

---

# 289H DIAGNOSTICS TESTS

---

The procedures for running the Diagnostic Tests are easy. In most cases, you simply select the test you wish to perform, and the MAP program does the rest. With some of the tests, however, you will need to enter the specific device, access number, or board number that you wish to inspect. After contact is established and the testing is completed, results from the testing are output to the computer terminal (or printer) where you can study the outcome. All test procedures begin at the 289H Diagnostics Menu illustrated in SCREEN 1.

```
289 LSS Diagnostics Menu
-----
 1. System Configuration
 2. Calibration Test
 3. Realtime Reading Test
 4. Specific Device Info
 5. Capacitance Test
 6. Ping Relays Test
 7. Cold Reset
 8. Leakage Test
 9. AC Test
10. DC Test
11. Dialout Phone Number Information
12. Device Alert Information
13. Get Tone Settings
14. Set Tone Default
15. Route Tone
16. Erase AMC Flash
17. Pair Realtime Reading Test

Choice?
```

SCREEN 1: 289H LSS DIAGNOSTICS MENU

**Note:** If you wish to step back to the previous menu (for example, if you wish to run tests on a different office), press <*Return*> without selecting a Diagnostics Test. If you do so, the phone connection to the office will be dropped, and you will be at a prompt where you can select a new office and/or test mode.

### *System Configuration*

Selecting the System Configuration option (by pressing *1* followed by <*Return*>), will display a screen similar to the one illustrated in SCREEN 2. This screen displays the current status of the 289H LSS that monitors the office you have selected. By viewing the data displayed on this screen, you can determine what slots are filled, which boards are in the 289H LSS monitor and if the 289H LSS is terminating calls correctly.

# OPERATIONS

---

```
System Configuration for Salt Creek                      CPAMS Diagnostics XX.XX.XX
10/23/2002 13:37                                     System Studies Incorporated
-----
LSS Engine:      289H LSS                               Version:        G.02/G.02
Password:        Set                                   System Reset:   No
Exit State:      Wait SOH State                       Exit Status:    Normal Termination

Inventory:
Slot            1    2    3    4    5    6    7    8    9    10   11   12   13   14   15   16
Chassis -----
  1 | SUB SUB AMC DED AMU SUB DED                               SUB
  2 | DED DED DED DED SUB
  3 |
  4 |

Hit <Return> to return to the 289H LSS Diagnostics menu.
```

SCREEN 2: SYSTEM CONFIGURATION FOR 289H LSS

The seven fields displayed on the screen are described below:

—**LSS Engine** field indicates the type of monitor to which you are connected, either a 289H or 289.

—**Version #** indicates the Version numbers of the firmware built into the 289H LSS that you are examining. The characters to the left of the slash represent the version of the firmware built into the ROM in the 289H. The characters to the right of the slash indicate the patch level installed in the 289H. Because the firmware can be patched, the 289H can be updated via PressureMAP. Both firmware and patch versions are labeled with alphabetic characters to the left of the decimal point, and the numeric characters, 1 through 99, to the right of the decimal point.

—**Password** is either Set or Reset. Set indicates that a password is required to enter the 289H, while Reset indicates that a password is not required. Every time that PressureMAP calls the 289H, it sets the password to the one indicated on the System Information Screen in the PressureMAP Editor. If there is no password on the System Information Screen, Reset will appear in this field.

—**System Reset** Resetting the 289H is the same as rebooting a computer. The 289H has the ability to reset itself under a number of circumstances, or it can be reset on demand from PressureMAP. A special dispatch is generated whenever the 289H is reset. The System Reset field indicates whether the 289H has gone through a reset since the last time the 289H was called.

—**Exit State** indicates the state of the communications protocol when an end of session was detected. The normal reading is "Wait SOH State" but a message other than this is not normally a cause for alarm. This is primarily a tool System Studies personnel use to diagnose a problem.

—**Exit Status** indicates how the last session ended and will usually read "Normal Termination." It is similar to the **Exit State** field in that it may contain other messages and is primarily intended for System Studies' use. Normal Exit Status values are NORMAL TERMINATION, USER ABORT, and HUNGUP.

RETRY EXCEEDED, PREMATURE TERMINATION, RECEIVED DATA, NO RESPONSE, ASYNC PROTOCOL RECEIVED, or DCD LOST may indicate a problem. Call System Studies Technical Support if these types of status indicators persist.

OUT OF SYNC or BAD RESPONSE together with no readings indicate a problem. If any of these messages are displayed, please call System Studies Technical Support for assistance.

—*Inventory* is displayed in a table that shows what type of cards are loaded within each slot in the 289H. Each expansion chassis is shown on a separate line. SUB represents a subscriber card; DED identifies a standard dedicated card; AMC designates an addressable transducer card; and AMU identifies a Universal Addressable Monitoring Card. SRA, SRB and SRC represent the three configurations of the Sparton Dedicated Replacement Card (SPDR); please note that SPDR cards must be placed in the 289H chassis in front of other relay card types, and that they must be ordered (configured) as A, B, C, A, B, C, etc.

A blank space indicates that no card is present in that slot. UNK is displayed if the card is unrecognized; it indicates that the card is either not seated properly or possibly defective, or is not supported by the system’s version of PressureMAP. An inventory is taken automatically whenever the 289H is reset.

Hitting <Return> will take you back to the 289H Diagnostics Menu.

**Calibration Test**

Prior to performing either a board scan or a set of realtime readings, PressureMAP performs a Calibration Test on the boards involved. From the results of the Calibration Tests, PressureMAP is able to adjust the subsequent device readings to compensate for any error in calibration of the device. This is referred to as normalizing the readings. The inclusion of this Calibration Test in 289H Diagnostics allows a user to initiate a Calibration Test and study the results.

Calibration Test for Salt Creek			CPAMS Diagnostics XX.XX.XX	
05/21/2004 13:38			System Studies Incorporated	
-----				
<b>Resistor</b>	<b>Counts</b>	<b>Volts</b>	<b>Ohms</b>	<b>Correction</b>
-----	-----	-----	----	-----
Battery	39339	47.4		
Open (H)	28		+++++M	
3.8M (H)	983		3.934M	3.5%
100K (H)	36168		103.7K	3.7%
100K (L)	1313		102.9K	2.9%
10K (L)	10287		10.41K	4.1%
Short (L)	43362		96	
Which board?				

SCREEN 3: CALIBRATION TEST

To choose the Calibration Test from the 289H Diagnostics menu, press 2 followed by <Return>. You will first be prompted for the board number that you would like to test. After typing in a board number followed by <Return>, you will be able to examine the report displayed in SCREEN 3.

## OPERATIONS

---

—The **Resistor** field indicates which calibration resistor is being tested.

—**Counts** are the raw counts from the ADC as returned by the 289H. This information is useful to System Studies Technical Support personnel.

—**Volts** applies only to the battery calibration resistor and indicates the voltage of the CO batteries minus 0.7 volts.

—**Ohms** indicates the electrical resistance of each calibration resistor. The value in this field should be very close to the resistance implied in the name. For example, a 3.8 megohm calibration resistor could read 3.937M. A field with all pluses and a "M" for megohms ("+++++M") indicates a number whose magnitude is too great to fit in the field.

—**Correction** is the percentage difference between the theoretical resistance and the computed resistance. PressureMAP corrects readings using the calibrated values, resulting in less than a 1% error for a reading. Differences greater than 10% between the theoretical and computed resistance are reasons for concern and may indicate a faulty resistor.

At the bottom of the screen displaying the Calibration Test results you will be prompted to test another board. If you want to perform another Calibration Test, type in the board number followed by <Return>. To return to the 289H Diagnostics Menu, just hit <Return>.

### **Realtime Reading Test**

The Realtime Reading Test is primarily intended to be a tool for servicing the 289H. The realtime readings offered through the Specific Device Information function of PressureMAP is the preferred method of obtaining realtime readings for checking the pressurized cable system. Individual realtime readings are not available for the following addressable devices: Lancier, Nicotra and Inelcom. For these devices it is necessary to use the Pair Realtime Reading Test, described later in this section.

After a new device has been wired to the 289H LSS monitor and the device/access numbers have been entered into the PressureMAP database, PressureMAP must call for readings from the new device to install it in the database. After PressureMAP has called, you can initiate a realtime reading for the device for comparison with its manual reading.

**Note:** Do not short an addressable pair as this can damage the AMC or UAMC.

- Shorting a pair on an AMC can blow the F3 fuse. Once the F3 is blown, the AMC cannot read any of the addressable devices. The F3 fuse will need replacement to correct this condition.
- Shorting a pair on a UAMC causes the pair not to tune up, and no readings will be possible until the next scan cycle after the short is cleared.

After you select a Realtime Reading Test from the Diagnostics menu by pressing **3** followed by <Return>, you will see the message:

**Calibrating...**

After a few seconds, you will be asked for the device number that you would like to check:

**Test which device?**

You may select a monitoring device by entering either the device number or the corresponding access number. Access numbers are entered with a leading sharp character (e.g. "#001A") to distinguish them from device numbers. In most cases (except for addressable transducers), they can also be abbreviated. For 289H LSS devices, the device/access number is a card/pair combination. For example, "#2-1" is interpreted as "002-01". However, to look at a device with access number 001-02, you could enter either "#1-2" or "#2" since if you only specify the pair, the program assumes card 1.

It is important to note that the sharp (#) is already allowed as a valid character in user defined device numbers, and continues to be allowed in these numbers. All user input entered with a leading sharp character that **exactly** matches an existing device number (leading sharp included) is NOT treated as an access number; rather, it references the matching device number. For example, if a 289H office has a user defined device number "#11", then a user entry of "#11" selects device, NOT access, number "001-11".

Upon entering a valid device/access number, you will see the realtime reading for that device repetitively displayed on a screen similar to the screen samples that follow. You may wish to refer to the charts in the PressureMAP Tables sub-section that provide conversions from milliamperes to the corresponding reading value for current loop devices, and the equivalent information for resistive and System Studies addressable devices.

Data entry errors can cause many problems with readings, so checking the data is a valuable tool for troubleshooting. For example, if device information is entered in PressureMAP with an incorrect TD Type, it can easily be checked on the Specific Device Information Screen. Another cause for errors is entering two different devices with the same access number. Duplicate access numbers can be identified by running a Device History for the entire office by Access #.

Realtime Reading Test for Salt Creek				CPAMS Diagnostics XX.XX.XX				
01/02/1998 13:38				System Studies Incorporated				
Access #	Type	Counts	Scaled	Ohms	Range	Step	Status	Reading
001-01	F	35578	1045	101672	H	1		9.5
001-01	F	35580	1045	101672	H	1		9.5
001-01	F	35579	1045	101672	H	1		9.5
001-01	F	35579	1045	101672	H	1		9.5
001-01	F	35579	1045	101672	H	1		9.5
001-01	F	35580	1045	101672	H	1		9.5

SCREEN 4: REALTIME READING TEST DISPLAY—RESISTIVE DEVICE (FLOW)

Realtime readings for a current loop device vary from the sample shown in SCREEN 4, in that there is no scaling of the counts and no steps are shown. SCREENS 5 through 8 show the Realtime readings of current loop devices.

# OPERATIONS

---

Realtime Reading Test for Cedar City				CPAMS Diagnostics XX.XX.XX		
01/14/1999 13:38		System Studies Incorporated				
Access #	Type	Counts	Milli-Amps	Delta P	Status	Reading
001-29	F	3715	4.72	0.92		8.0
001-29	F	3620	4.60	0.77		7.4
001-29	F	3632	4.61	0.79		7.5
001-29	F	3599	4.57	0.73		7.2

SCREEN 5: REALTIME READING TEST DISPLAY—CURRENT LOOP DEVICE (FLOW)

Realtime Reading Test for Salt Creek				CPAMS Diagnostics XX.XX.XX		
01/02/1998 13:38		System Studies Incorporated				
Access #	Type	Counts	Milli-Amps	Status	Reading	
001-05	P	12787	14.99		20.0	
001-05	P	12787	14.99		20.0	
001-05	P	12787	14.99		20.0	
001-05	P	12787	14.99		20.0	

SCREEN 6: REALTIME READING TEST DISPLAY—CURRENT LOOP DEVICE (PRESSURE)

Realtime Reading Test for Cedar City				CPAMS Diagnostics XX.XX.XX		
01/14/1999 13:38		System Studies Incorporated				
Access #	Type	Counts	Milli-Amps	Status	Absolute	Reading
001-28	P	7110	9.04		6.6	9.4
001-28	P	7114	9.04		6.6	9.4
001-28	P	7114	9.04		6.6	9.4
001-28	P	7109	9.03		6.5	9.3

SCREEN 7: REALTIME READING TEST DISPLAY—CURRENT LOOP DEVICE (PRESSURE, WITH BAROMETRIC TRANSDUCER INSTALLED IN OFFICE)

```

Realtime Reading Test for Cedar City
01/14/1999 13:38
CPAMS Diagnostics XX.XX.XX
System Studies Incorporated
-----
Access #   Type   Counts   Milli-Amps   Status   Reading
-----
001-11    B     3674     4.67         -----   24.2
001-11    B     3675     4.67         -----   24.2
001-11    B     3665     4.66         -----   24.1
001-11    B     3670     4.66         -----   24.2
    
```

SCREEN 8: REALTIME READING TEST DISPLAY—CURRENT LOOP DEVICE (BAROMETRIC)

Realtime readings for addressable devices are displayed in SCREEN 9. This example shows readings for a System Studies Addressable Dual Transducer: the flow and pressure sensors share the same address, but the flow device is assigned to channel A and the pressure device to channel B. It is important to make sure “A” is coded for the flow sensor and “B” for the pressure sensor in the dual transducer, so that reading counts are associated with the correct device/access number and converted to the appropriate measurements (SCFH or PSI).

```

Test which device? 225
Realtime Reading Test for BONNEY LAKE
05/21/2004 13:38
CPAMS Diagnostics XX.XX.XX
System Studies Incorporated
-----
Access #   Type   Counts   Status   Reading
-----
001-A1-005A  F     6         -----   5.7
001-A1-005A  F     6         -----   5.7
001-A1-005A  F     6         -----   5.7

Test which device? 226
Realtime Reading Test for BONNEY LAKE
01/14/1999 13:38
CPAMS Diagnostics XX.XX.XX
System Studies Incorporated
-----
Access #   Type   Counts   Status   Reading
-----
001-A1-005B  P     74        -----   9.8
001-A1-005B  P     74        -----   9.8
001-A1-005B  P     74        -----   9.8
    
```

SCREEN 9: REALTIME READING TEST DISPLAY—ADDRESSABLE DEVICE (DUAL)

The fields displayed in the preceding screens are described below:

—**Access #** While the user is asked to input either the PressureMAP device number or the corresponding access number to do a realtime reading on a specific device, only the access number of that device is displayed. A list of device numbers with the corresponding access numbers can be reviewed in the PressureMAP Device Log.

## OPERATIONS

---

- Type** represents the second letter of the device type (for example, "F" for a flow device).
- Counts** are the raw ADC counts returned by the 289H. This information is useful to System Studies Technical Support personnel.
- Scaled** shows the scaled counts that have been adjusted for any discrepancy based on the calibration. This information is also useful to the Technical Support personnel.
- Ohms** indicates the resistance calculated from the scaled counts.
- Range** indicates which range of the measurement circuit was used for the measurement ("H" = high range, "L" = low range). The high range is used for measurements above 100K ohms.
- Step** represents the approximate step number of a 20-step transducer. A reading of 100k ohms is step 1 and 3.8M ohms is step 20. A reading below step 1 displays as 0 and a reading above step 20 displays as ++.
- Milli-Amps** shows the electrical current output calculated from the data in the **Counts** field.
- Delta P** represents the pressure differential value created by the Flow Finder orifice to which the current flow transducer is pneumatically connected. This value is converted by PressureMAP to the appropriate flow reading for the defined flow range of the device.
- Status** indicates the status of the pair. The status indicator message is the precursor to the corresponding "verbose" reading (see Appendix 1 of the *MAP System Operations Manual*). Values for non-addressable devices are listed in Table 8-1.

<u>Status</u>	<u>Reading</u>	<u>Cause</u>
(Blank)	(Blank)	Device not scanned yet
Busy	BUSY	Subscriber pair was in use when reading taken
Noise	NSE	AC voltage on pair
Leak	UBAL	Imbalance
Volt	VOLT	Stray voltage on pair (> 10Vdc or 6Vac)

TABLE 8-1: STATUS INDICATOR DEFINITIONS FOR NON-ADDRESSABLE DEVICES

When a verbose reading appears for addressable devices, the Status value can be used to further define the problem. Comparing the reading to other devices on the same pair may also be helpful. The status indicators for addressable devices, the related verbose reading values, and interpretations are listed in Table 8-2.



<u>Status</u>	<u>Reading</u>	<u>Cause</u>
NRead Addr	(Blank) ADDR	No new reading (device not scanned yet) Incorrect address, improper wiring, or defective module; invalid type (data entry)
NoRsp Comm	NONE NSE	Device not responding Device communication error; attempt to read device timed out
Noise DOpen POpen Load	NSE OPEN OPEN PAIR	Excessive noise on pair Open between TD and transceiver Pair is open Loading on pair is greater than expected maximum
Misma	PAIR	Data mismatch (this status message was replaced by N/A in PressureMAP Version 20.00.51, ADDR/PROG in Version 20.01)
Prog DShrt PShrt	PROG SHRT SHRT	Invalid programming for device(s) on pair Short between TD and transceiver Short on pair

TABLE 8-2: STATUS INDICATOR DEFINITIONS FOR ADDRESSABLE DEVICES

—**Absolute** defines the actual pressure reading provided by the current loop device before its reading is adjusted for barometric pressure. This field appears only if a barometric pressure transducer is installed in the office.

—**Reading** represents the **unbiased** reading for that type of device. (The actual reading might be biased by an offset in the PressureMAP Database—e.g., an SP device.) When running the Diagnostic Realtime Reading on a Trunk and Toll contactor, the usual reading will be replaced by a series of question marks. A VOLT reading in this column indicates the presence of lethal voltage. (A complete list of “verbose” readings is provided in Appendix 1 of the *MAP System Operations Manual*.)

Realtime readings will continue to be posted to the screen until **<Esc>** is pressed, at which time you will be prompted for another device number. Enter another device number followed by **<Return>** to perform another Realtime Reading Test. Hit **<Return>** to return to the 289H Diagnostics Menu.

***Specific Device Info***

The fourth option of the menu, Specific Device Info, is provided so device information can be viewed without having to leave the 289H Diagnostics Menu. The screen of information that is displayed is essentially the same screen displayed by the PressureMAP option, Specific Device Information, described in detail in Section 2 of the *MAP System Operations Manual*.

```

Specific Device Information for Salt Creek                CPAMS Diagnostics XX.XX.XX
05/21/2004 13:38                                     System Studies Incorporated
-----
Device #: 001A           Access #: 001-01           Type: UP
Address: MH-20 SOQUEL   Loc: 15 Pipe: BA
TD Type: RA
Sheath(s): 02

Cable:      02           Prim Pair: 704           Sec Pair:           Sort Key:
Plat #:     UG-7         Stickmap: 5
Phone:
Latitude:           Longitude:

Office 1 Loc: 14           Distance 1 (kft): 2.9           Field 1 Loc: 16
Office 2 Loc:           Distance 2 (kft):           Field 2 Loc:

Remarks:
Readings      Curr Last Tdy  -1  -2  -3  -4  -5  -6  Wk-1 Wk-2 Wk-3 Wk-4
-----
                12.0 12.0  7.0  7.0  7.0  7.0
    
```

SCREEN 10: SPECIFIC DEVICE INFORMATION DISPLAY

**Capacitance Test**

If you choose Realtime Capacitance Test from the 289H Diagnostics Menu by pressing **5** and **<Return>**, you will first be asked for the device number to test. After entering a valid device number, or the corresponding access number, a screen similar to SCREEN 11 will be displayed. (Even though you are asked to enter the device number, only the access number will be displayed on the screen.) The display for both sides of the pair will include the raw capacitance counts, the capacitance (in picofarads), the distance of an open from the Central Office in thousands of feet (kilofeet), and a location indication.

**Note:** The Capacitance Diagnostic Test should *not* be performed on addressable pairs.

```

Capacitance Test for <OFFICE NAME>                CPAMS Diagnostics XX.XX.XX
01/02/2003 13:39                                     System Studies Incorporated
-----
Access #   -----Tip Side-----           -----Ring Side-----
           Counts  p-farads  K-feet  Loc.           Counts  p-farads  K-feet  Loc.
-----
001-01     48365    139551   1.837  OUT           80932    233520   3.537  OUT
001-01     46829    135119   1.866  OUT           80813    233177   3.537  OUT
001-01     47046    135746   1.843  OUT           80594    232345   3.537  OUT
    
```

SCREEN 11: CAPACITANCE TEST DISPLAY

This test is used to determine how far the 289H is located from an OPEN on a pair. Although only a very rough estimate is given, it is useful to determine if the OPEN is within the CO or outside. Readings are displayed continuously until an **<Esc>** is entered. The screen that is displayed shows the status of the following fields.

—*Counts* is the raw response from the 289H's capacitance counter. This information is useful to System Studies Technical Support personnel.

—*p-Farads* is the capacitance in picofarads, computed from the raw counts. (One picofarad is .000001 microfarads.)

—*K-feet* is the rough computed distance of an open from the 289H monitor in thousands of feet. It is important that you NOT use this distance for fault locating because it is a rough estimate.

—*Location* indicates whether the open is inside (IN) or outside (OUT) the CO.

The test results will continue to be listed until you press <Esc>. At that point you will be prompted for another device number. Either enter the number of the next device that you would like to test, or press <Return> to go back to the 289H Diagnostics Menu.

**Ping Relays Test**

The Ping Relays Test is a simple test to determine whether all of the line selection relays on a given board are operating. The test requires that someone is listening near the 289H when it is performed. When the test is run, the relays on the chosen card "ping" with a distinctive rhythm. This pinging of the relays is performed repetitively, in groups of five, with a pause of approximately five seconds between repetitions. If the listener detects a gap in the sequence of pings, he can calculate which relay is not pinging.

**Note:** The Ping Relays Diagnostic Test should not be performed on addressable pairs.

There are two reasons why a relay would not ping during the test. One is that the relay is faulty, the other is that the line is busy. While busy lines are obviously not a problem when testing a dedicated board, they could confuse a test on a subscriber board. For that reason, this test provides a display that indicates busy lines.

When running this test on a dedicated board, the output displayed is the word "ping" for each time the board is pinged. For subscriber boards, the output displayed is a sequence of ones and zeros - one digit for each line. The first digit displayed corresponds to the first line on the selected card. A value of 0 indicates the line was free whereas a value of 1 indicates that the line was found to be busy. After removing the relays that were found to be busy during the test from the list of relays found to be silent, the remaining ones are determined to be faulty.

To run the Ping Relays Test, select it from the 289H Diagnostics Menu by pressing **6** <Return>, and you will be asked for a board number to test. Upon entering a valid board number (see the introduction to this section for a description of how boards are numbered), you will see a display similar to SCREEN 8. In this example, all of the subscriber lines were found to be on hook except line 9 which was found to be busy all four times that the test was run.

```

Ping Relays Test for Salt Creek                                CPAMS Diagnostics XX.XX.XX
01/02/2003 13:42                                           System Studies Incorporated
-----
Pairs 1-25 00000 00010 00000 00000 00000
Pairs 1-25 00000 00010 00000 00000 00000
Pairs 1-25 00000 00010 00000 00000 00000
Pairs 1-25 00000 00010 00000 00000 00000
    
```

SCREEN 12: PING RELAYS TEST DISPLAY

## OPERATIONS

---

The test will continue until you press <Esc>, after which you will be prompted for the number of another board to reset. You may then enter the number of another board, or hit <Return> to go back to the 289H Diagnostics Menu.

### ***Cold Reset***

This option will remotely command the 289H to reset. Executing a Cold Reset wipes out patches and any knowledge of a device's status. If the 289H is equipped for Dedicated Tone capability, the reset monitor will default to the condition where the pseudo-data tone is routed to all pairs. In addition, the password is reset so that none is required and a board inventory is automatically taken after the 289H is reset. Cold Reset does not cause an addressable card (UAMC or AMC) to clear or erase its device table. A reset 289H with both dedicated and addressable cards will have to reload data for the dedicated devices, but not the addressables. Please note: PressureMAP's initial call that reloads the device data will be considerably longer than an ordinary scheduled call.

After choosing Cold Reset by pressing 7 followed by <Return>, you will see the message:

**Do you want to cold reset the 289H LSS? Y[es], N[o].**

This message acts as a confirmation to make sure that a Cold Reset is not initiated by mistake. Pressing Y followed by <Return> will implement the Cold Reset. You will then see the message:

**Cold reset accepted. It will not occur until we hang up.**

**Hit <Return> to return to the 289H LSS Diagnostic Menu.**

The actual cold resetting process does not take place until after you hang up, which is accomplished by hitting <Return> to return to the 289H LSS Diagnostics Menu, and then hitting <Return> again.

### ***Leakage Test***

If you choose Leakage Test from the 289H Diagnostics Menu by pressing 8 and <Return>, you will first be asked for the device number to test. After entering a valid device number, or the corresponding access number, a screen similar to SCREEN 13 will be displayed. Even though you are asked to enter a device number, only the corresponding access number will be displayed on the screen.

**Note:** The Leakage Diagnostic Test should *not* be performed on addressable pairs.

The Leakage Test measures the actual resistance on tip/gnd, ring/gnd and across tip and ring. These measurements can be used to determine if a SHORT on a flow transducer circuit is due to leakage on the pair or some other factor.

The Leakage Test is generally used for resistive type devices, but can also be used to confirm the type of device installed. For example, a current loop device that reads PAIR and has a value of .2 to .7 mA in the Realtime Reading Test can be further tested to see if it is a resistive device input in PressureMAP as a current flow device. A value between 1,000 and 9,000 ohms (in the Tip/Ring Ohms column) represents a valid reading for a current loop device; but a value between 100K ohms and 3.8M ohms indicates that the transducer is actually a resistive device.

```

Realtime Leakage Test for CITRUS HEIGHTS          CPAMS Diagnostics XX.XX.XX
03/04/2002 13:42                               System Studies Incorporated
-----
Access #      Tip/Ring Ohms      Tip/Gnd Ohms      Ring/Gnd Ohms
-----
001-15       6,816                    100M              86,231,576

Test which device?
    
```

SCREEN 13: LEAKAGE TEST DISPLAY

At the bottom of the screen displaying the Leakage Test results you will see the prompt:

**Test which device?**

If you want to perform another Leakage Test, type in the device number followed by <Return>. To return to the 289H Diagnostics Menu, just hit <Return>.

**AC Test**

The AC test measures AC voltage on tip/gnd and ring/gnd. This test should be run to determine the actual voltage on the pair if the device has a VOLT message in the **Status** column during a realtime reading. If the device has acquired a VOLT reading during the normal call cycle, lethal voltage has been found on the pair. The AC test can also be useful when troubleshooting pressure transducer pressure drops. By running this test, wire problems can be diagnosed before a technician is dispatched to the field.

**Note:** The AC Voltage Diagnostic Test should *not* be performed on addressable pairs.

To choose the Realtime AC Test from the 289H Diagnostics menu, press **9** and <Return>. You will be prompted for the device number to test. After entering a valid device number, or the corresponding access number, a screen similar to SCREEN 14 will be displayed. Even though you are asked to enter a device number, only the corresponding access number will be displayed on the screen.

```

Realtime AC Test for Salt Creek                  CPAMS Diagnostics XX.XX.XX
01/02/2003 13:42                             System Studies Incorporated
-----
Access #      VAC      VAC
Tip/Gnd      Tip/Gnd  Ring/Gnd
-----
001-01       0.0412  10.0373

Test which device?
    
```

SCREEN 14: AC TEST DISPLAY

## OPERATIONS

---

The AC voltage indicated in the **VAC Tip/Gnd** and **VAC Ring/Gnd** columns should be 1.0 VAC or less.

At the bottom of the screen displaying the AC Test results you will see the prompt:

**Test which device?**

If you want to perform another AC Test, type in the new device number followed by **<Return>**. To return to the 289H Diagnostics Menu, just hit **<Return>**.

### **DC Test**

The DC test measures DC voltage on tip/gnd and ring/gnd. This test should be run to determine the actual voltage on the pair if the device has a VOLT message in the **Status** column during a realtime reading. If the device has acquired a VOLT reading during the normal call cycle, lethal voltage has been found on the pair. The DC test can also be useful when troubleshooting pressure transducer PSI drops. By running this test, wire problems can be diagnosed before a technician is dispatched to the field.

**Note:** The DC Voltage Diagnostic Test should *not* be performed on addressable pairs.

To choose the Realtime DC Test from the 289H Diagnostics menu, press **10** and **<Return>**. You will be prompted for the device number to test. After entering a valid device number, or the corresponding access number, a screen similar to SCREEN 15 will be displayed. Even though you are asked to enter a device number, only the corresponding access number will be displayed on the screen.

Realtime DC Test for Salt Creek		CPAMS Diagnostics XX.XX.XX
01/02/2003 13:42		System Studies Incorporated
-----		
<b>Access #</b>	<b>VDC Tip/Gnd</b>	<b>VDC Ring/Gnd</b>
-----	-----	-----
001-01	0.0031	0.0000
Test which device?		

SCREEN 15: DC TEST DISPLAY

Readings in the two **VDC** columns should be under 1.0 volt, as shown above.

At the bottom of the screen displaying the DC Test results you will see the prompt:

**Test which device?**

If you want to perform another DC Test, type in the device number followed by **<Return>**. To return to the 289H Diagnostics Menu, just hit **<Return>**.

**289H Device Alert Options**

The next two options of the 289H Diagnostics Menu will only be displayed if the 289H that has been called has been upgraded with device alert capabilities. If you do not see menu items 11 and 12 on the 289H Diagnostics Menu, (SCREEN 1), and you wish to upgrade your 289H monitor with device alert capabilities, please call System Studies for more information.

**Note:** If the Access Number Translation capability has been enabled, the following two diagnostics options are renumbered to **12** and **13**.

**Dialout Phone Number Information**

Selecting the Dialout Phone Number Information option (by entering the number **11** followed by **<Return>**) enables you to test the alert dialout capabilities of the 289H LSS from PressureMAP. This menu option produces a display similar to the one illustrated in SCREEN 16.

The data fields on the screen provide key information about the 289H LSS to be tested and the PressureMAP system initiating the dialout phone number test. Please note that the alerting configuration shown in this sample is merely intended to show the different formats for information that may be displayed; it does not reflect the setup of an actual 289H monitor.

Dialout Phone Number Information		CPAMS Diagnostics XX.XX.XX System Studies Incorporated		
01/02/2003 10:33		-----		
PMAP ID	MAP Alert #	289 ID	Status	Attempts
-----				
1	0202 4759999	4234444	NORMAL	0
2	0111 T9W14089231844	4234444	NO CARRIER	3
3	0999 T192.168.0.1:3002	1463001	NORMAL	0
4				
Test dialout phone number? (y/n)				
Hit <Return> to return to the 289 LSS Diagnostics menu.				

SCREEN 16: DIALOUT PHONE NUMBER INFORMATION SCREEN

The data fields displayed on the screen are described below.

—**PMAP ID** This is the "System Number" that was assigned by System Studies when the MAP System was installed.

—**MAP Alert #** The phone number of the 289H's alert modem is listed here. It can also be found in the **MAP alert #:** field of the PressureMAP Office Information Screen. For 289H/H-M monitors using a network connection to PressureMAP, this field contains the IP address for the PressureMAP computer.

—**289 ID** This column contains the last seven digits of the PressureMAP office's phone number or IP address, as input in the **Phone number:** field of PressureMAP's Office Information Screen.

—**Status** The call error message (if any) is recorded in this column. If no modem errors have occurred in the last 289H alert test function, the message "Normal" appears. Other possible status conditions could included the following: No Answer, No Connect, Busy, Incoming, Retry

## OPERATIONS

---

Exceeded, No Response, Incorrect Response, No Modem Response, Undefined Error, etc. A complete list of 289H LSS Alert Modem Status Codes appears in Appendix 5 of the *289H LSS Installation and Operations Manual*.

—**Attempts** The number in this column indicates how many unsuccessful attempts have been made to contact the 289H alert modem. This number is reset to zero when PressureMAP connects with the alarm modem.

After choosing Dialout Phone Number Information from the 289H LSS Diagnostics Menu by pressing **11** followed by **<Return>**, you will see the message:

```
Test Dialout phone number?  Y[es], N[o].
```

Pressing **Y** followed by **<Return>** will produce the following message:

```
PMAP_ID?
```

Enter the number assigned to the PressureMAP system to which you would like to place a test call. This is the three digit number located in the **PMAP ID** data field. The program responds with the following:

```
Please Wait, Disconnecting..
```

```
This test will take between 45 and 120 seconds
```

This part of the process sends a “force call” request to the 289H LSS, and then terminates the call in order to allow the 289H LSS to call PressureMAP. If PressureMAP cannot reach the 289H being called, it displays the following message:

```
Office does not answer; waiting..
```

```
Attempting call again...
```

Once the connection has been made and the “force call” request is initiated, PressureMAP hangs up and waits for the 289H’s call. The following displays indicates that PressureMAP is awaiting a call:

```
1           15           30           45           60
.....
```

```
Test call was SUCCESSFUL!
```

Eventually PressureMAP will display the message above and redial the selected 289H LSS office so that other 289H LSS Diagnostics options can be selected, if desired.

### **Device Alert Information**

The next option of the 289H Diagnostics Menu lists the set alert level and current reading for any device you select. You may enter more than one device number by using the list/range format described in the Preface section of the *MAP System Operations Manual*.

Select the Device Alert Information option by entering the number **12** followed by **<Return>**. You will see a screen similar to the one illustrated in SCREEN 17.



Device Alert Information for 289H				CPAMS Diagnostics XX.XX.XX	
01/02/2003 13:37				System Studies Incorporated	
Device #	Access #	Type	TD Type	Scan Rdg	Alert Level
001-05	003A	UP	RP	8.5	8.0
001-06	003B	MF	RF	11.0	13.0
001-08	004B	TC	RP	(9949)	
001-09	005A	CA	RP	OK	(420K)
001-10	005B	CA	RP	ALRM	

Device alert information for which device?

SCREEN 17: DEVICE ALERT INFORMATION SCREEN

—**Device #** The assigned number for the device. Note that this number can be the same as the access number if User Defined Device Numbering is turned off.

—**Access #** The access number for the device.

—**Type** The PressureMAP device type for the device.

—**TD Type** The transducer type. A list of possible transducer types is listed at the end of the Preface in the *MAP System Operations Manual* and in Appendix 1 of the *MAP System Data Entry Manual*.

—**Scan Rdg** A current "Realtime Reading" of the device. If this number is in parentheses, the device reading is displayed in measurement units (e.g., ohms or milliamperes) instead of reading units (e.g., PSI or SCFH).

—**Alert Level** This is the programmed device reading level at which the 289H LSS will generate a call to PressureMAP. A blank entry in this column indicates that the alert threshold is not enabled. This condition usually occurs when a device has already alerted and cannot issue another alert, either because the reading has approached the extreme "bad" end of its range (e.g., near 0 if a pressure transducer) or, if the device is a contactor, the reading is now ALRM.

