

# LMS-188-4P

## 4 POINT DIGITAL MONITOR/ALARM

### OPERATING INSTRUCTIONS



**WARNING:** This product can expose you to chemicals including lead, which is known to the State of California to cause cancer. For more information, go to [www.P65Warnings.Ca.gov](http://www.P65Warnings.Ca.gov)



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## Front Panel

The Multi-Probe Alarm System front panel consists of the following:

- Graphic LCD
- Channel Status LEDs (*STATUS*)
- Alarm LED (*ALARM*)
- Audible alarm indicator (buzzer)
- Buttons
  - Test & Reset (*TEST/RESET*)
  - Step button (*STEP*)
  - Alarm Limits & decrement button (*vv*)
  - Min/Max & increment button (*^^*)
  - Mute & Menu increment button (*MUTE/MENU*)



## Sensor Probe

The probes supplied with the Multi-Probe Alarm System are highly accurate temperature sensors. The sensor may be put in water or other mild aqueous solutions from -100°C to 100°C. **NOTE:** Avoid submerging the probe in solvents or harsh chemicals. Use protective thermowells when monitoring such materials.

**NOTE: The warranty does NOT cover damage to probes or electronics that is caused by exceeding temperature limitations, or damage to probes caused by using them in solvents or other unsuitable environments.**

**NOTE:** If the displayed temperature shows a consistent high (> 100°C) or low (< -100°C) value, most likely, the probe has failed.

## Probe Installation

RTD sensors supplied with the LMS-188-4P should be installed using the supplied fittings, which are 1/2" MNPT x 1/8" compression. After installing the fitting into a tee, insert the RTD into the fitting and adjust the depth of the probe so as the tip of the probe is approximately at the center of the piping. Tighten the nut finger tight, then with a small wrench turn the nut 1/4 to 1/2 turn past finger tight. Warning – do not overtighten.

## Power-up

Shows LMS startup screen.

NO BATTERY

Power Down + Install Battery

The unit will run without a backup battery but will show “NoBatt!” on the display to indicate lack of backup battery.

When a battery is properly installed battery status is shown on the display

up arrow	charging
solid block	full charge
flashing block or block with blank lines	battery problem

## Power-down Sequence

To shut off the battery to allow complete power down:

Tap the TEST/RESET button to enter relay test, then unplug unit.

Alternately you may Press-and-Hold the TEST/RESET button to trigger a hardware reset, and while the screen is blank unplug the unit and then Release the button.

## Runtime Display

The runtime display shows the current readings of 2, 3 or 4 probes.

## Alarm Conditions

### Temperature Alarms

If the readings are within the alarm limits, the STATUS LED will blink green.

When the temperature reading meets or exceeds the temperature limits the STATUS LED will blink red.

After the probe's alarm delay time is exceeded the unit will blink the ALARM LED and beep the buzzer.

The user can MUTE the buzzer by tapping the MUTE/MENU button. The unit will reduce the audible signal from a loud beep, to a quieter and less frequent chirp. It will remain muted until MUTE time expires or a different probe goes into alarm.

Once the Alarm state has been signaled the unit will wait the appropriate Relay Delay(s) time before tripping the appropriate Relay(s). Units with individual channel relays, have individual Relay Delay times. Units with a single relay have one Relay Delay time that applies to any alarm condition.

Limit Parameters

**1 Low, 1 High, 2 Low, 2 High, 3 Low, 3 High, 4 Low, 4 High**

Time Parameters

**1AlarmDelay, 2AlarmDelay, 3AlarmDelay, 4AlarmDelay**

Single Relay Units

**RelayDelay**

Individual Channel Relays

**1RelayDelay, 2RelayDelay, 3RelayDelay, 4RelayDelay**

### Low / High Alarm Limits

For a quick view the Low and High Alarm Limits tap the DOWN ARROW.

<b>1</b>	AlarmLow	2.0°C
	AlarmHigh	8.0°C
<b>2</b>	AlarmLow	2.0°C
	AlarmHigh	8.0°C
<b>3</b>	AlarmLow	2.0°C
	AlarmHigh	8.0°C
<b>4</b>	AlarmLow	-40°C
	AlarmHigh	-20°C

### Min/Max Readings

To view the Min/Max readings since power up or user commanded reset, tap the UP ARROW.

<b>1</b>	ActualMin	3.1°C
	ActualMax	6.8°C
<b>2</b>	ActualMin	3.6°C
	ActualMax	6.6°C
<b>3</b>	ActualMin	3.0°C
	ActualMax	7.2°C
<b>4</b>	ActualMin	-38°C
	ActualMax	-32°C

To manually reset the Min/Max readings, while the Min/Max readings are shown on the display, tap the TEST/RESET button. You will be asked to repeat TEST/RESET to confirm.

## LMS Email Notification Feature

The LMS sends email on unit reset, alarm, continued alarm and recovery from alarm. The unit sends email 5 minutes after email failure and repeats every 10 minutes after that. Once daily, it sends a report of the last 24 hours that includes temperatures on the hour and alarms to contact #1.

The email subject line identifies the unit and reports the current temperature. The message reports the last 10 minutes of data. The unit is identified by the name ID001, where 001 is the unit number assigned by the user as an LMS parameter. All mail settings are setup using web pages accessed by the IP assigned to the unit.

### LMS EMAIL SETUP PARAMETERS -- IP, Setup Web Page Passcode

NAME	Description	Explanation	Factory Set
IP1	IP 1	First number of IP (1.2.3.4)	192
IP2	IP 2	Second number of IP	168
IP3	IP 3	Third number of IP	0
IP4	IP 4	Fourth number of IP	141
NetworkCode	PassCode	5 digit PassCode for Setup web page access (-30000 to 30000)	-22718

**Depending on the Network being utilized, the factory setting on the alarm unit for IP1, IP2 and IP3 may need to be changed to match the corresponding settings of the network. IP4 may also need to be changed if another device is using the default number.**

Main page:

Access by entering IP address on your browser's URL.

Main page displays

- the designated email server and the email address
- the last 10 minutes of data from the LMS
- the contact list of up to 8 email addresses

Main page has links to

- edit the contact list \*
- send a test email to all contact list addresses
- view a log of alarm emails and test emails
- clear the email log \*
- retry getting date & time from nist server

\* requires list name/password

Setup page:

Requires the Master name "setupadmin", and the LMS five digit passcode.

Allows specification of Subnet Mask, Gateway, DNS Server, SMTP Server, SMTP auth user, SMTP password, List Administrator Name, List Password, Time zone [EST: -5, CST: -6, MST: -7, PST -8], Daylight Savings start and end, and the time the daily report should be sent [0-23].

Edit contact link:

Requires the List User Name and List Password for access.

Allows specification of up to 8 email contact addresses.

### **Protonode Option**

If the Protonode option has been installed with the alarm unit, please contact Leonard Valve for complete interface instructions.

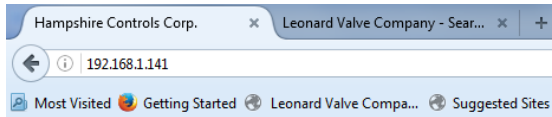
### **Resetting Computer IP Address**

If LMS-188-4P is not communicating with your computer, your computer's IP address may need to be manually set. Use the following directions: 1) Get to the 'Network and Sharing Center' section either through 'Control Panel' or the internet connection icon on your taskbar. 2) Click on 'Local Area Connection' to bring up the status page. 3) Click properties and then highlight 'Internet Protocol Version 4 (TCP/IPv4)' and click 'Properties'. 4) In this new window, click the option 'Use the Following IP Address' and enter the numbers for IP1, IP2 and IP3 from the LMS unit. For IP4, enter any combination of numbers, 1-3 digits long. Just be sure it is not the same as LMS-188-4P. Subnet Mask is 255.255.255.0 and the Default Gateway is left blank.

### **Web Pages:**

[Main Page]

[Access by entering the IP in browser address bar]



**MPS Email Alarm Notification v1.0**

Server: smtp.land1.com    Address: t140@hampshirecontrols.com

**Last Data Reported**

05/25/2016 16:09 DST..Ok 85°F 84°F 83°F 84°F  
05/25/2016 16:10 DST..Ok 85°F 84°F 83°F 84°F  
05/25/2016 16:11 DST..Ok 85°F 84°F 83°F 84°F  
05/25/2016 16:12 DST..Ok 86°F 84°F 83°F 84°F  
05/25/2016 16:13 DST..Ok 85°F 84°F 83°F 84°F  
05/25/2016 16:14 DST..Ok 85°F 84°F 83°F 84°F  
05/25/2016 16:15 DST..Ok 85°F 84°F 83°F 84°F  
05/25/2016 16:16 DST..Ok 85°F 84°F 83°F 84°F  
05/25/2016 16:17 DST..Ok 85°F 84°F 83°F 84°F  
05/25/2016 16:18 DST..Ok 85°F 84°F 83°F 84°F  
[05/25/2016 16:19 DST]

**Contact List**

- 1:ericcosta@leonardvalve.com
- 2:efontaine@leonardvalve.com
- 3:rcota@leonardvalve.com
- 4:cpotter@leonardvalve.com
- 5:
- 6:
- 7:
- 8:

[Edit Contact List](#)

[Send test email \(to all\)](#) --click once and please wait

[View Test/Email/Time Log](#)

[Clear Log](#)

[View Single Email Debug](#)

[retry nist time](#) --click once, wait 1 minute, then check log



[Setup page – "initial setup"]

[Access by adding "setup.html" to the IP]

[ User: setupadmin (not editable, case sensitive) Password: <5-digit code from LMS>]

Subnet Mask	255.255.255.0
Gateway	192.168.1.100
DNS Server	8.8.8.8
SMTP Server	smtp.1and1.com
SMTP auth user	t140@hampshirecontrols.com
SMTP password	D41yR757368
List/Log User	listadmin
List/Log Password	idoemallist
Timezone(EST:-5,PST:-8)	-5
DST *starts (mm/dd/yy)	3/13/16
DST *ends (*Sunday)	11/6/16
Daily Report Time(0-23)	8

Submit Reset

Gateway on Setup Page **MUST** match the Gateway of the network that is utilized. See Network administrator for DNS Server & SMTP information. If these parameters are unavailable, use **8.8.8.8** for **DNS Server**, **smtp.1and1.com** for SMTP Server, [t140@hampshirecontrols.com](mailto:t140@hampshirecontrols.com) for **SMTP auth user**, and **D41yR757368** for SMTP password. **Note that these parameters are for test purposes only!**

[Contact List Page for maintaining contact list]

[Access via link from main page]

[ User: <as defined by Setup> Password: <as defined by Setup> ]

1	ericcosta@leonardvalve.com
2	efontaine@leonardvalve.com
3	rcota@leonardvalve.com
4	cpotter@leonardvalve.com
5	
6	
7	
8	

Submit Reset

Defaults:

Web	Setup Administrator	setupadmin	*this is coded into the firmware and is not editable
	Setup Password	-22718	*use LMS NetworkCode as password
Web	List Administrator	listadmin	
	List Password	idoemaillist	

Please define:

LMS: IP (IP1, IP2, IP3, IP4)  
NetworkCode: number –30000 to 30000  
Web Setup: Subnet Mask SMTP Server  
Gateway SMTP auth user  
DNS Server SMTP password  
Contacts: At least 1 email contact

**Installation Instructions:**

#1 – Set Your IP

From the LMS front panel: Tap Menu to enter Edit.  
Tap Test and Menu simultaneously, to switch to the \*SETUP\* group of parameters.  
Use Step to advance to IP1,IP2,IP3,IP4 and set them accordingly.  
If desired modify your Unit ID and NetworkCode.  
Tap Menu 3 times to advance out of Edit and back to the runtime temperatures.  
Hold Reset until the display goes blank, then release.

#2 -- Define your network and email settings

Using your web browser enter the IP address to access the unit.  
After reviewing main web page, add "/setup.html" to the IP, to access the Setup Info.  
Name: setupadmin (unchangeable, case sensitive) Passcode: -22718  
Enter your Subnet Mask, Gateway, DNS Server.  
Enter your SMTP server, SMTP auth user, and SMTP password.  
Submit.

Back at the main page verify server and address at top of page, then click "Edit Contact List"

Name: listadmin Passcode: idoemaillist  
Please add one contact email address.  
Submit.

#3 -- Test

Back at main page click "Send test email", and wait.  
Click "View Test/Email Failure Log".  
Success: "Admin Test 1sent"  
Failure: "Admin Test 1fail"

Check your email for message received

After Daylight Savings Time ends in November, and before it begins in March, please update the Setup Parameters DST start and end to ensure proper date/time.

<b>DST Start</b>	<b>DST End</b>
Sunday March 13, 2016	Sunday November 6, 2016
Sunday March 12, 2017	Sunday November 5, 2017
Sunday March 11, 2018	Sunday November 4, 2018
Sunday March 10, 2019	Sunday November 3, 2019
Sunday March 8, 2020	Sunday November 1, 2020
Sunday March 14, 2021	Sunday November 7, 2021
Sunday March 13, 2022	Sunday November 6, 2022

## LMS Overview

Buttons: **TEST/RESET**, **STEP**, **DOWN**, **UP**, **MUTE/MENU**

### Runtime Display

1: 8.9'C  
2: 8.4'C

### Edit Parameters

At Runtime tap **MENU**  
Return to Runtime

Repeat **MENU, MENU,..** To **Edit Limits**, **Edit Times**,

#### **Edit Limits**

or while in Edit tap **MENU AND RESET** simultaneously to access

**\*SETUP\*** group

1 **Low**

-30.3

To step through parameters in group use **STEP**

To **STEP BACK** tap **TEST**

To modify parameter values use **DOWN**, **UP**

To step out of edit and back to runtime screen use **MENU**

#### Group 1 **Limits**

1 **Low**, 1 **High**, 2 **Low**, 2 **High**

#### Group 2 **Times**

1**AlarmDelay**, 2**AlarmDelay**, **DoorAlrmDly**,  
1**RelayDelay**, 2**RelayDelay**, **Mute**

#### Special Group **\*SETUP\***

1 **Offset**, 2 **Offset**,

# **channels**,

1 **Define**, 0:tenthC 1:wholeC 2:tenthF 3:wholeF 4:wholeRH

2 **Define**,

**Relay Def**, 0:single unit relay 1:individual channel relays

**DoorAlarm** -1:AlarmOnContactClosed 0:NoAlarm 1:AlarmOnContactOpen

**Unit ID** -1:AlarmOnContactClosed 0:NoAlarm 1:AlarmOnContactOpen

**IP1**, **IP2**, **IP3**, **IP4**, IP 1.2.3.4

**NetworkCode** -30,000 to 30,000 Setup Web Page Password

### Door Status Display

Upon Door Alarm, the Door Status Displays until user responds, OR By User command at

Runtime tap **STEP**

**Door**

**Door**

**Door**

**Closed**

**Open**

**Open**

<DoorStatus:

Open/Closed>

**Ok**

**Delay**

**Alarm**

<AlarmStatus:

Ok/Delay/Alarm>

### Low/High Alarm Setpoint Display

At Runtime tap **DOWN**

1 **AlarmLow** 2.0'C  
**AlarmHigh** 8.0'C  
2 **AlarmLow** 2.0'C  
**AlarmHigh** 8.0'C

## Min/Max Temperatures Display

At Runtime tap **UP**

**1** ActualMin 3.1'C  
ActualMax 6.8'C  
**2** ActualMin 3.6'C  
ActualMax 6.6'C

## Relay Test

At Runtime tap **TEST**

**Relay Test**

**Rly1 15**  
To Step, tap **STEP**  
To Hold, hold **STEP**

**Relay Test**

**Rly2 15**  
To Step, tap **STEP**  
To Hold, hold **STEP**

## Min/Max Reset \*while viewing Min or Max

tap **RESET**

**Min & Max**

**Reset**

**RESET** to confirm  
**STEP** to cancel

\* seconds counting down

## **ALARM DELAY MODULE (RDU Option)**

### **INSTALLATION INSTRUCTIONS**

#### **I Description:**

The Alarm Delay Module is designed to accept dry contact inputs, either Normally Open (N.O.) or Normally Closed (N.C.), and to delay the transmission of the contact change information to another device.

#### **II Application:**

The primary application is in alarm systems where it is desirable to insert a fixed time interval between the detection of an alarm condition and the transmission of the alarm information to monitoring systems, telephone dialers, external services, etc.

Such delay is particularly important in areas where short power interruptions are frequent, or where transitory alarm conditions are likely to occur. The user can select a time period of delay that results in the minimum number of "false" (self-correcting) alarm transmissions while still providing the degree of safety required.

#### **III Installation:**

1. Remove the plastic case cover by removing the 2 Phillips screws from the back. Apply light pressure on the face plate, the cover and face plate will come off together.
2. Locate the **ALARM INPUT** switch on the circuit board. Move the switch to the condition of the contacts in the alarm sending device **when in the NON-ALARM condition**. The unit is shipped with the switch in the N.O. (Normally Open) position, this will be correct for the majority of installations, however, if your alarm device opens its contacts when it alarms, simply slide the switch to the N.C. position.
3. Locate the row of pins on the short edge of the board labeled "minutes". A shorting clip will be at the 8 minute position. In this position the alarm delay module will require 8 minutes of CONTINUOUS incoming alarm indication before sending the alarm status on to the next system. Move the jumper to the set of pins marked either 0.5, 1, 2, 4, 8, 16, or 32 minutes, as your needs require. The pair of pins marked "T" are for test purposes and should not be used.
4. Install the signal wires from your alarm. Route the wires through the drilled hole at the bottom of the case and to the terminals marked 1 & 2.
5. Install the output wires to your output device, route the wires through the drilled hole at the bottom of the case and to the terminals marked 4 & 5 if

it requires contact closure for operation or to terminals 3 & 4 if it requires contact opening for operation.

6. Install a 9 volt **rechargeable battery** in the holder provided if you desire the battery back up function AND you have the 120 Volt adapter. If you do not have the 120 Volt adapter you may use any 9Volt battery, we recommend Alkaline.

7. Check the system for proper operation and reassemble.

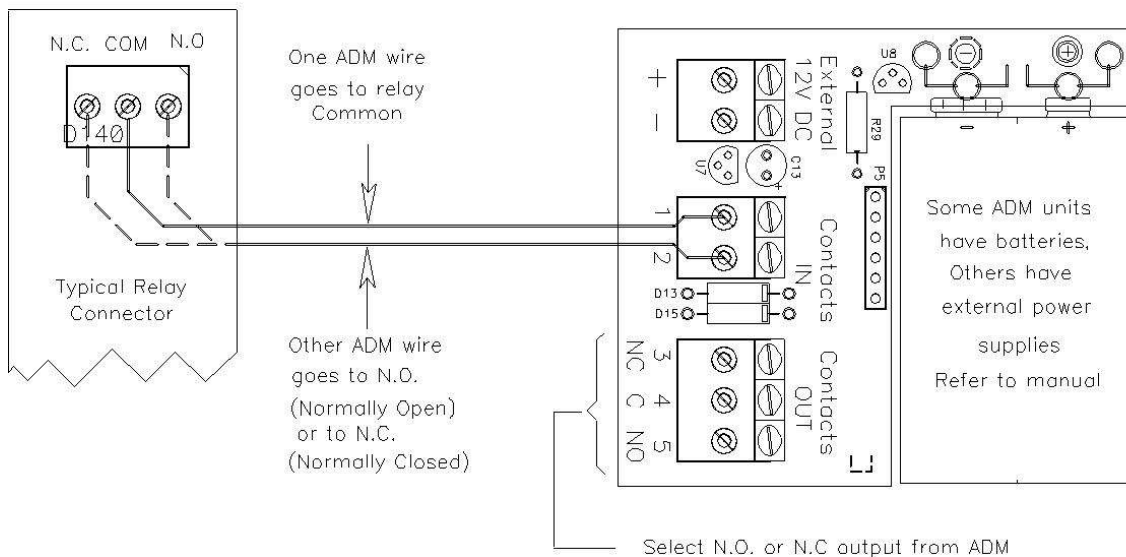
8. Using the peel-and-stick Velcro provided, mount the RDU where the LED indicators can be easily seen.

## IV Operation

When the unit is monitoring there are no LEDs lit, pressing RESET will light the green LED to indicate OK.

- A flashing yellow light indicates that an alarm condition is being timed.
- A flashing red light means that an alarm condition has persisted for the set time and has been transmitted to the monitoring device, this LED will continue to flash even if the alarm condition has corrected itself.
- Pressing **RESET** will cause the red LED to stop flashing and reset the output contacts to their normal non-alarm state, if the alarm condition persists the yellow LED will again flash to indicate timing and, after timing out, will light the red LED and change the output contacts.

NOTE It is important that the battery condition be checked regularly by pressing **RESET**. A dead battery may prevent proper operation of the Alarm Delay Module.



This is the hookup from a relay (contact) output of an LMS-188-4P, or other device, to the RDU.

Use the slide switch on the main board to choose N.O. or N.C. input.

On the output side, the RDU offers Normally Open (4, 5) or Normally Closed (3, 4)

contacts, and may be connected to a dialer, beeper, strobe light, etc.

## **SOLENOID CONTROL OPTION PROVIDED BY LEONARD VALVE**

### **Description:**

The Solenoid Control Option (SCO) is designed to accept dry contact inputs, either Normally Open (N.O.) or Normally Closed (N.C.), in order to switch an AC powered solenoid opened or closed. **Solenoid valve and associated power supply are to be provided by others.**

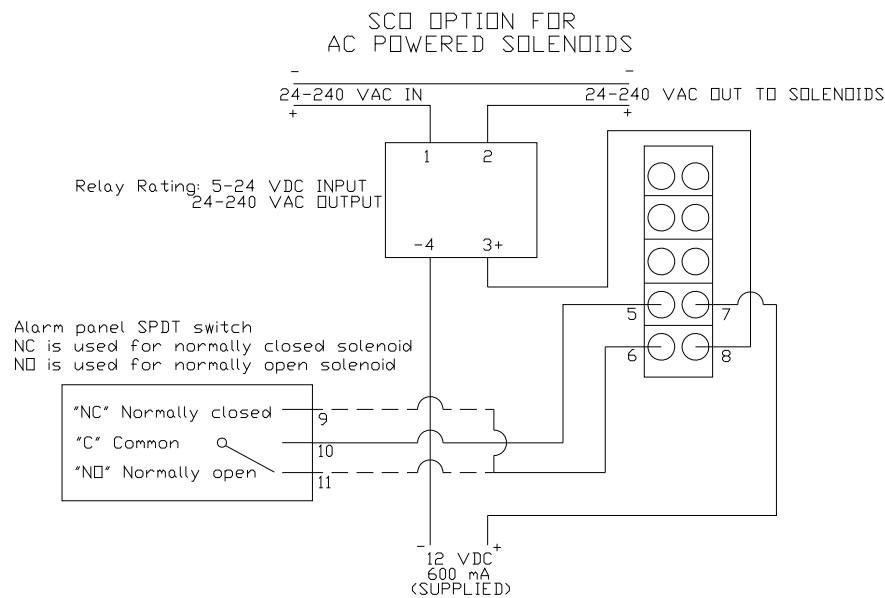
### **Application:**

The primary application is in systems where it is desirable to control an AC powered solenoid in the event that the alarm on the LMS-188-4P is active. When in non-alarm condition the relay is in a N.O. state and the solenoid will allow water to flow through it freely. Once the alarm is active, the relay on the LMS-188-4P will switch to N.C. and the solenoid will shut down. **Solenoid valve and associated power supply are to be provided by others.**

### **Installation:**

Included with every SCO is a 12 VDC/600 mA power source with a 10' lead that requires a dedicated 110 VAC outlet to plug into. See wiring diagram below for reference. Do Not Energize SCO, LMS-188-4P, or solenoid valve until wiring is complete. **Solenoid valve and associated power supply are to be provided by others.**

1. Connections from the power source to the SCO (+ side to terminal **7**), terminal to solid state relay (terminals **3+ to 8**), and power source to solid state relay (- side to terminal **4-**) have been made at the factory.
2. Properly ground the SCO by using the screw provided inside of the enclosure and connect to suitable earth ground
3. Connect terminal **5** (12VDC) to the **COMMON 'C'** terminal (**9**) of the LMS-188-4P relay switch.
4. Connect either terminal **9 or 11** from the LMS-188-4P relay switch to terminal **6** on the terminal strip. Use terminal **9** with N.C. solenoids; use terminal **11** with N.O. solenoids.
5. Connect the positive side of the solenoid power supply to terminal **1** on the solid state relay.
6. Connect terminal **2** on the sold state relay to the positive side of the solenoid valve. Complete the circuit by connecting the neutral side of solenoid to the neutral side of power supply.



## DC POWERED SOLENOID CONTROL HARDWARE SUPPLIED BY OTHERS

### Description:

This solution is for systems that utilize a DC powered solenoid valve and want to make use of the SPDT relay switch included with LMS-188-4P. **Solenoid valve and associated power supply are to be provided by others.**

### Application:

The primary application is in systems where it is desirable to control a DC powered solenoid in the event that the alarm on the LMS-188-4P is active. When in non-alarm condition the relay is in a N.O. state and the solenoid will allow water to flow through it freely. Once the alarm is active, the relay on the LMS-188-4P will switch to N.C. and the solenoid will shut down. **Solenoid valve and associated power supply are to be provided by others.**

### Installation:

Solenoid power supply is to be supplied by others and is not available from Leonard Valve. The relay contacts are rated up to 30 V/1A. See wiring diagram below for reference. Do Not Energize LMS-188-4P or solenoid valve until wiring is complete. **Solenoid valve and associated power supply are to be provided by others.**

1. Connect positive side of power supply to the **COMMON** terminal (2).
2. Connect either terminal **1** or **3** from LMS-188-4P relay switch to positive side of DC solenoid. Use terminal **1** with N.C. solenoids; use terminal **3** with N.O. solenoids.
3. Connect neutral side of power supply directly to neutral side of DC solenoid.



# DC POWERED SOLENOIDS SUPPLIED BY OTHERS

Alarm panel SPDT switch  
NC is used for normally closed solenoid  
NO is used for normally open solenoid

