# System Studies Incorporated Digital Panel Rack Assembly



## **System Studies Incorporated**



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## **Installation Instructions**

These simplified installation instructions are intended to guide you through the process of installing and hooking up your new central office Digital Display Panel Rack Assembly. Instructions are also provided for operating the digital display components installed on the panels. While the photos illustrate a dual rack installation, they also apply to single rack installations.

If you have any questions about the pneumatic hookups, the function and operation of the digital display components, or the wiring procedures, please contact the System Studies Customer Service Department at the numbers below.

#### Tools required for installation:

- 9/16" Open end wrench
- 5/8" Open end wrench
- 1" Open end wrench
- 1-1/8" Open end wrench
- Phillips type screwdriver
- Flat blade screwdriver
- Drill motor with appropriate drill bit for

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- Position the card so that the component side (the one with the orange relays) is facing upward and the card backplane connector (center gold-colored edge connector) is facing to the right.
- Locate the J2 jumpers which are positioned near the bottom of the backplane connector. These individual jumpers are labeled W2 and W3 on the card surface.





3) Remove both of these connectors by pulling them straight upwards. This simple procedure disables tone capability for all of the relays on the card. Note: you may wish to save these connectors if you foresee ever having to restore tone capability to this card.



4) Repeat the above procedure for any other dedicated relay cards monitoring devices in the office.

This completes the Digital Panel Rack Assembly installation procedures. Please contact System Studies Incorporated at (800) 247-8255 or (831) 475-5777 if you have any questions regarding the panels' monitoring capabilities and digital display operation. 1) Press the *Flow* button (#1) and the recessed *Setup* button (#3) simultaneously. These function buttons must be held for two seconds to enter setup mode. Notice that when you are in the setup mode, the right decimal point on the flow display's LED will be lit until the setting is saved. Release *Setup* button.

- 2) Press the *Up Arrow / Down Arrow* buttons (#4 and #5) to scroll through the available ranges (0-9.5, 0-19, 0-47.5, 0-95, 0-475 and 0-950 SCFH).
- 3) Select the appropriate flow range and release the buttons to store the new value.

Once the new flow range has been set, you may wish to reset the flow contact alarms as described on the previous page.

#### **Silencing High Flow or Low Pressure Alarms**

When either the pressure or the flow contact alarm initiates, the appropriate display flashes (one second on, one second off). The output of these displays can be reset as follows:

- 1) For the high flow alarm, press and hold the *Flow* button (#1) and the *Down Arrow* button (#5).
- 2) To reset a low pressure alarm, press and hold the *Pressure* button (#2) and the *Down Arrow* button (#5).

The display will continue to flash, but more rapidly (1.5 seconds on, 0.5 seconds off) until the alarm clears.

#### Manual Flow Reading Adjustment

The following steps explain how to adjust the indicated flow value shown in the top LED display (SCFH).

- 1) Press and hold down the Setup button (#3).
- 2) At the same time hold the *Flow* and *Pressure* buttons (#1 and #2). A small LED light will shine in the bottom right of the top display.
- 3) Release buttons #2 and #3, while continuing to hold button #1.
- 4) Press buttons #4 (*Up Arrow*) to increase and #5 (*Down Arrow*) to decrease indicated flow.
- 5) Release all buttons.

## **Disabling Tone to a Dedicated Relay**

The tone capability (locator tone and pseudo-data tone) of properly configured 289H LSS monitors is not compatible with the digital panel equipment. Consequently, you will need to disable tone on any dedicated relay cards used in your digital panel-fed offices.



**A.** Remove equipment rack from shipping crate. Two or more people are required to tilt equipment upright and move it to the desired location.

**Note:** If rack assemblies are ordered with a 289H LSS, 289H-M LSS monitor, or uM260 Micro Monitor, the office monitors will be shipped separately.

**B.** If your order includes multiple racks, remove them from the crates and place all racks together at their designated location.

*Note:* Make sure racks are placed no closer than two feet from back wall to allow access to rear of panels.

#### STEP 2

STEP 1

Drill pilot holes in the concrete floor for the rack base mounting bolts.







Place metal anchors into holes, insert bolts, and tighten securely using socket or open-end wrench. For multiple rack shipments, bolt racks together for added stability.





## STEP 4

Connect pneumatics from CO air dryer to stainless steel manifold that is mounted vertically at the back of the rack assembly. Repeat procedure as necessary for multiple racks.

There are three common methods used to make this connection, as shown here.

Flanges are available in grey PVC (Schedule 80) or green high impact plastic (Chem-aire).

*Note*: Delivery pressure from the dryers must be set at 12 to 15 PSI.

- 2) Press the *Up Arrow / Down Arrow* buttons (#4 or #5) to increase or decrease the pressure setpoint to the desired level. The values are shown in the bottom LED display.
- 3) When the desired pressure contact alarm value displays, release the buttons to store the alarm setting.

#### Adjusting Pressure for Altitude

The Dual Digital Panel Meter provides the means of adjusting the displayed pressure value to compensate for variations in absolute PSI readings that occur at different altitudes. To set the altitude offset for your installation:

- Press and hold the recessed Setup button (#3) and press the Pressure button (#2). Observe the rightmost decimal LED on the PSI display (this confirms that you are in the setup mode). Then release the Setup button while holding down the Pressure button. The current pressure reading displays.
- 2) While still holding the *Pressure* button (#2), press the *Up Arrow / Down Arrow* buttons (#4 and #5) to correct the pressure reading.
- 3) Release the buttons to store the adjusted value.

*Note:* This procedure is not required if you have zero adjusted the DDPM components on each panel as described in Steps 9 and 13.

The following procedures explain how to set a new flow range if the panel's on-board Flow Finder needs to be replaced with one of a different range, and how to silence alarms.



#### Setting the Flow Range

In rare instances when it is desirable to change the flow rate of the pipe or distribution panel (i.e., replace the panel's Flow Finder with one of a different range), it will be necessary to reset the flow range of the Dual Digital Panel Meter's flow contact alarm.



- Once an adjustment has been selected and the parameter has been changed, the changed value will be stored when the parameter (pressure or flow) is released for more than two seconds.
- The *Up Arrow / Down Arrow* buttons are used to increase or decrease the setting.
- The *Flow* button (#1) must be held to adjust flow alarm and range.
- The *Pressure* button (#2) must be held to adjust pressure alarm and range.
- The *Pressure* button has no effect on flow settings, and the *Flow* button has no effect on pressure settings.
- When reading in alarm, the display flashes the reading for a duration of one second on and one second off.
- After the alarm has been reset, the display continues to flash the reading (1.5 seconds on and 0.5 seconds off) until the alarm is cleared.
- When a reading exceeds 20mA, the corresponding display will read PEG.

## **Dual Digital Meter Panel Setup and Operation**

The following procedures explain how to establish and change DDPM settings. These simple, intuitive procedures need to be performed after the power connection has been completed and before the panel is placed in operation.

#### Setting the Flow Contact Alarm

- 1) Press and hold the *Flow* button (#1). See picture on the right.
- 2) Press the *Up Arrow / Down Arrow* buttons (#4 or #5) to increase or decrease the flow setpoint to the desired level. The changing values are displayed in the top LED display.
- 3) When the desired flow contact alarm value displays, release the buttons to store the alarm setting.

## Setting the Pressure Contact Alarm

1) Press and hold the *Pressure* button (#2).



Locate -48V DC to -24V DC Converter Panel installed near the top of the rack assembly. Depending upon number of digital panels on the assembly, there may be

STEP 5

Mounted on the back of this panel are two components: the -48V DC to -24V DC power converter and the terminal strip that is prewired to the panels' Dual Digital Panel Meters (DDPM).

one or more converter panels supplied.



STEP 6

**A.** Uncoil the 16 gauge blue/black power conductors located on the white spool near the terminal strip. On one end, these conductors are connected to the DC to DC Converter's Power On/Off Switch; the other end is for incoming CO battery power.

*Note*: Before connecting power, remove fuse for designated power pair at fuse panel.

**B.** Connect power conductors to -48V DC CO Battery power. Blue conductor is for -48V DC; black is positive common (return). Run grounding strap to the copper grounding bar on back of panel.

Repeat wiring procedure if shipment includes additional DC to DC Converter Panels.

*Note:* If the supplied wire for DC power is too short, use only 16 gauge wire to complete the connections.

## STEP 7

Replace fuse for designated power pair at fuse panel. Turn on power to the rack assembly, using On/Off switch on front of DC to DC Converter Panel.

*Note*: Power switch also functions as a re-settable circuit breaker.



STEP 8

STEP 9

**A.** Connect 3/8" tubing for cables in the vault to the Digital Distribution Panel's manifolds at the back of the panel.

**B.** Secure firmly in place with open-end wrench.



To compensate for variations in absolute PSI readings that occur at different altitudes, zero adjust the PSI LED as follows:

- Press and hold the recessed Setup button (#3) and press the Pressure button (#2). Observe the rightmost decimal LED on the PSI display (This confirms that you are in the setup mode). Then release the Setup button while holding down the Pressure button. The current pressure reading displays.
- 2) While still holding the *Pressure* button (#2), press the *Up Arrow / Down Arrow* buttons (#4 and #5) to zero the displayed PSI value.
- 3) Release the buttons to store the adjusted value.

The table below indicates what function can be performed by pressing a designated DDPM button or multiple buttons.

| Button | Function                       |
|--------|--------------------------------|
| 1      | Adjust flow alarm setpoint     |
| 2      | Adjust pressure alarm setpoint |
| 3      | Enable setup functions         |
| 4      | Increase setting               |
| 5      | Decrease setting               |
| 1&3    | Choose flow range              |
| 2&3    | Apply altitude PSI correction  |
| 1 & 5  | Reset flow alarm output        |
| 2 & 5  | Reset pressure alarm output    |

## **Default Settings**

Digital Panel assemblies are available in a variety of flow ranges, which are specified when ordering. Before shipment, the flow range of the panels' Dual Digital Panel Meters are pre-set in the factory. Other DDPM default ranges and alarm settings are shown below:

| Flow range:      | Specified on order and pre-set in factory (either 9.5, 19.0, 47.5, or 95.0 SCFH) |
|------------------|--|
| Pressure range:  | -4.2 absolute pressure to 30 PSI   |
| Pressure offset: | 0.0 PSI  |
| Pressure alarm:  | 0.0 PSI  |
| Flow alarm:      | Full scale – same as pre-set flow range  |

*Note:* If the flow range is changed, the flow alarm defaults to the full scale for the new flow range. For example, if you replace a panel's Flow Finder with a 0-95 SCFH Flow Finder, the default flow alarm value becomes 95 SCFH.

## **Setting Requirements**

There are some general requirements that apply to the use of the Dual Digital Panel Meter button settings. These are summarized as follows:

- Function buttons and button combinations must be held for two seconds to enter setup mode. To confirm that you're in the setup mode, the rightmost decimal LED on the appropriate display will illuminate.
- Up Arrow / Down Arrow buttons have no effect until an adjustment has been selected.



## **STEP 16**

Connect 25-pair male-tomale amphenol cables from 289H or 289H-M LSS to the connector block located on the bottom rear of the rack assembly. Connectors 1 and 3 are used for rack's monitoring pairs.





**A**. Once tubing has been installed and the panel is zero adjusted, set delivery pressure to 10 PSI at front of panel using LED display.

**B**. Repeat this procedure for each Digital Distribution Panel on the rack assembly.



289H Dedicated Card Monitoring Capability can be maximized by running cables from two or more connector blocks to an intermediate block. All transducer pairs can then be consolidated into sequential groups of 25 pairs.

**CONTACT ALARM PAIRS 1-25** 



**STEP 11** 

**A.** Locate the Digital Pipe Panel's Flow Finder(s) at the back of the assembly.

**B**. Remove the threaded red cap from the Flow Finder's 45 degree fitting, apply thread sealant, and insert a 1/2" air pipe fitting (1/4" NPT-M AMP fitting or equivalent).



## **Digital Panel Controls**

The LED display component or Dual Digital Panel Meter (DDPM) consists of two 3digit LED displays and five tactile switch buttons. The top display reads flow output in SCFH; the bottom display reads pressure output in PSI. During setup, the LEDs corresponding to the parameter being adjusted will be displayed. For example, the flow display will be used to display the flow alarm setpoint while it is being adjusted.



STEP 12

A. Cut over the CA3131 air pipe as shown.

**B**. Use a crimper tool to secure the fitting. Repeat this step for each air pipe in the office.







**STEP 14** 

Zero adjust the PSI LED at front of Digital Pipe Panel using same procedure as described in Step 9.

A. Turn ON / OFF valve on

the front of the panel to ON

B. Set delivery pressure to

10 PSI using LED display.

C. Repeat steps 13 and 14

for each Digital Pipe Panel

on the rack assembly.

position.



CONTACT TRANSDUCER ALARM PAIRS PAIRS



In most cases space has been provided on the equipment rack for the installation of a 289H, 289H-M LSS monitor (depending upon the specifics of your order), or a uM260 Micro Monitor. This equipment is shipped separately and is intended to be installed as described in the unit's Installation and **Operations Manual.** 

Please refer to this documentation also for instructions on completing power, phone and network connections to the monitor.

**Note:** Panel transducers and contact alarms are pre-wired to connector blocks as described below. The transducers are wired to the group of pins on the left; contact alarms pairs are terminated on the right side.



## **STEP 15**

Rack assemblies that include a Transducer Panel are equipped with a Barometric Transducer and a Deliverv Pressure Transducer. Both of these devices provide ongoing remote information via PressureMAP.

Delivery pressure from the air dryers to the panel assembly can be manually checked by using a C pressure gauge on the High Resolution Pressure Transducer's tank valve.



For smaller installations that include a uM260 Monitor and Termination Adapter, refer to Section 3 of the unit's Installation and Operations Manual for wiring instructions.

Pair numbering is determined by the position of the panels on each rack. Starting from left to right, top to bottom, Pairs 1 & 2 are used for the first dual transducer on the rack assembly (Pair 1-flow TD, Pair 2-pressure TD). Pairs 3 & 4 are for the next dual transducer to the right or below (Pair 3-flow TD, Pair 4-pressure TD). This sequence is followed for all pre-wired panel transducers.

Contact Alarm wiring on the right side of the block follows the same sequence used for transducers. The contact alarms on the digital display component that corresponds to Transducer #1 are wired to the first two sets of pins (Pair 1-high flow contact alarm, Pair 2-low pressure contact alarm). This pattern repeats for each digital display component.

Note: For flow transducers, the tip conductor has blue insulation, and the ring conductor has *blue/white* insulation. The pressure transducer tip conductor has orange insulation, and its ring conductor has orange/white insulation.