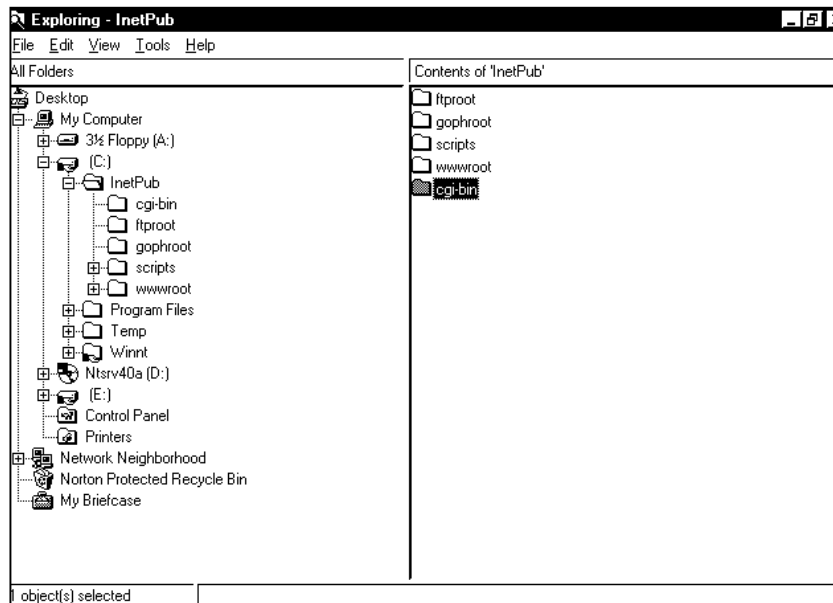


Before installing METEX, Microsoft IIS must be configured to execute CGI applications. Perform the following steps to properly set up Microsoft IIS to execute METEX:

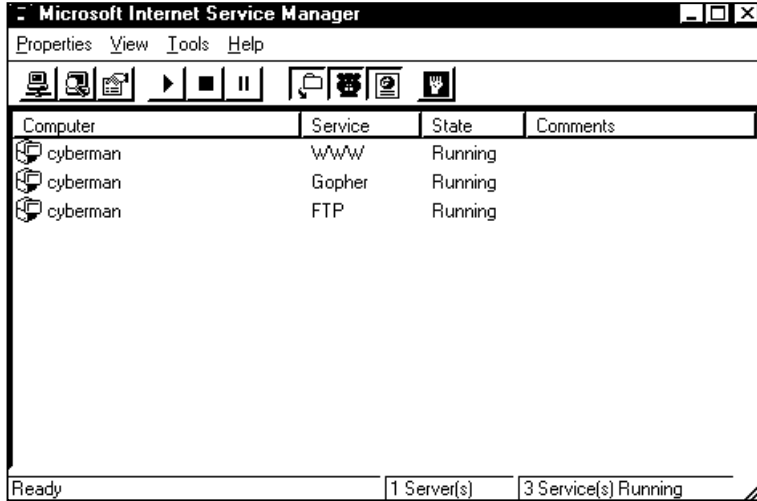
Start Windows Explorer. Double-click on the INETPUB directory on the C: drive (select the appropriate drive if you did not install IIS to the C: drive). Your screen should look like this:

IIS-2 Directory Listing

With the INETPUB directory highlighted, click on File, followed by New, and then Folder. Type "cgi-bin" followed by Enter to name the directory cgi-bin. Your screen should now look like this:



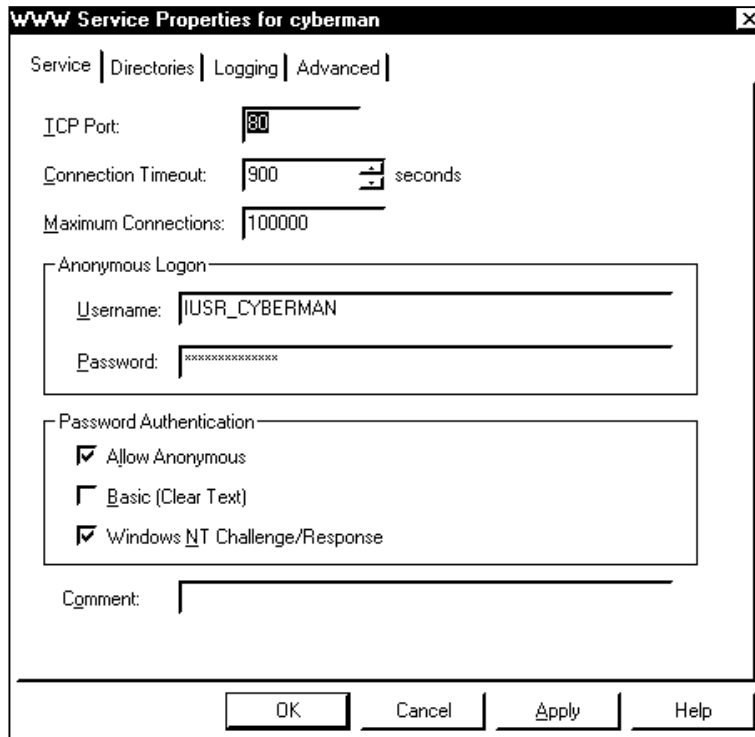
IIS-2 Creating the CGI-BIN Directory



IIS-2 Internet Service Manager

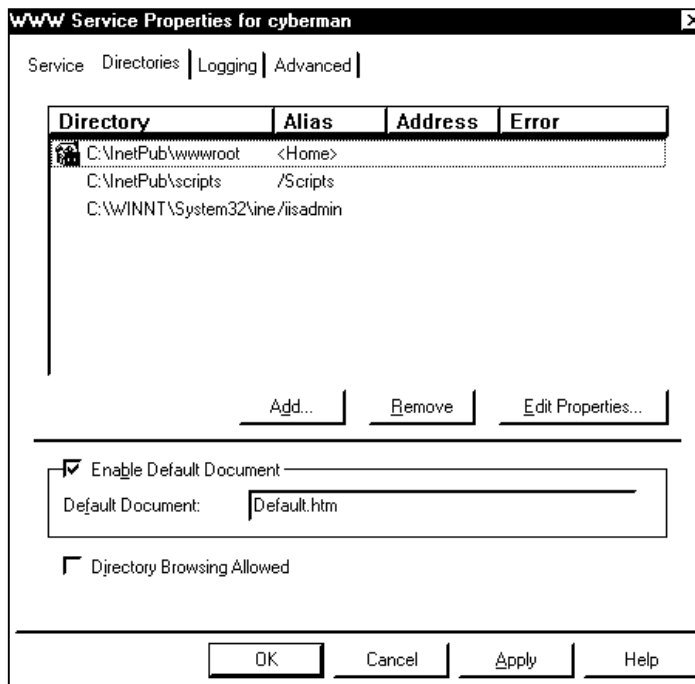
Close (or minimize) Windows Explorer. The next step is to allow IIS to use this new directory and to allow execute privileges on it. To do this, click on **Start | Programs | Microsoft Internet server (common)**, and then Internet Service Manager. This will start the IIS configuration utility. You should see the screen at left:

The listing for COMPUTER will match the network name of your server. Double-click on the computer name next to the service named WWW. This will bring up the following window:



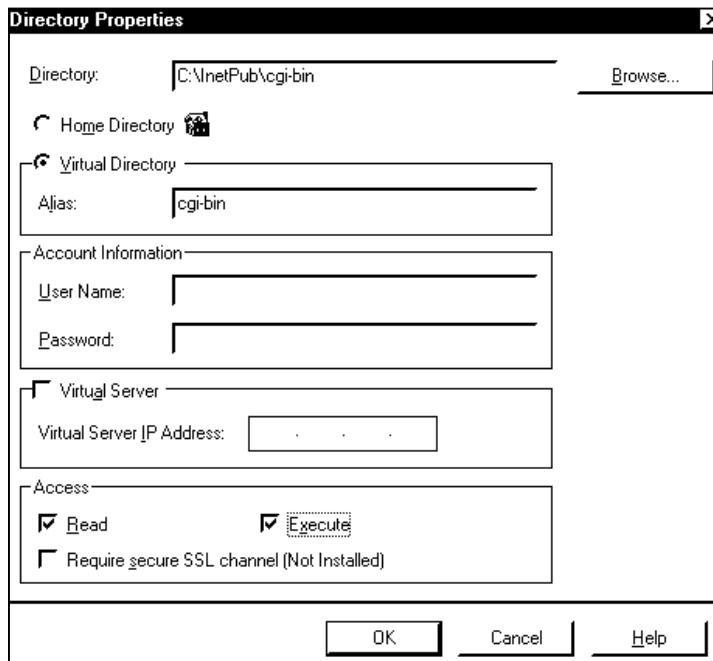
IIS-2 WWW Service Properties

Click on the tab labeled directories. You should see the following window:



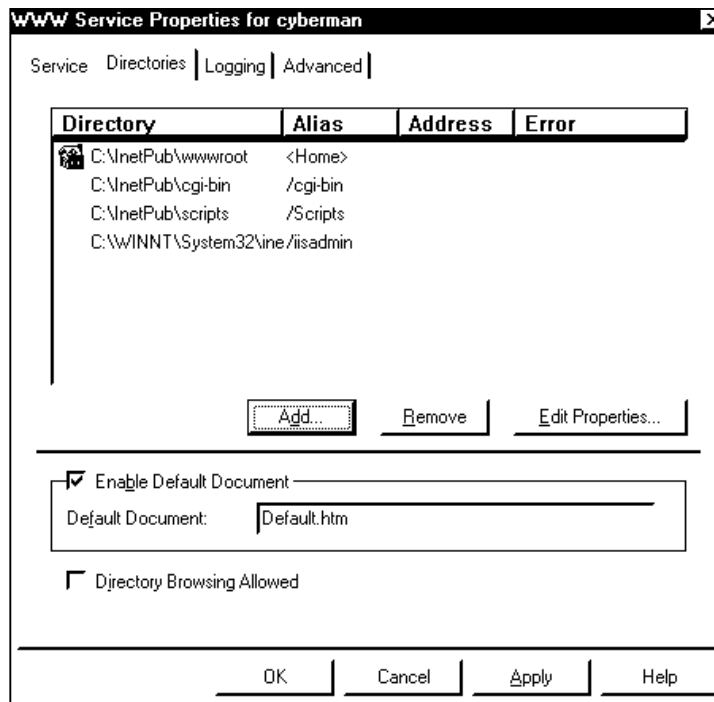
IIS-2 Service Properties

Click **Add**. Make sure your entries in this next window look like the following:



IIS-2 Directory Properties

You may click **Browse** to select the drive and directories listed above, or you may type them in manually. Make sure to complete the entry for Alias, and to checkmark Execute before clicking **OK**. After this, you should see the following:



IIS-2 Directory Listing Properties

Note the new directory entry for cgi-bin. Click **OK** to finish. You may now close the Microsoft Internet Service Manager.

Installation – Microsoft Internet Information Services (IIS) version 4

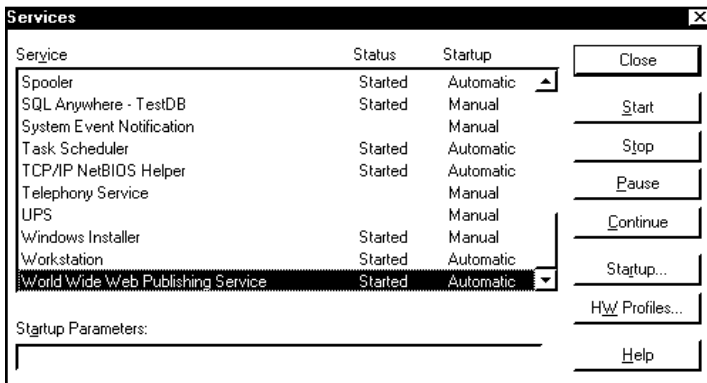
For this section of the manual, we are going to refer to the Microsoft Internet Information Services Version-4 as **IIS 4**.

This installation process assumes you are copying files to the C: drive. If you are not, then replace C: in the steps that follow with your actual target drive.

This software **MUST** be installed on the MET/CAL server. If you wish to install METEX on a computer other than the MET/CAL Database server, please refer to Appendix A.

Microsoft IIS-4 is contained on later versions of the Microsoft Windows NT CD-ROM or can be downloaded from the Microsoft website. Please insert this CD-ROM into the drive at this time and run the setup or install program to start the installation.

Follow the instructions to install IIS-4 for the default installation. After the installation is complete, and the computer has been rebooted, you should verify that the services have been started properly.



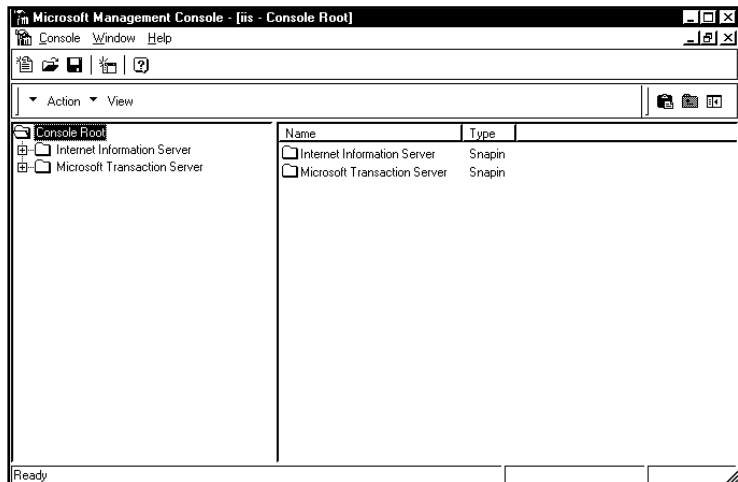
Click on **Start | Settings | Control Panel** and click on **Services**. Scroll through the services and make sure the World Wide Web Publishing Service is **Started** and the Startup is **Automatic**.

IIS-4 Configuring Services

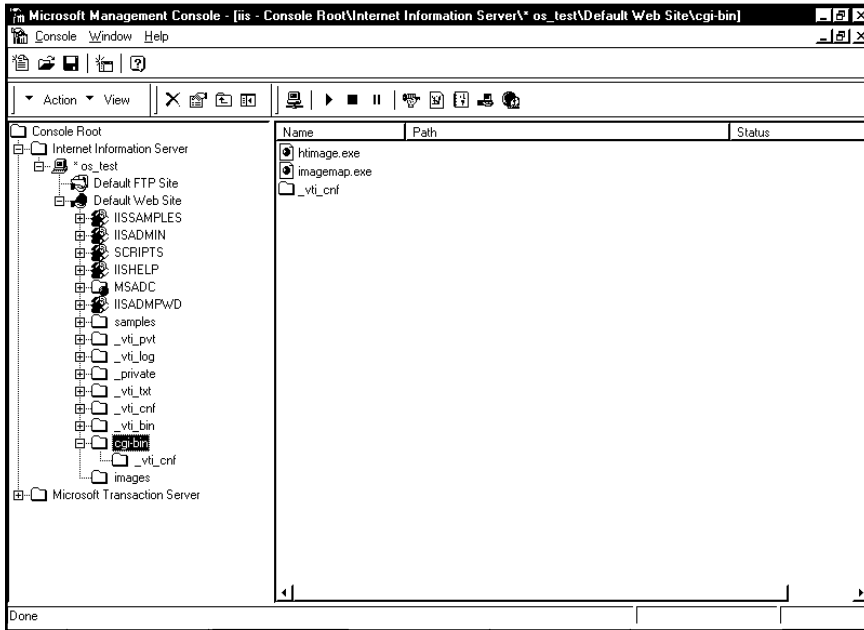
Start the Microsoft Internet Information Server Internet Service Manager. Click on **Start | Microsoft Internet Information Server | Internet Service Manager**. If you downloaded the IIS 4 update from the Microsoft Web Site, you may have to click on Windows NT 4.0 Option Pack first.

When you start the program, you will notice that the interface resembles Windows Explorer.

Click on the Internet Information Service and drill down through all the components.

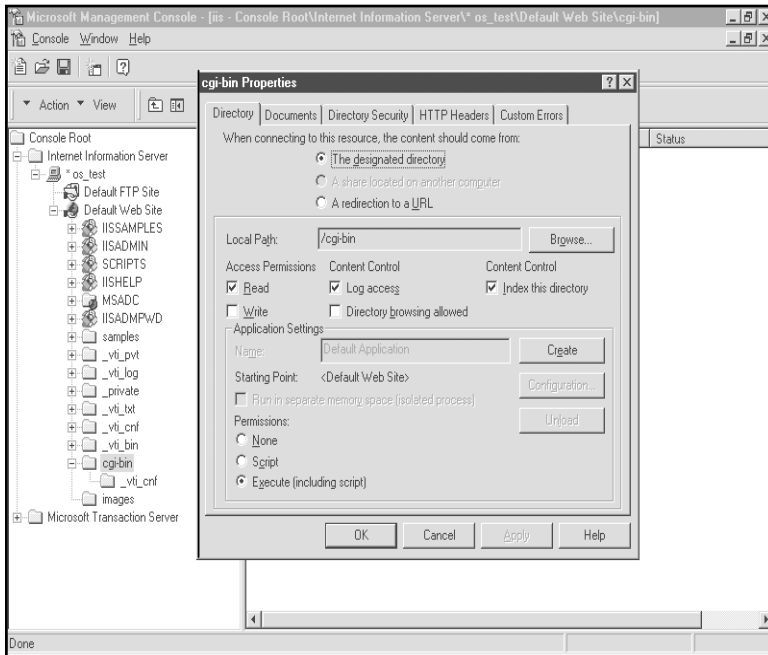


IIS-4 Management Console



In our example at left we have a list of all the components Internet Information Service. The name of our computer in this example is OS_TEST. The network name of the computer you are configuring will be different.

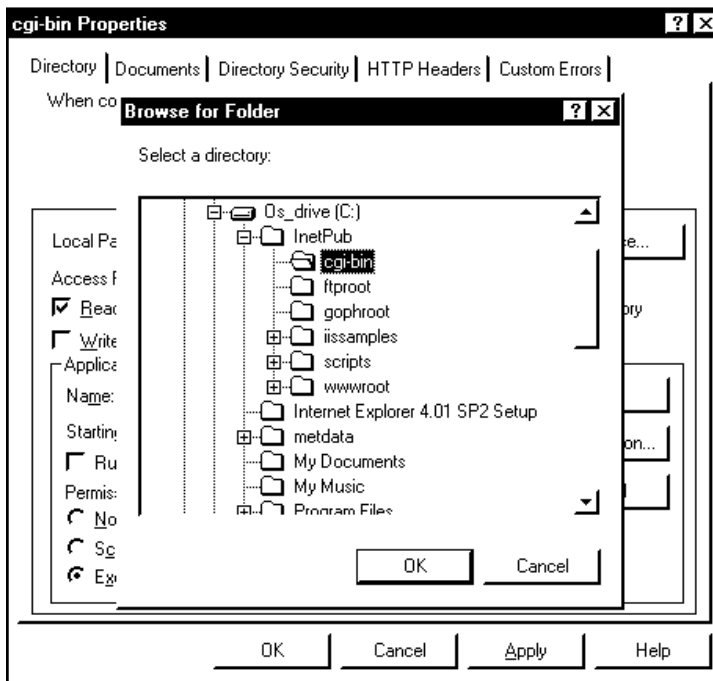
IIS-4 Web Server Component List



The first step is to configure the CGI-BIN Directory. This is the directory where the MET_EX.EXE program will reside and execute from. This version of IIS may create the actual file directory under wwwroot or c:\inetpub\wwwroot\cgi-bin. **For Metrology Xplorer to work properly, the directory should be C:\inetpub\cgi-bin. If there is not a cgi-bin directory under inetpub, then go ahead and create it.**

The next step is to tell IIS-4 where the CGI-BIN directory is and define the properties. Point your mouse at CGI-BIN in the component list, perform a left click, and select properties. You should have a screen similar to the one at left.

IIS-4 CGI-BIN Properties



Click **Browse** on the local path. We need to select the correct CGI-BIN directory. Remember, this is the CGI-BIN directory that is under the INETPUB directory. Click **OK** to save this location.

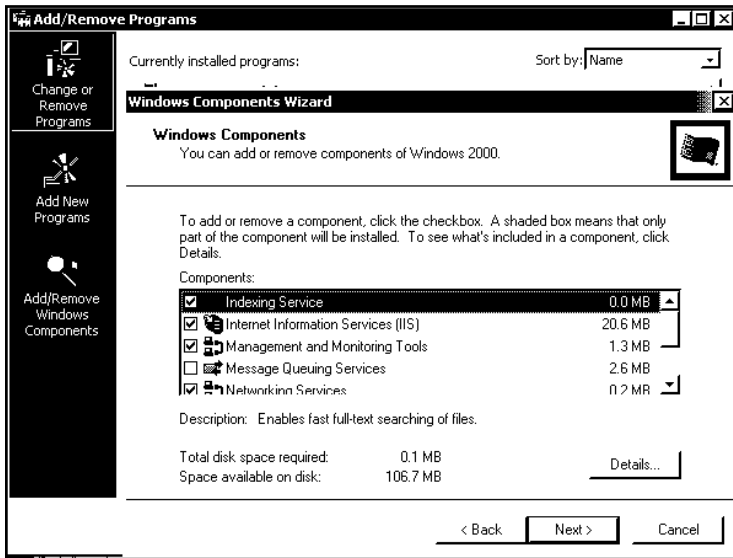
IIS-4 Selecting the CGI-BIN Directory

Installation – Microsoft Internet Information Services (IIS) version 5

For this section of the manual, we are going to refer to the Microsoft Internet Information Services Version-5 as **IIS 5**. This installation process assumes you are copying files to the C: drive. If you are not, then replace C: in the steps that follow with your actual target drive.

This software **MUST** be installed on the MET/CAL server. If you wish to install METEX on a computer other than the MET/CAL Database server, please refer to Appendix A.

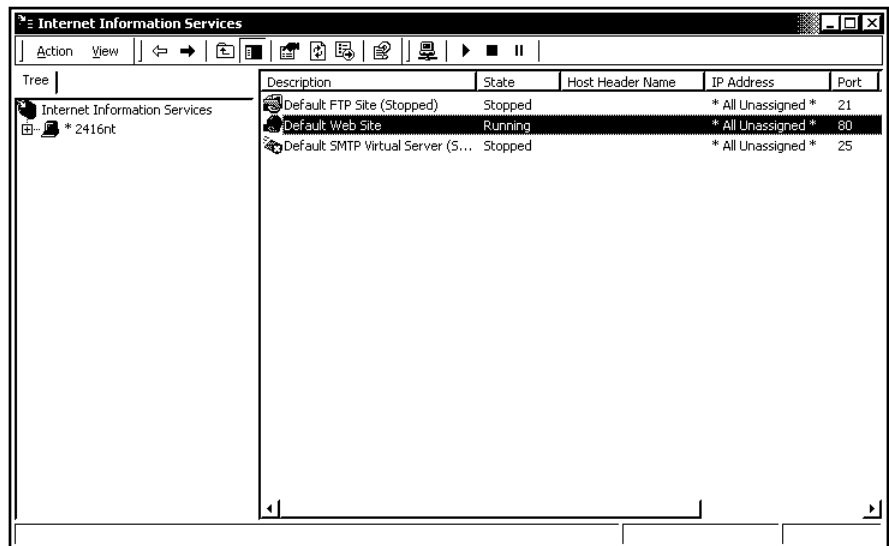
Microsoft IIS is contained on the Microsoft Windows 2000 CD-ROM. Please insert this CD-ROM into the drive at this time.



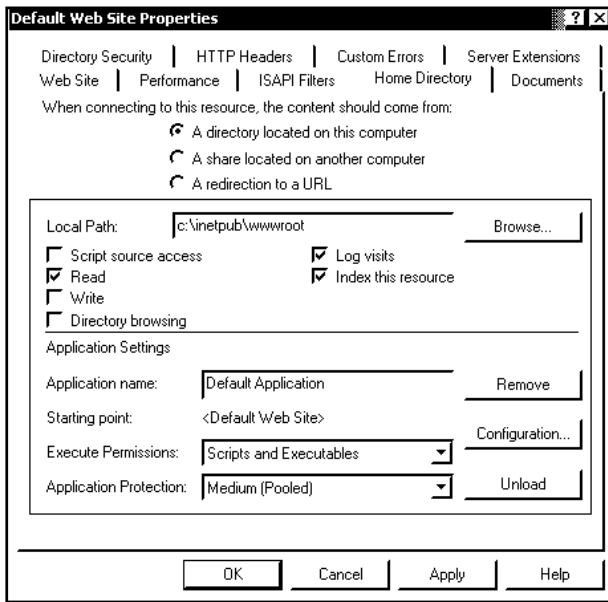
Click on **Start | Settings | Control Panel | then Add/Remove Programs**. Click on **Add/Remove Windows Components** and put a check next to **Internet Information Services (IIS)** and click **Next**. Now, click on **Start | Programs | Administrative Tools | Internet Services Manager**. The next screen will look as follows after clicking on current machine name:

IIS-5 Adding Internet Services

Looking at the screen at right, Right-Click on **Default Web Site** and choose **Properties**, which will give you the following screen on the next page.



IIS-5 Selecting Default Web Site Properties

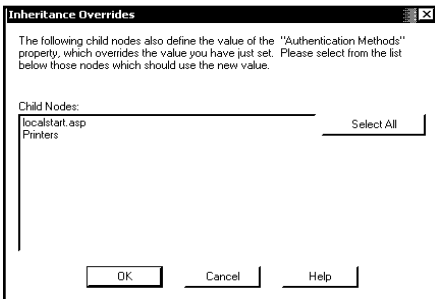


IIS-5 Configuring Execute Permissions

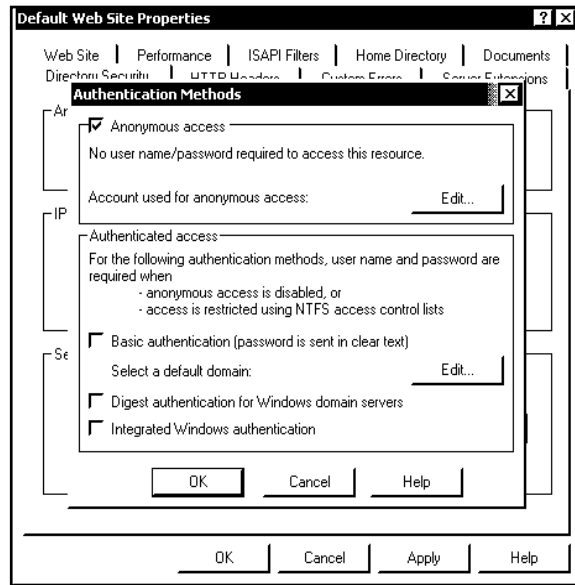
Click on the **Home Directory** tab and verify **Local Path**, select **Read** access only (for security reasons) and be sure **Execute Permissions** are set to **Scripts and Executables**.

Choose **Directory Security**, click **Edit** and put a check next to **Allow Anonymous Access**. Click **OK**. Be sure and uncheck **Integrated Windows Authentication**. Click **OK**, then click **Apply**.

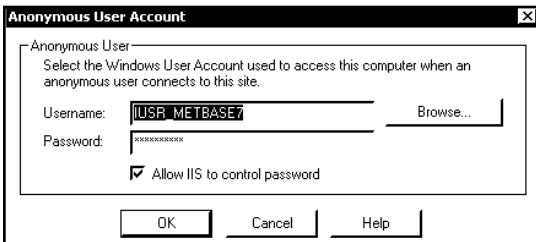
A window may pop up that looks like the following, just click **Select All** then **OK**. This will set Authentication modes recursively.



IIS-5 Configuring Web Site Authentication

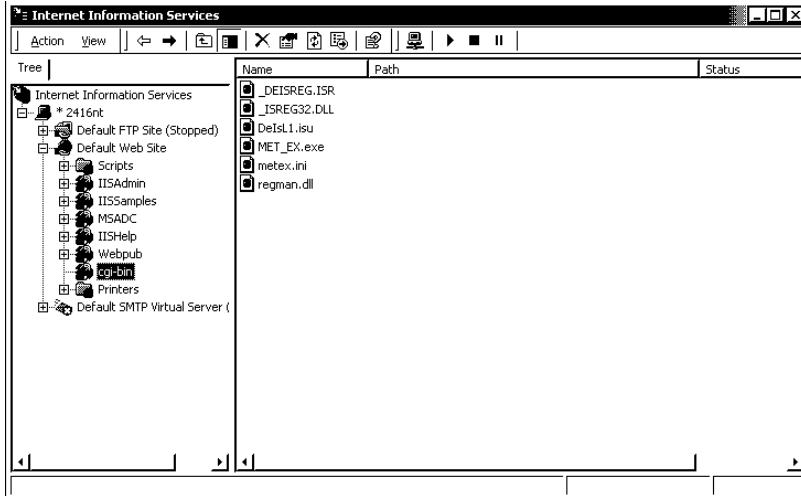


Permissions



IIS-5 Assigning Permissions

There may be certain cases where the CGI tries to load DLL's and dependencies but the application will not run. Depending on the configuration of the Windows system, the system administrator will need to set administrative log in permissions when the application is executed. In the screen above, click **Edit** and the screen at left will appear. At this point the administrator can assign an administrator log on and password.

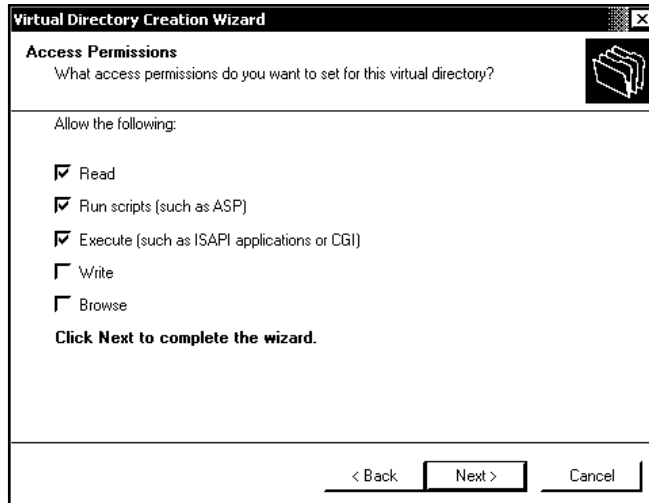


IIS-5 Creating the CGI-BIN Virtual Directory

Before installing METEX, Microsoft IIS must be configured to execute **CGI** applications. First you will need to create the directory C:\inetpub**cgi-bin** (or the drive you specified during the previous steps) using Windows Explorer or through My Computer. Next, right click on **Default Web Site** in the left pane and choose **New**, then **Virtual Directory**. Give it the alias of **cgi-bin**.

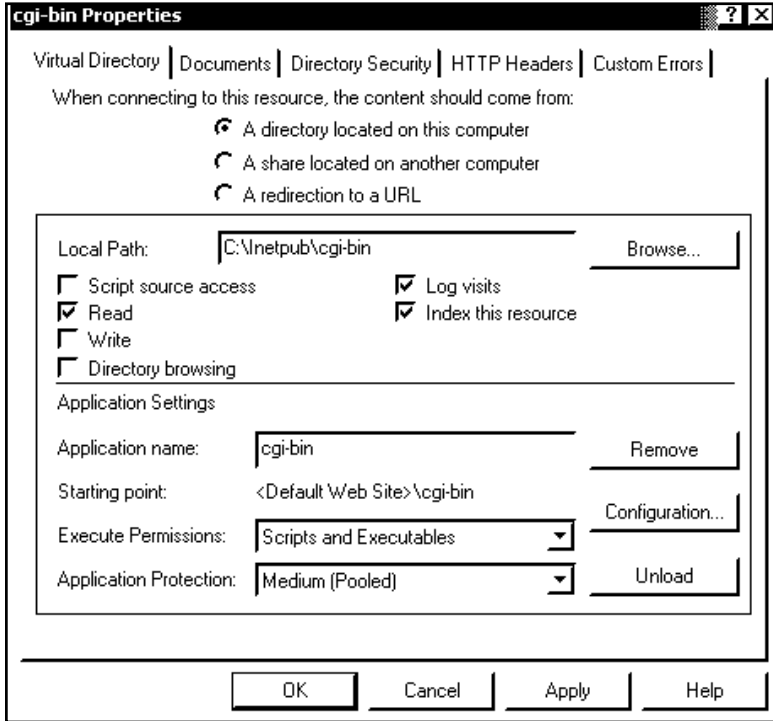
Expand **Default Web Site** by clicking on the plus sign.

This will bring up the **Virtual Directory Creation Wizard**. Be sure and put a check next to **Read**, **Run Scripts**, and **Execute**. Click **Next** and then click **Finish**.



IIS-5 Setting Permissions for the CGI-BIN Virtual Directory

Right click on the **cgi-bin** directory you created earlier and choose **Properties**. This will bring up the following screen to verify settings:



IIS-5 Verifying the CGI-BIN Properties

Again, verify the location of **Local Path**, this should be C:\inetpub\cgi-bin (or drive specified in earlier steps). Select **Read** access, and set **Execution Permissions** to **Scripts and Executables**. Next click on **Directory Security**, click **Edit** and place a check next to **Anonymous Access**. Click **OK** to exit this screen. Click **Apply**. The Inheritance Overrides screen may come up again, just click **Select All** and then **OK**. On the METEX installation CD is a file called **default.htm**, place this file in the directory C:\inetpub\wwwroot, or whatever directory you specified in earlier steps, and overwrite if prompted. IIS should now be configured to work with METEX, which should be installed into the **cgi-bin** directory you created.

Using Themes and Backgrounds – Please Read This

A new feature of Metrology Xplorer 1.2, are the themes and backgrounds that are automatically installed on the server. During the installation of the Metrology Xplorer CGI program, there are some new subdirectories that are installed under the CGI-BIN directory. It does not matter whether this is on an Apache or IIS system. There are seven subdirectories. They are CALLAB, METAL, SCRATCHPAD, NAVY_STRIPES, TRANQUIL, UV, and BW. These directories contain several style sheets for a new enhanced look and some JPG files. You can look through the directories with Windows Explorer for the JPG files and see what types of backgrounds are provided. Please note that BW is a black and white display only with no pictures and should be installed if no backgrounds are to be used.



Different Background Themes

These backgrounds and style sheets will not take effect unless the contents of one of these directories are copied to the default location of your web server files. For example, if your web server is Apache and you wanted to use the CALLAB background, all you need to do is copy the files from the CALLAB subdirectory to the HTDOCS subdirectory under Apache. All the files in the subdirectories under CGI-BIN have the same names. If you want to try out the different themes, just copy over the files again. For IIS, the theme files should be copied to WWWROOT. For Apache, copy these files to HTDOCS. It is possible that your system may have another default location and you should contact your IT Administrator.

METEX CGI Installation

The METEX CGI is the interface between the web server software and your MET/CAL database. As such, it should be installed on the MET/CAL server. If you have installed the web server software on a computer other than your MET/CAL server, then refer to Appendix A for instructions for configuring the CGI after you have performed these installation steps.

Installation of the CGI requires a reboot before METEX can perform. You will need direct access to the server; it would be a good idea to schedule "down-time" to perform this step.

To start the METEX CGI installation process, insert the METROLOGY XPLOER CD-ROM, and click on START, followed by RUN, and enter "D:\cgi\metexcgi.exe", where "D:" is the drive letter of your CD-ROM. The CGI installation routine will start.

After a few introductory messages, you will be prompted for the installation directory. The default is "C:\inetpub\cgi-bin", which is the default for Internet Information Server Web Server. If you are using Apache as your web server, then change the installation directory to match the proper CGI execution directory for Apache. The typical Apache default CGI directory is: "C:\Program Files\Apache Group\Apache\cgi-bin". You may need to direct the CGI installation program to another drive/directory depending on your choices made during installation of Apache.

After selecting the installation directory, the installation program will continue, and you will be prompted to reboot the computer.

After rebooting the computer, it is time to copy the sample web page that will allow access to METEX from the web browser. There are two sample web pages included on the METROLOGY XPLOER CD-ROM to get you started and they are also copied to the CGI-BIN directory during installation:

DEFAULT.HTM – For use with Internet Information Server
INDEX.HTML – For use with Apache

These files are located on the CD-ROM in the HTML directory. You will need to copy one of these files to the server (depending on the web server software installed) to allow web browsers to access METEX.

If you are using Internet Information Server, copy DEFAULT.HTM from the CD-ROM to the "\inetpub\wwwroot" directory on the server.

If you are using Apache, copy INDEX.HTML from the CD-ROM to the "\Apache\HTDOCS" directory on the server.

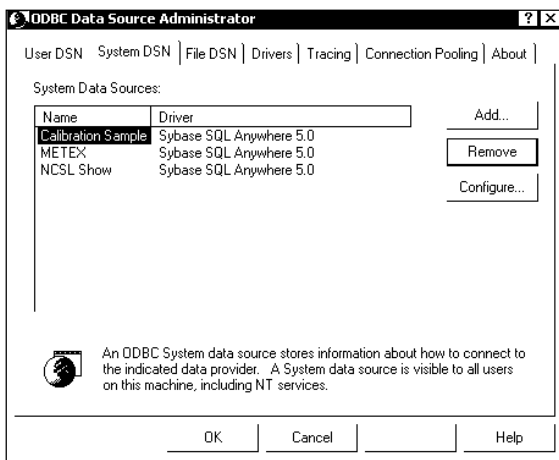
To test the proper copy of the sample web page, point your browser to: <http://xxx.xxx.xxx.xxx> where "xxx.xxx.xxx.xxx" is the IP address of your server. You should see a page titled "Welcome to the Metrology Lab web site!". If you don't, then review the previous instructions to make sure that you have copied the sample web page to the proper directory, and that the web server is started/operational.

Configuring Sybase 8 ODBC for the CGI

IMPORTANT: The Sybase 8 ODBC drivers are automatically installed on the client machine during the installation of the MET/TRACK server application from the CD.

NOTE: it is only necessary to perform this step if ODBC has not been configured for the client computer.

This step configures the 32-Bit ODBC for use by the METEX CGI program. To start the configuration for Windows 98/NT/2000, select **Start** | **Settings** | **Control Panel** | **32-Bit ODBC**. If you are using Windows 2000 or XP select **Start** | **Settings** | **Control Panel** | **Administrative Tools** | **Data Sources (ODBC)**. If the 32-Bit ODBC icon is not visible, close the Control Panel and select **Start** followed by RUN, and enter "odbcad32.exe". The following example is shown with Win2000.

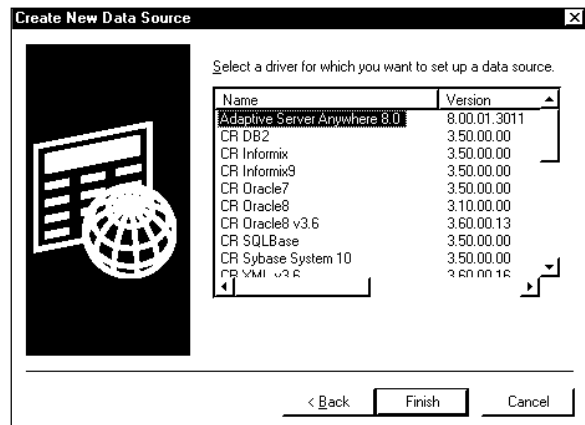


Select **System DSN** and you should have a screen like the one at left. Select **Add** and then double-click on Adaptive Server Anywhere 8.0.

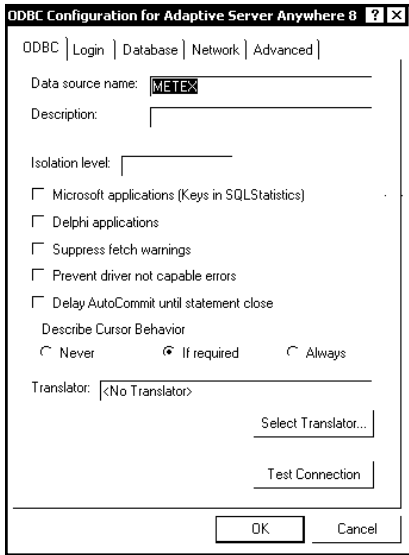
32 Bit ODBC Data Source Listing

You should see the screen at right: (may be different for various versions of the operating system). You need to select the data source driver that is Adaptive Server Anywhere 8.0.

These instructions assume that the 32 Bit Sybase Adaptive Server Anywhere 8.0 drivers have been installed.

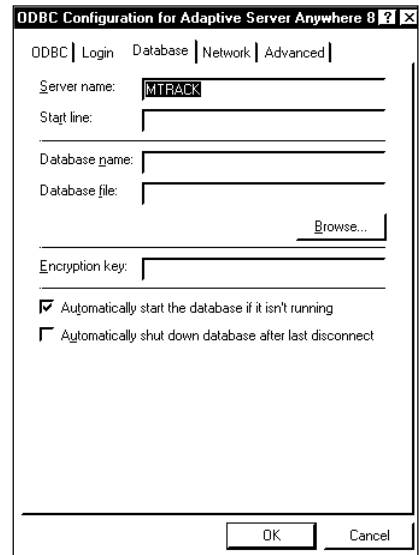


Selecting the Sybase Drivers

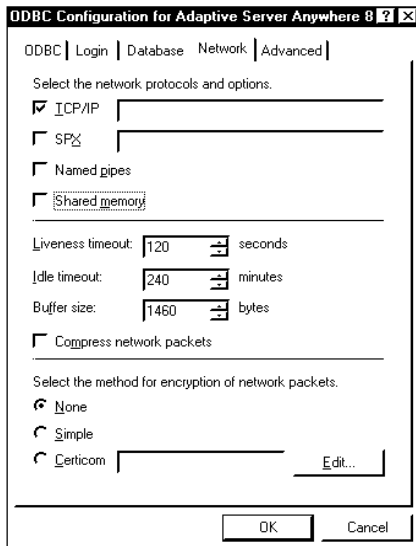


For **Data Source Name** enter "METEX". NOTE: It is possible to use another data source name, especially when more than one database has been configured. Refer to the end of this section for more information. Click on the 'Database' Tab.

For **Server Name** replace "<default>" with the name of your MET/BASE database engine. Traditionally it is named **mtrack**. However, most database installations will have an alias name assigned to the database.



ODBC Configuration for Sybase 8



Click on the 'Network' Tab. A screen similar to the one at left is displayed. This screen is used to configure network options. In our example, we have selected TCP/IP for our network communication. It may be necessary to identify the database server to the Sybase Client. The Sybase Adaptive Server Anywhere does not have a separate network requester like the earlier versions of Sybase. The network requester is actually part of the ODBC driver. You can identify the network server with the following command:

HOST= actual network name of server.

This configuration will be entered adjacent to the checked TCP/IP option. If the network uses SPX, then enter the server options next to the SPX option. Refer to the Sybase documentation for more information on configuring the ODBC settings.

ODBC Sybase 8 Network Options

Click on the 'ODBC' Tab. There is a **Test Connection** button that will allow you to test the network connection to the database. This is a useful tool for troubleshooting connections.

Select **OK** and then select **OK** again to exit the ODBC configuration. You should now have the ODBC portion configured properly.

Alternative ODBC Setup

When the CGI program is installed, the METEX.INI file is installed in the CGI-BIN subdirectory. Instead of creating a separate METEX ODBC source. You may want to use the "Calibration Data" ODBC source instead. The METEX.INI file installs already configured to you calibration data. Open this file with Notepad and make sure the "DATASOURCE=Calibration Data" does not have any leading "#" or ";" characters which will comment out the line. This can simplify the installation.

METEX Administrator Installation

The METEX Administrator is the utility that allows you to configure the operation of METEX and allow access to users. This program should be installed on the workstation(s) that is(are) also used to administrate MET/CAL. It is not recommended that the administrator be installed on the server.

NOTE: If you are installing the administrator on Windows NT/2000 Workstation or NT/2000 Server, then you will need to log in as "Administrator" to allow for the updating of shared libraries and dependencies.

With the METROLOGY XPLOER CD-ROM inserted, click on Start, followed by Run, then enter "D:\admin\metexadm.exe" where "D:" is the drive letter for your CD-ROM.

The administration utility installation program will run and present you with a few welcome screens. You will then be prompted to enter the destination directory that defaults to "C:\metcal". It is recommended that you install the administration utility to the shared MET/CAL drive/directory. At this point, you should select the drive/directory that you would like the administration utility installed to.

Next, you will be given the option of where you would like the icons for the administration and OTS software registration programs to be placed. The default is "Fluke Metrology Software" for convenience, but they may be placed wherever you like, or even in a separate program group if you prefer.

After these selections, you will be prompted to restart your computer. The administration utility and the software registration program require a restart before they will operate.

Software Registration

METROLOGY XPLOER is not able to operate until it has been registered. A registration certificate may have been included in the materials that METEX was shipped in. If no registration certificate was included, or if you are installing MET /EX for evaluation purposes, then please call On Time Support using one of the methods listed on the back cover of this manual.

If you were given a registration certificate, or have obtained a registration code from On Time Support, then you are ready to proceed. Make sure that you have installed the METEX administration utility on one or more computers. If you have not done this already, then refer to the section of the manual titled "METEX Administrator Installation" for instructions on installing the administration and registration software tools.

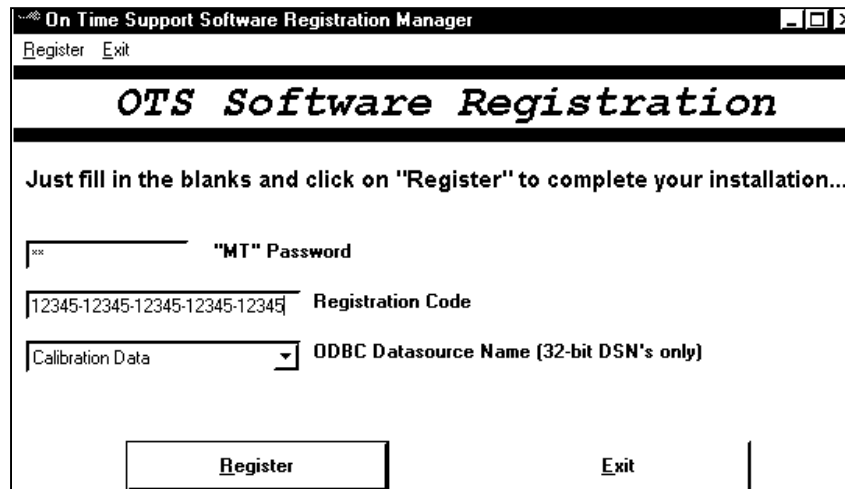
In the "Fluke Metrology Software" program group (or wherever you instructed the administration installer to place the icons), you should see an icon titled "OTS Registration Manager". Double-click on this icon to start the software registration utility.

You will be presented with a screen with 3 boxes requiring information. The first one requires your "MT" (MET/CAL system administrator) password. Enter the password for the "MT" user.

The next box is for the entry of the registration code. Enter the registration code provided, including the "dashes" (-).

In the final box, select the 32-BIT ODBC data source that is used to connect to the MET/CAL database.

Click on Register, and the program will register METEX and update MET/CAL to allow for METEX operation.



OTS Registration Manager

Next Page

Section 3 - Administration

METEX Administrator

As the name implies, the administrator is where you control the features of METEX. Everything from security to reports can be set up from the administrator's workstation.

This section is designed to instruct you in the topics that you will most likely encounter after successfully installing and registering METEX. Each topic is followed by a series of instructions and screen shots. Menu options are selected according to the following example:

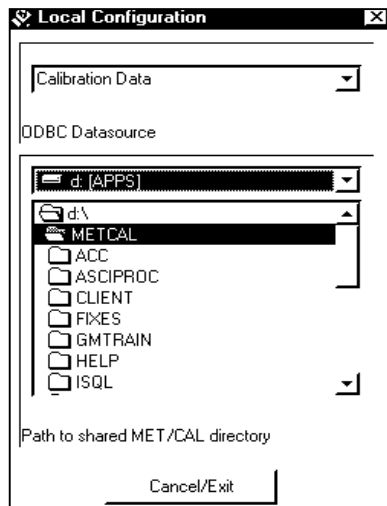
CLICK ON FIRST MENU OPTION | CLICK ON SECOND MENU OPTION | etc, etc.

After selecting the menu options given, you should see the screenshot that follows. Follow the instructions given and you will be able to accomplish the task in that portion of the administration utility.

Local Configuration

After starting the METEX administrator for the first time, **and before you log in**, you may need to set local configuration options for the workstation.

CONFIGURATION | LOCAL CONFIGURATION



You'll need to tell METEX where the "Metcal" directory is on the server. Also you must choose the Open-Database Connectivity (ODBC) data source that METEX will use. In the ODBC DATA SOURCE box, use the drop down menu to choose METEX. In the box directly below ODBC DATA SOURCE, select the absolute path to the "METCAL" share.

METEX Administrator – Selecting the METCAL Shared Directory

“Tweaking” the Browser Display

NOTE: METEX uses the Browse Screens in MET/TRACK in the Default Desktop to calculate the data locations. The Edit screens are not used by METEX.

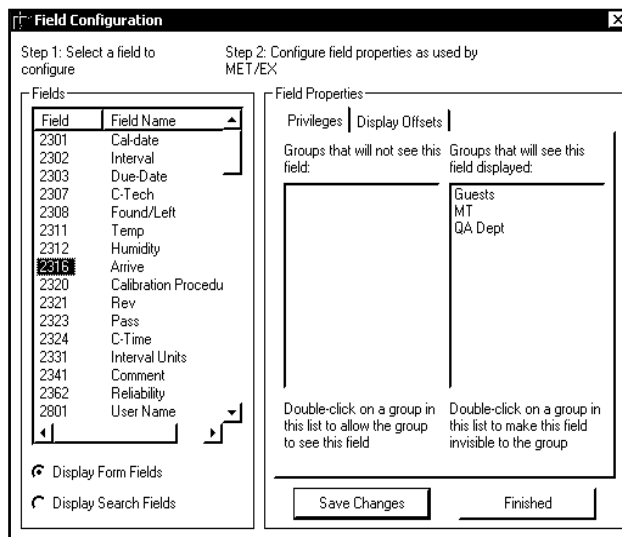
When the browser displays the MET/CAL forms, the field titles and data may not line up exactly as shown by the MET/CAL clients. The discrepancy is due to rounding errors in the conversion calculations, differences in browser display mechanisms, and differences in how certain fonts are scaled and displayed.

The administration utility provides a mechanism for fine-tuning or “tweaking” browser displays so that the alignment is more accurate. This involves looking at a form in a browser and applying “offsets” to either the field title or data to position it correctly in the display.

Before starting the “tweaking” phase, you need to determine which browser/version is the most dominant in the facility or environment that METEX is being used in. For example, if most of the people that will be using METEX have version 6.0 of Internet Explorer, then Internet Explorer 6.0 is the dominant browser. Before you start tweaking displays, you should make sure that you have access to the dominant browser on the same machine that the administrator is installed on, or have an assistant look at a computer that is running the dominant browser and give you corrections to be made.

After determining what the dominant browser is, the next step is to pick a MET/CAL form to work with. Start MET/TRACK Query and view this form. Use the query tool as a reference when making adjustments to METEX. Typically, the Inventory form is the starting point for browser tweaking. Start the dominant browser and display the same form that query is showing. In the administration program, select the following menu options:

CONFIGURATION | FIELD CONFIGURATION



METEX Field Configuration – Permissions

Start the tweaking process by working from top to bottom, left to right on the form you have selected to work with. This order must be used, since applying offsets may move fields to the right after the offset has been applied.

You should see the following screen in the administration program. Select the first field you would like to work with by selecting it from the list on the left side.

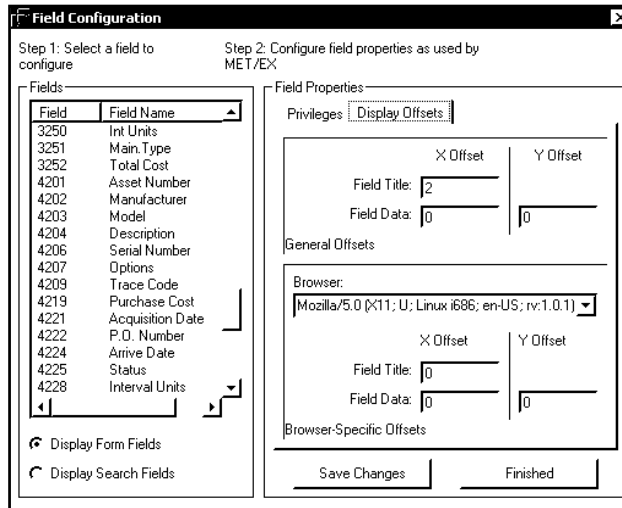
Under the PRIVILEGES tab, double-click a group that you want to allow or disallow to see the field you just highlighted. The left pane on the right side displays groups that will not see the field in question, and the right pane on the right displays groups that will see the fields in question.

If you are going to have different screen configurations for different users, it will be easier if you set which fields are available to the groups.

NOTE: There are two radio buttons for use with MET/CAL 7.x. MET/CAL 7.x utilizes a different search form than previous versions on MET/CAL. If you are “Tweaking” the Search Form for version 7.x, be sure to select “Display Search Fields”.

By default, all groups can see the field, and you must manually de-select groups in order for them not to see the field. This is very useful for limiting access to sensitive data. For example, you could have a "Guest" user and "QA" group that would not be able to see the calibration time recorded by the technician.

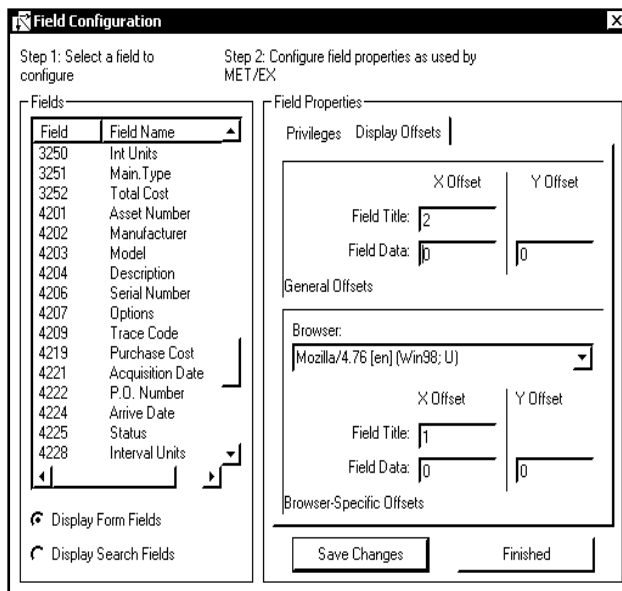
After selecting groups that you do not want to have access to this field (if any), click on the "Display Offsets" tab. You should see the following screen:



In the "general offsets" section, enter the offsets required to bring the field into the proper position on the dominant browser. For example, if the field you are working with has a title that is too far to the right by 2 spaces, enter a "-2" in the "Field Title X Offset" box. Likewise, if the title was in the correct position, but the data field was too far to the left by three spaces, then enter a "3" in the "Field Data X Offset". Positive numbers entered in the "X Offset" column move objects to the right, negative numbers to the left. Positive numbers entered in the "Y Offset" column moves objects down, negative numbers up. After entering offsets for the field, click **Save Changes**, then go to the browser and click on the "Refresh Data" link at the bottom of the form in your browser.

METEX Field Configuration – Display Offsets

The display should refresh, and show the changes made. Continue changes working your way to the right on the first row, then move to the second row and repeat until the form looks proper. After this form is finished, pick another one and repeat the previous step.



After the dominant browser has been "tweaked" to display the forms correctly, you may now make adjustments to other browsers/versions to make them display the forms correctly. Offsets specific to a browser are contained in the "Browser-Specific Offsets" section of the "Display Offsets" tab. Before you can enter browser-specific "tweaks", that browser must view one of the forms in METEX. When this happens, METEX records the identification string that the browser uses to identify itself when viewing web sites.

The process of tweaking the different browser is very similar to tweaking the dominant browser. Start with a form/field, and in the "Browser-Specific Offsets" section, select the browser you want to "tweak" from the drop down browser list as shown.

METEX Field Configuration – Display Offset / Other Browsers

If there are settings for this browser, then they will be displayed. Make necessary corrections just as you did for the dominant browser, except that you will be entering corrections in the "Browser-Specific Offsets" section instead of the "General Offsets" section. You may need to access METEX first with the new browser so that it will show in the list.

If another browser/version is used in the future and you need to make corrections to the form display to compensate, then follow the same process but select that browser from the browser list and apply corrections for it.

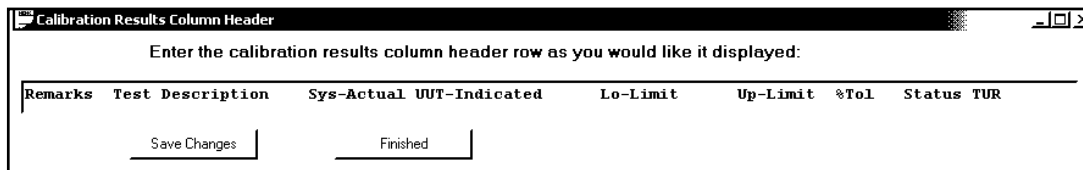
Here's a tip. You may encounter a user with a browser that has not been "tweaked". This user may be some distance away or even in another city. Try tweaking the different browsers over the phone. For example, the administrator runs the administrative program and the user describes the field offsets. Over the phone the user could say, move the MFG label 2 characters to the left. The administrator makes the changes and tells the user to refresh his browser screen for the changes to take effect. This method has been proven even though it may take a little time to go through all the fields.

Calibration results form column header

CONFIGURATION | CALIBRATION RESULTS COLUMN HEADER

For experienced MET/CAL/TRACK users, you may have noticed that the results table does not have any type of formatting for the header. When the calibration results form is displayed in your browser, the data displayed will not have any column heading, thus making the displayed data difficult to understand.

In the large blank space, you can type a header to be displayed whenever the user requests calibration results. You may enter something like "Remarks Test Description UUT Indicated" so that this column header gives some meaning to the data displayed underneath it. The entry point for the calibration results column header is displayed below:



METEX Field Configuration – Calibration Results Header

MET/TRACK version 7.0 and higher has a new result format. In past versions, MET/CAL and MET/TRACK could only store the actual measurement results in a text format. The measurement results could not be separated into different fields. With version 7, there is now the Full Results (about 250 columns) table. METEX 1.2 now supports both results formats. When viewing the "Treeview" the phrase "Cal Results" will link to the old text results format, and the phrase "Full Results" will link to the new results format.

NOTE: There is only one result header available, so be sure to configure it to fit the results that you view the most.

Whenever calibration results are displayed, the header row as you have entered it will be displayed. Click Save Changes.

Here's a tip, you can open the Browser Page with the results displayed and overlay the Calibration Results Header above and actually line up the fields. The fonts are the same so everything will line up.

“Tree-view” Configuration

The “tree-view” is the form that is displayed after a search is performed in METEX. The tree-view contains links to the various forms associated with instruments returned by the query. You may customize what fields are displayed in the tree-view. Each “branch” of the tree represents a form, and the fields that identify the form can be customized. For example, if you want a calibration event displayed on the tree-view to show cal-date and due-date only, then this is where you would come to make that change.

CONFIGURATION | TREE VIEW CONFIGURATION

METEX Field Configuration – Tree-View

Under SUMMARY FIELD DISPLAY, there are six tabs: Inventory, Calibration, Location, Maintenance, Customers, and Full Results. Each tab corresponds to the form of the same name in the MET/CAL database. To make a field appear in the tree view, click on the appropriate tab and double-click the fields on the left to make them appear on the right pane, and appear in the tree view.

Under FEATURES, type in how many assets you want to show at once to the user in the tree-view. Keep in mind that higher numbers make it more difficult to use the tree-view and also increase the amount of data transferred to the browser. An entry of “0” (zero) allows unlimited numbers of instruments to be included on a search. Click **Save Changes** to save your work.

Full Results Configuration

Configuring the Full Results

The Full Results display is a new feature for METEX 1.2. You can insert the results fields into the web display. However, there are some rules to note. The “Remarks” and “Test Description” fields are always hard-coded into the left side of the form. They cannot be removed. The Test Status Field is also hard-coded into the form, but it can be moved into a different position. The tol_err and TUR fields, if used, are always positioned is a fixed position on the form. The form will work best if Test Status is located to the right side of the form. You can insert other variables like “High Limit” and “Low Limit” in the form or any of the other variables that are in the list. By double-clicking on the fields, you can have them displayed or removed from the form.

Web Page Configuration

CONFIGURATION | WEBPAGE CONFIGURATION

The screenshot shows a window titled "Web Page Configuration" with a close button in the top right corner. The window is divided into two main sections: "Web Page" on the left and "Page Properties" on the right. The "Web Page" section has a list of pages, with "Login Form" highlighted. The "Page Properties" section contains three fields: "Style Sheet" to apply (with the value "mx_login.css"), "Background Color" (a dropdown menu currently showing "None"), and "Wallpaper" (an empty text box). At the bottom of the window, there are three buttons: "Save Changes", "Finished", and "Reset All Pages to Defaults".

For each of the web pages that are generated automatically by METEX, there are three properties that can be configured for each. To change the properties for a page, select the page from the list on the left, and modify its properties on the right. The background color can be selected from a drop-down list of available colors. Default file sheet names are automatically inserted for each web page. It is possible to modify these sheets. The "Style-Sheet" and "Wallpaper" properties are covered in more detail in Appendix B. Click **Save Changes** to save your work.

METEX Field Configuration – Web Page Properties

Clicking on **Reset All Pages to Defaults** will insert the default CSS file names. Default for the Wallpaper entry is set to "Blank" and the Background Color is set to "None".

Creating/Configuring Reports

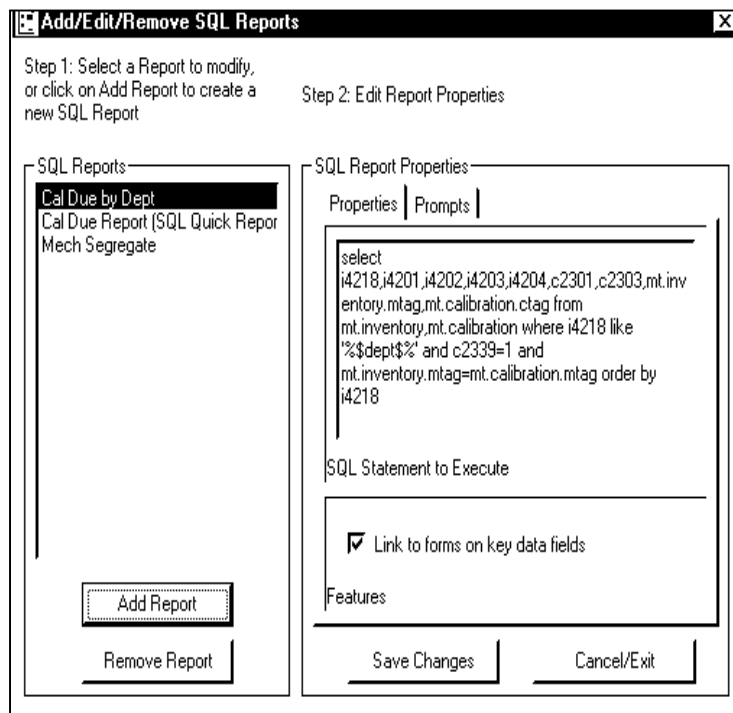
There are two types of reports that can be made available to METEX users: SQL and Crystal. SQL Quick reports are simple database queries that return a set of data that is then displayed to the user in a report-style format. **You must have Crystal Reports version 10 to use Crystal Reports with METEX 1.2.**

SQL Quick Reports

REPORTS | ADD/EDIT/REMOVE SQL REPORTS

Here you can draft SQL statements to be read directly by the database engine (server). Writing a direct query can be more versatile and faster than calling a standard Crystal report. If you are unfamiliar with writing an SQL statement, please use the Crystal Reports writer to make a report to be called by METEX. If you are familiar with SQL, keep in mind that you won't be able to write destructive commands here; only queries are allowed.

To add a new SQL report, click **Add Report**. You will be prompted to type the name of a new report.



Under the PROPERTIES tab, type in the SQL statement you want to have METEX execute. Some examples of SQL statements, along with a discussion of using more advanced SQL queries in METEX are covered in Appendix C.

You can also provide prompts (questions) to the user. These prompts can be used to limit the query to more specific data, such as inventory for a certain department, or calibrations due by a certain date. SQL prompts are handled simply by replacing a key phrase in the query with information that the user enters. For example, to select a list of instruments for a certain department, create an SQL statement to select these instruments, but instead of specifically naming the department, put a key phrase such as \$DEPT\$ in the SQL statement where the department would normally go. Consider the following statement:

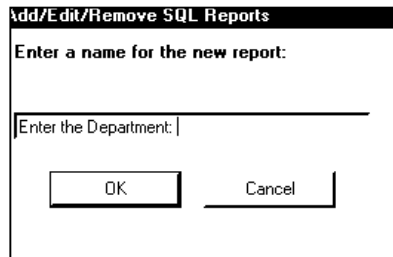
METEX SQL Quick Reports – Adding a Report

```
SELECT I4201,I4202,I4203 FROM MT.INVENTORY WHERE I4218 = '$DEPT$'
```

The object of the prompt is to ask the user a question when the report is run ("What department?"), and replace the \$DEPT\$ text in the SQL statement with whatever the user enters in response to the question. For example, if the user enters "218" for the department, then \$DEPT\$ in the above statement becomes "218". Thus, when the query is run, only instruments for department 218 are returned.

To create prompts for your reports, click the PROMPT tab and then click **Add Prompt**. Follow the steps as they are displayed to you.

Step 1:



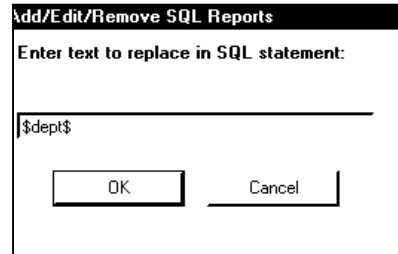
Enter the question you want to ask a user. Usually this means asking the user to type in a date, department or other information that the report needs. In the Prompt, it may be a good idea to indicate how long the entered value can be. Try to make the prompt convey a clear message. Prompts will not use validation files from MET/TRACK.

Adding an SQL Prompt – Step 1

Step 2:

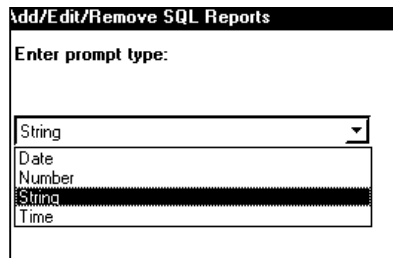
Enter the text string you intend to substitute in the SQL statement. In the example listed above, you would enter "\$DEPT\$" here.

It's a good idea to use the "\$" as a way of identifying to the administrator, which items in the SQL statement is a prompt.



Adding an SQL Prompt – Step 2

Step 3:



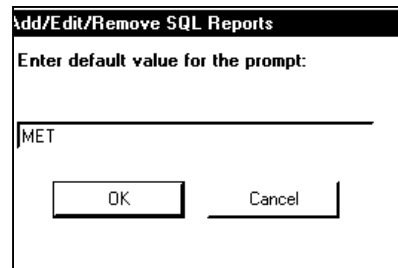
From the drop-down menu, choose which data type your are expecting in response to the question. All fields in MET/CAL have a certain type of data that they may contain. Some fields can contain only certain types of data such as date fields. You'll need to tell METEX what data types to expect so that the answer may be formatted properly.

Adding an SQL Prompt – Step 3

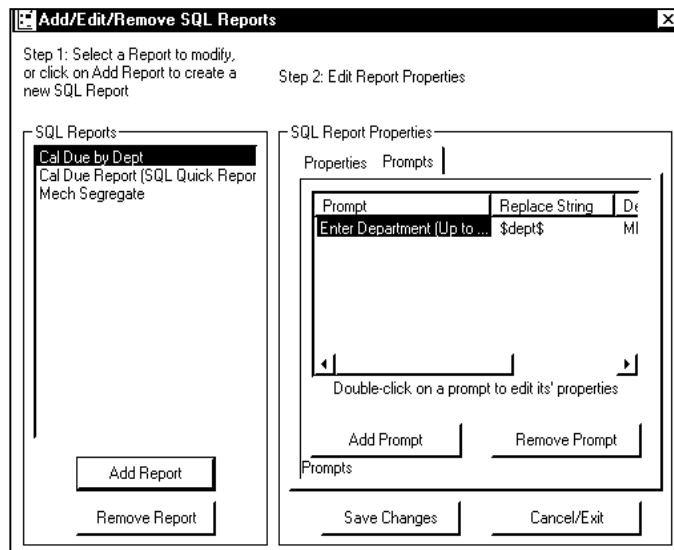
Step 4:

Enter a default syntax you want to present to the user before data is entered. Sometimes this is useful to show the user just exactly what format you expect the user to input information. It may also speed report execution if the majority of users enter the default text.

The example shown has a default value for MET. The operator will enter the department. This database could also use the segregate field to designate differences between MECHanical, ELECTrical, and PROCess and use that for the prompt.



Adding an SQL Prompt – Step 4



After entering in the prompt, it will be displayed in the "Prompts Window". You can Edit all the parameters of the Prompt, except for the Prompt message to the operator. If you need to change the prompt message to the operator, then you will need to remove the prompt and then re-enter it.

Editing a prompt is accomplished by double clicking with the mouse. You can also add additional prompts for the operator to fill in.

When creating a report with prompts, it is recommended to minimize the number of prompts displayed to the operator to reduce confusion when entering data.

Adding an SQL Prompt – Main Screen with Prompt

Example Output from a SQL Quick Report

Asset Number	Manufacturer	Model	Description	Serial Number	Cal-date	Due-Date	User Name	Checkout Date
SAMPLE-8842	Fluke	8842	DMM	884200987	08/14/1998	08/13/1999	D. RAWLINS	06/23/1999
SAMPLE-11	Fluke	11	DIGITAL MULTIMETER	1100110001	06/04/1999	06/02/2000	J. BENSON	06/23/1999
SAMPLE-10	Fluke	10	DIGITAL MULTIMETER	10101010	07/25/1999	07/24/2000	R. ISAAC	06/23/1999
SAMPLE-87	Fluke	87	DIGITAL MULTIMETER	87001001	08/11/1999	08/10/2000	B. EICHNER	06/23/1999
SAMPLE-732	Fluke	732	DC REFERENCE STD	732000001	07/02/2002	07/21/2004	D. DEEVER	06/23/1999
M651259	Fluke	97	OSCILLOSCOPE/MULTIMETER	DM547273	04/08/2004	10/08/2004	M. Nicholas	04/05/2005
TDS210	Tektronix	TDS210	OSCILLOSCOPE	B013767	04/14/2004	10/14/2004	R. Lynde	04/05/2005
TDS420	Tektronix	TDS420A	OSCILLOSCOPE	B010251	05/27/2004	11/26/2004	D. Fillpot	04/05/2005
SAMPLE-5725	Fluke	5725A	BOOST AMPLIFIER	572500001	07/02/2002	12/17/2004	D. DEEVER	06/23/1999
SAMPLE-5500	Fluke	5500A	CALIBRATOR	4820000	07/02/2002	12/17/2004	A. CASE	06/23/1999
1342695	Fluke	PM6680	COUNTER, TIMER	601-973	06/23/2004	12/23/2004	D. Scott	04/05/2005
TDS540B	Tektronix	TDS540B	OSCILLOSCOPE	B010656	06/24/2004	12/24/2004	D. Scott	04/05/2005
M652113	HP	44701A	VOLTMETER	2919A11809	03/08/2004	03/08/2005	D. Lynde	04/05/2005
HP44701A	HP	44701A	VOLTMETER PLUG-IN	2919A11120	03/28/2004	03/28/2005	J. DeGroot	04/05/2005
M637918	Fluke	87	MULTIMETER	53730315	04/23/2004	04/22/2005	D. Hermann	04/05/2005
M652759	Fluke	87III	MULTIMETER	84800330	04/28/2004	04/28/2005	D. Fillpot	04/05/2005
TDS520	Tektronix	TDS520	OSCILLOSCOPE	B022274	08/30/2004	05/04/2005	D. Lynde	04/05/2005
M652969	Fluke	97	OSCILLOSCOPE/MULTIMETER	DM5610164	06/08/2004	06/08/2005	D. Scott	04/05/2005
TDS784D	Tektronix	TDS784D	OSCILLOSCOPE	B022519	06/23/2004	06/23/2005	D. Fillpot	04/05/2005
M653079	Fluke	95	OSCILLOSCOPE/MULTIMETER	DM6060159	06/23/2004	06/23/2005	D. Hermann	04/05/2005

The output of this report only produced two assets. Notice that the Asset # and Cal-Date have links that are shown as an underline. If you click on these links, you will go to the actual MET/TRACK screen.

SQL Quick Reports are automatically formatted. They are not as formatted as the Crystal Report, but they are fast and easy to create.

Example SQL Quick Report

SQL Quick Reports and Segregation

Segregation is a popular topic because of security issues. Segregation allows the users to view only the section of the database that they are associated with. Remember, the segregate must exist first and the user must be part of a segregate. Let's look at an example. Let's assume that we have a user who belongs to the MECH segregate. He is only interested in mechanical tools. For your purposes, this segregate could be a department or a cost center. When this user logs in to look at the screens, the system will only retrieve information for this segregate. Here is an example SQL statement for segregation in reports:

```
select i4201,i4202,i4203,i4204,c2303 from mech.inventory,mech.calibration where c2339=1  
and mech.inventory.mtag=mech.calibration.mtag
```

Notice that we have to define the MECH segregate where the tables are linked together. If this user attempts to run a report for any other segregate, the system will generate an error screen and no data will be returned. If you segregate the database and the users, be sure to create reports for each segregate.

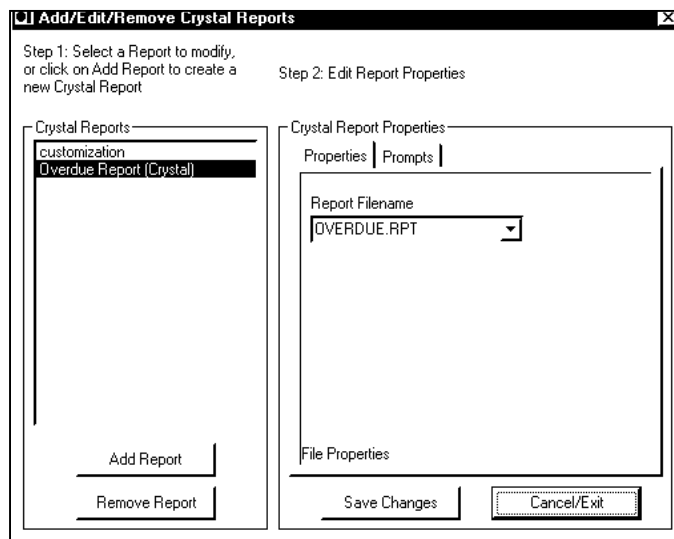
If you have several segregates, we suggest copying and pasting and then edit the segregate. For example, if we had an ELEcTrical segregate, we could paste the SQL statement in our new report and change the MECH to ELEC. Another helpful tip, when creating reports, try using the SQL Editor first. You can easily debug the report first, then add it to the administration program, and add the prompts last. The prompts will not work in the SQL Editor.

Crystal Reports

If you would like to have METEX execute a Crystal Report:

REPORTS | ADD/EDIT/REMOVE CRYSTAL REPORTS

To add an existing Crystal Report's report to METEX, you should have already created one in the Crystal Reports editor, and copied it to the shared MET/CAL directory (notes on configuring the CGI to use reports in this directory below) or the CGI-BIN directory on the server.



Adding a Crystal Report

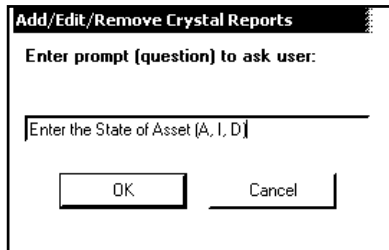
Step 1:

Make up a name for your new report. This name should somehow describe what the report does. Click **Add Report**.

Step 2:

Under the PROPERTIES tab on the right side, choose the filename of the Crystal Report to run. Note that this list of filenames comes from whatever directory has been defined under LOCAL CONFIGURATION. If this directory is not correct, then refer to the section of the manual describing the LOCAL CONFIGURATION for the METEX administrator.

Step 3:

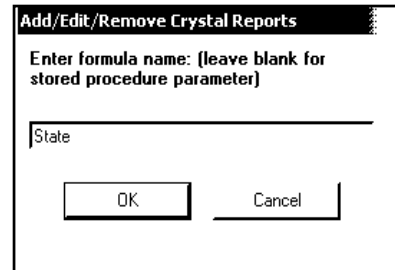


If you need to add prompts (questions) to users, click on the "prompts" tab and add the prompt. Prompts for Crystal Reports are created just like prompts for SQL reports. You may want to enter options in the actual prompt text. For example, the State of the asset can be (A)ctive, (I)nactive, or (D)eleted.

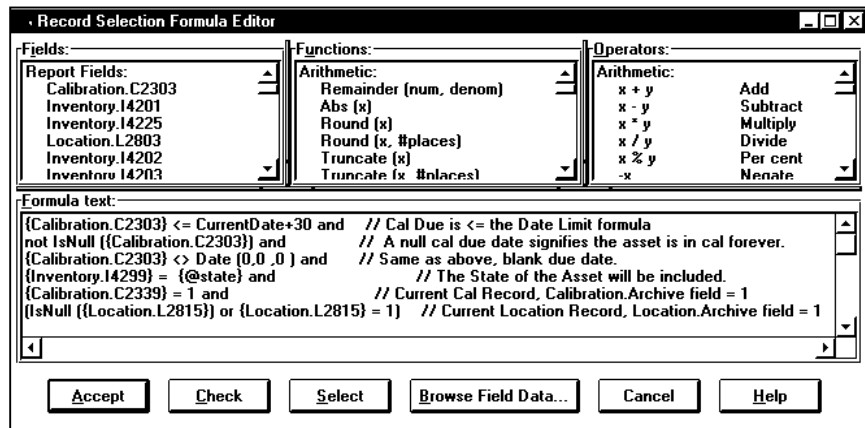
Adding a Crystal Report Prompt - Step 3

Step 4:

Next, you are asked to enter a formula name rather than text to replace. The response to the prompts by the user is entered into the formula specified. When the report is run, the user-entered response is given to the formula in the report. Your reports should use the contents of this formula for discriminating data to be used in the report. Using a formula is not always very efficient when running a report. This example assumes that the formula called "state" is used in the Edit Selection Formula in Crystal Reports.



Adding a Crystal Report Prompt - Step 4

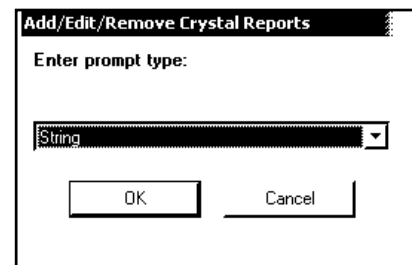


Crystal Report Prompt Edit Selection Formula

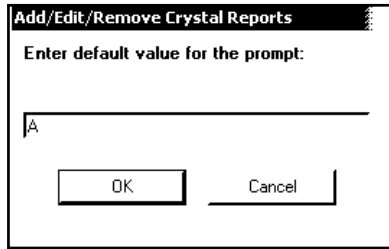
This picture shows the Edit Selection Formula of our example report. Notice that the @state formula is compared to Inventory field i4299. If 'A' is entered in the report prompt, then active assets will be selected. If 'I' is entered, then Inactive assets will be selected. The administrator needs to have proper training on creating Crystal Reports to make use of formulas.

Step 5:

Enter the Prompt type. In our example this is a String. Prompt types can be Strings, Dates, Numbers, or Time.



Adding a Crystal Report Prompt - Step 5

Step 6:

In our example, we are using a default value of 'A' which will select Active Assets.

Adding a Crystal Report Prompt - Step 6

Click **Save Changes** to save your work.

Metex.ini File

METEX has the capability of running Crystal Reports either from the CGI-BIN directory on the server, or if the server has access to the shared METCAL directory, can execute reports from there. For security reasons, it is better to copy the reports to the CGI-BIN directory, but if you would rather run the reports from the METCAL directory, follow these steps:

- 1) On the server that the METEX CGI was installed on, in the directory where the CGI was installed, create (or modify) a text file named metex.ini.
- 2) In this text file add the statement "METCAL=" and add the drive and directory where the shared MET/CAL files are located. It also can be configured to use a different ODBC data source other than METEX. Here is an example of a METEX.INI file that identifies the reports location and a different ODBC data source:

```
METCAL=D:\METCAL
DATASOURCE=Calibration Data
RUNDIAGS=OFF
```

Note: After creating any report, either SQL or Crystal, it must be given permission to execute by a group. If you do not have specific groups created, then the default "MT" group must be given permission to execute the report. Refer to the section of the manual that discusses GROUP PRIVILEGES in the METEX administrator for details on allowing a group to execute a report. For security reasons, the new report is not allowed execution by any group until it has been specifically designated for execution by a group.

Segregation and Crystal Reports

Segregation with Crystal Reports is possible, but you will have to build the reports with the Segregated Tables. If you have a report that uses "mt.inventory" for the inventory table, the corresponding segregated table will have to be used. For example, if you have a group of users connected with a MECHANICAL segregate, then the inventory would have to be mech.inventory. A drawback of using Crystal Reports for segregation is that there is not an easy way to convert a report for all users to a report for segregates. You will also have to use the historical tables that are also segregates. A simple report for our example would link "mech.inventory" and "mech.calibration" with mtag.

A good way to test your report is to run it in Crystal Reports first before adding it to METROLOGY XPLORER.

Example Crystal Report

UNIT UNDER TEST:	Tektronix TDS520 OSCILLOSCOPE	TEST RESULT:	FAIL
SERIAL NUMBER:	B022274	PERFORMED ON:	27 August 2004
ASSET NUMBER:	TDS520	DATA TYPE:	AS-FOUND
PROCEDURE NAME:	Tektronix TDS520: (1 year): VER.IEEE/5300-SC600 : 1.00	TEMPERATURE:	24.00 *C
PROCEDURE REV.:	\$Revision: 1.00 \$	HUMIDITY:	42 %
CALIBRATED BY:			
P.O. NUMBER:			
CUSTOMER:			

Hotshot Calibration Services certifies that the above listed instrument meets or exceeds all specifications as stated in the referenced procedure unless otherwise noted. It has been calibrated using measurement standards traceable to the National Institute of Standards and Technology (NIST), or to NIST accepted intrinsic standards of measurement, or derived by the ratio type of self-calibration techniques. This calibration complies with MIL-STD-45662A and ANSI/NCSL Z540.1-1999 (R2002).

This report may not be reproduced, except in full, unless permission for the publication of an approved abstract is obtained in writing from the calibration organization issuing this report.

Note: Any Test Uncertainty Ratio (TUR) that is less than four to one will appear under the "TUR" heading on the data record. If the TUR meets or exceeds four to one, the field is left blank.

REMARKS: LIMITED CALIBRATION - AUX 1 BANDWIDTH = 490 MHz - Demo data

Standards Used

Asset #	Description	Cal Date	Due Date
SAMPLE-5500	Fluke 5500A CALIBRATOR	7/2/2002	12/17/2004

Test Results

Test Description	True Value	Test Result	Lower limit	Upper limit	Units	TUR
UNIT IDENTIFICATION						

This is an example of a Crystal Report for Assets grouped by status. It takes longer to run, but the report has more formatting available.

Example Crystal Report

Date Formats for SQL Quick Reports and Crystal Reports

For SQL Quick Reports and Crystal Reports you must enter the date in the following format: MM/DD/YYYY. For example, our SQL query could read as follows:

```
select i4201,i4202,i4203,i4204,i4223,c2301,c2303,mt.inventory.mtag,mt.calibration.ctag
from mt.inventory,mt.calibration where c2339=1 and C2303 <= '$enddate$' and
mt.inventory.mtag=mt.calibration.mtag order by c2303
```

Notice that the variable \$enddate\$ is enclosed in single quotes. When using a Crystal Report, you must enter the Formula Name used in the report into the prompt.

There are some additional tools that you can use in the prompts for date and time. If you enter the word "today" as the default value for a date, the operator will see the current date in the prompt. This keeps the date prompt with a current date and the operator can still enter a different date.

If you enter the word "now" as the default for a time, the operator will see the current time in the prompt and will still be able to enter a different time.

Using Cal Lists with Crystal Reports

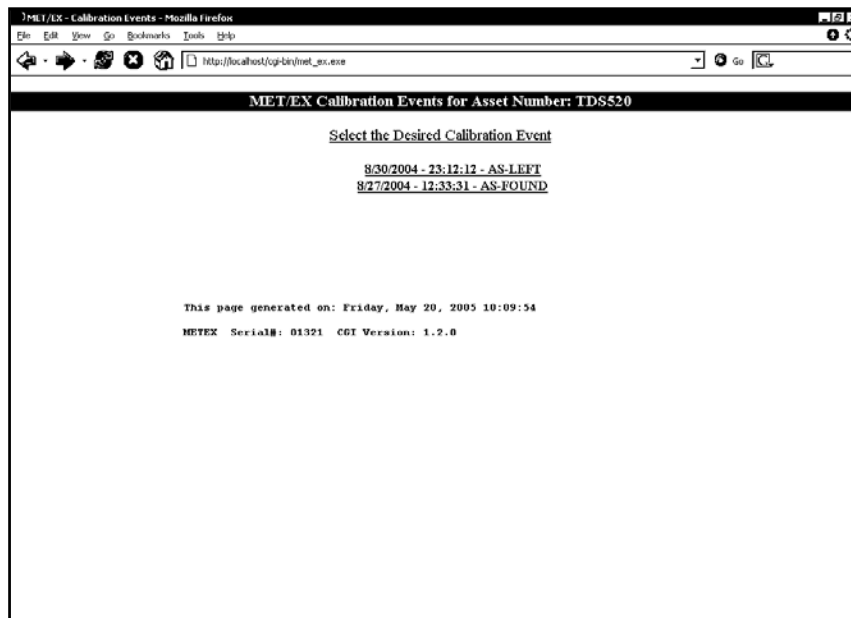
A new feature of METEX 1.2 is the use of stored procedures and being able to select a cal history for the report. This was a much-requested feature from our customers. There are basically two types of Crystal Reports:

- Reports that use individual tables that are linked together.
- Reports that use stored procedures.

Stored procedures have the advantage of running very fast. MET/TRACK uses stored procedures for reports such as calibration certificates. With METEX 1.2, you can run a report that uses a stored procedure for calibration results. There are some rules:

- The procedure that is called must use ASSET_CTAG for the parameter. However, in METEX, you create a prompt that will ask for an asset number. METEX knows that a report using a ASSET_CTAG will require an asset number prompt.
- Using a stored procedure with a ASSET_CTAG parameter will automatically display a list of calibration events. These events are sorted by Cal Date, Cal Time, and Found/Left status.
- At this time METEX only supports stored procedures using ASSET_CTAG as the parameter.
- You must create a prompt for the UUT Asset Number to run reports with the stored procedure.

When you run a report, METEX will prompt for the asset number and then a list of cal records is displayed. Here is an example:



Calibration Lists Display using Crystal Reports

After this list is displayed, you click on the link for the desired report and the report will be displayed.

There are some things to note. First, if you want to print more than one report calibration history for the same asset, you will have to click at least twice on the same link to reset the report to the new history.

It is probably preferable to go back to the report prompt for the asset number and start over. If you click a link and the report does not display after the Windows hourglass disappears, click the link again.

When running a Crystal Report, please be patient. These reports take longer to run because there is a conversion process to display the report in HTML.

Basic Security Topics

When first installed, METEX does not ask for user identification (logins). All activities are performed as part of the default "MT" group. Adding/Removing/Editing groups are covered in the section titled "Advanced Security Topics".

For convenience, it is possible to add and modify MET/CAL/EX users from the METEX administrator. The METEX administrator includes the same options allowed in the Fluke DB Setup utility, and also includes functionality for METEX as well.

USERS/GROUPS | ADD/MODIFY USERS –

This is where you will add new users or modify current users in your MET/CAL - METEX database.

The screenshot shows a window titled "Add/Modify Users" with two panes. The left pane, "Usernames", lists users: doug3, doug5, FLUKE, fluke1, Fluke3, Guest, jim5, METWEB. The right pane, "User Properties", has fields for Password, Confirm Password, Level (3), Segregate (MT), Group (MT), Security, Real Name (Doug Lynde), Labor Rate, and a checked "Allow MET/EX Use" checkbox. Buttons for "Add User", "Save Changes", and "Cancel/Exit" are visible.

In the pane on the left, you will find listed the users that are currently inside your database. The current information for that user will be displayed as default. To modify any user, highlight his or her user name and modify their information on the right side.

The PASSWORD, CONFIRM PASSWORD, LEVEL, SEGREGATE, and REAL NAME entries are the same as entries made in the Fluke DB Setup utility. Choose a group from the drop-down list that the user should belong to and insert the labor rate (if you use labor rates) for that user in the LABOR RATE box. If you have not created any groups, then assign the user to the default "MT" group.

Adding users to the Database

Some changes require the user's password in order to make the change. Changing the user's segregate, level, and password all require the knowledge of the user's current password in order to change. If you are not prompted to enter a password when making a change, then it is not required and the change is made for you when you click Save Changes.

The box "Allow METEX Use" is only functional if you have enabled METEX security (require logins).

Advanced Security Topics

Overview

When first installed, METEX does not have user logins enabled by default. The permissions of all users that access METEX are those of the default "MT" group.

Without first "activating security" in METEX, users will not be asked to login and therefore cannot be assigned privileges or access rights. When users log in, METEX determines what privileges to assign based upon the group the user is assigned to. After a user has logged in, the session is assigned an identification that is stored in the web browser in the form of a "cookie". Session properties are discussed later in this section.

Security features are first activated in the METEX Administrator by selecting the following menu options:

SECURITY | CONFIGURE SECURITY FEATURES



Check this box to force users to log into your database. Remember that the users will need to have "cookies" enabled on their browsers for session settings to be recorded. Refer to the help menu in your browser about cookies if you are unsure about how to enable this feature.

After selecting the "Require Users to Log In" option, users will be asked to login using their MET/CAL usernames and passwords. After a successful authentication, a session confirmation is sent to the web browser and the user may proceed to access METEX.

Click **Save Changes** to save your work.

Enabling Security Login

Group Creation/Modification

A group is a collection of users that share the same privileges. You may choose what reports the group can execute, when members of the group can access METEX, and other such functions. When METEX is first installed, the default group of "MT" is created, and all users assume the privileges of this default group.

Assigning users to groups allows the administrator to tailor privileges for several people at once, and also allows for easily expansion of the user base.

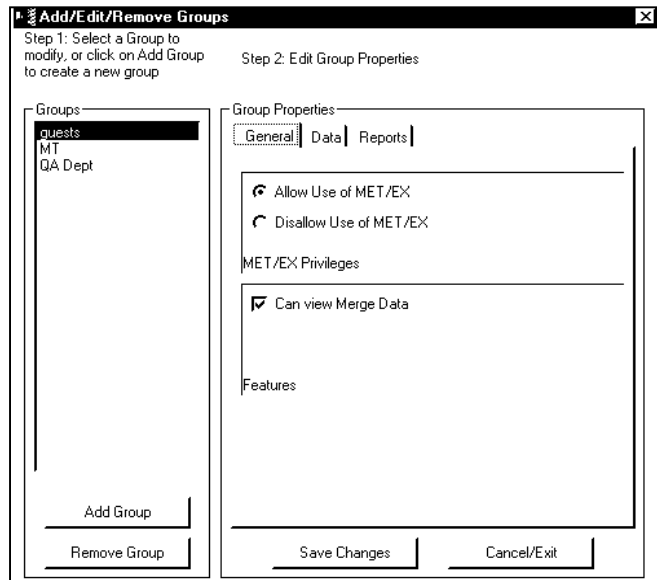
For example, you could create a group for technicians, assign privileges and reports appropriate for technicians, and assign users (technicians) to this group. You could have a group for managers and have privileges appropriate for managers, along with reports that are useful for managers.

To create or modify groups, use the METEX administrator and select the following menu options:

USERS/GROUPS | ADD/EDIT/REMOVE GROUPS

To create a new group, follow the steps listed below:

Step 1:



Create a new group by clicking on **Add Group** and entering a name for the new group in the box that appears and click **OK**. The group name should be somewhat descriptive to what the group does, such as 'validation' or 'QA'. You may also remove a group by highlighting the group and then clicking the REMOVE GROUP button. Keep in mind that all new users that are created are assigned to the MT group. Afterwards, you may put these users into another group. **When adjusting the features in the following sections, make sure that you have highlighted the correct group.**

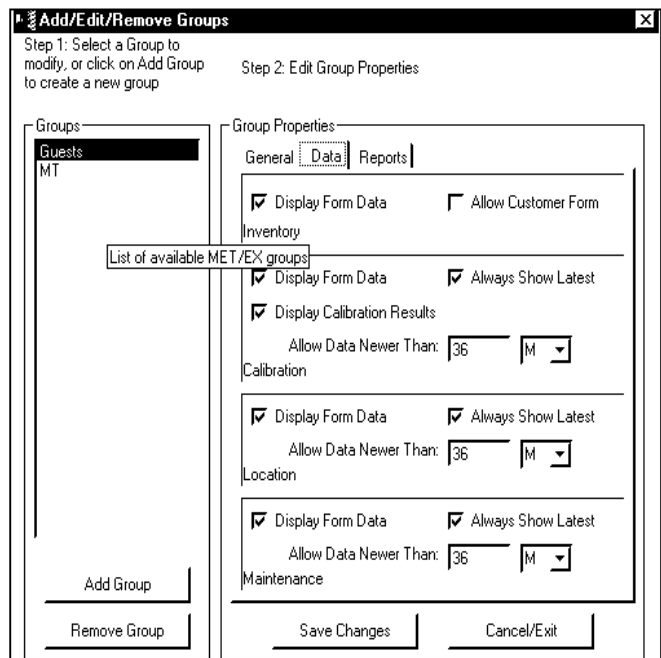
Adding New Groups

Step 2:

Adjust the properties of the group. On the GENERAL tab, you can allow or disallow the group to use METEX by toggling the radio buttons. You also can allow or disallow the group to view merge tables by checking or unchecking the CAN VIEW MERGE DATA box. Merge tables are tables that are associated with fields in a particular table. When you check this box, the title of the merged field is hyperlinked in the user's browser. Refer to your Fluke manual for more information on merge tables.

Step 3:

On the DATA tab, choose what forms the groups will see by checking the DISPLAY FORM DATA box for the appropriate table (Inventory, Customers (version 6 and 7 of MET/CAL only), Location, Calibration, Maintenance). For example: If you don't want a group to see the Location screen, then you would uncheck the DISPLAY FORM DATA box for location.



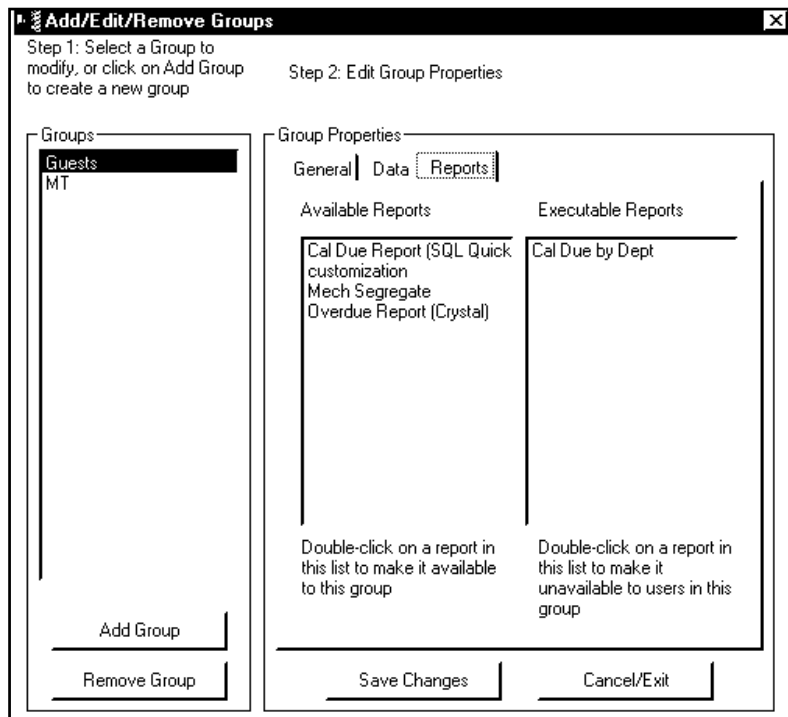
Configuring Group Data Properties

Step 4:

Determine how far in the past a group can view calibration records. Enter any natural number (positive integer) and pick a letter (D)ays, (M)onths, (Y)ears for the ALLOW DATA NEWER THAN boxes. Check the ALWAYS SHOW LATEST boxes if you want to show the latest records first.

NOTE: The Maintenance Forms in MET/TRACK work differently than the other historical records. There can be several current records, one for each maintenance type. If you check the "Always Show Latest" record box for Maintenance, then multiple records may appear, but they will be the current record for that Maintenance type.

Step 5:



Configuring Group Report Properties

In the REPORTS tab, you will find two panes. The left pane contains reports that are available for use, but cannot be executed. The right pane contains reports that can be executed. To make a report executable by a group, double-click on the report in the left pane to place it in the right pane. To make any report unavailable for use by a group, double-click on it from the right pane to place it in the left pane.

In our example, our Guest group will only be able to run the "Cal Due by Dept" report.

When you are finished in this section, click **Save Changes** and **Cancel/Exit**.

Sessions

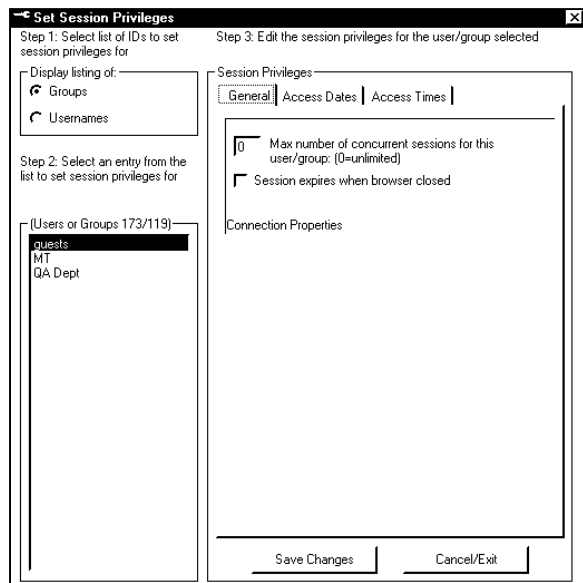
A session is a period of access time beginning with the initial login of the user and lasting until a date/time configured by the METEX administrator. If the user attempts to login to METEX at a time that falls outside of the allowable session date/time range, then the login attempt is denied. You may define session privileges by group and by user. Thus, while a user is a member of a group that has certain session privileges, you may further restrict that user's access while still allowing the rest of the group to have normal group session privileges.

To modify session privileges for a user or group, select the following menu options from the METEX administrator:

SECURITY | SET SESSION PRIVILEGES

Follow the below listed steps to configure session privileges for a user or group.

Step 1:



Choose to modify a group's or an individual's privileges by clicking the radio button for either **GROUPS** or **USERNAMES**. The appropriate list will show up. Highlight the group or username.

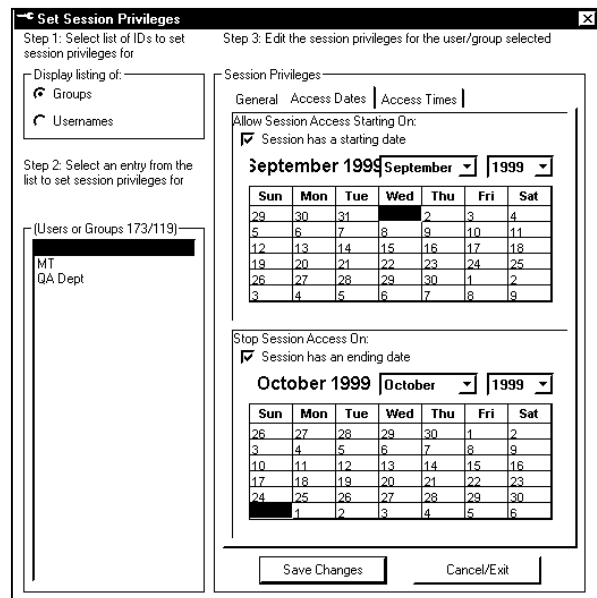
Step 2:

Modify the properties. On the **GENERAL** tab, set the number of browser windows that can access the database at the same time. Also, check the **SESSION EXPIRES WHEN BROWSER CLOSED** box if you want the user to automatically log out after they close their browser window. Set the maximum number of instances of active browsers that may access the server at any one time. Keep in mind that this will allow the user to still use other browser instances for other tasks.

Configuring Group Report Properties

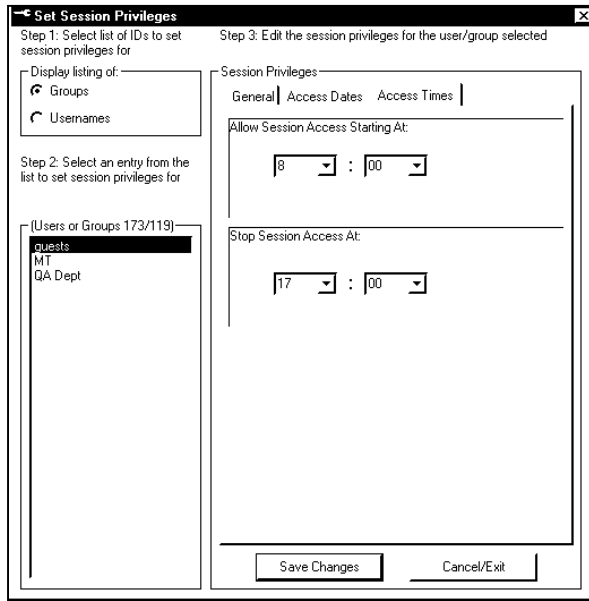
Step 3:

Set the session access date range. If you have specific requirements regarding dates that a user may log in, such as for contractors, then check the checkbox either for start, stop, or both dates. A calendar will appear with the current date as default. Using the drop-down menus, select a month, year and day for the events to occur.



Configuring Group Access Dates

Step 4:



Configuring Group Access Times

Set the access times. To set when a user or group may log in during the day, set a specific time. For example, if you have shift work, then you can allow only swing-shift workers to view their data after they show up for work by setting the time they normally come in for work.

In our example, the guest group will be able to log in from 8:00 AM to 5:00 PM.

Next Page

Section 4 – Browser Configuration

Using your Browser

Now that you have installed the Web Server, the CGI, and the Admin Program, how do you actually get data to display on the browser? Your situation may differ because there may be issues with proxy servers. These instructions will help get you started.

Start your Web Browser and make sure you have cookies enabled. Type in the following URL:

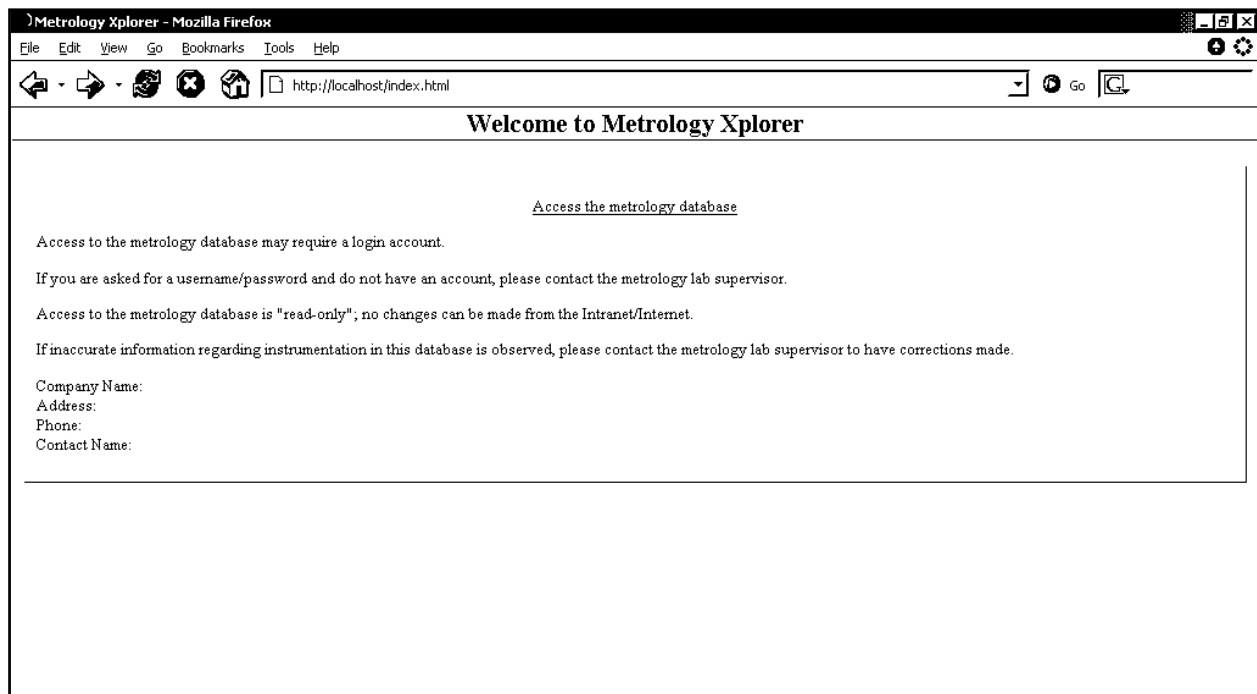
Apache Web Server System:

<http://<your server name>/index.html>

IIS Web Server System:

<http://<your server name>/default.htm>

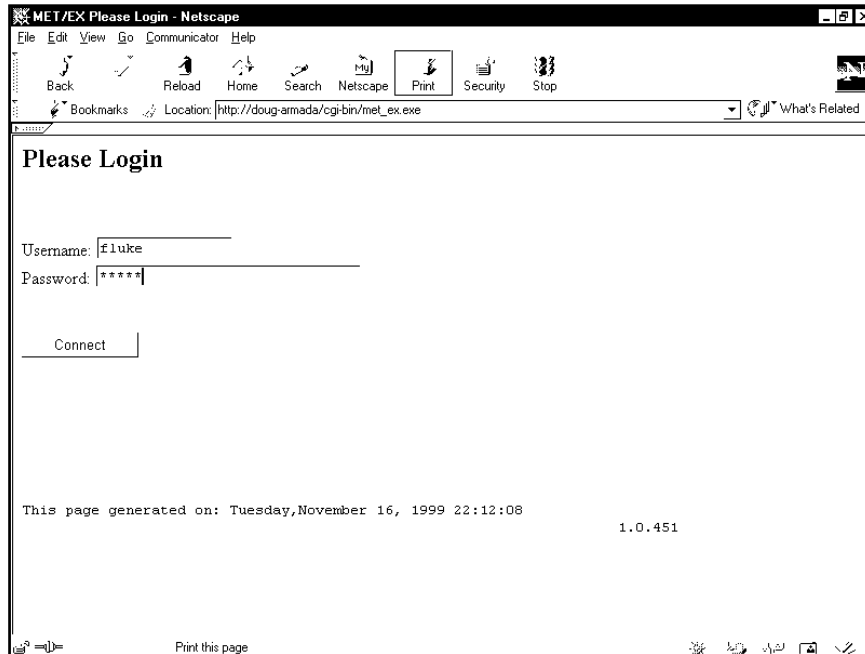
You may not have to type in the index/default part, but it is probably a good idea. Here is the system default screen:



Initial Screen for METROLOGY XPLOER

The example shown has local host in the URL for our example. You or your company can modify this initial page to add graphics, special text, or some other information. The following pages will be automatically generated by the METEX system.

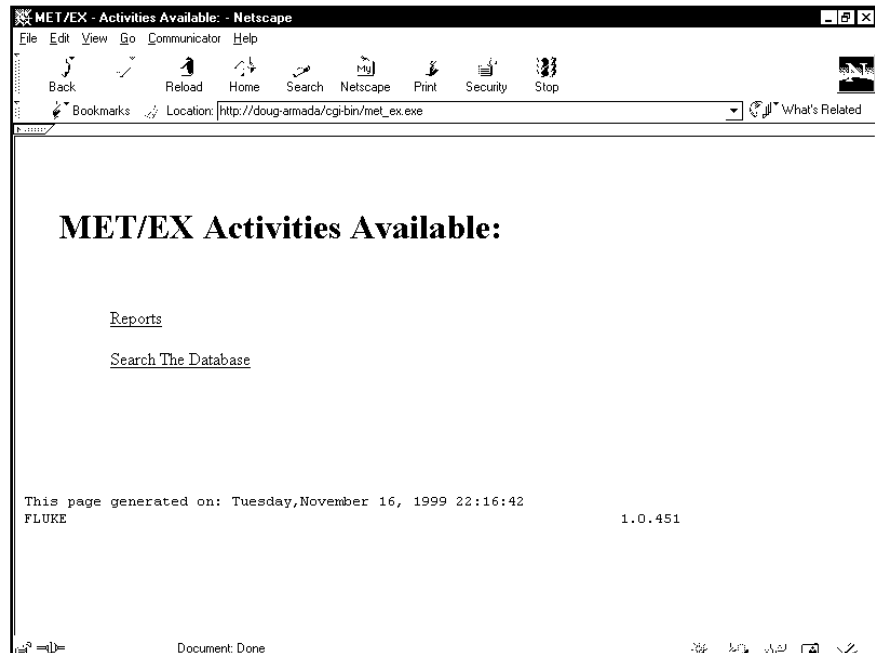
If security is enabled, you should see the following screen:



After Logging in you will be presented with a screen either accepting your password or denying it. After you continue, you will access the METEX activities screen.

System Login Screen

The METEX Activities Screen will display Reports, Search The Database, or both links, depending on the configuration for the user. At the bottom of the screen is the date the page was created and the user login. Click on the desired link to go to the next screen. We will click on Search the Database.



Activities Screen

This is the Search Screen that is automatically generated from the MET/TRACK Database in our example. Your screen will look different. We are going to type 87 in the Model field and search for Fluke 87's. You can use wildcards. METROLOGY XPLORER supports the "*" and "?" characters. A search using the 87* will return any model number starting with 87 whether or not there are following characters. A 87? will return a model number starting with 87 and an additional character.

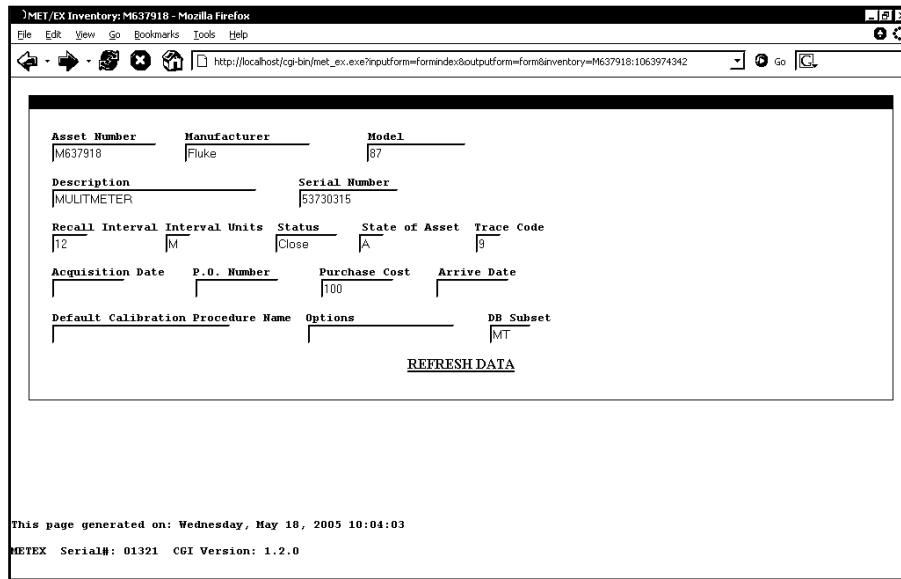
You can also search on a combination of fields.

Example Search Screen

Our Search returned three assets. What is displayed is called the Treeview. From the Treeview, you can click on a link and go to the desired screen. Remember, the system can be configured to limit events and the amount of history displayed on a per user basis.

We are going to click on the Inventory View for our example.

Example Tree View



Here is the Inventory Screen in our example. Your screen will look different. Notice that Mfg is underlined. This is a link to a merge table.

Remember, you will need to tune your browser for field title alignment. This was covered under the administration section.

Example Inventory Screen

From here you should be able to navigate the system. Be sure to click on the "Back" button in your browser to go to previous screens.

Appendix A: Using different servers for the database and web services or serving multiple MET/CAL databases

Overview

The instructions for installing and configuring METEX are written using the assumption that you are installing the web server and CGI to the same computer that is serving your MET/CAL database, and you are only providing access to a single database. If this is not the case, then the following instructions will assist in the process of setting up METEX to run under these different conditions.

Warning: Using separate computers for the database and web serving functions has serious performance implications! It is not recommended that you use this configuration! In most cases, you can expect a reduction of 3-4 times (3-4x increase in delay times) using this configuration. In some cases, the use of METEX is impossible due to significant delay times and huge increases in network traffic. The use of separate machines for METEX should be carefully decided, since the use of this configuration can nullify any benefits of providing access through a web browser due to the impaired performance of the configuration.

The instructions for providing access to multiple MET/CAL databases assume that you are running multiple databases on the same server/database engine. If you are using separate servers for each database, then you may use the normal METEX installation methods for each server. If you are using multiple METEX installations on the same site, then special licensing methods are required. Please contact On Time Support using one of the methods listed on the back cover of this manual to inquire about the licensing restrictions of METEX.

Installing METEX on a server that is not running the MET/CAL database

Please note the warning listed above. Again, this is not a recommended configuration.

If you need to install METEX on a server that is not running the MET/CAL database, then follow these instructions, referring when instructed to the appropriate section of the manual that gives details on the installation/configuration topic.

1. On the computer that is to become the web server, choose and install a web server software package. If you choose a web server that is supported in the METEX documentation, then you may follow the instructions in this manual for installing and configuring the web server. Please note that any mention of an IP address during the installation of the web server refers to the computer that you are installing the web server software on, not the MET/CAL server.
2. You will probably need to install the 32-bit Sybase SQL Anywhere client software on the web server. This will allow the web server to connect to MET/CAL. Follow the instructions in the appendix titled "32-Bit Sybase SQL Anywhere Client installation".

3. Configure ODBC on the web server. Follow the instructions listed in the chapter titled "ODBC Configuration". It is recommended that when entering the "Start Command" properties of the data source, to add the following parameter:

```
{host=xxx.xxx.xxx.xxx}
```

Add this to the end of the "Start Command" line immediately after the "-x tcpip" (no spaces following the "tcpip"). Replace the "xxx.xxx.xxx.xxx" with the IP address of the **MET/CAL** server.

4. Install the METEX CGI onto the web server, using the instructions in this manual.
5. Install the METEX administrator utility as normal, and register the software.
6. Test the operation of METEX, remembering that the IP address to be entered into the browser is for the web server and not the MET/CAL server as described in the instructions. All future references to METEX by web browsers should be directed to the web server.

Serving multiple databases on the same server

Installing and configuring METEX to serve multiple databases is straightforward, involving only a few additional steps to the regular installation and configuration. Here are the steps to perform if you want METEX to serve multiple databases on the same server:

Step 1:

Install a web server software package on the MET/CAL server using the installation and configuration instructions provided in this manual.

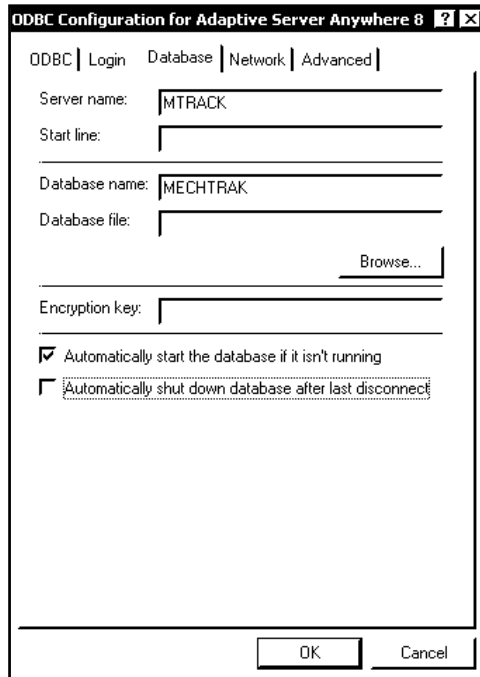
Step 2:

After the web server software has been installed and configured, you will need to create additional directories under the "cgi-bin" directory that was created during the web server software installation/configuration process. For each MET/CAL database that is being served by the database server, you must create a directory under "cgi-bin". It is a good practice to use short, descriptive names for these directories. For example, let's assume that you have two databases being served by a single SQL Anywhere database engine on the database server. One of the databases is for electrical assets and the other is for mechanical assets. In this example, you could create two directories under "cgi-bin"; one directory named "elec" and the other "mech".

Step 3:

Create and configure a single data source **for each database**. For the example system given in the previous step, two data sources would need to be created, one for the electrical database and the other for the mechanical. When creating the data sources, use descriptive names. Do not use "METEX" as the name for one of the data sources since it does not describe what database it connects to. It is recommended to use a more descriptive name, such as "Electrical", to assist with troubleshooting or upgrading METEX later. When configuring ODBC to connect to a database engine that is serving multiple databases, you will also need to specify the database file name in the "database name" blank. Your ODBC entry should look similar to the following picture:

You will need to enter the Server Name and the Database Name that match the configuration of your system.



Step 4:

Install the METEX CGI application into **EACH** of the subdirectories that you created in step 2. You do not need to restart after every installation, but you will need to restart after the final copy of the CGI has been installed. If it is more convenient, you may install the CGI into the first directory, and then copy the complete contents of the directory into the others that you have created.

Step 5:

Using notepad, or another text editor, create a file named "metex.ini" in each of the directories that you created under "cgi-bin". The contents of the file should look like the following:

```
DATASOURCE=xxxxxxxxx
CGIBIN=yyyyyyyyyy
```

Configuring ODBC Sources for Multiple Databases

Where "xxxxxxxx" is the ODBC data source that connects to the database that the directory was created for. For example, in the previous situations listed above, in the "mech" directory, create the metex.ini text file and make the first line of the file "DATASOURCE=MECHANICAL". This will allow the CGI application located in the "mech" subdirectory to connect to the mechanical database.

Set "yyyyyyyy" equal to the directory where the CGI resides. For example, if you installed the CGI in the "mech" directory under "cgi-bin", then replace "yyyyyyyy" with "/cgi-bin/mech". NOTE: Use **forward** slashes, not reverse ones like are used with DOS and Windows. Forward slashes are the standard for web servers.

Do this for each of the subdirectories that you created.

NOTE: If you use "Notepad" to create the metex.ini file, the file may actually be named "metex.ini.txt". If this happens, you will need to change the name of the file back to "metex.ini". If the file does not have the name of "metex.ini", then the CGI will be unable to connect to your database!

Step 6:

On the client computer that has been designated as an administrator workstation, create multiple 32-bit ODBC data sources just as you did in step 3.

Step 7:

Install the METEX Administrator as usual and register the software. Please note that you will need to perform the registration process for each database, selecting the appropriate data source for connection to the database that you wish to register.

Step 8:

In order to administrate each METEX system (you have a separate system per database), you need to configure the METEX administrator as to be able to connect to the particular database that you wish to administrate. The easiest way is to create separate "shortcuts", one for each METEX system that you need to administrate. Create multiple shortcuts on your desktop to the METEX administration utility (webadmin.exe). On the command line, add the data source name after the path to the administration utility. For example, to connect to the mechanical database using the "mechanical" data source, use the following command-line example:

```
M:\metcal\metex\webadmin.exe mechanical
```

This example assumes that you have installed the administration utility to the "M" drive, in the "\\metcal\metex\" directory.

Step 9:

In order to view one of the METEX systems with your web browser, you need to direct it not only to the MET/CAL server, but also to the correct directory that contains the CGI that will connect to the correct database. Using the examples given previously, if you wanted to view the mechanical database, you would enter the following URL into the web browser:

http://xxx.xxx.xxx.xxx/cgi-bin/mech/met_ex.exe

By entering this URL, the browser accesses the CGI that connects to the mechanical database, because in the "mech" subdirectory the metex.ini points to the "mechanical" data source.

This means that on the main introductory web page (index.html or default.htm), separate links must be provided so that the different databases can be accessed. The existing link on the sample web page looks like this:

```
<a href="../../../cgi-bin/met_ex.exe">Access the metrology database</a>
```

You would need to add additional links (phrases just like what is listed above) for each database you would like to access. Modify the part containing "/cgi-bin/met_ex.exe" so that it (using the mechanical database example) reads "/cgi-bin/mech/met_ex.exe". You will probably want to change the link text from "Access the metrology database" to "Access the mechanical database", or something similar.

After completing these steps, it is a good idea to test each connection to the databases. Using your web browser, check each installation of the CGI by entering the URLs as listed above. Make sure that the CGI in that directory is connecting to the proper database by searching for individual assets that you know exist only in that database. You should perform this test on each of the METEX systems to verify proper connection to the intended database.

Appendix B: Customization of the METEX web pages

Overview

This section shows you how to customize the look of METEX. METEX comes to you pre-configured with default html pages. These pages can easily be modified in the METEX Administrator by using several options. The different options that may be applied are: "Background Color", "Wallpaper", and "Style Sheets". Style sheets contain html code that is used to modify the current html code in METEX's default pages.

Style Sheets

METEX retrieves all style sheets from the directory where your webserver application stores html pages, style sheets, code, etc. The default directory varies from webserver to webserver and may also have been changed manually by an administrator.

How to write a style sheet is beyond the scope of this manual. There are several books about how to write HTML code if you are not familiar with HTML or style sheets.

Step 1:

Inserting the style sheets is very easy. First, in the METEX administrator, select the CONFIGURATION | WEB PAGE CONFIGURATION menu options and simply select which METEX page you want to modify from the left under WEBPAGE.

Step 2:

Under PAGE PROPERTIES | STYLE SHEET TO APPLY, enter the filename only of the style sheet you want to apply. Remember, this filename must exist in the directory where your webserver keeps its style sheets. Typically, a style sheet filename ends in ".css".

Background Color

For the BACKGROUND COLOR, pick a color from the drop down box. You can have a different background color for each screen and be sure to pick the appropriate screen from the list.

Wallpaper

For WALLPAPER, insert the filename only of the background you want to use. This file can be in any format, but it must be in the same directory as your style sheets. It has been discovered that different browsers may not recognize certain file types like BMP's, GIF's and JPEG's. JPEG's are probably the preferred choice

You may also choose to use any combination of the above features and not all need to be used at once.

Appendix C: Advanced SQL Report Topics

Overview

The instructions in this appendix relate to the creation of SQL Reports for use with METEX, using more advanced linking techniques and other features of METEX relating to the display of results from an SQL query.

SQL Linking

If you have added an SQL report for use with METEX, then you may have noticed the option "Link to forms on key data fields". This option, when used in conjunction with a properly constructed SQL query, can allow METEX users to quickly view MET/CAL forms by clicking on a link in the report. For example, if you have a report that lists overdue instrumentation, you may allow a link to the Inventory form from the report. When a user runs this report, the asset number or "I4201" field is displayed as a link, and when the user clicks on the link, the MET/CAL Inventory form appears with information for that asset displayed. This can be a nice feature for your users.

Enabling this feature in a report requires two steps:

1. Create the SQL query, making sure to include the necessary columns (more on this later).
2. "Checkmark" the Link to forms option when adding the report in the METEX administrator.

The first step, creating the SQL query, involves adding a few columns to the query. The exact columns to add depends on the MET/CAL form you are trying to link to. Refer to the following chart for a listing of the additional columns that must be returned by the query in order for the link to be generated:

Form to display -----	Columns that need to be present in query -----
INVENTORY	I4201, MTAG
CALIBRATION	C2301, CTAG
LOCATION	L2809, LTAG
MAINTENANCE	R3230, RTAG

At this time, these are the only fields that can be linked (I4201,C2301,L2809,R3230).

For example, if you would like an inventory list containing asset number (linked), manufacturer, and model number, then the query would look something like this:

```
SELECT I4201,MTAG,I4202,I4203 FROM MT.INVENTORY
```

When the output from the report is displayed, the "MTAG" column is not displayed, but is used to form the link for asset number. If you include any of the "Tags" (MTAG, CTAG, LTAG, RTAG) in your query, and the linking option is check-marked, then the Tags will not be displayed. The Tags are only used in the creation of the links.

If you use stored procedures, or other such methods to produce results for a report, and want to use this linking feature, then simply make sure that the query returns columns with the same names as listed in the table above. The best method to test the return results for proper column inclusion is to run the query in a tool such as ISQL, and observe the output from the query.

“Merge Data” reporting

“Merge” data is additional information related to an entry in a field. For example, if you have an instrument with a manufacturer of “Fluke” listed in an inventory field, and would like to have additional information regarding Fluke (such as street address, phone number, etc.) stored in the database, you could create a Merge table using the database configuration tools provided with MET/CAL.

Merge data is contained in a database table created when you create the merge definitions. The name of the merge table is “mrg” and the last four numbers of the field that the merge is linked to. For example, if you create a merge table for the manufacturer field (I4202), then the merge table that this data is contained in would be named mt.mrg4202.

To include data in the merge table in your SQL reports, you must link the merge table with the field that the merge data is based on. In the above example, the merge table, mt.mrg4202, needs to be linked to the manufacturer field (I4202), in order to provide meaningful results. The following SQL statements illustrate the linking of a merge table in a report:

A simple SQL statement to return asset numbers and manufacturers:

```
SELECT I4201,I4202 FROM MT.INVENTORY
```

The same statement, including “address1” and “address2” fields from the merge table:

```
SELECT I4201,I4202,ADDRESS1,ADDRESS2 FROM MT.INVENTORY LEFT OUTER JOIN  
MT.MRG4202 ON MT.INVENTORY.I4202 = MT.MRG4202.MERGE
```

When merge data is included in your reports, the column name returned by the query is the column name that will be listed in your report. When creating reports using columns from the “normal” MET/CAL tables (inventory, calibration, etc.), METEX automatically translates the field number into the proper name given during customization. For example, if you include field I4202 in your query, the column name will be taken from your customization and your definition for field I4202 will be displayed, instead of “I4202”.

Since merge definitions are not customizable after you make the definitions, you may need to change the column header for a merge field in your reports. To do this, alter your SQL query slightly to include a more proper field definition than what was created previously. Consider the following example:

```
SELECT ADDRA,ADDRB,CITYA FROM MT.MRG4202
```

In the above listed example, the columns ADDRA, ADDR B, CITYA are selected from the merge table. When this report is run, the column headers displayed in the report will be ADDRA, ADDR B, and CITYA. These column headings, while making sense to the system administrator at the time of configuration, will probably be very meaningless to the user running the report. To display more meaningful column titles, modify the query as shown:

```
SELECT ADDRA ADDRESS,ADDRB P.O. BOX,CITYA CITY FROM MT.MRG4202
```

The revised query will instead show ADDRESS, P.O. BOX, and CITY. Make sure to place a space between the column name and the desired column name. When the report is run, the user will see these new column names, and understand the report information much more easily.

Barcode Magician reporting

Barcode Magician is a separate utility offered by On Time Support used to make repetitive entries in MET/CAL easier and faster using a keyboard or barcode system. When Barcode Magician is installed, it creates several tables in the MET/CAL database that can be used in your SQL reports run from METEX.

Although several tables are created, only one contains useful information for inclusion in a report – the Barcode Magician users database (table). The table name is mt.bcmusers. The contents of this table is listed below:

Column name -----	Purpose -----
USERID	User identification scanned
USERNAME	The user’s real name
NOTES	Any additional notes about the user
GUESTEXPIRE	Date the user’s account in Barcode Magician terminates
U0001	
U0002	
U0003	
U0004	
U0005	
U0006	
	User-defined fields (configured in the Barcode Magician system configuration tool)

A common use of this table is displaying more detailed information about a person associated with a location record entry. For this example, the Barcode Magician USERNAME is an entry in the L2801 field in location history. This query will display an instrument, its’ current user, and fields from the Barcode Magician users table in the query:

```

SELECT
    I4201,
    L2801,
    U0001,
    U0002,
    NOTES
FROM
    MT.INVENTORY LEFT OUTER JOIN MT.LOCATION ON MT.INVENTORY.MTAG =
    MT.LOCATION.MTAG, MT.LOCATION LEFT OUTER JOIN MT.BCMUSERS ON MT.BCMUSERS.USERNAME =
    MT.LOCATION.L2801
    
```

Note that this query returns column names such as U0001, and U0002, which are not meaningful to the user running this report. It would be a good idea to modify the "select" portion of the query to something like this for readability:

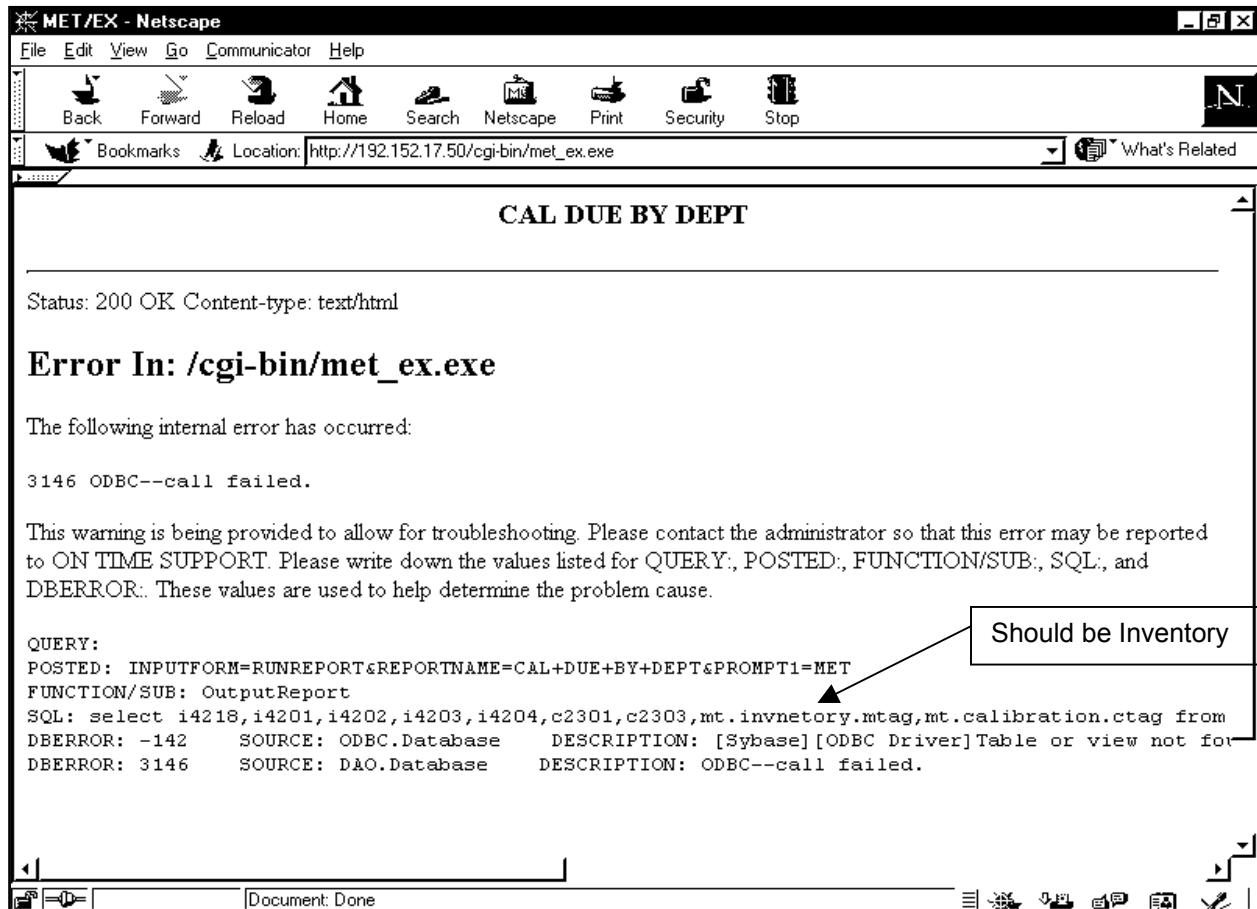
```
SELECT
    I4201,
    L2801,
    U0001 Office,
    U0002 Phone Number,
    NOTES
```

This is the same method described previously in the section describing methods of linking merge tables in your SQL reports.

Appendix D: Error Messages

When creating reports, you are going to encounter errors. When an error occurs, the CGI is going to generate a page with an error message. This page is meant to be used for troubleshooting. It is impossible to cover all the possible errors with this package. However, let's take a look at an error screen.

We have an SQL Quick Report that uses a prompt to recall instruments by department. After running the report, we see the following screen:



Example Error Screen

When you see a screen like this, look for the problem. In this example, the word "Inventory" is spelled wrong. Error screens like this do not shut down the system.

The error screen like the one shown should usually be displayed for report errors only. If the user encounters one of these error screens, they should copy the screen to the clipboard by performing a print screen. The user should then create an E-Mail and paste the screen as a JPEG, and then E-Mail the message to the system administrator. The system administrator should be able to figure out the problem or at least find some help.

Troubleshooting the Metrology Xplorer Installation

By its nature, Metrology Xplorer can be difficult to make operational under certain environments. Usually, when Metrology Xplorer is installed on a typical system, using the default installation method and selections, there are no problems implementing an operational system. However, under situations where the software is performing in a non-standard environment (directories in different places, using another existing web server, etc.), complications may arise that can make getting Metrology Xplorer operational more difficult.

This application note was written for those situations where Metrology Xplorer is in a non-standard installation, or there have been complications in getting the software to operate. This document is written with the assumption that you are unable to view any Metrology Xplorer screens, and that you may or may not be getting any error messages from Metrology Xplorer, or from the web server software. The assumption is also made that the troubleshooting methods listed in the Metrology Xplorer manual have not assisted in getting the system operational. It is important that you follow the instructions in this document in order from start to finish, even if you can skip a step or two if a certain section of this procedure is working correctly. Performing steps in the incorrect order may not be able to solve your problem since each test builds upon itself.

Each test in this document must pass in order for Metrology Xplorer to operate! If a test fails, then refer to instructions in the test for solutions to the problem. Do not continue until the system is able to pass the test. After correcting the problem, you may try to operate Metrology Xplorer to see if that was the problem preventing operation, or you may continue testing.

Test 1: Web Server Installation

Before any other tests can be performed, you must first verify that all of the required web server software has been installed and located. It is not within the scope of this document to include troubleshooting procedures for every web server software package that Metrology Xplorer is compatible with. However, general testing procedures will be provided to verify that the web server you are using is operational and that you are comfortable with the location of special directories.

Step 1: Web Server Operation

Start a web browser on the server (if a browser is installed on it). For the URL (web site) enter localhost. Do not add "www" or anything else to the location – just enter "localhost". You will see one of two types of pages displayed (possibly after several seconds), one page should be either a welcoming page (such as the "welcome to the metrology lab web site" page included with Metrology Xplorer), or an error page or message. A welcoming page may be one that is included with the web server software. For example, when Apache is installed, a test page with links to apache.org and other messages are displayed. If you see any page at all that is not an error (such as "page not found" or "site unavailable"), then your web server software on the server is operating correctly. If you received an error, then you have not installed the web server software on this computer, or it may not be running. Refer to the documentation provided with the web server software to check installation and configuration settings, and to correctly start the software.

Step 2: Network connection to the web server

With the web server software operating correctly, the next step is to test your connection to the server. To test your network connection, start a web browser on a computer other than the server that is connected to the same network as the server. For the web site location (URL), enter the network name of the computer, or its "TCP/IP" address (such as 192.168.0.5). You should see the same web page you saw in the previous test. If you do not see this page and get an error, then you may be entering the incorrect network address or name, or you may not have a complete network connection to the server. If you are running MET/CAL on the same server that you are attempting connection to, and MET/CAL operates on the computer you are at now, then you are probably entering the wrong network address. Contact your Information Services department to obtain the correct network name or address for the server.

Step 3: Web Server Directory Locations

A common problem with Metrology Xplorer installations is that the web server software is located in a directory other than what was initially thought at the time of installation. By default, Metrology Xplorer assumes that you are using Internet Information Server (IIS) as your web server software, and allows you to change the installation directory if you are using another web server (such as Apache). If the Metrology Xplorer CGI is located in a directory other than what the web server software is using, then Metrology Xplorer will not operate properly.

There are two directories that need to be located; these directories are referred to as "HTML" and "CGI-BIN". These directory names vary by software selected and version. The best way to find them is to locate the "top level" directory of the web server software (for example, "inetpub" for IIS or "apache" for Apache) and look below that directory for the directories that may contain HTML documents (the "HTML" directory), and CGI applications ("CGI-BIN"). To make sure that you have located the proper directories, follow these steps:

- Start (if not already running) the web server software on the server. If you had to start the web server software, then make sure it is running properly by performing STEP 1 listed above
- Locate the "top level" directory for your web server software. For IIS, it is usually "inetpub". For Apache, it is usually located under "program files/apache group/apache". You may need to refer to the documentation for the web server software for assistance in finding this directory. You may also proceed to the next step to help you locate the "top level" directory for your web server software.
- Locate the "HTML" and "CGI-BIN" directories on the server. If you are not completely sure if you have found the correct directory, then this is not a problem since the remaining steps will insure if you have or have not located the proper directories. The "CGI-BIN" directory is usually named just that – you can use the "find files" utility to locate this directory if you like. The "HTML" directory can have various names. Look for a directory that has several documents with the "HTM" or "HTML" extension. This is probably your "HTML" directory. For IIS, the "HTML" directory is usually "wwwroot", and for Apache is usually "htdocs".
- In the directory you believe to be the "HTML" directory, create a temporary file named "test.html" and enter the following text into this new file:

```
<HTML><HEAD>This is the HTML directory!</HEAD></HTML>
```

- Start a web browser on the server (since you are already there) and enter the following for the URL: localhost/test.html. You should see a blank web page with the following text: "This is the HTML directory!". If you do, then you have located the proper "HTML" directory. If you get an error such as "page not found", then the directory you saved the test.html file in is not the "HTML" directory that your web server software is using. Perform a search on the server for files with a .HTM or .HTML extension to locate a possible "HTML" directory. Also refer to the documentation for the web server software you are using to assist in finding this directory.
- Once the "HTML" directory has been located, the "CGI-BIN" directory may be easy to find. Usually the "CGI-BIN" directory resides under the same directory level as the "HTML" directory. Verifying the correct "CGI-BIN" directory requires that you have the latest version of the Metrology Xplorer CGI. You can obtain a complete installation from our download site at: <http://www.ontimesupport.com/download.html>, or you may use Rsync to automatically obtain the latest version. Once you have obtained the latest version of the CGI, either install it (full installation) or copy it (met_ex.exe only) into the directory you believe to be the "CGI-BIN" directory. Once you have done that, enter the following for the URL (still using the browser on the server): localhost/cgi-bin/met_ex.exe?diag. You should see a page titled "MET_EX.EXE CGI Output". If you see this page, then you have located the proper "CGI-BIN" directory, and have installed the Metrology Xplorer CGI into this directory. If you receive an error similar to "page not found", then the directory you are working with is not the "CGI-BIN" directory, or the directory has not been created (IIS only) correctly. Refer to the Metrology Xplorer manual or IIS documentation for creating the "CGI-BIN" directory and the associated virtual directory entry. If the browser attempts to download MET_EX.exe rather than execute it, then "execute" permissions may not be granted on the "CGI-BIN" directory. This is usually the case with IIS; Apache already creates a "CGI-BIN" directory with execute permissions by default. Refer to the Metrology Xplorer manual for information on configuring the IIS "CGI-BIN" directory with execute permissions.

Step 4: CGI/Database Connection

After you have verified that the web server software is operational, and that the proper directories have been located and the permissions are proper, then it is time to verify that the CGI can connect to the database. Most Metrology Xplorer installation problems can be traced to an inability of the CGI to connect to the database.

The Metrology Xplorer CGI uses ODBC to connect to Sybase, and usually most connection problems involve improperly configured ODBC. At this point, check your configuration of the METEX ODBC datasource. Refer to the Metrology Xplorer manual for screenshots for reference if you like. Verify the proper configuration settings/steps for these items:

- Make sure the ODBC datasource name is "METEX". The name is not case-sensitive.
- Make sure that this datasource is listed under "System DSN" and not "User DSN" or "File DSN". If it is not in "System DSN", remove this entry and add a new one under "System DSN" using settings listed in the Metrology Xplorer manual.
- Check the "options" for this datasource. The "start command" should be similar to:
c:\sqlany50\win32\dbclient.exe -x tcpip.

If the "METEX" ODBC datasource appears to be correct, then the next step is to actually attempt connection to the database with Metrology Xplorer. To do this, perform the following steps on the server:

- Open a DOS window.
- "CD" to the "CGI-BIN" directory where the Metrology Xplorer CGI resides. Enter "met_ex diag" and press enter. Note that there is a space between "met_ex" and "diag".
- The CGI will attempt to connect to the database and create a text log of troubleshooting messages.
- At his point, one of several actions may happen depending on the connection problem (if it still exists). The CGI should not display any messages during operation and termination. If a "Connect to SQL Anywhere" login box appears, then the CGI is still unable to connect to the database – the CGI will need to be terminated using the task manager (CTRL-ALT-DEL, Task Manager, Processes, highlight any "MET_EX.exe" entries and click on "End Process" – repeat until all "MET_EX.exe" entries are gone).
- If no database connection window appears, then open the "metex.log" text file located in the "CGI-BIN" directory. There should be several lines of messages, but in particular look for messages such as:

Attempting connection to database using METEX datasource Connection made

If error messages are displayed after "attempting connection to database", then the CGI is still unable to connect to the database. Verify the following items:

- Is the database engine running? If not, start it and retry "MET_EX diag".
- Have you registered the software? If the registration code for Metrology Xplorer has not been entered then the CGI will not operate. Register the software using the instructions in the Metrology Xplorer manual.

If the database engine is running and the software has been registered, then there are one of two problems that still exist. The first problem is a DLL mismatch or missing file in regards to ODBC, and the second is an inability of the Sybase database client to start communications with the database engine (even though they are on the same computer). If you are NOT using Microsoft Windows 2000, or Microsoft IIS version 5 or later, then the problem is usually ODBC. Follow the instructions below for updating ODBC. If you are using Microsoft Windows 2000 or Microsoft IIS version 5 or later, then the problem exists with the Sybase client software. Follow the instructions below for updating the Sybase software on the server.