Version 2.4 Rev. 2021-11-29

MICRO CONTROL SYSTEMS

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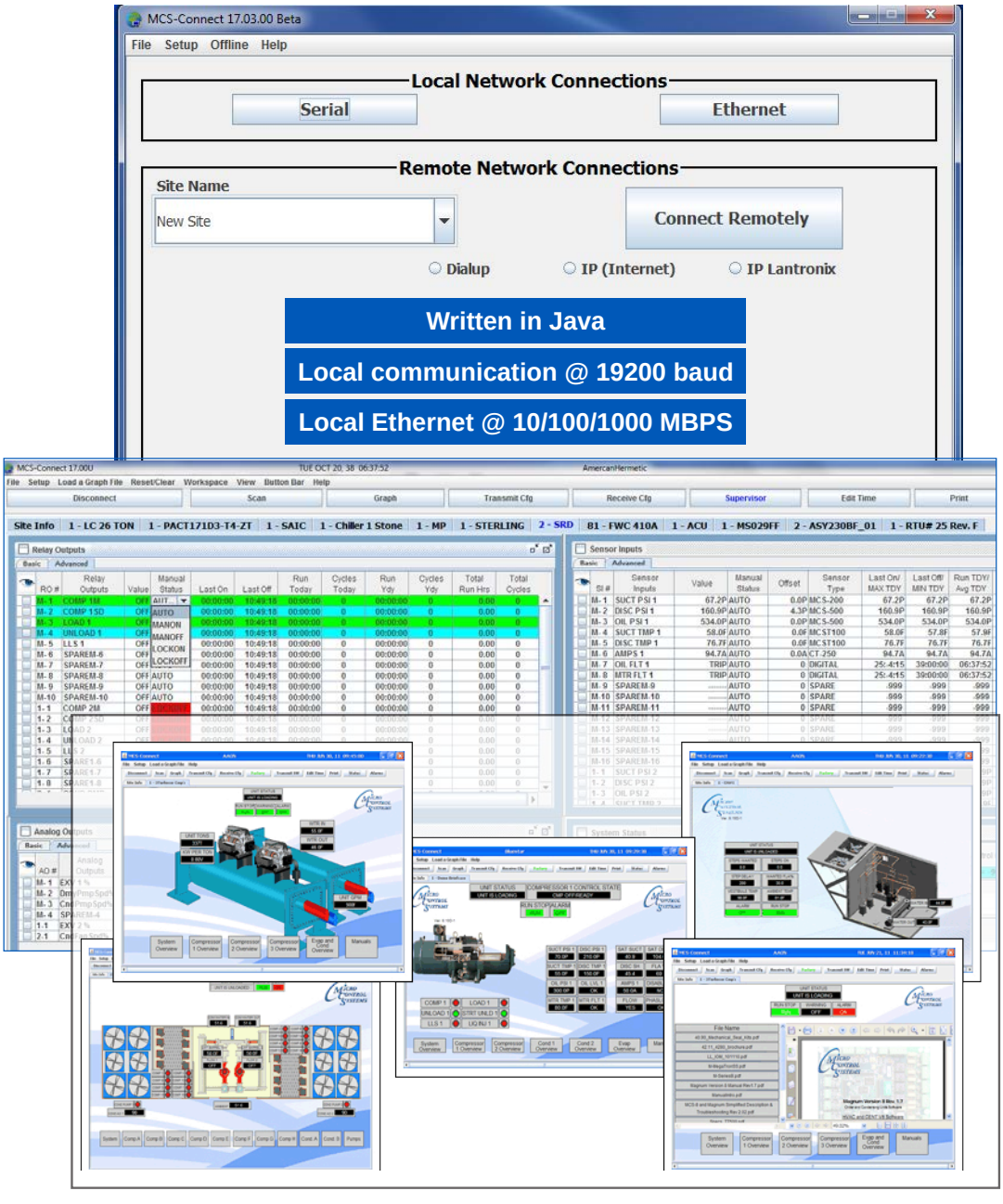
MCS-CONNECT

Manual and Installation Guide

Includes Graphics



MCS Total Solution for all your Control Needs

See Appendix section in back of Manual for quick steps for some MCS-CONNECT functions

RoHS Compliant

Energy Efficient and RoHS Compliant

Revision Page

Date	Author	Description of Changes
08-22-07	J. Walterick	Created manual.
09-06-07	J. Walterick	Alignment changes (Rev-1.1)
03-02-15	DEW	Convert to Indesign, edits
03-10-15	DEW	Edits
03-25-15	DEW	Edits
04-01-15	DEW	Edits - comments from Ray
04-07-15	DEW	Edits
04-17/20-15	DEW	Edits - comments from Ray
06-02-15	DEW	Edits
06-05-15	DEW	Edits
06-25-15	DEW	Edits
07-17-15-20	DEW	Edits
07-30-15	DEW	Added Diagnostic Save to section 9
09-29-15	DEW	Changed some network drawing, Graphic pages
12-09-15	DEW	Updated Screen shots added Diagnostic Save
2-11-16	DEW	Added graphic section at rear
3-04-16	DEW	Add new Alarm Alert setup Ver 17.12
3-7-16	DEW	Add lookup table, P/T Converter
6-13-16	DEW	Add New Live Graph Section
10-10/14-16	DEW	Edits from latest version
11-7-16	DEW	Updates and edits
06-20-17	DEW	Add BMS file print
06-22-17	DEW	Add info for editing Autostart file on touchscreen and MODBUS config
10-24-18	DEW	Add Diagnostic Save Pop up info
04-08-19	DEW	Add Fixed Values to Live Graph and Graph Pullback using Fixed Values
11-19-2021	DEW	Add Alarm Alerts setup for Gmail
11-29-2021	DEW	Add Hide/Show info

The MCS Commitment is to provide practical solutions for the industries needs and to be both a leader and partner in the effective use of microprocessor controls.

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Chapter - 1. Introduction

MCS-CONNECT software is part of the MCS Support System. Its purpose is to provide both local and remote communication for MCS micro controllers either by themselves or as part of a network.

MCS-CONNECT supports the following controllers:

- MCS-MAGNUM controller
- MicroMag controller
- MCS-8 controller with firmware version # (call MCS-SUPPORT)
- MCS-6 controller (limited with firmware)

MCS-CONNECT permits the user to monitor the status of the micro controller in real time and, with proper authorization, changes can be made to the system. In as fast as 10 seconds configuration files can be transmitted to or received from a MCS micro controller.

Another powerful feature of MCS-CONNECT is its ability to graph event history. Since MCS controllers automatically perform history logging, the user can select which inputs or outputs to graph and view the results either in real time or over a user selectable period of time.

MCS-CONNECT supports the SAVE of history data in the GRAPH function as a *.txt file. This allows the user to bring the data up in MCS-CONNECT offline or in a spreadsheet program such as Microsoft Excel.

Updates for MCS-CONNECT can be downloaded directly from the MCS website under “Support”, PC Software.

The program is available as Microsoft Windows based software or as Linux based software.

This manual was created using Adobe Indesign. An approved OEM of MCS may obtain a copy of this manual in PDF format and make copies or change sections of this manual to develop custom documentation for a site where an MCS controller is installed. In this way, MCS supports the documentation requirements of individual customer sites.

1.1. About MCS Controllers

The MCS controllers are rugged microprocessor based controllers that are designed for the hostile environment of the HVAC/R industry. They are designed to provide primary control, no mechanical controls; interface with building management systems; communicate both locally and remotely.

The MCS controllers provide flexibility with set points and control options that can be selected prior to commissioning a system or when the unit is live and functioning. Displays, alarms and other interfaces are accomplished in a clear and simple language that informs the user as to the status of the controller.

The MCS controllers are designed to safeguard the system that is being controlled, eliminate the need for manual intervention and to provide a simple but meaningful man-machine-interface.

Additional information on the setup and using MCS-CONNECT can be found on our web site.
A Powerpoint presentation can be found at:
http://www.mcscontrols.com/Documents/MCS/Presentations/MCS%20Connect.pps

Chapter - 2. PC Requirements & Product Features

To install and run the program we suggest the following minimum system requirements:

- PC with a Pentium2-class or higher processor
- Windows 7 or later operating system or Linux operating system
- Minimum 1GB of RAM
- Minimum 4GB Drive
- 14.4k baud modem or higher for remote communications
- 1280 x 800 pixel or higher display
- Ethernet 10/100/1000
- USB port 2.0 or higher

MCS-CONNECT PRODUCT FEATURES

- Java application runs on Windows/Linux
- Local communication @ 19200 baud
- Local Ethernet @ 10/100 MBPS
- Remote communication via phone or Internet
- Email/Test Message alarm alerts
- Auto Print to file on alarms
- Daily Scheduled Print to Files
- Temperature and PSI Conversion Wizard
- Extended History File Save - (MCS-MAGNUM 1008 Samples) - (MCS-MICROMAG 300 Samples)
- Interactive P/T Chart
- Lookup Tables
- Hide / Show Applicable Data
- Diagnostic Save/Auto-Send
- Window/Grids auto sizing based on screen resolution
- Customizable Workspace saving allow easy recall of window position & sizing
- Algorithm control states display
- Static & dynamic graphing / trending data
- Alarm retrieval & handling - these items can be printed and saved to PC for analysis and backup
- Manual / Auto mode control
- Setpoint modification
- Schedule modification
- Multiple authorization levels for security
- Runtime / Cycle count information
- Transmit / Receive configuration in as fast as 10 seconds
- Sensor Diagnostics
- Graphic Interface Sub List
    1. Customized to application
    2. User Customizable Gauges
    3. State Based Color and Image changes
    4. Animated device—pump rotating, comp moving, fan spin, etc.
    5. Easy view and access via graphic interface

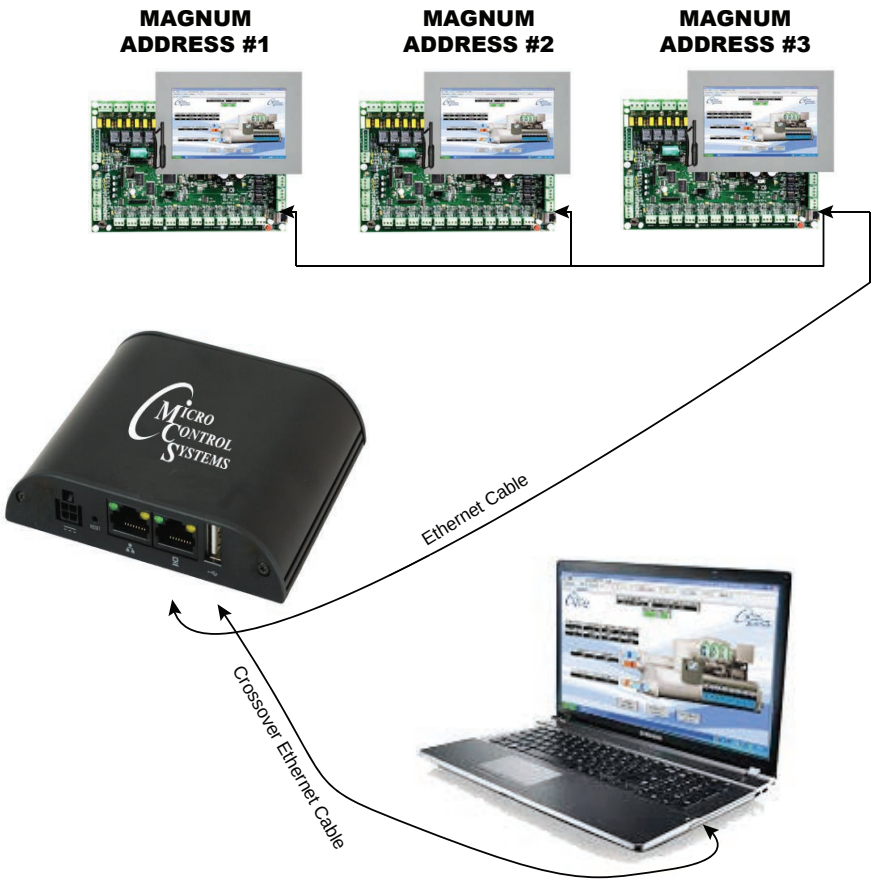
Chapter - 3. Setting up Communication with Controllers

The MCS 485 Network can support up to 20 MCS controllers. Access to the network can be local or remote via a 14.4K Baud modem. The PC connected to the network should be running at least Windows 7 or higher with MCS-CONNECT V17 or higher.

Each MCS controller in the network must be assigned a unique software network address. With proper authorization, this can be setup using a MCS controller and LCD/Keypad. This address will be the key in establishing communications with the appropriate MCS controller. This address can be changed from the LCD / keypad. (It is suggested that network addresses start with 1. This will allow any unit that has not had the address changed since leaving the factory to be accessible at address 0, which is the default.)

3.1. REMOTE - DIALUP - USING MCS-WIRELESS MODEM

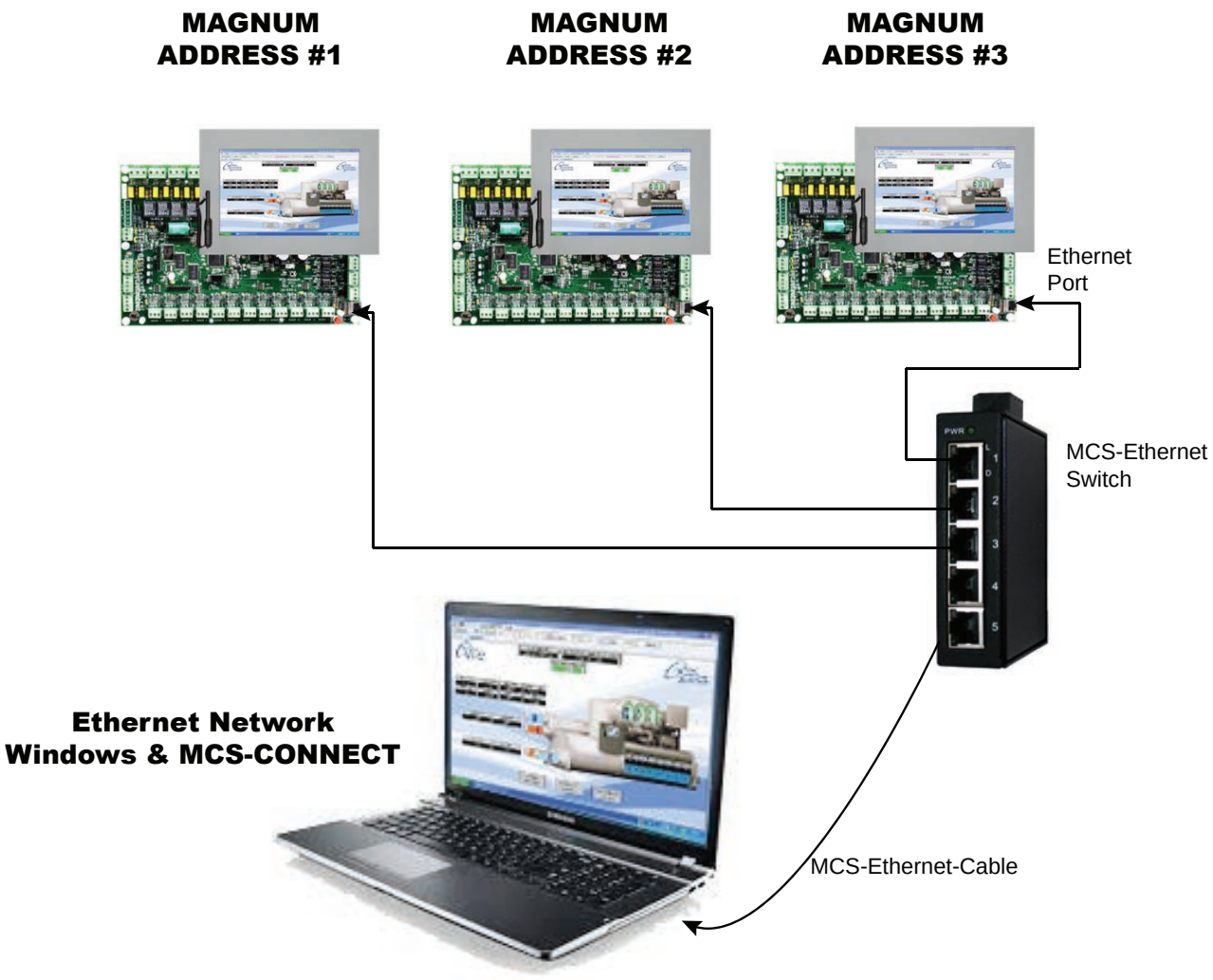
(Note, MCS controllers can be on the same network. Network addresses must be unique)



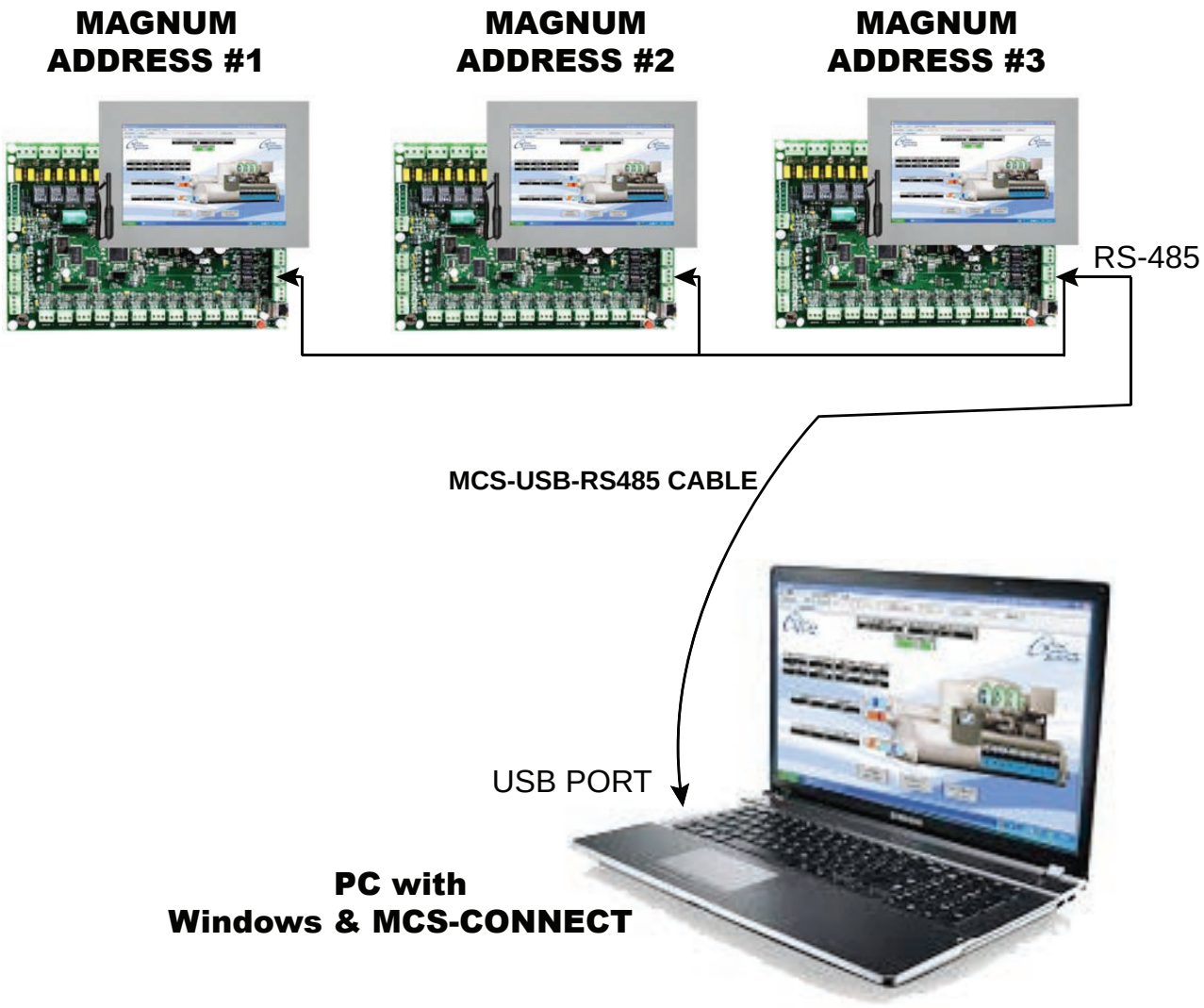
See Label for Actual Setting

MCS-WIRELESS MODEM is shipped from the factory with the IP address configured for you. Instructions on how to setup your PC to communicate with the MCS-WIRELESS MODEM will be included.

3.2. LOCAL CONNECTION USING CROSSOVER ETHERNET CABLE



3.3. NETWORK RS-485 CONNECTION



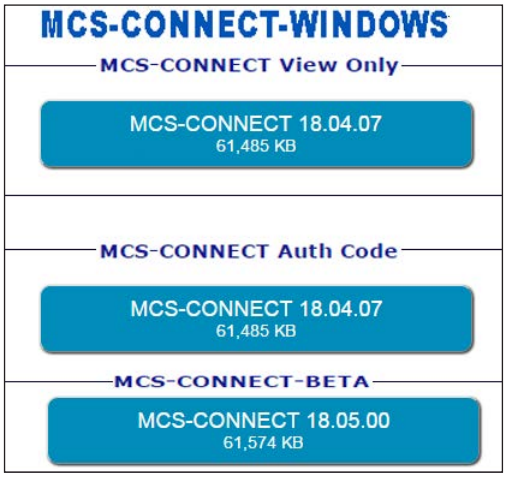
Chapter - 4. Installing MCS-CONNECT

4.1. Downloading from our Website

The latest versions of MCS-CONNECT can be downloaded from our website by going to:
http://www.mcscontrols.com/software.html

Navigate to MCS-CONNECT and choose the Windows or Linux version of the software.

MCS-CONNECT-WINDOWS and LINUX communicates with MCS-8, MCS-MAGNUM, and MicroMag micro controllers.



4.1.1 ► VIEW ONLY VERSION

This version is available to all OEM, Contractors, Installers and their personnel for downloading to their computers or laptop.

Changes cannot be made to a system when using this version.

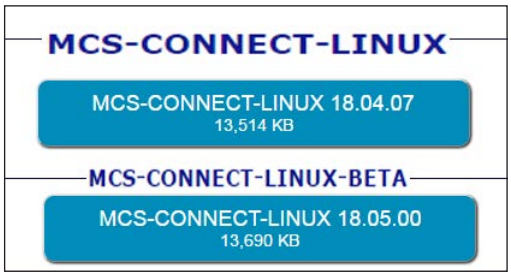
It is used for 'VIEW' only.

4.1.2 ► AUTH CODE VERSION

If you are an authorized OEM, Contractor, or Installer using Mirco Control Systems, you can be authorized to download this version of the software.

Changes can be made to your system when using this version.

Contact MCS for the authorization code needed.



Please Note:

The software contained on our website is the latest official release of MCS-CONNECT for Windows and Linux versions.

We post 'BETA' versions of the software here also. This is software that is being tested in our plant and is made available for testing in the field before its general release to OEM's, Contractors and Installers.

These are full install versions and does not require previous versions to have been installed. To install the software, first download (Save) the file to your computer or flash drive.

If installing on our Touchscreens, move the installer to the touchscreen via network or flash drive. Then run it by clicking on the downloaded file and following the instructions given.

IMPORTANT!!

Prior to making any changes to your Touchscreen, read the application notes which are posted to our website on upgrading.

APP113-UPGRADING MCS-CONNECT ON TOUCHSCREEN

Prior to upgrading MCS-CONNECT
make sure your firmware and Graphics are up to date
Consult MCS for support

Once downloaded, locate that file and run it. You will then see a dialog box similar to the following:

Now click the 'Next' button. Simply follow the instructions presented in order to complete the installation.

4.2. Competing Installation

Once installed, MCS-CONNECT is ready to be executed. The PC must be connected to an MCS controller or a MCS network by one of the following:

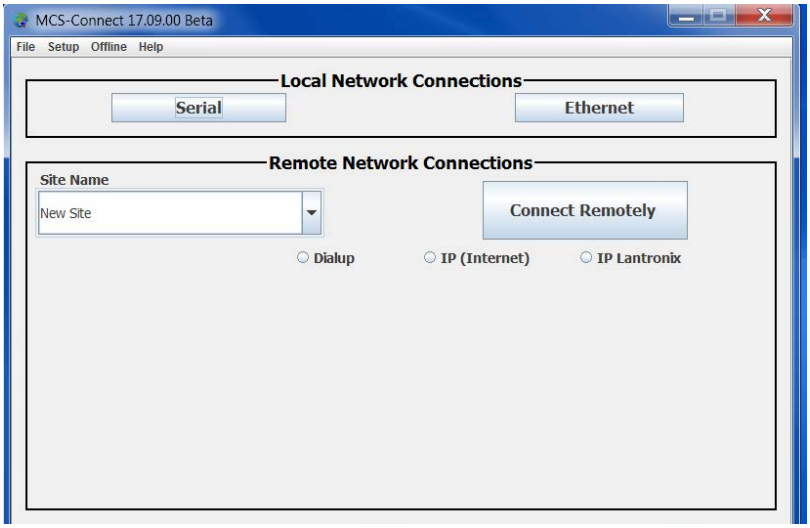
- Locally with a MCS-USB-RS485 cable connected from a USB port on the PC to the RS-485 port on the MCS controllers.
- MCS-485-GATEWAY with MCS-USB-RS-232 cable to USB port on PC
- Ethernet port using crossover cable connection
- Remotely with a PC that has a 14.4-baud modem and a phone line that is available to the PC.

NOTE: TO MAKE FIRMWARE CHANGES TO A CONTROLLER FROM MCS-CONNECT, YOU MUST BE LOCALLY COMMUNICATING WITH THE CONTROLLER.

4.2.1 MCS-CONNECT Icon - Window's Start Menu

Find the MCS-CONNECT Icon on your desktop or in the Window's Start Menu to launch the program.

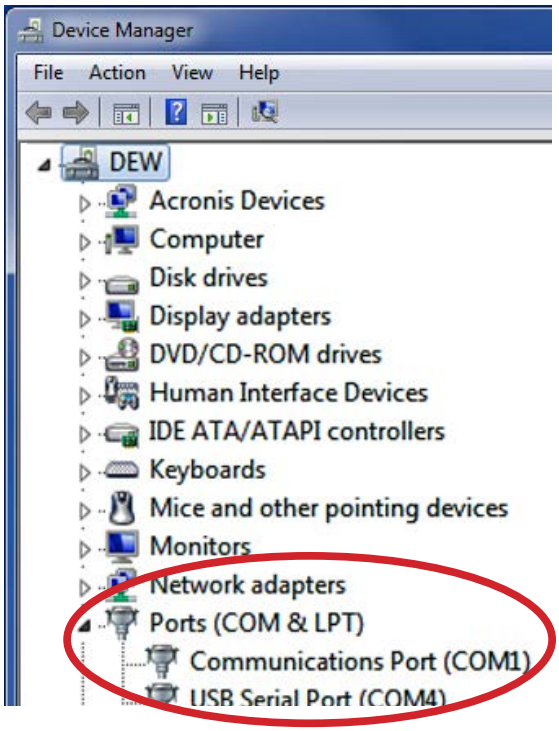
This is the Main user interface for MCS-CONNECT.



Chapter - 5. Setup Options for MCS-CONNECT

5.1. Finding your Communication Ports on your PC.

MCS-CONNECT defaults to COM1 for Local communications and COM2 for Remote communications. Local communication refers to a direct connection between your PC and the Unit, whereas Remote communication refers to communication via your modem. If your PC uses a different port, use the button to select the appropriate port.



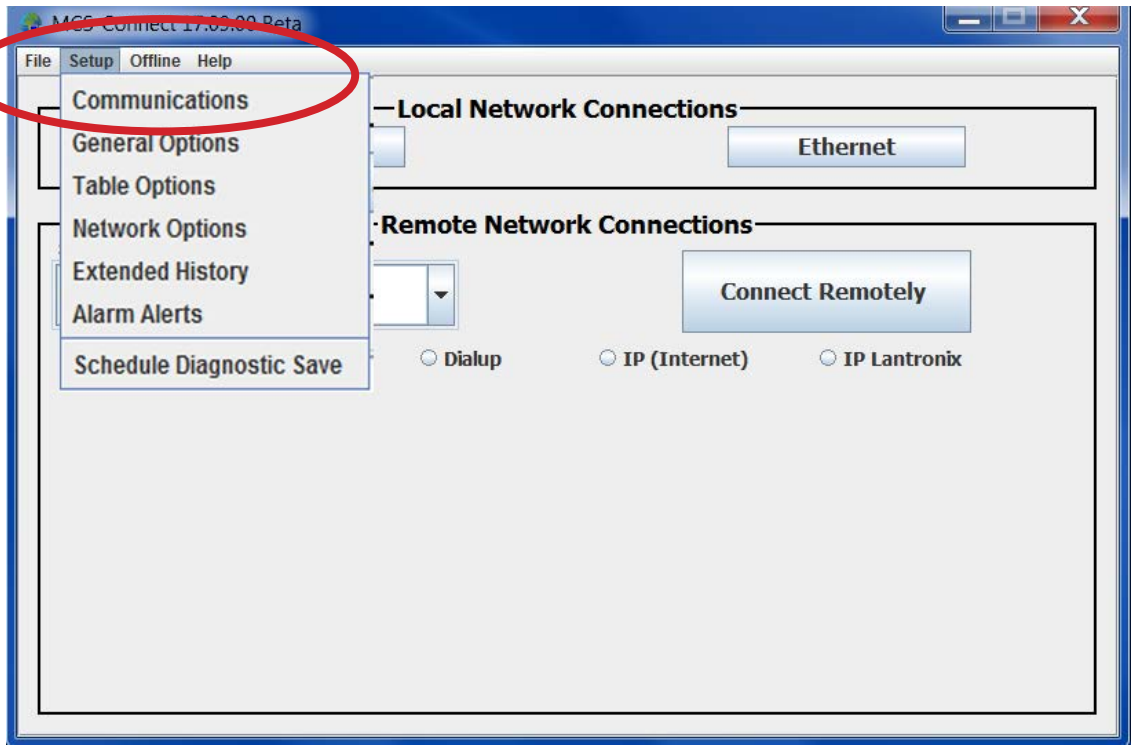
To find your PC's com port before starting setup for MCS-CONNECT:

For Microsoft Windows 7:

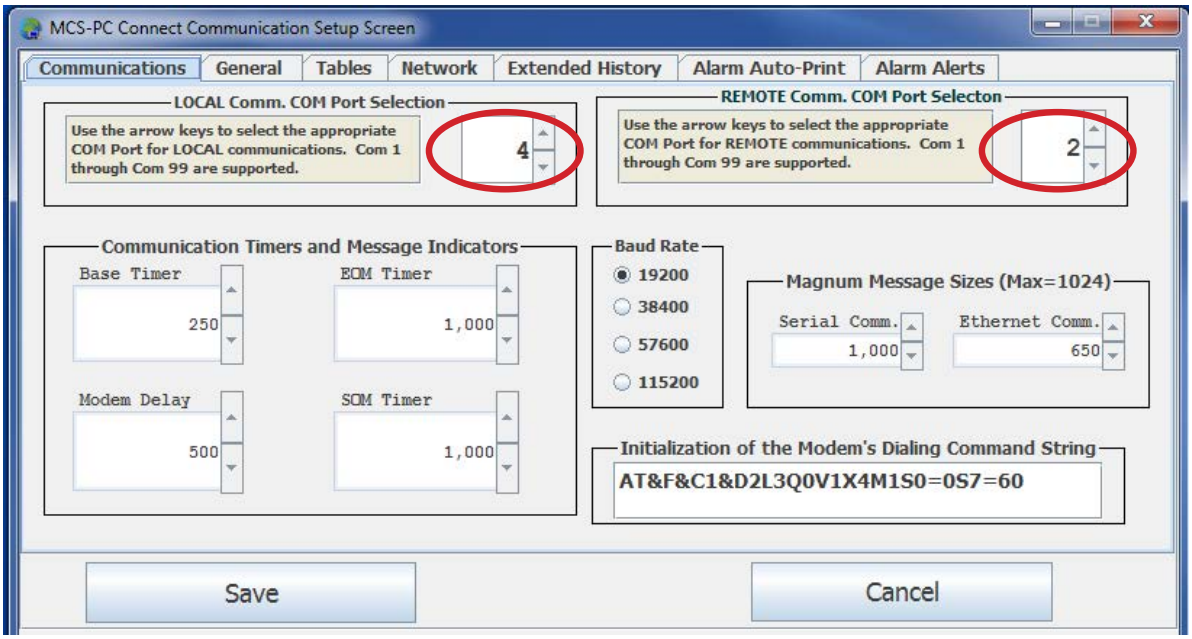
1. At your desktop, left click on Start.
2. Left click on Control Panel button.
3. Click on Device Manager.
4. Left click on Ports (COM & LPT) to see Port information.

5.2. MCS-PC-CONNECT Communication Setup

Before a serial connection can be made to an MCS controller the COM (communication) PORT must be selected. To select a COM PORT for communication, choose the Setup menu option and then choose Communication,



Next screen shows com ports - make changes as per your computer's communication ports and save these changes.



5.3. PC Communication Speed & Wait Timers

Base Timer: Time is length of wait before windows activates the main program loop where the normal communications occur. (Mouse clicks also cause an interrupt to the program to handle that function.)

SOM Timer: Timer is used to perform two functions:

When the system is scanning the network for active MCS controllers, this is the wait time before that address is considered not to have an active controller. When a controller is found or this amount of time has expired the system moves to the next network address.

Once communication has been established, the system will wait this length of time for a valid start of message (SOM) from the controller in response to a message request. If none is received, the system will retry and extend this time. Three retries are attempted before an error is reported. (Note that when communicating with an MCS-8 controller you should set this value to 1000 or greater to ensure proper communication.)

EOM Timer: Once a valid SOM has been received, the system will wait this length of time to receive a valid end of message (EOM) from the communicating controller.

5.4. PC Communication Modem - Remote

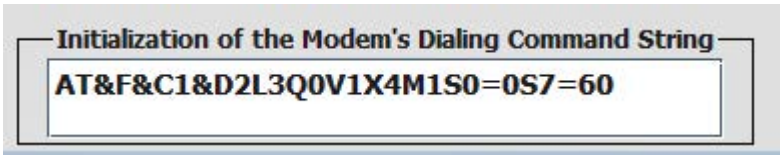
Modem Delay: Used only with remote communications. Once the PC's modem has been verified that it is active, on the COM PORT specified and the dial string has been sent to it, the system will wait this length of time for the response from the called modem. This is used only for the first response after communications has been established the SOM and EOM timers are used. The SOM timer will be extended with remote communications.

5.5. Initialization Dial String

If you have a standard “Hayes” compatible modem, no changes are required. If not, you must locate (your modem’s manual) and enter the equivalent values.

Note: Try AT&F if default string does not work.

Once you have set the modem initialization command string you should select the ‘Save’ button. If you want to abandon the change you should select the ‘Cancel’ button.

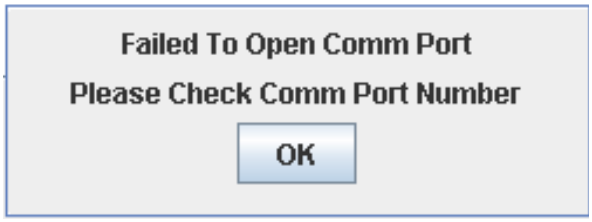


Communications can now be established.

5.5.1 Local Communication Errors

No modem detected or Comm Port initialization error – Can occur in either the local or remote modes. The COM PORT cannot be initialized. Check the COM PORT setting to determine if the correct port, base address and IRQ has been selected. A malfunctioning COM PORT on the PC can also cause this error.

This can be checked by executing a Windows terminal program and then shorting pins 2 and 3 together on the cable. Any characters that are typed at the PC will appear on the screen of the PC if the port is functioning. The following message will be displayed:

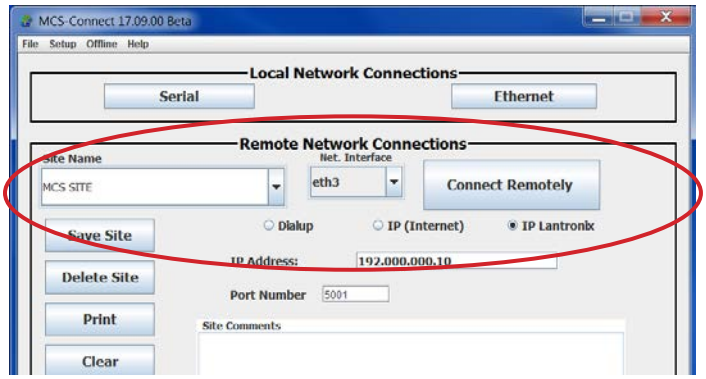


COM PORT is in use – Can occur in either the local or remote modes.

COM PORT is not available, it is busy - This can occur if another MCS-CONNECT is running on the network or another program is using the requested COM PORT. When this condition occurs the above message will be displayed:

5.6. Remote Communications

To establish remote communication select the option ‘DIALUP’, ‘IP (INTERNET)’ or ‘IP LANTRONIX’.



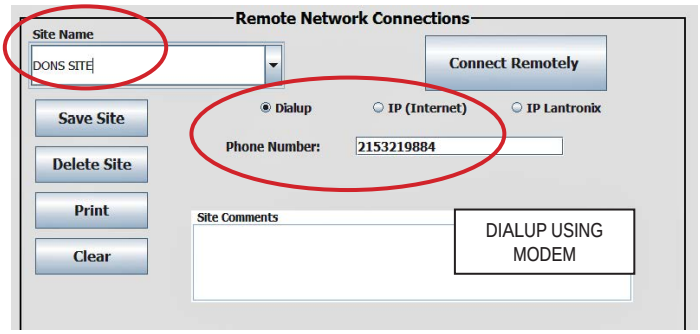
The site name can be up to 20 characters. The comment field, which is 20 characters, is used to store additional information about that site.

New sites can be added by entering the site name, filling in all information based on connection type and then clicking on the ‘Save Site’ button.

Existing sites can be modified by selecting the site; the telephone number and comments field will be displayed for that site. The information in any of these fields can be modified. Once the fields have been updated, click on the ‘Save Site’ button. The site information will be updated. Existing sites can be deleted by selecting the site and then clicking on the ‘Delete Site’ button.

5.7. DIALUP -

If you are setting up communications with a controller using a modem, click on the button ‘DIALUP’. Setup your ‘SITE NAME’, ‘PHONE NUMBER’, and ‘SITE COMMENTS’, click ‘SAVE SITE’.



Up to 200 phone numbers are supported. Each phone number is accessed via the Site Name drop down list.

The phone number can be up to 30 characters, thus enabling phone cards to be used.

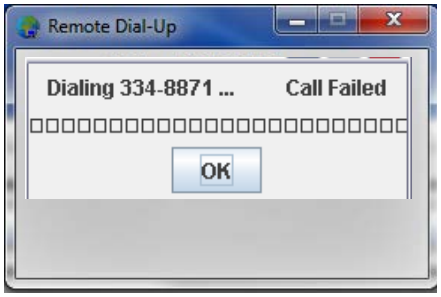
Once the ‘Connect Remotely button’ is selected the following pop-up appears: (only if ‘Dial up’.) There is an opportunity to hang-up the modem’s phone line by clicking the ‘Cancel’ button at anytime during this procedure.

A “Successful Connection!” message will be displayed if the PC modem successfully connects to the MCS controller.

5.7.1.1. Remote Communication Errors

No modem detected or COM PORT initialization error – Can occur in either the local or remote modes. The COM PORT cannot be initialized. Check the COM PORT setting to determine if the correct port, base address and IRQ has been selected.

A malfunctioning COM PORT on the PC can also cause this error. This can be checked by executing a Windows terminal program and then shorting pins 2 and 3 together on the cable. Any characters that are typed at the PC will appear on the screen of the PC if the port is functioning.



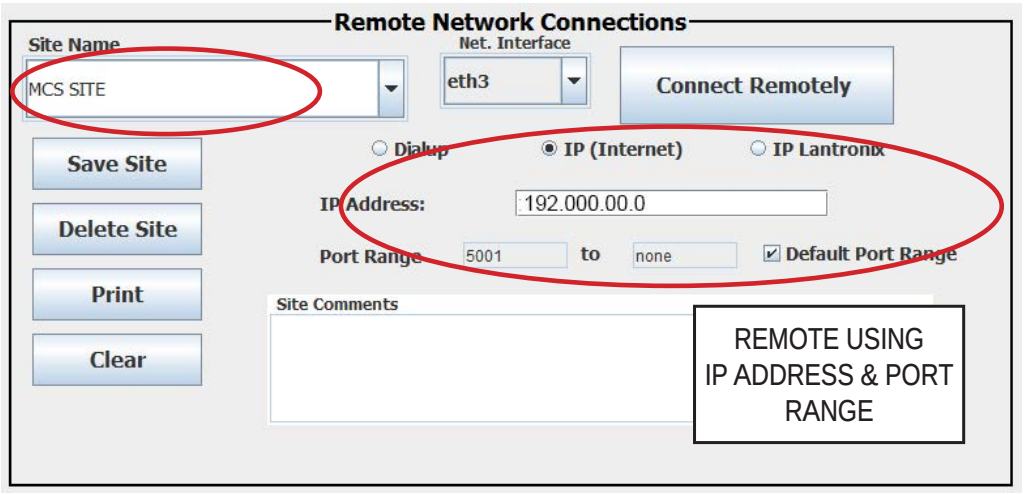
The following message will display:

5.7.1.2. IP (Internet)

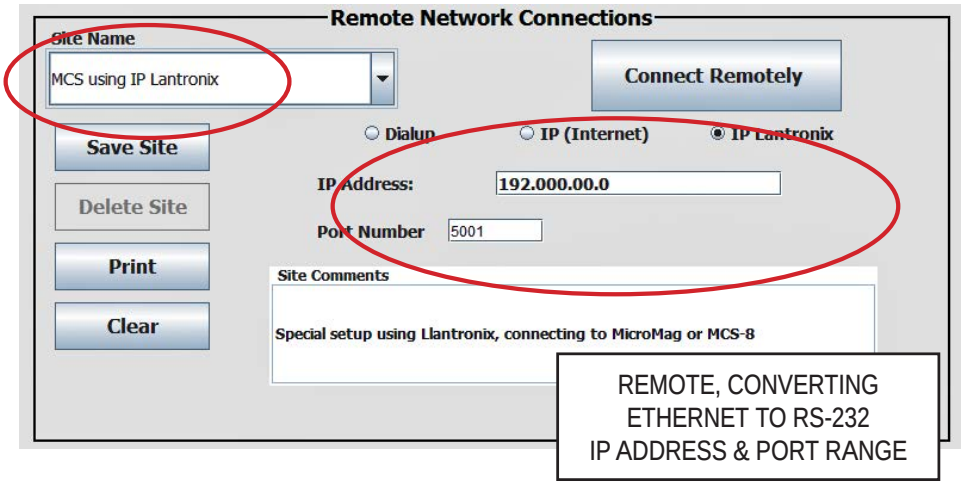
You can setup a remote Network connection using the IP address of the controller you are communicating with. Click on 'IP (Internet)', enter the 'IP Address', 'Port Range', (if you know the range is within a set of numbers, click on 'Default Port Range' to search that range of numbers only). Add any comments about the site, click on 'Save Site'.

5.7.1.3. IP LANTRONIX

If you are setting up communicating with a controller that has a RS-232 port, you can use a MCS-ETHERNET (Lantronix) .



The MCS-ETHERNET is a single-port RS-232 to Ethernet device server (pre-programmed at MCS) that allows MCS-CONNECT to communicate with a MicroMag or MCS-8 over a LAN or the Internet (requires a static IP). Click on 'IP LANTRONIX , setup 'Site Name', 'IP address of controller', and any comments about this controller, click 'Save Site'



5.8. General Setup Options

Authorization Keypad

Default 'Hide Keypad' - option to 'Show Keypad' If you are using a computer to communicate with MCS-CONNECT you can use the computer keypad and hide MCS-CONNECT keypad.

Exception Popups

Default 'Exception popups OFF'

Inactivity Shutdown Timer

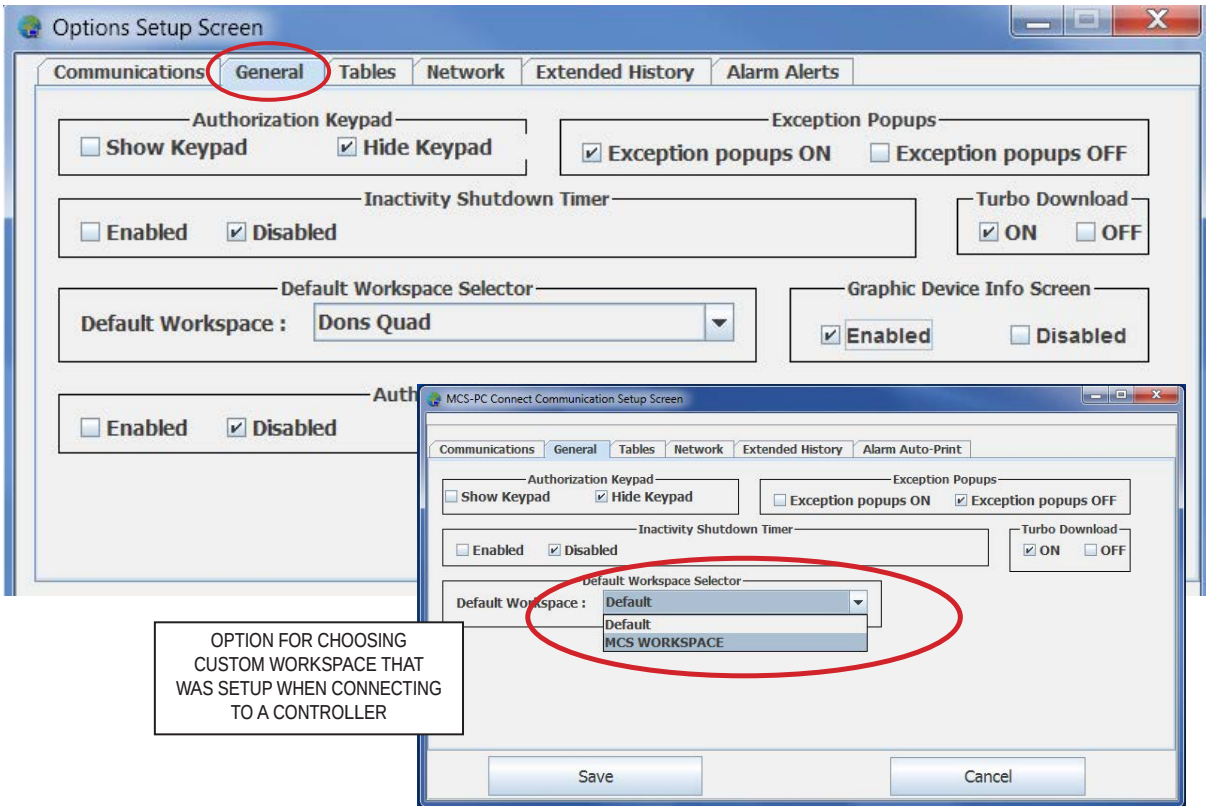
Allows the user to set a time when MCS-CONNECT will shut down due to "INACTIVITY'. Time can be set from 5 to 30 minutes.

Turbo Download

Default "ON' - (provides Faster baud rate communication during firmware transmission

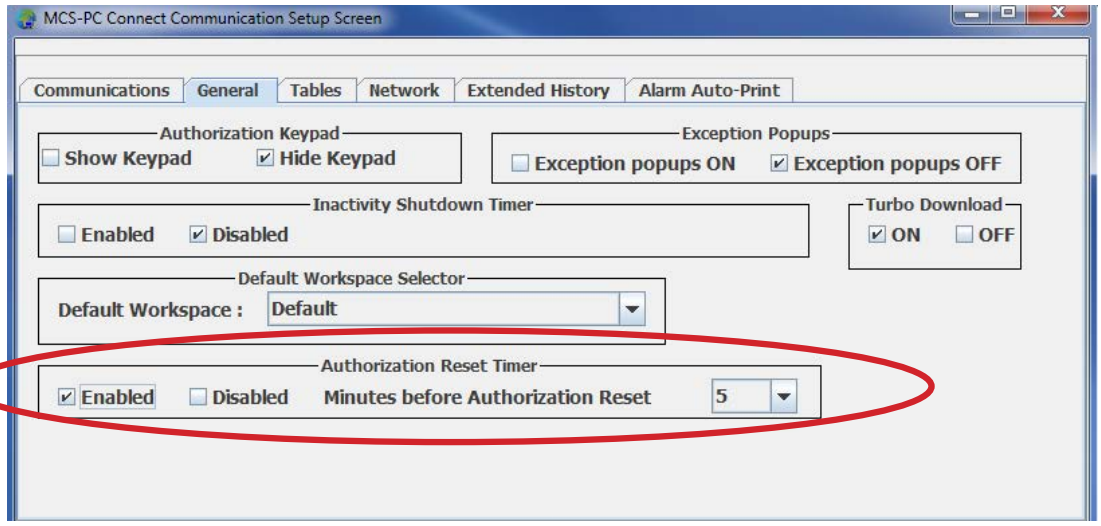
Default Workspace Selector

You have an option when working with different controllers to setup a custom workspace. You can choose this option in the 'MENU BAR' once connected to a controller.
See additional information under 'MENU BAR SETUP.

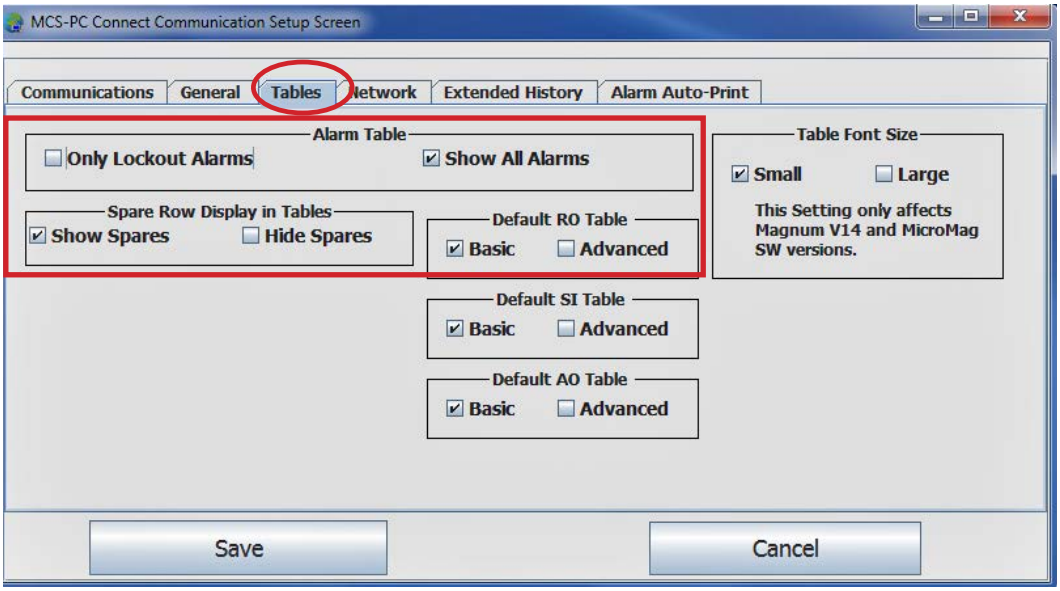


Authorization Reset Timer

This allows the user to set a 'timeout', time to revert to a View Only authorization level.

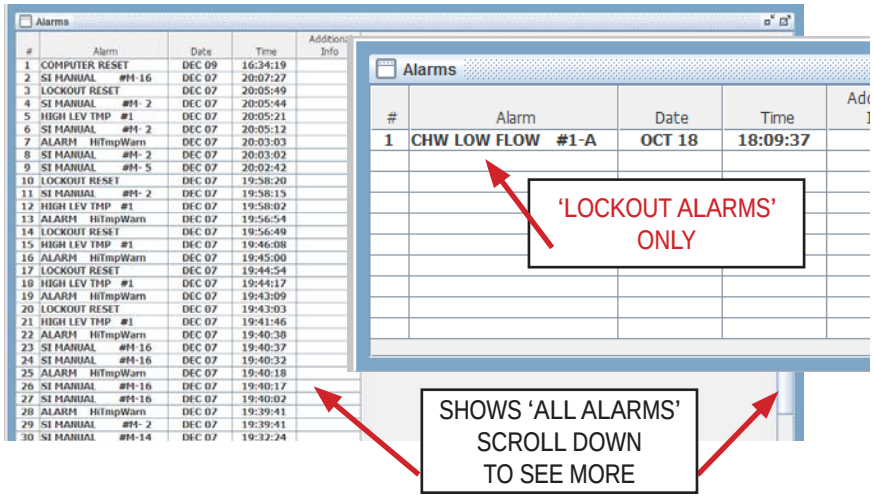


5.9. Tables Options



5.9.1 Alarm Table

Choose to show **'ONLY LOCK-OUT ALARMS'** or **'SHOW ALARMS'**



5.9.2 Table Font Size

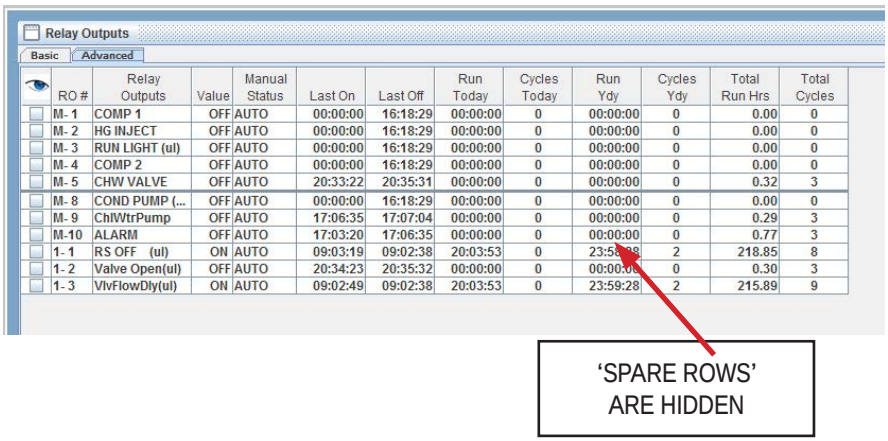
Only affects Magnum V14 MicroMag SW versions.

Default **'Small'**

5.9.3 Spare Row Display

Screen below shows 'Hide Spare Rows' -

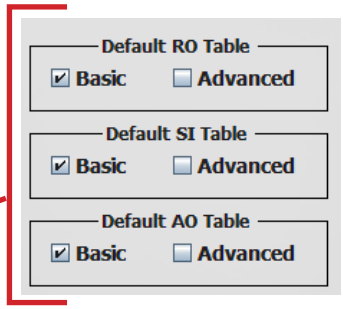
'**Default Show Spares**'

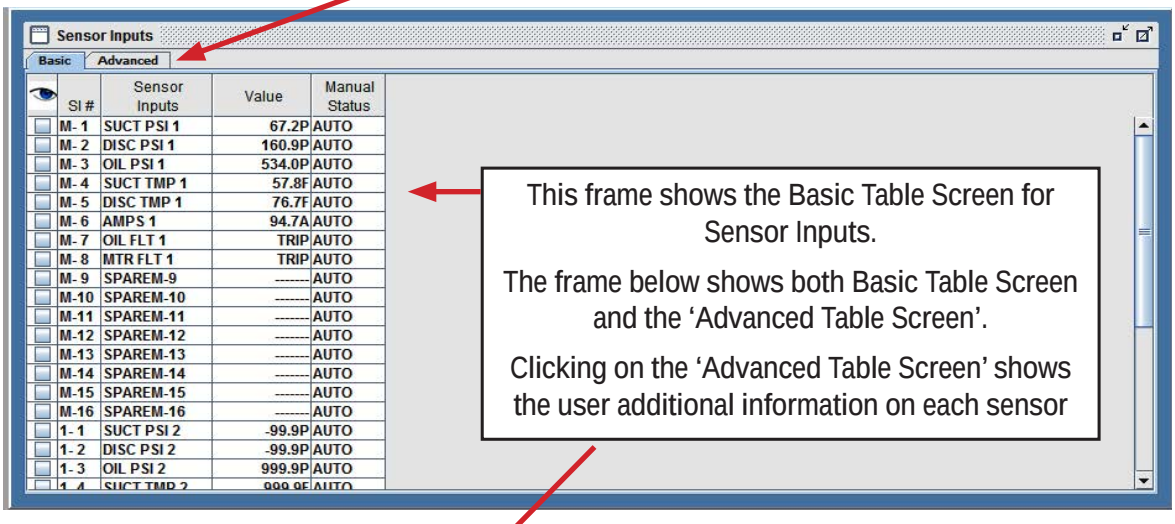


RO #	Relay Outputs	Value	Manual Status	Last On	Last Off	Run Today	Cycles Today	Run Ydy	Cycles Ydy	Total Run Hrs	Total Cycles
M- 1	COMP 1	OFF	AUTO	00:00:00	16:18:29	00:00:00	0	00:00:00	0	0.00	0
M- 2	HG INJECT	OFF	AUTO	00:00:00	16:18:29	00:00:00	0	00:00:00	0	0.00	0
M- 3	RUN LIGHT (ul)	OFF	AUTO	00:00:00	16:18:29	00:00:00	0	00:00:00	0	0.00	0
M- 4	COMP 2	OFF	AUTO	00:00:00	16:18:29	00:00:00	0	00:00:00	0	0.00	0
M- 5	CHW VALVE	OFF	AUTO	20:33:22	20:35:31	00:00:00	0	00:00:00	0	0.32	3
M- 8	COND PUMP (...	OFF	AUTO	00:00:00	16:18:29	00:00:00	0	00:00:00	0	0.00	0
M- 9	ChlWtrPump	OFF	AUTO	17:06:35	17:07:04	00:00:00	0	00:00:00	0	0.29	3
M-10	ALARM	OFF	AUTO	17:03:20	17:06:35	00:00:00	0	00:00:00	0	0.77	3
1- 1	RS OFF (ul)	ON	AUTO	09:03:19	09:02:38	20:03:53	0	23:59:39	2	218.85	8
1- 2	Valve Open(ul)	OFF	AUTO	20:34:23	20:35:32	00:00:00	0	00:00:00	0	0.30	3
1- 3	VlvFlowDly(ul)	ON	AUTO	09:02:49	09:02:38	20:03:53	0	23:59:28	2	215.89	9

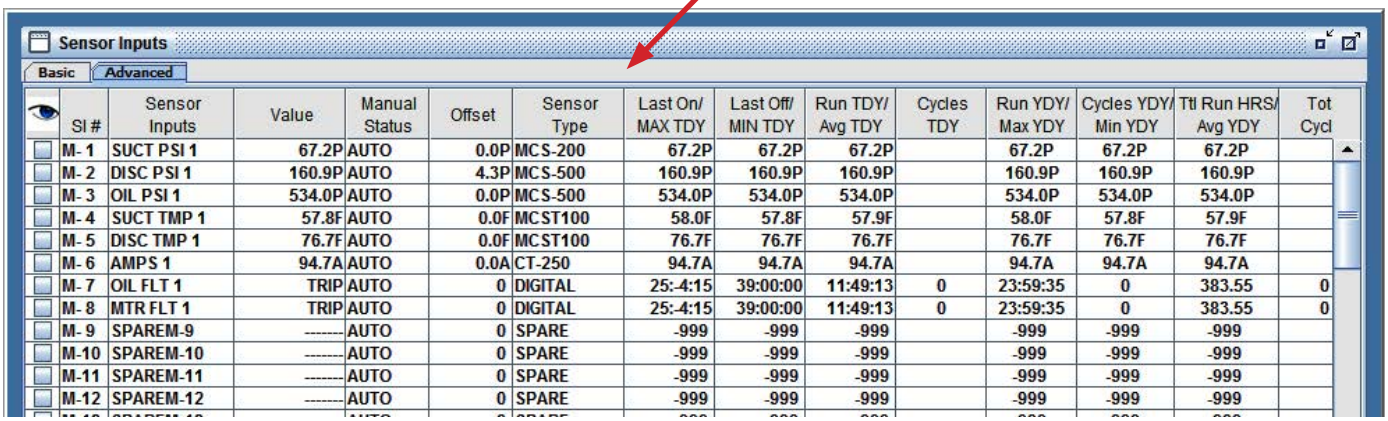
5.9.4 Basic and Advanced Display of Tables

- **Default RO Table** - Default 'Basic' - option 'Advanced'
- **Default SI Table** - Default 'Basic' - option 'Advanced'
- **Default AO Table** - Default 'Basic' - option 'Advanced'





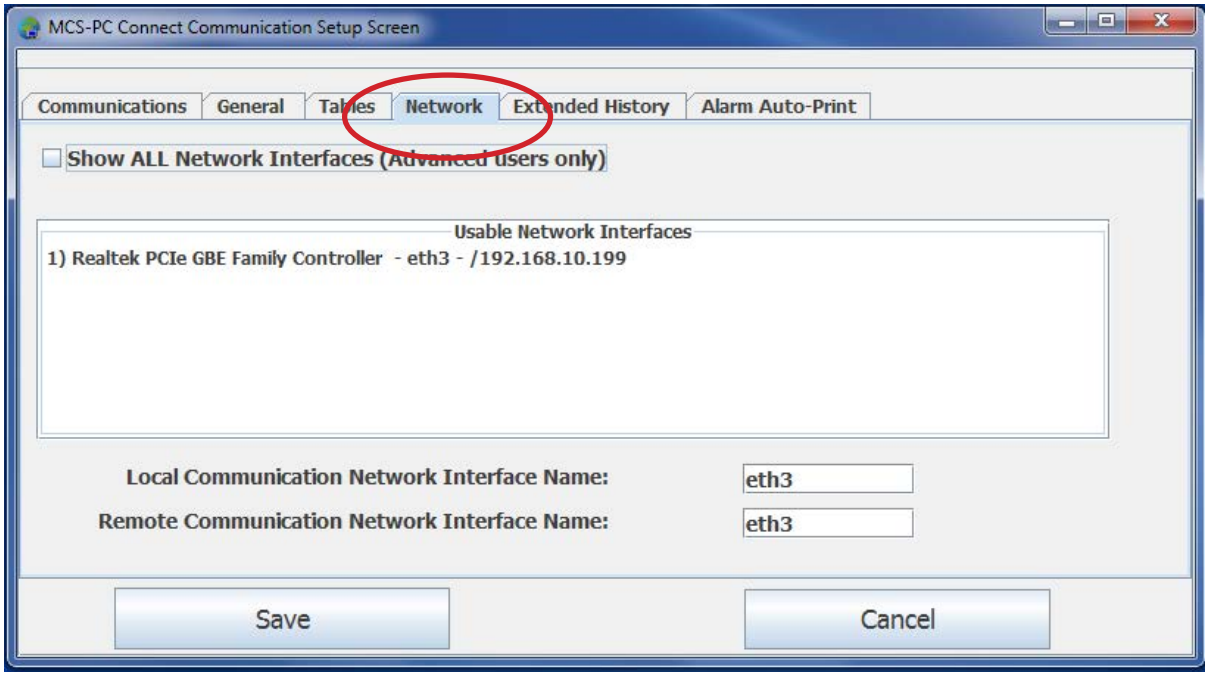
SI #	Sensor Inputs	Value	Manual Status
M- 1	SUCT PSI 1	67.2P	AUTO
M- 2	DISC PSI 1	160.9P	AUTO
M- 3	OIL PSI 1	534.0P	AUTO
M- 4	SUCT TMP 1	57.8F	AUTO
M- 5	DISC TMP 1	76.7F	AUTO
M- 6	AMPS 1	94.7A	AUTO
M- 7	OIL FLT 1	TRIP	AUTO
M- 8	MTR FLT 1	TRIP	AUTO
M- 9	SPAREM-9	-------	AUTO
M-10	SPAREM-10	-------	AUTO
M-11	SPAREM-11	-------	AUTO
M-12	SPAREM-12	-------	AUTO
M-13	SPAREM-13	-------	AUTO
M-14	SPAREM-14	-------	AUTO
M-15	SPAREM-15	-------	AUTO
M-16	SPAREM-16	-------	AUTO
1- 1	SUCT PSI 2	-99.9P	AUTO
1- 2	DISC PSI 2	-99.9P	AUTO
1- 3	OIL PSI 2	999.9P	AUTO
1- 4	SUCT TMP 2	999.9F	AUTO



SI #	Sensor Inputs	Value	Manual Status	Offset	Sensor Type	Last On/ MAX TDY	Last Off/ MIN TDY	Run TDY/ Avg TDY	Cycles TDY	Run YDY/ Max YDY	Cycles YDY/ Min YDY	Ttl Run HRS/ Avg YDY	Tot Cycl
M- 1	SUCT PSI 1	67.2P	AUTO	0.0P	MCS-200	67.2P	67.2P	67.2P		67.2P	67.2P	67.2P	
M- 2	DISC PSI 1	160.9P	AUTO	4.3P	MCS-500	160.9P	160.9P	160.9P		160.9P	160.9P	160.9P	
M- 3	OIL PSI 1	534.0P	AUTO	0.0P	MCS-500	534.0P	534.0P	534.0P		534.0P	534.0P	534.0P	
M- 4	SUCT TMP 1	57.8F	AUTO	0.0F	MCST100	58.0F	57.8F	57.9F		58.0F	57.8F	57.9F	
M- 5	DISC TMP 1	76.7F	AUTO	0.0F	MCST100	76.7F	76.7F	76.7F		76.7F	76.7F	76.7F	
M- 6	AMPS 1	94.7A	AUTO	0.0A	CT-250	94.7A	94.7A	94.7A		94.7A	94.7A	94.7A	
M- 7	OIL FLT 1	TRIP	AUTO	0	DIGITAL	25:-4:15	39:00:00	11:49:13	0	23:59:35	0	383.55	0
M- 8	MTR FLT 1	TRIP	AUTO	0	DIGITAL	25:-4:15	39:00:00	11:49:13	0	23:59:35	0	383.55	0
M- 9	SPAREM-9	-------	AUTO	0	SPARE	-999	-999	-999		-999	-999	-999	
M-10	SPAREM-10	-------	AUTO	0	SPARE	-999	-999	-999		-999	-999	-999	
M-11	SPAREM-11	-------	AUTO	0	SPARE	-999	-999	-999		-999	-999	-999	
M-12	SPAREM-12	-------	AUTO	0	SPARE	-999	-999	-999		-999	-999	-999	

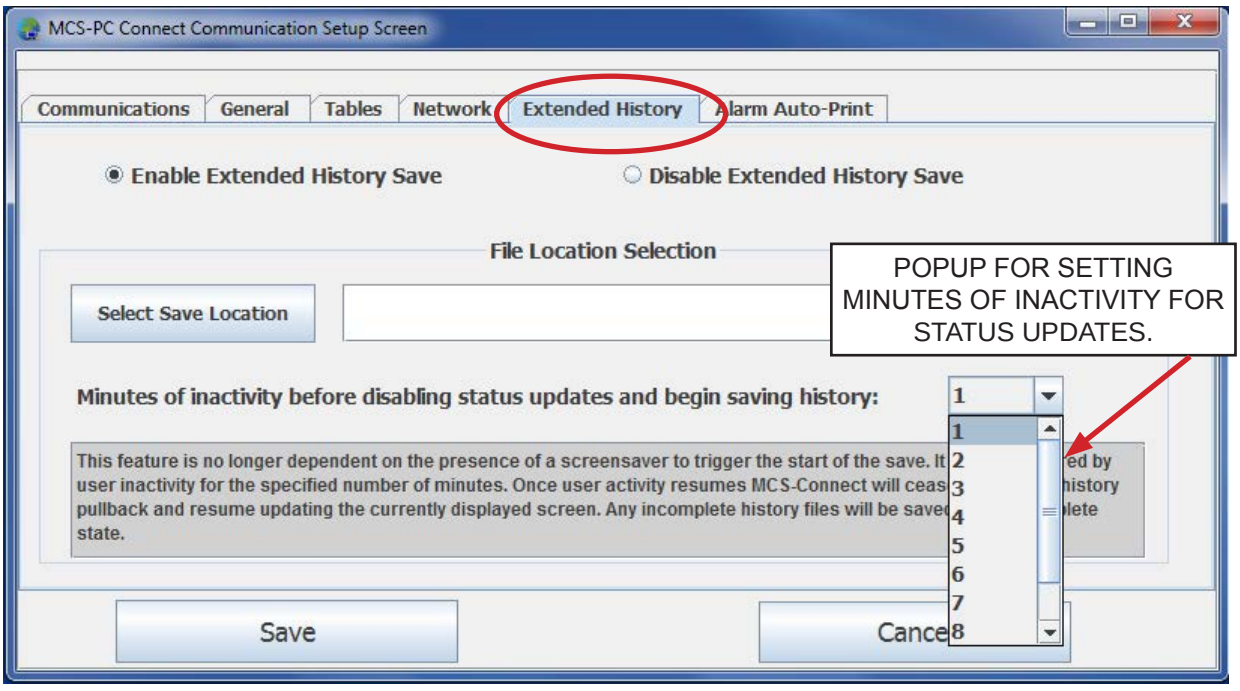
5.10. Network Options - Make any changes, click save.

- 'Show all Network Interfaces' - Default unchecked - User can have more than one network in which to connect to at some installations. If you need to search for more network interfaces, check this box.



5.11. Extended History Option - Make any changes, click save.

- **Option - Enable Extended History Save - allows user to specify location where to save the file, setup minutes of inactivity before disabling status updates and begin saving history.**
- **Default 'Disable Extended History Save**



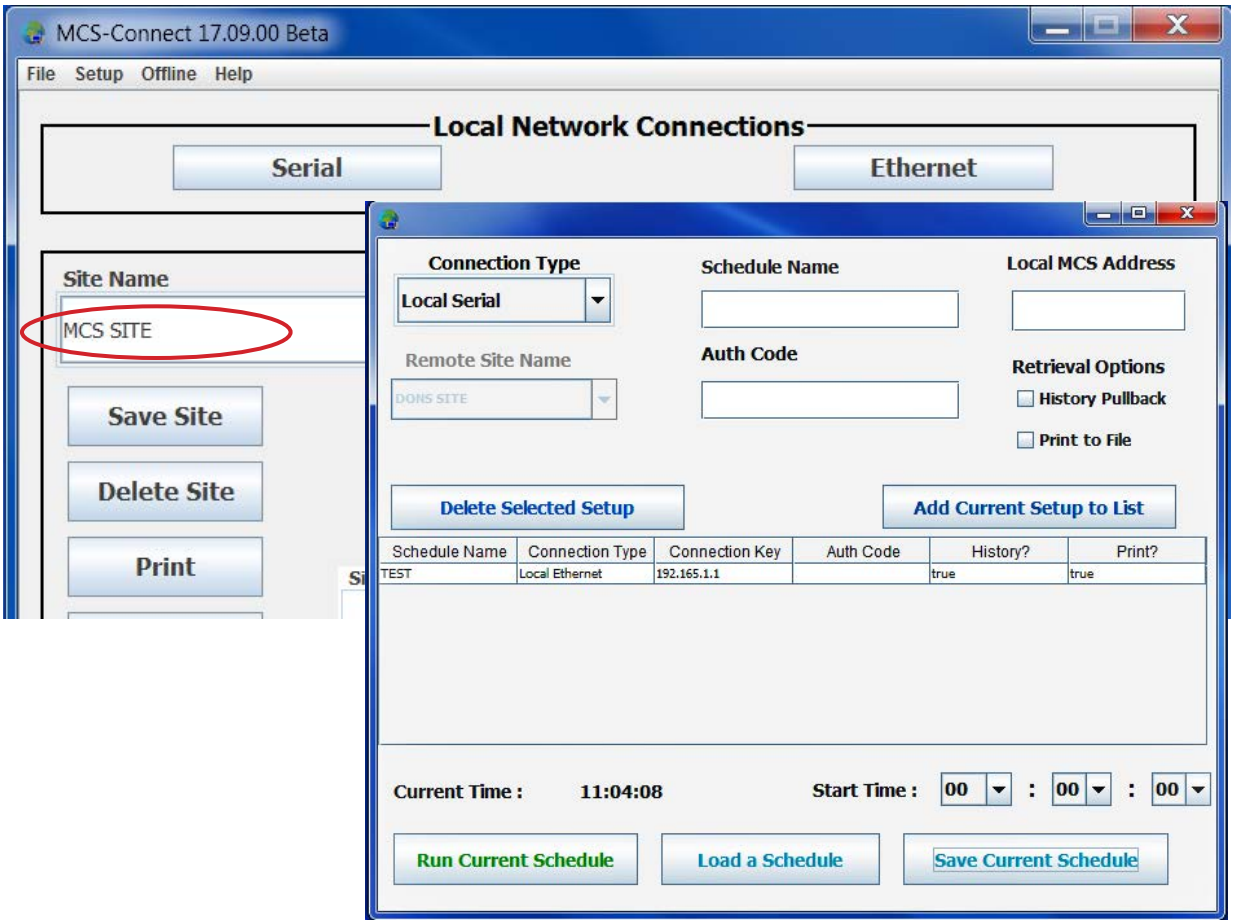
NOTE: 'CREATE SCHEDULED PRINT' WAS DISCOUNTED IN RELEASE #17.03.11 of MCS-CONNECT. SEE DIAGNOSTIC SAVE FOR PRINT OUT.

5.12. Create Scheduled Print (prior to 17.03)

If you need to receive information from a unit to check what is happening at certain times, you can Click on 'Setup' at the main menu screen- 'Create Scheduled Print' to setup a schedule of 'HISTORY PULLBACK' or 'PRINT TO FILE THE STATUS SCREEN OF THE UNIT. This is helpful if you suspect or you believe something is happening at a certain time of the day.

Setup the 'CONNECTION TYPE', 'SCHEDULE NAME' or specify the Local MCS address. Enter an 'AUTHORIZED CODE' is necessary.

You can have different Schedule Files to print, click on tab to 'Load a Schedule' to change files to print and time to print. After setting up a new schedule of files to print, click on 'SAVE THE CURRENT SCHEDULE'

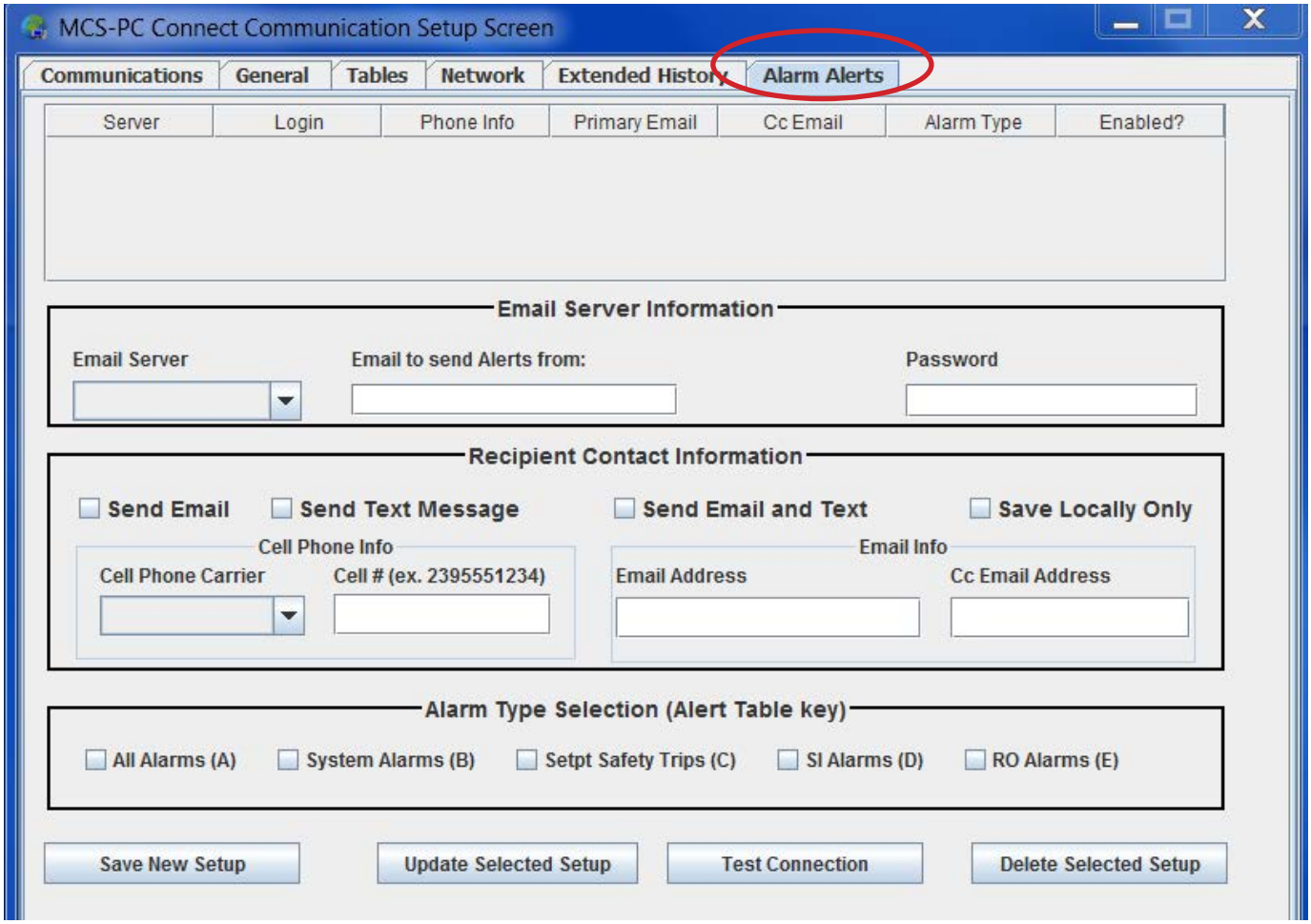


YOU DO NOT NEED TO BE CONNECTED TO THE UNIT TO PRINT THESE REPORTS- BUT YOU MUST HAVE A NETWORK CONNECTION TO PRINT/SAVE THESE FILES TO YOUR COMPUTER

5.13. Alarm Alerts - Versions (prior to Ver 17.12-3/16)

Clicking on Alarm Alerts will bring up the screen below - The screen below shows all elements for the setup. You will need to use the vertical tool bar to scroll thru the setup screen to see all areas that will need to be filled out.

This feature allows the technician to email and or text alarm information for the controller that they are communicating with.



5.13.1 Setup for Alarm Alerts Menu

Select desired Email Server for outgoing messages. Options are “MCS” and “Gmail”.

Enter selected Email Server’s login information.

Choose Alert notification type. Options are “Send Email”, “Send MMS Text Message”, and “Send Both”.

Enter information for chosen notification type. Either a cell phone carrier and number or an email address are needed. A single Cc email address is also an option.

Select Alarm type(s) that trigger alert message. Options are “All Alarms”(exclusive), “System Alarms”, “Setpt Safety Trips(lockout alarms)”, “SI Alarms” or “RO Alarms”. Multiple options can be selected.

Click the “Save New Setup” button at the bottom of scrollable panel.

Once fully filled in you may test the Setup’s functionality by clicking the “Test Connection” button. A popup message will verify that the message was sent. You can then check the specified account for the test message.

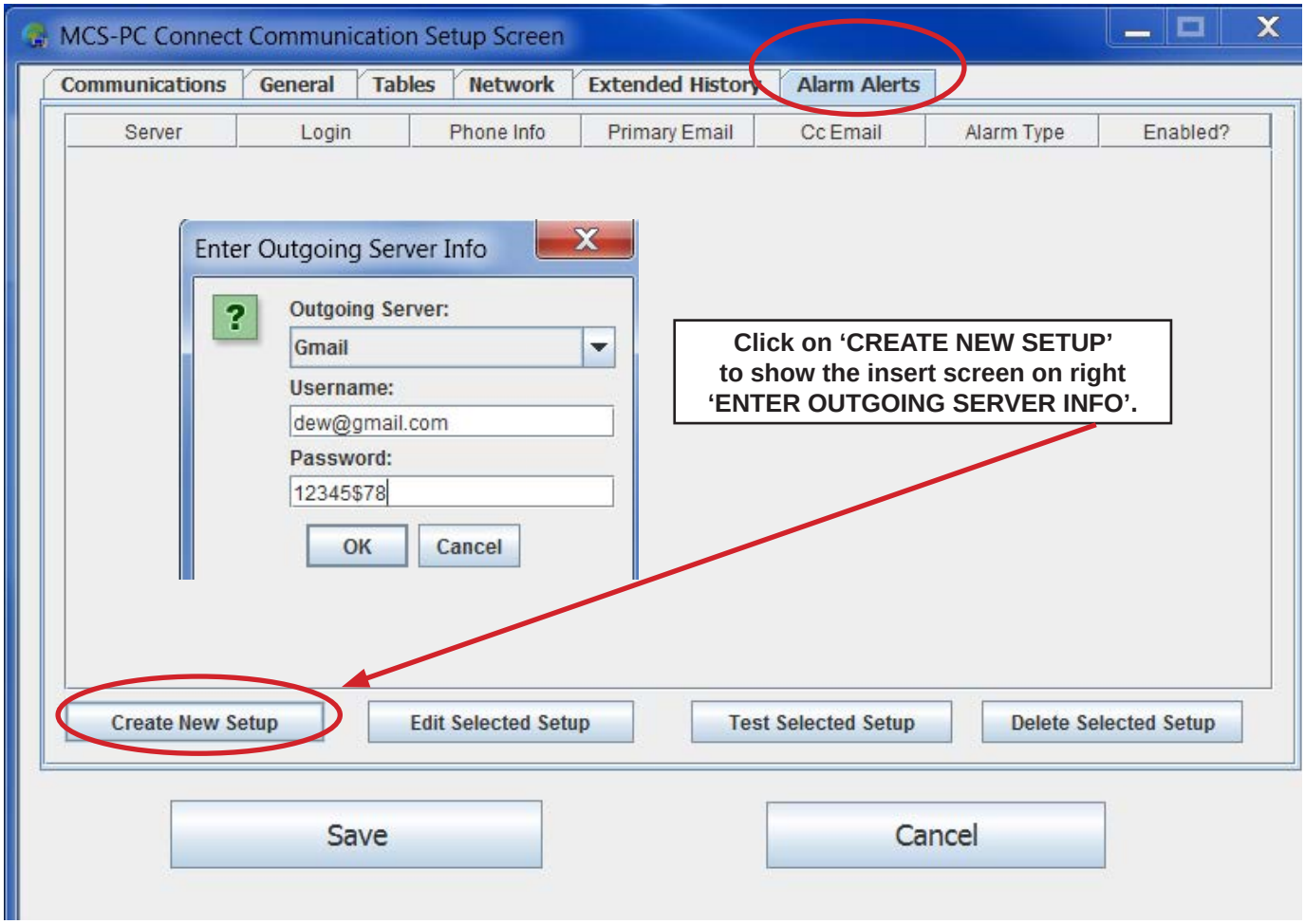
Once the new setup is added to the Alarm Alert Table at the top of the scrollable panel it can be activated by checking the “Enabled?” check box in the last column of the Alarm Alert Table.

A saved Alarm Alert Setup can be updated with new information by clicking on the row in the Alarm Alert Table that you would like to edit. This will load the setup into the Alarm info setup where it can be edited. When finished editing click the “Update Selected Setup” button.

When finished creating and/or updating Alarm Alerts click the “Save” button of the Setup User Interface. This will close the Setup UI and save the created Alarm Alerts. Your enabled Alarm Alerts will be active once you are connected to the desired Controller and in the Status Screen.

5.14. Alarm Alerts - VERSION 17.12

With Ver 17.12, clicking on Alarm Alerts will bring up the new setup screen below.



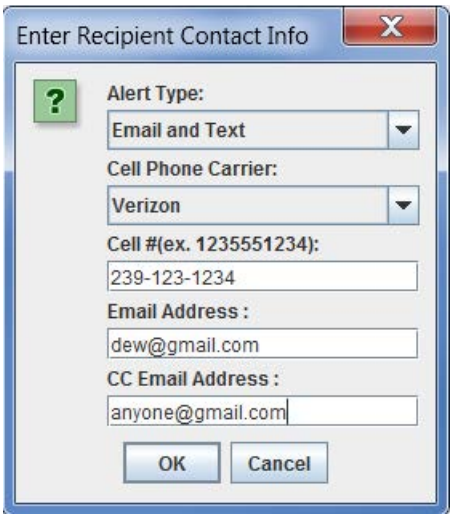
5.14.1 Enter the information for your ‘OUTGOING SERVER’

There are two types of accounts available - You can setup a new ‘GMAIL’ account or call support at MCS to establish an MCS email account.

Fill in your ‘USER NAME’ and ‘PASSWORD’

Clck on ‘OK’ to move to next setup screen

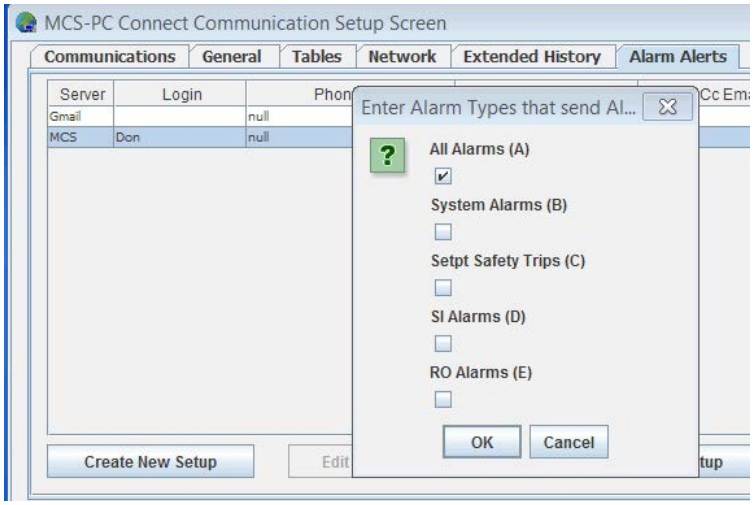
5.14.2 Enter Recipient Contact Info



Fill in the necessary information to have a text sent to your cell number and also to the email account you have setup.

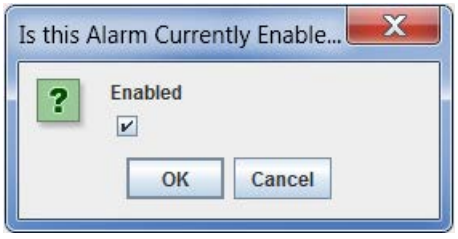
Click 'OK' to proceed to next setup screen.

5.14.3 Setup which alarms you want sent



Click on 'OK' when you have completed this screen.

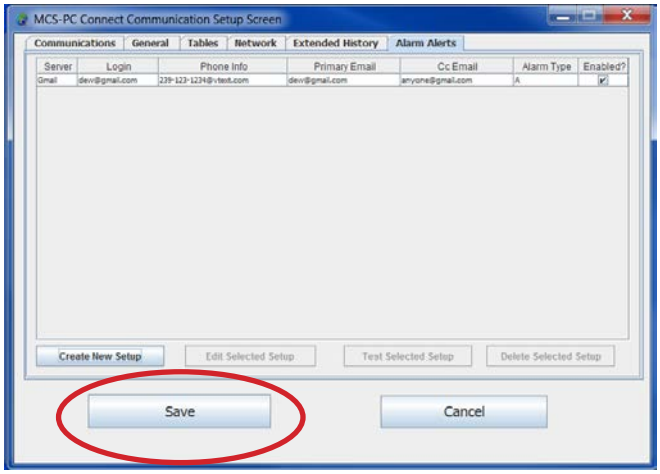
5.14.4 Enable



Next Screen - Enable the completed setup.

Click 'OK'

5.14.5 Save new Alarm Alert Setup



5.14.6 Alarm Alert Types

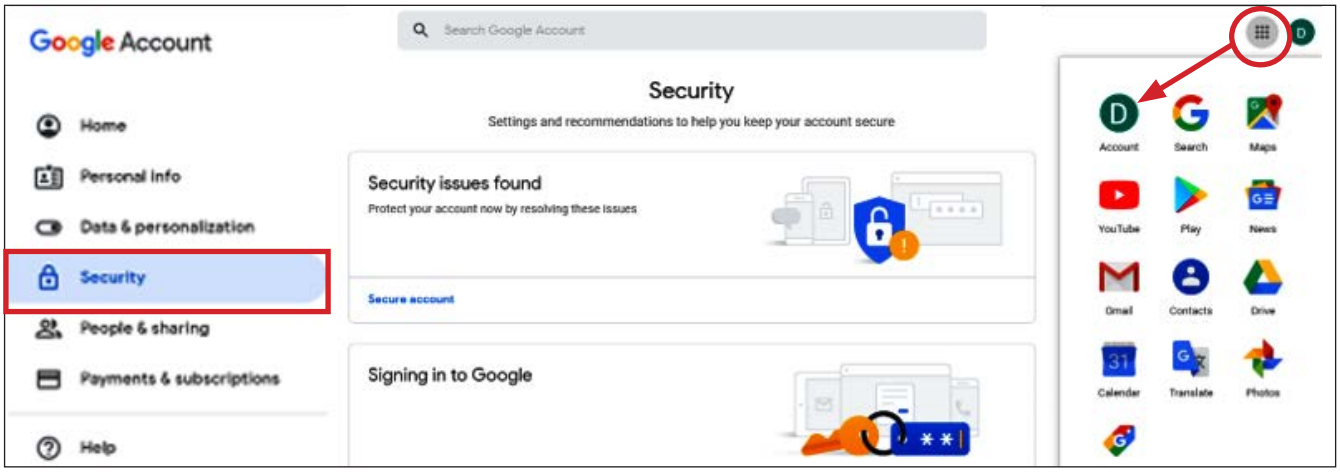
SYSTEM ALARMS

HVAC SETPOINT SAFETIES

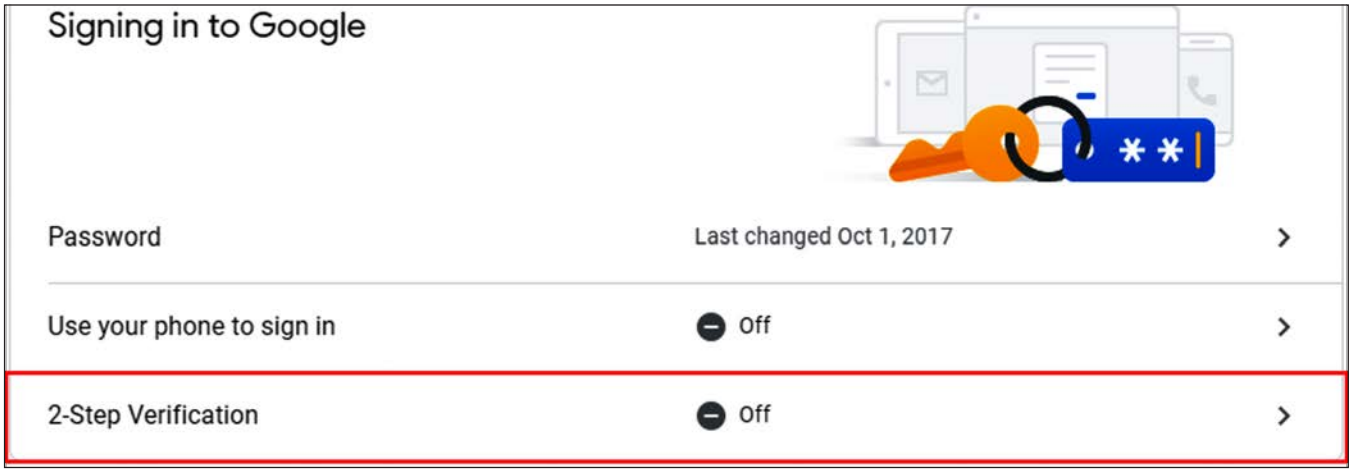
REF SETPOINT SAFETIES

5.15. Alarm Alerts - Gmail Account Setup

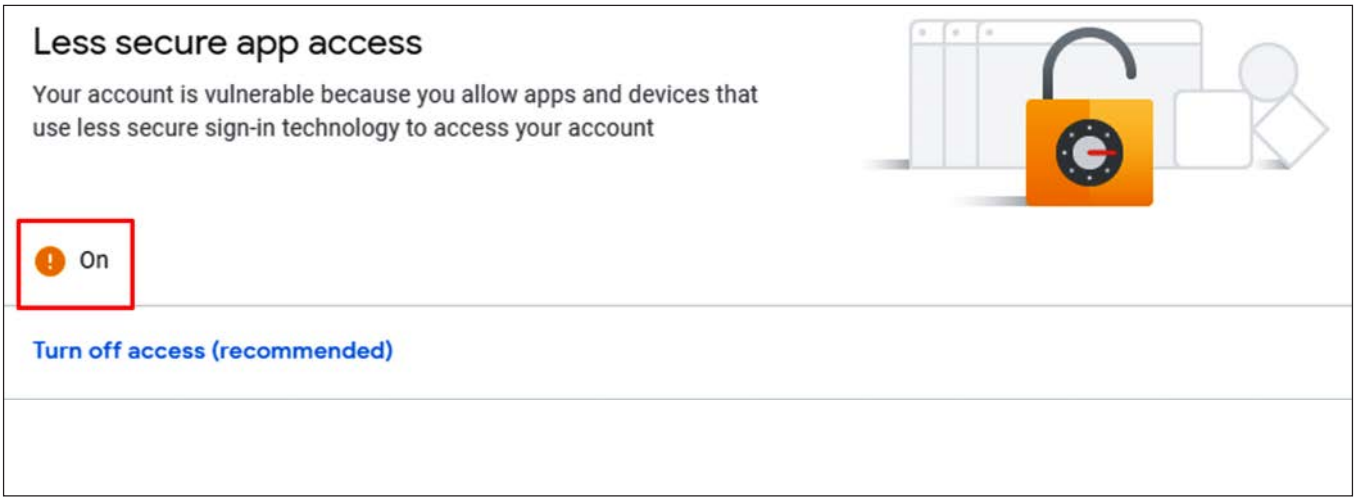
1. Log into your Gmail account and navigate to your Google Account Security settings.



2. Verify '2-Step Verification' is Off



3. Verify 'Less secure app access' is set to On

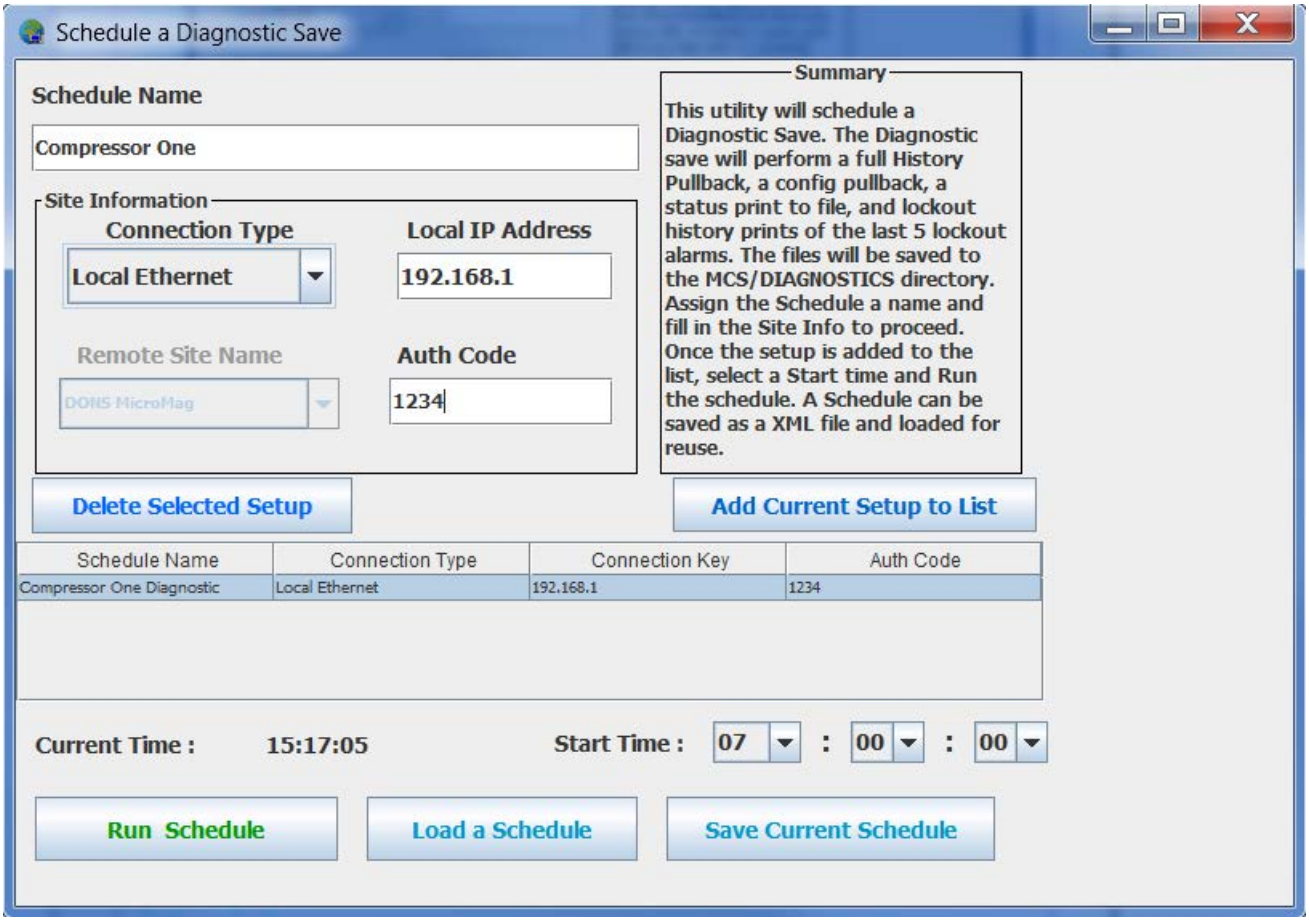


4. If either of these settings are setup incorrectly MCS Connect will not be able to access the Gmail account to send out alarm alerts.

5.16. Diagnostic Save Setup

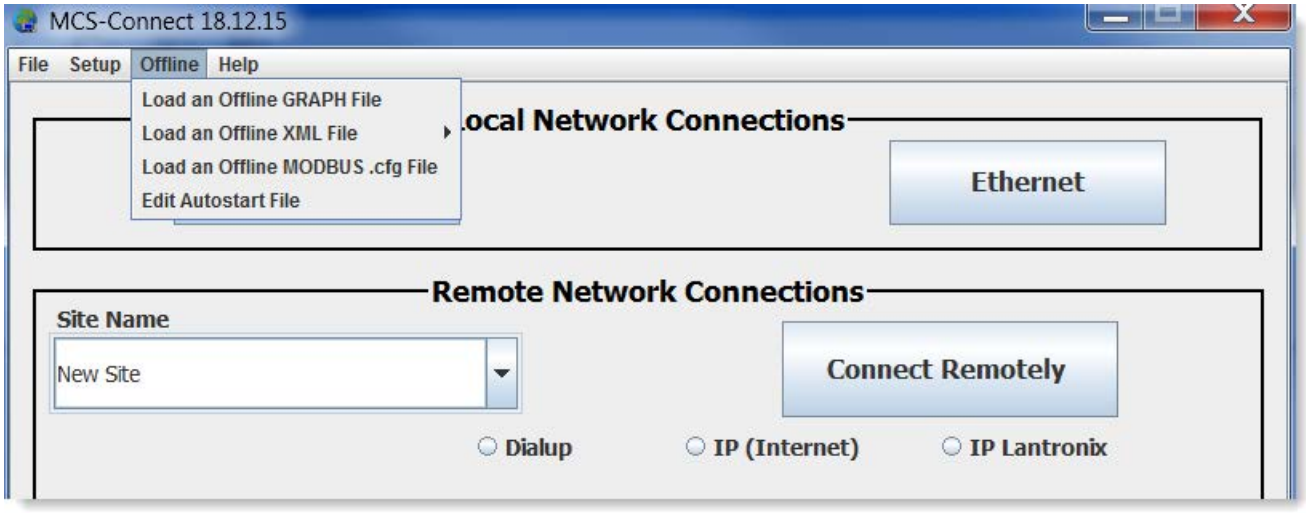
NOTE: This utility will schedule a Diagnostic Save. The Diagnostic save will perform a full History Pullback, a config pullback, a status print to file, and lockout history prints of the last 5 lock-out alarms. The files will be saved to the MCS/DIAGNOSTICS directory.

1. Click in “Schedule Name” - add the name you want for this diagnostic report.



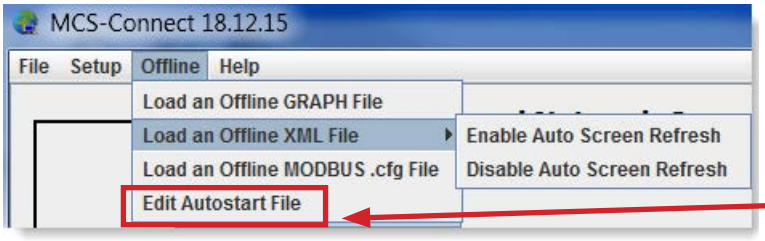
2. Click on ‘Site Information- and choose the connection type to communicate with this controller.
3. Add the ‘Local IP Address if Local Ethernet.
4. Add the Auth Code if needed.
5. Click ‘Add Current Setup to List
6. Click on ‘Load a Schedule - setting the time of day you want to generate the report.
7. Save current schedule
8. Run the Schedule if you want a report right now, otherwise the report will print at the scheduled time.

5.17. OFFLINE MENU BAR



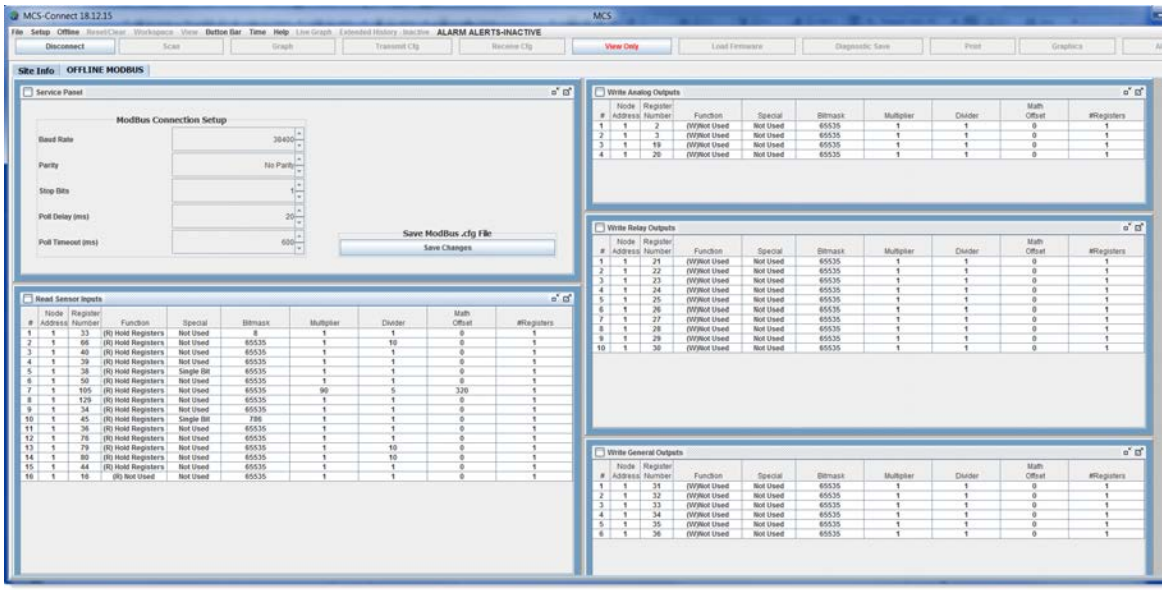
There are four options when you click on 'OFFLINE'

- **Load an Offline GRAPH File** - this allows you to load a 'GRAPH' file while offline which was saved to your local hard drive while connected to a controller.
- **Load an Offline XML file** - clicking on this tab allows the user to 'Enable or Disable Auto Screen Refresh'. If you are using the 'MCS-Graphic Builder' program, you can set your screen to auto refresh each time a change is made to your graphics.



USED ONLY ON TOUCHSCREEN
See APP#127 for information at www.mcscontrols.com

- **Load an Offline MODBUS.cfg File -** You can setup a MODBUS communication port using MCS-CONNECT and re-save the file once changes are made. Below is a sample of the screen.
- For more detail on setting up MODBUS control for a slave device, see MCS-MODBUS manual.



Chapter - 6. System Information Screen

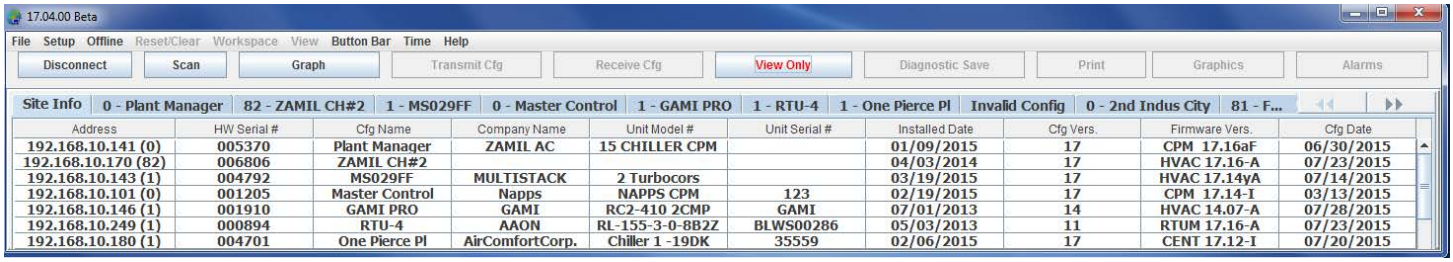
Once you have completed your setup of MCS-CONNECT, click on the communications button for MCS-CONNECT program to start scanning for MCS-controllers.

6.1. SCAN FOR CONTROLLERS

MCS-CONNECT will search for up to 60 MCS controllers that could be connected on the network.

Once all of the units are displayed or when the unit you want is displayed you may select that unit from the tab at the top of the grid or double click anywhere on that row to load up the controller's status.

You can use the horizontal or vertical arrows to scroll for more controllers tabs in the site info.



Address	HW Serial #	Cfg Name	Company Name	Unit Model #	Unit Serial #	Installed Date	Cfg Vers.	Firmware Vers.	Cfg Date
192.168.10.141 (0)	005370	Plant Manager	ZAMIL AC	15 CHILLER CPM		01/09/2015	17	CPM 17.16aF	06/30/2015
192.168.10.170 (82)	006806	ZAMIL CH#2				04/03/2014	17	HVAC 17.16-A	07/23/2015
192.168.10.143 (1)	004792	MS029FF	MULTISTACK	2 Turbocors		03/19/2015	17	HVAC 17.14yA	07/14/2015
192.168.10.101 (0)	001205	Master Control	Napps	NAPPS CPM	123	02/19/2015	17	CPM 17.14-I	03/13/2015
192.168.10.146 (1)	001910	GAMI PRO	GAMI	RC2-410 2CMP	GAMI	07/01/2013	14	HVAC 14.07-A	07/28/2015
192.168.10.249 (1)	000894	RTU-4	AAON	RL-155-3-0-8B2Z	BLWS00286	05/03/2013	11	RTUM 17.16-A	07/23/2015
192.168.10.180 (1)	004701	One Pierce Pl	AirComfortCorp.	Chiller 1 -19DK	35559	02/06/2015	17	CENT 17.12-I	07/20/2015

Serial Network Connection: If MCS-CONNECT does not find any MCS controllers, the Scan Finished message will be displayed in the title bar and no units will be displayed in the grid.

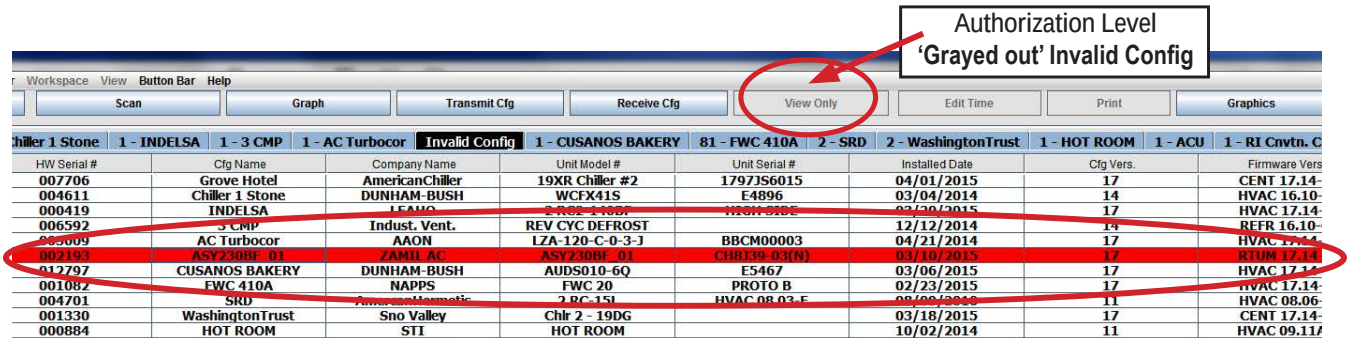
In the info grid MCS-CONNECT version and scanning information is displayed in the title bar.

Once in the Status Screen MCS-CONNECT version, day, date and time, plus the company name will be displayed.

If a MCS Controller has an invalid configuration, its entire row will have a RED background.

Installer needs to Transmit a new configuration file to this controller before continuing with setup.

The installer is authorized at 'View' level to 'Transmit Cfg' and 'Receive Cfg'.



HW Serial #	Cfg Name	Company Name	Unit Model #	Unit Serial #	Installed Date	Cfg Vers.	Firmware Vers
007706	Grove Hotel	AmericanChiller	19XR Chiller #2	1797JS6015	04/01/2015	17	CENT 17.14-
004611	Chiller 1 Stone	DUNHAM-BUSH	WCFX41S	E4896	03/04/2014	14	HVAC 16.10-
000419	INDELSA	LEAHO	2 RC2-140BF	HIGH SIDE	03/20/2015	17	HVAC 17.14-
006592	3 CMP	Indust. Vent.	REV CYC DEFROST		12/12/2014	14	REFR 16.10-
003609	AC Turbocor	AAON	LZA-120-C-0-3-J	BBCM00003	04/21/2014	17	HVAC 17.14-
002193	ASY230BF_01	ZAMIL AC	ASY230BF_01	CH8J39-03(N)	03/10/2015	17	RTUM 17.14-
012797	CUSANOS BAKERY	DUNHAM-BUSH	AUDS010-6Q	E5467	03/06/2015	17	HVAC 17.14-
001082	FWC 410A	NAPPS	FWC 20	PROTO B	02/23/2015	17	HVAC 17.14-
004701	SRD	AmericanHermetic	2 RC-15L	HVAC 08.03-E	08/09/2013	11	HVAC 08.06-
001330	WashingtonTrust	Sno Valley	Chlr 2 - 19DG		03/18/2015	17	CENT 17.14-
000884	HOT ROOM	STI	HOT ROOM		10/02/2014	11	HVAC 09.11A

Chapter - 7. Function Screens Connected to Controller

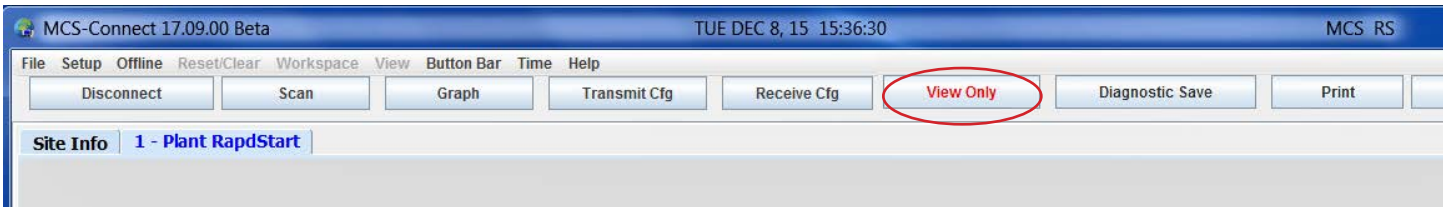
7.1. Getting Authorized

VIEW ONLY MCS-CONNECT SOFTWARE CANNOT BE AUTHORIZED TO A HIGHER LEVEL

OEM'S, CONTRACTORS and INSTALLERS MUST DOWNLOAD THE 'AUTH CODE' VERSION OF MCS-CONNECT TO BE ABLE TO MAKE CHANGES. CONSULT MCS SUPPORT.

At any time while connected to a MCS controller the user can get authorized to a higher level by clicking on the **'View Only'** button located at the top of the screen. Higher levels of Authorization may be necessary to make changes to the controller you are connected to.

See levels below:

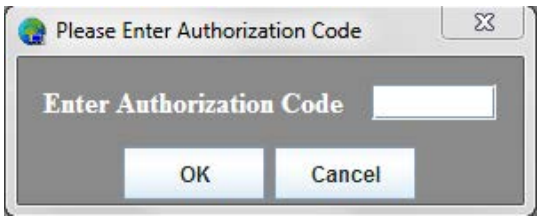


Note: The color of the Authorization button indicates what level you are authorized, and the current level of authorization. The system default is 'View' only.

YOU MUST HAVE AUTHORIZATION TO MAKE CHANGES TO THE SYSTEM HIGHER THAN VIEW. CONSULT YOUR SUPERVISOR FOR WHAT AUTHORIZATION LEVEL IS NEEDED FOR MAKING CHANGES TO THE SYSTEM.

Red = VIEW ONLY
Light Blue = USER LEVEL
Fuscia = SERVICE
Blue = SUPERVISOR
Green = FACTORY

When you select the Authorization button the following pop up will be displayed:
Enter the 4 digit authorization code in the space provided and press the 'enter' button.
The **Cancel** button will return the user to the previous screen with no changes made to the authorization level. *Note: That the code that is entered is not visually displayed*. If an invalid authorization code is entered, no message is displayed. The Authorization color and level will remain unchanged.



Authorization popup showing with keypad display and without keypad display.
This is set in the 'General Options' in the setup.

On each screen at the top there is a button bar with the following menu of buttons that will access all of the available screens and functions.

If a button is grayed out that function is disabled, and that screen cannot be viewed. See the button explanations below for access availability of the various screens or functions. To access some of the above buttons you must first select the MCS controller you wish to view from the System Information Screen. Clicking on the associated address tab will select the controller.

Exiting MCS-CONNECT

To end the communications link with the MCS controllers click on the **'DISCONNECT'** tab. If remote connection is underway, the PC's modem will receive a hang up command to terminate the live session. Control will be returned to the main user interface.

7.2. To Re-scan the Network for MCS Controllers

To force MCS-CONNECT to re-scan the network press the 'Scan' button.

7.3. Accessing the Graph Screen

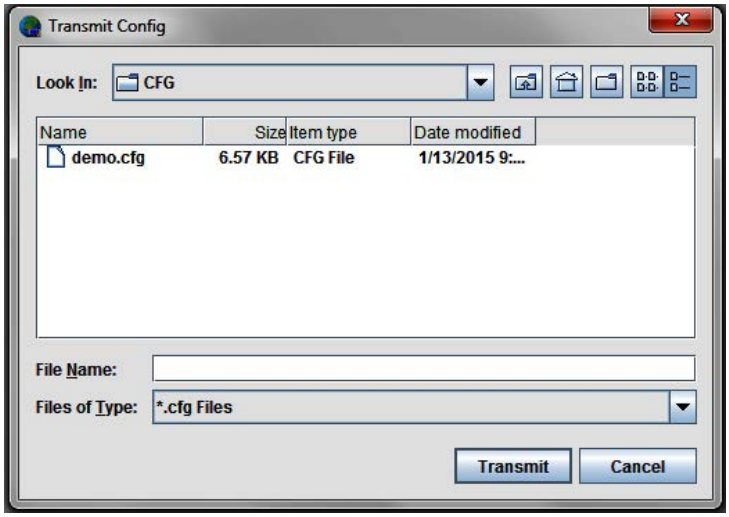
To access the Graph Screen, select the 'Graph' button. This screen displays data in a graphical form. The MAGNUM has 1008 history samples of every input & output for trending purposes. At a 10 minute sample rate this is 7 days of data. The user can also purchase an optional MCS-COMPACT card for extended history. On the 'Extended History' setup screen you have the option of naming a destination file for saving 'the Extended History' on your PC.

The MicroMag has 300 history samples of all points.

7.4. Accessing the Transmit Function

(NOTE: The 'RUN/STOP' should be put in stop before transmitting a new CFG file).

To Initiate a Configuration File Transmission the user must be authorized at a level greater than view only. **(If there is an invaid config file on a controller, 'View Only' level will allow you to transmit a new config file)**.



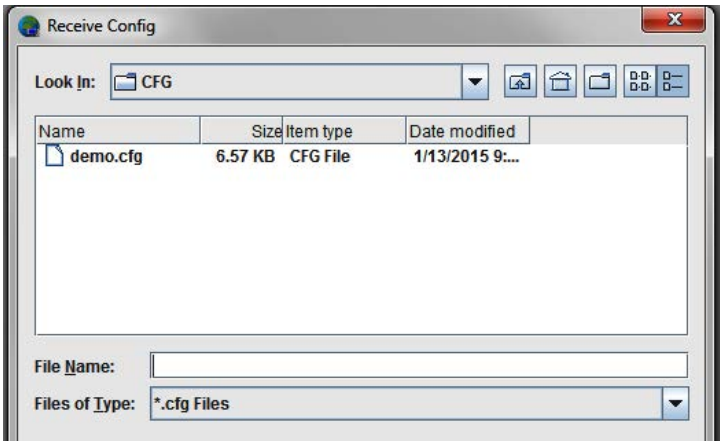
This option enables a configuration file to be transmitted to the MCS controller. Once transmission begins, the MCS controller will immediately turn OFF all output points. The transmission time is 40 seconds to 90 seconds. During this time the MCS controller LCD will display the message "CFG DOWNLOAD". When the transmission is completed, the MCS controller will reset and enter the STARTUP state.

Note: The configuration file (cfg) will be sent to you from the factory for your controller. Locate the directory where you have stored the downloaded file to start to transmit.

7.5. Accessing the Receive Function

When the '**Receive Cfg'** tab is clicked, the following file popup will appear:
Select the directory where the configuration file is to be written and then enter a name for the file. Click on the 'Receive' button to begin retrieval.

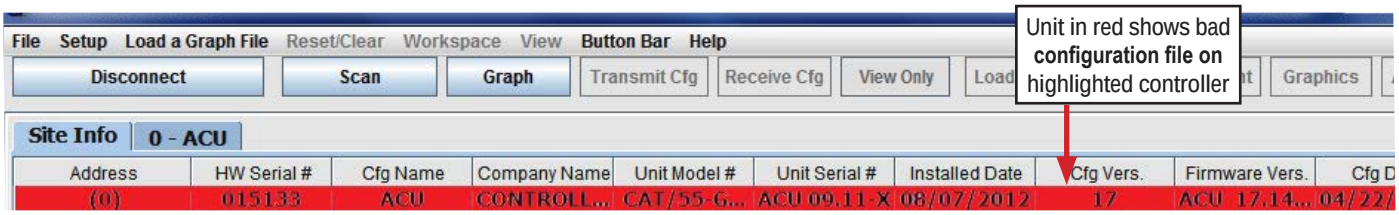
During retrieval a status popup screen will appear that is updated as the retrieval progresses.



Note: If the user is connected to an MCS controller with an invalid configuration file, the only options that will be accessible for that controller will be the Transmit and Receive buttons. The user must transmit a valid configuration file to communicate with the controller. Make sure when transmitting configuration files that the address is correct.

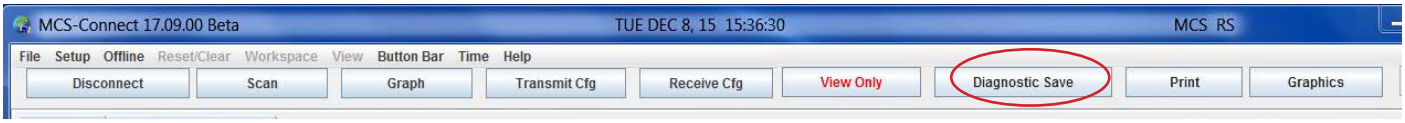
7.6. Understanding the Authorization Screen

To access the Authorization Screen, click the **'View Only'** button. See section in this manual on how 'GETTING AUTHORIZED' to a higher level.



7.7. Diagnostic Save

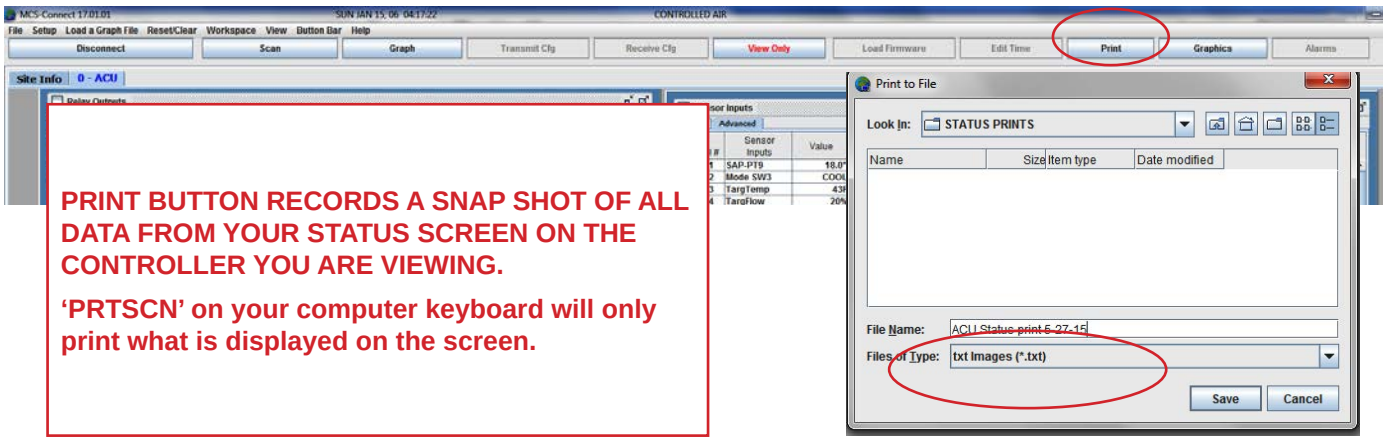
Saves the config, history printout, last 5 lockout alarm printouts and the status printouts to a zip file.



7.8. Accessing the Print Function

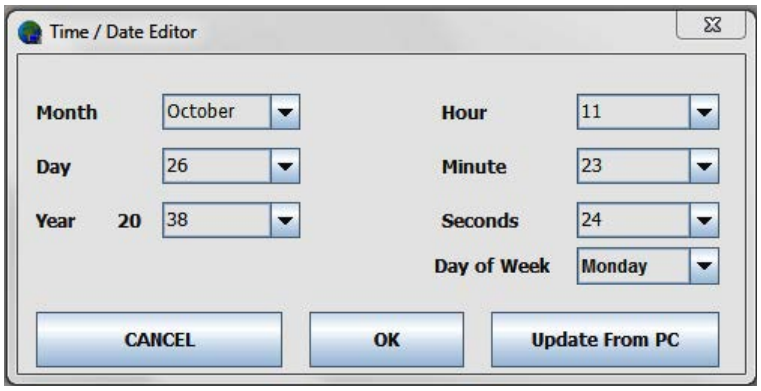
To access the Print to File function, click the **'PRINT' BUTTON**.

This screen allows the user to save to a .TXT file that can be viewed in Excel, Notepad or printed.



7.9. Edit Time/Date Screen

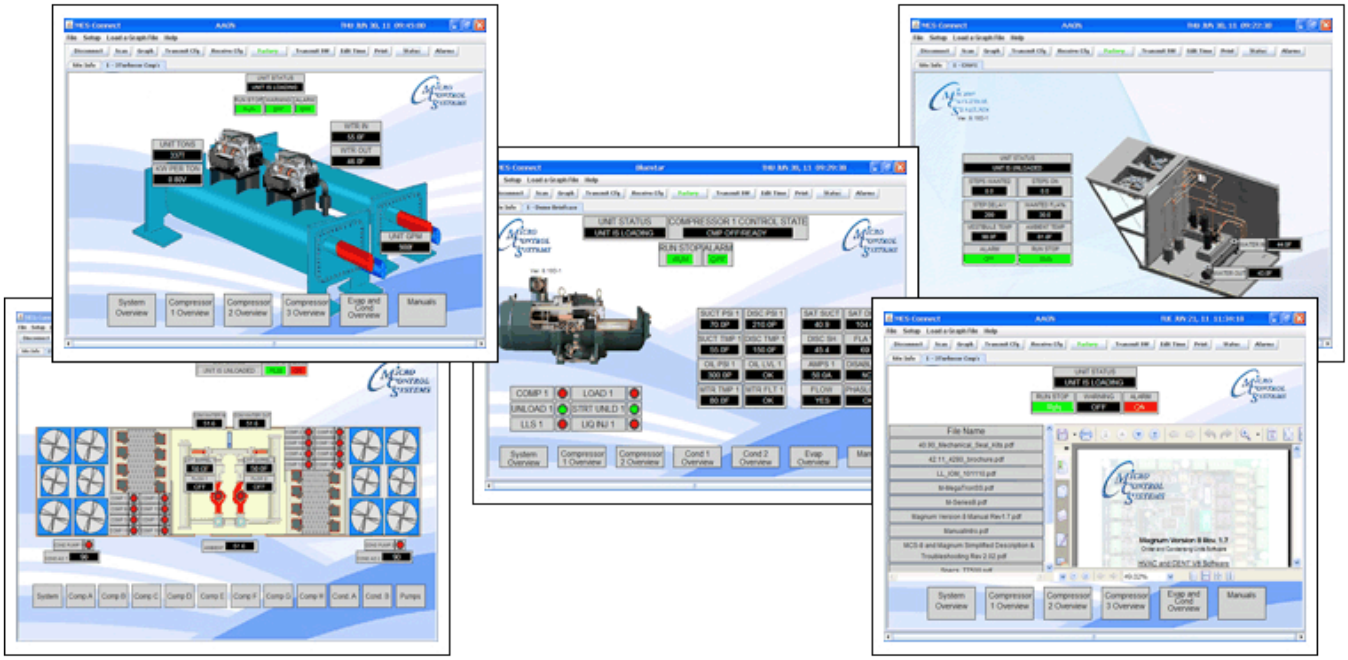
Allows MCS-CONNECT to correct the time in the controller to conform with actual time. User can enter a time manually or use the “Update from PC” button to sync the controller with the PCs time and date.



NOTE: ALL UNITS ARE SHIPPED WITH CURRENT USA EASTERN TIME

7.10. Graphics Screen

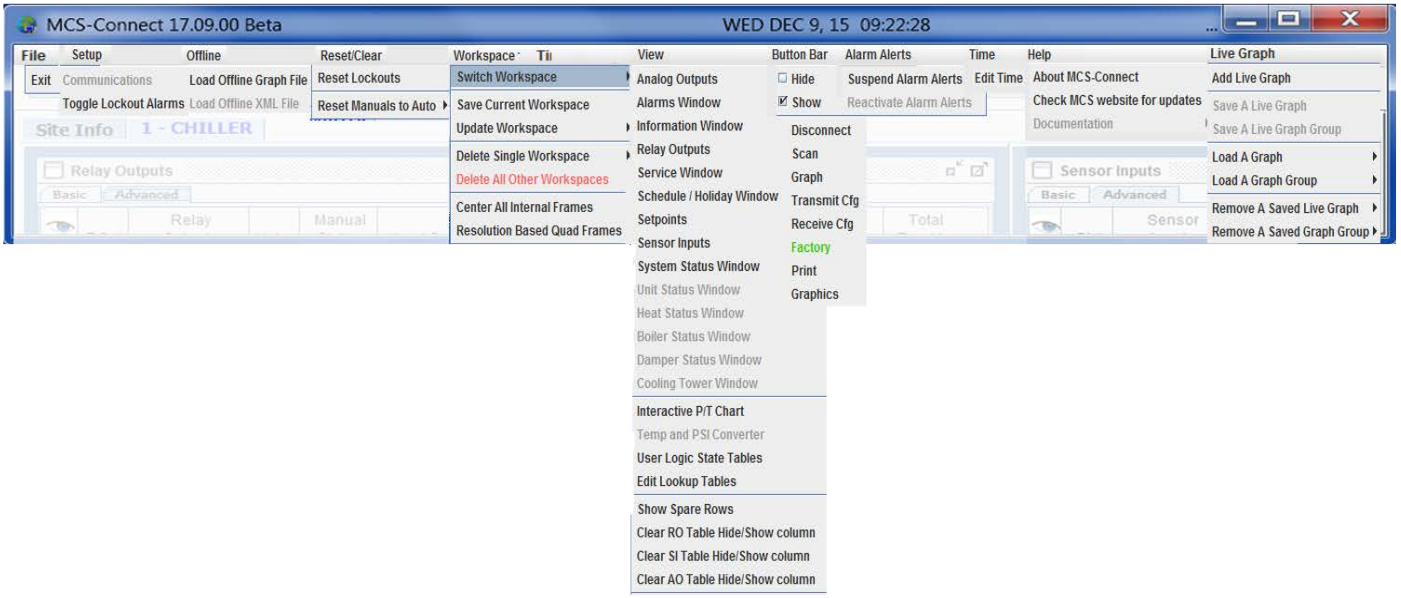
The Graphics feature allows the user to have a graphical interface of MCS-Connect.



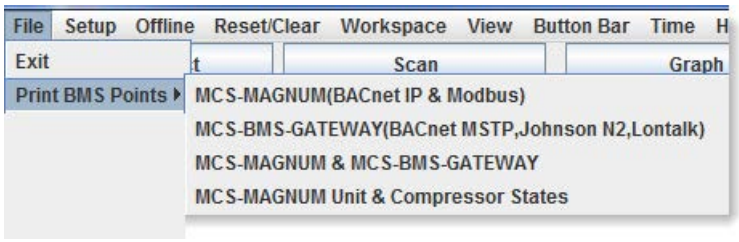
Additional information on MCS-GRAPHICS is discussed later in this manual.

Chapter - 8. Menu Bar Descriptions

Below is a pull down list of functions for the Menu Bar Tabs. The tabs allows the user to make fast screen changes, save custom workspaces, etc. See a description for each item below.



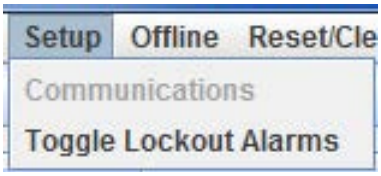
8.1. FILE BAR - Allows user to exit MCS-CONNECT and or print BMS points lists.



IMPORTANT

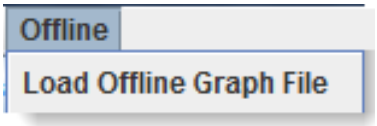
See Appendix in back on BMS print samples.

8.2. SETUP BAR - Toggle lockout alarms



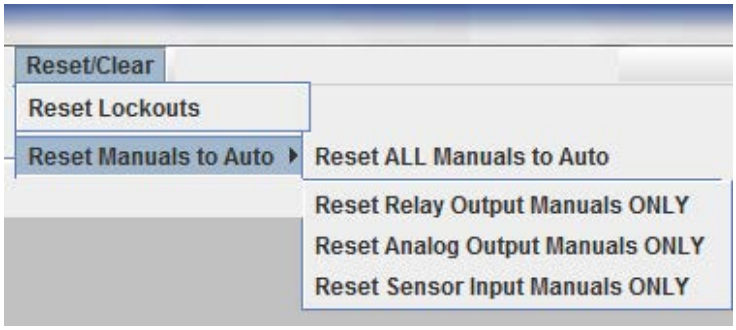
8.3. OFFLINE - Load an offline Graph

Load offline graph file gives you the ability to load a 'GRAPH FILE' that has been saved to your hard drive without being connected to your controller. ***See appendix in back section of this manual.***



8.4. RESET/CLEAR BAR - The following screen will appear when the RESET button is selected.

To clear lockouts, click on the button **'RESET LOCKOUTS'**



To clear lockouts the user must be authorized at a level greater than view.

If not the **'NOT AUTHORIZED MESSAGE WILL BE DISPLAYED'.**

NOTE:

Prior to doing a lockout reset, YOU MUST review the alarm grid to verify what caused the lockout. When the cause is corrected you can press 'RESET LOCKOUTS' and a message will appear stating that the controller has received lockout reset and an alarm notification will be logged.

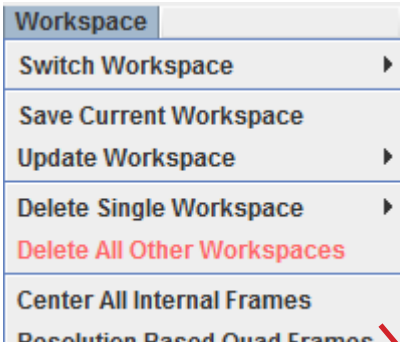
This feature allows the user to reset all lockouts.

If you have a circuit or the entire package is in lockout, clicking the Reset Lockout button through MCS-CONNECT will clear all lockouts. If the lockout condition still has not been corrected, the system will lockout instantly and not run.

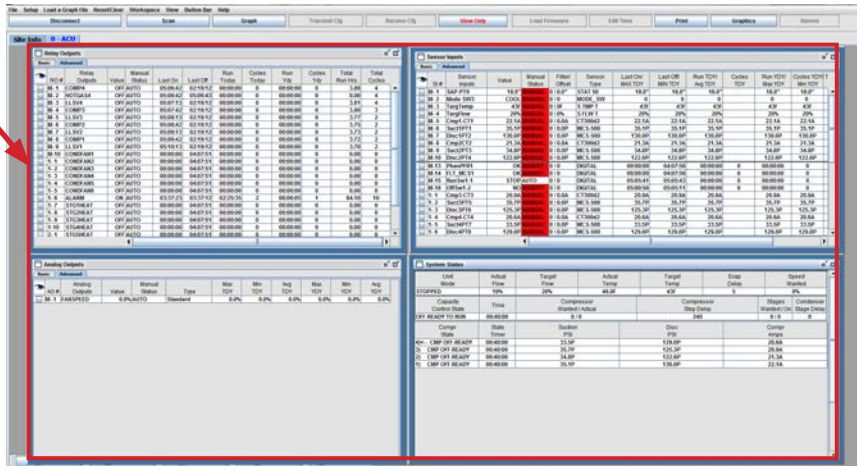
YOU ARE LIMITED TO 6 LOCKOUT RESETS PER DAY.

AFTER 6 LOCKOUTS, YOU NEED FACTORY OR HIGHER AUTHORIZATION TO CLEAR LOCKOUTS

8.5. WORKSPACE BAR

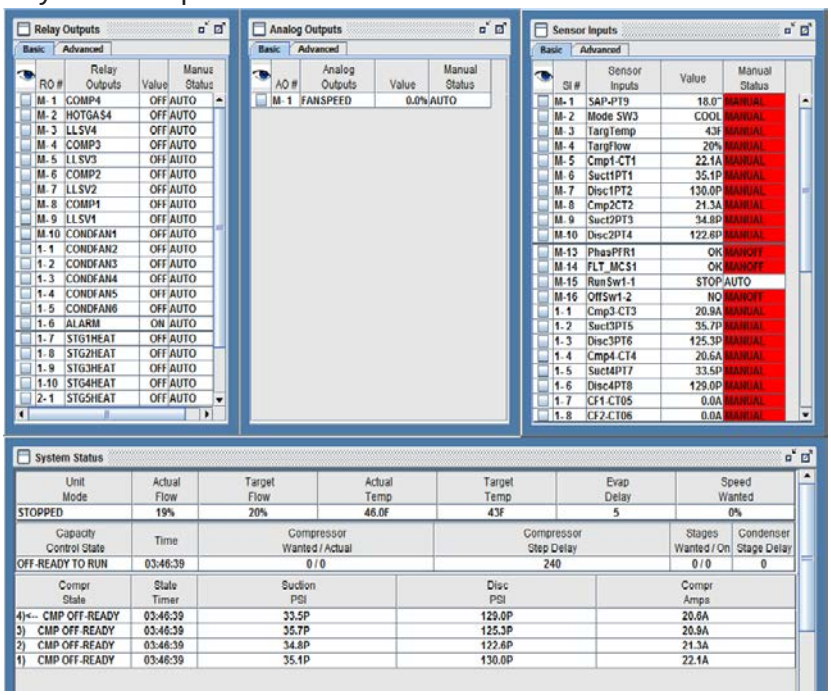


- A workspace is a custom layout of moved and re-sized frames.
- Your current workspace can be saved in the Workspace menu in the Menu Bar
- The Workspace menu is also used for managing or switching workspaces



8.5.1 CREATING A NEW WORKSPACE

1. Decide which items you wish to monitor in your workspace.
2. In the sample below, we have selected the following items for viewing for this workspace.
   - Relay Outputs frame
   - Analog Outputs frame
   - Sensors frame
   - Status frame



Drag each frame and position in your computer's window for best fit and viewing.

3. Click on 'SAVE CURRENT WORKSPACE' - YOU WILL PROMPTED FOR A NAME.

After creating and saving a workspace, continue to view other options under the 'Workspace Menu Bar'

8.5.2 Switch Workspace

User can select different 'SAVED WORKSPACES'

8.5.3 Save Current Workspace

Choose the items you wish to view and save the current workspace.

NOTE: At the 'GENERAL SETUP SCREEN' in MCS-CONNECT you can choose a workspace as your default workspace so each time you connect to your controller, your custom workspace will appear. You can change back to the default workspace or create a new workspace.

8.5.4 Update Workspace

If you make changes to your saved workspace, click to 'Update' the workspace.

8.5.5 Delete Single Workspace

Click to delete a single workspace.

8.5.6 Delete All Other Workspaces

Deletes all workspaces except the current workspace

8.5.7 Center all Internal Frames

Click here and each open frame will be centered in your viewing area.

8.5.8 Resolution Based Quad Frames

Click here and four frames will center within your viewing area.

8.6. VIEW BAR

Short cuts to additional frames not currently showing (items grayed out are already being viewed or do not pertain to this controller):

'ANALOG OUTPUTS'

'ALARMS WINDOW'

'INFORMATION WINDOW'

'RELAY OUTPUTS'

'SERVICE WINDOW'

'SCHEDULE / HOLIDAY WINDOW'

'SETPOINTS'

'SYSTEM STATUS WINDOW'

User can also view and use the:

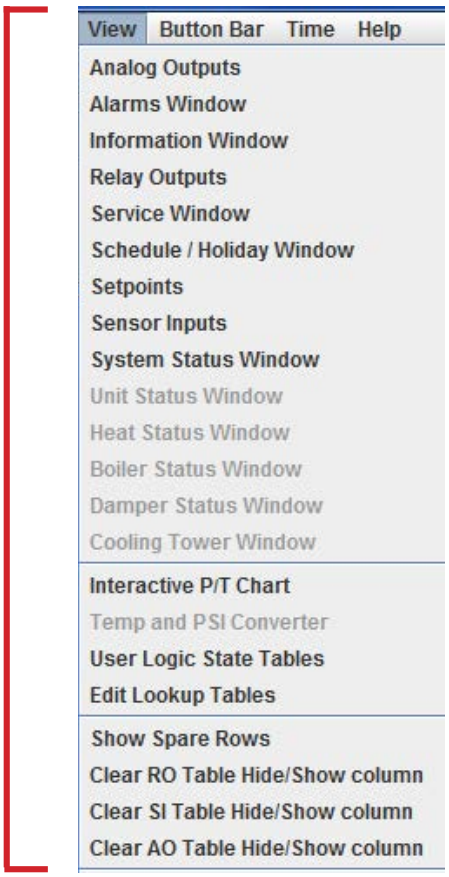
'INTERACTIVE P/T CHART'

'TEMP AND PSI CONVERTER'

'USER LOGIC STATE TABLES'

'LOOKUP TABLES'

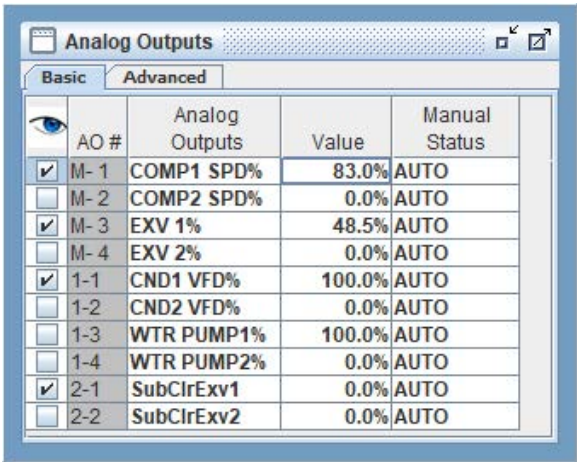
'HIDE SPARE ROWS'



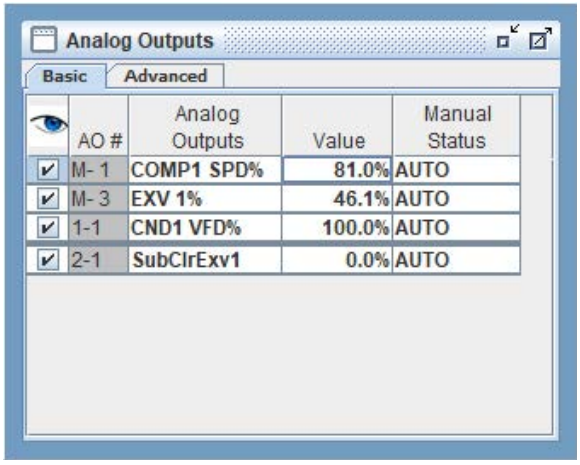
8.7. HIDE/SHOW ROWS

The ‘Hide/Show’ icon toggles the visibility of inputs/ outputs displayed on the screen.

- In this example things relating to circuit #1 are selected.
- Then click the “eye” and all unselected items will be hidden.
- Click the “eye” again to bring all unselected items back into view.
- The Hide/Show column is located in the:
  - Analog Outputs frame
  - Relay Output frame
  - Sensor Inputs frame

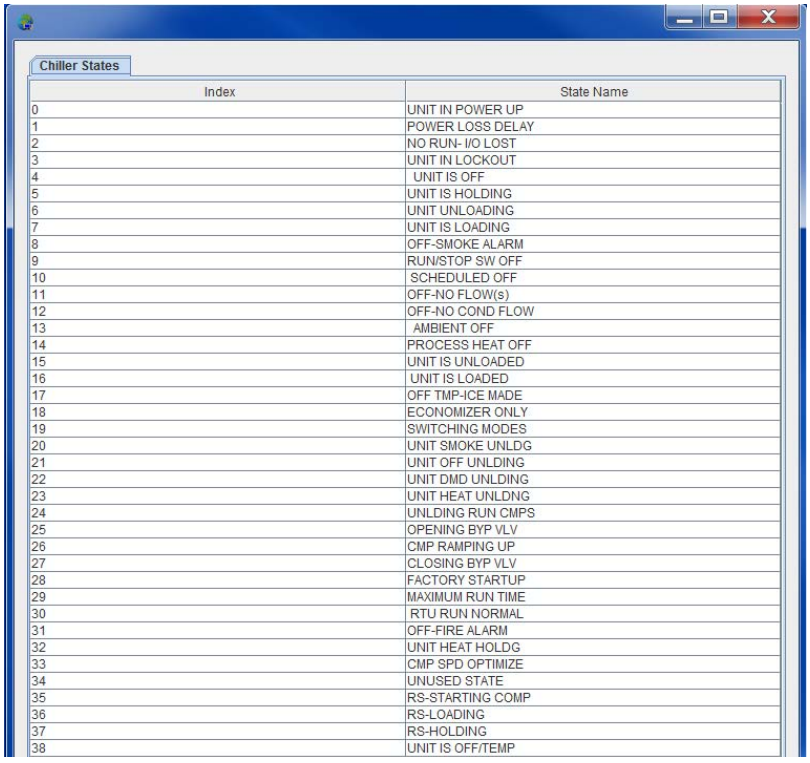


AO #	Analog Outputs	Value	Manual Status
M- 1	COMP1 SPD%	83.0%	AUTO
M- 2	COMP2 SPD%	0.0%	AUTO
M- 3	EXV 1%	48.5%	AUTO
M- 4	EXV 2%	0.0%	AUTO
1-1	CND1 VFD%	100.0%	AUTO
1-2	CND2 VFD%	0.0%	AUTO
1-3	WTR PUMP1%	100.0%	AUTO
1-4	WTR PUMP2%	0.0%	AUTO
2-1	SubClrExv1	0.0%	AUTO
2-2	SubClrExv2	0.0%	AUTO

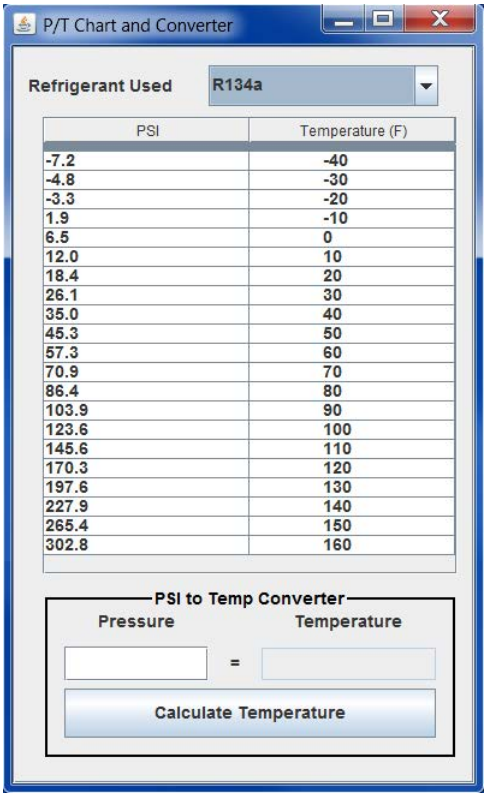


AO #	Analog Outputs	Value	Manual Status
M- 1	COMP1 SPD%	81.0%	AUTO
M- 3	EXV 1%	46.1%	AUTO
1-1	CND1 VFD%	100.0%	AUTO
2-1	SubClrExv1	0.0%	AUTO

8.7.1 USER LOGIC STATE TABLES - P/T CHART CONVERTER



Index	State Name
0	UNIT IN POWER UP
1	POWER LOSS DELAY
2	NO RUN- I/O LOST
3	UNIT IN LOCKOUT
4	UNIT IS OFF
5	UNIT IS HOLDING
6	UNIT UNLOADING
7	UNIT IS LOADING
8	OFF-SMOKE ALARM
9	RUN/STOP SW OFF
10	SCHEDULED OFF
11	OFF-NO FLOW(s)
12	OFF-NO COND FLOW
13	AMBIENT OFF
14	PROCESS HEAT OFF
15	UNIT IS UNLOADED
16	UNIT IS LOADED
17	OFF TMP-ICE MADE
18	ECONOMIZER ONLY
19	SWITCHING MODES
20	UNIT SMOKE UNLDG
21	UNIT OFF UNLDING
22	UNIT DMD UNLDING
23	UNIT HEAT UNLDNG
24	UNLDING RUN CMPS
25	OPENING BYP VLV
26	CMP RAMPING UP
27	CLOSING BYP VLV
28	FACTORY STARTUP
29	MAXIMUM RUN TIME
30	RTU RUN NORMAL
31	OFF-FIRE ALARM
32	UNIT HEAT HOLDG
33	CMP SPD OPTIMIZE
34	UNUSED STATE
35	RS-STARTING COMP
36	RS-LOADING
37	RS-HOLDING
38	UNIT IS OFF/TEMP



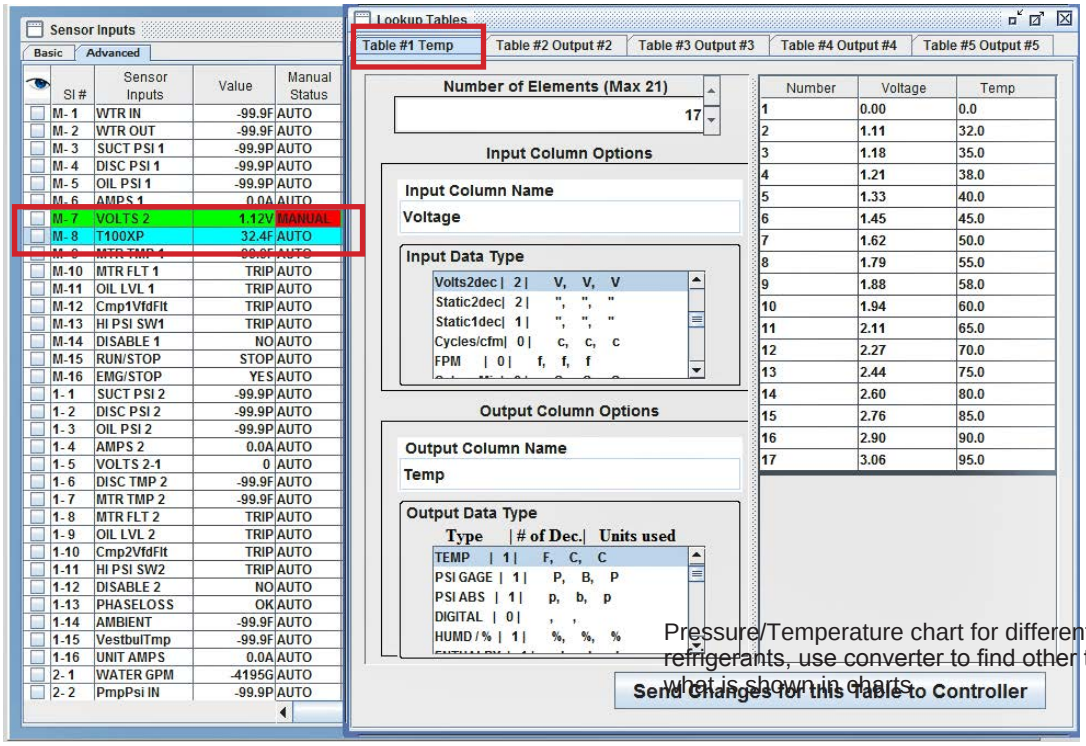
PSI	Temperature (F)
-7.2	-40
-4.8	-30
-3.3	-20
1.9	-10
6.5	0
12.0	10
18.4	20
26.1	30
35.0	40
45.3	50
57.3	60
70.9	70
86.4	80
103.9	90
123.6	100
145.6	110
170.3	120
197.6	130
227.9	140
265.4	150
302.8	160

State Table above shows different states of the compressor

8.7.2 Viewing the Lookup Table in MCS-Connect

In MCS-Connect we can view the sensor example as shown in Screen 4 and view the same information that we setup in MCS-Config. Changes can be made if you are authorized to view or make changes. We setup the authorization as 'FACTORY' in MCS-Config for this sensor example.

Screen 4



Pressure/Temperature chart for different refrigerants, use converter to find other than what is shown in charts.

8.7.2.1. Using as Control Temperature Sensor

The example sensor has been specified in MCS-Config as providing the control value reading. It will normally be the entering temperature, leaving temperature, or suction pressure. The Setpoints must be adjusted according to the type of control measurement selected.

8.8. BUTTON BAR - Click to hide/show Button Bar, short cuts to 'Scan', 'Graph','Transmit',

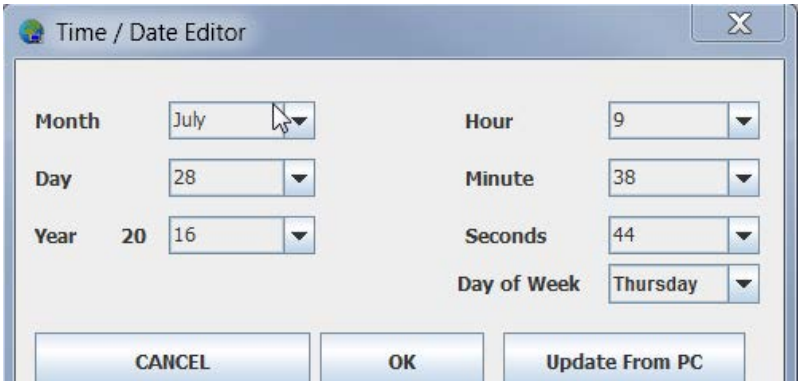
'Receive Ctg', 'Authorization Level', 'Print' and 'Graphics'.

8.9. ALARM ALERTS -

If you chose to use the 'Alarm Alerts' in the initial setup, Clicking on this tab allows the user to 'Suspend Alarm Alerts' or 'Reactivate Alarm Alerts'. Note, the choices will be grayed out if you did not setup in the General Setup screen.

8.10. TIME -

You must be authorized to make changes to the time feature.

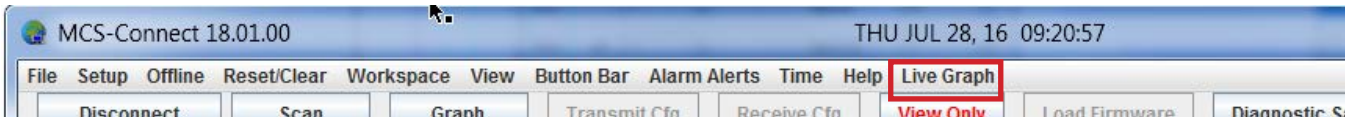


8.11. HELP BAR

About MCS-CONNECT - provides current version# and provides information on MCS.

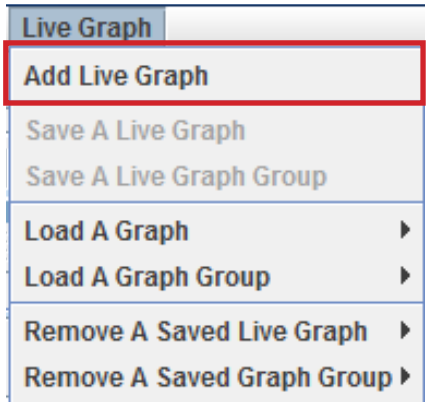
Check MCS website for updates - allows the user to check for latest updates.

8.12. LIVE GRAPH



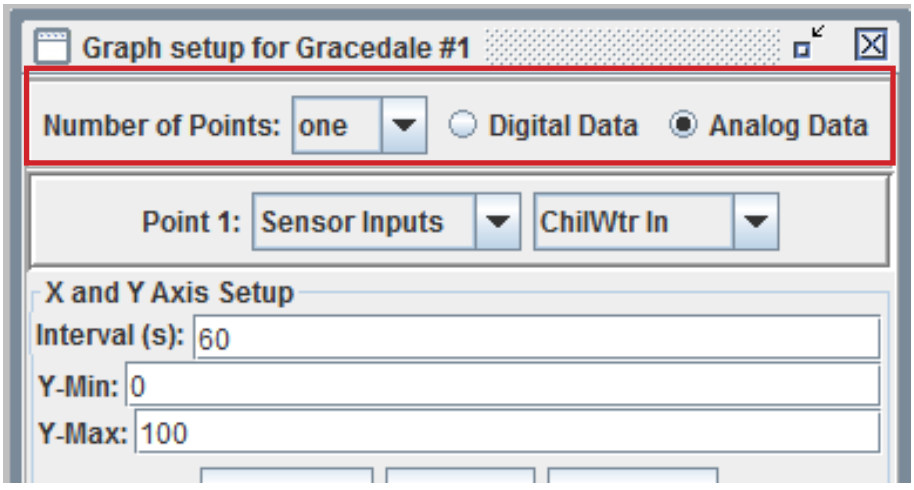
Click here to setup a 'Live Graph'.

'Live Graph' allows the user to view a graph in ***'Real Time'*** while connected to the controller. The system will grab data from the controller you are connected to and display it in graph format.

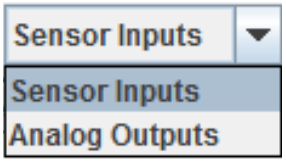


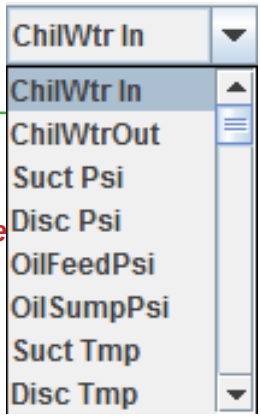
8.12.1 ANALOG GRAPH (DEFAULT)

When clicked, Live Graph will default to **'Analog Data'** for setting up your Graph. If you are going to use 'Live Graph" to graph a Digital Point, proceed to the next section on how to set up for 'Digital Points'.



The points can be '**Sensor input'** or **'Analog output'**.





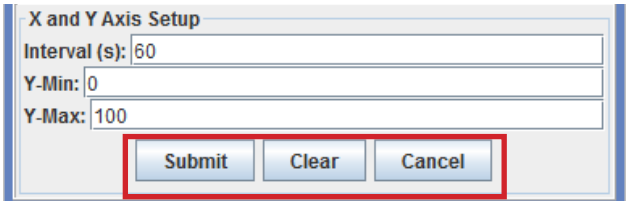
The User can select up to six (6) points to graph when 'Analog Data' is sele

A drop down menu next to the point you are graphing will show all the available sensor inputs and outputs configured to the controller you are connected to.

NOTE: Sensor inputs have digital and analog points that can be selected . Refer to your controller to graph the correct sensor information.

8.12.1.1. X AND Y AXIS SETUP

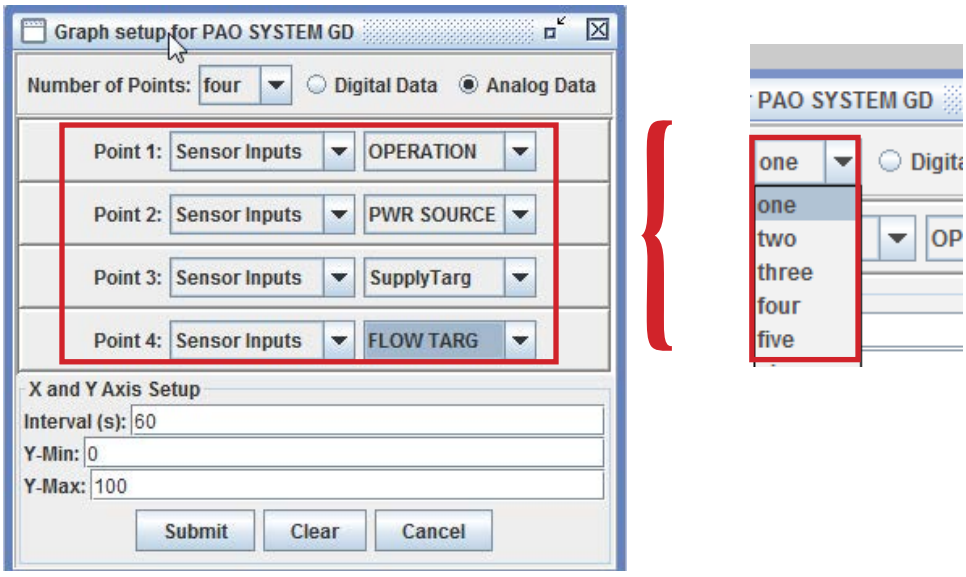
1. **Interval (s) -** Sets the X axis up with the given amount of seconds (time) you wish to graph
2. **Y-Min -** Lowest point of the graph
3. **Y-Max -** Highest point of the graph
4. **Submit - will create the graph**
5. **Clear - will erase the info in the text boxes**
6. **Cancel - will dispose of the frame and not create a graph**



Example of Analog Graph running for 60 seconds

8.12.2 DIGITAL GRAPH

User can select up to two (4) points to graph when 'Digital Data' is selected.
The points can be 'Sensor input' or 'Relay output'.

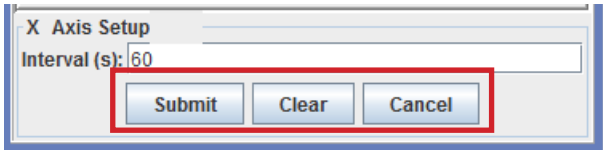


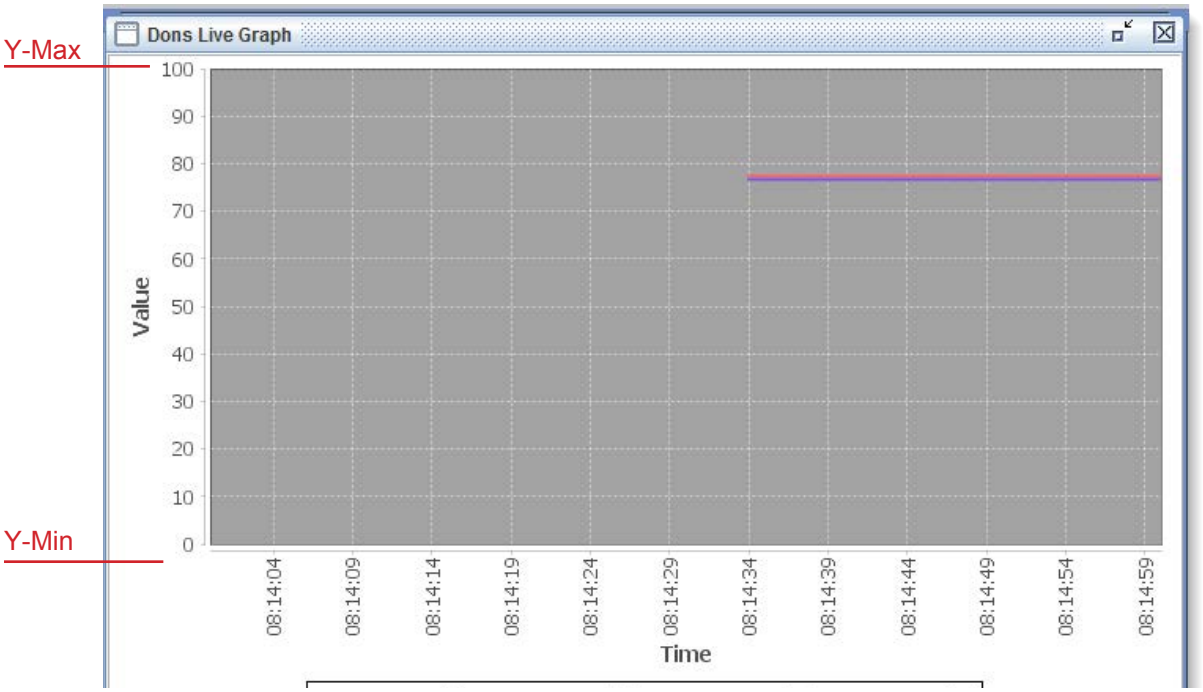
Drop down will show all the available inputs and outputs configured to the controller you are connected to.

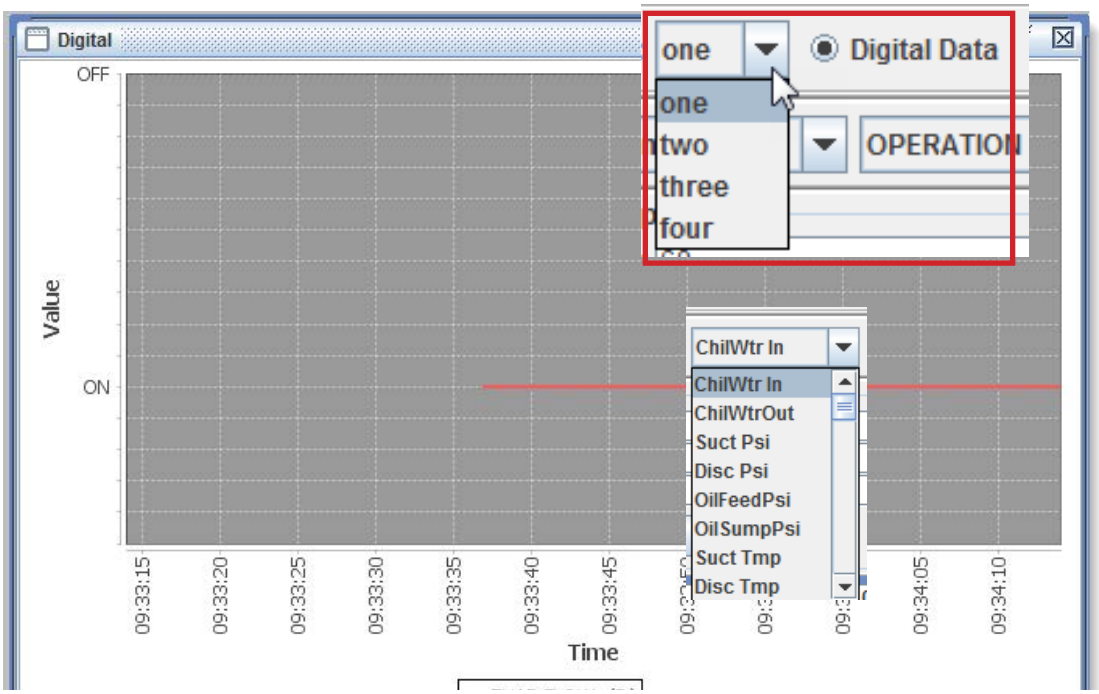
NOTE: Sensor inputs have digital and analog points that can be selected . Refer to your controller to graph the correct sensor information.

8.12.2.1. AXIS SETUP

1. **Interval (s)** - Sets the X axis up with the given amount of seconds (Time) you wish to graph.
2. **Off -** Shows Digital Point is off
3. **ON -** Shows Digital Point is on
4. **Submit - will create the graph**
5. **Clear - will erase the info in the text boxes**
6. **Cancel - will dispose of the frame and not create a graph**





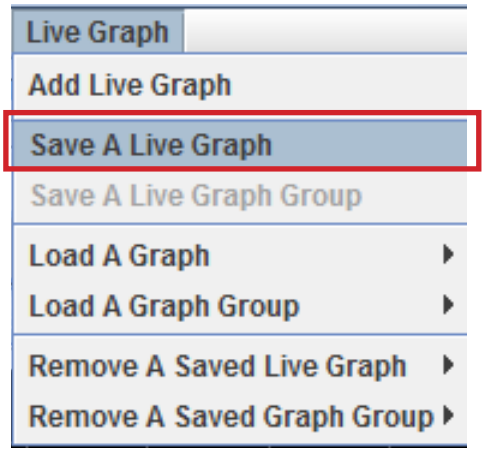


Example of Digital Graph running for 60 seconds

X Axis shows just ‘ON and OFF’

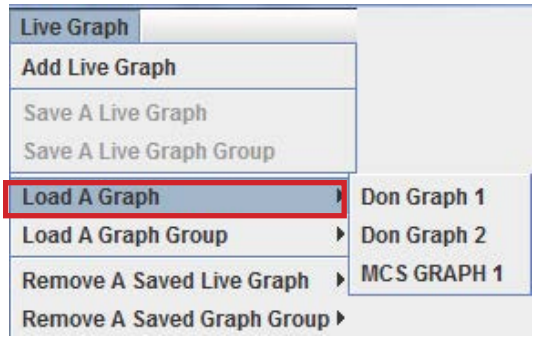
8.13. SAVING YOUR GRAPH (S) SETUP FILE

- Click on ‘Save a Live Graph” in the drop down window as shown below to save this graph setup. When you open the Graph Setup file again, it will be a **‘LIVE VIEW IN REAL TIME’**



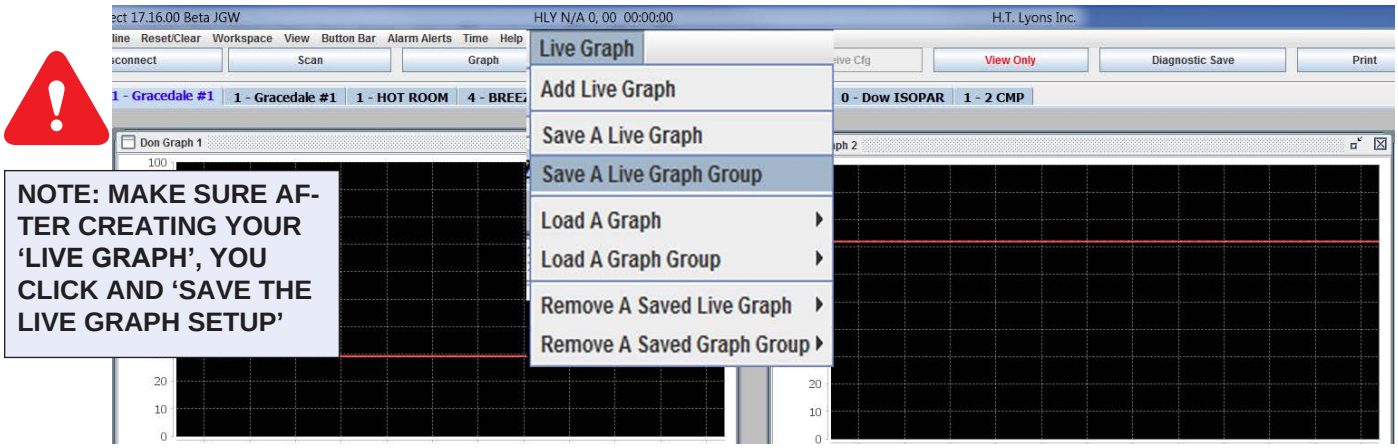
- When prompted, select your graph and click ok to save this SETUP to your computer.

- ***If you create a series of graphs for a controller, you have the ability to save the graphs as a group.***

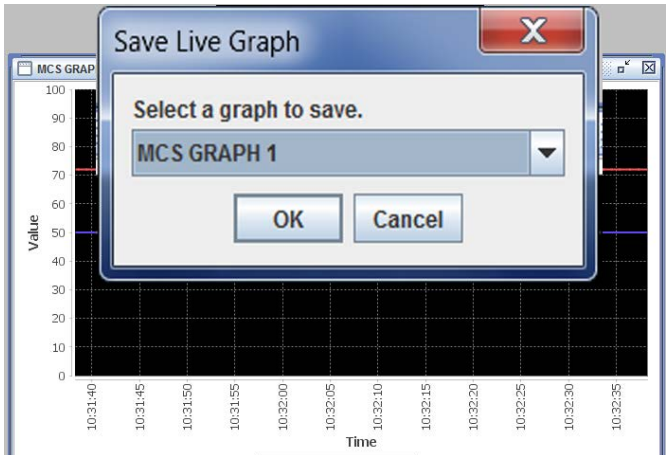


8.13.1 To create and save a group of graphs setup files for a controller:

1. Click on “Load a Graph’.
2. Choose the first graph which will open in your status window.
3. Choose the next graph that will open in your status window. You will need to move the second graph in order to view both in your status window.
4. Next, in your Live Graph drop down menu, click on ‘Save a Live Graph Group’.



5. Name the Group for these graphs

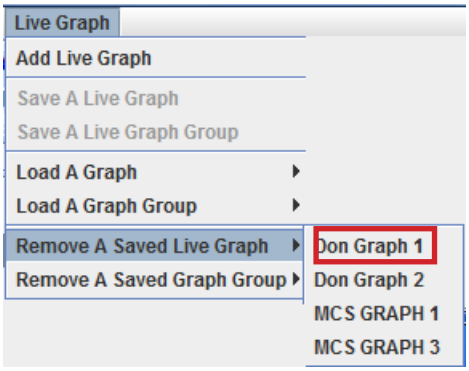


NOTE:

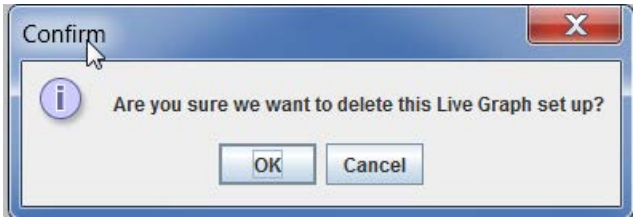
REMEMBER YOU ARE SAVING JUST THE SETUP FOR THE GRAPH EACH TIME YOU OPEN THIS GRAPH IT WILL BE A 'LIVE VIEW OF YOUR CONTROLLER'

8.13.2 Remove a Saved Live Graph

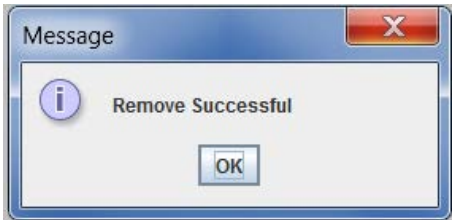
If you have saved Live Graph files, you can delete the files.



1. Click on the Live Graph Menu Tab and use your arrow keys to highlight **'REMOVE A SAVED LIVE GRAPH'**.
2. Click on the file you want to remove.
3. You will be prompted 'Are you sure we want to delete this Live Graph Setup?

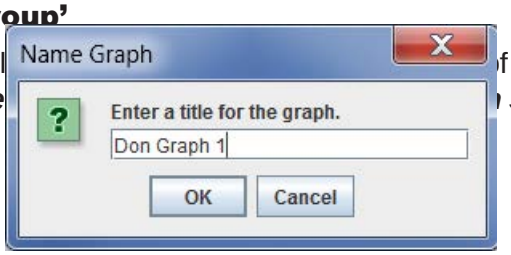


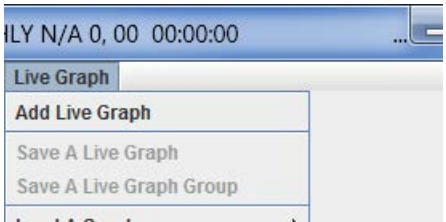
4. Click 'OK', the setup file highlighted will be permanently deleted.



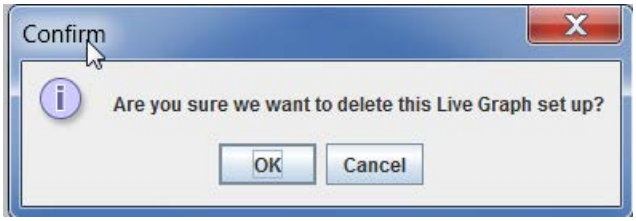
8.13.3 Remove a 'Saved Graph Group'

Removing a **'Saved Graph Group'** wil f Live Graph Files ***but will not remove the actual setup of the saved on your computer until you remove each file.***





1. Click on the Live Graph Menu Tab and use your arrow keys to highlight '**REMOVE A SAVED GRAPH GROUP'**.
2. Click on the **'GROUP'** file you want to remove.
3. You will be prompted 'Are you sure we want to delete this Live Graph Setup?

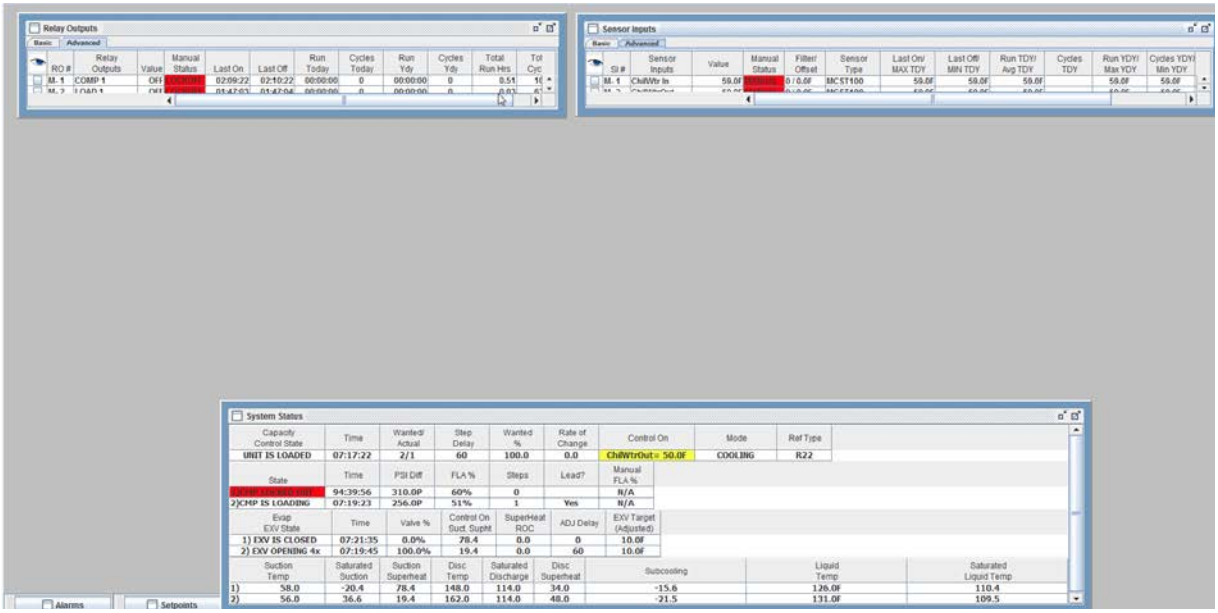


4. Click 'OK', the setup file for the group highlighted will be permanently deleted.

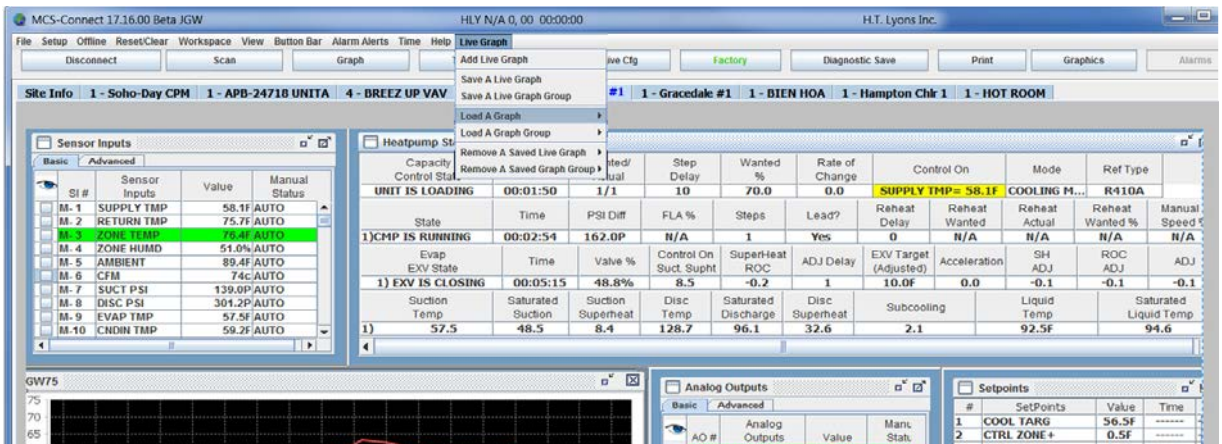
8.14. Save a 'WORKSPACE FOR THE LIVE GRAPH'

Setup your workspace, sized for the 'Live Graph'

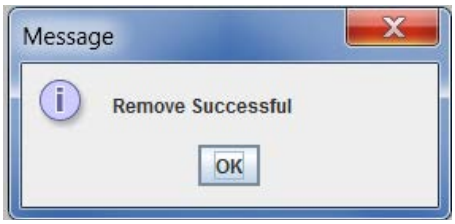
1. Drag your 'Relay, Analog, Status' screens, etc. so you can place the 'LIVE GRAPH' screen to fit in your workspace. Below, you will see a sample workspace allowing room for your 'LIVE GRAPH'.



2. Click on a 'LIVE GRAPH' file that was saved and place the 'Live Graph' setup file into your saved workspace. The next time you open the saved workspace, the 'Live Graph' will be placed in the exact location you specify in your workspace.



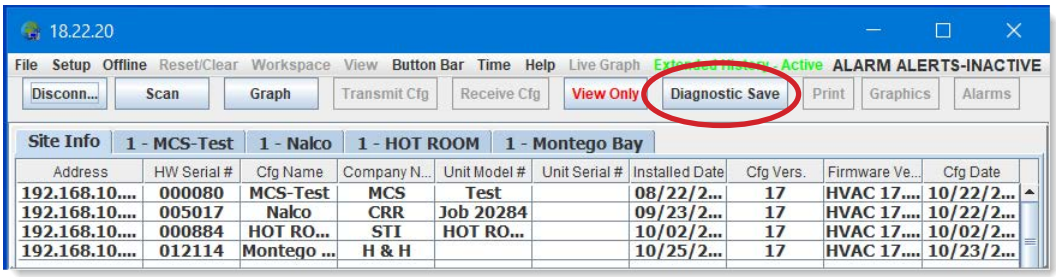
3. You can experiment with different workspace setups to allow room for two ‘Live Graph setups’.



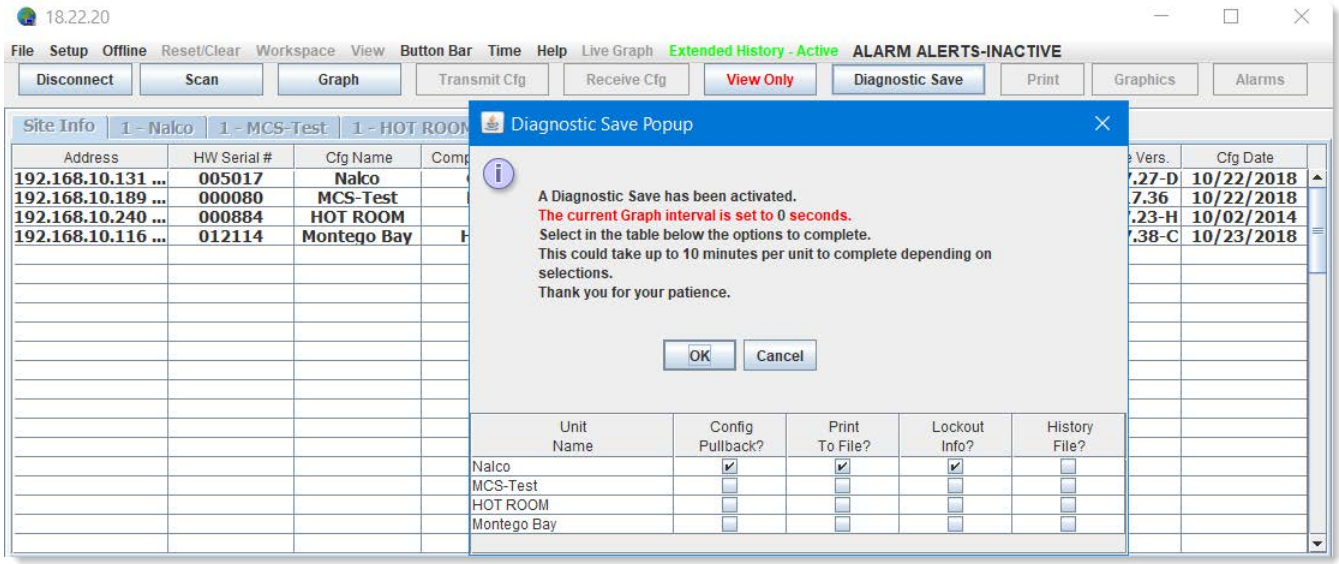
8.15. DIAGNOSTIC SAVE (POPUP)

(available in NUC-CONNECT Version 18.22.20)

The Diagnostic Save Popup can be activated when you are connected to a controller either by ‘Serial’, ‘Ethernet’ or connect ‘Remotely’.

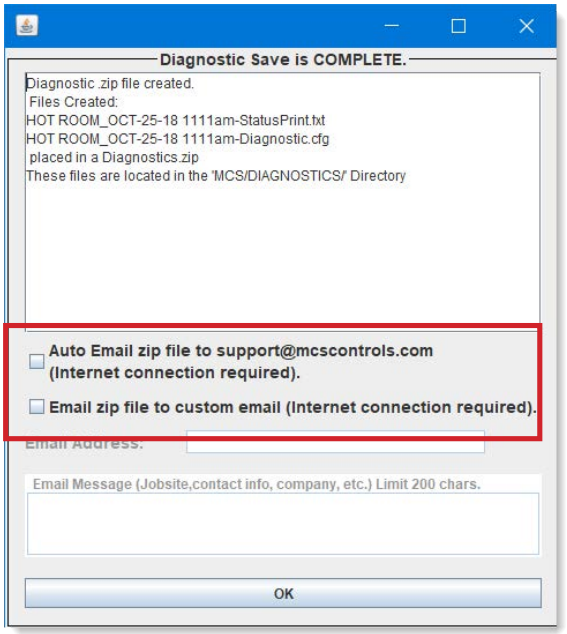


Once you scan for all controllers in NUC-CONNECT you can click on the ‘DIAGNOSTIC SAVE’ button at the top. The Diagnostic Save Popup will appear.



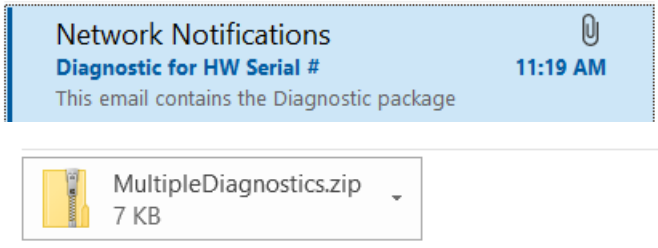
If you have multiple controllers connected to the network, you can choose a ‘Diagnostic Save’ for each controller, again you have the option of what information you want saved.

A second popup will appear showing the file has been saved to your hard drive.



You have the option to email the zip saved file to: support@NUCcontrols.com or to a custom email address (Internet connection required).

Below shows file that was emailed as per the setup in the ‘Diagnostic Save’.

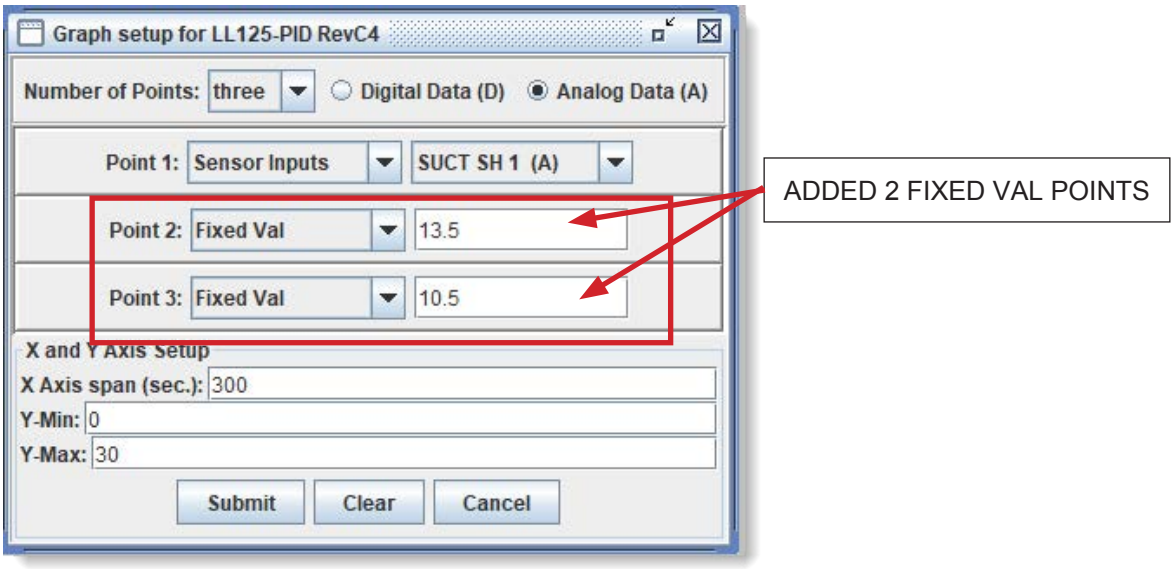


8.15.1 NUC-CONNECT - Version release 18.26.11 changes

With the release of NUC-CONNECT Version 18.226.11, the 'Live Graph' section has been upgraded to include the following:

- **GRAPHS - LEFT TO RIGHT READING** - Graphs now move from left to right as shown in screen shot below: This makes it easier when viewing the graph to see changes aligned with the legend on the left.

- **'FIXED VAL'** - When adding a new Live Graph you now can set 'Fixed Val' for setting up you zones for plotting a point. Each new Live Graph can contain 2 fixed values on the graph. These fixed values or lines help in seeing the movement of the plotted point (see above screen shot).



- **OVERWRITE A SAVED LIVE GRAPH** - Live Graphs now can be overwritten.
- **EDIT and RE-SAVE A LIVE GRAPH** - with this change a technician can now edit a saved Live Graph.

1. *OPEN THE LIVE GRAPH YOU WANT TO EDIT*
2. *MAKE CHANGES, CLICK 'SUMMIT'*
3. *ONCE THE EDIT IS CORRECT, CLICK SAVE, overwriting the Live Graph or saving as a new graph.*

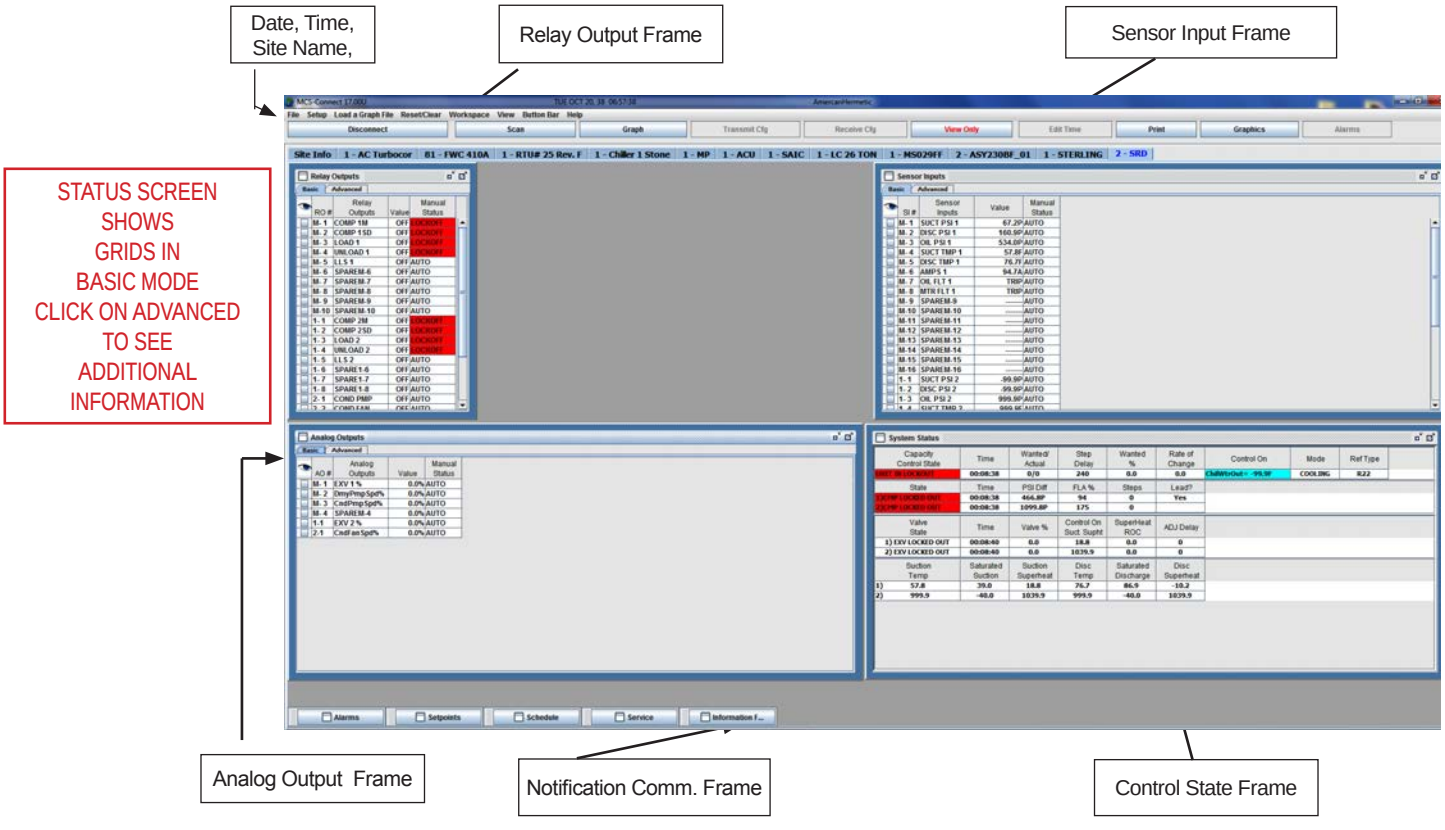
Chapter - 9. Various Screens connected to a Controller

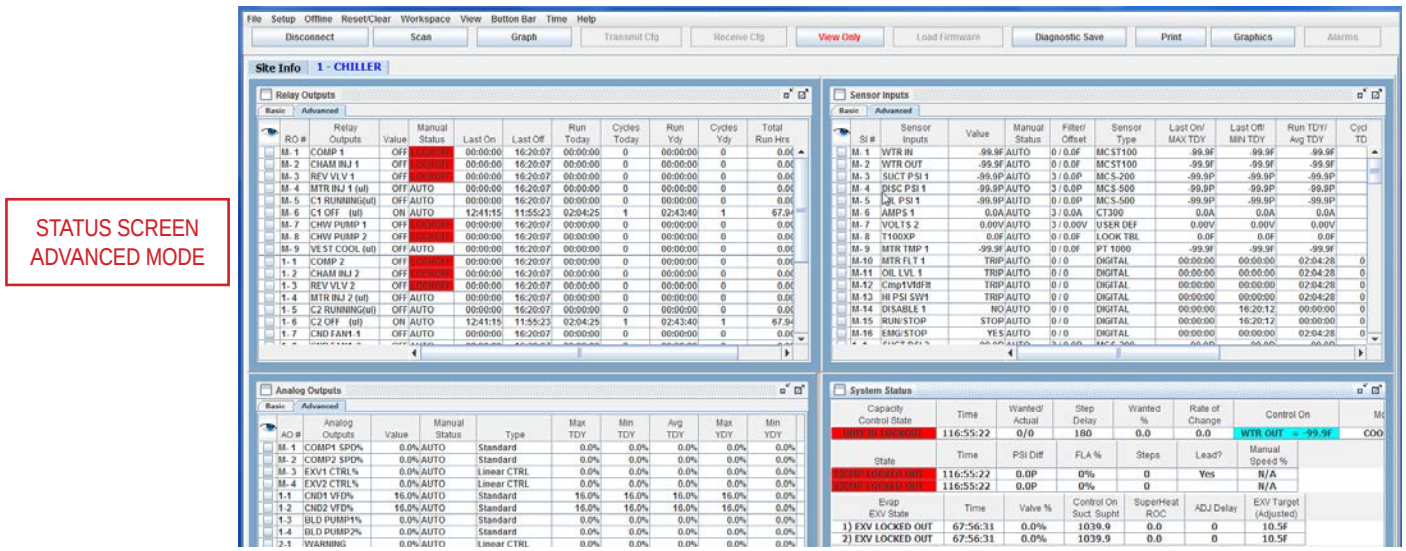
The Status screen contains information on Relay Outputs, Sensor Inputs, Analog Outputs, Current States, Set points, Alarms, Service Info, Schedule Info, Information/Help Box. The different parts of this screen are explained in other sections. Use the navigation arrows to move between frames.

The Basic/Advanced mode is only for the RO, SI and AO grids. Advanced mode setting on tables will display additional information as shown in the status screen 'ADVANCED MODE below.

Column 1 on all frames have a 'Hide/Show' icon which allows the user to only show the items which are 'Clicked to show".

This allows user to see critical information on sensors, relays, etc.





9.1. Relay Output Information

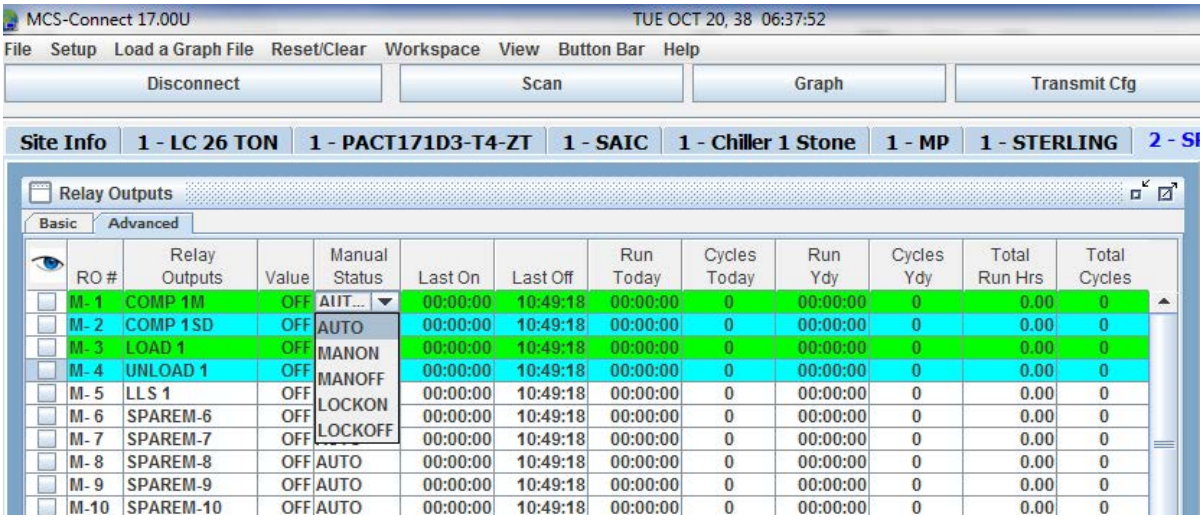
This window displays a grid which contains relay outputs. It shows the number, name, value, manual status, last on, last off, run today, cycles today, run yesterday, cycles yesterday, total run hours, and total cycles. The fields are explained in more detail below. Use the horizontal scroll bars to view all data for all the relays.

To assist in identifying an item, the background color can be toggled between 'WHITE '(unsettled), 'GREEN' or 'BLUE' (color alternated by line), by clicking on the item's Name cell. The highlighting will remain active clicked off or until MCS-CONNECT is exited OR THE USER SELECTS A

DIFFERENT CONTROLLER.

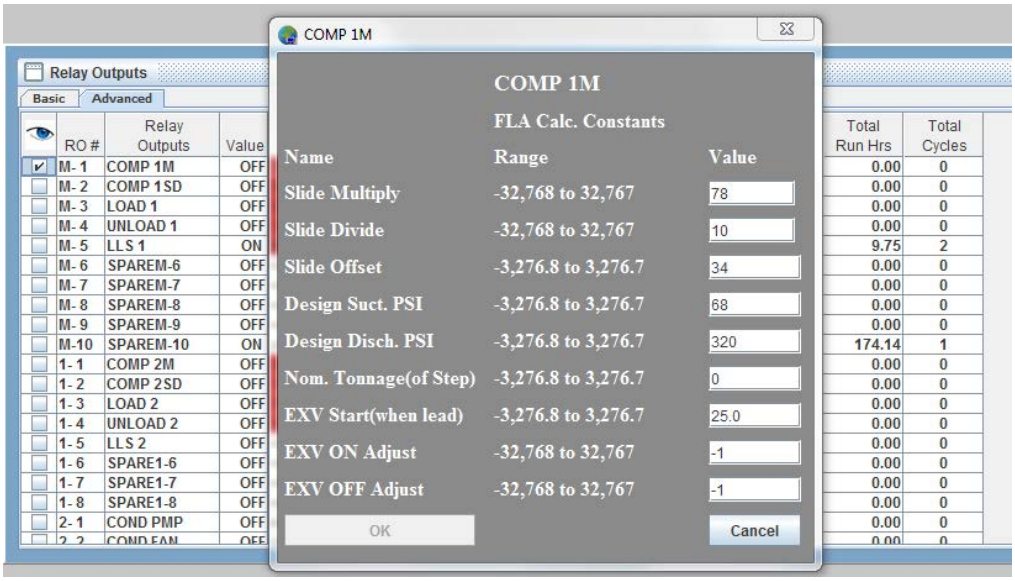
RO # - This is the number of the Relay Outputs. M-1 shows the data for RO #1 on the Master board and a 1-1 would show data for RO #1 on I/O board #1 and so on.

Status Screen shows backgrounds on ROWS in alternated colors, WHITE, GREEN, BLUE



Relay Outputs - This is the name of the Relay Output. Click on this cell to toggle highlight function

Double clicking on Controller's RO brings up FLA popup. (for compressor relay outputs)



Value – This is the value of the Relay Output. A value of On or Off shows the value as a normal digital RO. This field can be changed, see Relay Output Manual Status Change.

Manual Status – This is the status of the device, i.e. AUTO, MANON, MANOFF, LOCKOFF, LOCKOFF AND MANCMP%. If the status is other than AUTO, the background for that cell will be RED. This is to highlight a condition that is not normal operations.

Last On – Last time the relay was turned on.

Last Off – Last time the relay was turned off.

Run Today – The time (hours: minutes, seconds) the relay has run today.

Cycles Today – The total times the relay has cycled today.

Run Yesterday – The time (hours: minutes, seconds) the relay had run yesterday.

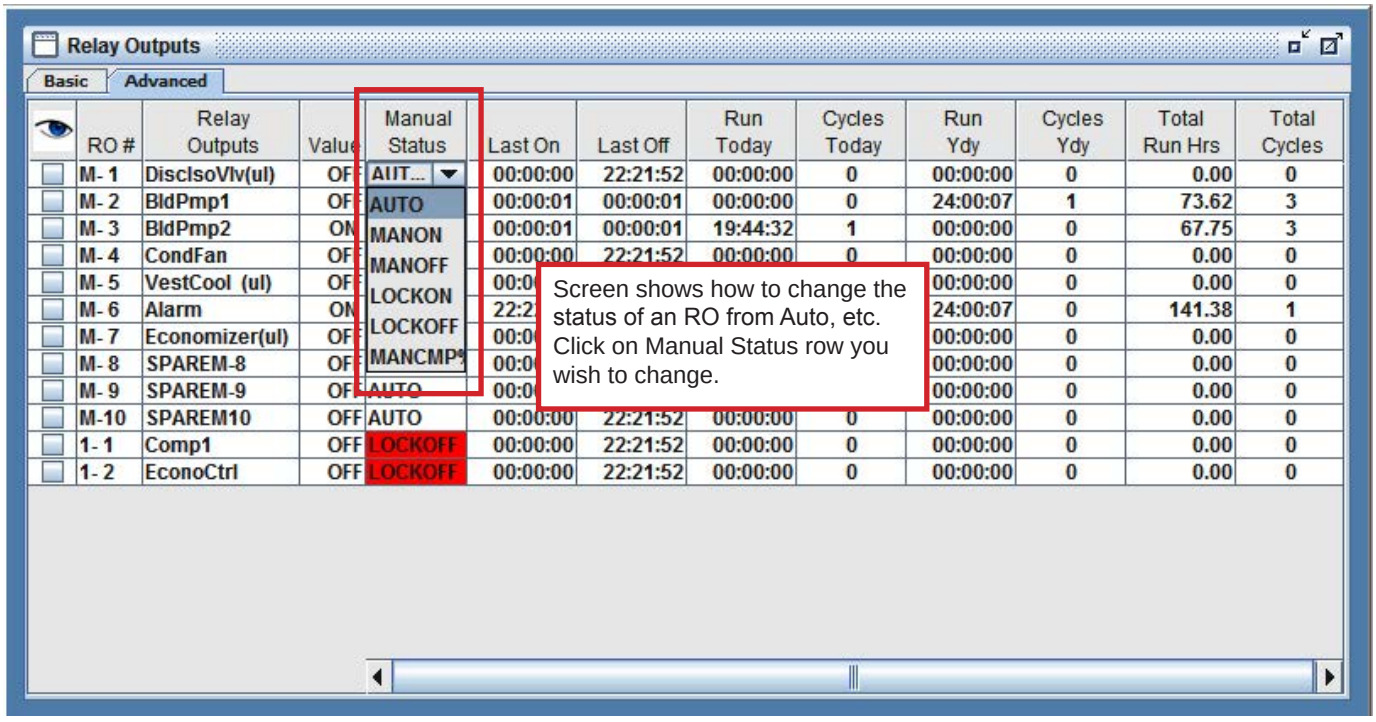
Cycles Yesterday – The total times the relay had cycled yesterday.

Total Run Hours – The accumulated time (hours: minutes) the relay has run.

Total Cycles – The accumulated number of times the relay had cycled.

Relay Output Manual Status Change

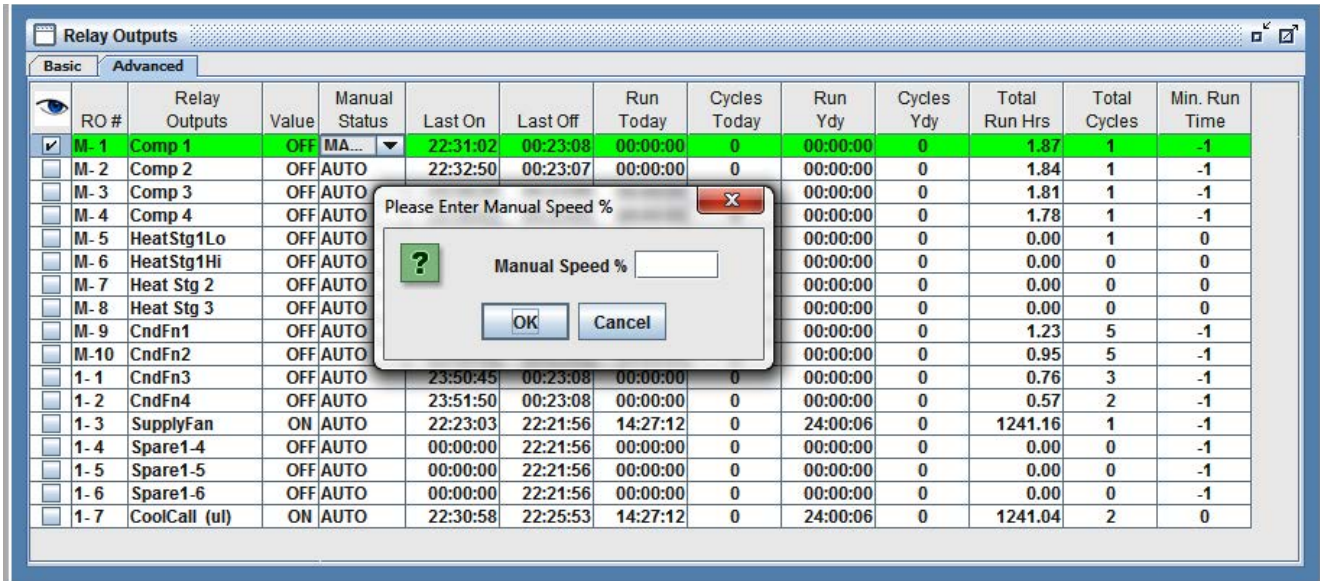
To change the status of a RO, single click on the MANUAL STATUS cell for that RO. A drop down menu will appear and user slects new value. The arrow keys will scroll through the options: AUTO, MANON, MANOFF, LOCKON, LOCKOFF and MANCMPS: When the status desired is highlighted, single click on that entry. The information is transmitted to the MCS controllers. The following message will appear in the information frame “Change has been made to the MCS controller and acknowledged” if the transmission is successful. You must be properly authorized to make these changes. If you do not have proper authorization, refer to the section “Getting Authorized” in this manual.



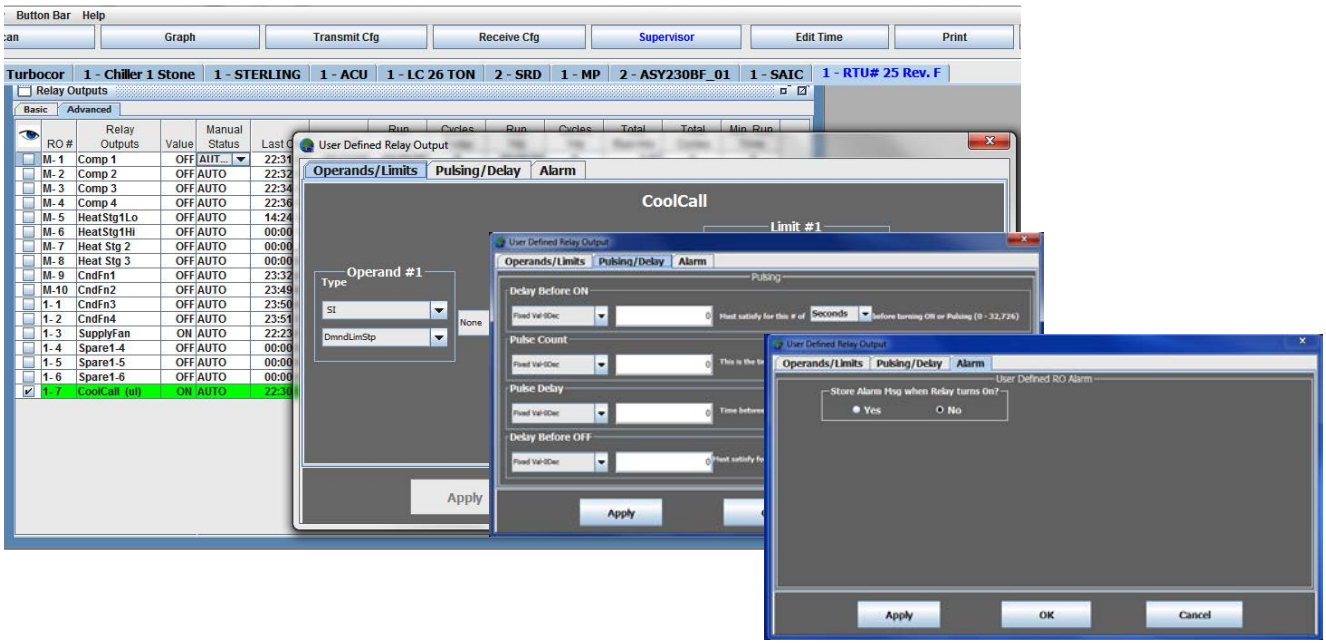
9.1.1 Relay Output Manual Percentage Value Change

If you are controlling with a pulsed output, (any relay output that would utilize a pulsed output such as a slide valve or inlet guide valve) a screen will appear that allows the user to enter a manual percentage value. If the status is already set to Manual, the user can click on the percentage value and the screen will also appear. Enter the desired change, the following message will appear in the information frame “Change has been made to the MCS controller and acknowledged” if the transmission is successful. You must be properly authorized to make these changes. If you do not have proper authorization, refer to the “Getting Authorized” in this manual.

COMP SETTING SCREEN
shows changing the speed
on a slide valve or inlet guide valve



RELAY OUTPUT USER LOGIC SETTING SCREEN
Click on a Relay with a (ul) to see these popups.
make changes, apply and click ok.



9.1.2 Relay Output Manual Resetting Run Hours\Cycles Today

If equipment is changed in your system - pumps, fans, etc., you can reset the

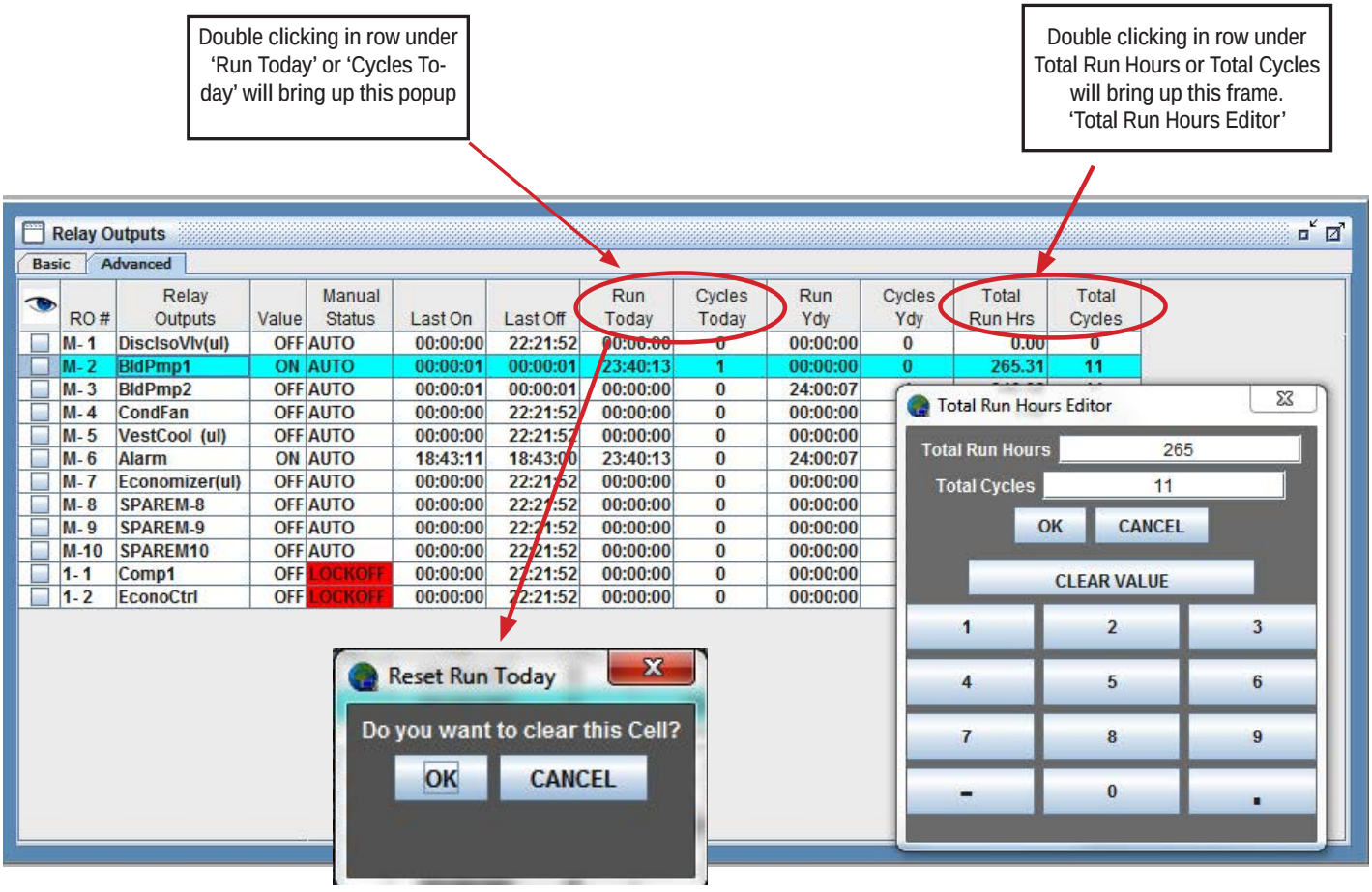
'RUN TODAY HOURS' by double clicking on the 'RELAY' in that row.

Clicking 'OK' will clear that cell allowing you to reset the hours to '0'.

The 'CYCLES TODAY' can be changed the same way resetting that to '0'.

Double clicking "TOTAL RUN HOURS' for that unit allows you to reset the total run hours and total cylces of the unit. If the replacement unit has been running elsewhere, you can enter values in this screen if they are known. SEE SCREEN BELOW.

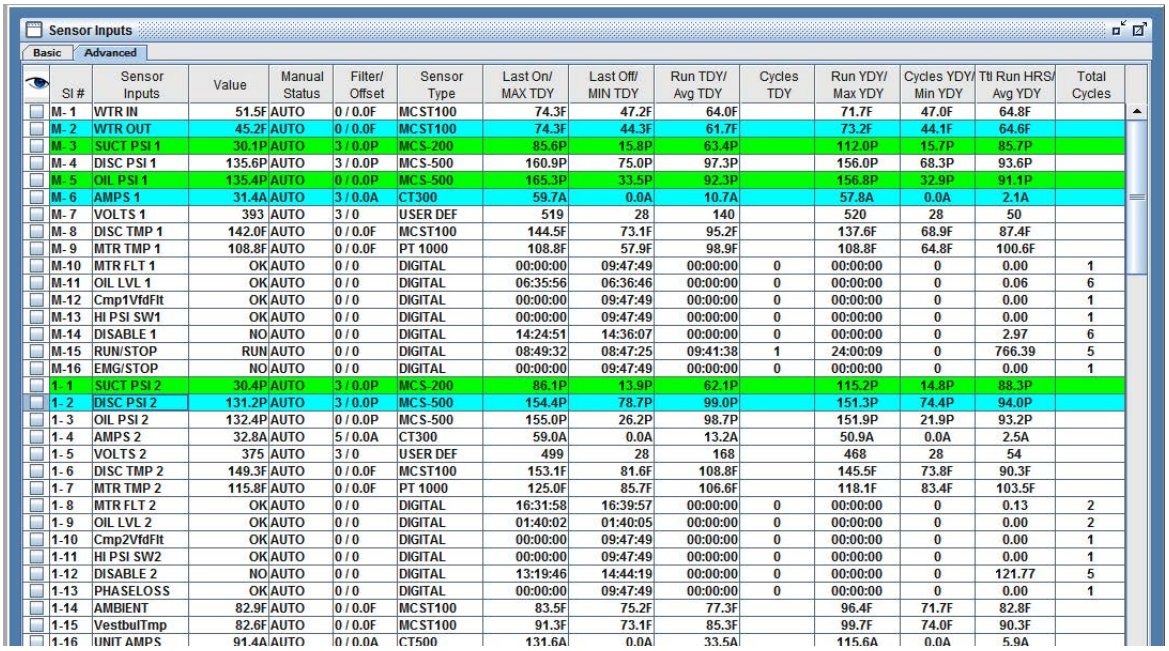
'You must be properly authorized to make these changes. If you do not have proper authorization, refer to the 'Getting Authorized' in this manual.



9.2. Sensor Input Information

This window displays a grid which contains the number, name, value, manual status, offset, sensor type, last on or maximum today, last off or minimum today, run today or average today, cycles today, run yesterday or maximum yesterday, cycles yesterday or minimum yesterday, total run hours or average yesterday and total cycles. The value and manual status are updated on every cycle. The fields are explained further below. Use the scroll bars to view all data.

To assist in identifying an item, the background color can be toggled between WHITE(unselected) and GREEN or BLUE (color alternated by line), highlighted, by clicking on the items Name cell. The highlighting will remain active until clicked off or MCS-CONNECT is exited. Individual MCS controllers's can have different items highlighted.

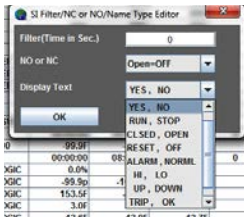


SI #	Sensor Inputs	Value	Manual Status	Filter/ Offset	Sensor Type	Last On/ MAX TDY	Last Off/ MIN TDY	Run TDY/ Avg TDY	Cycles TDY	Run YDY/ Max YDY	Cycles YDY/ Min YDY	Ttl Run HRS/ Avg YDY	Total Cycles
M-1	WTR IN	51.5F	AUTO	0 / 0.0F	MCST100	74.3F	47.2F	64.0F		71.7F	47.0F	64.8F	
M-2	WTR OUT	45.2F	AUTO	0 / 0.0F	MCST100	74.3F	44.3F	61.7F		73.2F	44.1F	64.6F	
M-3	SUCT PSI 1	30.1P	AUTO	3 / 0.0P	MCS-200	85.6P	15.8P	63.4P		112.0P	15.7P	85.7P	
M-4	DISC PSI 1	135.6P	AUTO	3 / 0.0P	MCS-500	160.9P	75.0P	97.3P		156.0P	68.3P	93.6P	
M-5	OIL PSI 1	135.4P	AUTO	0 / 0.0P	MCS-500	165.3P	33.5P	92.3P		156.8P	32.9P	91.1P	
M-6	AMPS 1	31.4A	AUTO	3 / 0.0A	CT300	59.7A	0.0A	10.7A		57.8A	0.0A	2.1A	
M-7	VOLTS 1	393	AUTO	3 / 0	USER DEF	519	28	140		520	28	50	
M-8	DISC TMP 1	142.0F	AUTO	0 / 0.0F	MCST100	144.5F	73.1F	95.2F		137.6F	68.9F	87.4F	
M-9	MTR TMP 1	108.8F	AUTO	0 / 0.0F	PT 1000	108.8F	57.9F	98.9F		108.8F	64.8F	100.6F	
M-10	MTR FLT 1	OK	AUTO	0 / 0	DIGITAL	00:00:00	09:47:49	00:00:00	0	00:00:00	0	0.00	1
M-11	OIL LVL 1	OK	AUTO	0 / 0	DIGITAL	06:35:56	06:36:46	00:00:00	0	00:00:00	0	0.06	6
M-12	Cmp1VfdFlt	OK	AUTO	0 / 0	DIGITAL	00:00:00	09:47:49	00:00:00	0	00:00:00	0	0.00	1
M-13	HI PSI SW1	OK	AUTO	0 / 0	DIGITAL	00:00:00	09:47:49	00:00:00	0	00:00:00	0	0.00	1
M-14	DISABLE 1	NO	AUTO	0 / 0	DIGITAL	14:24:51	14:36:07	00:00:00	0	00:00:00	0	2.97	6
M-15	RUN/STOP	RUN	AUTO	0 / 0	DIGITAL	08:49:32	08:47:25	09:41:38	1	24:00:09	0	766.39	5
M-16	EMG/STOP	NO	AUTO	0 / 0	DIGITAL	00:00:00	09:47:49	00:00:00	0	00:00:00	0	0.00	1
1-1	SUCT PSI 2	30.4P	AUTO	3 / 0.0P	MCS-200	86.1P	13.9P	62.1P		115.2P	14.8P	88.3P	
1-2	DISC PSI 2	131.2P	AUTO	3 / 0.0P	MCS-500	154.4P	78.7P	99.0P		151.3P	74.4P	94.0P	
1-3	OIL PSI 2	132.4P	AUTO	0 / 0.0P	MCS-500	155.0P	26.2P	98.7P		151.9P	21.9P	93.2P	
1-4	AMPS 2	32.8A	AUTO	5 / 0.0A	CT300	59.0A	0.0A	13.2A		50.9A	0.0A	2.5A	
1-5	VOLTS 2	375	AUTO	3 / 0	USER DEF	499	28	168		468	28	54	
1-6	DISC TMP 2	149.3F	AUTO	0 / 0.0F	MCST100	153.1F	81.6F	108.8F		145.5F	73.8F	90.3F	
1-7	MTR TMP 2	115.8F	AUTO	0 / 0.0F	PT 1000	125.0F	85.7F	106.6F		118.1F	83.4F	103.5F	
1-8	MTR FLT 2	OK	AUTO	0 / 0	DIGITAL	16:31:58	16:39:57	00:00:00	0	00:00:00	0	0.13	2
1-9	OIL LVL 2	OK	AUTO	0 / 0	DIGITAL	01:40:02	01:40:05	00:00:00	0	00:00:00	0	0.00	2
1-10	Cmp2VfdFlt	OK	AUTO	0 / 0	DIGITAL	00:00:00	09:47:49	00:00:00	0	00:00:00	0	0.00	1
1-11	HI PSI SW2	OK	AUTO	0 / 0	DIGITAL	00:00:00	09:47:49	00:00:00	0	00:00:00	0	0.00	1
1-12	DISABLE 2	NO	AUTO	0 / 0	DIGITAL	13:19:46	14:44:19	00:00:00	0	00:00:00	0	121.77	5
1-13	PHASELOSS	OK	AUTO	0 / 0	DIGITAL	00:00:00	09:47:49	00:00:00	0	00:00:00	0	0.00	1
1-14	AMBIENT	82.9F	AUTO	0 / 0.0F	MCST100	83.5F	75.2F	77.3F		96.4F	71.7F	82.8F	
1-15	VestbulTmp	82.6F	AUTO	0 / 0.0F	MCST100	91.3F	73.1F	85.3F		99.7F	74.0F	90.3F	
1-16	UNIT AMPS	91.4A	AUTO	0 / 0.0A	CT500	131.6A	0.0A	33.5A		115.6A	0.0A	5.9A	

SI # – This is the number of the Sensor Input. M-1 shows the data for SI #1 on the Master board and a 1-1 would show data for SI #1 on I/O board #1 and so on.

Sensor Input Name – This is the descriptive name of the Sensor Input.

Value – This is the value of the Sensor Input. If the sensor is an analog, the value plus a character will be displayed. If the sensor is a digital, the status will be displayed as per this popup:



Manual Status – Auto or Manual, if manual and an analog, the value displayed will be the manual value. If digital then it can be 'MANON' on or 'MANOFF'. This field can be changed, see Sensor Input Manual Status Change. If the status is something other than AUTO, the background for that cell will be RED. This is to highlight a condition that is not normal operations.

Filter/Offset – Is the amount of adjustment that has been made to the actual value of an analog input. This field can be changed, see Sensor Input Offset Change.

Sensor Type – Displays the type of sensor. This field can be changed, see Sensor Input Type Change.

Last On / Maximum Today –

IF DIGITAL INPUT – Time that it was last on

IF ANALOG INPUT – Maximum value today

Last Off / Minimum Today
IF DIGITAL INPUT – Time that it was last off
IF ANALOG INPUT – Minimum value today

Run Today / Average Today
IF DIGITAL INPUT – Total time on today
IF ANALOG INPUT – Average today value of sensor

Cycles Today - Digital only, total number of time the sensor cycled today

Run YESTERDAY / Maximum YESTERDAY
IF DIGITAL INPUT – Total time yesterday
IF ANALOG INPUT – Maximum value of sensor

Cycles YESTERDAY / Minimum YESTERDAY
IF DIGITAL INPUT – Total cycles yesterday
IF ANALOG INPUT – Minimum value of sensor

Total Run Hours / Average YESTERDAY
IF DIGITAL INPUT – Total time on yesterday
IF ANALOG INPUT – Average value of sensor

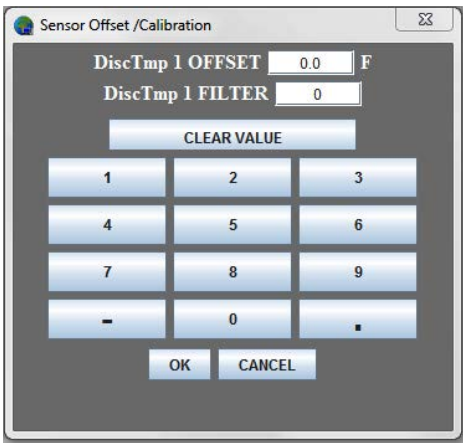
Total Cycles - - Digital only, total number of times the sensor cycled

9.2.1 Sensor Input Manual Status Change

Changing the status of an **analog input** to manual will cause the following screen to appear. Enter the desired sensor and press **ENTER**. or click 'OK'

9.2.2 Sensor Input Filter/Offset Change

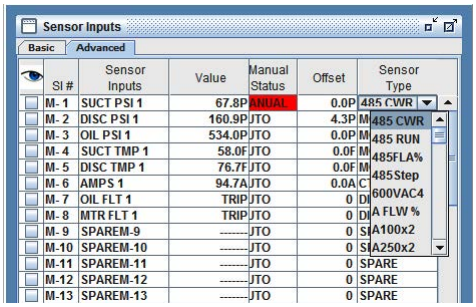
To change the offset of an analog input, double click on the OFFSET cell that is to be changed. The screen below will appear. Enter the desired offset then press 'ENTER' or 'OK' button to transmit the change to the MCS controller.



NOTE: IF CHANGING THE FILTER TIME - MAKE SURE THE UNIT IS NOT RUNNING

9.2.3 Sensor Input Sensor Type Change

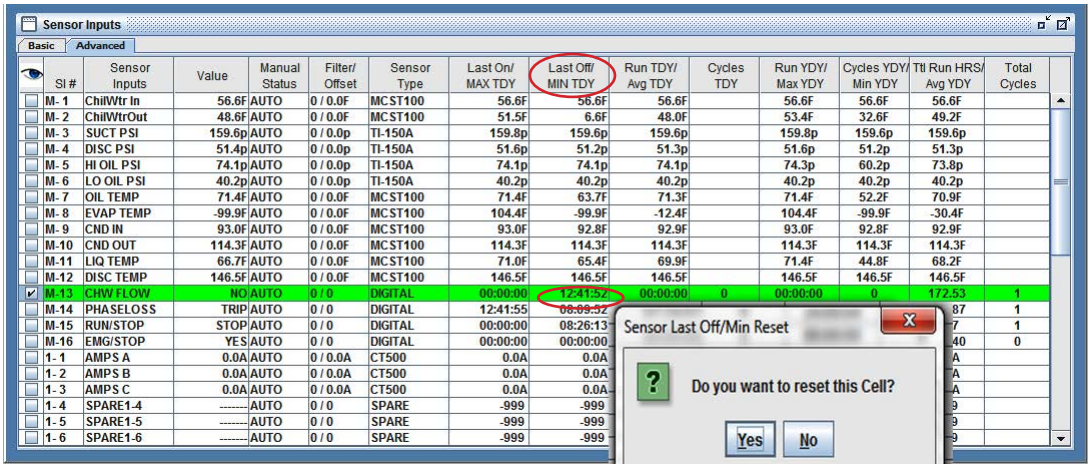
To change the type of sensor on the input, click on the Sensor Type. The following screen will appear: Scroll down to the appropriate sensor type, and select the desired change. The following message will appear in the information frame "Change has been made to the MCS controller and acknowledged" if the transmission is successful. You must be properly authorized to make these changes. If you do not have proper authorization, refer to the section "Getting Authorized" in this manual.



If properly authorized you may change the type of sensor you have on the input sensor.

9.2.4 Clearing of a 'Last On/ MAX TDY' and 'Last Off/ MIN TDY' cell

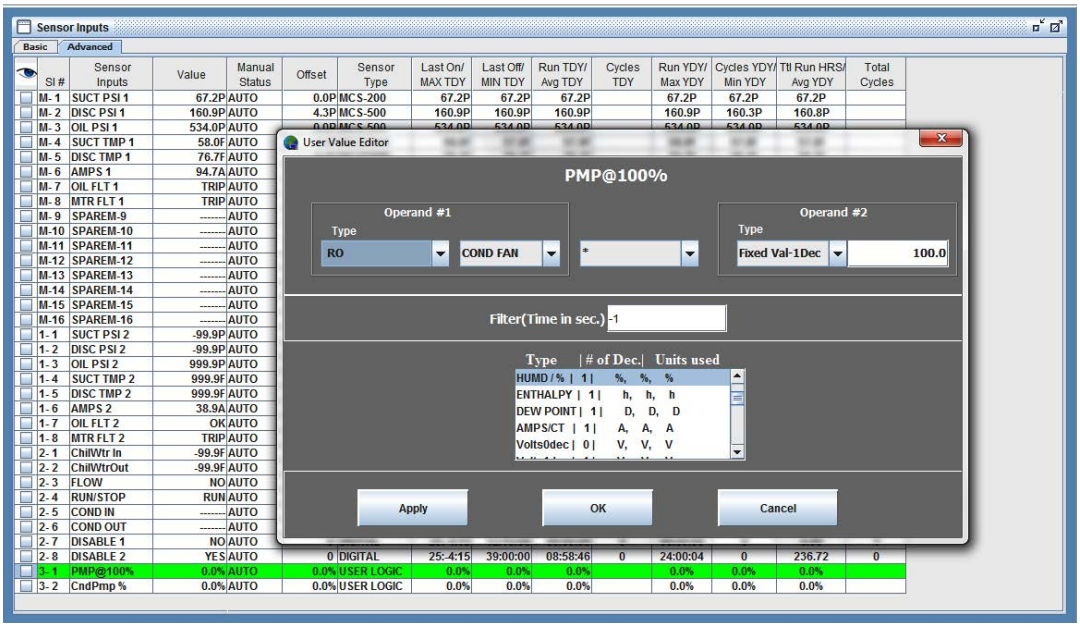
Double click the column and row you wish to clear.



Sensor Input - 'User Logic'

To make changes to this type of sensor, double click on name of user logic sensor, the screen above will appear, make changes, click 'Apply', then click on 'OK"

SENSOR INPUT USER LOGIC SETTING SCREEN
make changes, apply and click ok.



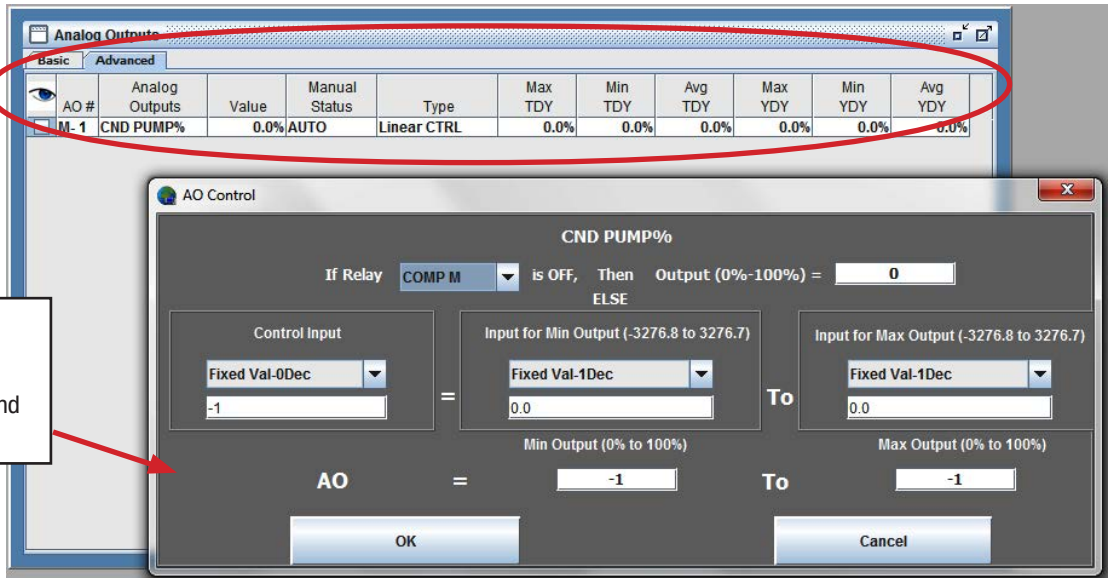
9.3. Analog Output Information

This window displays the #, name, value, manual status, type, and maximum today, minimum today, average today, maximum yesterday, minimum yesterday and average yesterday.The fields are explained further below. Use the scroll bar to view all data.

Analog Output - Linear Control

To make changes to this type analog output device, click twice on the name and the below screen will appear. Make changes and click ok.

ANALOG OUTPUT LINEAR CONTROL SETTING SCREEN
make changes, apply and click ok.



To assist in identifying an item, the background color can be toggled between WHITE, normal, and GREEN or BLUE (color alternated by line), highlighted, by clicking on the items Name cell. The highlighting will remain active until clicked off or MCS-CONNECT is exited. Individual MCS controllers's can have different items highlighted and this will not be lost when moving between units.

AO # – This is the number of the Analog Output. M-1 shows the data for the 1st AO on the Master board. The MCS-8 has 1 AO on the master. The Magnum has 4 AO's on the master. A 1-1 would show data for AO #1 on I/O board #1 and so on.

Analog Output Name – This is the name of the Analog Output. Click on this cell to toggle highlight function.

Value – This is the current percentage value of the analog output.

Manual Status - This is the status of the device, i.e. auto, manual. If the device is in 'Manual'. then the information in the value field is for the manual setting. If the device is not in AUTO status, the background for this cell will be RED.

Maximum Today – This is the maximum value that has occurred in the value field today.

Minimum Today - This is the minimum value that has occurred in the value field today.

Average Today - This is the average value that has occurred in the value field today.

Maximum Yesterday - This is the maximum value that occurred in the value field yesterday.

Minimum Yesterday - This is the minimum value that occurred in the value yesterday.

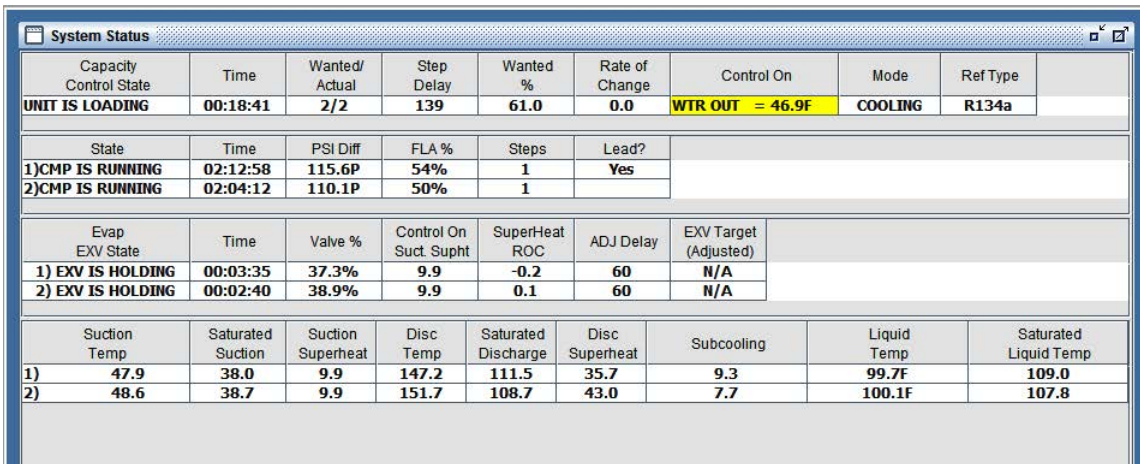
Average Yesterday - This is the average value that occurred in the value field yesterday.

9.4. Status Information

This window displays the status of the system being controlled. **The information will vary depending on the system**. Detailed definitions of this screen and the information displayed are contained in the specific operating manuals for each set of MCS controller firmware manual..

The windows shown is for the MCS-MAGNUM HVAC VERSION 17 FIRMWARE.

This window displays the capacity control state, time, steps wanted on, steps on, sensitivity, slope, variable %, compressor number, state, time, oil differential, lead/lag and steps on. The window is for the standard HVAC firmware. The fields are explained further below. Use the scroll bar on the right to view data vertically and the scroll bar on the bottom right to view data horizontally.



9.4.1 Capacity Information

Capacity Control State	Time	Wanted/ Actual	Step Delay	Wanted %	Rate of Change	Control On	Mode	Ref Type
UNIT IS LOADING	00:18:41	2/2	139	61.0	0.0	WTR OUT = 46.9F	COOLING	R134a

Capacity Control State – State of the chiller. (Startup, disabled, lockout, lost I/O, off, holding, step-, and step+) See the MCS controller manual for your application for descriptions of each state.

Time – The time the chiller has been in the state

Steps Wanted On – Number of steps wanted on

Steps On – Actual steps on

Step Delay – Sensitivity of control temperature. The set point (step sensitivity) value assigned to limit or dampen the rate of change between compressor steps. If sensitivity = 1, then 1 degree of difference from target accumulators 1 second worth of delay. If sensitivity = 2, then 1 degree of difference from target accumulators .5 seconds worth of delay.

Wanted FLA % - Percentage of FLA if variable steps

Rate of Change – Slope of the control temperature.

Control On – Sensor input that is being used to determine the needed capacity of the system, background color based on if it is above or below the Control On value.

Mode - Cooling, Heating, Dehum

Ref type - Type of Refrigeration used in the system

State	Time	PSI Diff	FLA %	Steps	Lead?
1)CMP IS RUNNING	02:12:58	115.6P	54%	1	Yes
2)CMP IS RUNNING	02:04:12	110.1P	50%	1	

9.4.2 Compressor Information

State – State of the compressor and compressor # (Off, lube, st unload, loading, holding, unloading, discharge hold, discharge unload, suction unload, unloaded, suction hold, hot gas load, U1 load, loaded, pump down, anti-cycle, disable, safety, lock out and lost I/O) See the MCS controller manual for your application for descriptions of each state.

Time – Time the compressor has been in the state

PSI DIFFERENTIAL – Oil differential pressure

FLA % (Full Load Amps.)- actual FLA % for compressor

Steps On - Indicates number of steps associated with this compressor that are turned on.

Lead? - Lead compressor - Will display 'YES' others remain blank

9.4.3 Compressor/Superheat Info

	Suction Temp	Saturated Suction	Suction Superheat	Disc Temp	Saturated Discharge	Disc Superheat	Subcooling	Liquid Temp	Saturated Liquid Temp
1)	47.9	38.0	9.9	147.2	111.5	35.7	9.3	99.7F	109.0
2)	48.6	38.7	9.9	151.7	108.7	43.0	7.7	100.1F	107.8

Suction Temp – Compressor number and current valve of the Suction Temperature, if available.

Saturated Suction – Calculated Suction Saturated Temperature, if available. The Suction Pressure is converted into temperature based upon the type of refrigerant (R22, R134a, R407c, and R410a are supported.)

Suction Superheat – Calculated Suction SUPERHEAT, only available if both the Suction Temperature and the Suction Pressure are used. The calculation is Suction Temperature minus the Suction Saturated Temperature.

Disc Temp – Discharge Temperature, if available

Saturated Discharge – Calculated Discharge Saturated Temperature, if available. The Discharge pressure is converted into temperature based upon the type of refrigerant (R22, R134a, R407c, and R410a are supported.)

Disc Superheat – Calculated Discharge SUPERHEAT, only available if both the Discharge Temperature and the Discharge Pressure are used. The calculation is Discharge Temperature minus the Discharge Saturated Temperature.

Subcooling – the amount of heat removed below the refrigerants condensing temperature at a particular pressure measured in deg. F

Liquid Temp – The temperature of the refrigerant.

Saturated Liquid Temp. – Temperature and pressure of refrigerant.

9.4.4 EXV Info

Evap EXV State	Time	Valve %	Control On Suct. Supht	SuperHeat ROC	ADJ Delay	EXV Target (Adjusted)
1) EXV IS HOLDING	00:03:35	37.3%	9.9	-0.2	60	N/A
2) EXV IS HOLDING	00:02:40	38.9%	9.9	0.1	60	N/A

Evap EXV State – Compressor number and current valve of the EXV.

Time – The time the valve has been in this state.

Valve % – This is the current valve % opening. While 0 to 100 % is the range, there are set points that limit the range to avoid unnecessary movement outside the required operating range.

Control on Suction Superheat – The current superheat for this circuit.

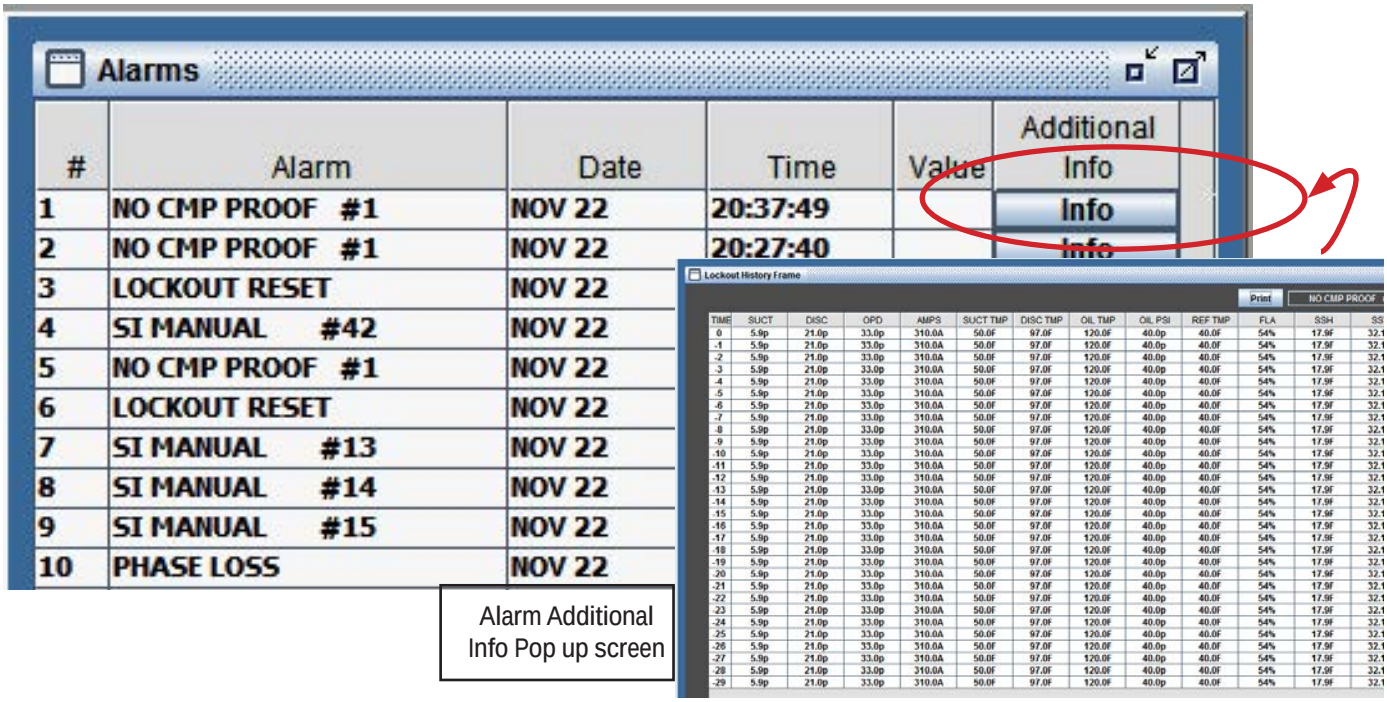
SuperHeat ROC – The rate of change of superheat based on the time defined in the superheat target setpoint.

ADJ Delay – When this value reaches zero the controller will adjust the EXV based on the current status.

EXV Target (Adjusted) – The adjusted value of the EXV based on setpoints.

9.5. Alarm Information

This window will display the alarm name, date alarm occurred, time alarm occurred. The fields are explained further below. Use the scroll bar to view all data.



There are three types of alarms that are generated by the MCS controller control logic (See your MCS controller manual for your application for more details regarding types of alarms generated):

Information only alarms

- System generated alarms
- Alarms as a result of individual action
- Alarms generated by the control algorithm

MCS controller system alarms

- Configuration problem alarms
- MCS local network problem alarms
- Key sensor problem alarms
- Emergency stop alarm

Chiller set point safety alarms

- Sensor inputs used in conjunction with MCS controller set point safeties
- Set point safeties

 # – This is the number of the alarm generated by the MCS controller.

Alarm Name – This is the name of the alarm generated by the MCS controller.

Date – Date the alarm was generated.
Time - Time alarm occurred.

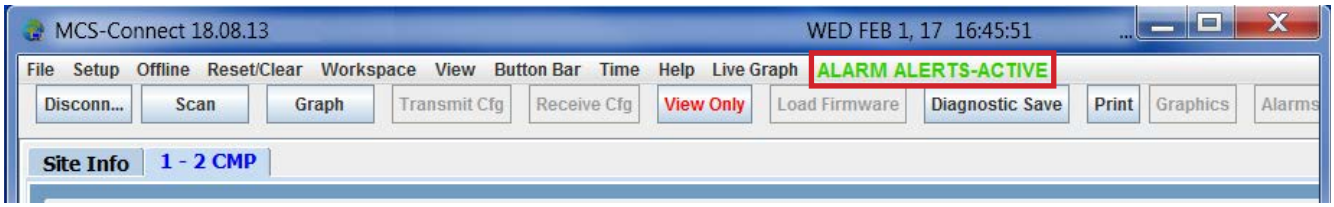
Alarm Additional Information

Additional information column allows the tech to view all information for the alarm.

9.6. Alarm Alerts - Active/Inactive Button

A feature has been added in MCS-CONNECT version 18.07.04 (and later) on the status screen that shows whether the **ALARM ALERTS** are **'ACTIVE'** or **'INACTIVE'**.

If you have enabled the **'ALARM ALERTS'** in the MCS-CONNECT setup, the button will show: **'ALARM ALERTS-ACTIVE'** and will be **'GREEN'**.

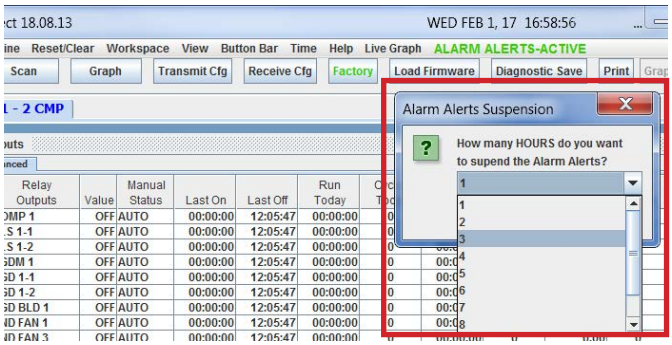


Clicking on the **'ALARM ALERTS ACTIVE BUTTON'** will open the following screen:

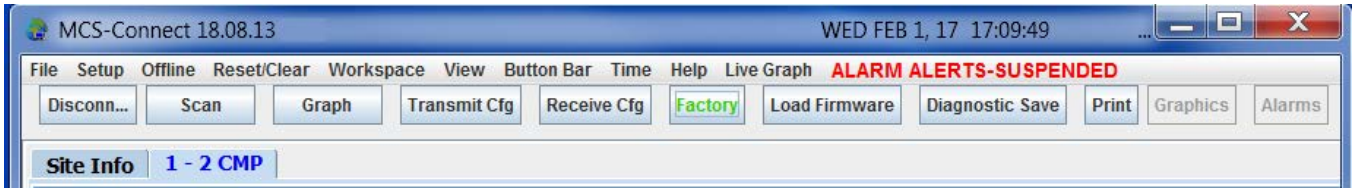
You can choose to **'SUSPEND'** the Alarm Alerts here on the status screen or **Reactivate Alarm**

Alerts if they were previously suspended without going back to the setup screen at the startup.

Clicking on **'SUSPEND ALARM ALERTS'** brings up a sub menu screen allowing you to choose the amount of time you wish to suspend the **Alarm Alerts**. The time period can be from **1 hour to 8 hours**.



Once you **'SUSPEND'** the **'ALARM ALERTS'** and set the time you want them suspended for, the button at the top will read **'ALARM ALERTS-SUSPENDED'** and turn **'RED'** as shown below.



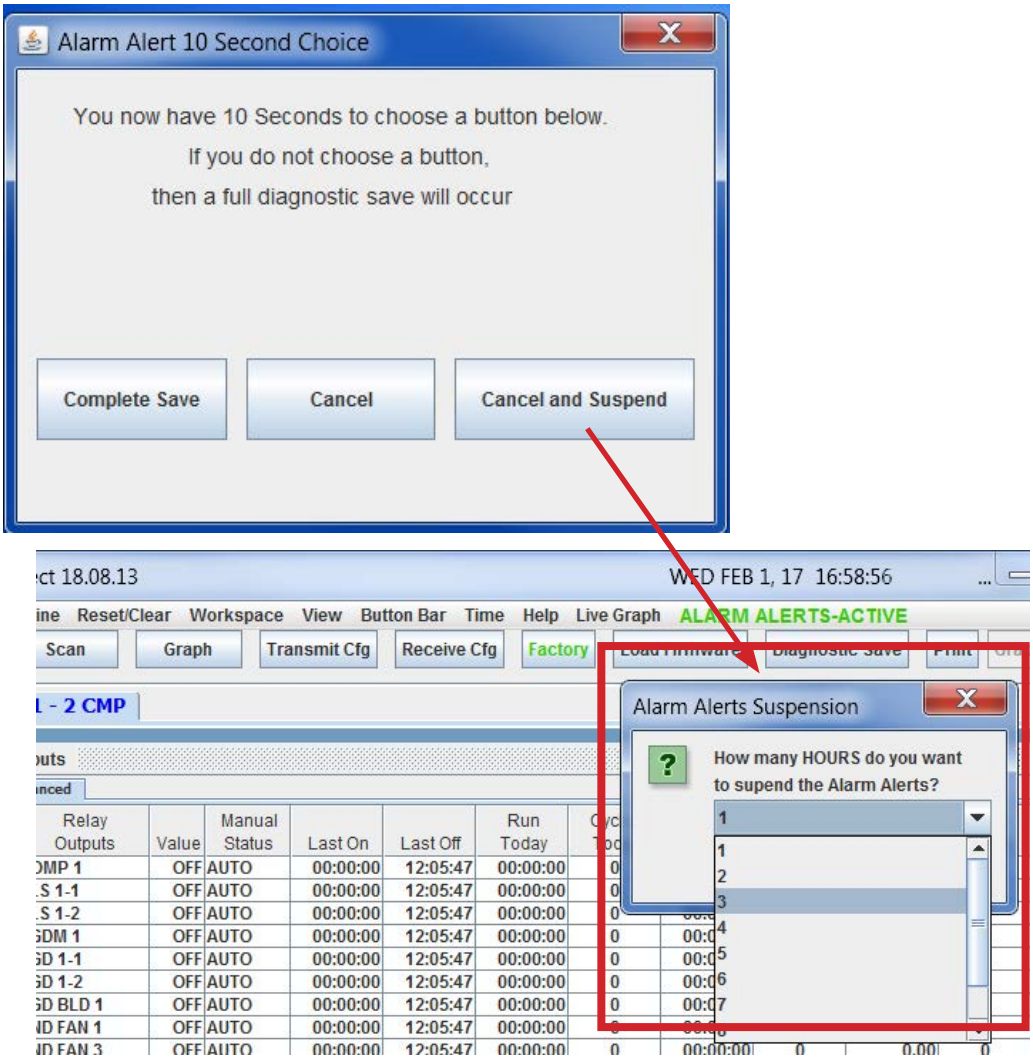
After the time has expired, the **'ALARM ALERTS' button will show 'ACTIVE'** and turn **'GREEN'**.

The Alarm Alerts are now active again and will save a Diagnostic Save once an alarm occurs.

9.6.1 Suspending 'ALARM ALERTS' after they occur

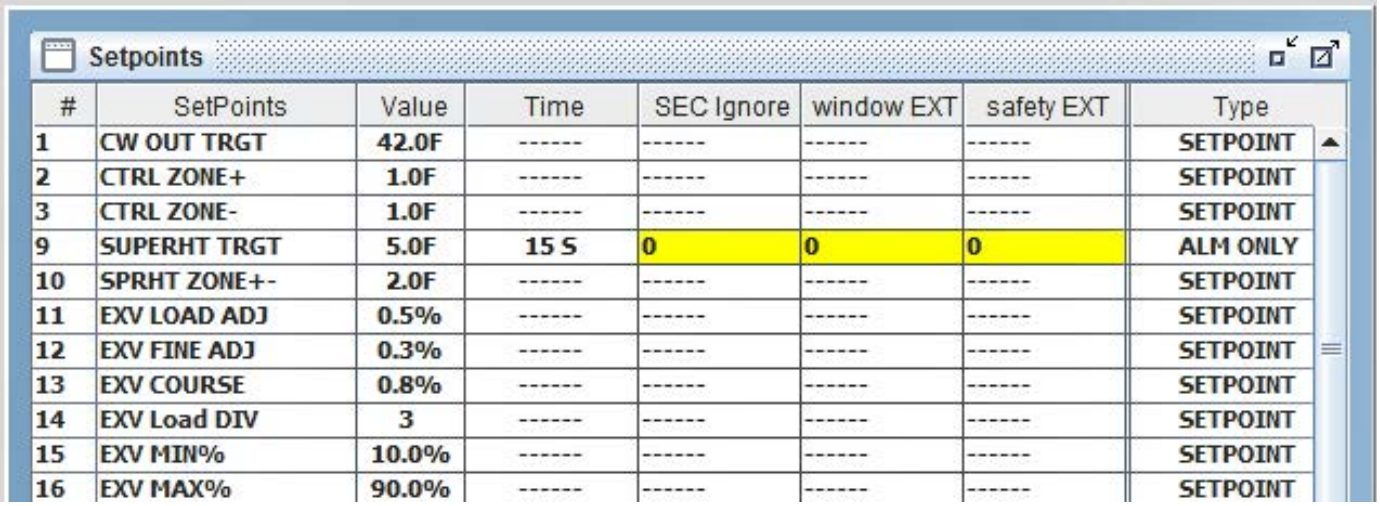
If an alarm occurs and the **'ALARM ALERTS'** is enabled, the screen below will pop up allowing you 10 seconds to **Cancel** the Diagnostic Save, **Suspend** the save or **Complete** the save:

1. **COMPLETE THE SAVE** - MCS-CONNECT will continue with the Diagnostic Save.
2. **CANCEL** - the Diagnostic Save will be canceled.
3. **CANCEL AND SUSPEND** - the Diagnostic Save will be canceled and can be suspended for a set time (one to 8 hours).



9.7. Set Point Information

Displays the set point name, value, time and type. The fields are explained further below. Use the scroll bar on the right to view all data.



#	SetPoints	Value	Time	SEC Ignore	window EXT	safety EXT	Type
1	CW OUT TRGT	42.0F	------	------	------	------	SETPOINT
2	CTRL ZONE+	1.0F	------	------	------	------	SETPOINT
3	CTRL ZONE-	1.0F	------	------	------	------	SETPOINT
9	SUPERHT TRGT	5.0F	15 S	0	0	0	ALM ONLY
10	SPRHT ZONE+-	2.0F	------	------	------	------	SETPOINT
11	EXV LOAD ADJ	0.5%	------	------	------	------	SETPOINT
12	EXV FINE ADJ	0.3%	------	------	------	------	SETPOINT
13	EXV COURSE	0.8%	------	------	------	------	SETPOINT
14	EXV Load DIV	3	------	------	------	------	SETPOINT
15	EXV MIN%	10.0%	------	------	------	------	SETPOINT
16	EXV MAX%	90.0%	------	------	------	------	SETPOINT

 # – This is the Set Point number.

Set points – This is the name of the set point.

Value – This is the value or target of the set point.

Time – This is the time that the set point must be true before it will trip, e.g. a high discharge safety must have its value exceeded for this length of time before it will trip. This time is always in seconds.

SEC Ignore (Sec. to Ignore Safety)**-** Time delay that the safety will be ignored upon compressor startup.

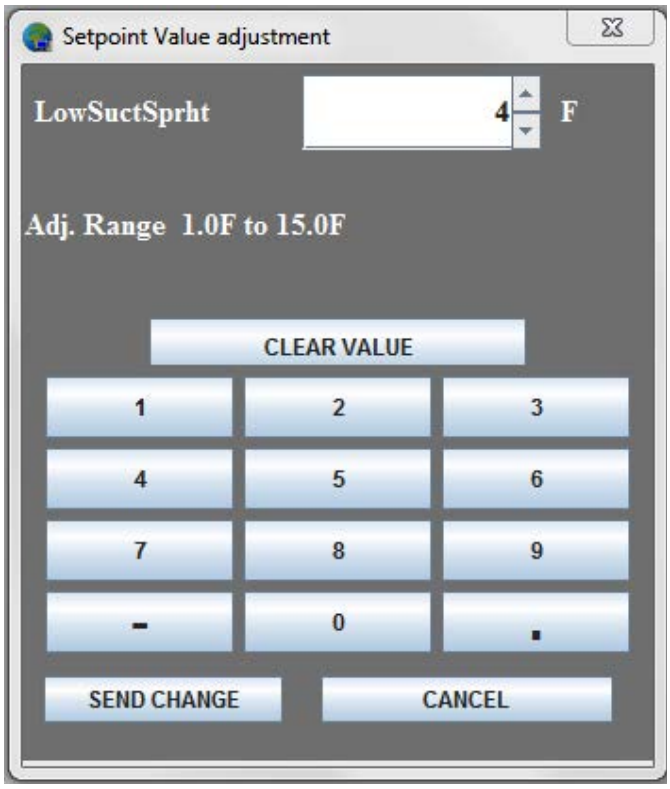
Window EXT (Window to Extend Safety Time) **-** The amount of time after compressor startup (or “Sec to Ignore Safety” if used) in which the “Safety Time Extension” field is added to the ”Time (sec)” field.

Safety EXT (Safety Time Extension)**-** The amount of time added to the “Time (sec)” field during the “Window to Extend Safety Time”.

9.7.1 Set Point Value Change

To change the value of a set point you must be authorized at a level that will accept a change to the set point in question. If your authorization is not sufficient the system does not respond to the request

If the authorization is sufficient then the following screen will appear:

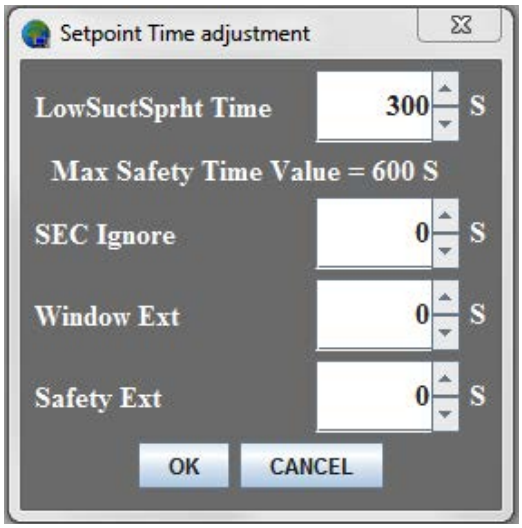


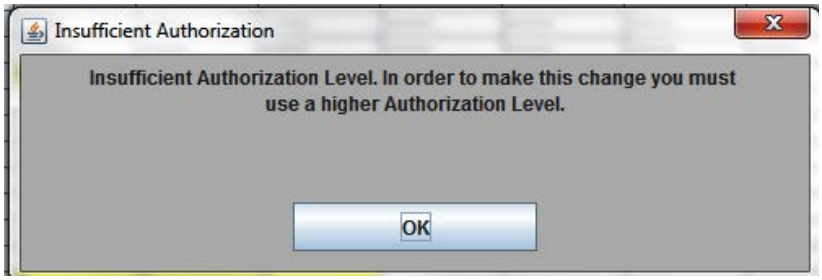
Type in the desired value within the range allowed.Click ‘Send Change” when complete.

The request will be acknowledged in the information frame screen.

9.7.2 Set Point Time Change

To change the time of a set point click on the appropriate set point cell and the following screen will appear. Type in the values wanted then press OK. The value will change in the setpoint screen.





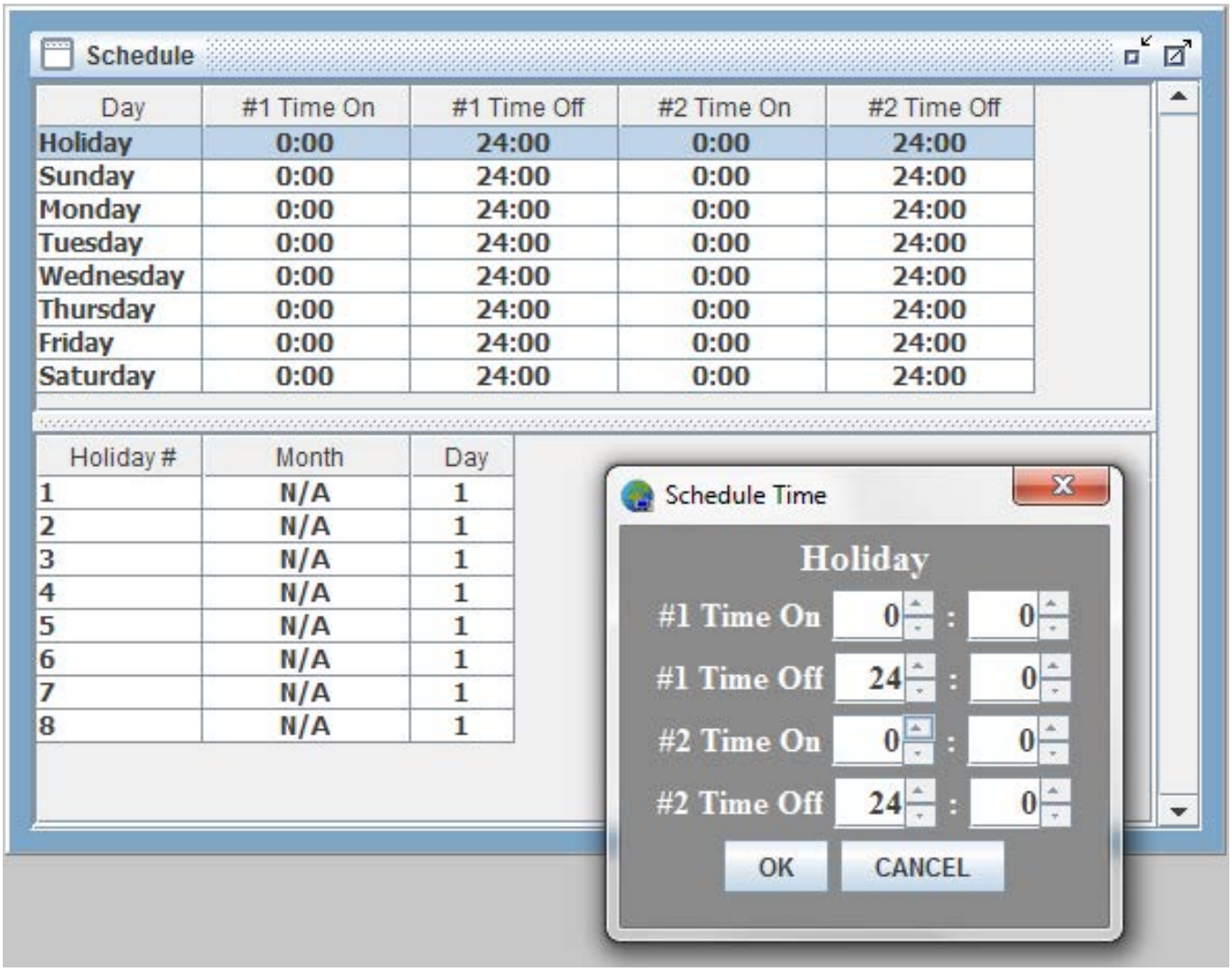
IF THE FOLLOWING SCREEN APPEARS -
YOU NEED A HIGHER AUTHORIZATION LEVEL
TO MAKE CHANGES

Chapter - 10. Schedule Window for MCS Controller

This screen displays and supports updates to the current schedules. Time is displayed in the

Military Time format, HH:MM where HH is a value from zero to 24. A schedule is always true if the Time ON is 00:00 and Time Off is 24:00. If a system is not running, check to make sure that the schedule for that day and time is true.

The schedules on the left of the screen are normal operating schedules. The number of schedules per day can be either one or two depending on the software in the controller. Some versions of software in the MCS-8 do not support Holidays.



To change a schedule, click on any cell tin the row to be changed and enter the new values. When all changes have been made, click on the OK button to update the system.

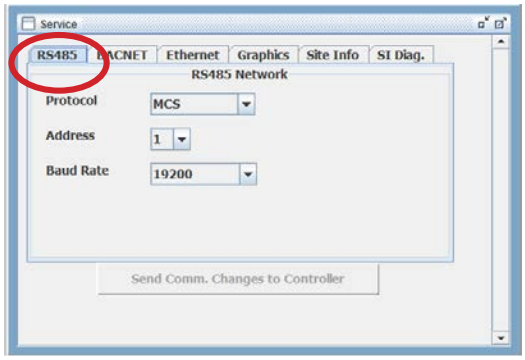
The CANCEL button will keep the schedules as their original values.

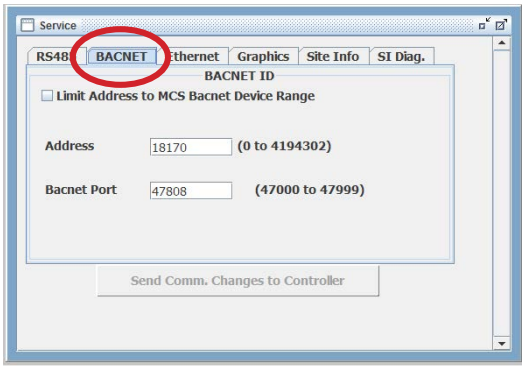
Note different types of control software may product a different schedule format.

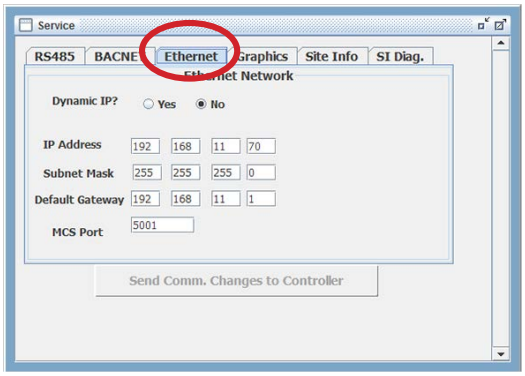
Chapter - 11. Service Windows

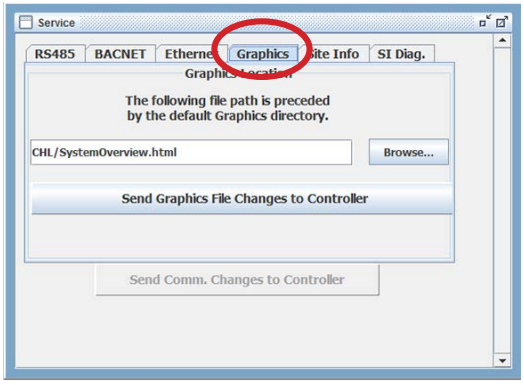
The main Service windows shows the different setup for com ports, graphics and site info for the controller you are connected to as shown below. Click on the button at the top to view the information for that frame and make changes.

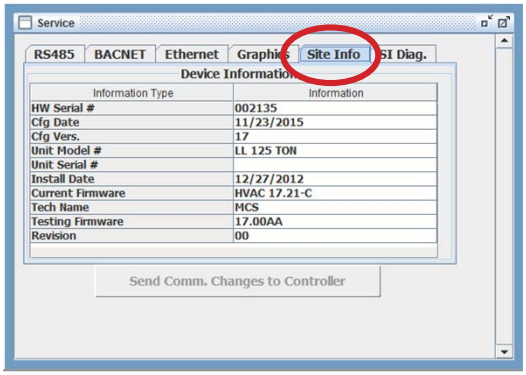
1. **RS485**- allows the installer to choose a different Protocol, address and baud rate for communicating.
2. **BACNET** - if you know the range for the BACNET, set the address and than click on the limit address to MCS Bacnet Device Range to show only that range of numbers (100).
3. **ETHERNET** - click YES/NO for Dynamic IP, change the MCS Port. If you click no to the Dynamic IP, you must manually add the IP Address, Subnet Mask,and the defaut Gateway.
4. **GRAPHICS** - allows the installer to change the file path where the Graphic files will be stored on PC running MCS-CONNECT.
5. **SITE INFO** - shows information for the controller you are connected to.

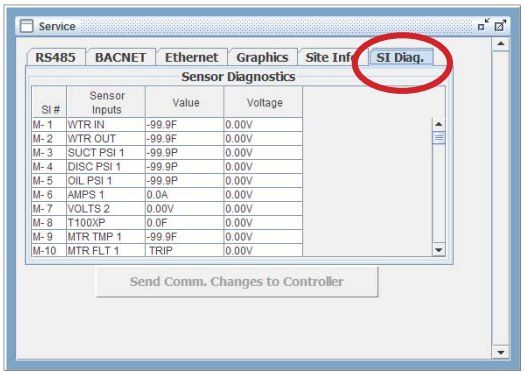






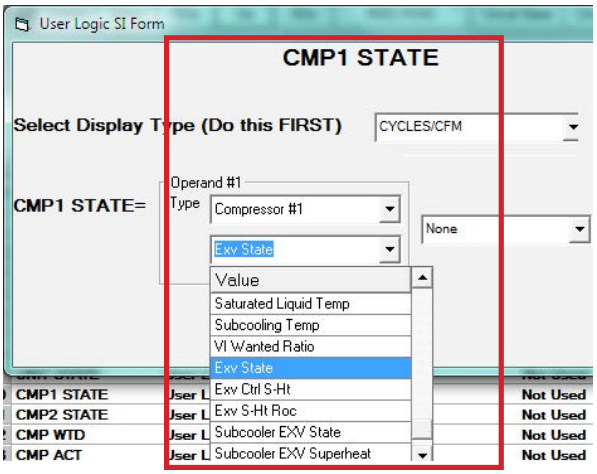






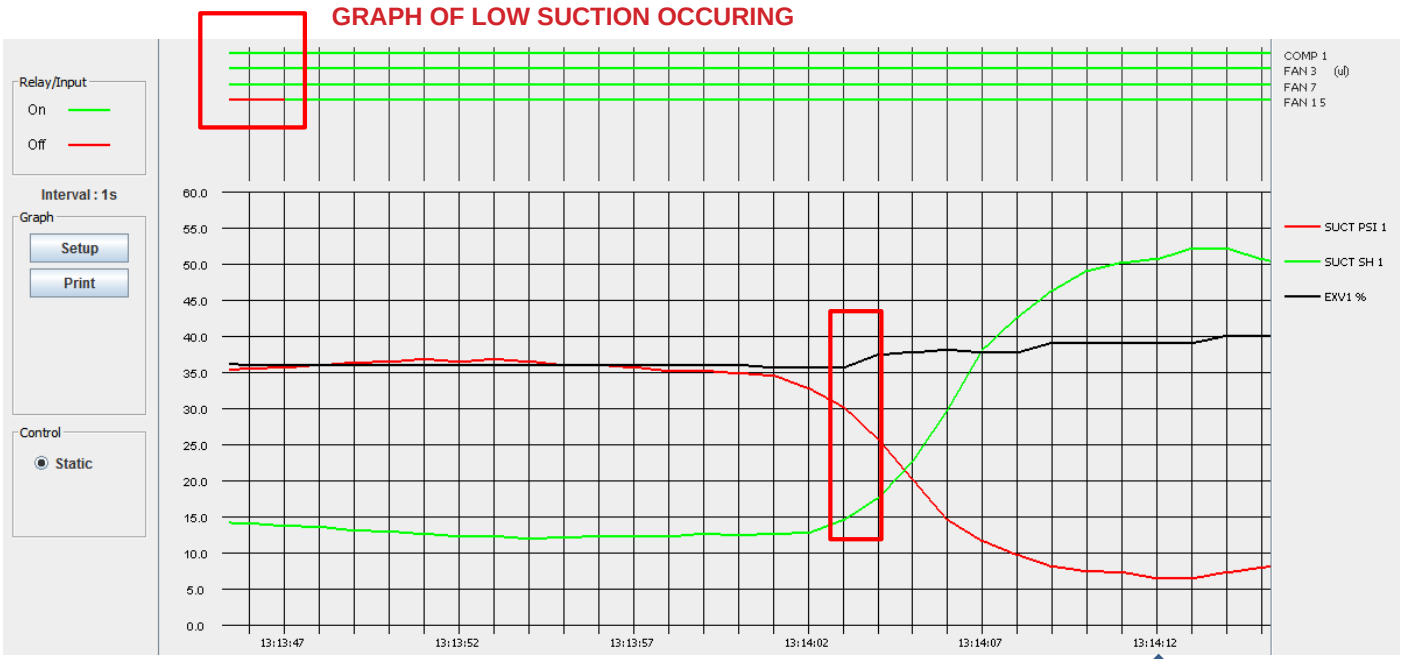
Chapter - 12. Graph Capabilities of MCS Controllers

The MCS controller captures history of the status for all RO, AO and SI points based on the setup of your configuration file. Through MCS-Config, the user is also able to setup additional “USER LOGIC’ statements to capture additional internal information for plotting.



For example, you might want to capture and ‘graph’ information on the Unit States, Compressor States, EXV States, Number of compressors Wanted on and Actual on, Suction and Discharge Superheat, Saturated Suction and Discharge, etc. The insert on the right shows an example of setting up EXV State.

When the GRAPH button is selected, the screen below will appear. On the MCS-8 the # of samples is 144 and can be retrieved in about 1 minute. In the MAGNUM the number of samples is 1008 and will take about 3 + minutes to pull back.



The above screen contains the following:

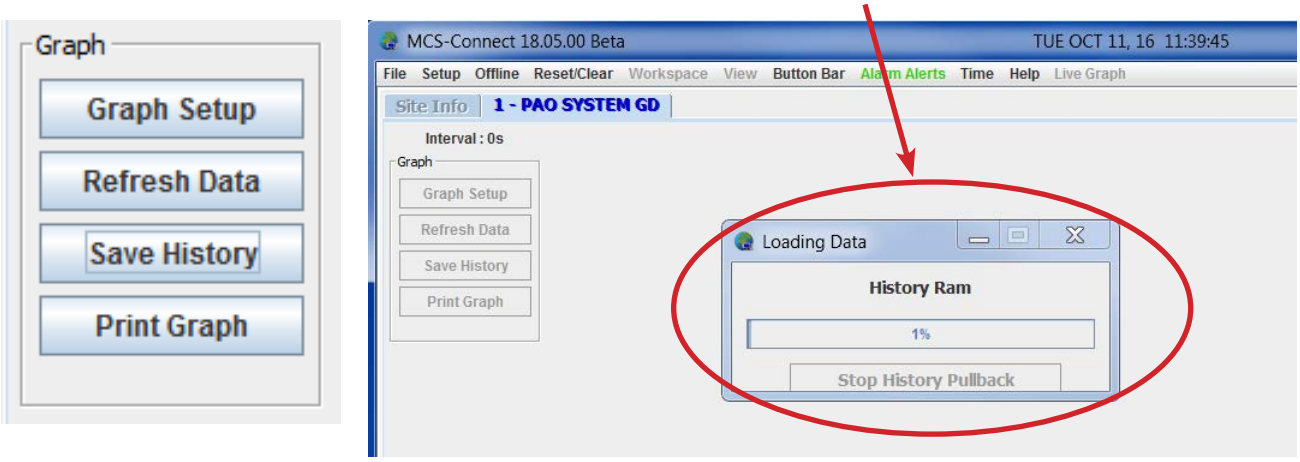
The Relay Outputs and the Digital Inputs are graphed across the top of the screen with line bars. The ON/OFF status coding is indicated to the left of the line bars and the name of the set points being graphed is on the right. The items being graphed can be changed in the SETUP screen.

The Analog Inputs are charted on the graph grid. The name of the points being graphed is to the right of the grid, note the color-coding. The slide bar on the bottom of grid is used to move the portion of the graph being displayed. The X-axis contains the time intervals, and Y-axis, contains the value range. Items be graphed can be changed in the SETUP function.

The following pages will show you how to setup for seeing and saving the Graph History for your unit.

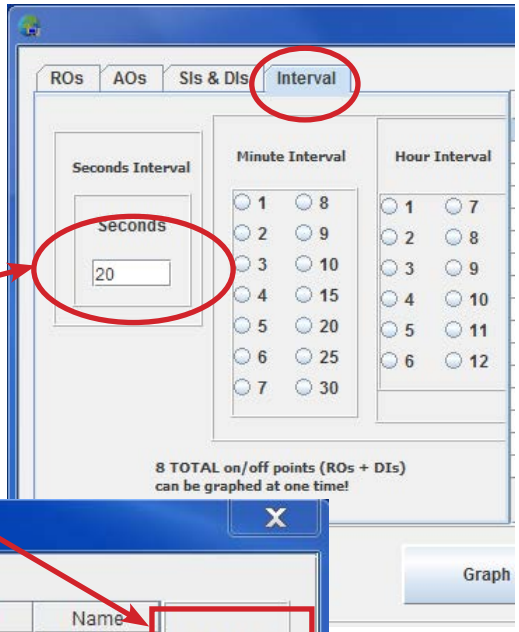
12.1. Graph Setup Tabs

When you click on the Graph button, the screen will display the following, plus if you have a saved 'GRAPH FILE', MCS-CONNECT will begin pulling back the history for the points you have saved for that graph file. Click on 'STOP HISTORY PULLBACK' to setup a new 'GRAPH'.



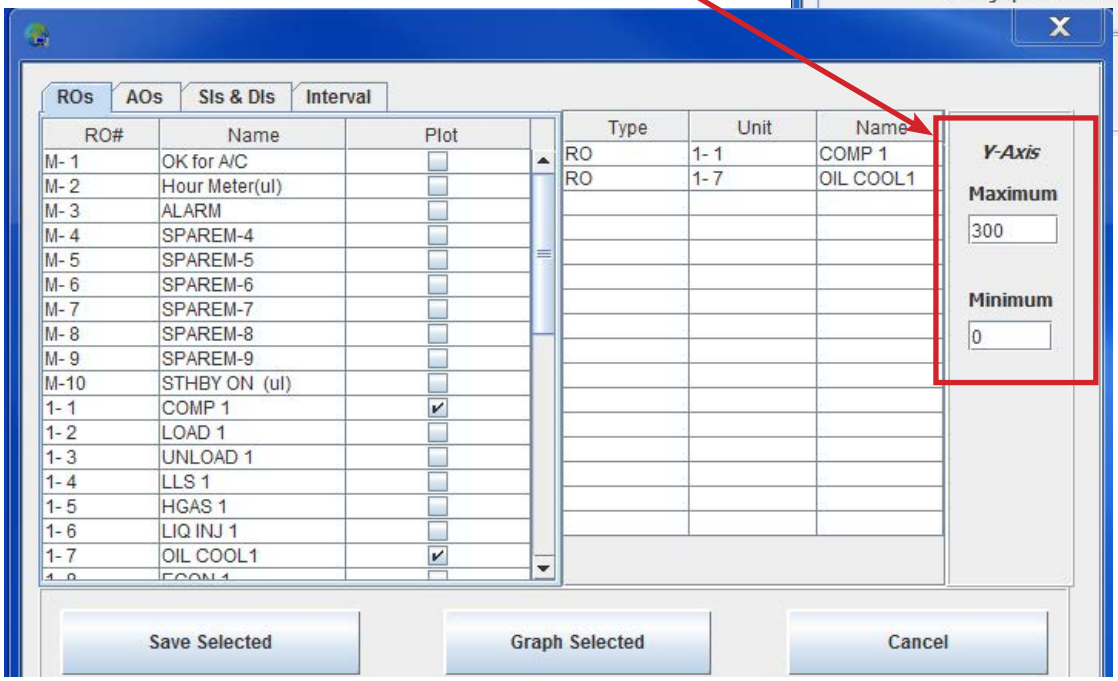
12.1.1 Graph Setup Button

This function allows changes to be made to the graph setup function.
When the SETUP button is clicked on, the following screen will appear. Here you will pick the points you want to graph, the 'INTERVAL(time)', and the 'Y-AXIS values'



12.1.1.1. Interval and Y AXIS SETUP

1. **Interval (s) -** Sets the given amount of seconds (time) you wish to graph
2. **Y-Axis Max -** Highest point of the graph
3. **Y-Axis Min -** Lowest point of the graph



This Graph setup screen displays in tabbed pane at top of the screen: the RELAY OUTPUTS(RO), ANALOG OUTPUT(AO), SENSOR INPUT(SI's) or DIGITAL INPUT(DI's) of all the points in this configuration file.

To add a point to the list that will be graphed, move the cursor to the check box next to the point you wish to graph, and click. The name will be added to the Points to Graph list in the right screen of the popup and a check mark will appear in the box. To remove an item from the list, click on the box to remove the check mark. The item will be removed from the Points to Graph list.

When you are finished adding the points, you can click 'Save Selected', which will save all points for the controller you are viewing. If you view another MCS controller you can setup the graph points so each time you view the MCS controller your points for the graph will be loaded for that MCS controller.

Clicking 'Graph Selected' will plot the current selections in the graph.

The Y-Axis section contains the maximum and minimum setting for the Y-axis. The axis is divided proportionally between these two points divided by the # of lines specified.

YOU ARE LIMITED TO A MAXINUM OF EIGHT(8) DIGITALS AND EIGHT (8) ANALOGS ON A GRAPH

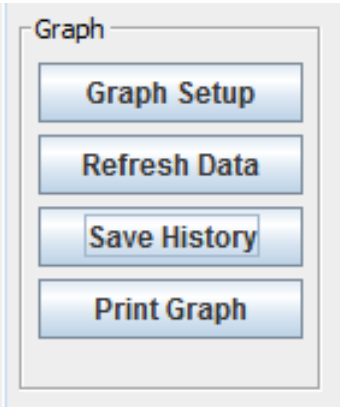
Click on Interval to see the setup for the sampling times.

The Interval tab enables the interval to be changed. The time is recorded in seconds. Click on the appropriate radio buttons in minutes or hours. The Seconds History Interval Box automatically updates in seconds. (You may double click on the seconds box and put in a value as small as 2 seconds).

Save Selected- Clicking on this button will enable the current settings to be saved. If the settings are saved, they will be active when the system is again accessed.

Cancel - Clicking on this button will return control to the GRAPH screen. None of the changes that were made will be reflected on this screen. The original settings will be used.

12.1.2 Refresh Data Button



This function will reread the history data that is being accumulated, thus providing fresh data to be graphed.

12.1.3 Save History Button

This function will save the current history data with sensor names as a '.Txt' formatted file.
The standard Window SAVE AS screen will appear. Specify the name of the file and where it is to be saved. The file can be read into a spreadsheet program such as EXCEL and then graphs, charts etc can be produced using the graphing capabilities of the spreadsheet program.
The Magnum supports 1008 History Samples for all inputs & outputs.

By adding the MCS-COMPACT (which uses Flash 2G cards) to the Magnum this increases the storage history up to a year+ of run data.

SEE APPENDIX IN BACK SECTION ON Viewing History/Graph Files Offline

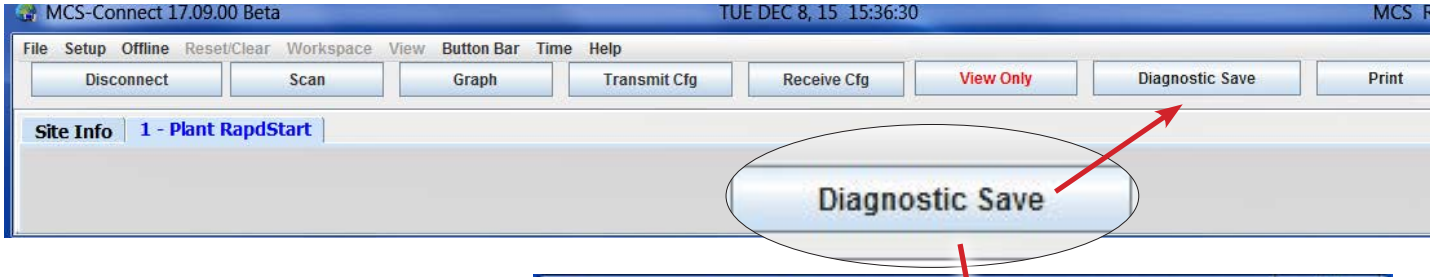
12.1.4 Print Graph

Prints the current Graph on the screen.

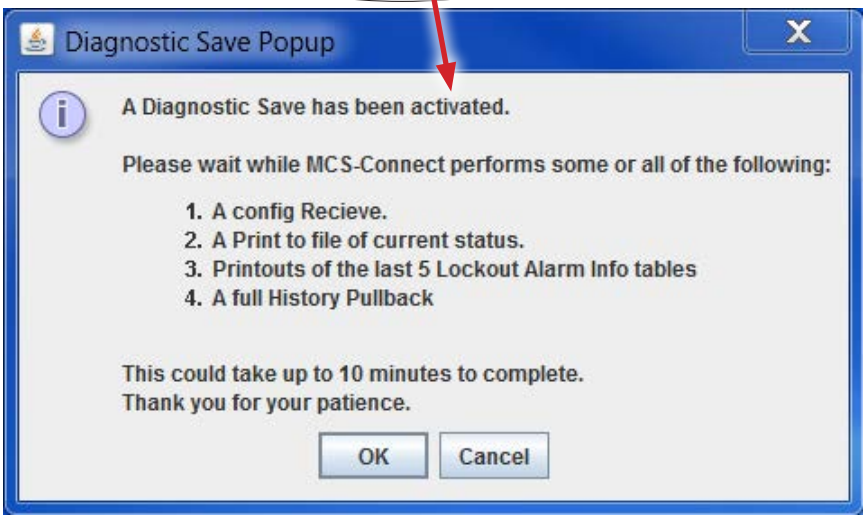
Chapter - 13. Diagnostic Save 'EASY BUTTON'

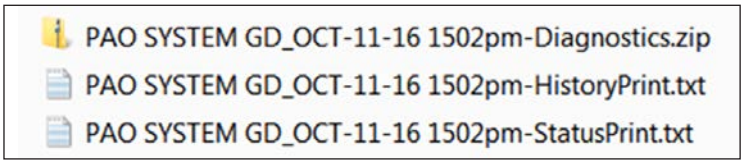
13.1. Diagnostic Save

Clicking on **'DIAGNOSTIC SAVE'** allows the users to save files which can be viewed in a txt program such as Notepad or better yet in Excel.

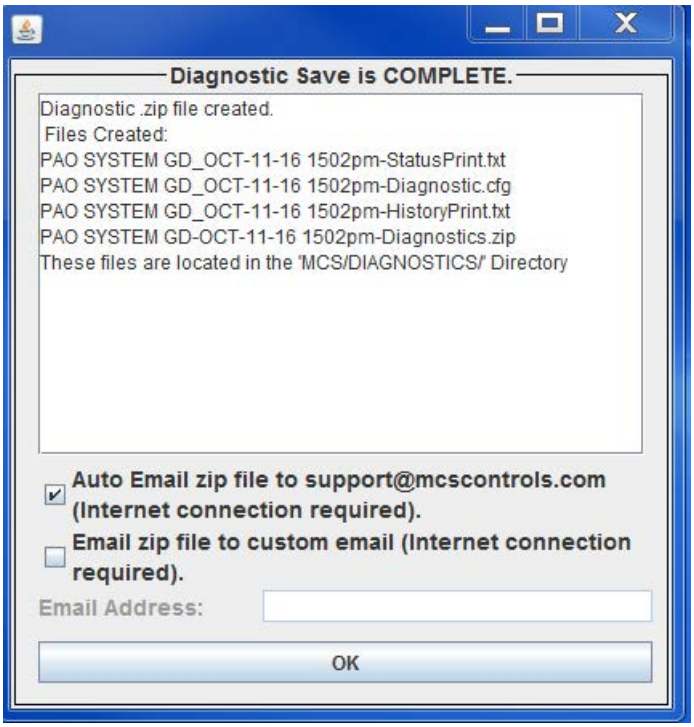


The screen on right appears alerting the user that MCS-CONNECT is ready to perform a diagnostic save of the unit that is being monitored.





Saves a Zip file to your computer and can Auto Email zip file to: support@mcscontrols.com



'The Easy Button'
for MCS-CONNECT

Chapter - 14. Graphics and MCS-Connect

14.1. GRAPHICS

With the new Graphical Interface and MCS-Connect, you now have a better view of your controller's many functions.

If you purchased a MCS-MAGNUM Control Cabinet with a Touchscreen, a MCS-MAGNUM and Touchscreen, or a MCS-REMOTE with Touchscreen your graphics has been pre-installed based on the information you supplied the factory at the time of purchase.

If you have a MCS-MAGNUM Control Cabinet with a MCS-Keypad, MCS-Connect is available to be purchased along with a Graphic package which can be pre-installed for your controller(s).

MCS-Connect can also communicate with other control boards sold by MCS.

MicroMag Controller

MCS-MAGNUM NEMA4-15.4
CONTROL CABINET

MCS-MAGNUM
15.4 TOUCHSCREEN

MCS-REMOTE 15.4
CONTROL CABINET

PC LAPTOP
RUNNING MCS-CONNECT
with the option to communicate using an MCS-485-USB cable direct to your controller or you can communicate remotely using a MCS-WIRELESS-MODEM cabled to your controller using the internet.

Chapter - 15. MCS-CONNECT PC Requirements & Product

To install and run the program we suggest the following minimum system requirements:

- PC with a Pentium2-class or higher processor
- Windows 7 or later operating system or Linux operating system
- Minimum 1GB of RAM
- Minimum 4GB Drive
- 14.4k baud modem or higher for remote communications
- 1280 x 800 pixel or higher display
- Ethernet 10/100/1000
- USB port 2.0 or higher

MCS-CONNECT PRODUCT FEATURES

- Java application runs on Windows/Linux
- Local communication @ 19200 baud
- Local Ethernet @ 10/100 MBPS
- Remote communication via phone or Internet
- Email/Test Message alarm alerts
- Auto Print to file on alarms
- Daily Scheduled Print to Files
- Temperature and PSI Conversion Wizard
- Extended History File Save
- Interactive P/T Chart
- Lookup Tables
- Hide / Show Applicable Data
- Diagnostic Save/Auto-Send
- Window/Grids auto sizing based on screen resolution
- Customized Workspace saving, allow easy recall of window position & sizing
- Algorithm control states display
- Static & dynamic graphing / trending data
- Alarm retrieval & handling - these items can be printed and saved to PC for analysis and backup
- Manual / Auto mode control
- Setpoint modification
- Schedule modification
- Multiple authorization levels for security
- Runtime / Cycle count information
- Transmit / Receive configuration in as fast as 10 seconds
- Sensor Diagnostics
- Graphic Interface Sub List
    1. Customized to application
    2. User Customized Gauges
    3. State Based Color and Image changes
    4. Animated device—pump rotating, comp moving, fan spin, etc.
    5. Easy view and access via graphic interface

Chapter - 16. About MCS-Graphical Interface

The Graphical interface is a combination of computer programs, Javascript, HTML, CSS, and XML which builds the screens showing your compressors in real time graphics.

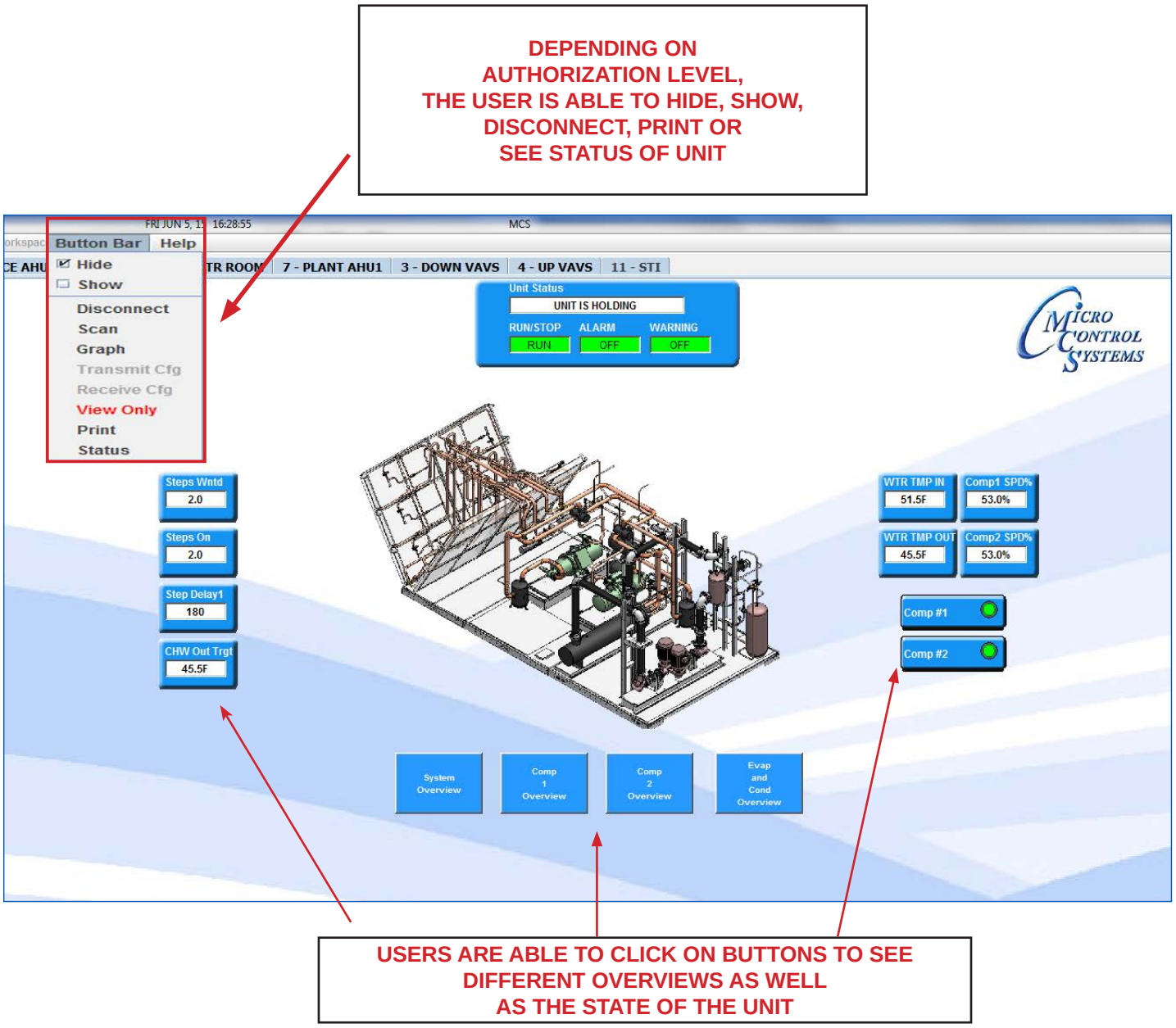
Graphical user interfaces are build to show the important status information for your controller.

Multiple screens can be built to help you see and monitor the operation of the compressor, its sensors, and relays.

Better knowledge of your installations before a service visit is a big help as a service technician.

It is just like being there with your laptop.

It provides customers with an easy-to-grasp overview of their systems and keeps costs for maintenance down.

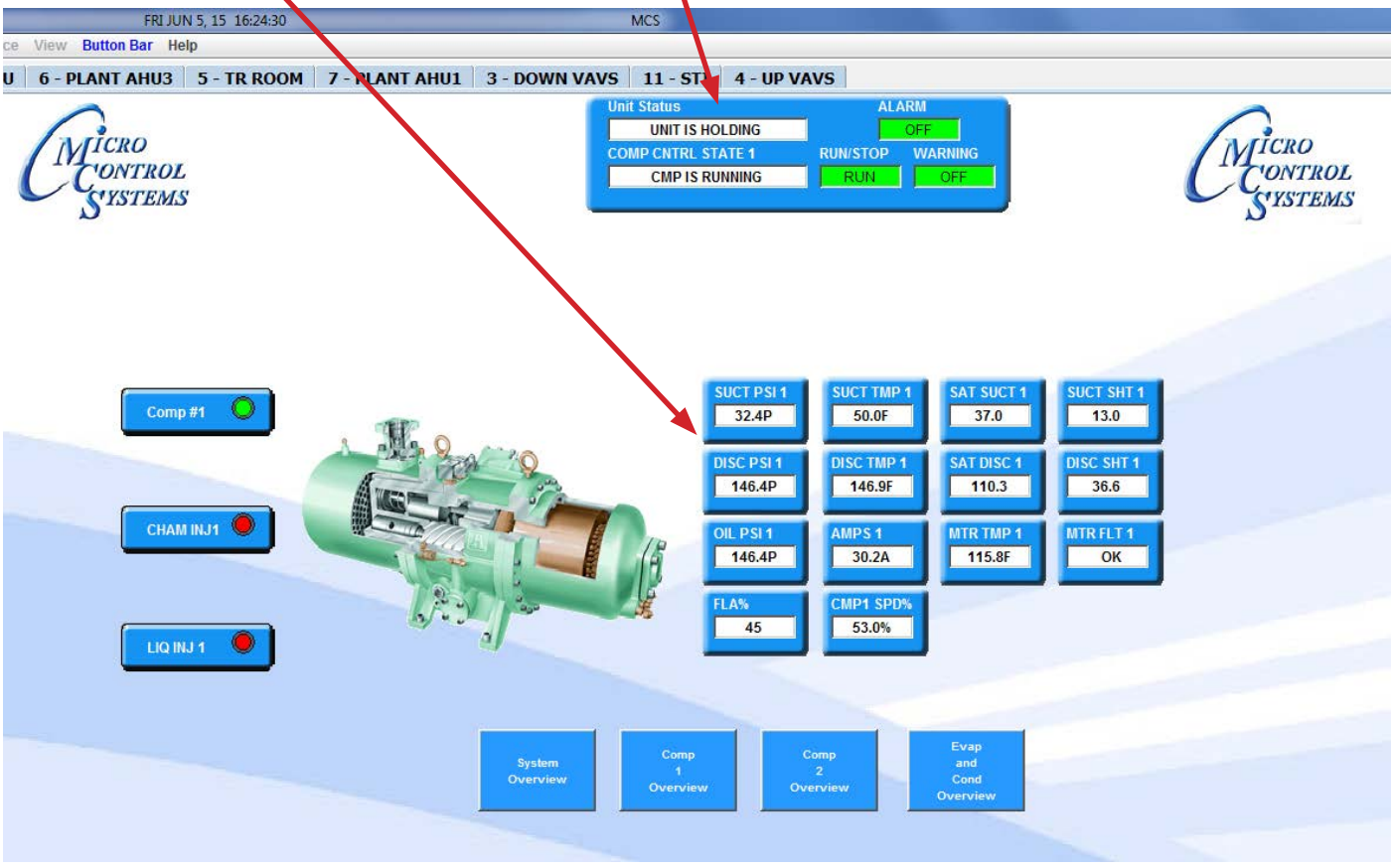


Remote monitoring using MCS-Connect and the 'Graphical user interface' will increase the value of your installation. It enables the user to change system settings without the need to call the customer or send out a technician. It enables the user to troubleshoot failures and have the appropriate repair parts on site as a technician arrives.

MCS-Connect and the 'Graphic Interface' can reduce a lot of service trips which mean savings in time and money, but more importantly you have better control of your compressors and can monitor all parameters in real time through MCS-CONNECT.

Each 'Graphic Package' screen is different depending on how you wanted the setup to be and what compressor(s) you are viewing.

THIS WINDOW SHOWS COMPRESSOR 1 RUNNING AND THE STATUS OF SENSORS AND PUMPS IMAGE IS A HANBELL COMPRESSOR



Graphic screens are for viewing only.

Changes to setpoints, relays, etc. can be made at the MCS-Connect status screen if you have the proper authorization.

Chapter - 17. Building of the Graphic Screens

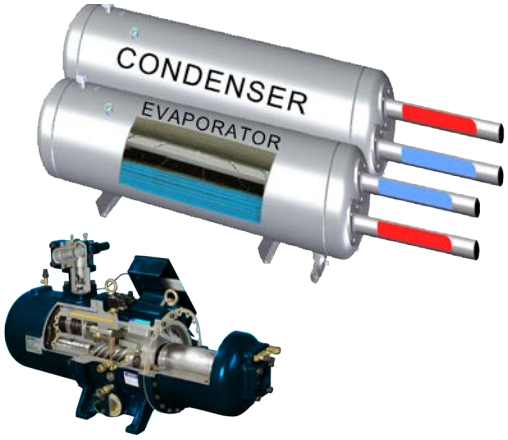
MCS builds basic graphic packages based on the compressor(s) that you will be monitoring. Optional custom graphic packages can be designed to fit your customer's needs.

17.1. BACKGROUND

The background we use is kept to a simple design which does not interfere with the buttons, images, animation and widgets used to show the status of your compressor(s).

17.2. IMAGES USED

Images used are graphics of your chillers, compressors, or created images to show the status of your sensors, relays, etc. The background screen above, shows the customer's logo.

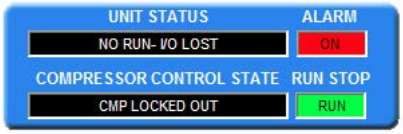


17.3. BUTTONS

Buttons are used to show a feature as **'Stop, Start,** and so forth. Examples of buttons are shown below.

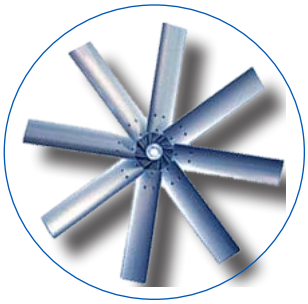
17.4. SENSOR INPUTS AND ANALOG OUTPUTS

Sensor and Analog outputs receive information from the compressors as to 'Suct PSI, Oil Diff, Amps, Targets for 'Chill water in' Chill water out'.



17.5. ANIMATION GRAPHICS

Animation is used to show motion. A fan graphic would depict whether the air handler or furnace is running or not. Fan blades on the fan graphic would spin faster depending on the amount of air flow (expressed in cubic feet per minute, or CFM) that the blower is delivering at a particular point in time.

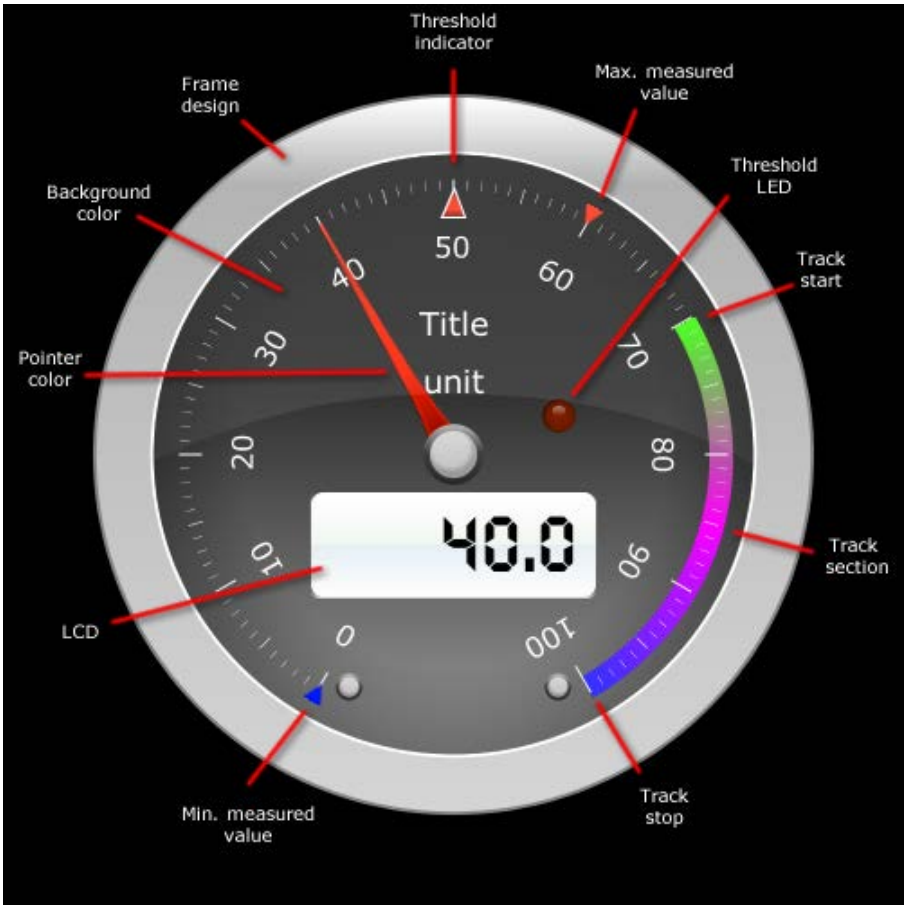


17.6. GAUGES

A gauge used in our graphic package is “a device for measuring a physical quantity”, [1] pressure of flow”, [2] or “a device that displays the measurement of a monitored system by the use of a needle or pointer that moves along a calibrated scale”.

There are two types of gauges soon to be available in the Graphic Package:

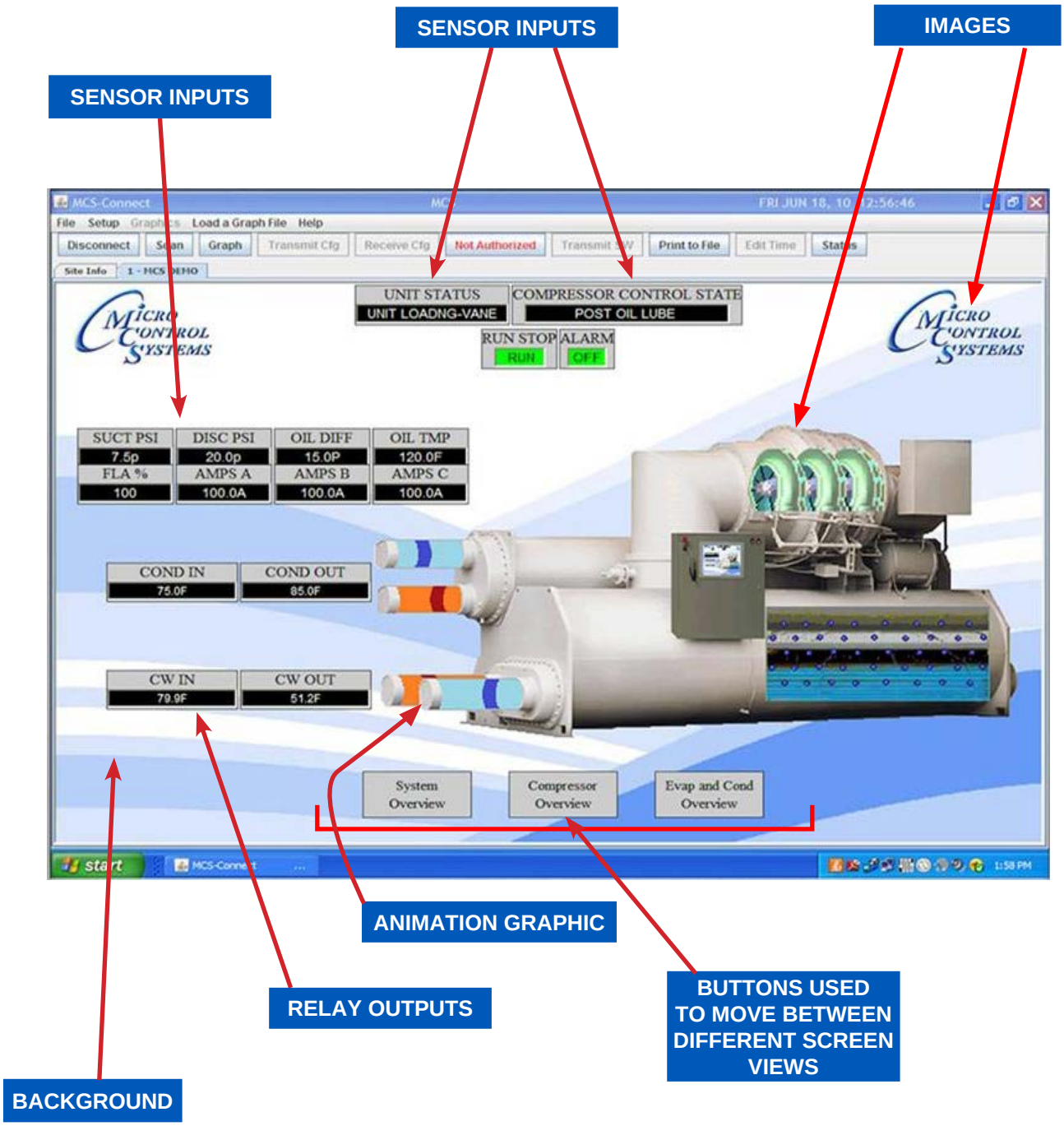
Radial gauges



Linear gauges

Chapter - 18. Sample Graphic Interface Screen

Below, you will see a breakdown of a typical graphic screen including buttons, images and Input of sensors, relays.



On this grapic package, there are three different screens available, **'System Overview', 'Comp Overview', 'Evap & Cond Overview'.**

The screen above shows the **'Compressor Overview'**. Clicking on the left button would show **'System overview'**, clicking on the right button would display the **'Evap and Cond overview'**.

Chapter - 19. MCS-GRAPHICS with MCS-CONNECT

Graphic packages are available thru your OEM supplier or thru a contractor who sells MCS controllers.

Below assumes you are installing MCS-Connect and your graphic package for the first time on your PC.

19.1. MCS-Connect and MCS-Graphics - Installed on your PC hard drive

MCS-Connect and the Graphic package can be installed direct onto your PC as long as your computer meets the requirements as shown on the beginning pages.

19.2. Installing MCS-Connect

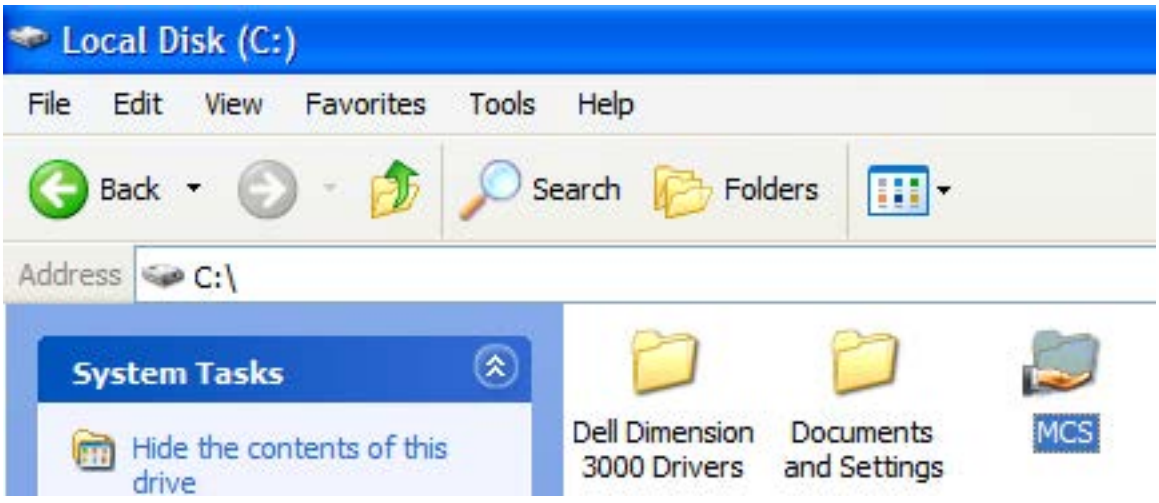
1. Navigate to www.mcscontrols.com using your computer's browser.
2. Once on the web site, go to **'Support - PC Software - MCS-Connect'** and download the latest version of the software. ALLOW THE INSTALLER TO PLACE THE FILES WHERE IT SHOWS IN THE INSTALLER PROGRAM.
3. Once MCS-Connect is installed, proceed to install the MCS-Graphic package.

19.2.1 Installing MCS-Graphics Files

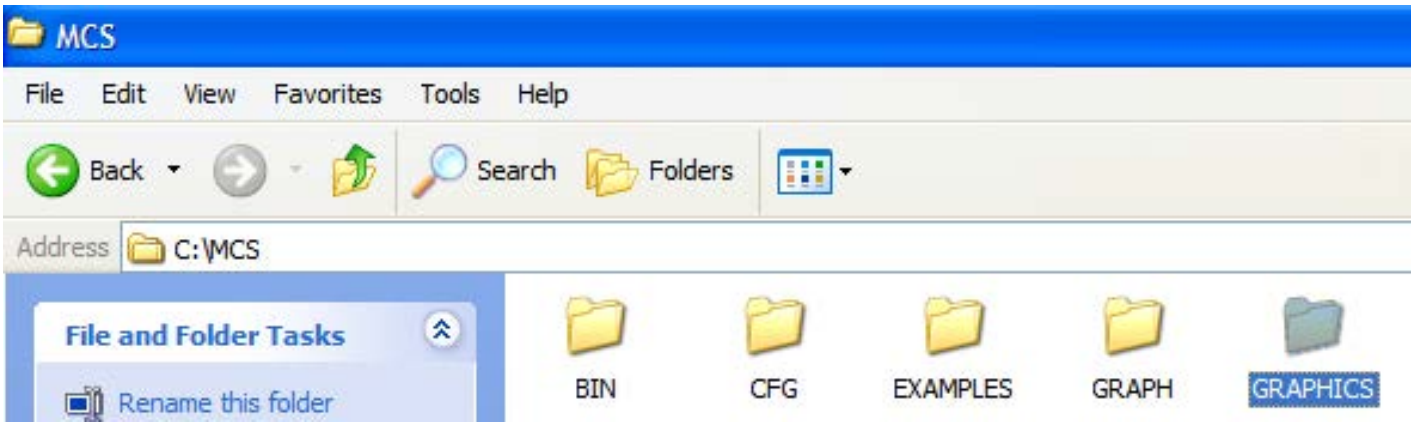
If you purchased a MCS-Graphics package for your controller or was supplied a file from your installer or OEM supplier, you will need to follow the instructions below to load the Graphic package into the MCS-Connect program.

It's a simple matter of placing the supplied files into 'MCS' directory, than into 'Graphics' and telling MCS-Connect where to find the graphic package.

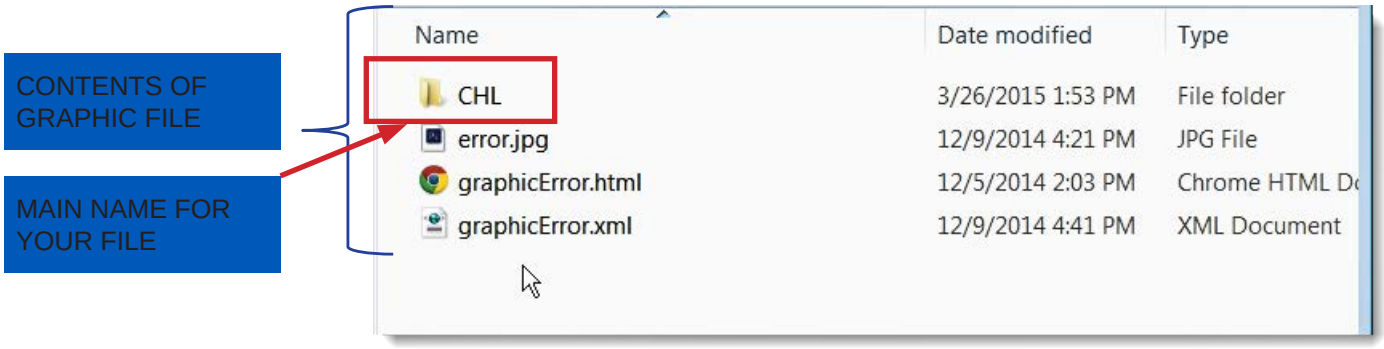
1. Navigate to your 'Desktop' click on the window icon to view your program files loaded on your hard drive.
2. The **'Graphics folder'** should be located in the 'root directory" of your computer under **'MCS'** where the installer wanted to place the files. If you overrode this location, you will need to change where you are going to place the new graphic package.
3. Open the **'MCS'** folder and place the supplied **'Graphic Files'** into the folder labeled **'Graphics'.**
4. **If the file was supplied as a 'zip' file, unzip the file and than place the contents into the 'Graphics folder.**



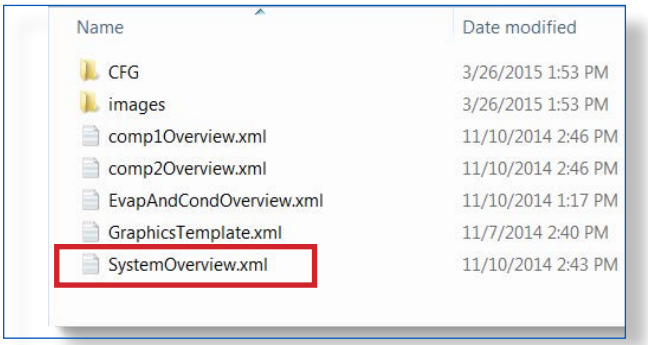
5. Below is a sample of what Graphic Files you will have depending on the configuration of your system.



19.3. Whats inside your Graphics files?



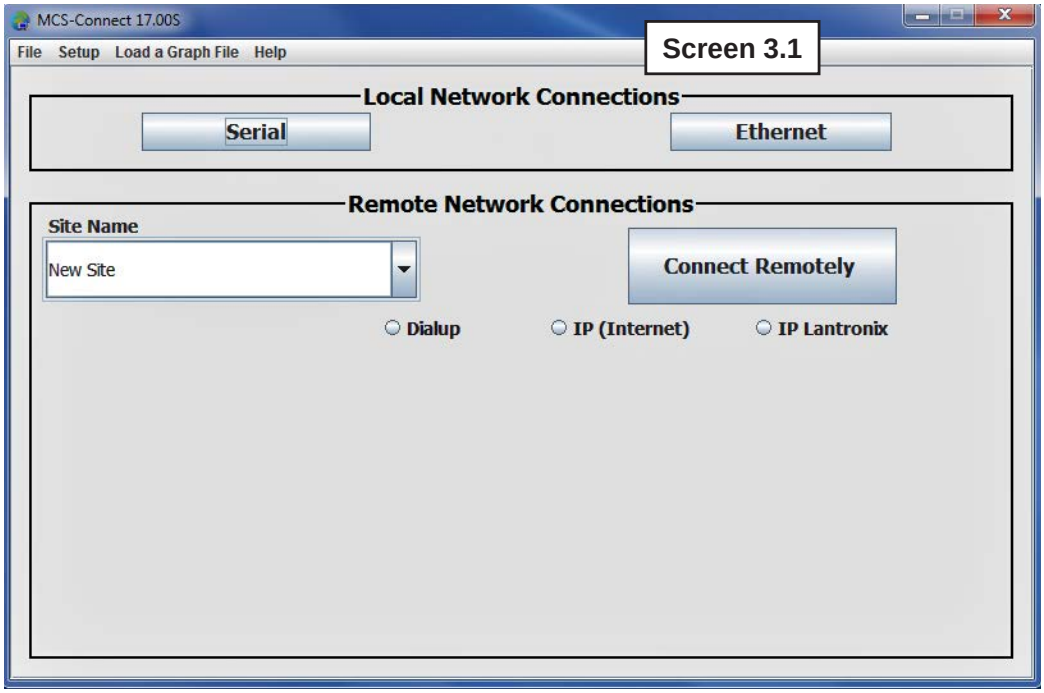
1. **CFG -** this sub directory contains your configuration files which tells your compressor what to do. These files are used by your installer.
2. **images -** sub directory of the images used for your 'graphics'.
3. **XML** - the next five files ending with .xml are the actual 'build' files for presenting your graphics while in MCS-Connect for this compressor.
4. **SystemOverview.xml** - is the main screen used by 'Graphics' to display the status of your compressor. The remaining .xml files are **'graphic builds'** of additional screens which show diffenence information of the compressor, its sensors, relays and settings.



5. The **'SystemOverview.xml'** is the file you will use to start the 'graphics' for your compressor.

WE'LL SHOW YOU WHERE THAT FILE IS STORED IN MCS-CONNECT IN THE NEXT PAGES OF THIS MANUAL.

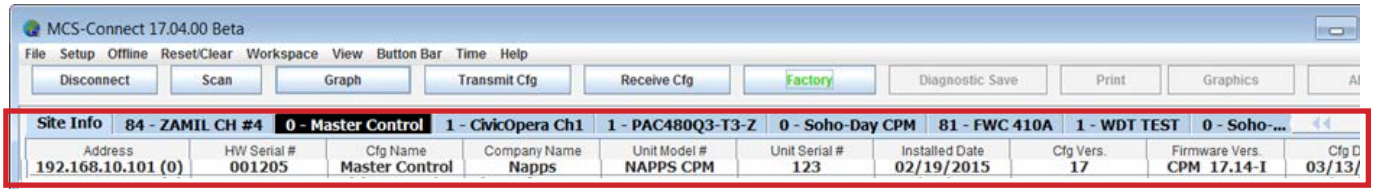
6. Navigate to the **'Desktop'**, locate the 'Shortcut' that was placed on your desktop when you loaded MCS-Connect.



7. Click on **'MCS Connect'** to run the program, screen below appears.
8. **Follow the steps to setup communication with your controller. The complete instructions for setting up MCS-Connect can be found in the MCS-Connect manual located on: www.mcscontrols.com under 'Support/Manuals'.**
9. Once communications has been setup for your controller, start MCS-Connect and proceed to scan for your controller.

19.3.1 Starting MCS-Connect

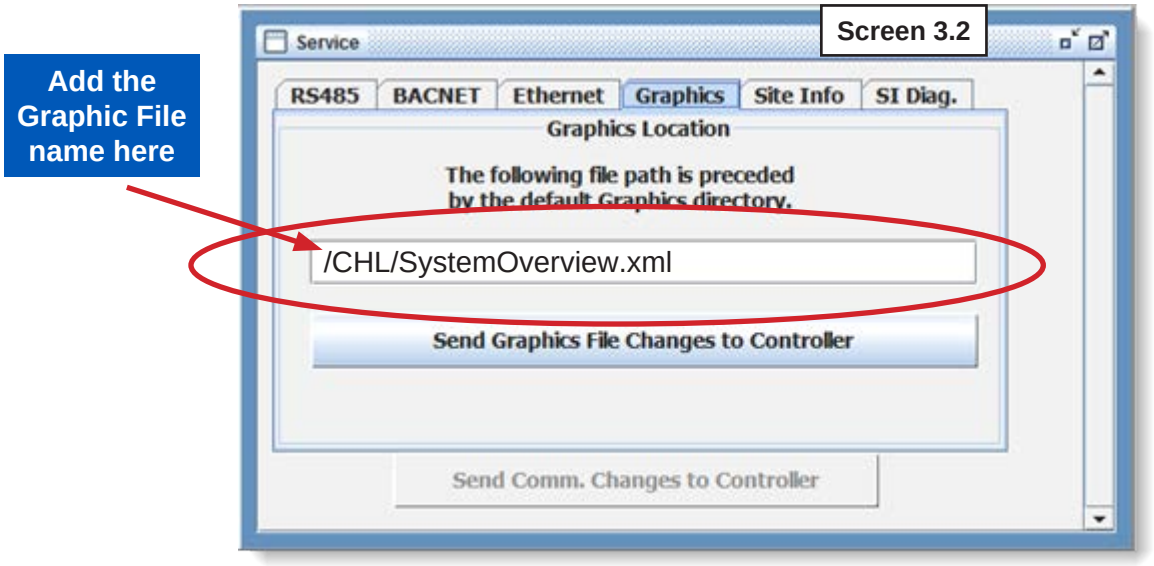
Start MCS-CONNECT and when your MCS controller appears in the site info grid select its tab and wait for all the information to be retrieved from the controller as shown.



19.3.2 Setting up where MCS-Connect finds the Graphic Interface file

In screen 3-2 the screen shows the location of the link for communication with MCS-Connect for displaying the graphics for your controller.

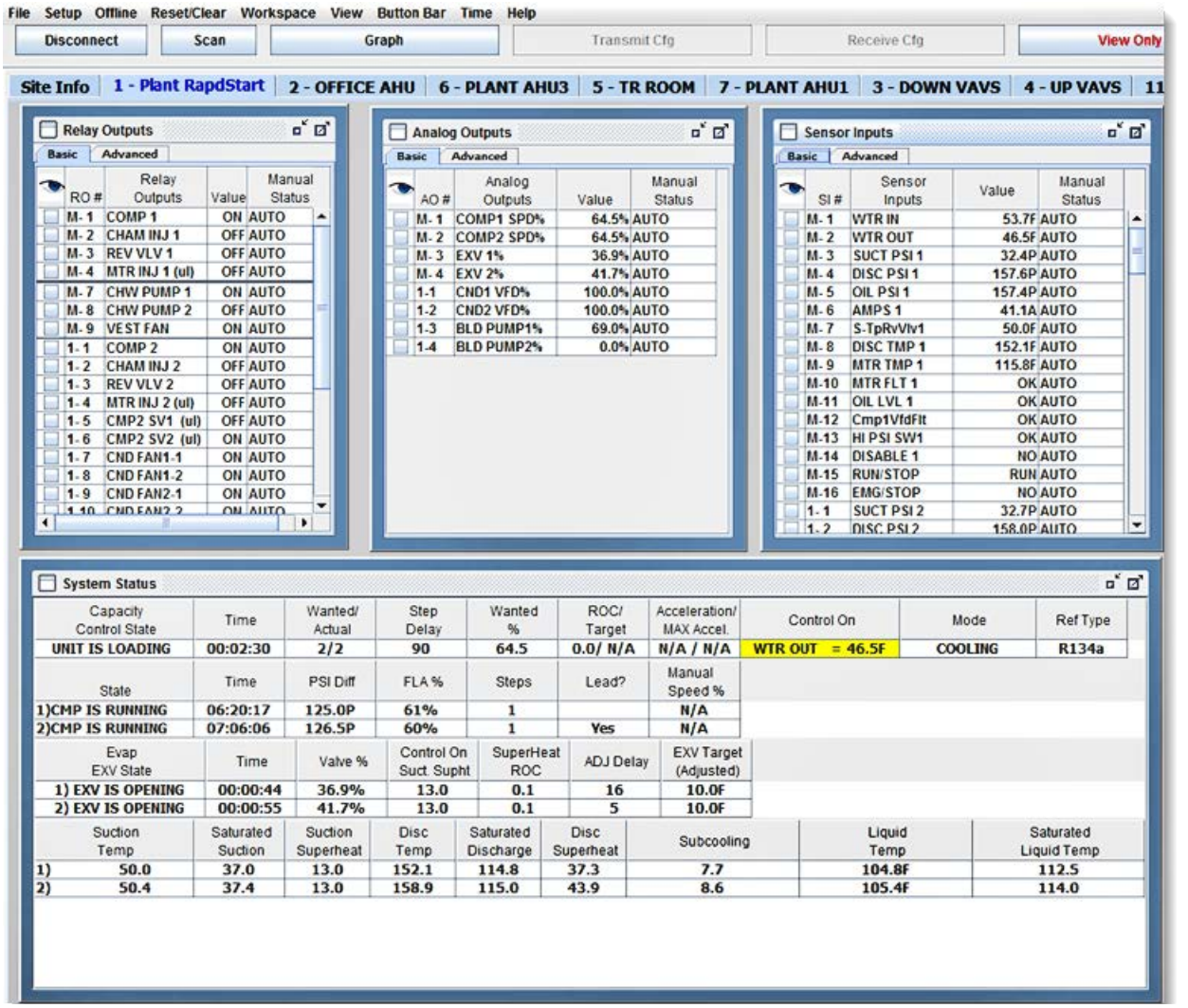
1. After your controller is loaded, at the bottom of your computer click on the 'Service' tab to open the below screen.
2. Click on the Graphics tab and locate where you need to enter the name for your **'Graphics'**.



3. The file's name can be copied to the above location.

19.3.3 Selecting the Graphic tab

Screen below shows status of the controller you are viewing and is the first screen showing after connecting to your chiller.



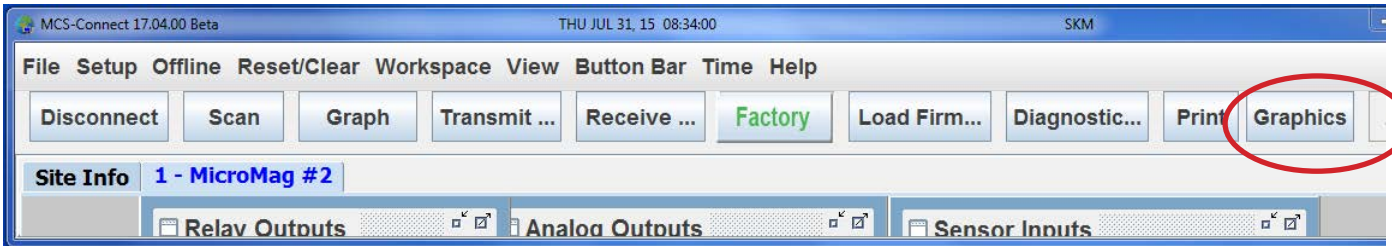
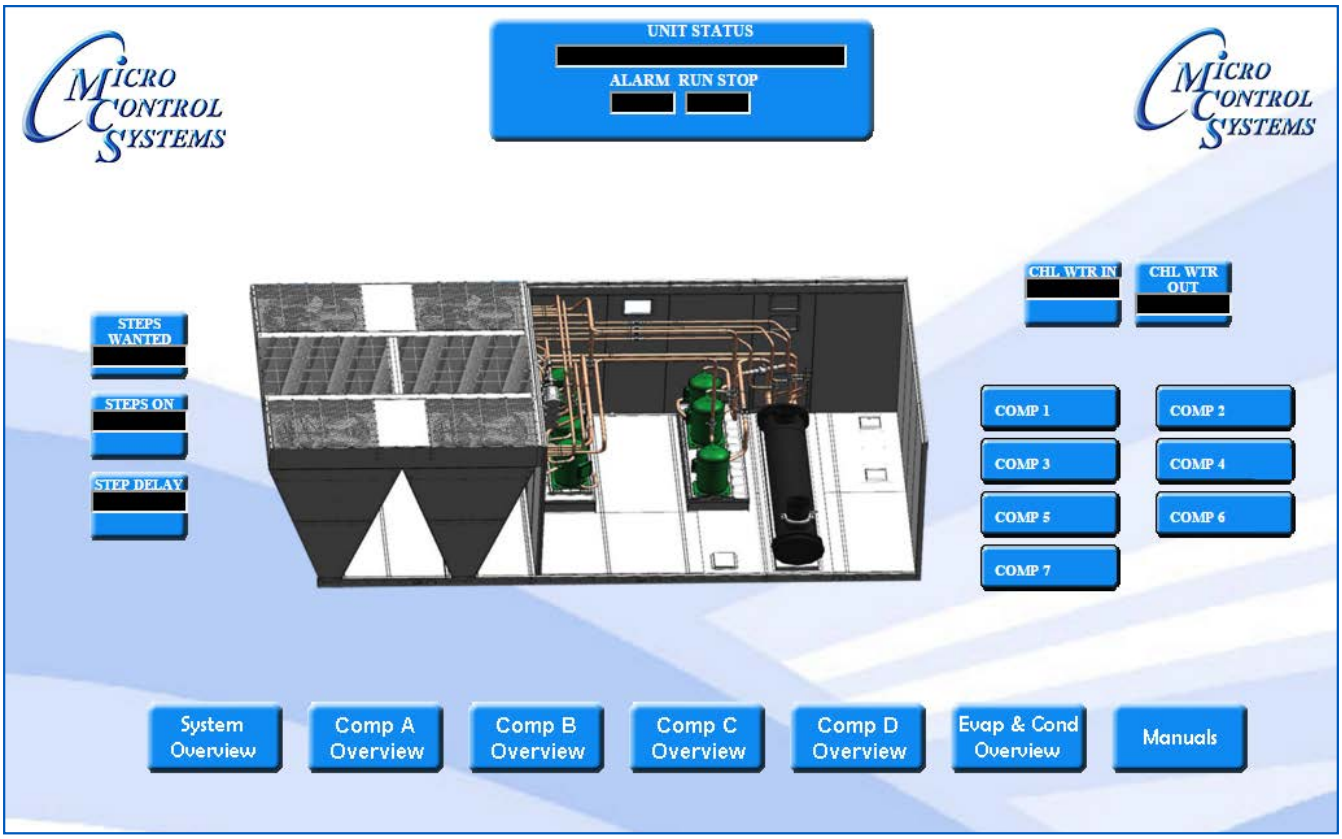
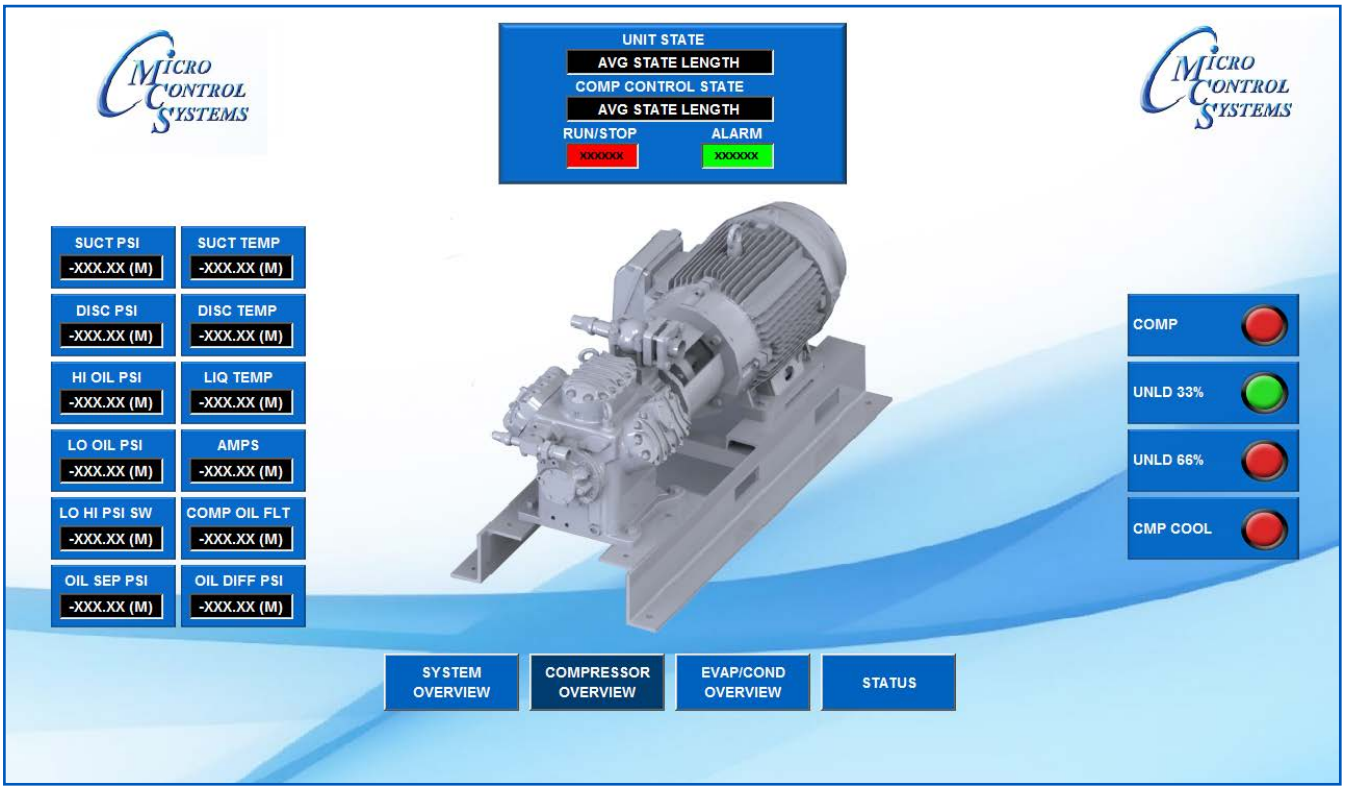


Figure 13.6

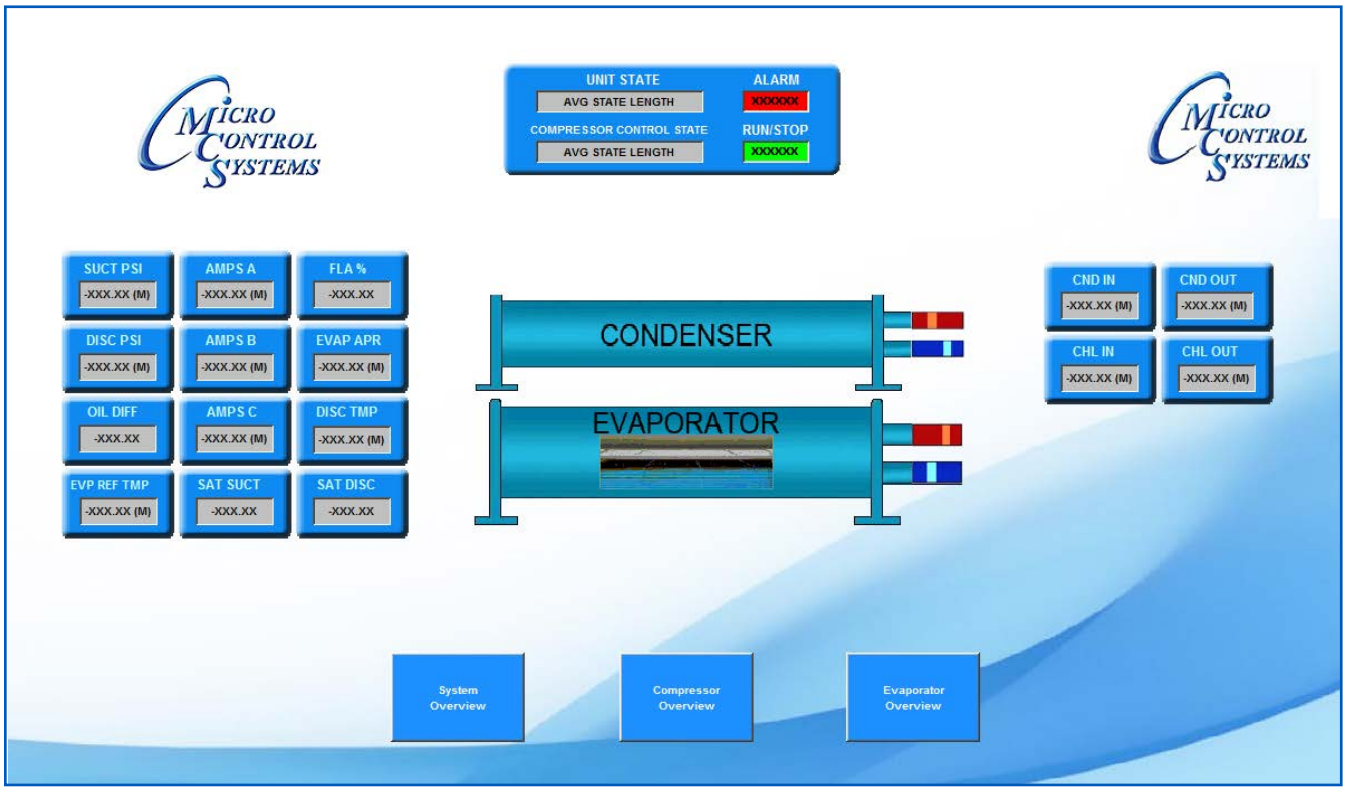
Now you can select the graphics button (Fig. 13.6) and wait for all the information to be displayed.

Chapter - 20. Samples of Graphics





UNIT STATE
AVG STATE LENGTH
COMP CONTROL STATE
AVG STATE LENGTH
RUN/STOP
ALARM
xxxxxx
xxxxxx
DANFOSS FLT
-XXX.XX (M)
PUMP ENABLE
-XXX.XX (M)
EVAP APPR
-XXX.XX (M)
CND APPR
-XXX.XX (M)
EVAP DIFF
-XXX.XX (M)
CND DIFF
-XXX.XX (M)
EVAP FLOW
CND FLOW
ROOM TEMP
-XXX.XX (M)
CTL ENC TEMP
-XXX.XX (M)
SUBCOOL
-XXX.XX (M)
EXH FAN
INTK DMP
CTL ENC FAN
GLY PUMP
SYSTEM OVERVIEW
COMPRESSOR OVERVIEW
EVAP/COND OVERVIEW
STATUS


UNIT STATE
AVG STATE LENGTH
ALARM
xxxxxx
COMPRESSOR CONTROL STATE
AVG STATE LENGTH
RUN/STOP
xxxxxx
SUCT PSI
-XXX.XX (M)
AMPS A
-XXX.XX (M)
FLA %
-XXX.XX
DISC PSI
-XXX.XX (M)
AMPS B
-XXX.XX (M)
EVAP APR
-XXX.XX (M)
OIL DIFF
-XXX.XX
AMPS C
-XXX.XX (M)
DISC TMP
-XXX.XX (M)
EVP REF TMP
-XXX.XX (M)
SAT SUCT
-XXX.XX
SAT DISC
-XXX.XX
CONDENSER
EVAPORATOR
CND IN
-XXX.XX (M)
CND OUT
-XXX.XX (M)
CHL IN
-XXX.XX (M)
CHL OUT
-XXX.XX (M)
System Overview
Compressor Overview
Evaporator Overview

Chapter - 21. Trouble Shooting problems MCS-Graphics

PROBLEM	POTENTIAL SOLUTION
Failed to Launch Graphics	Check to make sure File name and path is correct in Service/Graphics Link
Display of Graphics not correct	If you have upgraded to new graphic- download the latest MCS-CONNECT Version
Old Graphics still displays	It is important to remove the old graphic files from the directory where they are stored before copying the new files to that location.
Multiple Compressors	If you are connected to multiple compressors - make sure the correct ‘Graphic file” is linked to the correct compressor.

21.1. Troubleshooting Information

PROBLEM	POTENTIAL SOLUTION
Can't communicate with controller	Check the Com Port setting in your PC and in the setup in MCS-CONNECT if you are trying to connect 'LOCALLY'
MCS-Connect cannot make changes	This indicates you are not at a proper authorization level. Follow steps below for proper authorization • From either the SITE INFO or STATUS screen in MCS-Connect, click the 'View Only' button at the top of the screen, or click on the 'Passwords' menu option on the lower right of your Keypad/LCD display. • Follow prompts and enter a valid 4-digit authorization number. • The authorization level is displayed at the top of the display and is reflected by the color of the Authorization button. Red = View Only Light Blue = User level Fuscisa = Service level Dark Blue = Supervisor level Green = Factory level
MCS-CONNECT cannot see other controller on my network	Remember, each MCS-MAGNUM must have its own unique network address number.
Connecting with MCS-Connect to a MCS-MAGNUM over Ethernet	Go to www.mcscontrols.com / Support / Literature / APP NOTES / APP079 for instructions.
Failed to Launch Graphics	Check to make sure File name and path is correct in Service/Graphics Link
Display of Graphics not correct	If you have upgraded to new graphic- download the latest MCS-CONNECT Version
Old Graphics still displays	It is important to remove the old graphic files from the directory where they are stored before copying the new files to that location.
Multiple Compressors	If you are connected to multiple compressors - make sure the correct 'Graphic file" is linked to the correct compressor.

MCS-CONNECT support can help you with any problems you are having connecting to a contoller, setting and changing sensors, etc.

Collect your data and email to:
support@mcscontrols.com

Chapter - 22. Appendix - Transmit Config, Receive Config

Quick Steps for 'Transmiting a new 'Config' (loading to your controller)

1. Consult with factory for obtaining the latest MCS-Config file for your controller.
2. Download the file send to you from the factory to a location on your PC harddrive.
3. Click on MCS-CONNECT to start the program.
4. Click on the controller you wish to update.
5. Use the 'TRANSMIT CFG' button to begin (you must be authorized to make this change)
6. Locate the new 'CONFIG' file you just downloaded on your PC and begin transmitting to the controller.

Quick Steps for 'Receiving a 'Config' file from the controller:

1. Click on MCS-CONNECT to start the program.
2. Click on the controller you wish to "Receive the config file from.
3. Use the 'RECEIVE CFG' button to begin.
4. You are presented with a screen for naming the file and saving to a directory on your PC harddrive.

Chapter - 23. Appendix - Alarms - Print & Save

View Alarms, PRINT and SAVE file for viewing

1. Click on controller you wish to view
2. Click on ‘ALARMS’, under ‘Additional Info, click on ‘ALARM #, to view info
3. Save file for this ‘ALARM’ lockout to file on PC to the directory / ‘MCS’ / ‘ALARMS’
4. File can be printed using a .txt editor ‘NOTEPAD’ or can be opened in ‘EXCEL’
5. Click on ‘EXCEL’, click on ‘ALL FILES’ at bottom to view the .txt graph file you saved
6. Print file

Chapter - 24. Appendix - Graph - Quick steps to setup

Quick steps for setting up 'Graphing'

1. Locate controller to set up 'GRAPHING' file
2. Click on 'GRAPH' button at the top of the frame
3. Click on 'GRAPH SETUP' to pick 'RELAY OUTPUTS', 'ANALOG OUTPUTS', 'SENSOR OR DIGITAL INPUTS' and setting the 'INTERVAL' (time) for the 'GRAPH' report.
4. Click on 'SAVE SELECT' (clicking on this button will enable the current settings to be saved and will be active when the controller is again accessed) or 'GRAPH SELECTED' (will plot the current points selected over the specified Y-Axis and will not be active when the controller is again accessed).
5. History will be pulled from the controller and can be viewed on your PC or:
6. Click on 'PRINT' which will save the current 'GRAPH' to a file on your PC
7. Located the file on your PC to print a hard copy
8. File can be printed using a .txt editor 'NOTEPAD' or can be opened in 'EXCEL'
9. Click on 'EXCEL', click on 'ALL FILES' at bottom to view the .txt graph file you saved
10. Print file

Loading new 'Firmware' to the controller: (AUTHORIZATION LEVEL - FACTORY OR HIGHER)

YOU MUST BE LOCALLY CONNECTED TO THE CONTROLLER directly at the job site using a MCS-USB-RS485 cable.

NOTE: Important: VERSION XX FIRMWARE MUST USE VERSION XX MCS-CONFIG FILES. (EX: HVAC 17.25 must be using a MCS-CONFIG version 17).

MIXED FIRMWARE AND CONFIG FILE WILL NOT WORK. MAKE SURE YOU HAVE THE LATEST FILES PRIOR TO LOADING NEW FIRMWARE TO YOUR CONTROLLER.

Be sure to use the latest MCS-Connect programs. (Free upgrade @mcscontrols.com)

MCS-CONFIG update must be sent from MCS-SUPPORT if you have an older version than the MAGSOFT VERSION.

1. Consult with support@mcscontrols.com prior to upgrading your system.
2. To download the MAGSOFT upgrade: Go to www.mcscontrols.com
3. At top of main page click on 'SUPPORT', click on 'MAGNUM FIRMWARE'
4. Locate the latest version of the MAGSOFT for your controller - server will require a 'USERS NAME' and password.
   (call MCS-SUPPORT to receive that information)

5. **NOTE message about upgrading your ‘FIRMWARE’ before proceeding**
6. Start your download of MAGSOFT to the directory on your PC. ‘MCS/JOBSITES’
7. Connect the MCS-USB-485 cable to your PC and to the 485 port on the MAGNUM-N.
8. Open MCS-CONNECT, click on ‘FIRMWARE’ and upload the new MAGSOFT to your controller.
   Upload will take about 10-15 minutes.

Chapter - 25. Appendix - Loading New Firmware

How to Transmit Firmware Using MCS-Connect

NOTE: Important: VERSION XX FIRMWARE MUST USE VERSION XX MCS-CONFIG FILES. (EX: HVAC 17.25 must be using a MCS-CONFIG version 17).

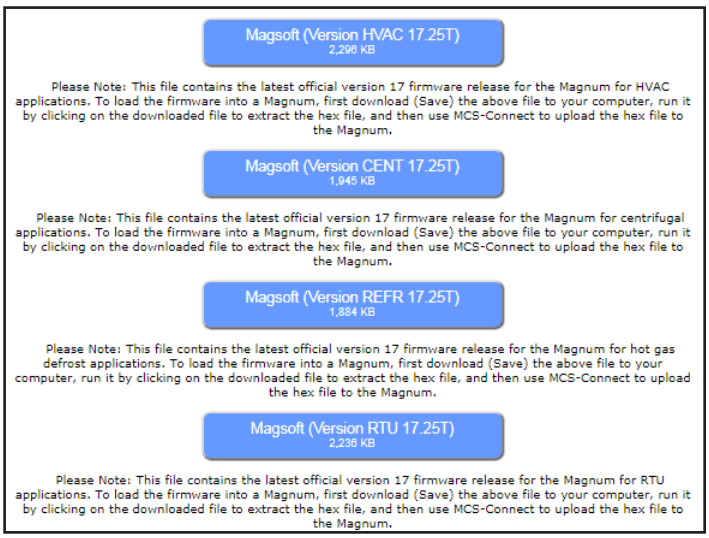
MIXED FIRMWARE AND CONFIG FILE WILL NOT WORK. MAKE SURE YOU HAVE THE LATEST FILES PRIOR TO LOADING NEW FIRMWARE TO YOUR CONTROLLER.

Be sure to use the latest MCS-Connect programs. (Free upgrade @mcscontrols.com)

MCS-CONFIG update must be sent from MCS-SUPPORT if you have an older version than the MAGSOFT VERSION that you are downloading. (Example: MCS-CONFIG version 16 will not work with MCS-CONFIG version 17)

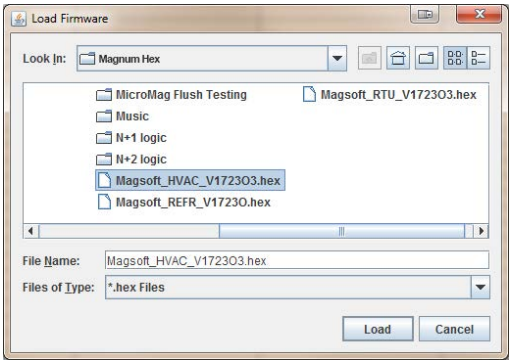
Consult with support@mcscontrols.com prior to upgrading your system.

1. To download the MAGSOFT upgrade: Go to www.mcscontrols.com
2. At top of main page click on 'SUPPORT', click on 'MAGNUM FIRMWARE'
3. Locate the latest version of the MAGSOFT for your controller - HVAC, CENT, REFR, or RTU - server will require a 'USERS NAME' and password. (call MCS-SUPPORT to receive that information)
4. **NOTE message about upgrading your 'FIRMWARE' before proceeding**
5. Start your download of MAGSOFT to the directory on your PC. 'MCS/JOBSITES'



Standard Method

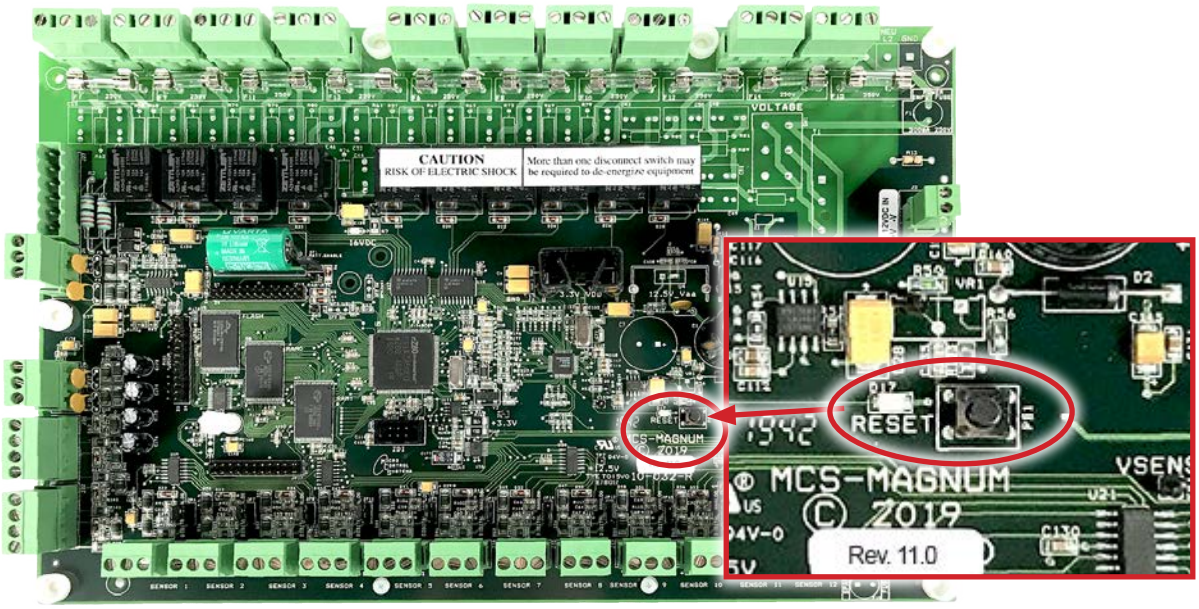
1. USING THE MCS-USB-485, connect the USB end to your PC port and connect the RS485 port to the MAGNUM-N port.
2. Open **MCS-Connect**
3. Select Local Serial as method of connection (you must already be connected to the Magnum using an MCS-USB-485 cable to the Magnum). This will bring up the Magnum scanning screen.
4. Select the Magnum controller you would like to connect to and click the respective tab. Wait for the tables to load.
5. Click the **'VIEW'** button and enter the correct authorization code (must be Service level or higher). This will enable the button.
6. Click the '**LOAD FIRMWARE'** button and navigate to the software you wish to insert in the menu that pops up. (will be a .hex file)
7. Once you have selected the firmware, click on 'LOAD' and wait until firmware has finished transmitting.



Backdoor Method

There may be certain situations where the standard method for transmitting software will not work (for example, software corruption through incomplete transfer, power failure, etc.). The magnum may be in constant reset and might not show up on the scanning screen of MCS-Connect. In such instances the following backdoor method must be used to transmit software.

1. Open MCS-Connect
2. Select Local Serial as method of connection (make sure you are NOT connected to the Magnum yet, keep the serial cable unplugged for this step so that the **'LOAD FIRMWARE'** does not become disabled). This will bring up the Magnum scanning screen. Click the button and navigate to the MAG-SOFT version you wish to insert in the menu that pops up (will be a .hex file).
3. Reconnect the MCS-USB-485 cable to the MAGNUM.
4. Before actually transmitting software however, locate the RESET button on the MCS-Magnum board. **You will need to start transmitting the software within seconds of pressing the RESET button.**



5. Press the RESET button and then immediately begin transmitting the software.

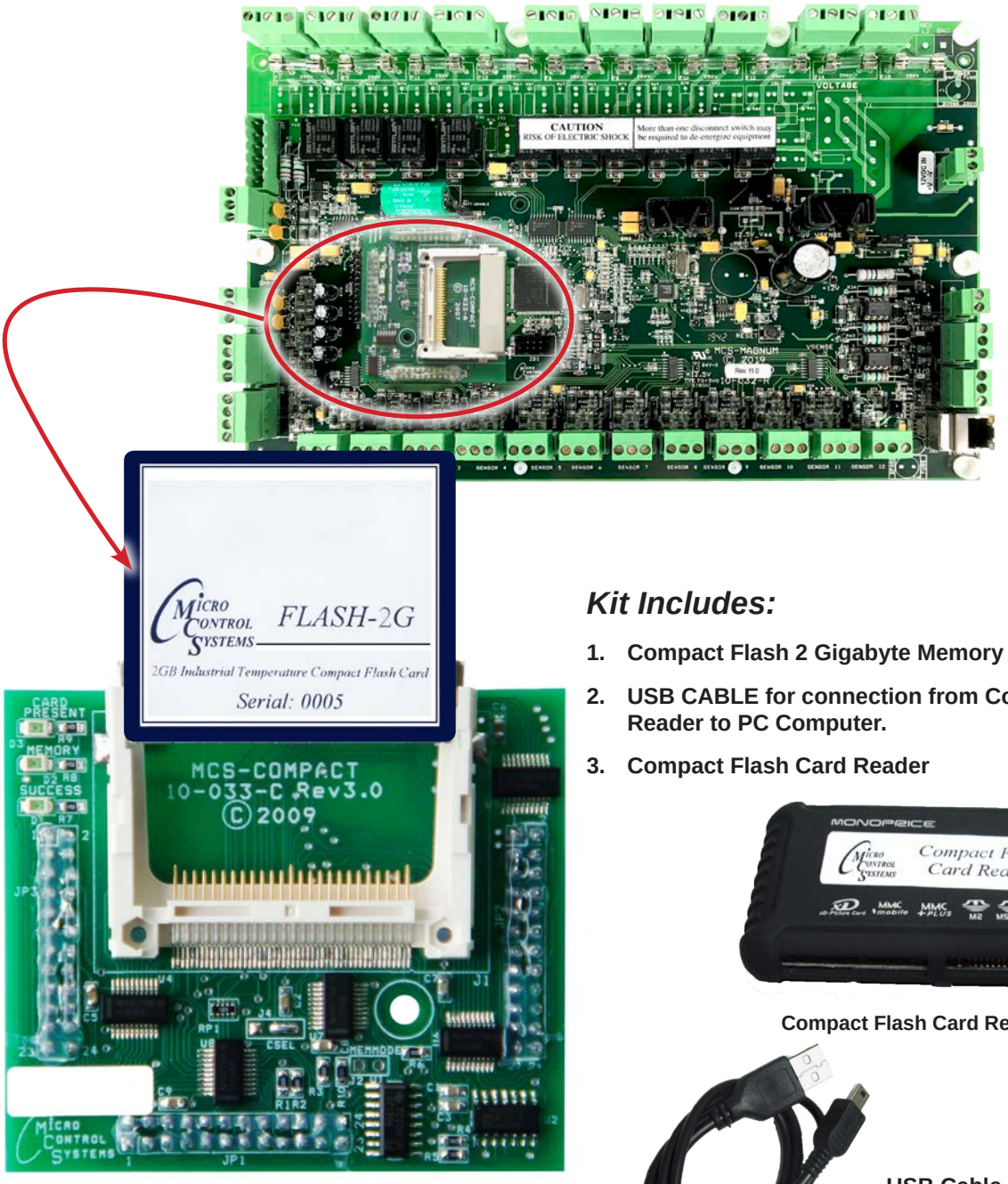
Chapter - 26. Appendix- History Storage & Viewing

26.1. INCREASE THE HISTORY STORAGE CAPACITY FOR YOUR MAGNUM

The **MCS-COMPACT** is a daugherboard able to hold a type 1 or type 2 compact flash memory card. It can easily be installed in the field by plugging it into the expansion pins on the MCS-MAGNUM.

The MCS-COMPACT increases the MCS-MAGNUM's history storage up to a year+ of run data.

MCS-COMPACT provides plug and play capability allowing it to be moved from one MCS-MAGNUM to another MCS-MAGNUM, making it a great service troubleshooting tool.



Part # **MCS-COMPACT**

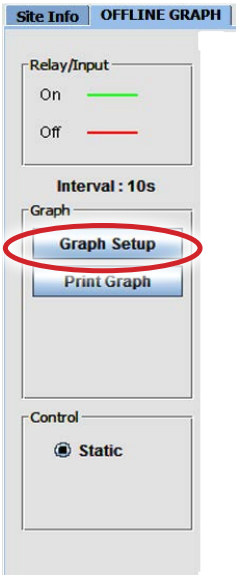
Kit Includes:

1. **Compact Flash 2 Gigabyte Memory Card as shown**
2. **USB CABLE for connection from Compact Card Reader to PC Computer.**
3. **Compact Flash Card Reader**

Compact Flash Card Reader

USB Cable
for connection from Compact Card Reader to computer

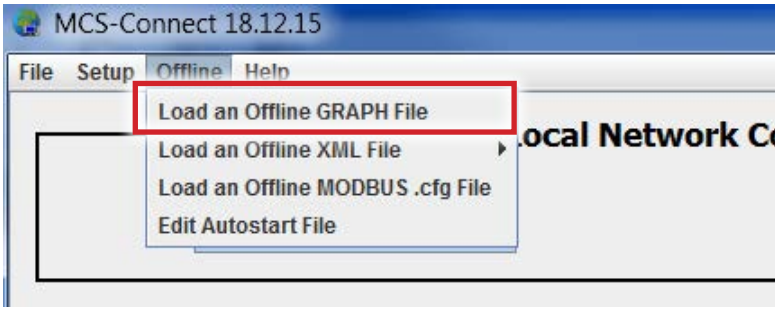
26.2. Viewing Magnum History Offline



You can view the history/graph files offline. When you are online with MCS-Connect and you go into the graphing screen, MCS-Connect pulls back the current history/trend data from the MCS-Magnum and you can view the data online.

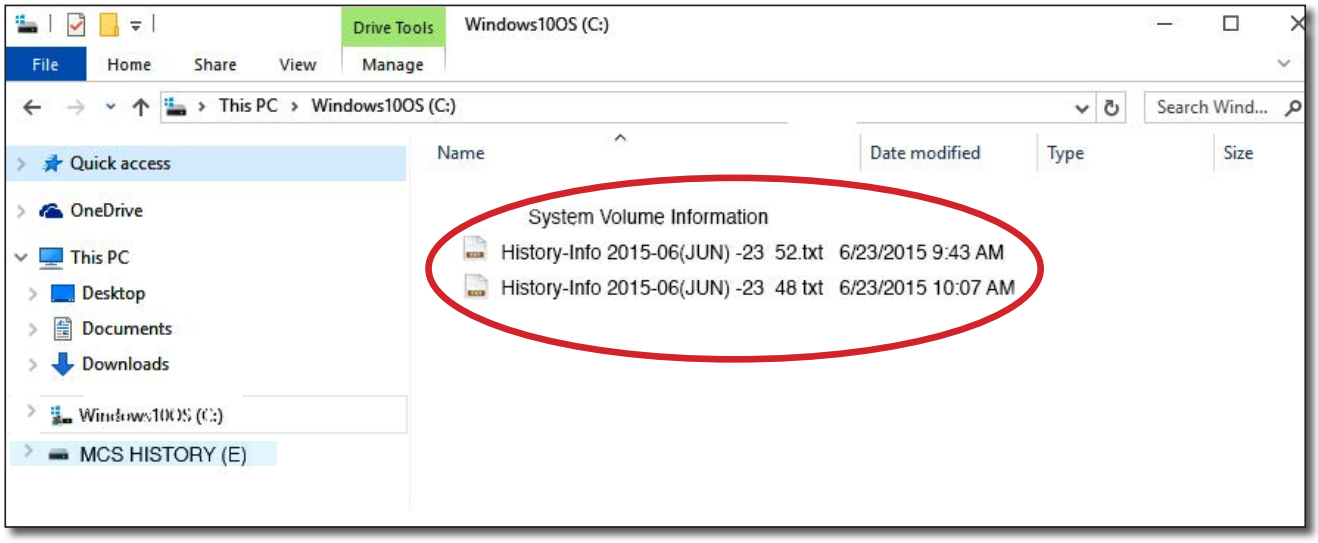
In the graphing screen over on the right hand side there is **'Save History'** button which will save all the data pulled back to a file on your PC hard drive.

This history file can be viewed at a later time, offline. When you are at the main screen for MCS-CONNECT, click on the 'OFFLINE' menu bar and click on the 'Load Offline Graph File'. Files should be located in the 'MCS\GRAPH' directory on your hard drive.



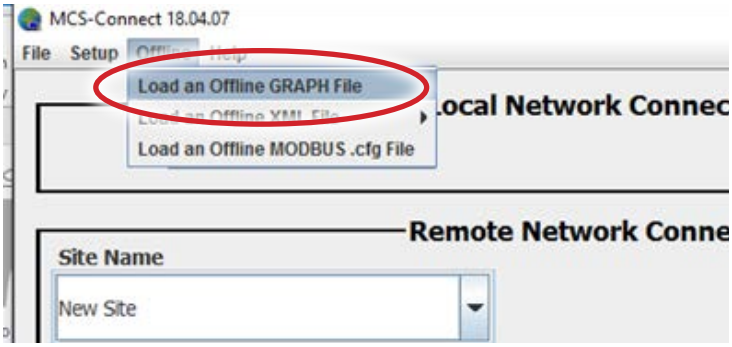
The MCS-Magnum can save onto a MCS-COMPACT, a 2G compact flash card, the same history file as in the graphing screen "Save History" option.

The only difference is MCS-Magnum names the history file and automatically saves the history file when the MCS-Magnum internal history data has filled up. You must remove the compact flash card from the MCS-Magnum and using the USB top Compact flash adapter, read the compact flash card on your laptop like you would read a USB memory stick.

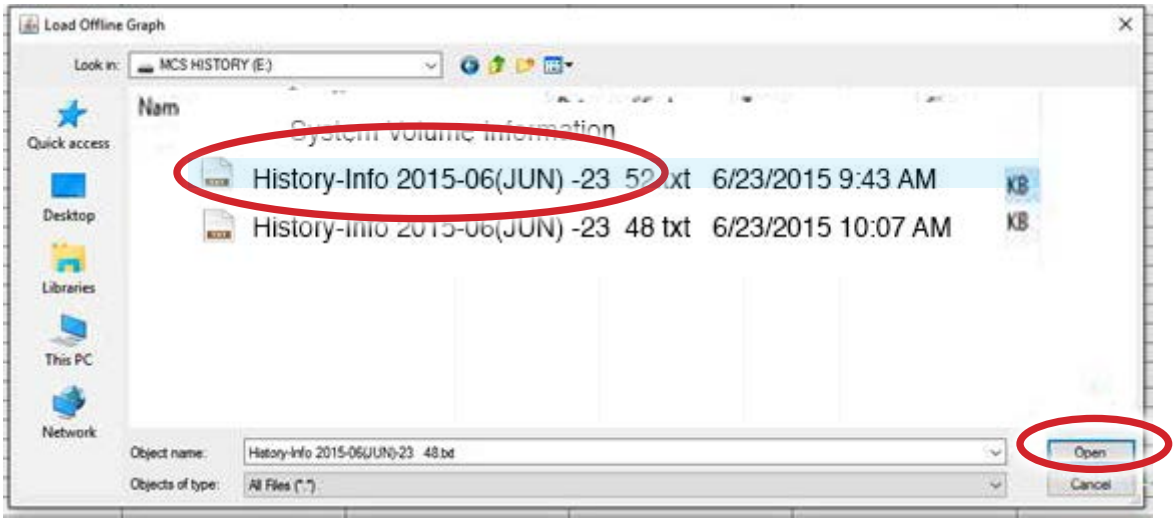


Once you insert the USB Compact adapter (with Compact Flash card plugs into it) into your laptop you will see all the history files saved on it. The MCS-Magnum names the file with 'HISTORY-INFO' plus the date and number. The Number is sequentially numbered starting from 1 every midnight. Please see below an example of history files saved on compact file card. In this example there are two files, both saved on June 6, 2015, one file was the 48 file saved that day and the other being the 52 file saved that day.

Now to view a graphing file that has been saved on the compact flash card or one you manually saved in the graphing screen open MCS-Connect and click on the “Offline” text at the top of the screen. Then in the popup menu click on **‘Load an Offline Graph File’**.

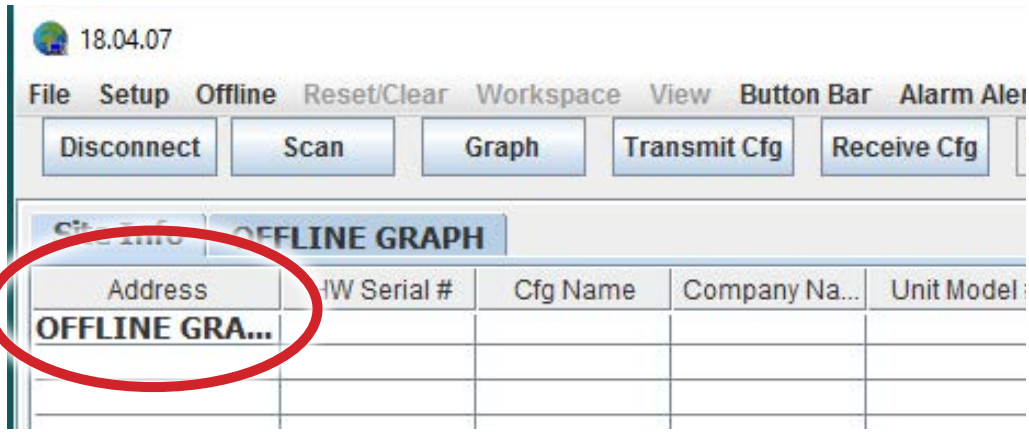


Then you will get a popup file selection window(see below photo) . Move to the folder where the history file has been saved and select the history file you want to view.



Then after you select the file you will see a screen like below.

Click on the offline graph tab and you will see the screen below:

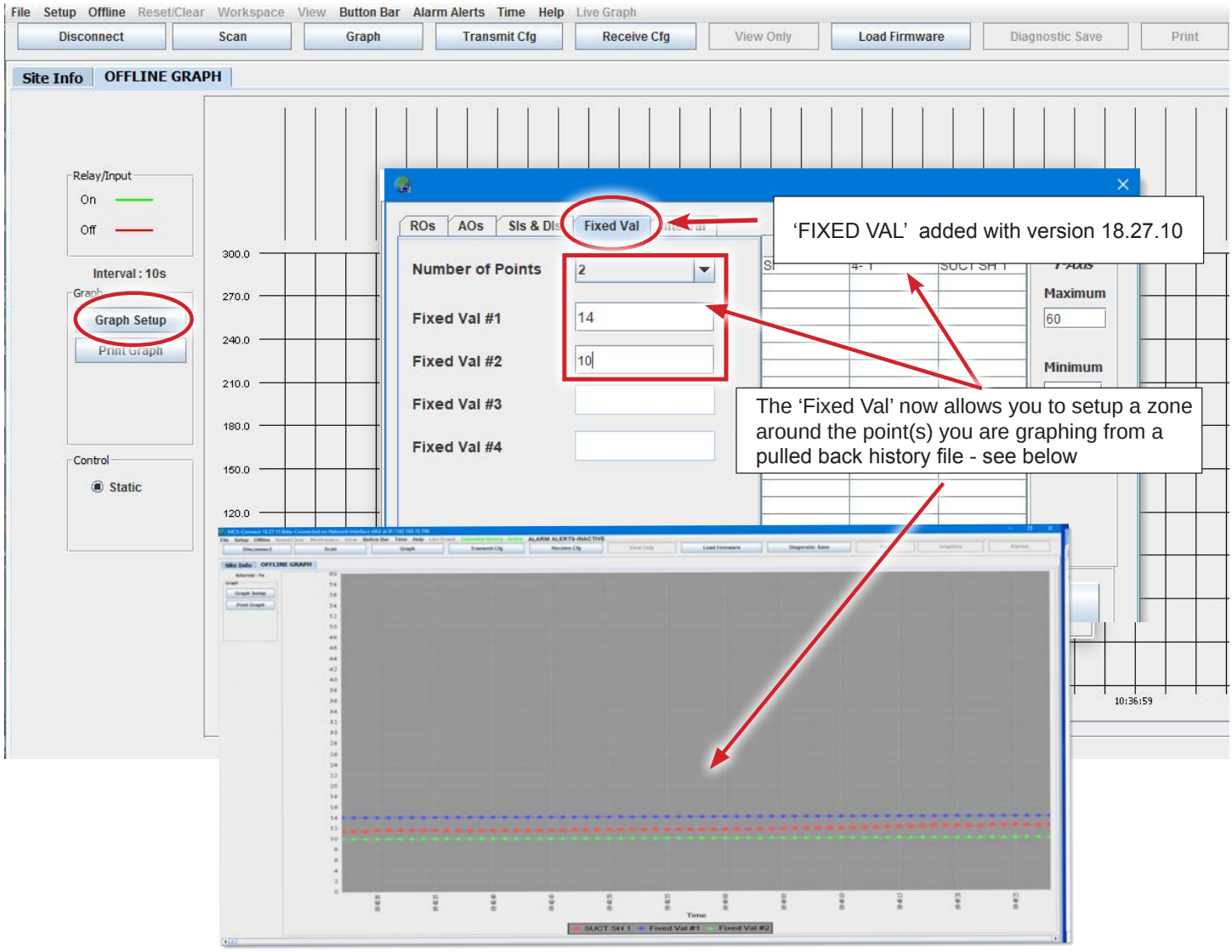


Now it will work just like the normal “Graph” button/screen in MCS-Connect, where you can select which points you want to graph.

Prior to MCS-CONNECT 18.27.10 when plotting a point(s) in a graph MCS-CONFIG was pre-programmed with user logic ‘fixed values’ so a technician could set a zone for the point plotted when reading a pulled back history file.

With the release of the above version, you are now able to add the fixed points **after** receiving the pulled back history file along with the points you are plotting.

Having user logic statements added to your config is no longer necessary.



You can set 4 different ‘fixed Vals’ for setting zones for different graphed points.

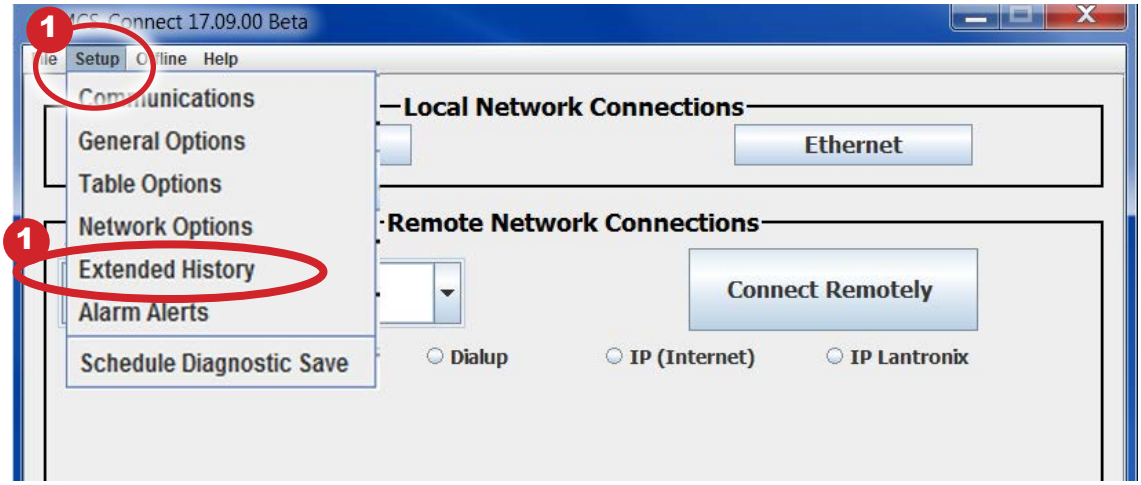
Chapter - 27. Appendix - Saving Extended History Files

27.1. Saving Extended History Files for Viewing

With MCS-CONNECT the technician can enable **'saving history files'** to a location on their PC hard drive or to a USB stick including saving on the MCS-TOUCHSCREEN to a USB stick.

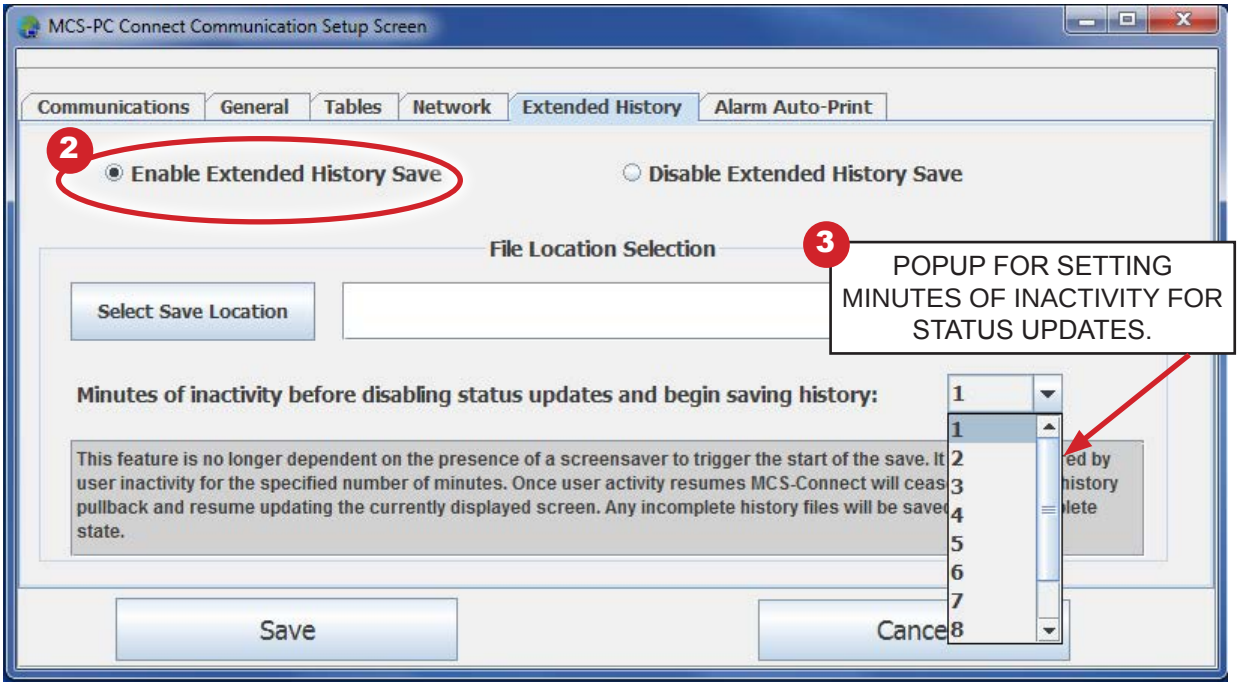
Using the setup in MCS-CONNECT, follow the instruction below.

1. Open MCS-CONNECT main screen, click on **'SETUP'** than **'EXTENDED HISTORY'** as shown below:



2. Next screen shows the Extended History screen, click on:

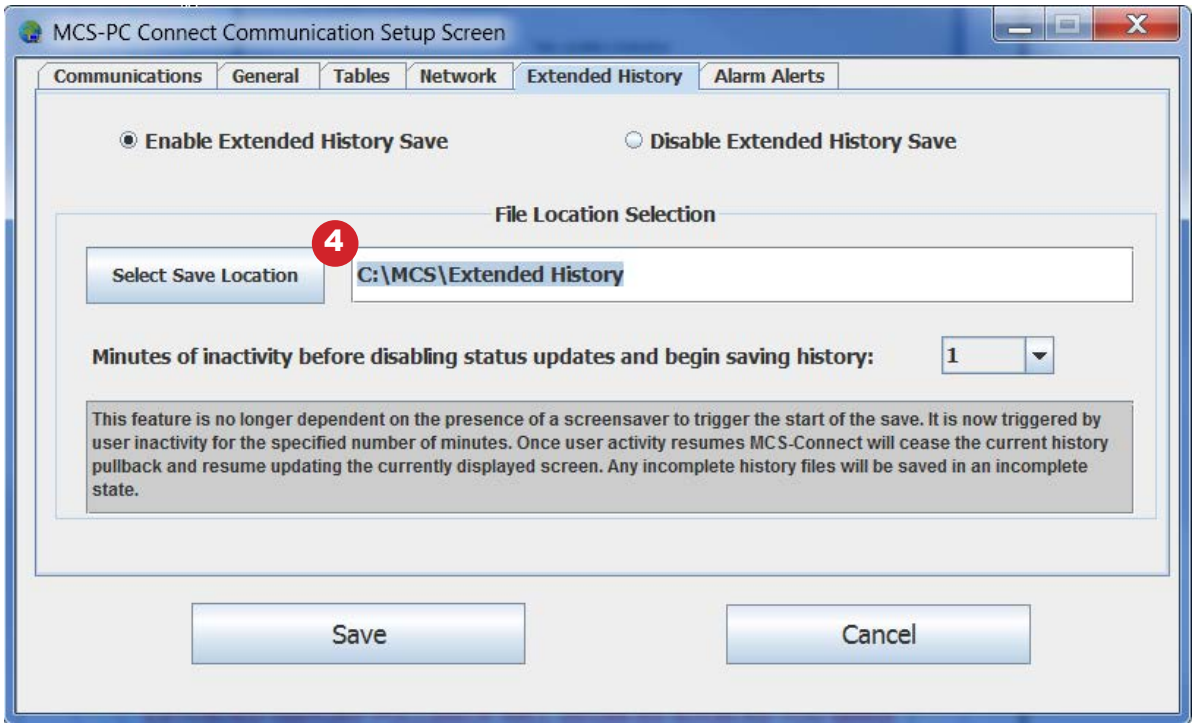
   'ENABLE EXTENDED HISTORY SAVE'



3. Set the number of minutes of inactivity for status updates to stop from the chiller, which enables the **'EXTENDED HISTORY SAVE'** to begin saving.

   (The unit will wait the time specified, then 'EXTENDED HISTORY pullback will begin.

4. Choose the location for MCS-CONNECT to save the file to. The file location when connected on a PC or laptop can be your 'C' drive and sub directory MCS where most of the MCS-CONNECT files are stored.



Once 'EXTENDED HISTORY SAVE' setup is complete and saved, connect to the controller.

After the time delay is satisfied that was entered in the setup,

MCS-CONNECT will begin pulling the current 'Live History'

for the controller

ONCE MCS-CONNECT HAS A COMPLETE HISTORY FILE IT WILL WRITE IT TO THE 'SPECIFIED LOCATION'

IMPORTANT:

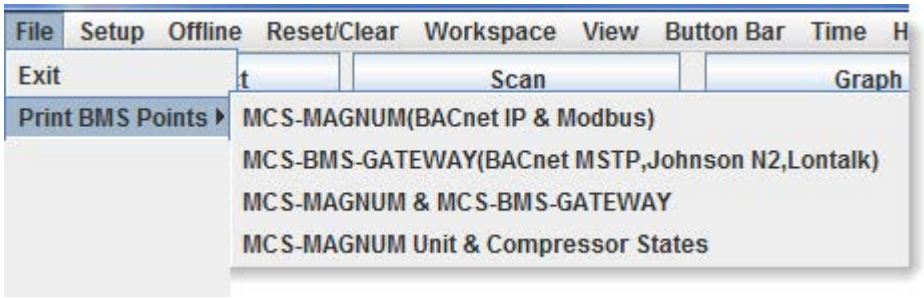
DO NOT CLICK ON THE COMPUTER OR TOUCHSCREEN AT THIS TIME IT WILL DISABLE EXTENDED HISTORY PULLBACK.

27.2. DISABLE THE EXTENDED HISTORY PULL BACK

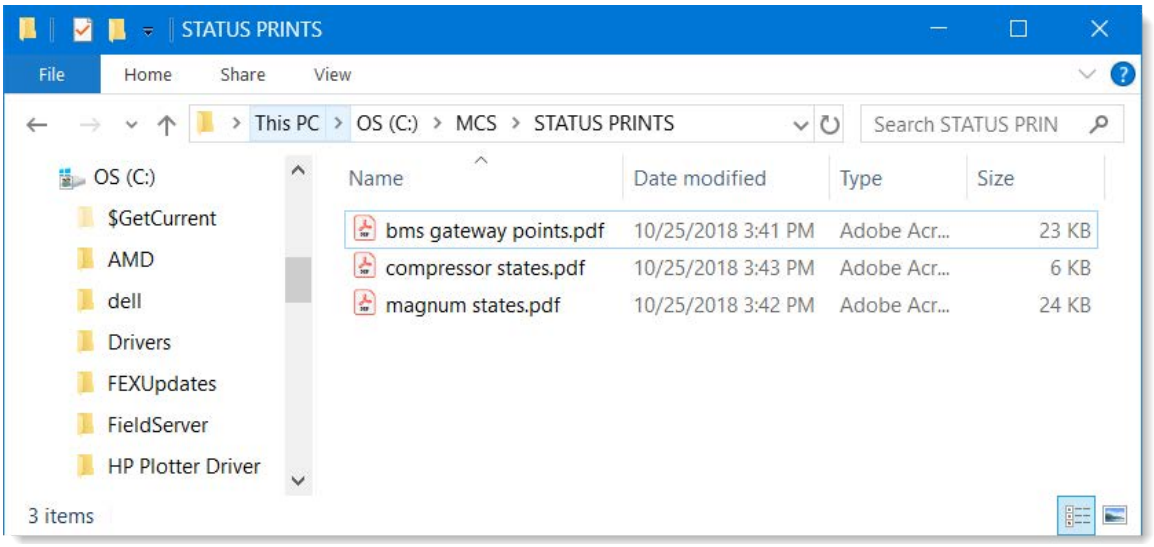
1. Click on the **'Button Bar'** and click **'DISCONNECT FROM THE CONTROLLER'**
2. Open MCS-CONNECT main screen
3. Click on **'SETUP'** than **'EXTENDED HISTORY'** and
4. Click on **'DISABLE EXTENDED HISTORY'** and save.

Chapter - 28. Appendix - Printing BMS Points Lists

Once you have scanned and connected to your controller, under the Menu Bar at the top of MCS-CONNECT, click to open the 'FILE' bar to open the drop down screen to view the options for printing 'BMS' point lists.



When you choose the points list you want to print, the next screen will open, choose where you will save the points list. MCS-CONNECT will print a pdf file in this location.



Below is the different point lists that can be printed.

- MCS-MAGNUM (BACnet IP & Modbus)
- MCS-BMS-GATEWAY (BACnet MSTP, JOHNSON N2, LONTALK
- MCS-MAGNUM & MCS-BMS-GATEWAY
- MCS-MAGNUM Unit & Compressor States

Sample prints are shown on the next page.

MCS-MAGNUM (BACnet IP & Modbus) Points List

NAME: OFFICE AHU COMPANY NAME: MicroCtrlSystem UNIT MODEL #: Cool/Heat/OA UNIT SERIAL #:
POINT MAPPING INFO BUILT IN MCS-MAGNUM
BMS Points SI Grid Information

MCS	MAGNUM	BACNET	ID	MODBUS	IP & RTU
PT #	NAME	ID	NAME	REGISTER	# ASSUMED DEC
M-1	SUPPLY TMP	AI:1	SUPPLY TMP	30001	1
M-2	RETURN TMP	AI:2	RETURN TMP	30002	1
M-3	ReturnHumd	AI:3	ReturnHumd	30003	1
M-4	RETURN CO2	AI:4	RETURN CO2	30004	0
M-5	COIL TMP	AI:5	COIL TMP	30005	1
M-6	OA TMP	AI:6	OA TMP	30006	1
M-7	OA HUMD	AI:7	OA HUMD	30007	1
M-8	DuctStatic	AI:8	DuctStatic	30008	2
M-9	MFG CO2	AI:9	MFG CO2	30009	0
M10	TRANE SPLY	AI:10	TRANE SPLY	30010	1
M11	SPAREM-11	AI:11	SPAREM-11	30011	0
M12	DmprClosed	AI:12	DmprClosed	30012	0
M13	SplyFanFlt	AI:13	SplyFanFlt	30013	0
M14	SPAREM-14	AI:14	SPAREM-14	30014	0
M15	SMOKE ALM	AI:15	SMOKE ALM	30015	0
M16	RUN/STOP	AI:16	RUN/STOP	30016	0
1-1	IonizerAlm	AI:17	IonizerAlm	30017	0
1-2	OA ENTHLPY	AI:18	OA ENTHLPY	30018	1
1-3	RUN ECNMZR	AI:19	RUN ECNMZR	30019	0
1-4	SPARE1-4	AI:20	SPARE1-4	30020	0
1-5	WtdOADmpr	AI:21	WtdOADmpr	30021	1
1-6	CoilContrl	AI:22	CoilContrl	30022	1
1-7	RtnDmpCtrl	AI:23	RtnDmpCtrl	30023	1
1-8	EntWtrTmp	AI:24	EntWtrTmp	30024	1
1-9	LevWtrTmp	AI:25	LevWtrTmp	30025	1
1-10	SPARE1-10	AI:26	SPARE1-10	30026	0
1-11	SPARE1-11	AI:27	SPARE1-11	30027	0
1-12	DmprMin%	AI:28	DmprMin%	30028	1
1-13	DmprCtrl%	AI:29	DmprCtrl%	30029	1
1-14	AllwEcnmzr	AI:30	AllwEcnmzr	30030	0
1-15	COOLING	AI:31	COOLING	30031	0
1-16	HEATING	AI:32	HEATING	30032	0
2-1	OCCUPIED	AI:33	OCCUPIED	30033	0
2-2	TMP RESET	AI:34	TMP RESET	30034	1

MCS-BMS-GATEWAY (BACnet MSTP, JOHNSON N2, LONTALK Points List

NAME: OFFICE AHU COMPANY NAME: MicroCtrlSystem UNIT MODEL #: Cool/Heat/OA UNIT SERIAL #:
POINT MAPPING INFO BUILT IN MCS-MAGNUM
BMS Points SI Grid Information

MCS	MAGNUM	BACNET	ID	MODBUS	IP & RTU
PT #	NAME	ID	NAME	REGISTER	# ASSUMED DEC
M-1	SUPPLY TMP	AI:1	SUPPLY TMP	30001	1
M-2	RETURN TMP	AI:2	RETURN TMP	30002	1
M-3	ReturnHumd	AI:3	ReturnHumd	30003	1
M-4	RETURN CO2	AI:4	RETURN CO2	30004	0
M-5	COIL TMP	AI:5	COIL TMP	30005	1
M-6	OA TMP	AI:6	OA TMP	30006	1
M-7	OA HUMD	AI:7	OA HUMD	30007	1
M-8	DuctStatic	AI:8	DuctStatic	30008	2
M-9	MFG CO2	AI:9	MFG CO2	30009	0
M10	TRANE SPLY	AI:10	TRANE SPLY	30010	1
M11	SPAREM-11	AI:11	SPAREM-11	30011	0
M12	DmprClosed	AI:12	DmprClosed	30012	0
M13	SplyFanFlt	AI:13	SplyFanFlt	30013	0
M14	SPAREM-14	AI:14	SPAREM-14	30014	0
M15	SMOKE ALM	AI:15	SMOKE ALM	30015	0
M16	RUN/STOP	AI:16	RUN/STOP	30016	0
1-1	IonizerAlm	AI:17	IonizerAlm	30017	0
1-2	OA ENTHLPY	AI:18	OA ENTHLPY	30018	1
1-3	RUN ECNMZR	AI:19	RUN ECNMZR	30019	0
1-4	SPARE1-4	AI:20	SPARE1-4	30020	0
1-5	WtdOADmpr	AI:21	WtdOADmpr	30021	1
1-6	CoilContrl	AI:22	CoilContrl	30022	1
1-7	RtnDmpCtrl	AI:23	RtnDmpCtrl	30023	1
1-8	EntWtrTmp	AI:24	EntWtrTmp	30024	1
1-9	LevWtrTmp	AI:25	LevWtrTmp	30025	1
1-10	SPARE1-10	AI:26	SPARE1-10	30026	0
1-11	SPARE1-11	AI:27	SPARE1-11	30027	0
1-12	DmprMin%	AI:28	DmprMin%	30028	1
1-13	DmprCtrl%	AI:29	DmprCtrl%	30029	1
1-14	AllwEcnmzr	AI:30	AllwEcnmzr	30030	0
1-15	COOLING	AI:31	COOLING	30031	0
1-16	HEATING	AI:32	HEATING	30032	0
2-1	OCCUPIED	AI:33	OCCUPIED	30033	0
2-2	TMP RESET	AI:34	TMP RESET	30034	1

MCS-MAGNUM & MCS-BMS-GATEWAY Points List

NAME: OFFICE AHU COMPANY NAME: MicroCtrlSystem UNIT MODEL #: Cool/Heat/OA UNIT SERIAL #:
POINT MAPPING INFO FOR MCS-BMS-GATEWAY
BMS Points SI Grid Information

BACNET MSTP		JOHNSON N2		LON TALK	
ID	NAME	ID	NAME	ID	NAME
AI:1	M_1_SUPPLY_TMP	AI:1	M_1_SUPPLY_TMP	AI:1	M_1_SUPPLY_TMPsi
AI:2	M_2_RETURN_TMP	AI:2	M_2_RETURN_TMP	AI:2	M_2_RETURN_TMPsi
AI:3	M_3_ReturnHumd	AI:3	M_3_ReturnHumd	AI:3	M_3_ReturnHumdsi
AI:4	M_4_RETURN_CO2	AI:4	M_4_RETURN_CO2	AI:4	M_4_RETURN_CO2si
AI:5	M_5_COIL_TMP	AI:5	M_5_COIL_TMP	AI:5	M_5_COIL_TMPsi
AI:6	M_6_OA_TMP	AI:6	M_6_OA_TMP	AI:6	M_6_OA_TMPsi
AI:7	M_7_OA_HUMD	AI:7	M_7_OA_HUMD	AI:7	M_7_OA_HUMDsi
AI:8	M_8_DuctStatic	AI:8	M_8_DuctStatic	AI:8	M_8_DuctStaticsi
AI:9	M_9_MFG_CO2	AI:9	M_9_MFG_CO2	AI:9	M_9_MFG_CO2si
AI:10	M10_TRANE_SPLY	AI:10	M10_TRANE_SPLY	AI:10	M10_TRANE_SPLYsi
AI:11	M11_SPAREM_11	AI:11	M11_SPAREM_11	AI:11	M11_SPAREM_11si
AI:12	M12_DmprClosed	AI:12	M12_DmprClosed	AI:12	M12_DmprClosedsi
AI:13	M13_SplyFanFlt	AI:13	M13_SplyFanFlt	AI:13	M13_SplyFanFltsi
AI:14	M14_SPAREM_14	AI:14	M14_SPAREM_14	AI:14	M14_SPAREM_14si
AI:15	M15_SMOKE_ALM	AI:15	M15_SMOKE_ALM	AI:15	M15_SMOKE_ALMsi
AI:16	M16_RUN_STOP	AI:16	M16_RUN_STOP	AI:16	M16_RUN_STOPsi
AI:17	1_1_IonizerAlm	AI:17	1_1_IonizerAlm	AI:17	1_1_IonizerAlmsi
AI:18	1_2_OA_ENTHLPY	AI:18	1_2_OA_ENTHLPY	AI:18	1_2_OA_ENTHLPYsi
AI:19	1_3_RUN_ECNMZR	AI:19	1_3_RUN_ECNMZR	AI:19	1_3_RUN_ECNMZRsi
AI:20	1_4_SPARE1_4	AI:20	1_4_SPARE1_4	AI:20	1_4_SPARE1_4si
AI:21	1_5_WtdOADmpr	AI:21	1_5_WtdOADmpr	AI:21	1_5_WtdOADmprsi
AI:22	1_6_CoilContrl	AI:22	1_6_CoilContrl	AI:22	1_6_CoilContrlsi
AI:23	1_7_RtnDmpCtrl	AI:23	1_7_RtnDmpCtrl	AI:23	1_7_RtnDmpCtrlsi
AI:24	1_8_EntWtrTmp	AI:24	1_8_EntWtrTmp	AI:24	1_8_EntWtrTmpsi
AI:25	1_9_LevWtrTmp	AI:25	1_9_LevWtrTmp	AI:25	1_9_LevWtrTmpsi
AI:26	1_10_SPARE1_10	AI:26	1_10_SPARE1_10	AI:26	1_10_SPARE1_10si
AI:27	1_11_SPARE1_11	AI:27	1_11_SPARE1_11	AI:27	1_11_SPARE1_11si
AI:28	1_12_DmprMin	AI:28	1_12_DmprMin	AI:28	1_12_DmprMinsi
AI:29	1_13_DmprCtrl	AI:29	1_13_DmprCtrl	AI:29	1_13_DmprCtrlsi
AI:30	1_14_AllwEcnmzr	AI:30	1_14_AllwEcnmzr	AI:30	1_14_AllwEcnmzrsi
AI:31	1_15_COOLING	AI:31	1_15_COOLING	AI:31	1_15_COOLINGsi
AI:32	1_16_HEATING	AI:32	1_16_HEATING	AI:32	1_16_HEATINGsi
AI:33	2_1_OCCUPIED	AI:33	2_1_OCCUPIED	AI:33	2_1_OCCUPIEDsi
AI:34	2_2_TMP_RESET	AI:34	2_2_TMP_RESET	AI:34	2_2_TMP_RESETsi

MCS-MAGNUM Unit & Compressor States Points List

NAME: OFFICE AHU COMPANY NAME: MicroCtrlSystem UNIT MODEL #: Cool/Heat/OA UNIT SERIAL #:

BMS Points Unit State Chart

STATE	BACnet	STATE TEXT
	STATE #	
0		UNIT IN LOST I/O
1		

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