



**Mustang Sampling<sup>®</sup>**

# SoftView<sup>®</sup> LNG Monitor Suite Operation Manual



# TABLE OF CONTENTS

Overview	4
Product Features	5
Configuring SoftView® LNG	7
User Interface	17
LNG Transfer Procedure	28
Advanced User Features & Procedures	36

## SoftView® LNG SOFTWARE OVERVIEW

The Mustang Sampling SoftView LNG Software is available for users who have the Mustang Sampling LNG vaporizer(s). The software is Windows-based and operates on a Windows XP, Windows 7, Windows 8, or Windows 10 PC platform.

This software is specifically designed to provide the user with an easy to use smart interface to the Mustang Sampling LNG vaporizers and associated gas chromatograph instruments. The software with the embedded SGX SCADA LNG Application operates as a Modbus “master” on an RS485 serial communications network to collect data on a 24/7 basis from up to five (5) Mustang Sampling Vaporizers and their associated gas chromatographs.

The SoftView LNG software saves the acquired vaporizer data in history files allowing the user to monitor and review the performance of the vaporizers and the gas chromatographs. The software also supports features which allow the user to configure the vaporizers.

## SoftView® LNG FEATURES

The SoftView LNG software provides the user with a number of features including the following:

- **LNG Custody Transfer Recording** – This is the primary feature of the software. Simple request actions from the SoftView LNG user or from the remote DCS interface instructs the software to:
  - Initialize for a “New Load”.
  - “Start Transfer”. This action marks the beginning of the LNG transfer. The software in response to this action initiates recording of the data collected from the Vaporizers and associated gas chromatographs for the LNG custody transfer.
  - “Suspend Recording”. This action is used to temporarily halt the recording if the transfer is halted.
  - “Resume Recording”. This action resumes data recording after the suspension.
  - “End Transfer”. This action marks the end of the LNG transfer process. The software in response to this action stops the data recording, averages the recorded Gas Chromatograph and Vaporizer LNG data associated with the transfer loading or offloading operation, creates and outputs composition reports and an “LNG Load Report” or “Load Ticket” containing the average data during the transfer operation.
  - “Archive Load”. This action marks the transfer as archived.
  - After the first “End Transfer” action, the user can optionally review the Ticket information and, if needed, easily edit the collected data and Load Ticket information. The “End Ticket” action can be requested again to re-process the collected information and create a new Ticket.
- **Simple Intuitive User Interface** – An important SoftView LNG design priority was to provide the user with an interface which is simple, intuitive and easy to use. As you will see in the visualization discussion below, this has been achieved for the day-to-day software user.
- **SCADA / DCS Interface** – The SoftView LNG software can optionally act as a Modbus RTU or Modbus TCP server to the customer’s SCADA or DCS system. The client system, using Modbus RTU or Modbus TCP protocol, can poll SoftView LNG for the latest Gas Chromatograph composition and Vaporizer data. This interface also allows LNG transfer actions to be initiated from the User’s DCS or SCADA system using Modbus commands. For details, see the associated DCS/SCADA Interface to SoftView LNG Modbus Interface Specification available from Mustang Sampling.
- **Station Network User Interface** – The SoftView LNG Station Network window is the “home page” for the user. The current transfer status of the vaporizers and the latest vaporizer and Gas Chromatograph data can be easily reviewed via this window. The Station Network is pre-configured to display as Station Points, the pertinent data for all vaporizers which have been marked as active by the user. The Station Network measurement data is presented to the user in station windows, as shown in the visualization windows below. The Stations and their assigned Station Points are presented color coded to designate normal or alarm condition. The Station Network visualization can be customized by the user. The user can enable or disable the display of pre-defined Points, add Points to existing Stations and add new Stations. The user can also pre-configure each station window by adding a desired BMP image for the background of each station window. He can also position the station measurements or points to desired locations over the BMP image.

- **Training Mode Configuration** – SoftView® LNG supports a training mode configuration. The software when installed is configured for training mode allowing the user to become familiar with the user GUI software interface without a need for physical instrument connection. The user can utilize all of the functionality in the software without having physical connections to the vaporizer or Gas Chromatograph instruments. The instrument communications is virtual or simulated. The novice user can gain familiarity with the software by performing virtual LNG load transfers. Then, when ready, the user can then easily switch the communications assignment to interface to the real instruments.
- **Instrument Configuration** – SoftView LNG allows the user to poll diagnostic data from the Vaporizer instrument and to configure key parameters in the Vaporizer instrument by editing and downloading configuration parameters to the instrument.
- **History Logging and Trending** – The user can, via the Trend window, review a graphic trend of selected Vaporizer or Gas Chromatograph measurement data in the history data log.

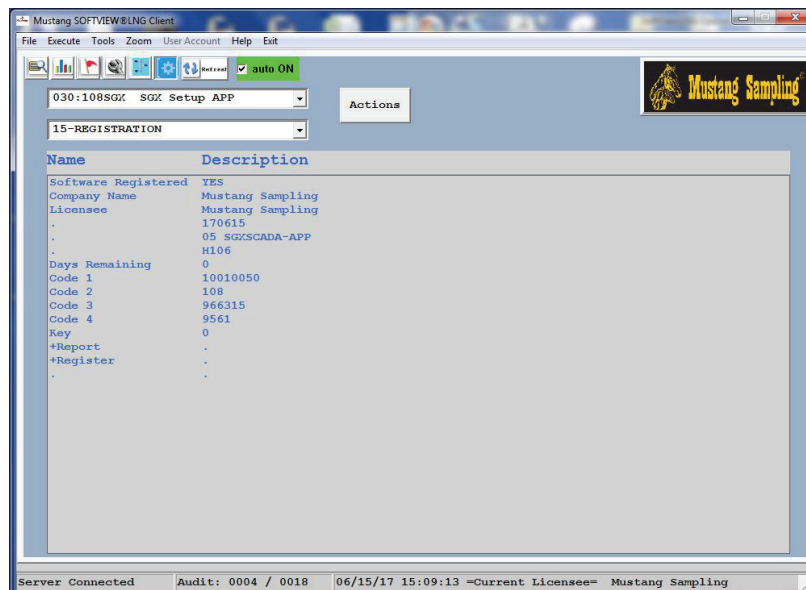
# QUICK START GUIDE - CONFIGURING SoftView® LNG

SoftView LNG, when initially installed, is configured for training mode with pre-defined vaporizer(s) defined as active. This mode allows the user to exercise all software functionality without physical connection to the instruments. Communications is virtual or simulated. The user should use this configuration to gain familiarity with the software.

The initial configuration also has pre-defined settings for instrument communications and for LNG custody transfer load ticket reports. This section defines the simple steps required to configure SoftView LNG for field operation.

## STEP 1 - REGISTER THE SoftView LNG SOFTWARE

SoftView LNG requires that the user register the software when installed for the first time on a PC and before the evaluation time expires. The user is reminded of this need when the software is opened. The evaluation period for a new install of the software is 60 days.



The following steps are used to register the SoftView LNG software.

1. Access the Configuration Window via the Configuration navigation button.
2. Select the 030:SGX Setup APP as the Focus APP.
3. Select the 15-Registration report as the Focus Report.
4. Edit Cell 02 to enter the customer company name.
5. Click on the +Report Action to create the Registration report.
6. Click on the Save Report menu option to save the report.

7. Email the Registration Report to Mustang Sampling or to CST.
8. Mustang Sampling will return the registration key code.
9. Edit the Key Cell to enter the registration key code.
10. Click on the +Register action to register the software.
11. Successful registration is noted with a Registration Procedure Complete message in the Message Status Bar.

## STEP 2 - BECOME FAMILIAR WITH THE USER INTERFACE

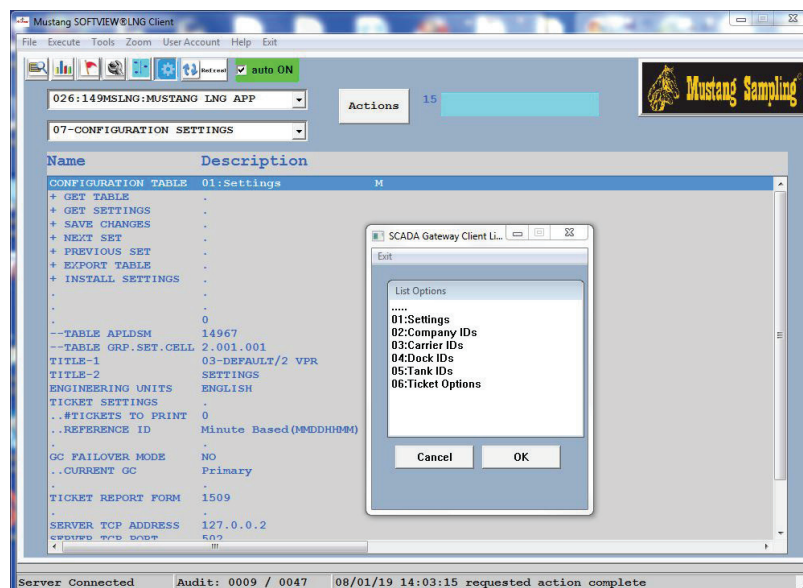
SoftView® LNG when installed is pre-configured for Training mode for instrument interfaces. This allows the user to use the Training Mode and the Visualization section documentation below to become familiar with the user interface and the complete LNG Transfer procedure without requiring physical instrument interfaces.

After this is accomplished, the user can then use the following steps to re-configure the software for operations use and for the physical instrument interface.

In many cases, SoftView LNG may be pre-configured for the user by Mustang Sampling. If this is the case then the user will not need to perform some of these steps.

## STEP 3 - CONFIGURE THE SoftView LNG DEFAULT TABLES

The End Transfer action processing creates and outputs an LNG Load Report or Ticket containing a Ticket header and the average Gas Chromatograph and vaporizer information for the transfer. The Ticket header contains information which can be optionally edited by the user, e.g. Carrier, Carrier Type, Dock ID, Tank ID, Inspector name, etc. for a particular Transfer Ticket. These tables are configured using the 07 Configuration Tables report in the 026 MUSTANG LNG APP



- ## STEP 4 - DEFINING THE VAPORIZER CONFIGURATION

Mustang SOFTWARE & LNG Client

File Execute Tools Zoom User Account Help Exit

026:149MSLNG:MUSTANG LNG APP

VP1-CFG :VPR01 GC CONFIG

Actions 15

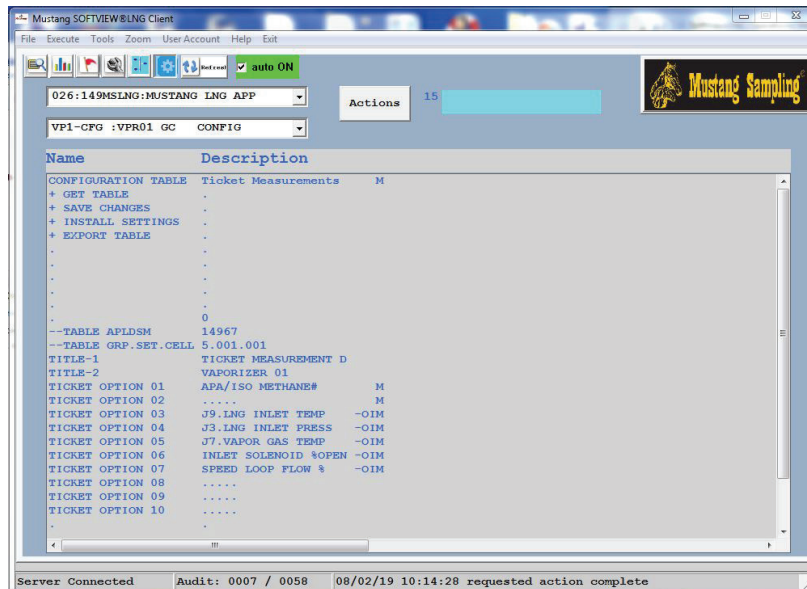
Name	Description
CONFIGURATION TABLE	Configuration M
+ GET TABLE	.
+ SAVE CHANGES	.
+ INSTALL SETTINGS	.
+ EXPORT TABLE	.
.	.
.	.
.	.
.	.
.	.
.	.
.	0
--TABLE AP LDSM	14967
--TABLE GRP.SET.CELL	3 001 001
TITLE-1	VAPORIZER DEFINITION
TITLE-2	VAPORIZER 01
VAPR GC ID	VPR01 GC
VAPR TYPE	Model 2
VAPR GC TYPE	DANALYZER XA
VAPR METER TYPE	NONE
.	.
VOLUME INPUT UNITS	GALLONS
GC PRIMARY STREAM	1
GC SECONDARY STREAMS	4
.	.
MM METER ACTIVE	NO
HMR ACTIVE	NO
HMR ACTIVE	N/A

Server Connected Audit: 0004 / 0014 08/02/19 09:59:24 -Current License= Mustang Sampling

- 
- Mustang SOFTWARE 8/LNG Client
- File Execute Tools Zoom User Account Help Exit
- 026:149MSLNG:MUSTANG LNG APP
- VP1-CFG : VPR01 GC CONFIG
- Actions 15
- | Name                 | Description       |
|----------------------|-------------------|
| CONFIGURATION TABLE  | Ticket Defaults M |
| + GET TABLE          | .                 |
| + SAVE CHANGES       | .                 |
| + INSTALL SETTINGS   | .                 |
| + EXPORT TABLE       | .                 |
| .                    | .                 |
| .                    | .                 |
| .                    | .                 |
| .                    | .                 |
| .                    | .                 |
| .                    | 0                 |
| --TABLE APLDSM       | 14967             |
| --TABLE GRP.SET.CELL | 4,001.001         |
| TITLE-1              | TICKET DEFAULTS   |
| TITLE-2              | VAPORIZER 01      |
| .                    | .                 |
| SUPPLIER/CUSTOMER    | ...               |
| CARRIER TYPE         | Boat/Ship         |
| CARRIER ID           | Carrier 01        |
| REFERENCE ID         | 0                 |
| ARRIVAL LOCATION ID  | Dock 01           |
| TANK ID              | Tank 01           |
| TRANSACTION          | LOAD              |
| INSPECTOR            | NAME              |
| .                    | .                 |
| .                    | .                 |
| .                    | .                 |
- Server Connected Audit: 0006 / 0024 08/02/19 10:02:37 requested action complete

- 10

## STEP 5 - SELECT OPTIONAL MEASUREMENTS FOR THE LOAD TRANSFER TICKET



The user can choose optional measurements from the following list to be included in the LNG ticket for the vaporizer. Some of these are calculated by SoftView® LNG and others are from instruments which may or may not be available in the hardware configuration.

1. ISO METHANE# - SoftView LNG calculation using the ISO Methane # method.
2. GB METHANE# - SoftView LNG calculation using the GB Methane # method.
3. APA/ISO METHANE# - SoftView LNG calculation using the APA/ISO Methane # method.
4. APA/GB METHANE# - SoftView LNG calculation using the APA/ISO Methane # method.
5. TOTAL MBTUs – Thousands of LNG BTUs transferred. Requires user weight input.
6. TOTAL VOLUME – LNG weight transferred. Requires user weight input.
7. MM.LNG DENSITY - From optional Micro-Motion Coriolis meter.
8. MM.LNG TEMP – From optional Micro-Motion Coriolis meter.
9. MM.LNG MASS FRATE – From optional Micro-Motion Coriolis meter.
10. MHR.TEMP – From optional Mustang® Heated Regulator instrument.
11. MV.TEMP – From optional Mustang® Vaporizer instrument.
12. LNG.TEMP – Optional from Mustang Intelligent Vaporizer Sampling System® Model 2 instrument.

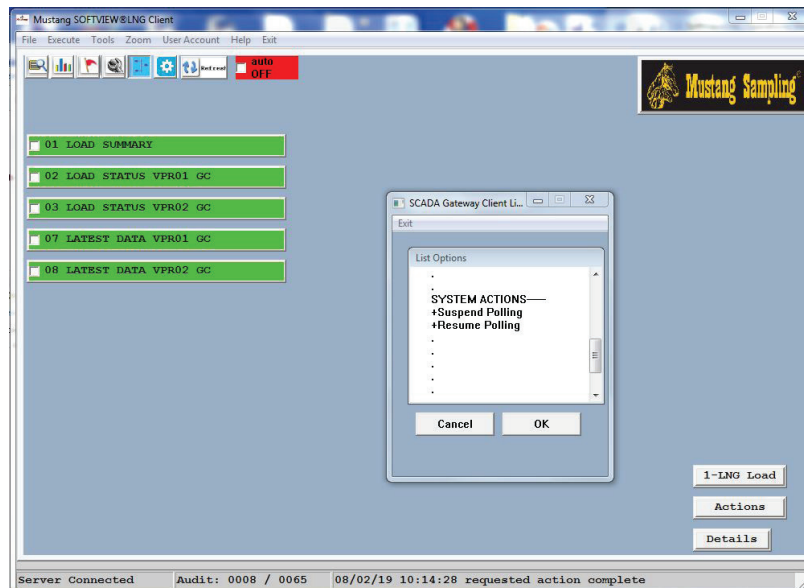
13. LNG TEMP – Optional from Mustang Intelligent Vaporizer Sampling System® Model 2 instrument.
14. LNG INLET TEMP – Optional from Mustang Intelligent Vaporizer Sampling System® Model 2 instrument.
15. LNG. INLET PRESS – Optional from Mustang Intelligent Vaporizer Sampling System® Model 2 instrument.
16. VAPOR GAS TEMP – Optional from Mustang Intelligent Vaporizer Sampling System® Model 2 instrument.
17. INLET SOLENOID %OPEN - Optional from Mustang Intelligent Vaporizer Sampling System® Model 2 instrument.
18. SPEED LOOP FLOW % - Optional from Mustang Intelligent Vaporizer Sampling System® Model 2 instrument.

Use the following steps to select the optional ticket measurements: The user must confirm that those measurements selected and noted as optional are available in his configuration.

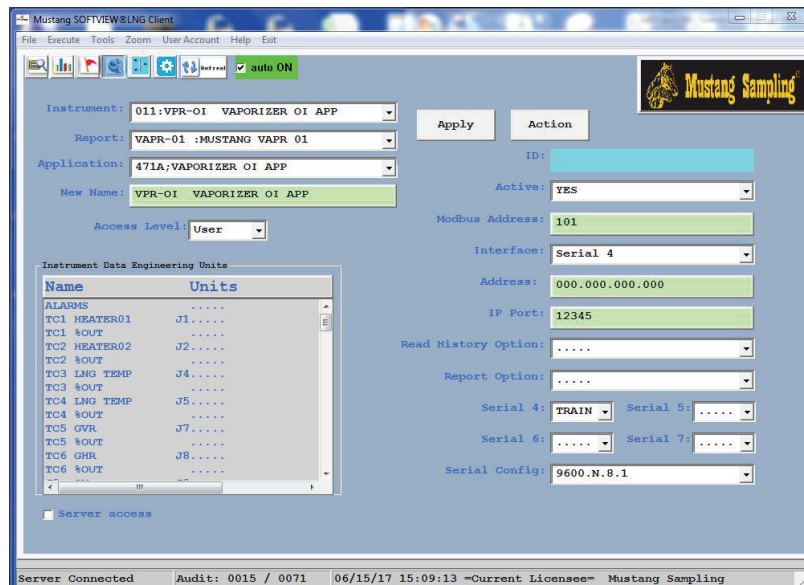
1. Access the Configuration window.
2. Select the 026 MUSTANG LNG APP.
3. Select the VPR01 GC CONFIG report.
4. Click on the Cell 01 value and select the Ticket Measurements option.
5. Click on the Cell 02 + Get Table action
6. Review and edit the Ticket Option settings to select the desired options.
7. Click on Cell 03 + SAVE CHANGES action to save any changes.
8. Click on Cell 04 +INSTALL SETTINGS action to install the changes
9. Select the VPR02 GC CONFIG report.
10. Repeat the above steps 3-7 for the Vaporizers 02 through 05 reports.

## STEP 6 - DEFINE AND TEST THE INSTRUMENTS COMMUNICATIONS INTERFACE

After using Training Mode to become familiar with the GUI this step is used to define the communications link between SoftView® LNG and the Vaporizer and Gas Chromatograph instruments and to test the live communications interface.



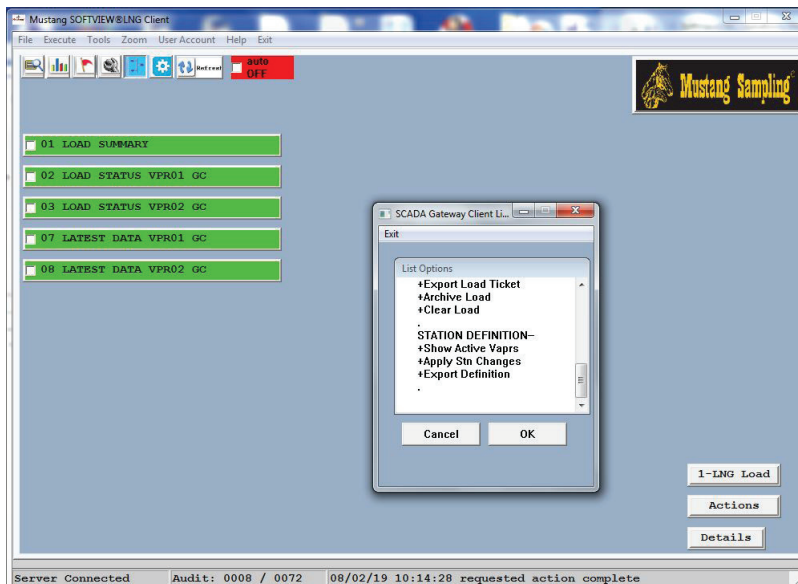
1. Access the Network window.
2. Click on the 1-LNG Load button and select the Suspend Polling action.
3. Access the Setup window.



4. Click on Train setting in Serial 4 field and select appropriate serial COM port.
5. Click on Apply button.
6. Select the 011 VAPORIZER OI Instrument APP.
7. Select the MUSTANG VAPR 01 report.
8. Edit the Modbus Address field if necessary
9. Click on Apply button.
10. Access the Operations window
11. Click on the Read Instrument to test communications.
12. Look for “received message processed” message in Message Status Bar to indicate successful communications.
13. Return to the Setup window.
14. Repeat steps 7-12 for VAPR 02, 03, etc. reports.
15. Repeat the above steps for the Gas Chromatograph reports in APPs 012 and 013 to define and test the Gas Chromatograph communications interface.

## STEP 7 - UPDATE THE STATION NETWORK FOR ACTIVE VAPORIZER GAS CHROMATOGRAPHS

The Station Network windows show measurements for defined active vaporizers.

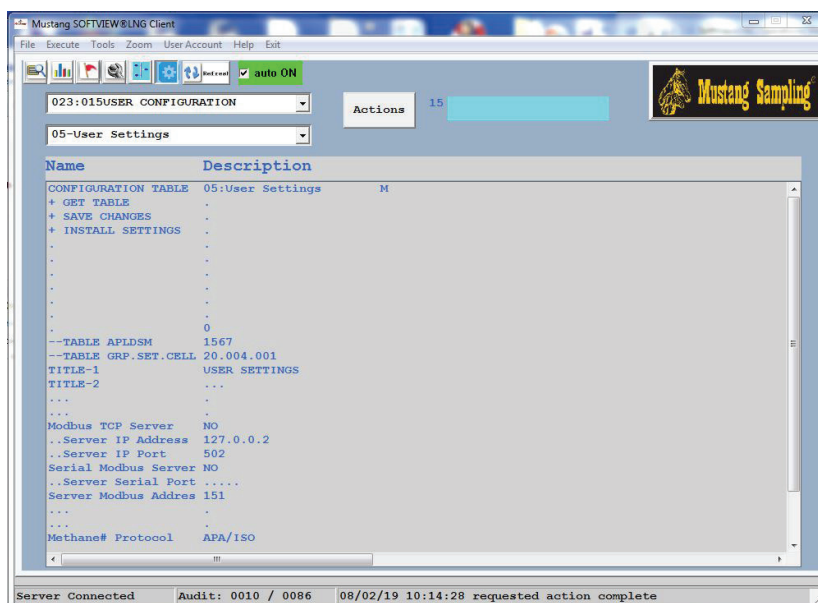


The following steps will update these windows to contain all active vaporizers.

1. Access the Station Network window.
2. Click on the Actions button.
3. Select the + Show Active Vaprs action.
4. Select the + Refresh Stations action.

## STEP 8 - CONFIGURE SoftView® LNG AS A MODBUS TCP SERVER OR A SERIAL MODBUS SERVER FOR A DCS OR SCADA CLIENT INTERFACE

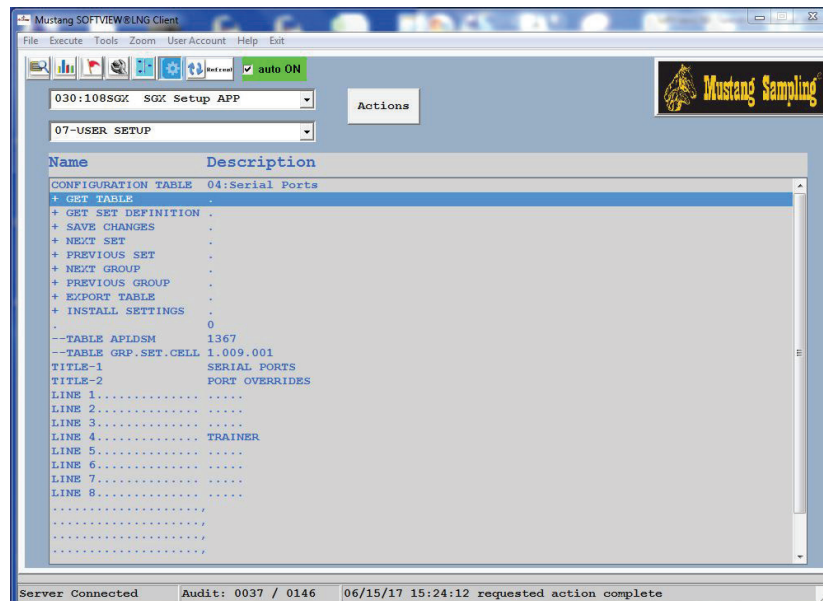
SoftView LNG can act as a Modbus TCP or Serial Modbus Server to the user's DCS or SCADA System. Use this procedure to pre-configure the software for this communications link.



1. Access the Configuration Window via the Configuration navigation button.
2. Click on the Focus APP down arrow at the top and select the 023:015USER CONFIGURATION APP as the Focus APP.
3. Click on the down arrow for the Focus Report field and select the 05-User Settings report as the Focus Report.
4. Click on the + GET TABLE action to retrieve the User Settings table data.
5. Click on the appropriate cells to enter the required communications link information.
6. Click on the +SAVE CHANGES action to save the changes.
7. Click on the +INSTALL SETTINGS action and wait for initialization to finish.
8. Close and re-open SoftViewLNG.

## STEP 9 - CONFIGURE SoftView® LNG AS A MODBUS RTU SERVER FOR A DCS/SCADA SERIAL INTERFACE

SoftView LNG can act as a Modbus RTU server to host clients such as a DCS or SCADA System. Use this procedure to define the serial comm port for this interface.



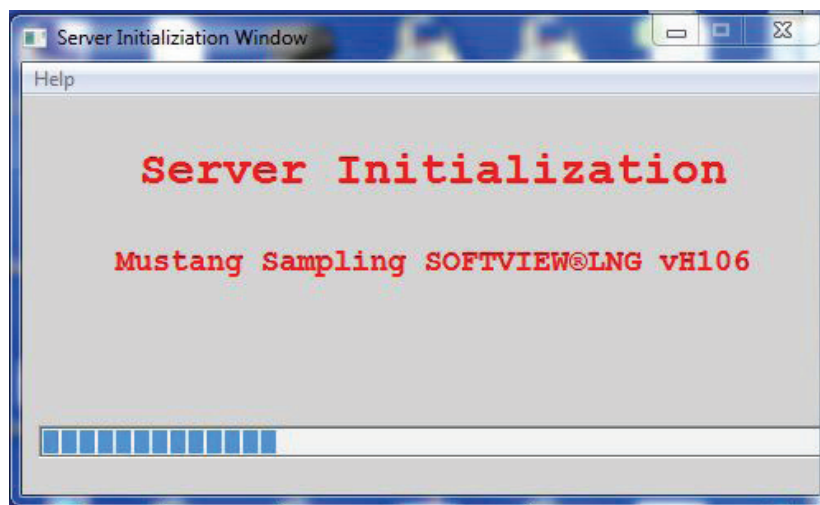
The following steps define the serial comm port information for the interface to a DCS or SCADA Modbus RTU client.

1. Access the Configuration Window via the Configuration navigation button.
2. Select the 030:SGX Setup APP as the Focus APP.
3. Select the 07-User Setup report as the Focus Report.
4. Click on the Configuration Table cell and select the 04:Serial Ports option.
5. Click on the +Get Table Action to access the above table data.
6. Click on the Line 8 Cell and select the desired serial comm port option.
7. Click on the +Save Changes Action to save the updated report.
8. Click on the +Install Settings Action to install the updated table.
9. SoftViewLNG should now respond to Modbus RTU commands from the SCADA or DCS host.

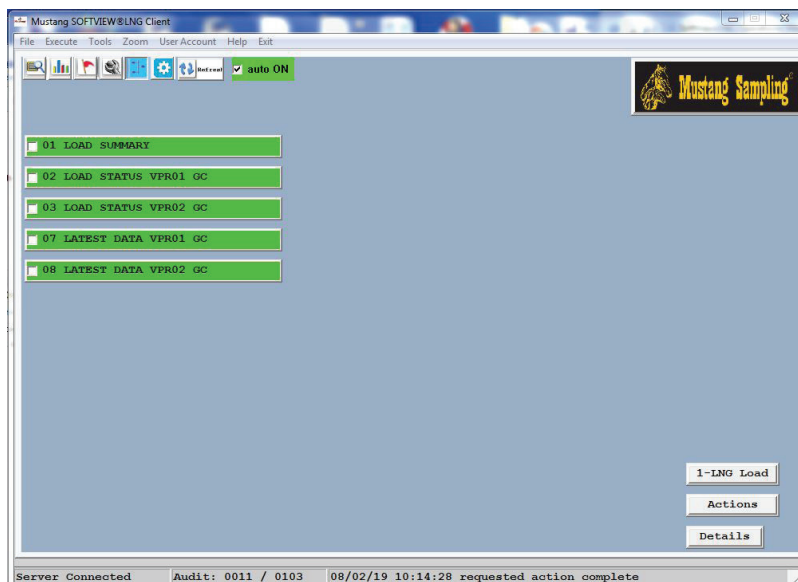
# USER INTERFACE - SoftView® LNG VISUALIZATION

## SoftView LNG STARTUP

After the software is installed, click on the SoftView LNG icon to open the software. The progress window indicates software startup and initialization of the Mustang Sampling SCADA Gateway Server.



## STATION NETWORK WINDOW



The Station Network Window is presented to the user after the software has completed initialization. This window serves as the "home" screen for the SoftViewLNG user.

The Station Network window provides direct access to all of the functionality needed to manage the LNG custody transfer activity (the Load) and to produce the Load Report or Ticket showing the average data for the LNG custody transfer operation.

Each button on this window references a "Station". So the buttons allow the user to access data associated with or assigned to the Stations. The Station configuration in SoftViewLNG will show data for all "active" vaporizers. SoftView® LNG can be configured to have up to 5 vaporizers. As an example, a common configuration could be two active vaporizers where vaporizer 1 is defined as a "Dock" vaporizer for LNG transfer to a ship and vaporizer 2 is defined as a "Tank" vaporizer for LNG transfer from a truck to a tank. The vaporizer configuration can be easily modified by the user using the configuration procedure defined above.

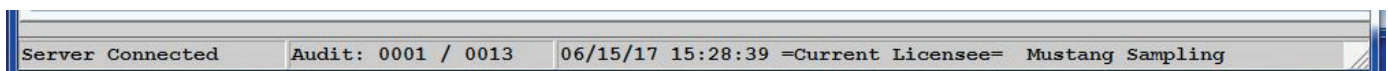
The Station Network definition is also configurable by the user. SoftViewLNG can support up to 30 Stations with up to 30 measurements assigned to each Network Station.

## SoftView LNG NAVIGATION BUTTONS



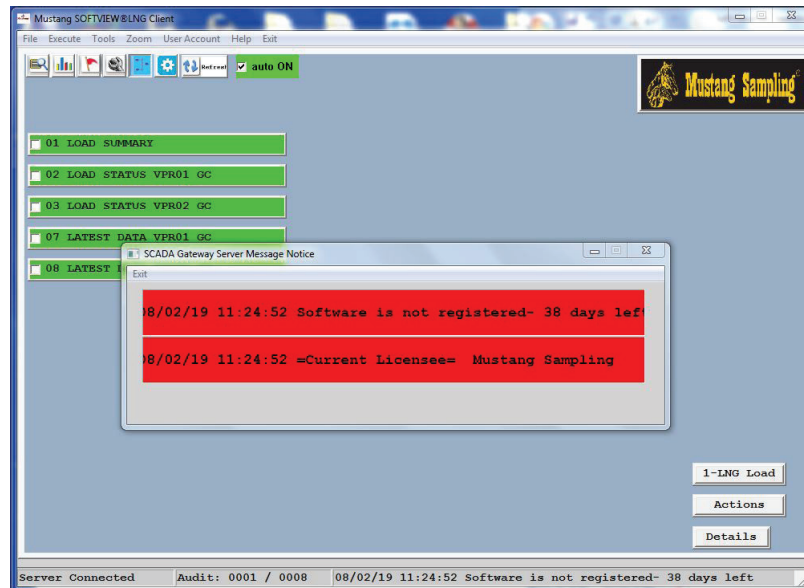
The above "Navigation" buttons at the top of all windows are used to access the Operations, Trend, Event, Setup, Station Network and Configuration Windows, respectively in SoftView LNG and to request a window refresh or to freeze auto refresh mode.

## MESSAGE STATUS BAR



The Status Bar at the bottom of the SoftView LNG window(s) is used to inform the user of important software processing status messages and information.

Important messages requiring user response are visualized using a popup window as shown in the following example:



## LOAD SUMMARY STATION WINDOW



The Load Summary Station Window allows the user to quickly review the status of all defined vaporizers and active LNG activity. The "Selected Vaporizer" point identifies the current "focus" vaporizer for the user Network Actions defined below in the LNG Transfer Procedure.

## VAPORIZER LOAD STATUS STATION WINDOW



The Load Status Window for a particular vaporizer allows the user to quickly review the Load status and the latest acquired key measurements for an active LNG Load transfer.

## VAPORIZER DATA STATION WINDOW



The Vaporizer Load Data Window allows the user to quickly review the latest acquired measurement data for the LNG activity. Again the user can add to or modify which measurements are assigned to the Station.

## VAPORIZER HISTOGRAM WINDOW



The Station Histogram Window is accessed via the Histogram tab on the Station window. This window allows the user to review station point measurement values relative to user pre-defined low and high limit settings for the measurements.

## STATION NETWORK WINDOW ACTION BUTTONS

The 1-LNG LOAD button provides the user with the actions required to manage an LNG Load Transfer plus some additional optional actions.

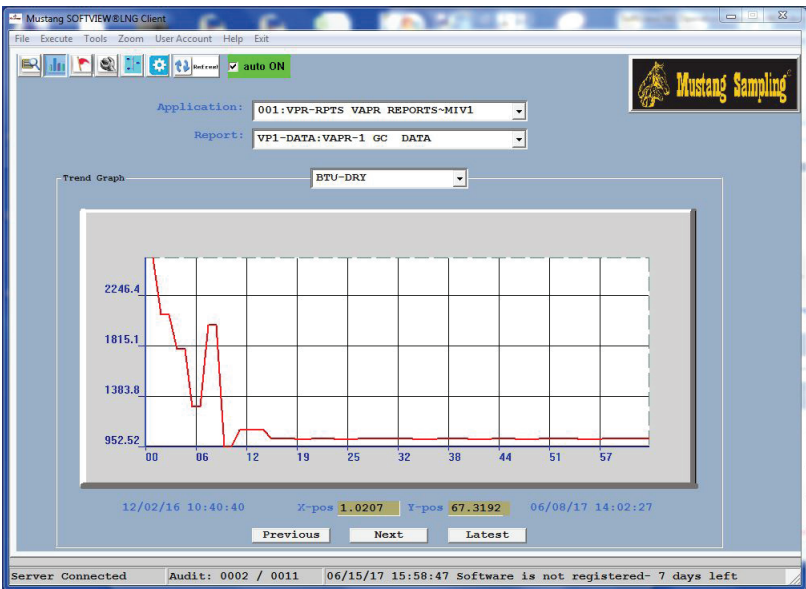
1. Select VPRnn GC – selects the desired “focus” vaporizer for the transfer.
2. Start Transfer - marks the beginning of the LNG load custody transfer for the focus vaporizer.
3. Suspend Recording – Suspends data recording during the load transfer, e.g. if the transfer is halted to take a sample.
4. Resume Recording – Resumes data recording during the load transfer, e.g. after completing a temporary halt to take a sample.
5. End Transfer – marks the end of the LNG load custody transfer for the focus vaporizer.
6. New Load – optional - tells the software to initialize for a new load.
7. Archive Load – optional - tells the software that all Actions for the load are complete and no further Actions are needed.
8. Export Comp Report – optional – creates comp report for focus vaporizer Gas Chromatograph
9. Suspend Polling – optional - stops all automatic polling of vaporizers and GCs
10. Resume Polling – optional - resumes automatic polling of vaporizers and GCs

The Actions button gives the user an expanded list of actions. These are not needed for normal day-to-day operation and are available primarily to support configuration and diagnostic activities.

1. Refresh Stations – refreshes the Station Network station data
2. Select Vapr GC nn – selects a vaporizer as the “focus” vaporizer.
3. Start Polling – initiate polling of the focus vaporizer and its assigned Gas Chromatograph.
4. Stop Polling – stop polling of the vaporizer and its assigned Gas Chromatograph.
5. Demand Poll – demand poll the vaporizer and Gas Chromatograph to test communications.
6. New Load – tells the software to initialize for a new load.
7. Start Load Transfer - marks the beginning of the LNG load custody transfer.
8. Suspend Recording – Suspends data recording during the load transfer, e.g. if the transfer is halted to take a sample.
9. Resume Recording – Resumes data recording during the load transfer, e.g. after completing a temporary halt to take a sample.
10. End Load Transfer – marks the end of the LNG load custody transfer.
11. Mark Load Complete – the software performs the load averaging function and outputs average reports for the LNG load.
12. Re-Do Load Complete – The user can via the Configuration Window edit or filter out data from the collected load history and use this Action to repeat the step 10 function.
13. Print Load Ticket – prints the LNG Load Report or Ticket to the default printer.
14. Export Load Ticket – allows the user to save the LNG Load Ticket as a digital file.
15. Archive Load – tells the software that all Actions for the load are complete and no further Actions are needed.
16. Clear Load – tells the software that the vaporizer is available for the next load.
17. Show Active Vaprs – This action is used to request an update to the Station Network Station and Station Point definition after changes are made to the vaporizer configuration tables. The software responds by automatically removing stations for non-active vaporizers and adding stations for active vaporizers. This refreshes the Network Station definition to show all “active” vaporizers.
18. Apply Stn Changes – This action is used to update the Station Network window stations to install changes made to the Station Network configuration table.
19. Export Definition – This action produces a report for user review showing the current Station Network definition.

TREND WINDOW

The Trend Window allows the user to review graphically the complete captured history of the selected measurement.



The complete history can be reviewed using the Latest, Next and Previous buttons to page through the history data.

SETUP WINDOW

The screenshot displays the 'Mustang SOFTWARELNG Client' interface for the 'Setup' window. It features a menu bar with 'File', 'Execute', 'Tools', 'Zoom', 'User Account', 'Help', and 'Exit'. Below the menu bar is a toolbar with various icons. The main area is divided into several sections. On the left, there's a list of 'Instrument Data Engineering Units' with columns for 'Name' and 'Units'. The 'Name' column lists units like 'ALAJOS', 'TC1 HEATER01', 'TC1 %OUT', 'TC2 HEATER02', 'TC2 %OUT', 'TC3 LNG TEMP', 'TC3 %OUT', 'TC4 LNG TEMP', 'TC4 %OUT', 'TC5 GVR', 'TC5 %OUT', 'TC6 GHR', and 'TC6 %OUT'. The 'Units' column lists corresponding units like 'J1.....', 'J2.....', 'J4.....', 'J5.....', 'J7.....', and 'J8.....'. On the right, there are configuration fields for 'Instrument', 'Report', 'Application', 'New Name', 'Access Level', 'Modbus Address', 'Interface', 'Address', 'IP Port', 'Read History Option', 'Report Option', 'Serial 4', 'Serial 5', 'Serial 6', 'Serial 7', and 'Serial Config'. The status bar at the bottom shows 'Server Connected', 'Audit: 0003 / 0014', and '06/15/17 16:04:24 Software is not registered- 7 days left'.

Click on the Wrench Navigation button to access the Setup window. This window is used to configure the communications link for the interface between SoftViewLNG and the Vaporizer and Gas Chromatograph instruments.

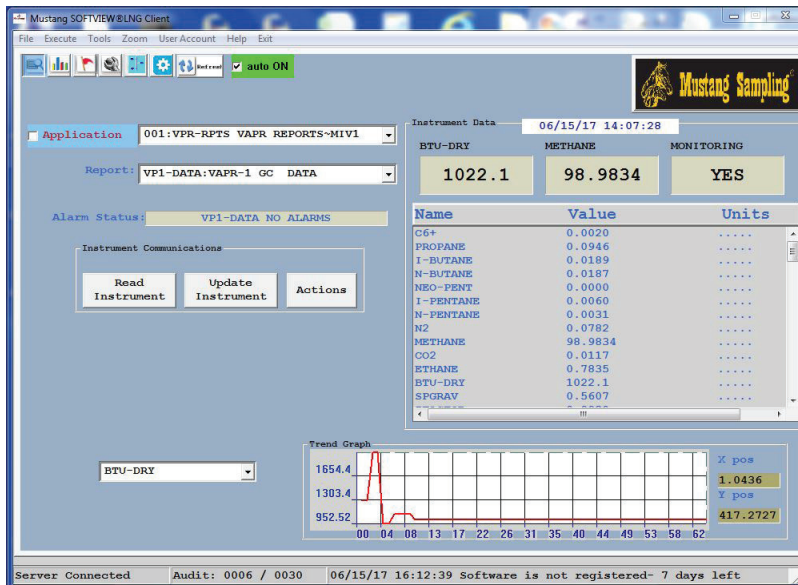
The Serial 4, Serial 5, Serial 6 and Serial 7 fields (lower right) are used to designate the COM serial ports to be used for serial communications. If the “Train” option is selected, then the polling function for all instruments assigned to that Serial option will operate in Training Mode using virtual communications.

Note that the Report field identifies “reports” contained in the selected APP. For the instrument APPs 011-013, these reports identify the physical instruments, e.g. a specific Vaporizer instrument. Click on the Report down arrow to select the desired instrument. Note the communications settings for the selected instrument, e.g. VAPR-01:

Active	Yes
Modbus Address	The Modbus Address for the instrument
Interface	The Serial option assignment, e.g. Serial 4
Address	IP address if Interface is Ethernet link
IP Port	IP Port if Interface is Ethernet link
Serial 4	COM port for instruments assigned to Serial 4
Serial 5	COM port for instruments assigned to Serial 5
Serial 6	COM port for instruments assigned to Serial 6
Serial 7	COM port for instruments assigned to Serial 7
Serial Config	The COMM parameters Baud Rate, Parity, etc. for the instrument

**The user must click on the Apply button to install any changes made to the instrument settings on the Setup window.**

## OPERATIONS WINDOW



Click on the Operations navigation button to access the Operations Window. The Operations window is used to test communications with the instruments. It can also be used to access and review the SoftView® LNG APP reports data.

The Actions button on the Operations Window provides access to user selectable actions.

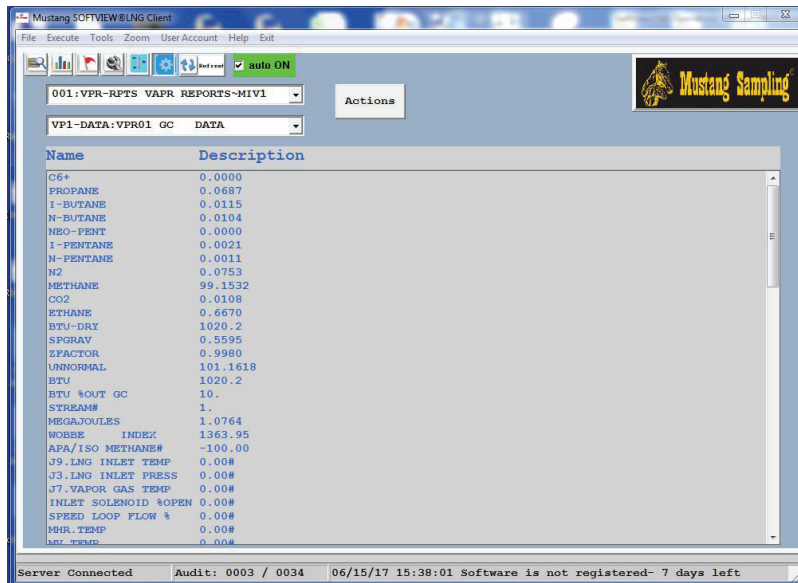
### Operations Window Real Time Trending

The Operations Window provides the user with a graphic trend visualization at the bottom of the window of the latest Vaporizer Gas Chromatograph measurement values for a user selected measurement.

1. Access the Operations window.
2. Click on the Application field
3. Select the 001 VAPORIZER RPTS APP.
4. Click on the Report field.
5. Select the 01 VAPORIZER 01 CONFIGURATION report.
6. Click on the down arrow to the left of the trend to select the desired measurement.

## CONFIGURATION WINDOW

The Configuration Window is accessed via the Configuration navigation button. This window is used to access, review and edit the SoftView® LNG Application and Configuration Tables. The two fields at the top of the window are used to select the desired APP, i.e. the “focus” APP, and the desired report, i.e. the “focus” report, within the APP respectively.



Click on the APP field down arrow to review a list of the installed applications or APPs. The following APPs are defined in the SoftView LNG software:

- 001 Vaporizer Gas Chromatograph Data Reports APP
- 002 Gas Chromatograph Comp Reports APP
- 004 Load Definitions APP
- 009 Mustang LNG MHR
- 010 Mustang LNG MV
- 011 Vaporizer Instruments APP
- 012 Daniel Gas Chromatograph Instruments APP
- 013 ABB NGas Chromatograph Instruments APP
- 016 Custom Instrument APP
- 023 User Configuration
- 024 Station Network APP

025 LNG Production Reports APP

026 Mustang LNG Configuration APP

029 ACS Client Setup APP

030 SGX Server Setup APP

APPs 009, 010, 011, 012, 013 are the instrument APPs. These APPs contain the latest data acquired from the instruments. The other APPs are non-instrument APPs used for SoftView® LNG processing and for configuration.

APP 001 provides the user with direct access to reports containing the latest measurement data for the defined Vaporizer Gas Chromatographs. APP 004 provides access to reports containing the LNG Transfer Ticket definition information. APP 026 provides access to SoftViewLNG Configuration Tables. APP 030 provides access to SGX Server Configuration Tables.

## APP 004 LOAD DEFINITIONS



Name	Description
MONITORING ACTIVE	NO
LOAD STATUS	....
CARRIER TYPE	Boat/Ship
CARRIER	Carrier 01
REFERENCE ID	0
ARRIVAL LOCATION	Dock 01
TANK	Tank 01
TRANSACTION	LOAD
INSPECTOR	NAME
ARRIVED	00/00/00
.	00:00
DOCKED	00/00/00
.	00:00
CONNECTED	00/00/00
.	00:00
START TRANSFER	00/00/00
.	00:00
END TRANSFER	00/00/00
.	00:00
DISCONNECTED	00/00/00
.	00:00
RELEASED	00/00/00
.	00:00
DEPARTED	00/00/00
.	00:00
TRANSFER WEIGHT	0
COMMENT	-
COMMENT	-

APP 004 can be used optionally prior to the “end transfer” event to access and enter information to be included in the load transfer ticket.

The 004 Load Definition APP reports for the vaporizers contain pertinent information for the LNG Load Ticket for each Vaporizer Gas Chromatograph. After a Start Transfer action is requested on the Station Network window, the user can at any time before the End Transfer action, review and edit the Load Definition Report for the applicable vaporizer to enter arrival, docked and connected dates and times or comments. The Actions accessed via the Actions button can also be used to set date and time information.

The following steps are used to access the LNG Load Definition report for a Vaporizer Gas Chromatograph.

1. Click on the Configuration navigation button to access the Configuration Window

2. Click on the down arrow in the APP field
3. Select the 004:LOAD DEF: LOAD DEFINITION App as the Focus APP.
4. Click on the down arrow in the Report field
5. Select the desired focus vaporizer as the focus report to view the contents of the selected table. This information is displayed in rows or “cells” in the displayed window.
6. Click on the desired row or cell to edit the cell information or use the Actions in the Actions button to set dates and times for the Ticket.

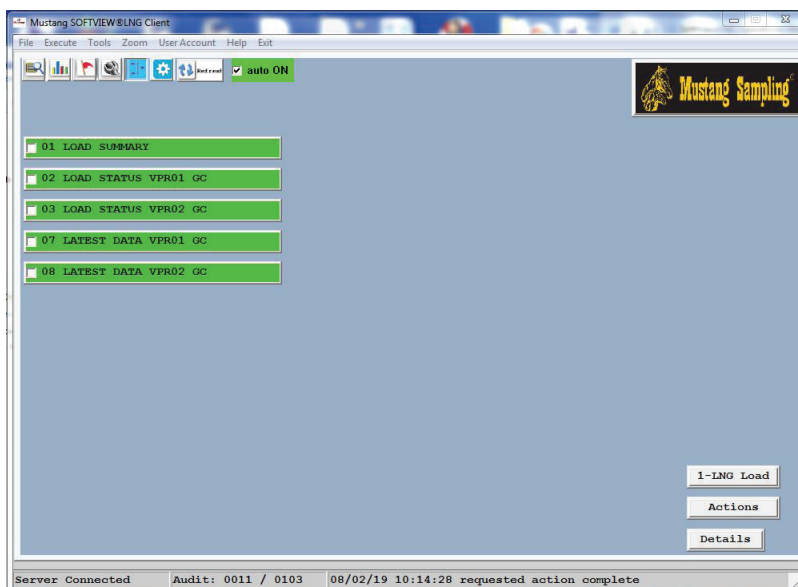
The LNG Load Ticket produced when the End Transfer action is requested by the user will contain the above edited information along with the average composition and vaporizer data.

## LNG TRANSFER PROCEDURE

SoftView® LNG provides the user with two options or procedures for the LNG Transfer event.

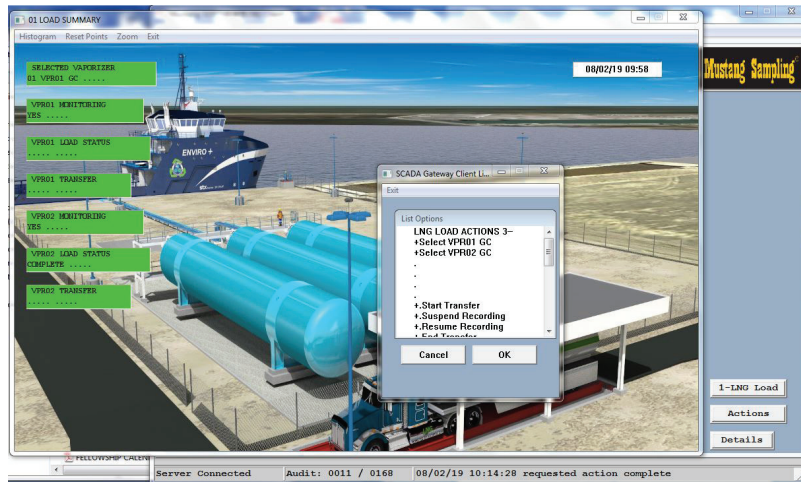
### Option 1 – Active Transfer Procedure using the Station Network Windows

This option requires the user via the Station Network window to click on appropriate “actions” to designate when events, e.g. the start transfer event and end transfer event occur.



Actions in the 1-LNG Load button on the Station Network window are used to execute the LNG Transfer procedure. The procedure is simple with popup messages provided in response to the actions to denote action processing. The following steps are recommended:

1. Access the Station Network window
2. Click on the 01 LOAD SUMMARY Station button to access the Load Summary window.
3. Position the windows as shown below to allow access to the 1-LNG Load button.



4. Click on the 1-LNG LOAD button and select the + Select VAPRnn action to set the “focus” vaporizer for the transfer and note the popup messages in response to the action.
5. Note via the display that the “Selected Vaporizer” is the desired focus vaporizer.
6. Use the + Start Transfer action to mark the start of the LNG transfer.
7. Optionally access the Configuration window to enter the arrival, docked, and connected dates and times for the Ticket if desired in the LOAD DEFINITION table.
8. Return to the Station Network window.
9. If necessary, use the + Suspend Recording action to stop data recording if the transfer is halted.
10. Use the + Resume Recording to restore recording after a Suspend action when the transfer is resumed.
11. Use the + End Transfer action to mark the end of the transfer and note that a Transfer Ticket report is displayed for the user to save and reference.
12. Following Steps 13-15 are only required if data filtering is required.
13. Optionally access the Configuration window and use the APP 04 LOAD DEFINITION table for the vaporizer to revise the report, i.e. to filter out data, or to enter disconnect and depart dates and times.
14. Return to the Station Network window.

15. Use the + End Transfer action again to create and output an updated Transfer Ticket.
16. Use the + Archive Load action archive the Load after the final desired Ticket is obtained.

## Option 2 – Post Transfer Procedure using the Transfer Processing Report

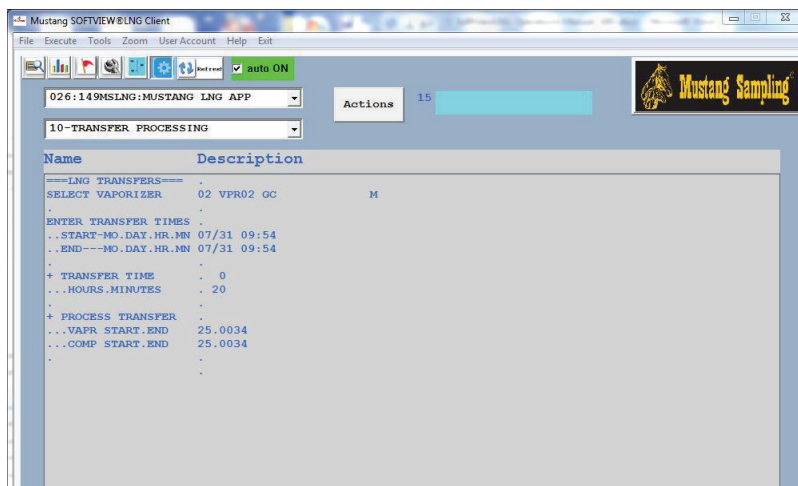
Option 2 allows the user to only interface once with SoftView® LNG after a physical transfer is complete to produce the Transfer Ticket for the transfer. The 026:149LNG APP / 10-TRANSFER PROCESSING report accessed via the Configuration window is used for this option. There are two pre-requisite requirements for this option:

1. SoftViewLNG must be actively recording data for the focus vaporizer during the complete physical transfer event, i.e. the Monitoring Active and Recording Status for the vaporizer must be YES during the complete period of the physical transfer.
2. The recorded data is retained for 7 days so the user must execute this procedure within 6 days after the start of the physical transfer.



To verify that the first requirement is met, the following steps should be performed prior to the start of the first physical transfer:

1. Access the Station Network window.
2. Click on the 01 LOAD STATUS VPRnn GC Station for each defined vaporizer to verify that the Monitoring Status and Recording Status for the vaporizer is YES.
3. If NO, click on the Station Network window 1-LNG LOAD button and select the + Select VAPRnn action for each vaporizer to initiate vaporizer monitoring and recording.



The following steps are then used after a physical transfer is complete.

1. Access the Configuration window
2. Click on the Focus APP down arrow at the top and select the 026:149...MUSTANG LNG APP as the Focus APP.
3. Click on the down arrow for the Focus Report field and select the 10-TRANSFER PROCESSING report as the Focus Report.
4. Click on the SELECT VAPORIZER cell to select the focus vaporizer used for the transfer.
5. Click on the START-MO.DAY.HR.MN cell and enter the date and time when the transfer started.
6. Click on the END--MO.DAY.HR.MN cell and enter the date and time when the transfer ended.
7. Click on the + TRANSFER TIME cell to compute the transfer time.
8. Click on the + PROCESS TRANSFER cell to get the Transfer ticket for the transfer.

Subsequent physical transfers then only require execution of the above 8 steps.

## LNG LOAD REPORT/TICKET

The LNG Load Report or Ticket produced via the End Transfer action summarizes the average data collected during the LNG load transfer.

As noted in the Step 5 section above, optional measurements are available and can be included in the ticket for the vaporizer depending on the availability of particular measurements from the instrument or on internal SoftViewLNG calculations. The vaporizer configurations in SoftViewLNG will include a subset of these options.

### LNG LOAD REPORT

```

CARRIER TYPE: Trailer                      03/04/16 09:05:18
CARRIER:      Carrier 01

ARRIVAL LOCATION: DOCK 01    LOAD REFERENCE ID: 16030409
TRANSACTION:    LOAD          TANK:      TANK 01
INSPECTOR:      NAME          LOAD STATUS: COMPLETE

Arrival      : 00/00/00 00:00 End Transfer: 03/04/16 09:05
Docked       : 00/00/00 00:00 Disconnected: 00/00/00 00:00
Connected    : 00/00/00 00:00 Released   : 00/00/00 00:00
Start Transfer: 03/04/16 09:02 Departed   : 00/00/00 00:00

VAPORIZER:      VP1-DATA:VAPORIZER 1
-----OPERATOR COMMENTS-----
-
-
-
-
-----

                        LNG LOAD AVERAGES

C6+          0.0000 BTU                      1007.3
PROPANE      0.0000 BTU %OUT GC              4.
I-BUTANE     0.0000 STREAM#                  1.
N-BUTANE     0.0000 MEGAJOULES               1.0627
NEO-PENT     0.0000 WOBBE INDEX             1348.75
I-PENTANE    0.0000 METHANE NUMBER          99.00
N-PENTANE    0.0000 .                      0.
N2           0.7031 .                      0.
METHANE      99.2881 .                      0.
CO2          0.0000 .                      0.
ETHANE       0.0088 .                      0.
BTU-DRY      1007.3 .                      0.
SPGRAV       0.5577 .                      0.
ZFACTOR      0.9980 .                      0.
UNNORMAL     100.0164 .                    0.

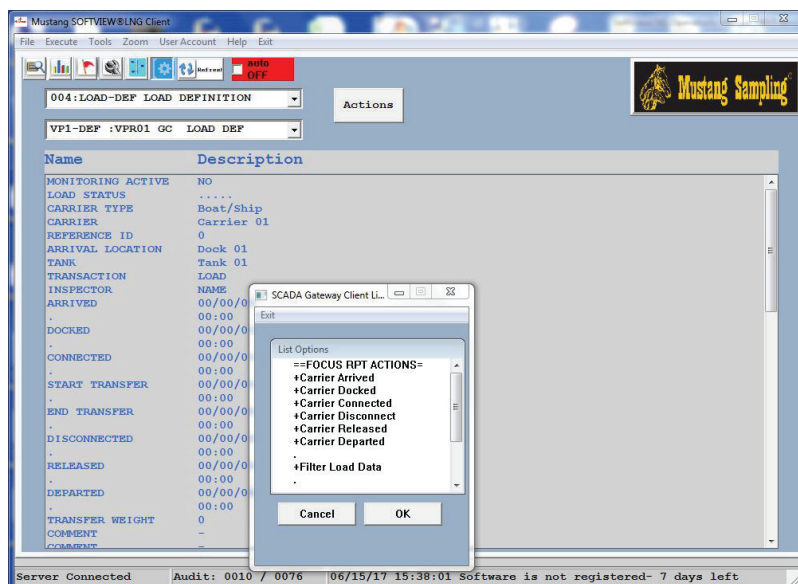
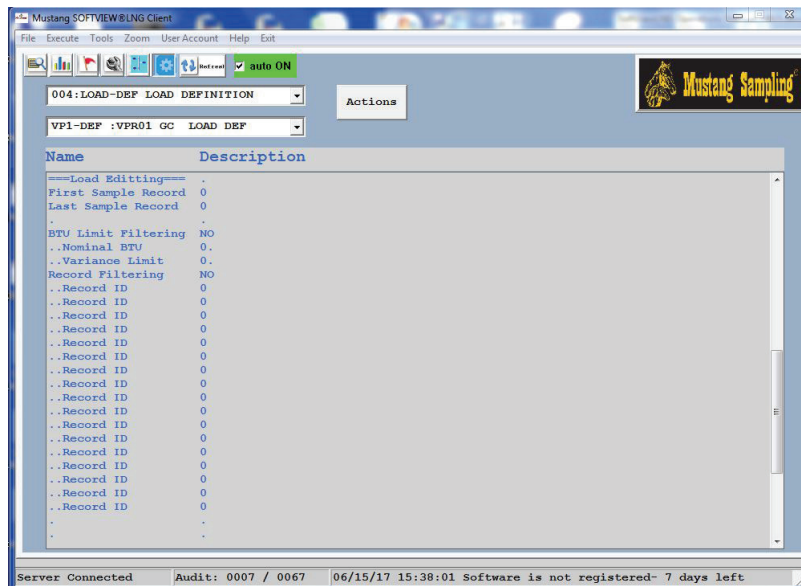
VAPORIZER ALARMS 0000000F PI1 PRES PROCESS J3 0.7
TC1 HTR1 PROCESS J1 1200. PI1 %OUT J10 2.
TC1 %OUT 100. FC8 FLOW PROCESS J11 11.7
TC2 HTR2 PROCESS J2 1200. FC8 %OUT J12 30.
TC2 %OUT 0. J13 PROCESS J13 73.8
TC3 HTR3 PROCESS J4 1200. J14 %OUT J14 0.
TC3 %OUT 0. ANALYZER ALARMS 1 00000000
TC4 HTR4 PROCESS J5 1200. ANALYZER ALARMS 2 00000000
TC4 %OUT 0. STREAM #1 LO LIMIT 00000000
TC5 MV PROCESS J7 159. STREAM #1 HI LIMIT 00000000
TC5 %OUT 13. STREAM #2 LO LIMIT 00000000
TC6 REG PROCESS J8 121. STREAM #2 HI LIMIT 00000000
TC6 %OUT 0. STREAM #3 LO LIMIT 00000000
FC7 LNG TEMP J9 39. SAMPLE FIRST REC 1610.
FC7 %OUT J6 0. SAMPLE LAST REC 1611.

```

## LNG TRANSFER TICKET DATA FILTERING

The End Transfer action saves the Gas Chromatograph composition history data acquired during the transfer to a Gas Chromatograph-COMPS.nn.CSV file where nn is the vaporizer number. The user can review this data using EXCEL or Notepad, etc.

The user, via the 004 LOAD DEFINITION APP report for the Vaporizer Gas Chromatograph, can specify specific data records to be filtered out of the Ticket averages, e.g. for a period of time when the transfer should have been suspended but was not. Two filtering methods are available. The user can filter out all records where the BTU value is outside a defined range or can filter out specific records by specifying the record numbers.

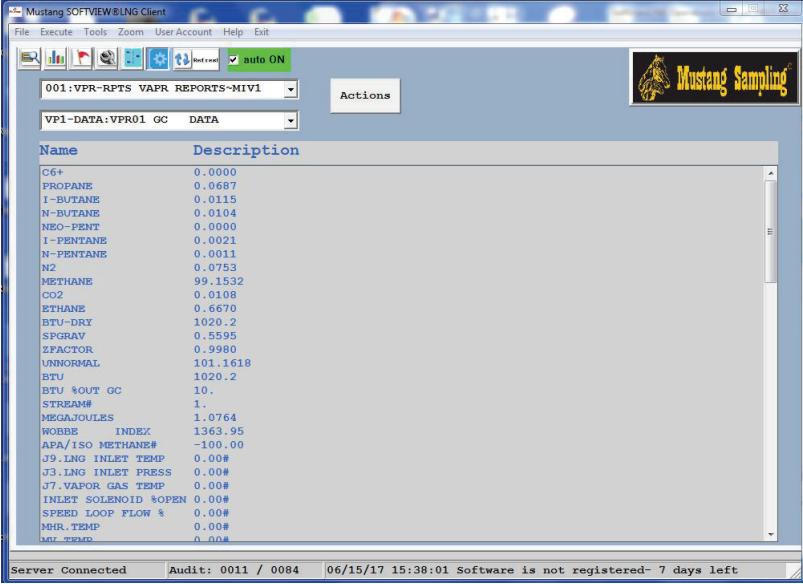


Use the following steps to filter the transfer data records and to create a new LNG Load Ticket after the End Transfer action:

1. Review the Gas Chromatograph-COMPS.nn.CSV file data and identify the data and record numbers to be filtered out.
2. Access the Configuration window and select the 004 LOAD DEFINITION APP Report for the vaporizer.
3. Scroll down to access the Load Editing section.
4. The user can filter out undesired data using either the BTU Limit Filtering option or the Record Filtering option by explicitly defining the records to be removed.
5. The BTU Limit Variance option allows the user to have records with BTU values outside of the variance range to be removed automatically. For this option click on and edit the applicable cells to enable the Variance option
6. For Record Filtering click on the Record Filtering cell and select YES to enable the record filtering option. Enter the record numbers to be filtered out in the appropriate cells.
7. After entering the Edit criteria above, click on Actions and select the +Filter Load Data Action.
8. Return to the Station Network window and click on the +End Transfer action to produce new reports for review.
9. After final reports are reviewed and approved, click on the +Archive Load action to mark the Load data as archived and to prevent further editing.

The above procedure can be repeated a number of times if necessary to obtain the correct Ticket report.

## APP 001 VAPORIZER GAS CHROMATOGRAPH DATA REPORT



The screenshot shows the Mustang SOFTWARE LNG Client window. At the top, there's a menu bar (File, Execute, Tools, Zoom, User Account, Help, Exit) and a toolbar with icons. Below the toolbar, there are two dropdown menus: '001:VPR-RPTS VAPR REPORTS-MIVI' and 'VP1-DATA:VPR01 GC DATA'. To the right of these is an 'Actions' button. The main area is a table with two columns: 'Name' and 'Description'. The table contains various gas chromatograph data points and their values. At the bottom, there's a status bar showing 'Server Connected', 'Audit: 0011 / 0084', and a timestamp '06/15/17 15:38:01'. A message at the bottom right says 'Software is not registered- 7 days left'.

Name	Description
C6+	0.0000
PROPANE	0.0687
I-BUTANE	0.0115
N-BUTANE	0.0104
NEO-PENT	0.0000
I-PENTANE	0.0021
N-PENTANE	0.0011
N2	0.0753
METHANE	99.1532
CO2	0.0108
ETHANE	0.6670
BTU-DRY	1020.2
SPGRAV	0.5595
ZFACTOR	0.9980
UNNORMGAL	101.1618
BTU	1020.2
BTU %OUT GC	10.
STREAM#	1.
MEGAJOULES	1.0764
WOBBE INDEX	1363.95
APA/ISO METHANE#	-100.00
J9.LNG INLET TEMP	0.00#
J3.LNG INLET PRESS	0.00#
J7.VAPOR GAS TEMP	0.00#
INLET SOLENOID %OPEN	0.00#
SPEED LOOP FLOW %	0.00#
MHR TEMP	0.00#
MVY TEMP	0.00#

The Vaporizer Gas Chromatograph reports contained in this APP allows the user to access and review the latest measurement data acquired for the Vaporizer Gas Chromatograph.

1. Click on the Application field down arrow and select the 001 Vaporizer Data as the Focus APP.
2. Click on the down arrow for the Report field to select the desired Vaporizer as the Focus Report.
3. Scroll through the Vaporizer Report data to review the latest data.

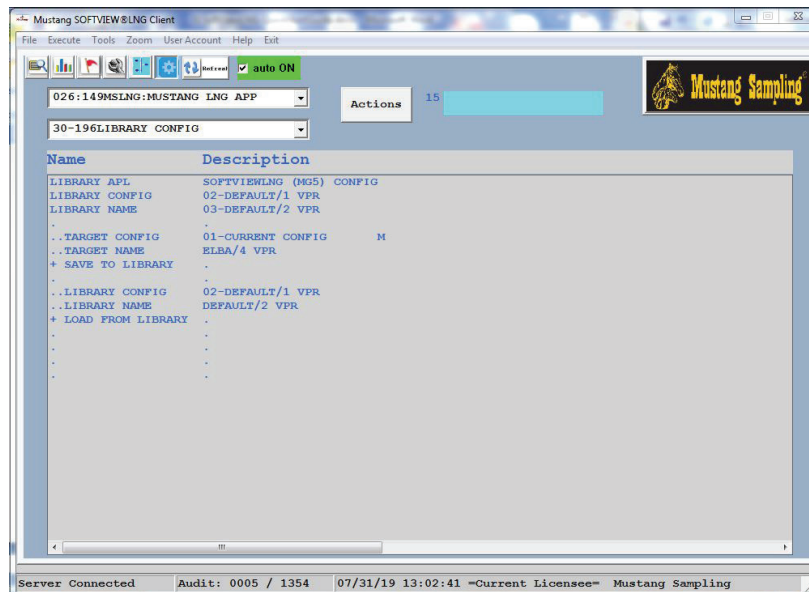
# ADVANCED USER FEATURES & PROCEDURES

A number of additional features for configuration are available in SoftView® LNG for the advanced user.

## CHOOSING A PRE-DEFINED SoftView® LNG LIBRARY CONFIGURATION

This procedure allows the person configuring SoftViewLNG for the first time to choose from a list of different base configurations and to install the desired configuration as a configuration starting point.

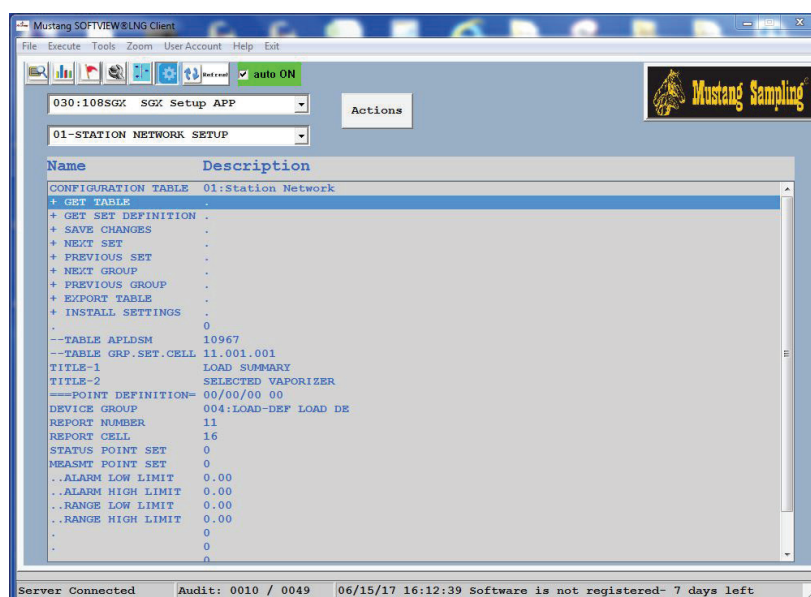
**WARNING:** Be aware that this procedure will replace the current configuration so this procedure should only be executed by trained users.



1. Access Setup window
2. Enter level2 in ID field
3. Click on Access Level down arrow and select Advanced option
4. Access the Configuration Window.
5. Click on the Focus APP down arrow at the top and select the 026:MUSTANG LNG APP as the Focus APP.
6. Click on the down arrow for the Report field and select the 30-196LIBRARY CONFIG report as the Focus Report.
7. Click on the LIBRARY CONFIG cell 9 and select the desired configuration.
8. Click on the + LOAD FROM LIBRARY (cell 11) action.
9. Wait a minute for the configuration to load and initialize.

10. Access the Network window.
11. Access the Setup window.
12. Click on Access Level down arrow and select User option.
13. Close and re-open SoftView® LNG.
14. Return to Network window to see the new station buttons for the configuration.

## CHANGING THE STATION NETWORK POINTS DEFINITION



The Stations and Station Points are defined using the Station Network Setup report in the 030:108SGX APP.

Note that the above report contains definition data for a station point and also the Actions needed to support the definition function. The following steps are used to define Stations and Station Points:

1. Access the Configuration Window.
2. Click on the APP down arrow at the top to access the 030:108SGX Setup APP application as the Focus APP.
3. Click on the down arrow for the Focus Report field and select the 01-STATION NETWORK SETUP report as the Focus Report.
4. Click on the + GET TABLE action to retrieve the Point Definition data.
5. Note that the --TABLE GRP.SET.CELL row defines the address of the point data currently displayed. Groups 11-40 contain the point definitions for stations 1-30. Each group contains 30 sets defining the points for a station. The +Next/Previous Group and +Next/Previous Set actions are used to access a desired point definition or the user can directly enter the desired group and set in the --TABLE GRP.SET.CELL row followed by the +GET TABLE action to access a desired point definition.

6. Edit the definition cells as needed to define or change the station point definition.
7. Select the +SAVE CHANGES action to install the updates.
8. After all point changes are completed, click on the +INSTALL SETTINGS action to re-build the Station Network.
9. Access the Station Network window.
10. Click on the Actions button and select the +Refresh Stations action to update the network display with the new Station changes and with the latest data.

## **DEFINING A CUSTOM APP TO INTERFACE TO AN INSTRUMENT USING MODBUS RTU/MODBUS TCP COMMUNICATIONS**

This procedure assumes that the user has a basic understanding of the Modbus protocol.

1. Access the Setup window.
2. Click on the Instrument down arrow and select a desired slot for the APP.
3. Click on the Application down arrow and select the 202A or 203A Custom APP.
4. Click on Apply button to install the APP.
5. Access the Configuration window.
6. Click on the focus report down arrow and select the 07-Report Definition report.
7. Click on the + Get Definition Action to get the current definition of the report cell defined at the top of the report.
8. Edit the cell definition to define the cell name, Modbus register, etc. Note: the Modbus register value to be entered here is the actual register number for the Modbus command, e.g. the actual register number for the Gould documented register 47001 register is 7000.
9. Click on the + Apply Changes action to save the new settings.
10. Use the + Next Cell action and repeat above steps for cells 2 through n.
11. Access the Setup Window to define the communications settings for the APP.
12. The APP can now be used for instrument communications.

The SoftView® software products and associated documentation are the property of Mustang Sampling, LLC. The SoftView® application uses the SCADA Gateway Executive (SGX) software from Cline SofTechnology (CST) which is protected by copyright laws. All electronic duplication or reverse engineering or photocopy duplication of associated documentation without permission from Mustang Sampling, LLC and CST is expressly prohibited.

## Analytically Accurate® **TECHNOLOGY**

### About Mustang Sampling

Mustang Sampling, LLC is the innovator of Analytically Accurate® solutions within sample conditioning systems. We provide custom solutions of products and services globally to the Natural Gas, Natural Gas Liquids (NGL), and Liquefied Natural Gas (LNG) industries. Mustang Sampling continues to pioneer integrated control systems, allowing our customers to maintain phase stability from sample extraction at the pipeline through sample analysis. Our products are continuously improved and subjected to the highest quality standards which provides our customers with the best sample conditioning solutions.

Mustang Sampling, LLC  
43 Ritmore Glen  
Ravenswood, WV 26164  
P: +1 304 273 5357  
F: +1 304 273 2531

[info@MustangSampling.com](mailto:info@MustangSampling.com)  
[www.MustangSampling.com](http://www.MustangSampling.com)

Copyright © 2017-2019 Mustang Sampling.

All rights reserved.

Mustang Sampling®, SoftView®, Mustang®, Mustang Intelligent Vaporizer Sampling System® and Analytically Accurate® are registered trademarks of Mustang Sampling, LLC  
Viton® and Kalrez® are a registered trademarks of DuPont.  
EZ-ZONE® is a registered trademark of Watlow.

No part of this publication may be reproduced in any material form without the written permission of Mustang Sampling, LLC and Cline SofTechnology (CST).

MS-IOMSVLNG.v4-EN-P August 2019  
Supersedes: MS-IOMSVLNG.v3-EN-P