

# **SMARTLINK**

## **for Model 2000 Two-Wire Transmitter**

# **INSTALLATION, OPERATION & MAINTENANCE MANUAL**

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## **USING THIS MANUAL**

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This manual is designed to assist in installing, operating, and maintaining the SMART LINK software used with the Model 2000 Two-Wire Transmitter for Aaliant Target Flowmeters.

## **SAFETY INFORMATION**

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Before installing the SMART LINK software, please read these instructions and those instructions for the flowmeter and transmitter to which it will be attached. Familiarize yourself with the requirements and functions. If any questions or problems arise please contact Aaliant Applications at 1-800-778-9251.

Ensure that all personnel involved with operating this device are suitably qualified. Observe all local and national electrical codes for the wiring of this device.

**NOTE:** Manufacturer's instructions and the National Electrical Code (ANSI/NFPA 70) must be followed when installing this equipment. Tampering or replacement with non-factory components may adversely affect the safe use of the system.

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## 1.0 PRODUCT DESCRIPTION

### 1.1 Function

SmartLink is a Windows-based program for configuration and set-up of the Model 2000 Two-Wire Transmitter.

### 1.2 Requirements

Flowmeter Application Requirements:

Requires a Model 2000 Datasheet for appropriate flowmeter serial number. (See Sensor ID)

**The units are calibrated at the factory to the end user's specifications.**

Hardware Requirements:

Requires a LSK (HART®) Modem available from Mactek, Model 010001F or equivalent. The LSK Modem connects to the PC Port on one end, and connects across a 250 ohm resistor in series with the 4-20 mADC loop on the other. As with all HART® digital communications, 250 ohm loop resistance is required. The leads of the (HART®) Modem can be clipped anywhere along the 4-20 mADC current loop.

PC Requirements:

Requires Windows 95, Windows 98, or Windows NT operating system. 40 MB free disk space. There is no distinction in the SmartLink software between communications with the display module and a HART® Model 275 Hand-Held Communicator. The software appearance and operation is similar to HART®.

## 2.0 INSTALLATION

Disk available upon request.

## 3.0 START-UP & OPERATION

### 3.1 Operation

Power up the Model 2000 transmitter (24 VDC supply, minimum 100 mA rating) and make the appropriate connections. Run the SmartLink Software. If all connections are correct, the program will begin communicating with the transmitter and the Display Data screen will be displayed - continuously updating on-line information. (See Figure 1) Instructions for the Display Data screen are found at the bottom right window.

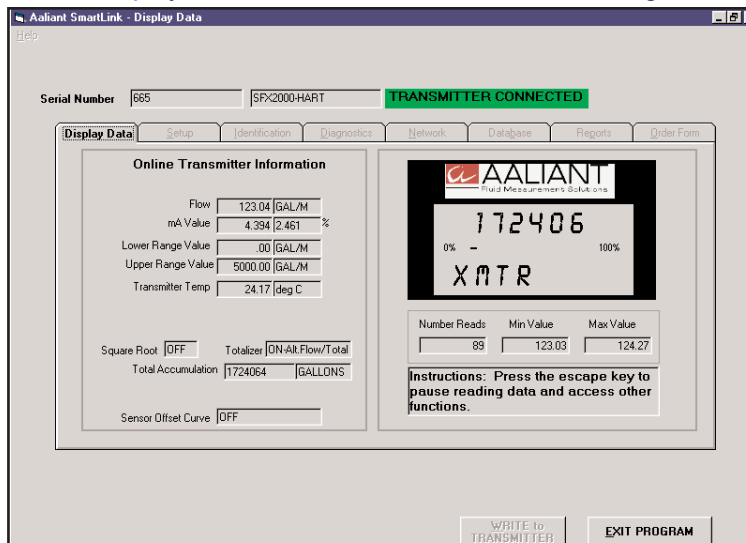


Figure 1. Display Screen

After SmartLink is loaded into your computer and the program executed, a display similar to the two-line integral display option is shown on the right side of the screen in the "Display Data" mode. Also shown on the right are the number of readings taken, the minimum and maximum flow rates since SmartLink was executed, and instructions for accessing other functions.

The left side of the screen shows the "Flow" (instantaneous value), "mA Value", "Lower Range Value", "Upper Range Value", "Transmitter Temp", "Square Root" status, "Totalizer" - ON/OFF, "Total Accumulation" - with engineering units and the "Sensor Offset Curve" - ON/OFF.

"Serial Number", "Model 2000" and connection status are displayed on the top line.

Hitting the Exit Program on the bottom of the screen exits the program.

Pressing the <ESC> key allows you to access other functions. Pressing the <ESC> key again returns you to the Display Data screen. Other functions include the following modes: "Setup", "Identification", "Diagnostics", "Network", "Database", "Reports", "Order Form".

If the software cannot communicate with the transmitter the Network screen will appear (See Figure 2). Verify that the transmitter is powered and the proper modem connections are made (including the 250 ohm resistance that is required for HART® Communications). Change the Communications Port, if necessary, and click on the 'Connect' button.

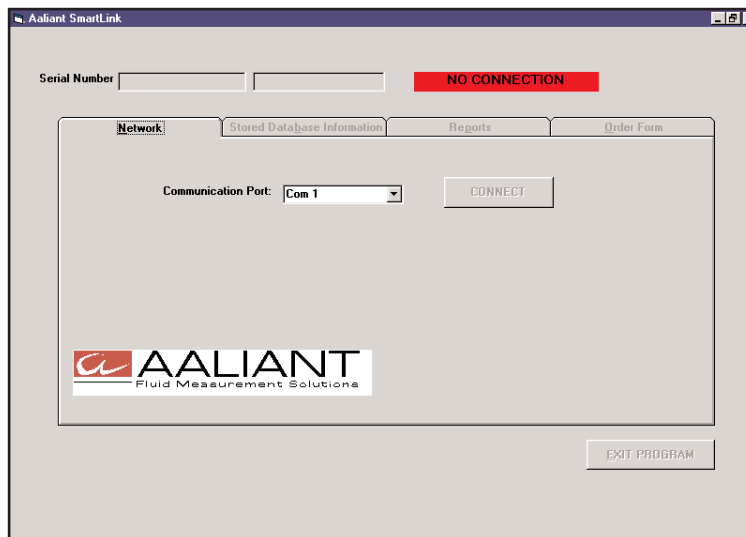


Figure 2. No Connection Screen

## SETUP

Pressing <ESC> and then the "Setup" tab allows you to enter the setup menus: "Input Setup", "Output Setup", "Failsafe Setup", "Transmitter Filtering", and "Local Display". Radio buttons take you to a selection chart. Highlighting the desired selection with the left mouse button enters the selected parameter. Scrolling is accomplished using the keys.

Larger Radio buttons take you to other setup sub-menu functions. Placing the cursor on the white highlighted items allows you to enter new values for the label displayed.

The Setup screen displays a majority of the configuration information for the connected Model 2000 transmitter. (See Figure 3)

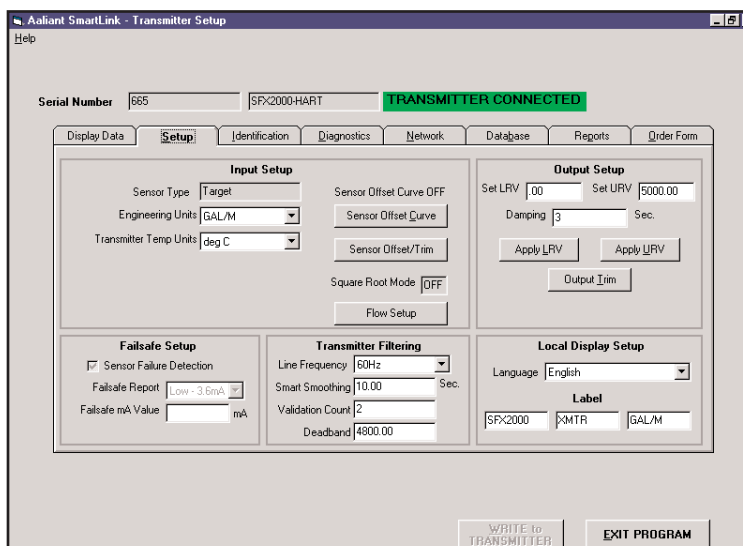


Figure 3. Transmitter Setup Screen

**Note:** If the Model 2000 has been supplied with the Target Flowmeter, it has been pre-calibrated at the factory and normally requires only a Sensor Offset Trim/Sensor Position Offset Trim adjustment. This offset procedure MUST be done when initially installing the flowmeter or if the flowmeter has been moved. Click the Sensor Offset Trim to access the submenu. Click the ZERO ADJUST [SENSOR POSITION OFFSET/TRIM] Sensor Offset Position Trim with NO flow in the line to reference zero flow output. It is recommended the flowmeter be at operating temperature when this is done to ensure maximum accuracy readings from the flowmeter.

Reset Sensor Trim to Factory Setting, trimming the 4mA and 20mA points, and trimming to a Custom 2 Points can be accomplished from this submenu screen. Current PV (present flow value) and flow units are displayed in the lower portion of the screen. (See Figure 4)

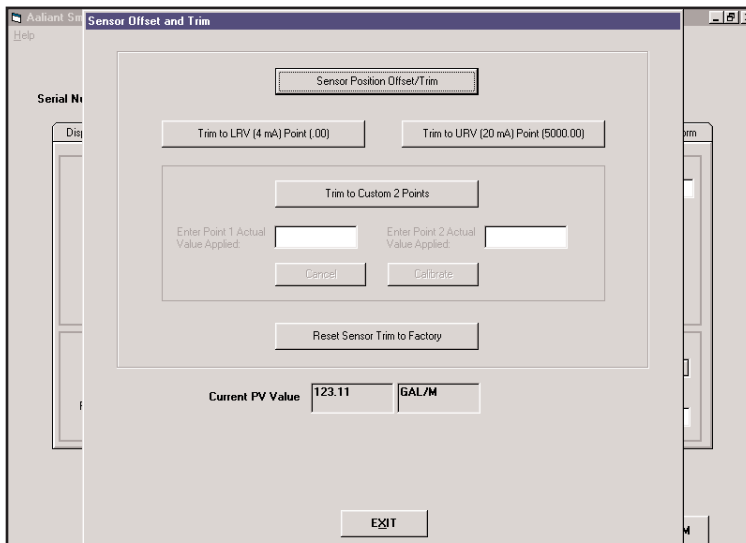


Figure 4. Offset Trim Screen

Additional configuration information is on sub-screens to the existing Setup screen and on the Identification screen. Select the Engineering Units in the Input Setup section. If necessary, access can be made to a Sensor Offset Curve by clicking the Sensor Offset Curve box. This allows you to View/Edit the points of the Sensor Offset Curve. Choose from 2 to 22 correction points. Choose 0 points to turn off the Sensor Offset Curve. This option allows you to linearize the transmitter for a non-linear output from the meter. This is normally not required as long as the unit is used within its calibrated range. Calibration data must be taken of actual flow versus displayed flow for entering data into this table. Also in the Setup section, Transmitter Temperature Units (future use), Square Root Status, and Flow Setup submenus can be found. (See Figure 5)

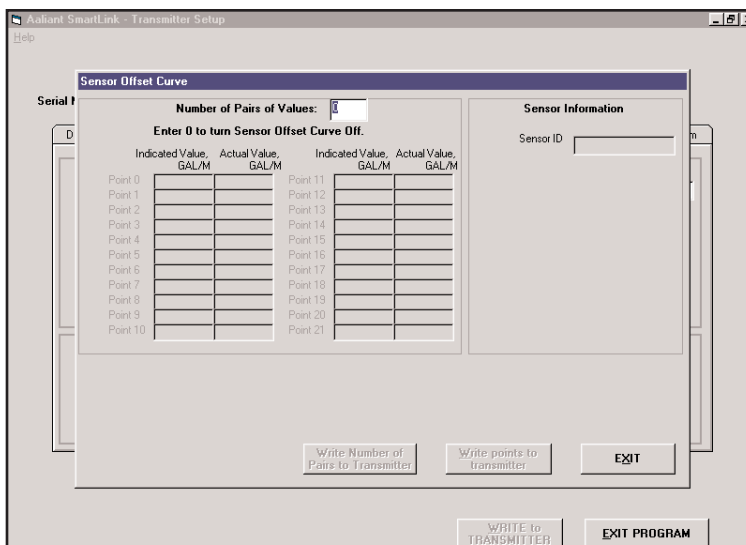
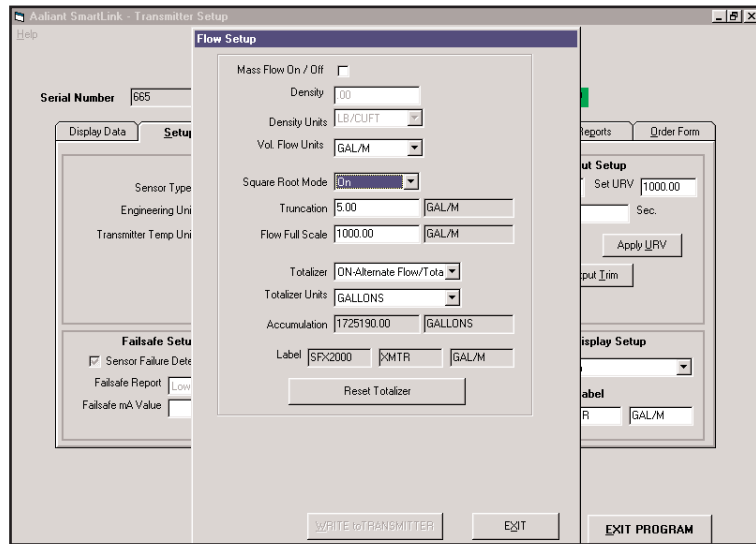


Figure 5. Sensor Offset Curve Screen

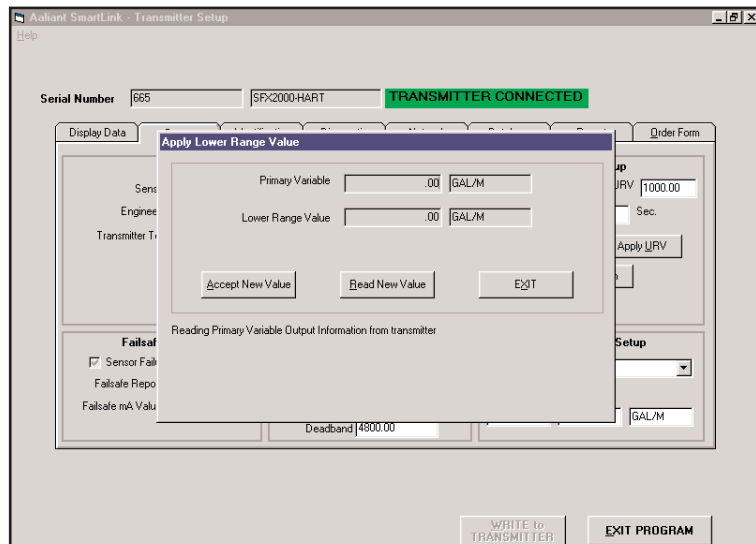
The Flow Setup submenu allows turning on/off the Mass Flow function along with the Density Units. Setting or selecting the following: Vol Flow Units, Square Root status - On/Off, Truncation (cutoff value), Flow Full Scale, Totalizer display function for the 2 line display (Off, On Alternate Flow/Total, On Display Flow Only and On Display Total Only). Select Total Units, and Reset Totalizer. Also found in the Flow Setup screen are the Accumulation (total), Total Units, and the transmitter label information. (See Figure 6)

**Note:** Flow Full Scale is not necessarily the operational Full Scale Value. It is the Flow Value at 2 m/V signal from the flowmeter.

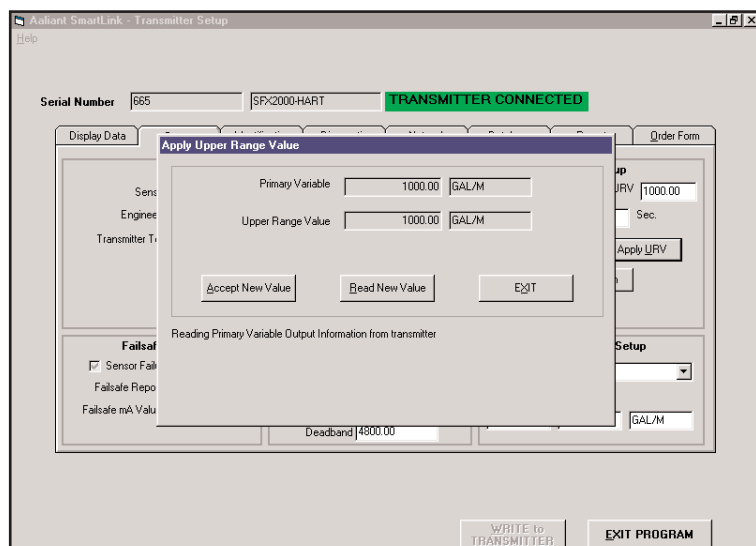


**Figure 6. Flow Setup Screen**

Set LRV (perform a device re-range by applying the 4mA value to the device input) (See Figure 7), URV (perform a device re-range by applying the 20mA value to the device input). (See Figure 8)



**Figure 7. Lower Range Value Screen**



**Figure 8. Upper Range Value Screen**

**Caution:** The 4.00mA and 20mA limit is factory calibrated to a precision standard. Using the Output Trim function voids the NIST trace ability of calibration. Do not arbitrarily trim the output unless a qualified and accurate local standard is available to measure the adjusted 4.00mA output! Also note that the 4.00mA limit should not be trimmed by more than about + 50  $\mu$ A, or transmitter operation may be impaired.

Damping function and Trim Output (perform Loop Test, See Figure 10), 4-20mA Trim and Reset functions (See Figure11) submenu for the output can be found in the Output Set section of the screen.

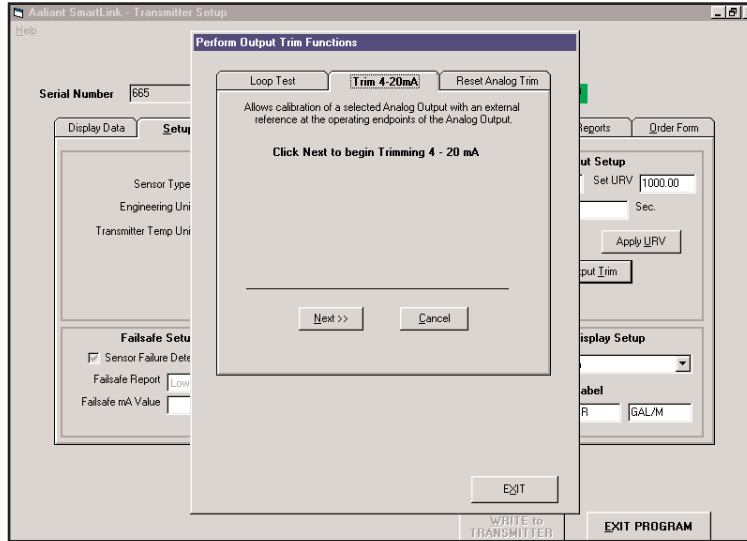


Figure 9. Output Trim Screen

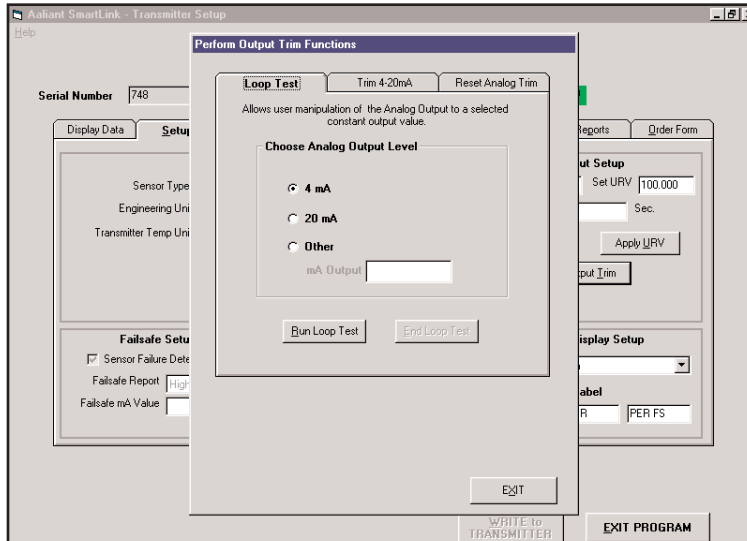
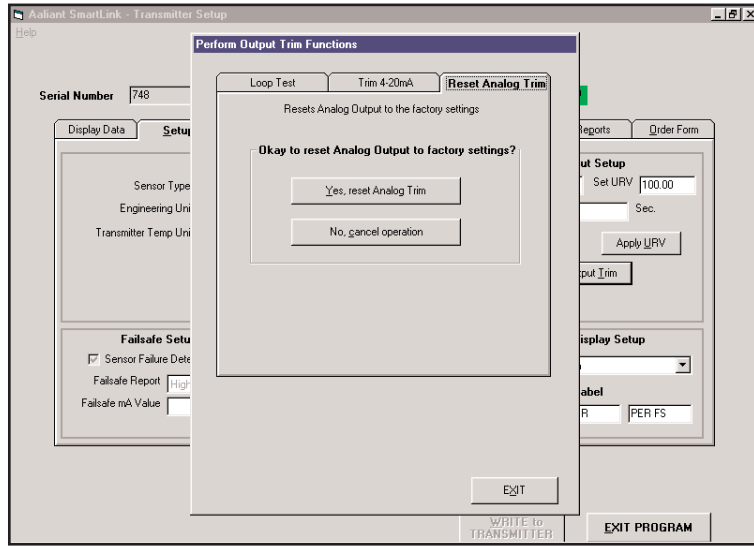


Figure 10. Loop Test Screen



**Figure 11. Reset Analog Trim Screen**

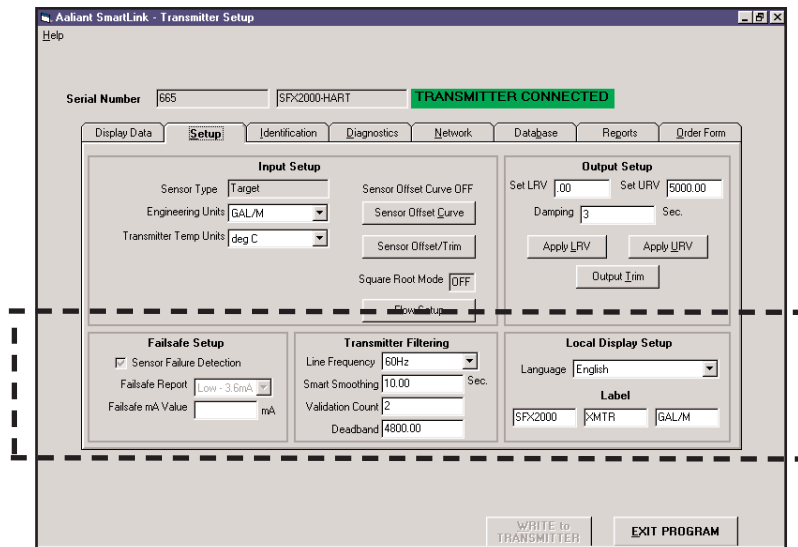
Failsafe Setup enables the detection of a sensor failure or line break. Checking the Sensor Failure Detection allows you to set a transmitted mA value should an error be detected. The selected output can be Off, Low - 3.6mA, High 23mA or other. Selecting other allows you to enter a value between 3.6 and 23mA in the Failsafe mA Value box. (See Figure 12)

Transmitter Filtering allows you to select 50 or 60 Hz. Typically set for the AC line frequency to the power supply generating voltage to the transmitter. Smart smoothing, typically set at 1.0 to 30 seconds, can be selected. Validation Count, typically set at 2.0 to 100 counts, can be selected. Deadband is typically set at 4800. Smoothing Deadband values from 0 to 32000 can be selected.

Local Display Setup - Language, only English is selected for now. Label, 7 character label that appears on the 3-line display. . XMITTER, Label, 7 character label that appears on the 3-line display. GAL/M, Label, 7 character label that appears on the 3-line display.

WRITE to TRANSMITTER - sends updated information to the Model 2000. Use this button as directed while programming.

EXIT PROGRAM - Exits the program



**Figure 12. Failsafe Setup Screen**

## IDENTIFICATION

Enter the tag information in the Tag box on the Transmitter Identification screen. Device information is displayed at the bottom of the screen. Enter any other pertinent information in the Descriptor and Message boxes. (See Figure 13)

Figure 13. Identification Menu Screen

## DIAGNOSTICS

The Diagnostics screen displays current and historical information about the connected transmitter. (See Figure 14)

Figure 14. Diagnostics Menu Screen

## NETWORK

Allows you to select the Communications Port: Com 1 or Com 2.

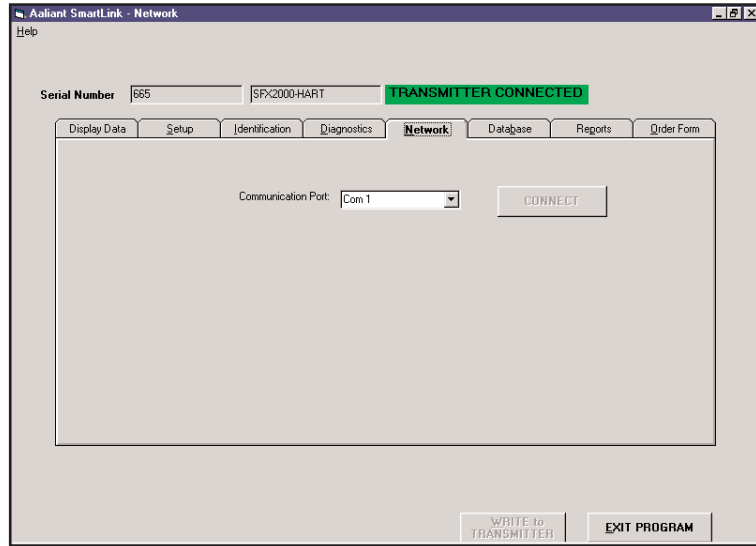


Figure 15. Network Menu Screen

## DATABASE Future release feature.

The Stored Database and the Order Form screens will be available in the full release of the SmartLink Transmitter Manager. Stored database information will allow the user to create and edit a set of parameters for a transmitter, providing a similar functionality to the Offline Configuration feature of the HC-275. (See Figure 16)

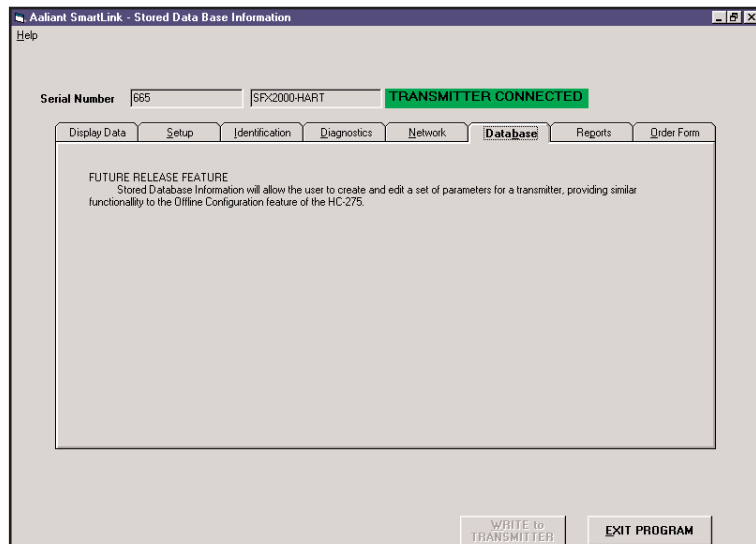
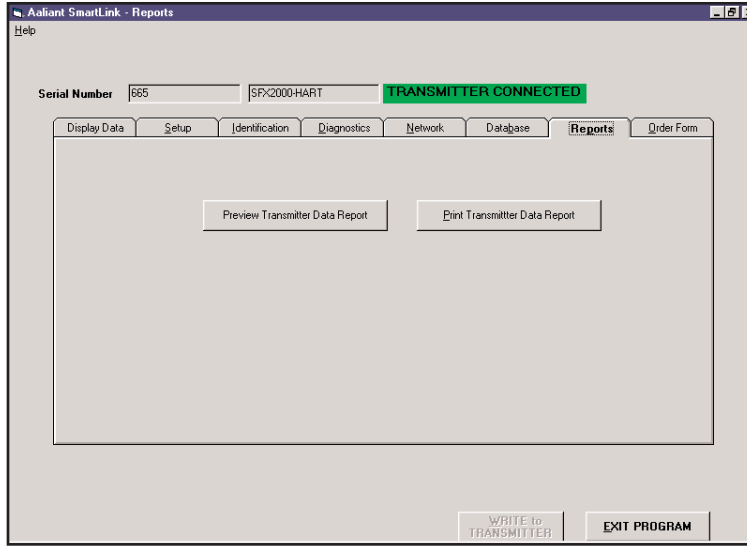


Figure 16. Database Menu Screen

**REPORTS**

The Report screen allows you to preview and or print a page containing all configuration information for the connected transmitter. (See Figure 17)



**Figure 17. Reports Menu Screen**

The Report will show the following format:  
 Transmitter Data for Serial Number XX  
 Generated by Aaliant SmartLink on (Date)

**EXAMPLE:**

Transmitter Identification

Serial Number:	294697	Manufacturer:	Aaliant
Model:	2000	Universal Rev:	5
Hardware Rev:	1	Field Device Rev:	1
Software Rev:	8	HART Tag:	
Description:			
Message:	ORDER # 149066		
Date:	01/30/2004		

On-line Transmitter Information

Flow	0 GAL/M
mA Value/ % Range	4.000 / .00%
Transmitter Temp	72.48 deg F
Lower Range Value	0 GAL/M
Upper Range Value	9000 GAL/M

Transmitter Setup

Input Setup

Sensor ID:	0303375		
Square Root Mode:	ON		
Sensor Type:	Target	Square Root Trunc:	450 GAL/M
Density:	0.000000 LB/CUFT		
Square Root Flow:	9000 GAL/M		
Totalizer:	ON-Alt. Flow/Total		
Total Accumulation:	2160.763 GALLONS		

Output Setup

Lower Range Value:	0 GAL/M
Upper Range Value:	9000 GAL/M
Damping:	3 seconds

Failsafe Setup

Failsafe Setup	ON
Failsafe Control:	3.6 mA

(Example continued)

Transmitter Filtering

Smart Smoothing: 10 seconds  
Validation Time: 2  
Deadband: 4800  
Line Frequency: 60 Hz

Local Display Setup

Display Language: English  
Display Label: GPM GPM GPM

Sensor Offset Curve

Sensor Offset Curve: OFF

**ORDER FORM** Future Release Feature

The Stored Database and the Order Form screens will be available in the full release of the SmartLink Transmitter Manager. These screens will enable you to access, store and download specific transmitter information to and from the Microsoft Access database; and create an order to Aaliant for your specific flow transmitter needs.

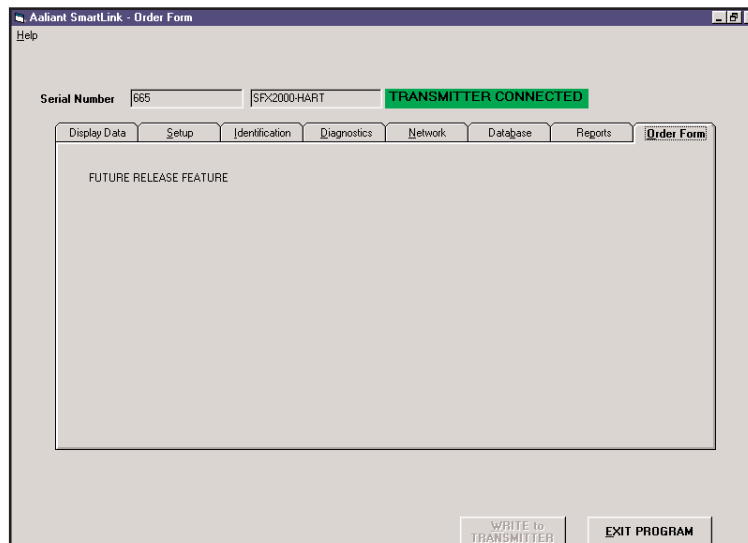


Figure 18. Order Menu Screen

### 3.2 MENU TREE for HART® Communication

#### HART Communication

The following Menu Tree is used with the HART® Model 275 Communicator. Refer to the user's manual shipped with your HART® communicator. Device description language for Model 275 communicator must be programmed into memory by a HART® authorized agency. HART® communicators are not supplied by Aaliant/Venture Measurement.



## 4.0 MAINTENANCE / PARTS LIST

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There is no required maintenance for the SmartLink software. Replacement parts include:

<b>Part #</b>	<b>Description</b>
60527G009	Software on CD
60527P017	LSK Modem RS232
60527P020	LSK Modem USB

## 5.0 TROUBLESHOOTING

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If you experience problems with the SmartLink software, verify installation of the software and connection of the Model 2000 transmitter to the flowmeter. If you have problems or need assistance, please call Aaliant Repair at 800-778-9251.



150 Venture Boulevard  
Spartanburg, SC 29306  
Phone: (864) 574-3327, Fax: (864) 574-8063  
Customer Care: (800) 778-9251  
Internet: <http://www.aaliant.com>  
email: [sales@aaliant.com](mailto:sales@aaliant.com)



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