DET-TRONICS®

A UTC Fire & Security Company

Instructions 95-8618

FlexVu™ Explosion-Proof
Universal Display Unit
Model UD10

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INSTRUCTIONS

FlexVu™ Explosion-Proof Universal Display Unit Model UD10

IMPORTANT

Be sure to read and understand the entire instruction manual before installing or operating the gas detection system. This product can be used with a variety of Det-Tronics gas detectors to provide early warning of the presence of a toxic or explosive gas mixture. Proper device installation, operation, and maintenance is required to ensure safe and effective operation. If this equipment is used in a manner not specified in this manual, safety protection may be impaired.

APPLICATION

The FlexVu™ Model UD10 is recommended for applications that require a gas detector with digital readout of detected gas levels as well as analog 4-20 mA output, relay contacts, and/or Modbus RS485. The UD10 Universal Display Unit is designed for use with Det-Tronics gas detectors listed in Table 1. The display unit is designed and approved as a 'stand alone' device and performs all the functions of a gas controller.

Gas concentration and unit of measurement are displayed on an alphanumeric display. The display unit provides a linear isolated/non-isolated 4-20 mA DC output signal (with HART) that corresponds to the detected gas concentration.

All electronics are enclosed in an explosion-proof aluminum or stainless steel housing. The display unit is used with a single detector that may be either coupled directly to the UD10, or remotely located using a sensor termination box.

The UD10 features non-intrusive calibration. A magnet is used to perform calibration as well as to navigate the UD10's internal menu.

DESCRIPTION

The UD10 Universal Display can be used with various 4-20 mA gas detection devices, with or without HART. The unit provides display, output and control capabilities for the gas detector.

The UD10 utilizes the following I/O:

Signal Inputs:	4-20 mA loop from the sensing device
User Inputs:	Magnetic switches (4) on the display panel HART Communicator (Emerson 375 Field Communicator or AMS)
Signal Outputs:	4-20 mA output loop with HART Modbus RS485 Three alarm relays and one fault relay
Visible Outputs:	Backlit LCD display HART slave interface via HART Communicator

Table 1—Range and Default Values for Alarms and Calibration Gas Concentration

UD10 ALARM DATA					CALIBRATION
Gas Detector		High Alarm Value	Low Alarm Value	Aux alarm Value	Cal Gas
GT3000--Hydrogen Sulfide	Range	10-90%	5-50%	5-90%	30-90%
	Default	40%	10%	40%	50%
GT3000--Ammonia	Range	10-90%	5-50%	5-90%	30-90%
	Default	40%	10%	40%	50%
GT3000--Chlorine	Range	10-90%	5-50%	5-90%	30-90%
	Default	40%	10%	40%	50%
GT3000--Hydrogen	Range	10-60%	5-50%	5-90%	30-90%
	Default	40%	10%	40%	50%
GT3000--Oxygen	Range	5-20.5	16-20.5	5-20.5	20.9
	Default	18%	18%	18%	20.9
GT3000--Carbon Monoxide	Range	10-90%	5-50%	5-90%	30-90%
	Default	40%	10%	40%	50%
GT3000--Sulfur Dioxide	Range	10-90%	5-50%	5-90%	30-90%
	Default	40%	10%	40%	50%
PIR9400	Range	10-60%	5-50%	5-90%	30-90%
	Default	40%	10%	40%	50%
PIRECL	Range	10-60%	5-50%	5-90%	30-90%
	Default	40%	10%	40%	50%
OPECL	Range	10-90%	5-50%	5-90%	30-90%
	Default	40%	10%	40%	50%
C706X*	Range	10-90%	5-50%	5-90%	30-90%
	Default	40%	10%	40%	50%
Model 505/CGS Combustibles	Range	10-60%	5-50%	5-90%	N/A
	Default	40%	10%	40%	N/A
NTMOS--Hydrogen Sulfide	Range	10-90%	5-50%	5-90%	50%
	Default	40%	10%	40%	50%

Notes: All values are a percentage of full scale with the exception of Oxygen, which is the actual percent of Oxygen.

Low alarm must be less than or equal to the high alarm (CSA requirement).

Changing the Measurement Range will reset all alarm and Cal Gas values to the default settings for the selected range.

Alarm relays are normally de-energized with selectable latching or non-latching contacts. Fault relay is normally energized (with no faults).

*Does not support O_2, but includes C7064C and C7064E hydrogen sulfide, C7067E chlorine, C7066E carbon monoxide, and C7068E sulfur dioxide.

HART COMMUNICATION

A HART interface provides device status information and field programming capability.

MAGNETIC SWITCHES

Four internal magnetic switches provide a non-intrusive user interface that allows navigation through the menu and adjustment of configuration parameters in the field without the use of a HART handheld device. See Figure 1 for switch locations.

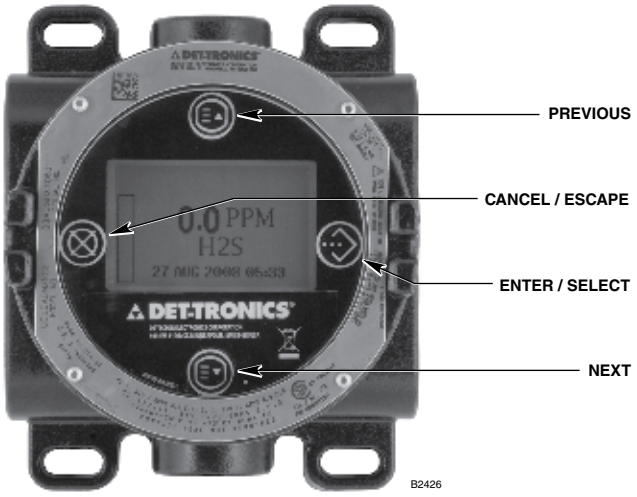


Figure 1—Faceplate of UD10

These switches are used for device configuration, checking status and event logs, and performing calibration. The switches are labeled as follows:


CANCEL / ESCAPE


ENTER / SELECT / MENU ACCESS


PREVIOUS or if on Main Screen:
Fault Shortcut


NEXT

To actuate a magnetic switch, lightly touch the magnet to the viewing window of the UD10 directly over the switch icon on the faceplate.

CAUTION

Handle magnets with care! Personnel wearing pacemakers/defibrillators should not handle magnets. Modern magnet materials are extremely strong magnetically and somewhat weak mechanically. Injury is possible to personnel, and magnets themselves can easily get damaged if allowed to snap towards each other, or if nearby metal objects are allowed to be attracted to the magnets.

NOTE

Det-Tronics offers two magnet options for activating internal magnetic switches. While the two magnets can usually be used interchangeably, the best results will be achieved if they are used as follows: The Magnetic Tool (p/n 009700-001) is the stronger magnet and is recommended for activating the switches on the UD10 viewing window. The Calibration Magnet (p/n 102740-002) is recommended for applications that involve initiating calibration or resetting the detector by touching the side of a metal junction box or detector housing (PIRECL, OPECL, etc). Throughout this manual, the term "magnet" can refer to either device.

Access To Menus

To access the menus, use the magnet to activate the ENTER/SELECT button. This will display the Main Menu.

The actual menu structure varies depending upon the device that is connected to the UD10. Menus for the various devices can be found in the corresponding Appendix in this manual.

Some areas of the menu contain additional information, which is indicated by the presence of an arrow on that particular line. By placing the magnet to the glass over the ENTER/SELECT button, the next screen with the additional information will be shown.

The UD10 automatically returns to the main screen after 10 minutes if no activity occurs.

Quick Access/Shortcut: Fault Screen

To access the fault menu quickly, when a fault is present, touch the magnet to the glass by the PREVIOUS button.

RELAYS

The display unit has 4 output relays — high alarm, low alarm, auxiliary alarm, and fault. The relays have form C (SPDT) contacts. Low, auxiliary and high alarm relay contacts are selectable for latching or non-latching operation. During normal operation, the fault relay is energized.

IMPORTANT

Direct connection of 120/240 VAC to the relay terminals inside the UD10 enclosure is not allowed, since switching relay contacts can induce electrical noise into the electronic circuitry, possibly resulting in a false alarm or other system malfunction. If the application requires that AC powered equipment be controlled by the transmitter, the use of externally located relays is recommended.

External relays, solenoids, motors, or other devices that can cause inductive transients should be transient suppressed. Place a diode across the coil for DC devices. See Figure 2.

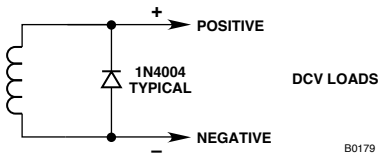


Figure 2—Transient Suppression for Inductive Loads

MODBUS COMPATIBILITY

The UD10 supports RS485 Modbus RTU communication.

DEVICE ENCLOSURE

The housing for the UD10 is a 5 port aluminum or stainless steel explosion-proof junction box with a clear viewing window.

DEVICE DISPLAY

The UD10 is provided with a 160 x 100 alpha-numeric backlit LCD display. See Figure 1.

During normal operation, the LCD continuously displays the detected gas level, gas type, and units of measurement. The real time clock can also be displayed if desired.

The display shows the following alarm information:

- High gas alarm
- Low gas alarm
- Aux alarm

The display indicates the following fault information:

- Device fault
- Display fault

The UD10 has smart capabilities to allow easy access to the following information:

- Detector information
- Measurement range
- Alarm setpoints
- Alarm and event logs

For detailed HART menu structure, refer to the appropriate Appendix.

LOGGING

Events that can be logged in the UD10 include:

- Calibration (Date, time and success Y/N are logged for detectors that do not provide their own calibration logging capabilities.)

Faults that are logged in the UD10 include:

- Detector fault
- Low power
- General fault

Alarms that are logged in the UD10 for gas detector inputs include:

- High gas alarm
- Low gas alarm
- Aux alarm.

The UD10 has its own battery backed real time clock (RTC) and its own event logs. The RTC in the UD10 can be set from the UD10 display, Modbus or HART interfaces. The RTC in the gas detector (any HART detector having an RTC) can be set independently using the UD10 menu, or by using the synchronize command, which will set the detector RTC to the same time as the UD10 RTC. See Figure 3.

The UD10 can display the detector event and calibration logs (if available). The UD10 has its own 1,000-entry event log available under the Display Status->History->Event Log menu.

UD10 event logs can be read from the HART interface or the Modbus interface.

Detector calibration and event logs can also be read from the detector HART interface (where available).

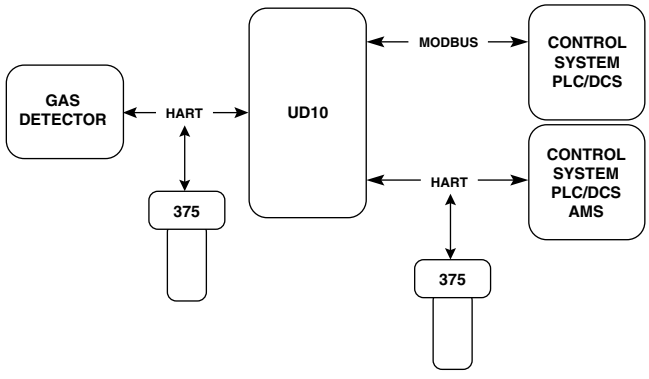


Figure 3—UD10 Logging

IMPORTANT SAFETY NOTES

CAUTION

The wiring procedures in this manual are intended to ensure proper functioning of the device under normal conditions. However, because of the many variations in wiring codes and regulations, total compliance to these ordinances cannot be guaranteed. Be certain that all wiring complies with the NEC as well as all local codes. If in doubt, consult the authority having jurisdiction before wiring the system. Installation must be done by a properly trained person.

CAUTION

This product has been tested and approved for use in hazardous areas. However, it must be properly installed and used only under the conditions specified within this manual and the specific approval certificates. Any device modification, improper installation, or use in a faulty or incomplete configuration will render warranty and product certifications invalid.

CAUTION

The device contains no user serviceable components. Service or repair should never be attempted by the user. Device repair should be performed only by the manufacturer.

LIABILITIES

The manufacturer's warranty for this product is void, and all liability for proper function of the detector is irrevocably transferred to the owner or operator in the event that the device is serviced or repaired by personnel not employed or authorized by Detector Electronics Corporation, or if the device is used in a manner not conforming to its intended use.

CAUTION

Observe precautions for handling electrostatic sensitive devices.

CAUTION

Unused conduit entries must be closed with suitably certified blanking elements upon installation.

INSTALLATION

NOTE

The gas detector housing must be electrically connected to earth ground. A dedicated earth ground terminal is provided on the UD10.

The detector must always be installed per local installation codes.

Before installing the gas detector, define the following application details:

IDENTIFICATION OF VAPOR(S) TO BE DETECTED

It is necessary to identify the vapor(s) of interest at the job site. The fire hazard properties of the vapor, such as vapor density, flashpoint, and vapor pressure should be identified and used to assist in selecting the optimum detector mounting location within the area.

For cross sensitivity information, refer to each gas detector's corresponding instruction manual. Refer to Table 5 in the Specifications section for a list of gas detectors and their corresponding instruction manuals.

IDENTIFICATION OF DETECTOR MOUNTING LOCATIONS

Identification of the most likely leak sources and leak accumulation areas is typically the first step in identifying the best detector mounting locations. In addition, identification of air current/wind patterns within the protected area is useful in predicting gas leak dispersion behavior. This information should be used to identify optimum detector installation points.

If the vapor of interest is lighter than air, place the detector above the potential gas leak. Place the detector close to the floor for gases that are heavier than air. Note that air currents may cause a gas that is slightly heavier than air to rise under some conditions. Heated gases may also exhibit the same phenomenon.

The most effective number and placement of detectors varies depending on the conditions on site. The individual designing the installation must often rely on experience and common sense to determine the detector quantity and best locations to adequately protect the area. Note that it is typically advantageous to locate detectors where they are accessible for maintenance. Locations near excessive heat or vibration sources should be avoided.

Final suitability of possible gas detector locations should be verified by a job site survey.

The gas detector must be mounted with the sensor in the correct orientation as shown in Table 2.

If the UD10 faceplate is not correctly oriented, it can be rotated at 90 degree increments by pulling the electronic module from the four mounting posts that secure it to the junction box and repositioning it as desired. Note that the module is held in place by a compression fitting – no screws are involved.

Table 2—Device Orientation

Device	Orientation
GT3000	Vertical with Sensor Pointing Down
PIR9400	Horizontal
PIRECL	Horizontal
OPECL	Horizontal (Fixed to a vertical post)
505/CGS	Vertical with Sensor Pointing Down
C706X	Vertical with Sensor Pointing Down
NTMOS	Vertical with Sensor Pointing Down

WIRING

POWER SUPPLY REQUIREMENTS

Calculate the total gas detection system power consumption rate in watts from cold start-up. Select a power supply with adequate capability for the calculated load. Ensure that the selected power supply provides regulated and filtered 24 Vdc output power for the entire system. If a back-up power system is required, a float-type battery charging system is recommended. If an existing source of 24 Vdc power is being utilized, verify that system requirements are met. The acceptable voltage range is 18-30 Vdc measured at the input to the UD10.

NOTE

The power supply must meet the noise requirements for HART systems. If noise or ripple on the main power source could interfere with the HART function, an isolated power source (Figure 7) is recommended.

WIRING CABLE REQUIREMENTS

Always use proper cabling type and diameter for input power as well as output signal wiring. 14 to 18 AWG shielded stranded copper wire is recommended. Correct wire size depends on the device and wire length. Refer to the appropriate Appendix for additional information. The maximum cable length from power source to UD10 is 2000 feet. Maximum cable length from UD10 to device/ STB sensor termination box is 2000 feet.

NOTE

The use of shielded cable in conduit or shielded armored cable is highly recommended. In applications where the wiring is installed in conduit, dedicated conduit is recommended. Avoid low frequency, high voltage, and non-signaling conductors to prevent nuisance EMI problems.

CAUTION

The use of proper conduit installation techniques, breathers, glands, and seals is required to prevent water ingress and/or maintain the explosion-proof rating.

WIRING PROCEDURE

Refer to Figure 4 for an illustration of the wiring terminal board.

Figure 5 shows a UD10 Wired to a PLC using 3-Wire Shielded Cable with a 4-20 mA Non-Isolated Sourcing Output.

Figure 6 shows a UD10 Wired to a PLC using 4-Wire Shielded Cable with a 4-20 mA Non-Isolated Sourcing Output.

Figure 7 shows a UD10 Wired to a PLC with a 4-20 mA Isolated Sourcing Output.

Grease/Lubrication

To ease installation and future removal, ensure that all junction box covers and sensor threads are properly lubricated. If the need arises for additional lubrication, use either Lubriplate grease (see Ordering Information for part number) or Teflon tape. Avoid the use of silicone grease.

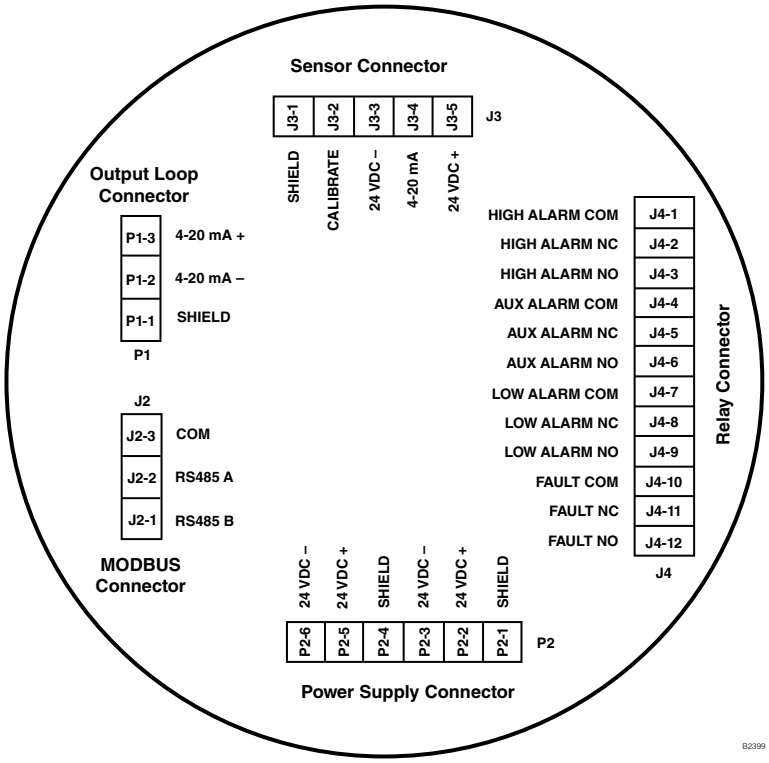
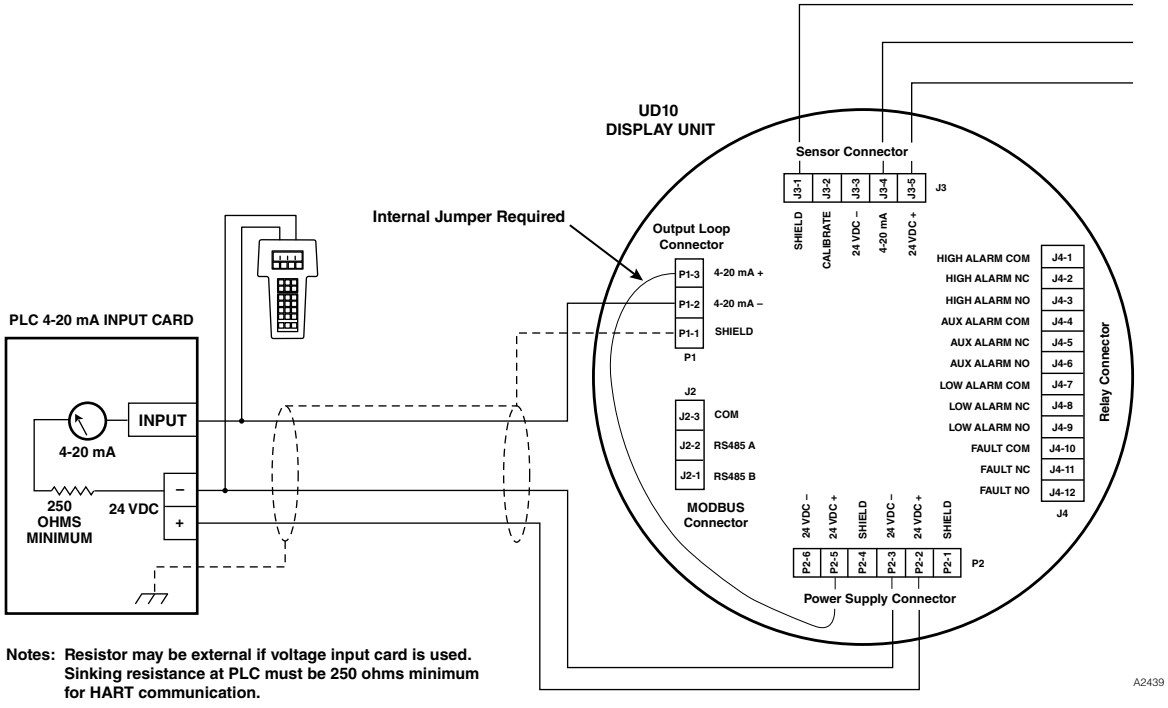


Figure 4—Wiring Terminal Board



Notes: **Resistor may be external if voltage input card is used. Sinking resistance at PLC must be 250 ohms minimum for HART communication.**

Figure 5—UD10 Wired to PLC using 3-Wire Shielded Cable with 4-20 mA Non-Isolated Sourcing Output

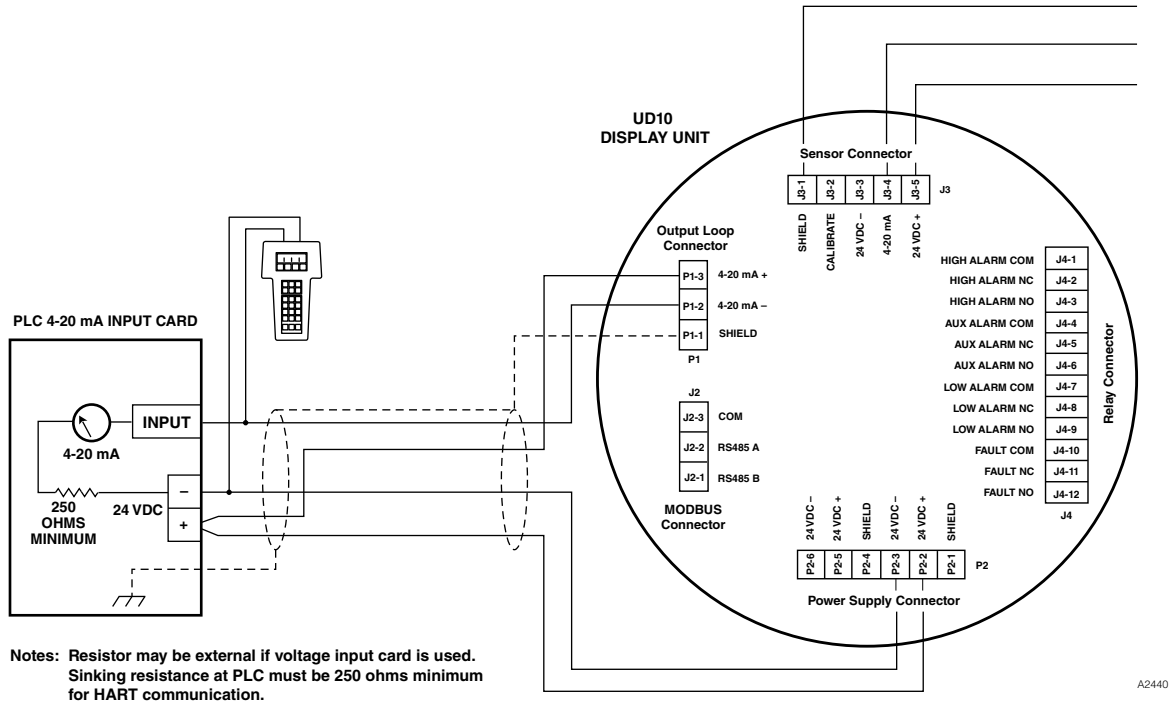


Figure 6—UD10 Wired to PLC using 4-Wire Shielded Cable with 4-20 mA Non-Isolated Sourcing Output

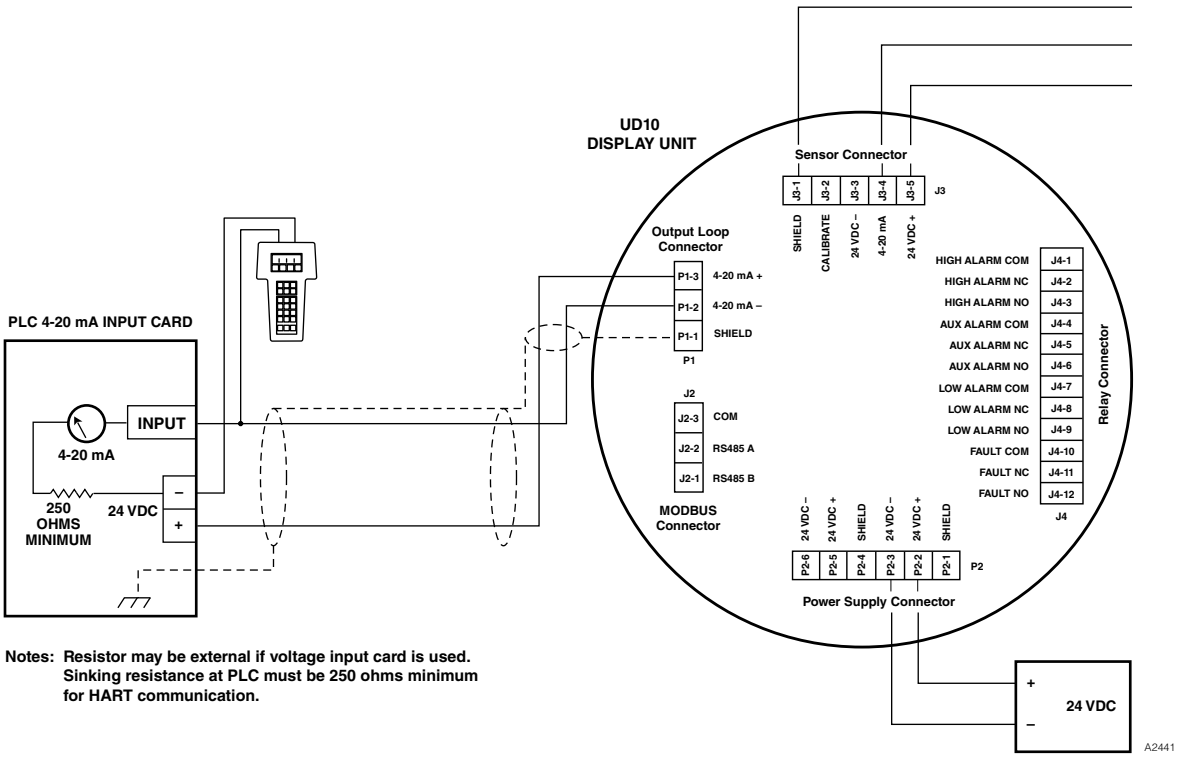
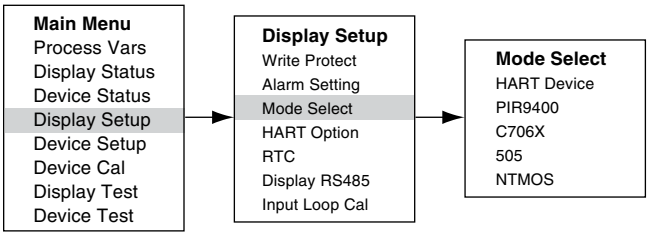


Figure 7—UD10 Wired to PLC with 4-20 mA Isolated Sourcing Output

STARTUP

After power has been applied and the warm-up period is complete, select the UD10 operating mode. To do this:

1. Access the Main Menu by touching the magnet to the ENTER/SELECT button. From there, navigate to the "Mode Select" menu.



2. From the "Mode Select" menu, select and enter the appropriate operating mode based on the type of detector being used.

NOTE

If using a PIR9400, note that changing the gas type on the UD10 does not change the gas type at the PIR9400. This change is made using a switch located in the PIR9400. Refer to the PIR9400 instruction manual (95-8440) for details.

NOTE

If using a C706X detector, navigate to the "Device Setup" menu and select the appropriate gas type and unit of measurement.

3. To exit, activate CANCEL/ESCAPE three times to return to the main display screen.

4. If the detector is replaced with another detector type, the UD10 will not recognize it until the mode is changed.

5. If the UD10 Display is in PIR9400 mode and if:

   a. The connection between PIR9400 and the UD10 is removed, the UD10 will show a FAULT on the Gas Screen. When the connection between PIR9400 and UD10 is restored, the UD10 will remove the FAULT indication when current increases beyond 3.6 mA.

   b. Someone removes the PIR9400 & connects a HART enabled Gas Detector, it will not be recognized by the UD10 Display until the mode is changed to HART.

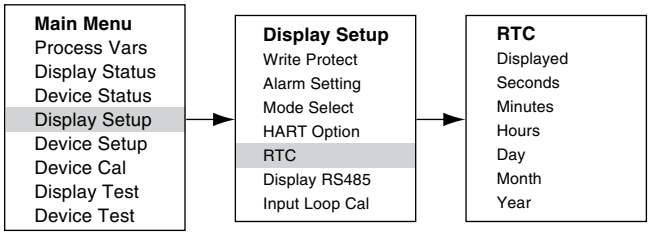
RTC

NOTE

The UD10 is set at the factory for US Central Standard time.

To display and set the Real Time Clock and Date for the UD10:

1. Using the magnet to activate the switches on the UD10 display, navigate to the RTC menu.



2. The first item on the RTC screen is "Displayed". Y (Yes) or N (NO) is shown to indicate whether the time and date will be displayed on the main screen. To change the setting, use the ENTER/SELECT button to go to the next screen, then use the PREVIOUS or NEXT buttons to toggle between Y and N. Once the chosen input is selected, use the ENTER/SELECT button to enter the selection. Use the CANCEL/ESCAPE button to exit without changing.

3. Use the same method to set time and date.

Specifically for the GT3000 Transmitter, the RTC for the transmitter can be synchronized to the RTC of the display by going through the Main Menu->Device Setup->RTC-> 1st slot "Sync W/Disp".

Latching Alarms

The high, auxiliary and low alarm relay settings are programmable and can be set for latching or non-latching operation. Alarm configuration can be done using the local display menu or external HART interface. Latched alarms on the display can be cleared through the Display Setup > Alarm Setting submenu using the magnet or external HART interface.

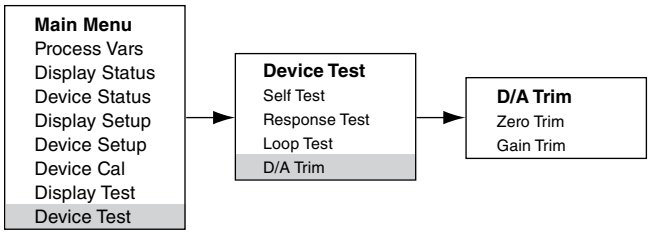
4-20 mA LOOP CALIBRATION

Both the input and output current loops of the UD10 can be trimmed in the field for maximum accuracy. If the detector connected to the UD10 is HART enabled, its 4-20 mA output signal can also be trimmed.

When the UD10 is used with a detector that supports HART communication, the output of the detector should be calibrated first.

Detector Signal Calibration

Connect a current meter between the detector and the UD10. Navigate down the menu to Device Test > D/A (Digital to Analog) Trim.

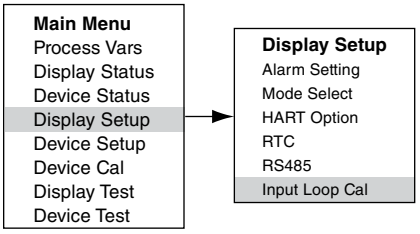


Select Zero Trim. Enter the measured value into the UD10. The UD10 calculates and corrects for the difference between the actual and entered values.

Select Gain Trim. Follow the same procedure for gain/span calibration.

UD10 Input Trim

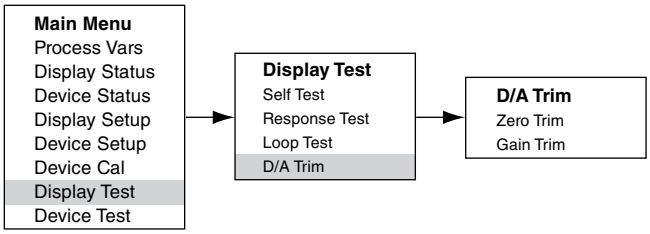
When the UD10 is used with a detector that supports HART communication, an automated process can be used to trim the UD10 input. Navigate down the menu to “Input Loop Cal”.



Upon entering Input Loop Cal, the UD10 commands the detector to output 4 mA, and then automatically calibrates its own input. The UD10 then commands the detector to output 20 mA and subsequently calibrates its own input.

UD10 Output Trim

To calibrate the UD10 output loop, connect a current meter to the UD10 output. Navigate down the menu to Display Test > D/A Trim.

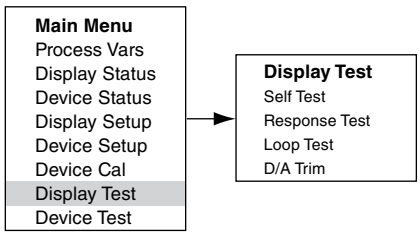


Select Zero Trim. Enter the measured value into the UD10. The UD10 calculates and corrects for the difference between the actual and entered values.

Select Gain Trim. Follow the same procedure for gain/span calibration.

OPTIONAL SYSTEM TESTS

The following tests are available for verifying proper operation of various functions of the gas detection system. The first three are accessed from the Display Test screen. (A "Device Test" screen is available for performing the same tests on HART enabled detectors.)



Self-Test

This test commands the UD10 to perform a fully automatic internal test. At the completion of the test, the UD10 will indicate a pass or fail.

Response Test

This test inhibits the UD10's outputs, thereby providing a means of testing the system by applying gas to the detector without activating any alarms or affecting the output.

Loop Test

This test temporarily forces the UD10's 4-20 mA output to a specific level. This is an easy way to test the output signal of the UD10 for accuracy, to verify the capabilities of the system, and to verify the input signal of a receiver. To perform this test, connect a current meter to the output loop. Navigate to Display Test and select Loop Test, then follow the prompts on the UD10 Screen.

NOTE

If the Response Test and Loop Test are not terminated by the operator, the test will automatically time out after ten minutes and the UD10 will return to normal operation.

Functional Test

A Functional Test (bump test) can be performed at any time to verify proper operation and calibration of the system. Since this test does not inhibit the UD10's outputs, secure any output devices prior to performing the test to prevent unwanted actuation.

HISTORY

There are two separate histories, one for the display and one for the detector (if available). Both will state the number of hours that the unit has been operating, and the highest and lowest recorded temperature (with time and date stamp).

TROUBLESHOOTING

If a Fault condition is indicated on the UD10 faceplate, the nature of the fault can be determined by using the magnetic tool to navigate to the appropriate Fault screen.

NOTE

Refer to the Menu in the appropriate Appendix of this manual for the path to the proper Fault screen.

Shortcut: From the main display screen, touch the magnet to the "Previous" switch to go directly to the Fault screen.

Example:

For a Display (UD10) related fault:

Main Menu > Display Status > Fault/Status > Fault

For a Device (Sensor) related fault:

Main Menu > Device Status > Fault/Status > Sensor Fault

When the active fault has been identified, refer to the Troubleshooting Tables for a description of the fault and suggested corrective action.

Refer to Table 3 for Display Faults and Table 4 for Device Faults.

Table 3—Troubleshooting Guide - Display Faults

Display Faults	Description	Recommended Action
Input Loop FLT	Fault in sensor or sensor loop	Check sensor wiring. Calibrate sensor. Ensure that sensor type matches configuration.
Output Loop FLT	Fault in 4-20 mA output loop	Check 4-20 mA loop wiring for shorts or opens.
EE Fault	Fault in non-volatile memory	Return to factory.
ADC Ref Fault	ADC reference voltage too high or low	Return to factory.
24V Fault	Problem in 24 volt power supply or power wiring	Check power wiring and output voltage of power supply.
Flash Fault	FLASH memory Fault	Return to factory.
RAM Fault	Fault in volatile memory	Return to factory.
WDT Fault	Watchdog timer is non-functional	Return to factory.
12V Fault	12 volt internal power supply out of tolerance	Check power source. Return to factory.
5V Fault	5 volt internal power supply out of tolerance	Check power source. Return to factory.
3V Fault	3 volt internal power supply out of tolerance	Check power source. Return to factory.

Note: A fault condition will cause an oxygen detector to generate an alarm output as the decreasing 4-20 mA signal passes through the alarm range.

Table 4—Troubleshooting Guide - Device Faults

Device Faults	Description	Recommended Action
Loop Fault	Current loop below fault threshold	Check 4-20 mA loop wiring for shorts or opens.
Supply Voltage Fault	24 volt power supply voltage too low	Verify proper wiring to the device and correct voltage output from the power supply.
Calibration Fault	Bad calibration	This fault can be caused if the calibration is allowed to time out. If so, recalibrate. Ensure that there is enough gas in the calibration bottle to complete the calibration. Ensure that the gas being used for calibration is the correct type and concentration. It must match the configured setting.
Memory Fault	Self-detected memory fault	Return to factory.
ADC Fault	Self-detected ADC fault	Return to factory.
Internal Voltage Fault	Self-detected voltage fault	Check supply voltage. Return to factory.
Zero Drift	Sensor signal has drifted negative	Device may have been calibrated with background gas present. Recalibrate the detector. Purge with clean air if needed.
Temperature Sensor Fault	Temperature sensor is out of range	Return to factory.
Wrong Sensor Type	Wrong sensor type is installed	Sensor type must match configuration. Change sensor or configuration.
Lamp Fault	Open or shorted lamp	Replace lamp. Return to factory.
Alignment Fault	Open path alignment problem	Align the device as specified in the instruction manual.
Blocked Optic Fault	Optical path is blocked	Locate and remove obstruction from the optical path.
Cal Line Active	Cal line is active at start-up	Ensure that the Cal line wiring is not shorted and the switch is open.
Sensor Fault	Self-detected fault with the sensor	Check sensor wiring. Calibrate sensor. Ensure that sensor type matches configuration.
Noise Fault*	Excessive noise on signal	Check OPECL alignment.
Align ADC Fault*	Alignment ADC saturated	Check OPECL alignment.
Align Fault*	Alignment fault	Check OPECL alignment.
Align Warning*	Alignment warning	Check OPECL alignment.
DAC Fault	DAC fault detected	Return to factory.
General Fault	Unspecified fault	Verify correct power wiring and supply voltage. Consult the factory.
High Fault	Detector output is higher than specified limit	Verify correct sensor type and calibration.
Low Fault	Detector output is lower than specified limit	Verify correct sensor type and calibration.
Dirty Optics	Detector optics are dirty	Perform the cleaning procedure as described in the detector manual, then perform calibration.
Start Cal Fault	Calibration fault	Verify correct sensor type and calibrate.

*OPECL only.

Table 4—Troubleshooting Guide - Device Faults, Continued

Device Faults	Description	Recommended Action
EE Fault	Fault in non-volatile memory	Power may have been interrupted while the device was updating its internal data logs. Recycle power.
Ref ADC Sat	Sensor signal level is outside the range of the AD converter	Return to factory.
Active ADC Sat	Sensor signal level is outside the range of the AD converter	Return to factory.
24V Fault	Problem in 24 volt power supply or power wiring	Check power wiring and output voltage of power supply.
Flash CRC Fault	Memory fault	Return to factory.
RAM Fault	Fault in volatile memory	Return to factory.
Low Voltage	Power supply voltage outside of limits	Check power supply voltage. Return to factory.
Temp Fault	Temperature sensor fault	Return to factory.
Software Fault	Internal software fault	Return to factory.
EE Safety Fault	Internal configuration fault	Return to factory.
Gas Under Range	Sensor signal has drifted negative	Device may have been calibrated with background gas present. Recalibrate the detector. Purge with clean air if needed.
Sensor Mismatch	Wrong sensor type is installed	Sensor type must match configuration. Change sensor or configuration.
ADC CNTR Fault	Internal hardware fault	Return to factory.
3V Fault	3 volt internal power supply out of tolerance	Return to factory.
Comm Fault	Communication fault	Check detector wiring and power supply.
GEN Fault	Unspecified fault	Verify correct power wiring and supply voltage. Consult the factory.
12V Fault	12 volt internal power supply out of tolerance	Return to factory.
5V Fault	5 volt internal power supply out of tolerance	Return to factory.

SPECIFICATIONS

OPERATING VOLTAGE—
24 Vdc nominal, operating range is 18 to 30 Vdc.

OPERATING POWER—
7 watts maximum.

Heater off: 2 watts @ 24 Vdc with alarm relays off and 4 mA output.
Heater off: 4 watts @ 24 Vdc with alarm relays on and 20 mA output.
Heater on: 5.5 watts @ 24 Vdc with alarm relays off and 4 mA output.
Heater on: 7 watts @ 24 Vdc with alarm relays on and 20 mA output.

NOTE

Heater function is not user configurable. Heater turns on when the internal temperature drops below –10°C.

NOTE

Appropriate relays will be activated when a fault or alarm occurs.

CURRENT OUTPUT—
Linear isolated 4-20 mA output with HART.
3.8 mA indicates calibrate mode.
3.6 mA or less indicates a fault condition.
Maximum loop resistance is 600 ohms at 18 to 30 Vdc.

RELAY CONTACTS—
Three Alarm Relays: Form C, 5 amperes at 30 Vdc. Selectable latching or non-latching. Refer to Table 1 for range and default settings.

WARNING

When in non-latching mode, the control device must latch the alarm output.

One Fault Relay: Form C, 5 amperes at 30 Vdc. Normally energized for no fault condition with power applied.

WIRING TERMINALS—
14 to 18 AWG wire can be used.

OPERATING TEMPERATURE—
–55°C to +75°C.

STORAGE TEMPERATURE—
–55°C to +75°C.

HUMIDITY RANGE—
15 to 90% RH.

CERTIFICATION—

FM: Class I, Div. 1, Groups A, B, C & D;
Class I, Div. 2, Groups A, B, C & D (T4);
Class I, Zone 1/2 AEx d IIC T6;
Class II/III, Div. 1/2, Groups E, F & G.
Tamb –55°C to +75°C
NEMA/Type 4X, IP66
Conduit seal not required.

Performance verified in accordance with:
ANSI/ISA-92.00.01
ANSI/ISA-92.02.01
FM 6341 (Draft)
ANSI/ISA-12.13.01
ANSI/ISA-12.13.04/FM 6325
FM 6310/6320

This approval does not include or imply approval of gas detector heads or other apparatus to which the subject instrument may be connected. In order to maintain a Factory Mutual Research approved system, the measurement input signal to which this instrument is connected must also be approved by Factory Mutual Research.

CSA: CSA 08 2029512.
Class I, Div. 1, Groups A, B, C & D;
Class I, Div. 2, Groups A, B, C & D (T4);
Class II/III, Div. 1/2, Groups E, F & G.
(Tamb = –55°C to +75°C)
NEMA/Type 4X, IP66
Conduit seal not required.
Performance verified in accordance with:
CSA C22.2 #152.

ATEX: CE 0539 Ex II 2 G
Ex d IIC T6
Tamb –55°C to +75°C
FM08ATEX0042X
IP66
Performance verified in accordance with:
EN 61779-1/-4 and EN 50241-1/-2.

Special Conditions for Safe Use ('X'):
The UD10 control unit complies with EN 61779-1/-4 and/or EN 50241-1/-2 only when connected to a Detector Head that also has been evaluated to EN 61779-1/-4 and/or EN 50241-1/-2.

IECEx: Ex d IIC T6
T_{amb} –55°C to +75°C
IECEx FMG 08.0010X
IP66
Performance verified in accordance with:
IEC 61779-1, -4.

Special Conditions for Safe Use ('X'):
The UD10 control unit complies with IEC 61779-1 and IEC 61779-4 when connected to a Detector Head with an IEC certificate of conformity to IEC 61779-1 and IEC 61779-4.

NOTE

Consideration must be given to overall Gas System Performance Requirements.

ELECTRO-MAGNETIC COMPATIBILITY—
EMC Directive 2004/108/EC
EN55011 (Emissions)
EN50270 (Immunity)

DIMENSIONS—
See Figures 8 and 9.

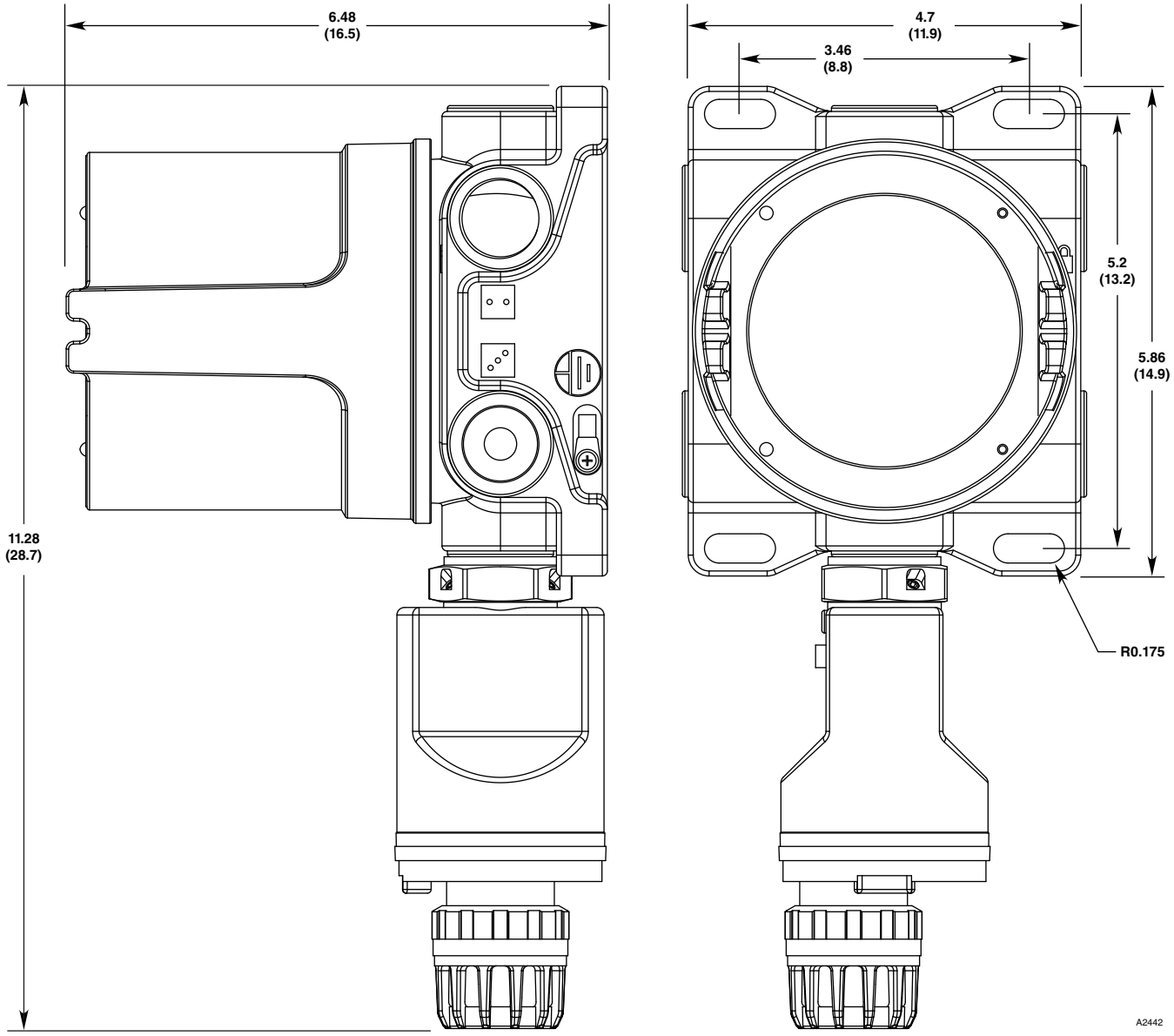


Figure 8—Dimensions of UD10 with GT3000 in Inches (Centimeters)

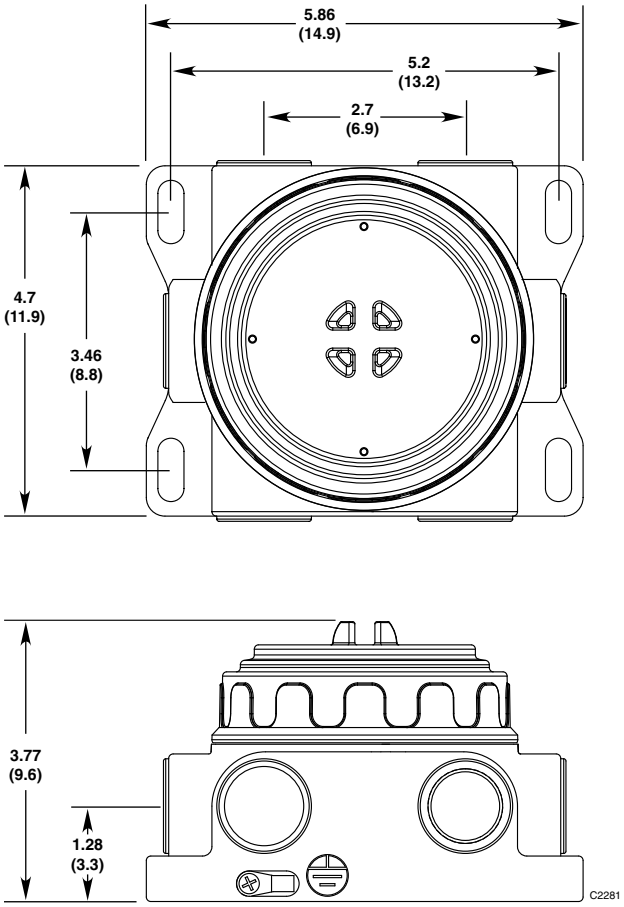


Figure 9—Dimensions of Model STB Termination Box in Inches (Centimeters)

CONDUIT ENTRIES—
3/4" NPT or M25.

ENCLOSURE MATERIAL—
Epoxy coated aluminum or 316 stainless steel.

SHIPPING WEIGHT—
Aluminum: 4.15 pounds (1.88 kilograms).
Stainless steel: 10.5 pounds (4.76 kilograms).

WARRANTY—
12 months from date of installation or 18 months from date of shipment, whichever occurs first.

DETECTOR COMPATIBILITY—
The UD10 can be used with the Det-Tronics gas detectors listed in Table 5.

Table 5—Gas Detectors Compatible with the UD10

Device	Toxic[1]	Catalytic Combustible	IR[2] Combustible	Instruction Manual
GT3000	X			95-8616
PIR9400			X	95-8440
PIRECL			X	95-8526
OPECL			X	95-8556
505/CGS		X		95-8472
C706X[3]	X			95-8396 95-8411 95-8414 95-8439
NTMOS[4]	X			95-8604

1 Hydrogen sulfide, Ammonia, Chlorine, Hydrogen, Oxygen, Carbon Monoxide, and Sulfur Dioxide.
2 Methane, Ethane, Ethylene, Propane, and Propylene.
3 C7065E Oxygen detector is not supported.
4 Hydrogen sulfide only.

DEVICE REPAIR AND RETURN

Prior to returning devices, contact the nearest local Detector Electronics office so that a Return Material Identification (RMI) number can be assigned. **A written statement describing the malfunction must accompany the returned device or component to assist and expedite finding the root cause of the failure**.

Pack the unit properly. Always use sufficient packing material. Where applicable, use an antistatic bag as protection from electrostatic discharge. The RMI number should be clearly marked on the outside of the box.

NOTE

Inadequate packaging that ultimately causes damage to the returned device during shipment will result in a service charge to repair the damage incurred during shipment.

Return all equipment transportation prepaid to the factory in Minneapolis.

NOTE

It is highly recommended that a spare be kept on hand for field replacement to ensure continuous protection.

ORDERING INFORMATION

Sensor module, transmitter module and termination boxes (if used) must be ordered separately.

Refer to the UD10 Model Matrix for ordering details.

UD10 MODEL MATRIX

MODEL	DESCRIPTION							
UD10	Universal Display Unit							
	TYPE	MATERIAL						
	A	Aluminum						
	S	Stainless Steel (316)						
		TYPE	THREAD TYPE					
		5M	5 Port, Metric M25					
		5N	5 Port, 3/4" NPT					
			TYPE	OUTPUTS				
			25	Relay, 4-20 mA, RS485, HART				
				TYPE	APPROVAL			
				W	FM/CSA/ATEX/CE			
					TYPE	CLASSIFICATION (Div/Zone)		
					2	Ex d (Flameproof)		

REPLACEMENT PARTS

Part Number	Description
009700-001	Magnetic Tool
009489-001	Electronics Module
101197-001*	Stop Plug, 3/4” NPT, AL
101197-004*	Stop Plug, 3/4” NPT, SS
103517-001	Stop Plug, M25, AL, IP66
101197-003	Stop Plug, M25, SS, IP66
102804-001	Reducer, M25 to M20, AL
102804-003	Reducer, M25 to M20, SS
103346-007	375 Field Communicator
102868-001	Lubriplate grease, 14 oz.
005003-001	Lubriplate grease, 1 oz.

*NEMA 4/IP66 rating requires addition of non-hardening thread sealant or Teflon tape.

ASSISTANCE

For assistance in ordering a system to meet the needs of a specific application, please contact:

Detector Electronics Corporation
6901 West 110th Street
Minneapolis, Minnesota 55438 USA
Operator: (952) 941-5665 or (800) 765-FIRE
Customer Service: (952) 946-6491
Fax: (952) 829-8750
Web site: www.det-tronics.com
E-mail: det-tronics@det-tronics.com

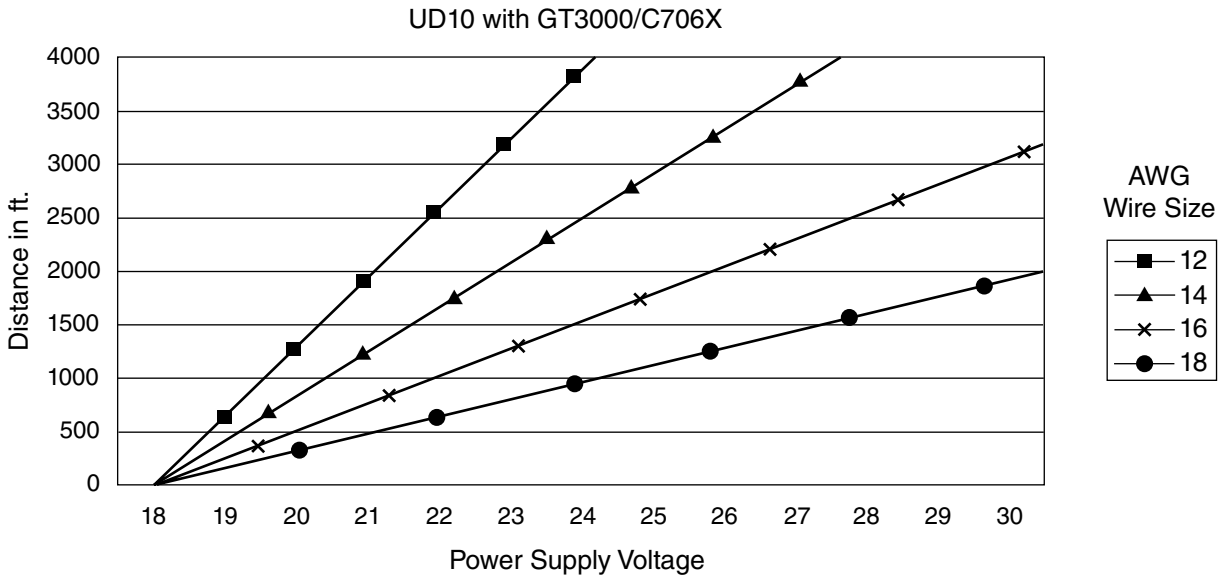
APPENDIX A

UD10 with LOOP POWERED DETECTOR

NOTE

Refer to the front of this manual for complete information regarding installation, wiring and startup of the UD10.

WIRING



Notes: Maximum cable length from power source to UD10 is 2000 feet.
Maximum cable length from UD10 to sensor/STB termination box is 2000 feet.

MENU STRUCTURE

Refer to the following menu tree when using the 375 HART handheld communicator, connected to the UD10's 4-20 mA output.

MENU HELP

Status menus only allow the user to view the data.
The Setup menus allow the user to both view and edit the data.

Main Menu

1) Process Variables →
2) Display Status Menu →
3) Device Status Menu →
4) Display Setup →
5) Device Setup →
6) Display Test Menu →

Process Variables

1) Gas Name	xxxxx
2) Gas Value	xxxx.x
3) High Alarm	T/F
4) Low Alarm	T/F
5) AUX Alarm	T/F
6) Analog Output	xxxxx
7) Upper Range Value	xxxxx
8) Lower Range Value	xxxxx
9) Fault	T/F

Display Status Menu

1) Display General Info
2) Display Fault/Status Info
3) Display History
4) Display Info

Device Status Menu

1) Device Info
2) Device Fault/Status
3) Device Info 2
4) Sensor Info
5) Device History Info

Display Setup

1) Alarm Setting
2) Display HART Option
3) Display RTC

Alarm Setting

1) Reset Latched Alarms	
2) High Alarm Level	xxxxx
3) High Alarm Latch	Y/N
4) Low Alarm Level	xxxxx
5) Low Alarm Latch	Y/N
6) AUX Alarm Level	xxxxx
7) AUX Alarm Latch	Y/N

Display HART Option

1) Tag	xxxxx
2) Descriptor	xxxxx
3) Message	xxxxx
4) Date	xxxxx
5) Final asmbly num	xxxxx

Display RTC

1) Seconds	xxxxx
2) Minutes	xxxxx
3) Hours	xxxxx
4) Day	xxxxx
5) Month	xxxxx
6) Year	xxxxx

Device Setup

1) Device HART Option

Device HART Option

1) Tag	xxxxx
2) Descriptor	xxxxx
3) Message	xxxxx
4) Final asmbly num	xxxxx

Display Test Menu

1) Self Test
2) Response Test
3) Reset
4) Loop Test
5) D/A Trim

Loop Test

1) 4 mA
2) 20 mA
3) Other
4) End

Device Info

1) Manufacturer	xxxxx
2) Tag	xxxxx
3) Descriptor	xxxxx
4) Message	xxxxx
5) Final Asmbly Num	xxxxx
6) Dev ID	xxxxx
7) Write Protect	xxxxx
8) Model	xxxxx

Device Fault/Status

1) Operating Mode	xxxxx
2) Calibration State	xxxxx
3) Device Status 1	xxxxx
4) Device Status 2	xxxxx
5) Device Fault 1	xxxxx
6) Device Fault 2	xxxxx
7) Device Fault 3	xxxxx
8) Device Fault 4	xxxxx

Device Info 2

1) Serial Number	xxxxx
2) Hardware Rev	xxxxx
3) Firmware Rev	xxxxx
4) Universal Rev	xxxxx
5) Fld Dev Rev	xxxxx
6) Software Rev	xxxxx

Sensor Info

1) Sensitivity	xxxxx
2) Gas Name	xxxxx
3) Revision	xxxxx
4) PV USL	xxxxx
5) PV LSL	xxxxx
6) Hours	xxxxx
7) Serial Number	xxxxx
8) Sensor Hardware Rev	xxxxx
9) Firmware Rev	xxxxx
Cal Point Zero	xxxxx
Cal Point Span	xxxxx

Device History Info

1) Calibration Log

Device Status 1

Calibration Active	ON/OFF
Warm Up	ON/OFF
Low Alarm	ON/OFF
Aux Alarm	ON/OFF
High Alarm	ON/OFF
Self Test	ON/OFF
Configuration Change	ON/OFF
Alignment Mode	ON/OFF

Device Status 2

Write Protect	ON/OFF
Response Test	ON/OFF
4-20 Fixed	ON/OFF
Sensor Removed	ON/OFF
Sensor End Of Life	ON/OFF
Loop Test Active	ON/OFF
Undefined	ON/OFF
Undefined	ON/OFF

Device Fault 1

Loop Fault	ON/OFF
Supply Voltage Fault	ON/OFF
Calibration Fault	ON/OFF
Memory Fault	ON/OFF
ADC Fault	ON/OFF
Internal Voltage Fault	ON/OFF
Zero Drift	ON/OFF
Temperature Sensor Fault	ON/OFF

Device Fault 2

Wrong Sensor Type	ON/OFF
Lamp Fault	ON/OFF
Alignment Fault	ON/OFF
Blocked Optic Fault	ON/OFF
Cal Line Active	ON/OFF
Sensor Fault	ON/OFF
Noise Fault	ON/OFF
Align ADC Fault	ON/OFF

Device Fault 3

Align Fault	ON/OFF
Align Warning	ON/OFF
DAC Fault	ON/OFF
Undefined	ON/OFF
Undefined	ON/OFF
Undefined	ON/OFF
Undefined	ON/OFF
Undefined	ON/OFF

Device Fault 4

Undefined	ON/OFF
Undefined	ON/OFF
Undefined	ON/OFF
Undefined	ON/OFF
Undefined	ON/OFF
Undefined	ON/OFF
Undefined	ON/OFF
General Fault	ON/OFF

Calibration Log

Calibration Log
CalCode: xx Timestamp: xxxxxxxx

First
Previous
Next
End

Display General Info

1) Manufacturer	xxxxx
2) Tag	xxxxx
3) Descriptor	xxxxx
4) Message	xxxxx
5) Final Asmbly Num	xxxxx
6) Dev ID	xxxxx
7) Write Protect	xxxxx
8) Model	xxxxx

DET-TRONICS

Display Fault/Status Info

1) Operating Mode	xxxxx
2) Display Status 1	xxxxx
3) Display Status 2	xxxxx
4) Display Fault 1	xxxxx
5) Display Fault 2	xxxxx

Display Status 1

Cal Line Active	ON/OFF
Cal SW Active	ON/OFF
HART Test	ON/OFF
LON Attached	ON/OFF
Response Test	ON/OFF
Manual Self Test	ON/OFF
Input HART	ON/OFF
Reserved	ON/OFF

Display Status 2

Any Fault	ON/OFF
Cal. Active	ON/OFF
Warm up Mode	ON/OFF
Low Relay Active	ON/OFF
Hi Relay Active	ON/OFF
Aux Relay Active	ON/OFF
Current Fixed	ON/OFF
MB Write Protect	ON/OFF

Display Fault 1

12V Fault	ON/OFF
5V Fault	ON/OFF
3V Fault	ON/OFF
ADC Range Fault	ON/OFF
Output Loop FLT	ON/OFF
Input Loop FLT	ON/OFF
Flash Code FLT	ON/OFF
HART Communication	ON/OFF

Display Fault 2

Calibration Flt	ON/OFF
Start Cal Flt	ON/OFF
EE Fault	ON/OFF
ADC Ref Fault	ON/OFF
24V Fault	ON/OFF
Flash Fault	ON/OFF
RAM Fault	ON/OFF
WDT Fault	ON/OFF

Display History

1) History
2) Event Log

History

1) Running Hrs	xxxx
2) Max Temp	xx.xx C
3) Max Temp Time	
4) Min Temp	xx.xx C
5) Min Temp Time	

DD/MM/YY HR:MM:SS
xx / xx / xx xx:xx:xx

Event Log

1) Event Log

Event Log

XXXX On dd/mm/yy-hh:mm:ss

First
Previous
Next
End

Display Info

1) Display RTC	
2) Serial Number	xxxxx
3) Hardware Rev	xxxxx
4) Firmware Rev	xxxxx
5) Universal Rev	xxxxx
6) Fld Dev Rev	xxxxx
7) Software Rev	xxxxx

Display RTC

1) Seconds	xxxxx
2) Minutes	xxxxx
3) Hours	xxxxx
4) Day	xxxxx
5) Month	xxxxx
6) Year	xxxxx

Detector Electronics

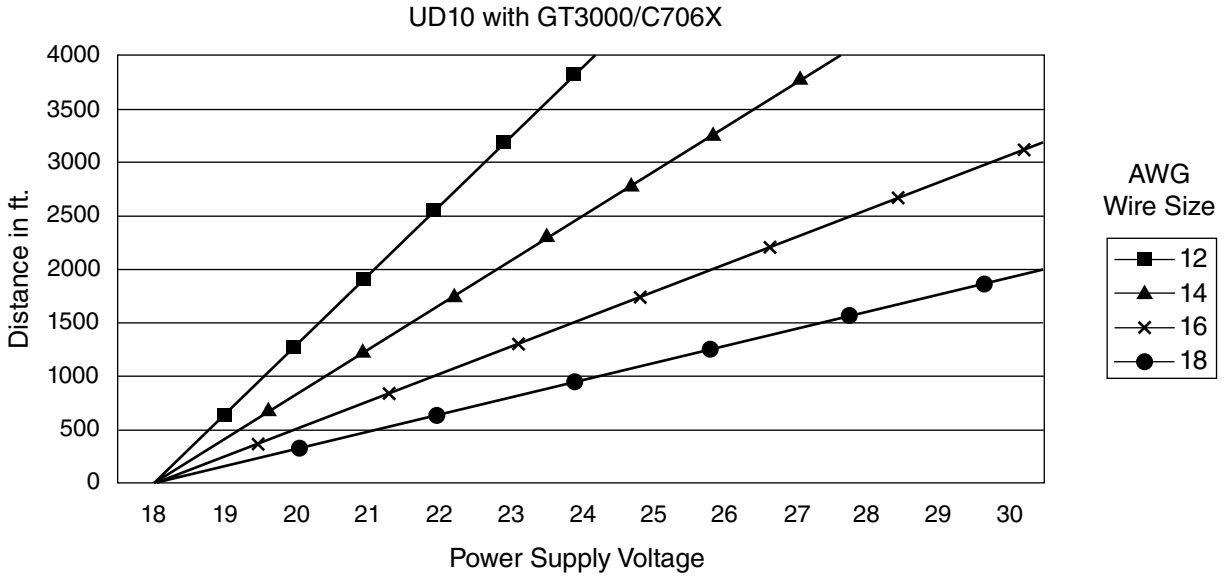
UD10 HART	March 25, 2009	1.17

APPENDIX B

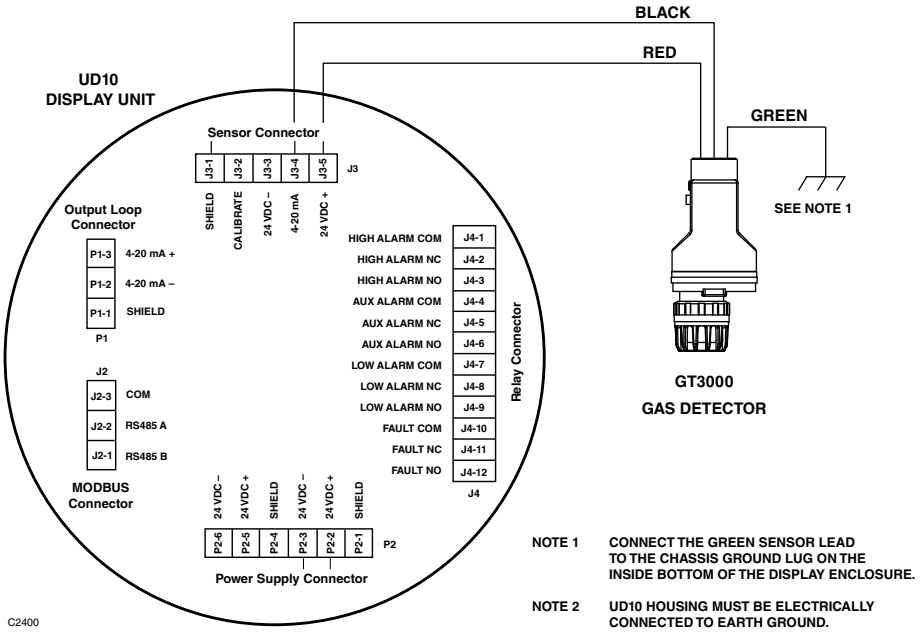
UD10 with GT3000 TOXIC GAS DETECTOR

NOTE
For complete information regarding the GT3000 Gas Detector, refer to instruction manual 95-8616.

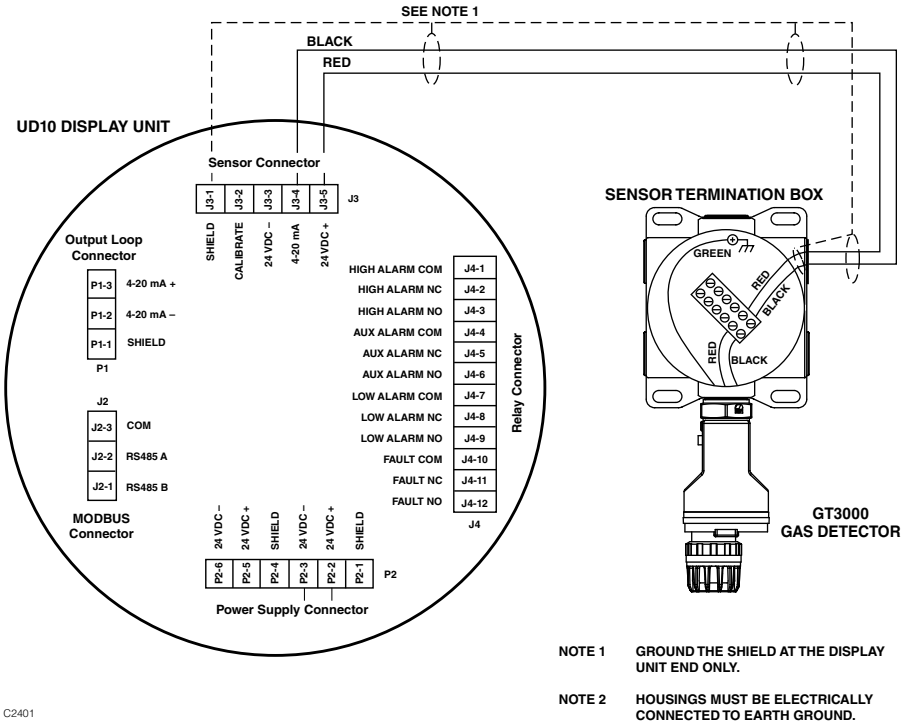
WIRING



Notes: Maximum cable length from power source to UD10 is 2000 feet.
Maximum cable length from UD10 to sensor/STB termination box is 2000 feet.



GT3000 Detector Wired Directly to UD10



UD10 Wired to GT3000 Detector with Sensor Termination Box

ORIENTATION

The device must be mounted in a vertical position only, with the GT3000 pointing down.

LIVE MAINTENANCE

NOTE

*The sensor module on the GT3000 Gas Detector can be hot swapped, i.e. replaced without removing power or de-classifying the area. To replace a GTX Transmitter connected to the UD10 with a new transmitter or a different detector type, the area **must** be de-classified.*

NOTE

Removing the sensor module with power applied will result in a fault condition until a new sensor module of the same type is installed. When replacing an oxygen sensor, this action will also result in an alarm condition as the decreasing 4-20 mA signal passes through the alarm range. Inhibit response devices to prevent unwanted actuation.

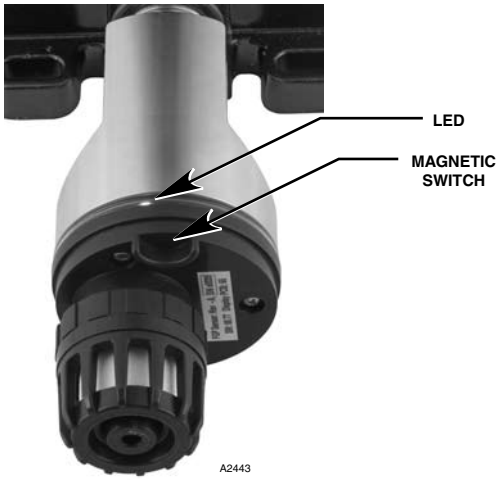
For complete information regarding sensor replacement with the GT3000 Gas Detector, refer to the GT3000 instruction manual number 95-8616.

CALIBRATION

GT3000 WITH TOXIC GAS SENSOR

From GT3000:

1. Using the magnet, activate the magnetic calibration switch on the GT3000. The green LED turns to amber.



Location of Magnetic Switch on GT3000

2. The UD10 will display “Waiting for Zero” on the main display screen, with the amber LED on the detector housing illuminated continuously.

3. The UD10 will then display “Waiting for Signal” on the screen, while the amber LED on the detector is flashing.

4. The UD10 will display “Waiting for Gas” on the screen, while the amber LED on the detector is flashing.

5. Apply calibration gas to the sensor.

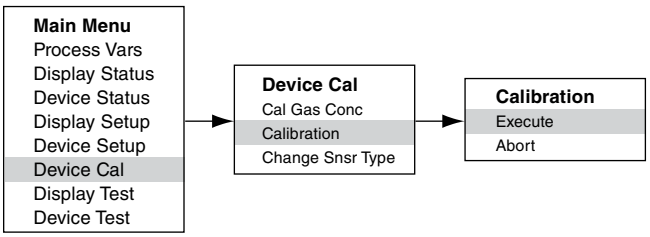
6. The UD10 will display “Waiting for Span” on the screen, while the amber LED on the detector is flashing.

7. When the UD10 displays “Remove Cal Gas” on the screen and all LEDs on the detector housing are off, remove the calibration gas.

8. After successful calibration, the UD10 automatically returns to the normal display with the green LED illuminated on the detector.

From UD10

1. Using the magnet to activate the switches on the UD10 display, navigate to the Calibration menu.



2. Activate “Execute” (Enter/Select) to start calibration.

3. The UD10 will display “Waiting for Zero” on the main display screen, with the amber LED on the detector housing illuminated continuously.

4. The UD10 will then display “Waiting for Gas” on the screen, while the amber LED on the detector is flashing.

5. Apply calibration gas to the sensor.

6. The UD10 will display “Waiting for Span” on the screen, while the amber LED on the detector is flashing.

7. When the UD10 displays “Remove Cal Gas” on the screen and the LEDs on the detector housing are off, remove the calibration gas.

8. After completion of a successful calibration, the UD10 automatically returns to the normal mode with the green LED illuminated on the detector.

GT3000 WITH OXYGEN SENSOR

From GT3000:

1. Using the magnet, activate the magnetic calibration switch on the GT3000. The green LED turns to amber.

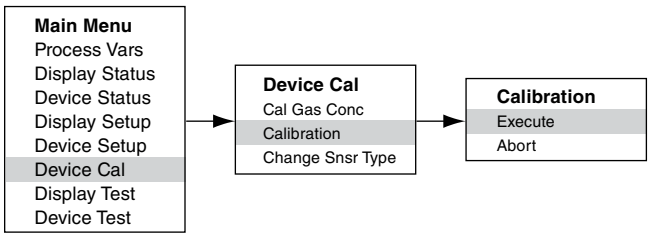
2. The device automatically performs the zero calibration.
   The amber LED on the GT3000 is on continuously.
   The UD10 displays "Waiting for Zero" on the main display screen.

3. When the amber LED on the GT3000 flashes, the device automatically performs the span calculation.
   If using bottled 20.9% oxygen, apply immediately.
   The UD10 displays "Waiting for Span" on the screen.

4. After successful calibration, the green LED on the GT3000 is on continuously and the UD10 automatically returns to the normal display.
   Remove calibration gas (if used).

From UD10

1. Using the magnet to activate the switches on the UD10 display, navigate to the Calibration menu.



2. Activate "Execute" (Enter/Select) to start calibration.

3. The UD10 will display "Waiting for Zero" on the main display screen, with the amber LED on the detector housing illuminated continuously. The device automatically performs the zero calibration.

4. When the UD10 displays "Waiting for Span" on the screen and the amber LED on the detector is flashing, the device automatically performs the span calculation. If using bottled 20.9% oxygen, apply immediately.

5. After completion of a successful calibration, the UD10 automatically returns to the normal mode with the green LED illuminated on the detector. Remove calibration gas (if used).

MENU STRUCTURE

UD10 with GT3000 Detector

Refer to the following menu when using the UD10's LCD display and internal magnetic switches.

When connecting a HART Communicator to the UD10's 4-20 mA output, refer to the "UD10 HART" menu in Appendix A.

MENU HELP

Status menus only allow the user to view the data. The Setup menus allow the user to both view and edit the data.

Main Menu
- Process Vars →
- Display Status →
- Device Status →
- Display Setup →
- Device Setup →
- Device Cal →
- Display Test →
- Device Test →

Process Vars

Gas Name	
Gas Value	x.xx
High Alarm	Y/N
Low Alarm	Y/N
Aux Alarm	Y/N
Analog Input	x.xx mA
URV	x.xx
LRV	x.xx
Fault	Y/N

Display Status
- General Info →
- Fault/Status →
- History →
- Display Info →
- RS485 →
- Debug Menu →

Device Status
- General Info →
- Fault/Status →
- Tx Info →
- Sensor Info →
- History →
- Debug Menu →

Display Setup
- Alarm Setting →
- Mode Select →
- HART Option →
- RTC →
- RS485 →
- Input Loop Cal

Device Setup
- Device Option →
- HART Option →
- RTC →

Device Cal
- Cal Gas Conc xx.xx
- Calibration →
- Change Snsr Type

Calibration
- Execute
- Abort

Display Test
- Self Test
- Response Test
- Loop Test →
- D/A Trim →

Loop Test
- Set 4-20 MA →

D/A Trim
- Zero Trim
- Gain Trim

Set 4-20 MA
3.5 MA, 4 MA, 6 MA, 8 MA, 10 MA, 12 MA, 14 MA, 16 MA, 18 MA, 20 MA

Device Test
- Self Test
- Response Test
- Loop Test →
- D/A Trim →

Loop Test
- Set 4-20 MA →

D/A Trim
- Zero Trim
- Gain Trim

Set 4-20 MA
3.5 MA, 4 MA, 6 MA, 8 MA, 10 MA, 12 MA, 14 MA, 16 MA, 18 MA, 20 MA

Device Option

Gas Name	xxxx
Unit of Measure	xxxx
URV	xxxx
LRV	xxxx
USL	xxxx
LSL	xxxx

Hart Option

Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxx
Final assy num	xxxx

RTC

Sync W/Disp	
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

Alarm Setting

Rst Latch Alarms	
Hgh Alarm Level	xx.xx
Hgh Alarm Latch	Y/N
Low Alarm Level	xx.xx
Low Alarm Latch	Y/N
Aux Alarm Level	xx.xx
Aux Alarm Latch	Y/N

Mode Select

HART Device
PIR9400
C706X
505
NTMOS

HART Option

Tag	xxxxx
Descriptor	xxxxx
Date	xxxxx
Message	xxxxx
Final assy num	xxxxx

RTC

Displayed	Y/N
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

RS485
- Baud Rate →
- Parity →
- Poll Address xxxx

Baud Rate
1200, 2400, 4800, 9600, 19.2K

Parity
None, Even, Odd

General Info

Manufacturer	→
Model	FGP_TX
Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxx
Final Assy Num	xxxxx
Device ID	xxxxx

Fault/Status

Op Mode	xxxxx
Cal State	xxxxx
Tx Status	Y/N
Tx Fault	Y/N
Sensor Status	Y/N
Sensor Fault	Y/N

Tx Info

RTC	→
Serial Number	xxxxx
H/W Rev	xx.xx
F/W Rev	xx.xx
Universal Rev	xxxxx
Fld Dev Rev	xxxxx
S/W Rev	xx.xx
Running Hours	xxxxx
Temperature	xx.xxC

Sensor Info

Sensitivity	xxxxx
Gas Type	xxxxx
Serial Number	xxxxx
H/W Rev	xx.xx
F/W Rev	xx.xx
Rev	xxxxx
USL	xx.xx
LSL	xx.xx
Running Hours	xxxxx
Cal Point Zero	xx.xx
Cal Point Span	xx.xx
PPM Hours	xxxxx
Temperature	xx.xxC

History
- Tx History →
- Sensor History →
- Calibration Log →
- Event Log →

Debug Menu

Modbus Errors xxxx

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RTC

Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

Tx History

Running Hours	xxxxx
Max Temp	xx.xx C
Max Temp Time	xxxxx
Min Temp	xx.xx C
Min Temp Time	xxxxx

Sensor History

Running Hours	xxxx
Max Temp	xx.xx C
Max Temp Time	xxxx
Min Temp	xx.xx C
Min Temp Time	xxxx

Calibration Log

Cal ID	xxx
Date	dd/mmm/yyyy
Time	hh:mm:ss
Zero	xx.xx
Span	xx.xx

Event Log

Event	xxxxx
Date	dd/mmm/yyyy
Time	hh:mm:ss

Tx Status

TX FAULT	ON/OFF
WARM UP	ON/OFF
CHANGE CONFIG	ON/OFF
MULTI DROP	ON/OFF
WRITE PROTECT	ON/OFF
SELF TEST	ON/OFF
RESPONSE TEST	ON/OFF
CURRENT FIXED	ON/OFF
LOOP TEST	ON/OFF
FACTORY MODE	ON/OFF
SNSR ASSY REMOVE	ON/OFF

Tx Fault

EE FAULT	ON/OFF
ADC FAULT	ON/OFF
DAC FAULT	ON/OFF
LOW VOLTAGE	ON/OFF
FLASH CRC	ON/OFF
RAM FAULT	ON/OFF
TEMP FAULT	ON/OFF
SOFTWARE FAULT	ON/OFF
EE SAFETY FAULT	ON/OFF
GAS UNDER RANGE	ON/OFF
SENSOR MISMATCH	ON/OFF
SENSOR FAULT	ON/OFF

Sensor Status

SENSOR FAULT	ON/OFF
WARM UP	ON/OFF
CAL ACTIVE	ON/OFF
CAL SWITCH	ON/OFF
WRITE PROTECT	ON/OFF
EOL SENSOR	ON/OFF
CHANGE CONFIG	ON/OFF
GEN ACTIVE	ON/OFF
GEN INSTALLED	ON/OFF

Sensor Fault

CAL FAULT	ON/OFF
EE FAULT	ON/OFF
ADC FAULT	ON/OFF
ADC CNTR FAULT	ON/OFF
3V FAULT	ON/OFF
ZERO DRIFT FAULT	ON/OFF
FLASH CRC FAULT	ON/OFF
RAM FAULT	ON/OFF
TEMP FAULT	ON/OFF
COMM FAULT	ON/OFF
GEN FAULT	ON/OFF

General Info

Manufacturer	→
Model	UD-10
Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxxx
Final Assy Num	xxxxx
Device ID	xxxxx

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Fault/Status

Op Mode	xxxxx
Fault	Y/N
Status	Y/N

Fault

CAL FAULT	ON/OFF
START CAL FAULT	ON/OFF
EE FAULT	ON/OFF
ADC REF FAULT	ON/OFF
24V FAULT	ON/OFF
FLASH FAULT	ON/OFF
RAM FAULT	ON/OFF
WDT FAULT	ON/OFF
12V FAULT	ON/OFF
5V FAULT	ON/OFF
3V FAULT	ON/OFF
ADC RANGE FAULT	ON/OFF
O/P LOOP FAULT	ON/OFF
INPUT LOOP FAULT	ON/OFF
FLASH CODE FAULT	ON/OFF
HART COMM FAULT	ON/OFF

Status

ANY FAULT	ON/OFF
CAL. ACTIVE	ON/OFF
WARM UP	ON/OFF
LOW RELAY ACTIVE	ON/OFF
HI RELAY ACTIVE	ON/OFF
AUX RELAY ACTIVE	ON/OFF
CURRENT FIXED	ON/OFF
MB WRITE PROTECT	ON/OFF
CAL LINE ACTIVE	ON/OFF
CAL SW ACTIVE	ON/OFF
HART SELF TEST	ON/OFF
LON ATTACHED	ON/OFF
RESPONSE TEST	ON/OFF
MANUAL SELF TEST	ON/OFF

History
- Display History →
- Event Log →

Display History

Running Hours	xxxx
Max Temp	xx.xx C
Max Temp Time	xxxx
Min Temp	xx.xx C
Min Temp Time	xxxx

Event Log

Event	xxxxx
Date	dd/mmm/yyyy
Time	hh:mm:ss

Display Info

RTC	→
Serial Number	xxxxx
H/W Rev	xxxxx
F/W Rev	xxxxx
Universal Rev	xxxxx
Fld Dev Rev	xxxxx
S/W Rev	xx.xx
Running Hours	xxxxx
Temperature	xx.xx C

RTC

Displayed	Y/N
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

RS485

Baud Rate	xxxxx
Parity	xxxxx
Poll Address	xxxxx

Debug Menu

HART Errors xxxxx

Detector Electronics

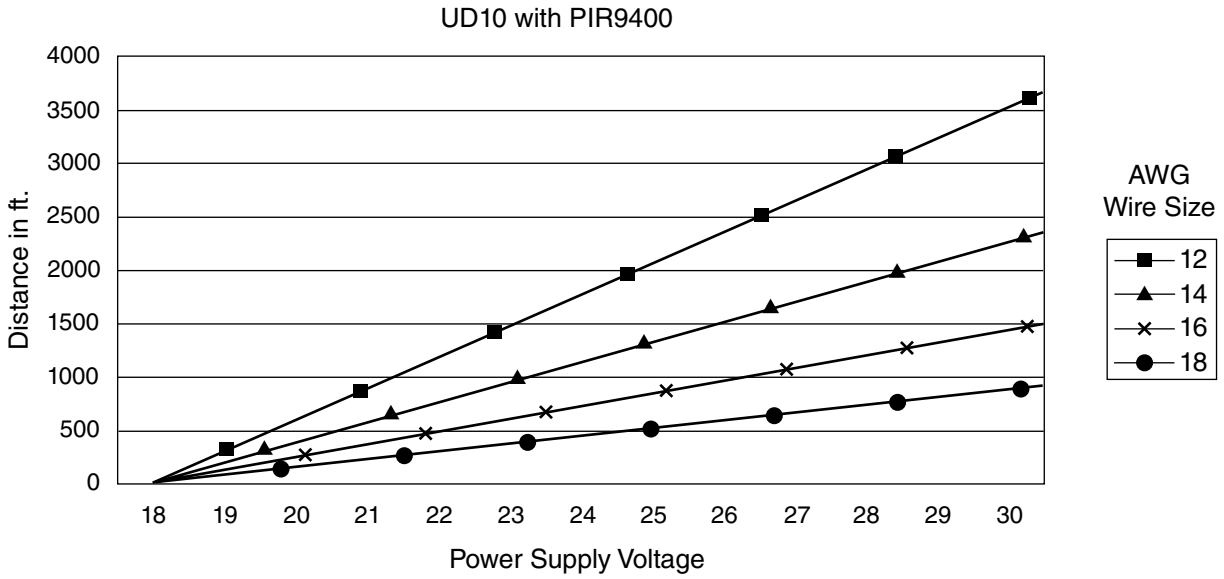
UD10 GT3000	March 25, 2009	1.17

APPENDIX C

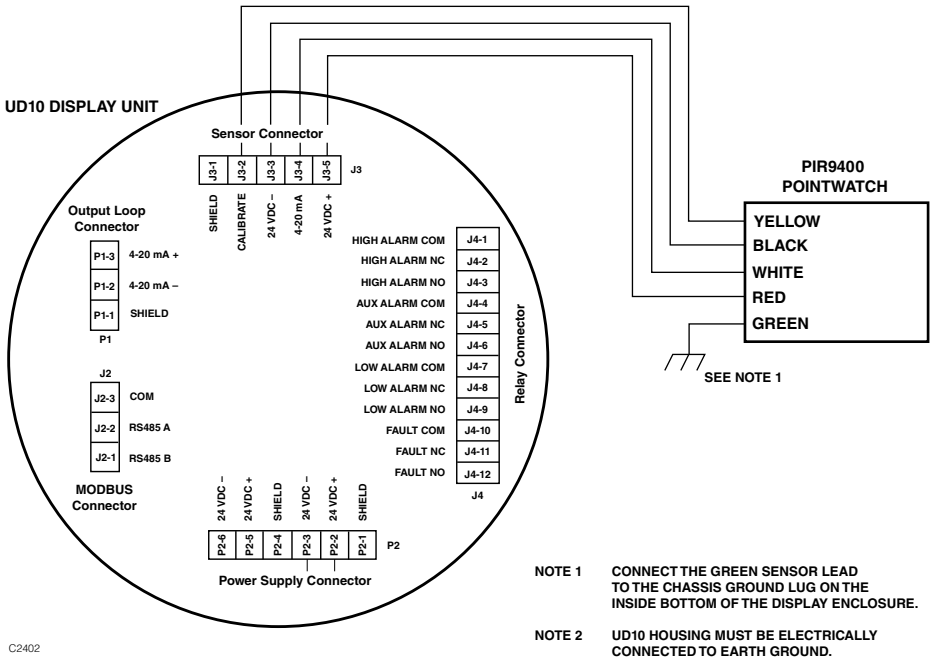
UD10 with PIR9400 POINTWATCH IR GAS DETECTOR

NOTE
For complete information regarding the PIR9400 Gas Detector, refer to instruction manual 95-8440.

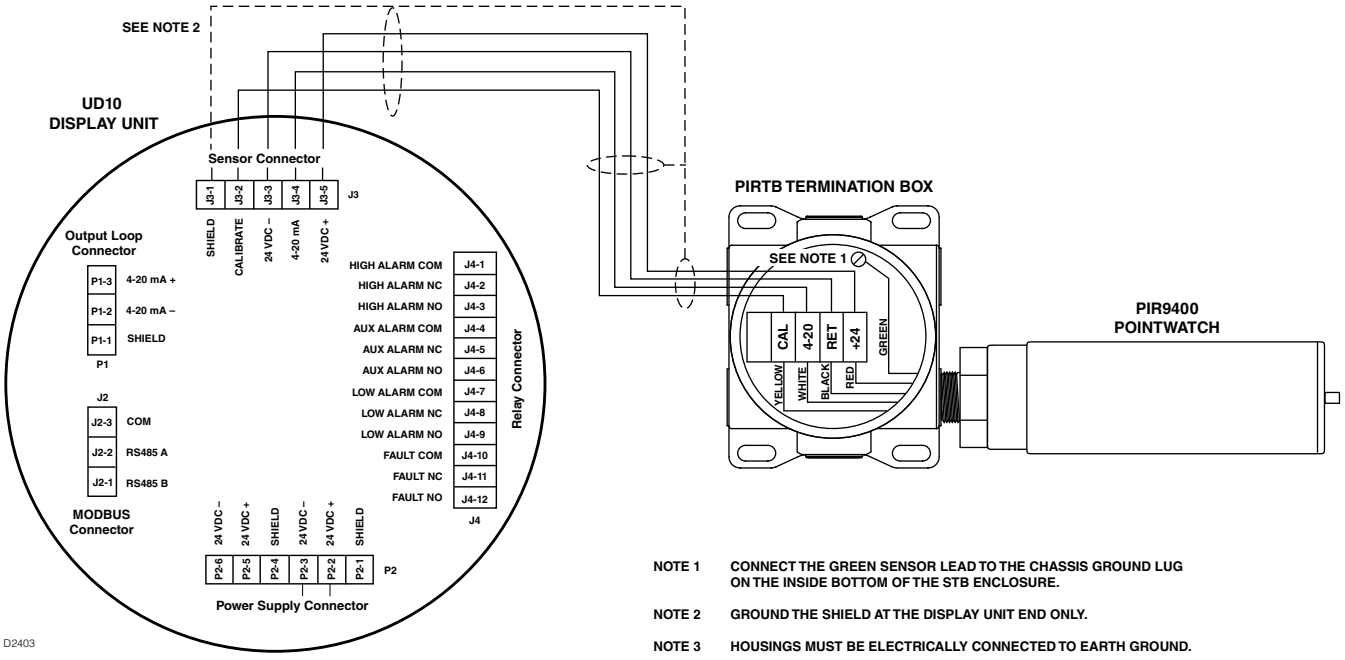
WIRING



Notes: Maximum cable length from power source to UD10 is 2000 feet.
Maximum cable length from UD10 to detector/STB termination box is 2000 feet.



PIR9400 Wired Directly to UD10



UD10 Wired to PIR9400 with PIRTB Termination Box

INSTALLATION NOTES

IMPORTANT

Hydrocarbon-based grease emits hydrocarbon vapors that will be measured by PointWatch, resulting in inaccurate gas level readings. ***Use only low vapor pressure Lubriplate grease or Teflon tape on the PointWatch detector and associated termination box.*** *Do not get grease on the optics of the detector. A suitable grease is listed in the "Ordering Information" section in this manual.*

IMPORTANT

In applications where both PointWatch and catalytic type sensors are used, ensure that the grease used to lubricate the PointWatch detector threads does not come into contact with the catalytic sensors, since poisoning of the catalytic sensors could result. It is strongly recommended that maintenance personnel wash their hands between handling the two types of sensors.

ORIENTATION

It is highly recommended that the PIR9400 be installed in the horizontal position. The detector is not position-sensitive in terms of its ability to detect gas. However, the weather baffle assembly provides superior performance when installed in a horizontal position. (See illustration below).

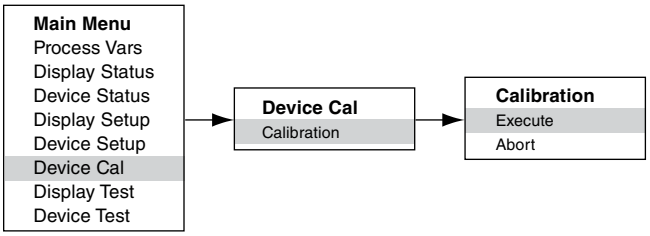
CHANGING OPERATING MODES

When used with a PIR9400, the operating mode of the UD10 must be changed from “HART Device” to “PIR9400” mode. Refer to the “Startup” section of this manual for details.

CALIBRATION

To initiate calibration of the PIR9400 from the UD10 Display:

1. Using the magnet to activate the switches on the UD10 display, navigate to the “Calibration” menu.



2. Activate “Execute” (Enter/Select) to start calibration.
3. The UD10 will display “Waiting for Zero” on the main display screen.
4. The UD10 will then display “Waiting for Gas” on the screen.
5. Apply calibration gas to the PIR9400.
6. The UD10 will continue to display “Waiting for Gas” on the screen.
7. When the UD10 displays “Remove Cal Gas” on the screen, remove the calibration gas from the PIR9400.
8. The UD10 automatically returns to the normal mode after successful calibration.

MENU STRUCTURE

UD10 with PIR9400 PointWatch Detector

Refer to the following menu when using the UD10’s LCD display and internal magnetic switches.

When connecting a HART Communicator to the UD10’s 4-20 mA output, refer to the “UD10 HART” menu in Appendix A.

MENU HELP

Status menus only allow the user to view the data. The Setup menus allow the user to both view and edit the data.

Main Menu

- Process Vars →
- Display Status →
- Device Status →
- Display Setup →
- Device Setup →
- Device Cal →
- Display Test →

Process Vars

Gas Name	
Gas Value	x.xx
High Alarm	Y/N
Low Alarm	Y/N
Aux Alarm	Y/N
Analog Input	x.xx mA
URV	x.xx
LRV	x.xx
Fault	Y/N

Display Status

Gen Info	→
Fault/Status	→
History	→
Display Info	→
Display RS485	→
Debug Meun	→
Display Temp	xx.xxC

Device Status

- Device Info →
- Calibration Log →

Device Info

Manufacturer	→
Model	PIR9400
Gas Name	xxxxx
Unit of Measure	xxxxx
URV	xx.xx
LRV	xx.xx

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Calibration Log

Cal ID	xxxx
Date	dd/mmm/yyyy
Time	hh:mm:ss

Display Setup

- Alarm Setting →
- Mode Select →
- HART Option →
- RTC →
- RS485 →
- Input Loop Cal

Alarm Setting

Rst Latch Alarms	
Hgh Alarm Level	xx.xx
Hgh Alarm Latch	Y/N
Low Alarm Level	xx.xx
Low Alarm Latch	Y/N
Aux Alarm Level	xx.xx
Aux Alarm Latch	Y/N

Mode Select

- HART Device
- PIR9400
- C706X
- 505
- NTMOS

HART Option

Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxxx
Final assy num	xxxxx

RTC

Displayed	Y/N
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

RS485

Baud Rate	→
Parity	→
Poll Address	xxxx

Baud Rate

- 1200
- 2400
- 4800
- 9600
- 19.2K

Parity

- None
- Even
- Odd

Device Setup

- Device Option →

Device Option

Gas Type	→
Gas Name	xxxxx
Unit of Measure	%LFL
URV	xx.xx
LRV	xx.xx

Gas Type

- Methane
- Ethane
- Propane
- Propylene
- Ethylene

Device Cal

Calibration	→
Cal Gas Concentration	50 %LFL

Calibration

- Execute
- Abort

Display Test

- Self Test
- Response Test
- Loop Test →
- D/A Trim →

Loop Test

- Set 4-20 mA ->

D/A Trim

- Zero Trim
- Gain Trim

Set 4-20 mA

- 3.5mA
- 4 mA
- 6 mA
- 8 mA
- 10 mA
- 12 mA
- 14 mA
- 16 mA
- 18 mA
- 20 mA

Gen Info

Manufacturer	→
Tag	xxxxx
Descriptor	xxxxx
Message	xxxxx
Final Assy Num	xxxxx
Dev ID	xxxxx
Model	xxxxx

DET-TRONICS

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Minneapolis, MN 55438
USA

Fault/Status

Op Mode	xxxxx
Fault	Y/N
Status	Y/N

Fault

CAL FAULT	ON/OFF
START CAL FAULT	ON/OFF
EE FAULT	ON/OFF
ADC REF FAULT	ON/OFF
24V FAULT	ON/OFF
FLASH FAULT	ON/OFF
RAM FAULT	ON/OFF
WDT FAULT	ON/OFF
12V FAULT	ON/OFF
5V FAULT	ON/OFF
3V FAULT	ON/OFF
ADC RANGE FAULT	ON/OFF
O/P LOOP FAULT	ON/OFF
INPUT LOOP FAULT	ON/OFF
FLASH CODE FAULT	ON/OFF
HART COMM FAULT	ON/OFF

Status

ANY FAULT	ON/OFF
CAL. ACTIVE	ON/OFF
WARM UP MODE	ON/OFF
LOW RELAY ACTIVE	ON/OFF
HI RELAY ACTIVE	ON/OFF
AUX RELAY ACTIVE	ON/OFF
CURRENT FIXED	ON/OFF
MB WRITE PROTECT	ON/OFF
CAL LINE ACTIVE	ON/OFF
CAL SW ACTIVE	ON/OFF
HART SELF TEST	ON/OFF
LON ATTACHED	ON/OFF
RESPONSE TEST	ON/OFF
MANUAL SELF TEST	ON/OFF

History

- Display History →
- Event Log →

Display History

Running Hours	xxxx
Max Temp	xx.xx C
Max Temp Time	xxxx
Min Temp	xx.xx C
Min Temp Time	xxxx

Event Log

Event	xxxxx
Date	dd/mmm/yyyy
Time	hh:mm:ss

Display Info

RTC	→
Serial Number	xxxxx
H/W Rev	xxxxx
F/W Rev	xxxxx
Universal Rev	xxxxx
Fld Dev Rev	xxxxx
S/W Rev	xx.xx
Running Hours	xxxxx
Temperature	xx.xx C

RTC

Displayed	Y/N
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

RS485

Baud Rate	→
Parity	→
Poll Address	xxxx

Debug Menu

HART Errors	xxxxx

Detector Electronics

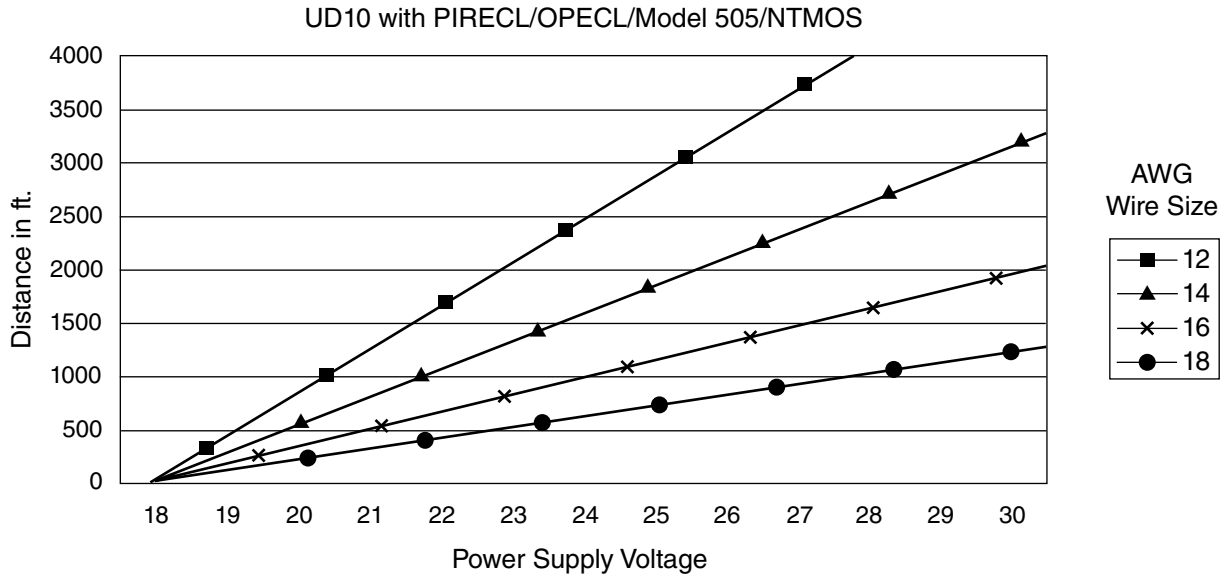
UD10 PIR9400	March 25, 2009	1.17

APPENDIX D

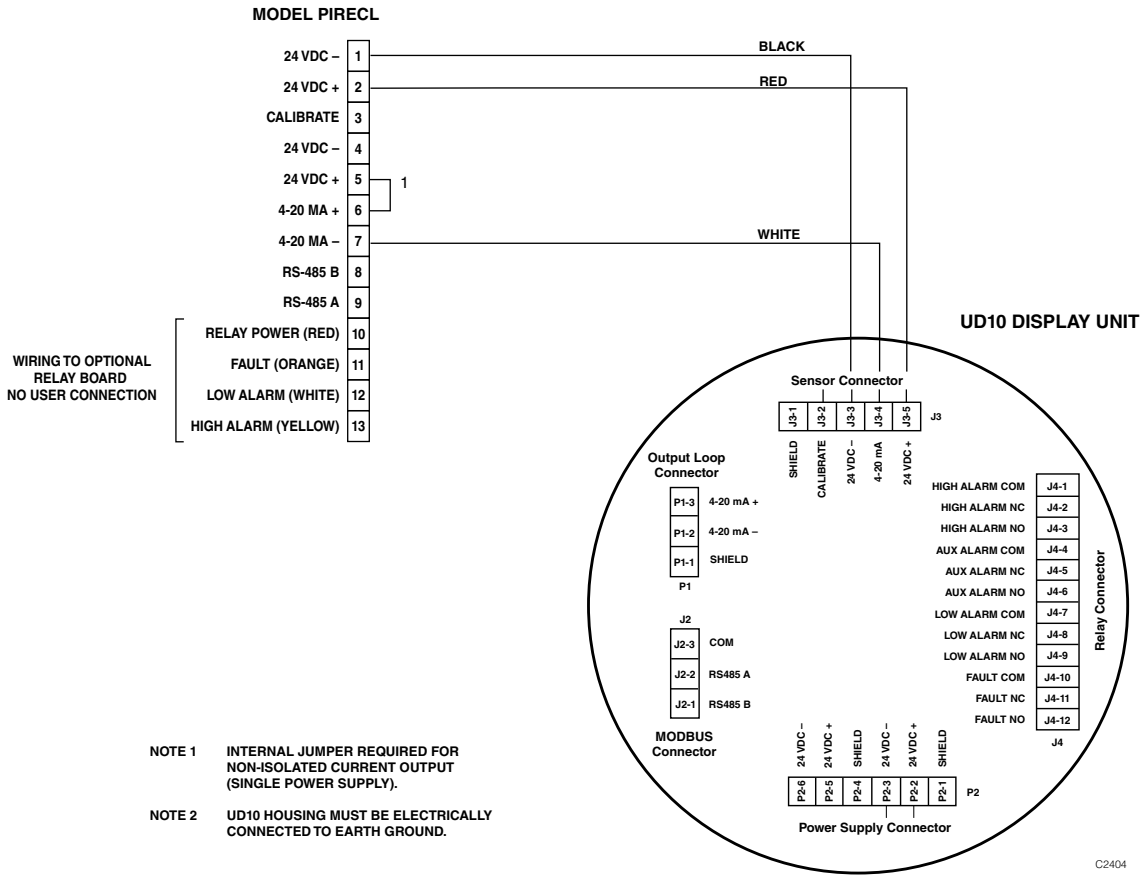
UD10 with MODEL PIRECL

NOTE
For complete information regarding the PIRECL Gas Detector, refer to instruction manual 95-8526.

WIRING



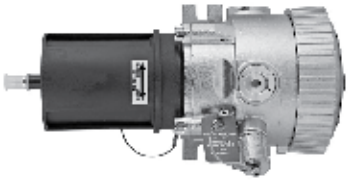
Notes: Maximum cable length from power source to UD10 is 2000 feet.
Maximum cable length from UD10 to sensor/STB termination box is 2000 feet.



Model PIRECL Wired Directly to UD10

ORIENTATION

It is highly recommended that the PIRECL be installed in the horizontal position. The detector is not position-sensitive in terms of its ability to detect gas. However, the weather baffle assembly provides superior performance when the PIRECL is installed with the baffle in a horizontal position.



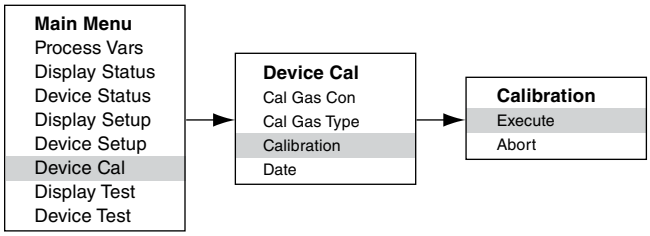
CORRECT

INCORRECT

CALIBRATION

To initiate calibration of the PIRECL from the UD10 Display:

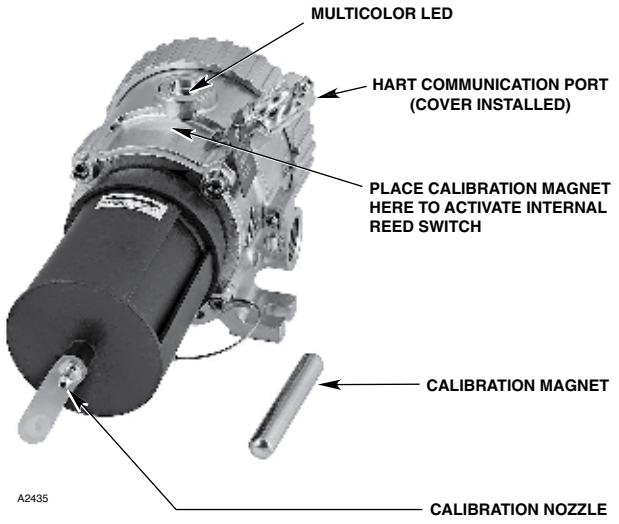
1. Using the magnet to activate the switches on the UD10 display, navigate to the “Calibration” menu.



2. Activate “Execute” (Enter/Select) to start calibration.
3. The UD10 will display “Waiting for Zero” on the main display screen, with a solid red LED on the PIRECL housing illuminated.
4. The UD10 will then display “Waiting for Gas” on the screen, while the LED on the PIRECL is flashing red.
5. Apply calibration gas to the PIRECL
6. The UD10 will display “Waiting for Span” on the screen, while a red flashing LED on the PIRECL housing is illuminated.
7. When the UD10 displays “Remove Cal Gas” on the screen and the LED on the PIRECL housing is off, remove the calibration gas.
8. After successful calibration, the UD10 automatically returns to the normal display with the green LED illuminated on the PIRECL housing.

To initiate calibration from the PIRECL while monitoring calibration using the UD10 display:

1. Using the magnet, activate the magnetic calibration switch on the PIRECL detector. See Figure below. The LED turns from green to red.
2. The UD10 will display “Waiting for Zero” on the main display screen, with a solid red LED on the PIRECL housing illuminated.
3. The UD10 will then display “Waiting for Gas” on the screen, while the LED on the PIRECL is flashing red.
4. Apply calibration gas to the PIRECL detector.
5. The UD10 will display “Waiting for Span” on the screen, while a red flashing LED on the PIRECL housing is illuminated.
6. When the UD10 displays “Remove Cal Gas” on the screen and the LED on the PIRECL housing is off, remove the calibration gas.
7. After successful calibration, the UD10 automatically returns to the normal mode with the green LED illuminated on the PIRECL



Model PIRECL Gas Detector

MENU STRUCTURE

UD10 with Model PIRECL

Refer to the following menu when using the UD10's LCD display and internal magnetic switches.

When connecting a HART Communicator to the UD10's 4-20 mA output, refer to the "UD10 HART" menu in Appendix A.

MENU HELP

Status menus only allow the user to view the data. The Setup menus allow the user to both view and edit the data.

Main Menu

Process Vars	→
Display Status	→
Device Status	→
Display Setup	→
Device Setup	→
Device Cal	→
Display Test	→
Device Test	→

Process Vars

Gas Name	
Gas Value	x.xx
High Alarm	Y/N
Low Alarm	Y/N
Aux Alarm	Y/N
Analog Input	x.xx mA
URV	x.xx
LRV	x.xx
Fault	Y/N

Display Status

General Info	→
Fault/Status	→
History	→
Display Info	→
RS485	→
Debug Menu	→

Device Status

General Info	→
Fault/Status	→
Device Info	→
Sensor Info	→
History	→

Display Setup

Alarm Setting	→
Mode Select	→
HART Option	→
RTC	→
RS485	→
Input Loop Cal	

Device Setup

Device Option	→
Alarm Setting	→
Hart Option	→
RS485	→

Device Cal

Cal Gas Conc	xx.xx
Cal Gas Type	→
Calibration	→
Cal Date	dd/mmm/yyyy

Display Test

Self Test	
Response Test	
Loop Test	→
D/A Trim	→

Device Test

Self Test	
Response Test	
Reset	
Loop Test	→
D/A Trim	→

Device Option

Gas Type	→
Unit of Measure	→
URV	xx.xx
LRV	xx.xx
USL	xx.xx
LSL	xx.xx
Analog Code Val	→
Analog Flt Code	→

Alarm Setting

Rst Latch Alarms	
High Alarm Level	xx.xx
High Alarm Latch	Y/N
Low Alarm Level	xx.xx
Low Alarm Latch	Y/N

Hart Option

Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxxx
Final assy num	xxxxx

RS485

Baud Rate	→
Parity	→
Poll Address	xxx

Gas Type

Methane
Ethane
Propane
Ethylene
Propylene
Butane
Special

Unit of Measure

%LFL
PPM
Vo %

Analog Code Val

Warm Up	xx.xx
Blocked Optic	xx.xx
Calibration	xx.xx
Fault	xx.xx

Analog Fault Code

ECLIPSE
PIR9400
USER DEFINED

Baud Rate

1200
2400
4800
9600
19.2K

Parity

None
Even
Odd

Cal Gas Type

Same As Measure Gas
Methane
Propane

Calibration

Execute
Abort

Set 4-20 MA

3.5 MA
4 MA
6 MA
8 MA
10 MA
12 MA
14 MA
16 MA
18 MA
20 MA

Loop Test

Set 4-20 MA	→

D/A Trim

Zero Trim
Gain Trim

Alarm Setting

Rst Latch Alms	
High Alm Level	xxxxx
High Alm Latch	Y/N
Low Alm Level	xxxxx
Low Alm Latch	Y/N
Aux Alm Level	xxxxx
Aux Alm Latch	Y/N

Mode Select

HART Device
PIR9400
C706X
505
NTMOS

HART Option

Tag	xxxxx
Descriptor	xxxxx
Message	xxxxx
Date	xxxxx
Final assy num	xxxxx

RTC

Displayed	Y/N
Seconds	xxxxx
Minutes	xxxxx
Hours	xxxxx
Day	xxxxx
Month	xxxxx
Year	xxxxx

RS485

Baud Rate	→
Parity	→
Poll Address	xxxx

Loop Test

Set 4-20 mA	->

D/A Trim

Zero Trim
Gain Trim

Gen Info

Manufacturer	→
Model	ECLIPSE
Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxxx
Final Assy Num	xxxxx
Device ID	xxxxx

Fault/Status

Op Mode	xxxxx
Cal State	xxxxx
Tx Fault	Y/N
Tx Status	Y/N

Device Info

Serial Number	xxxxx
Universal Rev	xxxxx
Fld Dev Rev	xxxxx
S/W Rev	xxxxx

Sensor Info

Active	xx.xx
Reference	xx.xx
Ratio	xx.xx
Absorption	xx.xx
Temperature	xx.xxC
Vol %	xx.xx
USL	xx.xx
LSL	xx.xx
Span Factor	xx.xx

History

Device History	→
Calibration Log	→
Event Log	→

Baud Rate

1200
2400
4800
9600
19.2K

Parity

None
Even
Odd

Loop Test

3.5mA
4-mA
6 mA
8 mA
10 mA
12 mA
14-mA
16-mA
18-mA
20 mA

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Tx Fault

Cal Fault	ON/OFF
Dirty Optics	ON/OFF
Open Lamp FAULT	ON/OFF
Start Cal Fault	ON/OFF
EE 1 FAULT	ON/OFF
EE 2 FAULT	ON/OFF
Ref ADC Sat	ON/OFF
Active ADC Sat	ON/OFF
24V FAULT	ON/OFF
12V FAULT	ON/OFF
5V FAULT	ON/OFF
Zero Drift FAULT	ON/OFF
Flash CRC FAULT	ON/OFF
RAM FAULT	ON/OFF

Tx Status

Tx Fault	ON/OFF
Cal Active	ON/OFF
Warm Up	ON/OFF
Low Alarm	ON/OFF
High Alarm	ON/OFF
Current Fixed	ON/OFF
MB Write Protect	ON/OFF
Cal Input Active	ON/OFF
Mag Switch	ON/OFF
HART Self Test	ON/OFF

Device History

Running Hours	xxxxx
Max Temp	xx.xxC
Max Temp Time	xxxxx
Min Temp	xx.xxC
Min Temp Time	xxxxx

Calibration Log

Cal Id	xxxxx
Hours	xxxxx

Event Log

Event ID	xxxxx
Hours	xxxxx

General Info

Manufacturer	→
Model	UD-10
Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxxx
Final Assy Num	xxxxx
Device ID	xxxxx

DET-TRONICS
6901 West 110th Street
Minneapolis, MN 55438
USA

Fault/Status

Op Mode	xxxxx
Fault	Y/N
Status	Y/N

Fault

CAL FAULT	ON/OFF
START CAL FAULT	ON/OFF
EE FAULT	ON/OFF
ADC REF FAULT	ON/OFF
24V FAULT	ON/OFF
FLASH FAULT	ON/OFF
RAM FAULT	ON/OFF
WDT FAULT	ON/OFF
12V FAULT	ON/OFF
5V FAULT	ON/OFF
3V FAULT	ON/OFF
ADC RANGE FAULT	ON/OFF
O/P LOOP FAULT	ON/OFF
INPUT LOOP FAULT	ON/OFF
FLASH CODE FAULT	ON/OFF
HART COMM FAULT	ON/OFF

Status

ANY FAULT	ON/OFF
CAL. ACTIVE	ON/OFF
WARM UP MODE	ON/OFF
LOW RELAY ACTIVE	ON/OFF
HI RELAY ACTIVE	ON/OFF
AUX RELAY ACTIVE	ON/OFF
CURRENT FIXED	ON/OFF
MB WRITE PROTECT	ON/OFF
CAL LINE ACTIVE	ON/OFF
CAL SW ACTIVE	ON/OFF
HART SELF TEST	ON/OFF
LON ATTACHED	ON/OFF
RESPONSE TEST	ON/OFF
MANUAL SELF TEST	ON/OFF

History

Display History	→
Event Log	→

Display History

Running Hours	xxxx
Max Temp	xx.xx C
Max Temp Time	hh:mm:ss dd/mmm/yyyy
Min Temp	xx.xx C
Min Temp Time	hh:mm:ss dd/mmm/yyyy

Event Log

Event	xxxxx
Date	dd/mmm/yyyy
Time	hh:mm:ss

Display Info

RTC	→
Serial Number	xxxxx
H/W Rev	xxxxx
F/W Rev	xxxxx
Universal Rev	xxxxx
Fld Dev Rev	xxxxx
S/W Rev	xx.xx
Running Hours	xxxxx
Temperature	xx.xx C

RTC

Displayed	Y/N
Seconds	xxxxx
Minutes	xxxxx
Hours	xxxxx
Day	xxxxx
Month	xxxxx
Year	xxxxx

RS485

Baud Rate	→
Parity	→
Poll Address	xxxx

Debug Menu

HART Errors	xxxxx

Detector Electronics

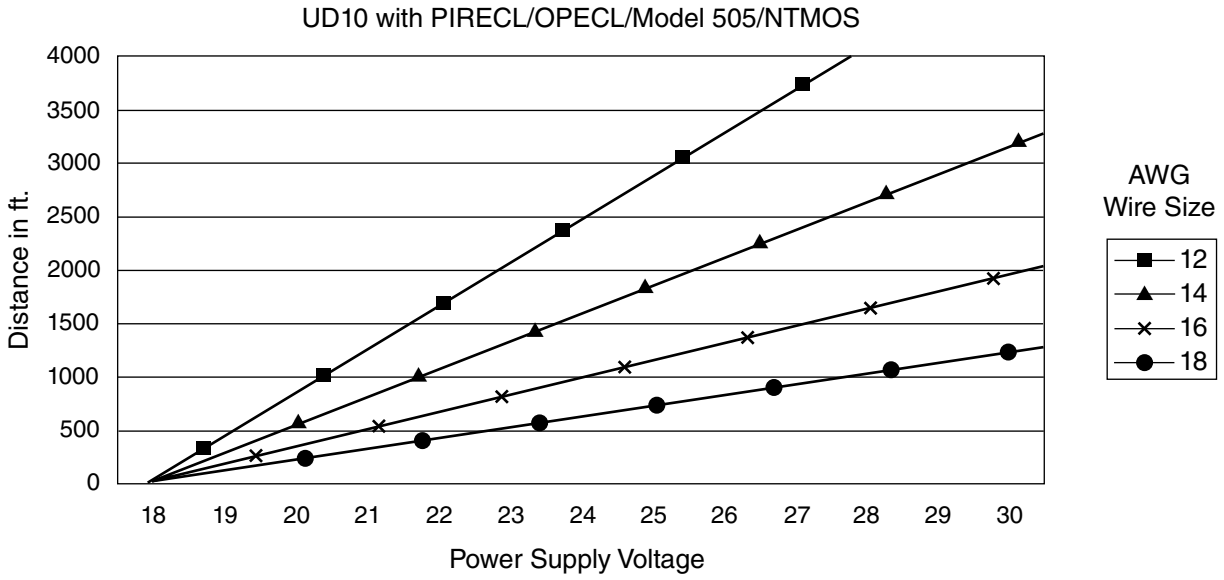
UD10 Eclipse	March 25, 2009	1.17

APPENDIX E

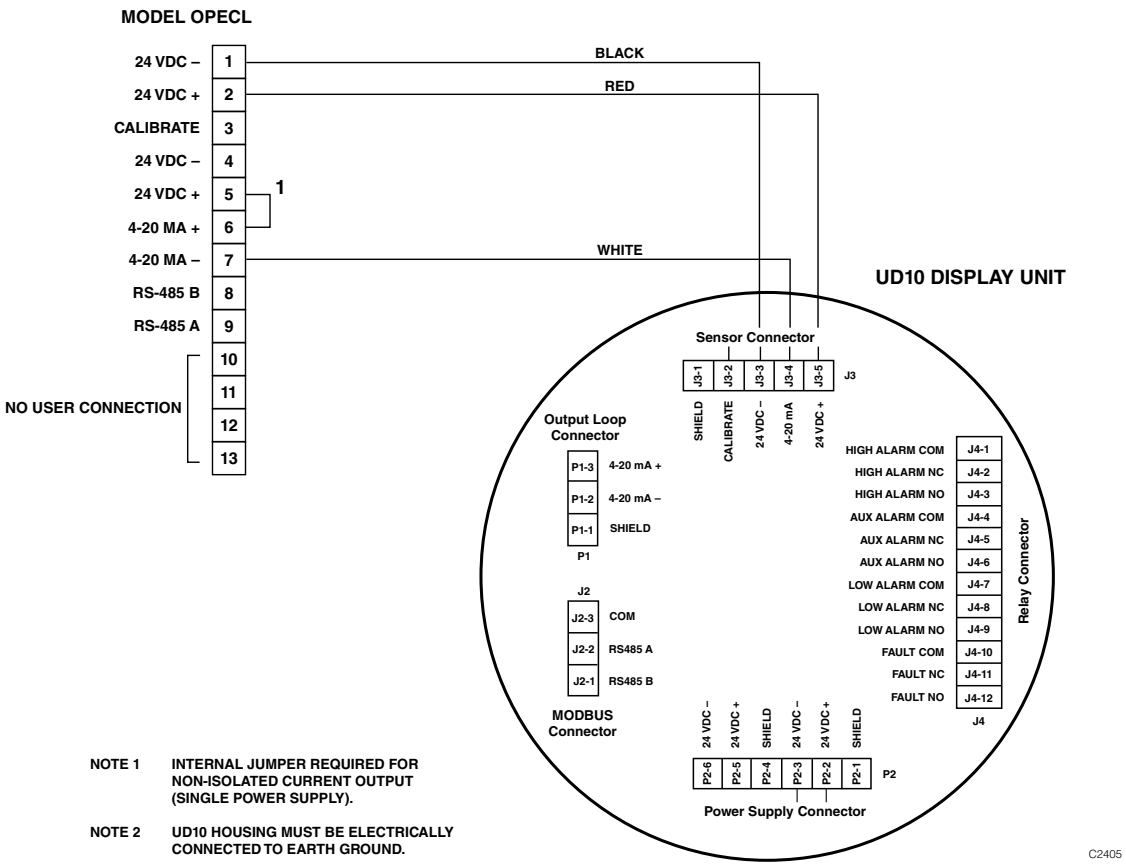
UD10 with OPEN PATH ECLIPSE MODEL OPECL

NOTE
For complete information regarding the OPECL Gas Detector, refer to instruction manual 95-8556.

WIRING



Notes: Maximum cable length from power source to UD10 is 2000 feet.
Maximum cable length from UD10 to sensor/STB termination box is 2000 feet.

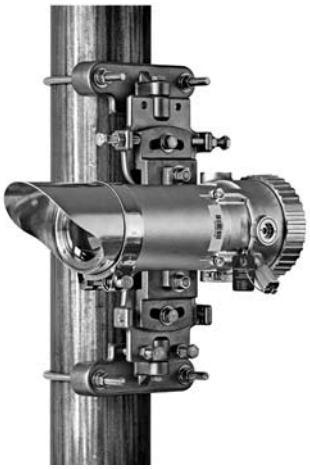


Model OPECL Wired Directly to UD10

ORIENTATION

OPECL modules must be affixed to a solid, non-vibrating structure capable of supporting a minimum of 100 lbs (46 kg), located within the system's rated separation distance. See examples below.

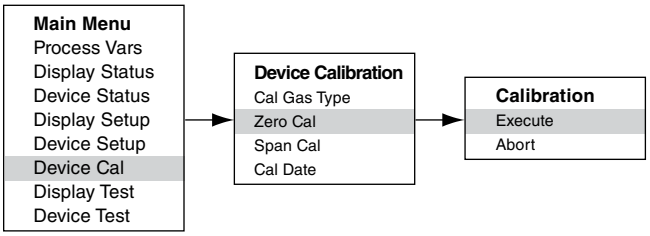
In all cases, the maximum movement of the supporting structure under all anticipated operating conditions must be no more than ±0.25 degrees. When using a vertical post, the post should be absolutely stable and without vibration. Generally, when the post is set into the ground, the portion below grade should be set in concrete at least 1 meter deep.



CALIBRATION

To initiate zero calibration of the OPECL from the UD10 Display:

1. Using the magnet to activate the switches on the UD10 display, navigate to the "Calibration" menu.



2. Activate "Execute" (Enter/Select) to start calibration.

3. The UD10 will display "Waiting for Zero" on the main display screen, with a solid red LED on the OPECL housing illuminated.

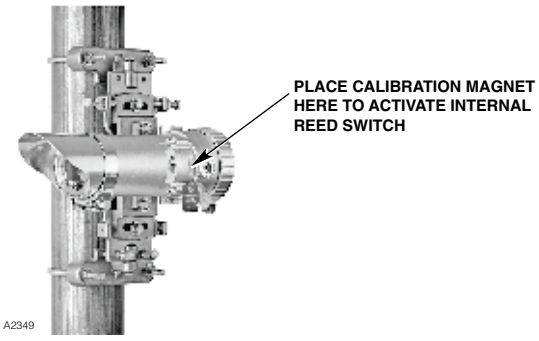
4. After the calibration is successfully completed, the UD10 automatically returns to the normal display with the green LED illuminated on the OPECL housing.

To initiate zero calibration from the OPECL:

1. Using the magnet, activate the magnetic calibration switch on the OPECL receiver. See Figure below. The green LED will turn red.

2. The UD10 will display “Waiting for Zero” on the main display screen, with a solid red LED on the OPECL housing illuminated.

3. After the calibration is successfully completed, the UD10 automatically returns to the normal display with the green LED illuminated on the OPECL housing.



Location of Receiver’s Internal Magnetic Switch

MENU STRUCTURE

UD10 with Open Patch Eclipse Model OPECL

Refer to the following menu when using the UD10’s LCD display and internal magnetic switches.

When connecting a HART Communicator to the UD10’s 4-20 mA output, refer to the “UD10 HART” menu in Appendix A.

MENU HELP

Status menus only allow the user to view the data. The Setup menus allow the user to both view and edit the data.

Main Menu
- Process Vars →
- Display Status →
- Device Status →
- Display Setup →
- Device Setup →
- Device Cal →
- Display Test →
- Device Test →

Process Vars

Gas Name	
Gas Value	x.xx
High Alarm	Y/N
Low Alarm	Y/N
Aux Alarm	Y/N
Analog Input	x.xx mA
URV	x.xx
LRV	x.xx
Fault	Y/N

Display Status

General Info	→
Fault/Status	→
History	→
Display Info	→
RS485	→
Debug Menu	→

Device Status

General info	→
Fault/Status	→
Device Info	→
Sensor Info	→
History	→

Display Setup

Alarm Setting	→
Mode Select	→
HART Option	→
RTC	→
RS485	→
Input Loop Cal	

Device Setup

Device Option	→
Alarm Setting	→
HART Option	→
RS485	→
RTC	→

Device Option

Gas Name	→
URV	xxxxx
LRV	xxxxx
USL	xxxxx
LSL	xxxxx
Analog Flt Code	→
Analog Code Val	→
Block Optic Time	xxxxx
Heater Control	x

Gas Name
- Methane
- Ethane
- Propane
- Propylene
- Butane
- Special

Unit of Measure
- LFLM
- VOLM

Analog Fault Code
- OPECL
- PIR9400
- User Defined

Analog Code Val

Warm Up	xxxxxx
Blocked Optic	xxxxxx
Calibration	xxxxxx
Fault	xxxxxx

Alarm Setting

Rst Latch Alarms	
Hgh Alarm Level	xxxxx
Hgh Alarm Latch	Y/N
Low Alarm Level	xxxxx
Low Alarm Latch	Y/N

HART Option

Tag	xxxxx
Descriptor	xxxxx
Message	xxxxx
Date	xxxxx
Final assy num	xxxxx

RS485

Baud Rate	→
Parity	→
Poll Address	xxx

Baud Rate
- 1200
- 2400
- 4800
- 9600
- 19.2K

Parity
- None
- Even
- Odd

RTC

Sync W/Disp	
Seconds	xxxx
Minutes	xxxx
Hours	xxxx
Day	xxxx
Month	xxxx
Year	xxxx

Device Calibration

Cal Gas Type	→
Zero Calibration	→
Span Cal Factor	xxxxx
Cal Date	dd/mmm/yyyy

Cal Gas Type
- Same As Measure Gas
- Methane
- Propane

Zero Calibration
- Execute
- Abort

Display Test
- Self Test
- Response Test
- Loop Test →
- D/A Trim →

Loop Test
- Set 4-20 mA →

D/A Trim
- Zero Trim
- Gain Trim

Set 4-20 mA
- 3.5mA
- 4 mA
- 6 mA
- 8 mA
- 10 mA
- 12 mA
- 14 mA
- 16 mA
- 18 mA
- 20 mA

Device Test
- Self Test
- Response Test
- Reset
- Loop Test →
- D/A Trim →

Loop Test
- Set 4-20 mA →

D/A Trim
- Zero Trim
- Gain Trim

Set 4-20 mA
- 3.5mA
- 4 mA
- 6 mA
- 8 mA
- 10 mA
- 12 mA
- 14 mA
- 16 mA
- 18 mA
- 20 mA

Alarm Setting

Rst Latch Alms	
High Alm Level	xxxxx
High Alm Latch	Y/N
Low Alm Level	xxxxx
Low Alm Latch	Y/N
Aux Alm Level	xxxxx
Aux Alm Latch	Y/N

Mode Select
- HART Device
- PIR9400
- C706X
- 505
- NTMOS

HART Option

Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxxx
Final assy num	xxxxx

RTC

Displayed	Y/N
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

RS485

Baud Rate	→
Parity	→
Poll Address	xxxx

Baud Rate
- 1200
- 2400
- 4800
- 9600
- 19.2K

Parity
- None
- Even
- Odd

General Info

Manufacturer	→
Model	OPECL_RX
Tag	xxxxx
Date	dd/mmm/yyyy
Descriptor	xxxxx
Message	xxxxx
Final Assy Num	xxxx
Device ID	xxxxx

DET-TRONICS
6901 West 110th Street
Minneapolis, MN 55438
USA

Fault/Status

Op Mode	xxxxx
Cal State	xxxxx
Tx Fault	Y/N
Tx Status	Y/N

Device Info

RTC	→
Serial Number	xxxxx
Universal Rev	xxxxx
Fld Dev Rev	xxxxx
S/W Rev	xxxxx

Sensor Info

Active	xx.xx
Reference	xx.xx
Ratio	xx.xx
Gas Gain	xx.xx
Temperature	xx.xx C
Absorption	xx.xx
Coefficient	→

History

Device History	→
Calibration Log	→
Event Log	→

Tx Fault

Cal Fault	ON/OFF
Dirty Optics	ON/OFF
Lamp Fault	ON/OFF
Start Cal Fault	ON/OFF
EE Fault	ON/OFF
Noise Fault	ON/OFF
Ref ADC Sat	ON/OFF
Active ADC Sat	ON/OFF
24v FAULT	ON/OFF
Align ADC Sat	ON/OFF
Align Fault	ON/OFF
Zero Drift FAULT	ON/OFF
Flash CRC FAULT	ON/OFF
RAM FAULT	ON/OFF
Align Warning	ON/OFF
Blocked Optics	ON/OFF

Tx Status

Tx Fault	ON/OFF
Cal Active	ON/OFF
Warm Up	ON/OFF
Low Alarm	ON/OFF
High Alarm	ON/OFF
Current Fixed	ON/OFF
MB Write Protect	ON/OFF
Cal Input Active	ON/OFF
Mag Switch	ON/OFF
HART Self Test	ON/OFF
Lon Attached	ON/OFF
Response Test	ON/OFF
Manual Self Test	ON/OFF
Align Mode	ON/OFF
Loop Back Error	ON/OFF
DPOT Flag	ON/OFF

RTC

Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

Coefficient

Coeff A	x.xxxxx
Coeff B	x.xxxxx
Coeff C	x.xxxxx
Coeff D	x.xxxxx
Coeff E	x.xxxxx

Device History

Running Hours	xxxx
Max Temp	xx.xx C
Max Temp Time	xxxxx
Min Temp	xx.xx C
Min Temp Time	xxxxx

Calibration Log

Cal ID	xxxxx
DTime	mm/dd hh:mm

Event Log

Event	xxxxx
Dtime	mm/dd hh:mm

General Info

Manufacturer	→
Model	UD-10
Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxxx
Final Assy Num	xxxxx
Device ID	xxxxx

DET-TRONICS
6901 West 110th Street
Minneapolis, MN 55438
USA

Fault/Status

Op Mode	xxxxx
Fault	Y/N
Status	Y/N

Fault

CAL FAULT	ON/OFF
START CAL FAULT	ON/OFF
EE FAULT	ON/OFF
ADC REF FAULT	ON/OFF
24V FAULT	ON/OFF
FLASH FAULT	ON/OFF
RAM FAULT	ON/OFF
WDT FAULT	ON/OFF
12V FAULT	ON/OFF
5V FAULT	ON/OFF
3V FAULT	ON/OFF
ADC RANGE FAULT	ON/OFF
O/P LOOP FAULT	ON/OFF
INPUT LOOP FAULT	ON/OFF
FLASH CODE FAULT	ON/OFF
HART COMM FAULT	ON/OFF

Status

ANY FAULT	ON/OFF
CAL. ACTIVE	ON/OFF
WARM UP MODE	ON/OFF
LOW RELAY ACTIVE	ON/OFF
HI RELAY ACTIVE	ON/OFF
AUX RELAY ACTIVE	ON/OFF
CURRENT FIXED	ON/OFF
MB WRITE PROTECT	ON/OFF
CAL LINE ACTIVE	ON/OFF
CAL SW ACTIVE	ON/OFF
HART SELF TEST	ON/OFF
LON ATTACHED	ON/OFF
RESPONSE TEST	ON/OFF
MANUAL SELF TEST	ON/OFF

History

Display History	→
Event Log	→

Display History

Running Hours	xxxx
Max Temp	xx.xx C
Max Temp Time	hxxxx
Min Temp	xx.xx C
Min Temp Time	xxxx

Event Log

Event	xxxxx
Date	dd/mmm/yyyy
Time	hh:mm:ss

Display Info

RTC	→
Serial Number	xxxxx
H/W Rev	xxxxx
F/W Rev	xxxxx
Universal Rev	xxxxx
Fld Dev Rev	xxxxx
S/W Rev	xx.xx
Running Hours	xxxxx
Temperature	xx.xx C

RTC

Displayed	Y/N
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

RS485

Baud Rate	xxxxx
Parity	xxxxx
Poll Address	xxxxx

Debug Menu

HART Errors	xxxxx

Detector Electronics

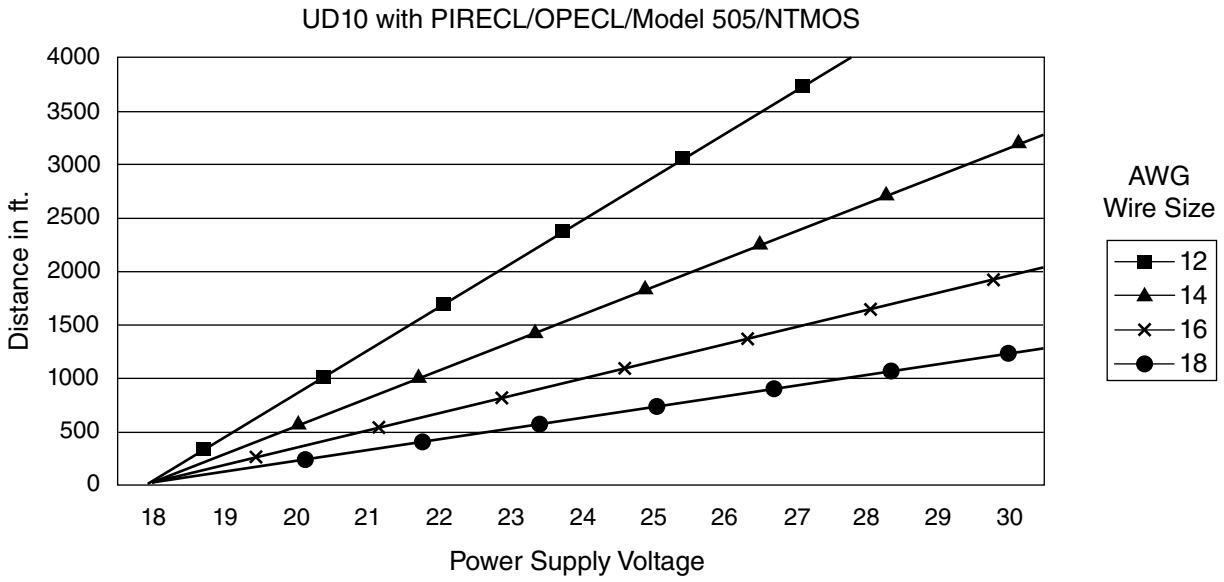
UD10 Open Path	March 25, 2009	1.17

APPENDIX F

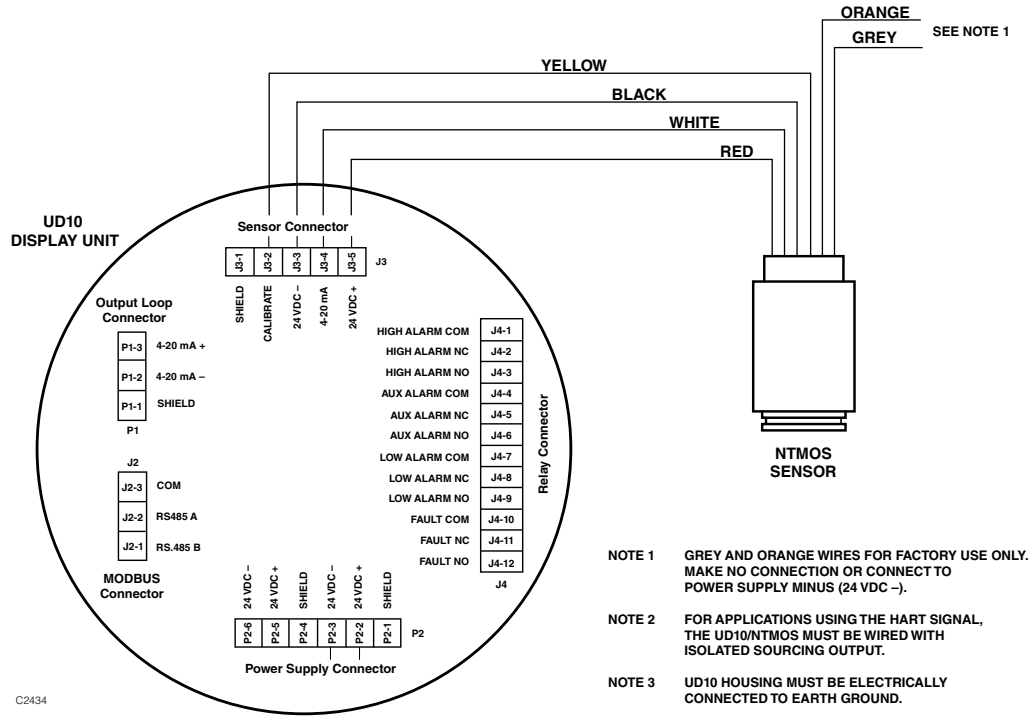
UD10 with NTMOS H_2S SENSOR

NOTE
For complete information regarding the NTMOS Gas Detector, refer to instruction manual 95-8604.

WIRING



Notes: Maximum cable length from power source to UD10 is 2000 feet.
Maximum cable length from UD10 to sensor/STB termination box is 2000 feet.

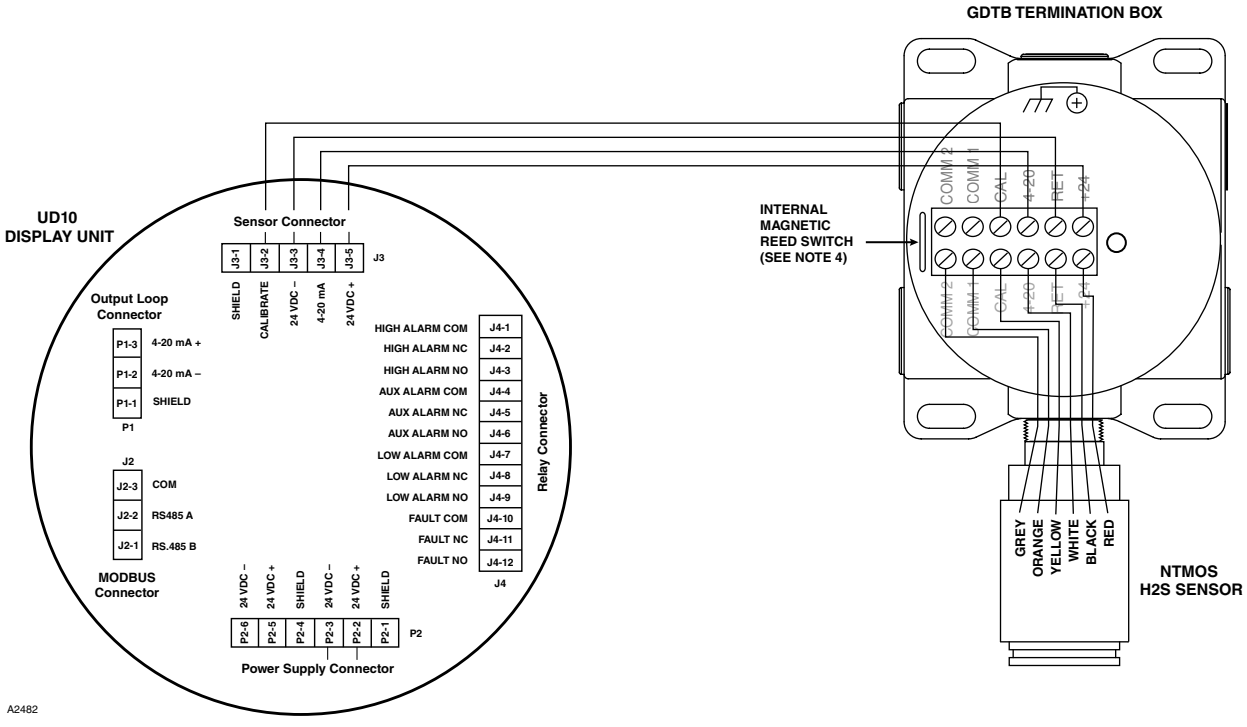


NOTE 1 GREY AND ORANGE WIRES FOR FACTORY USE ONLY. MAKE NO CONNECTION OR CONNECT TO POWER SUPPLY MINUS (24 VDC –).

NOTE 2 FOR APPLICATIONS USING THE HART SIGNAL, THE UD10/NTMOS MUST BE WIRED WITH ISOLATED SOURCING OUTPUT.

NOTE 3 UD10 HOUSING MUST BE ELECTRICALLY CONNECTED TO EARTH GROUND.

NTMOS Sensor Wired Directly to UD10



NOTE 1 GREY AND ORANGE WIRES FOR FACTORY USE ONLY.

NOTE 2 FOR APPLICATIONS USING THE HART SIGNAL, THE UD10/NTMOS MUST BE WIRED WITH ISOLATED SOURCING OUTPUT.

NOTE 3 UD10 HOUSING MUST BE ELECTRICALLY CONNECTED TO EARTH GROUND.

NOTE 4 PLACE MAGNET AT THIS LOCATION APPROXIMATELY ONE INCH ABOVE MOUNTING SURFACE TO ACTUATE SWITCH.

UD10 Wired to NTMOS Sensor with GDTB Termination Box

INSTALLATION NOTES

NOTE

Never use silicone grease with the NTMOS sensor.

NOTE

A junction box spacer or standoff may be used to increase the distance between the device and the mounting surface, thereby facilitating installation and use of the ampoule calibrator.

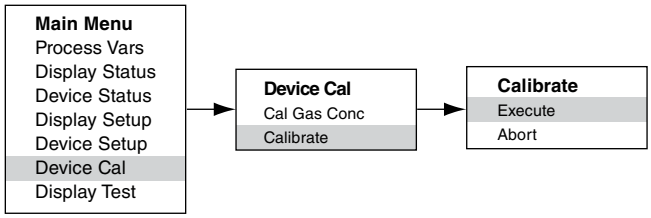
ORIENTATION

The UD10/NTMOS assembly must be mounted with the detector pointing down (see photo below).

CALIBRATION

The NTMOS sensor must be calibrated using 50 ppm H_2S ampoules (never use bottled H_2S gas). To calibrate the NTMOS sensor with the FlexVu UD10 Display:

1. Touch the magnet to the ENTER/SELECT button to display the Main Menu. Follow the illustration below to navigate to the "Calibrate" menu.



2. Activate "Execute" (Enter/Select) to begin the zero calibration.

3. The UD10 will display "Waiting for Zero" on the main display screen.

4. When zero calibration is complete (approximately one minute), the UD10 will display "Waiting for Gas" on the main display screen.

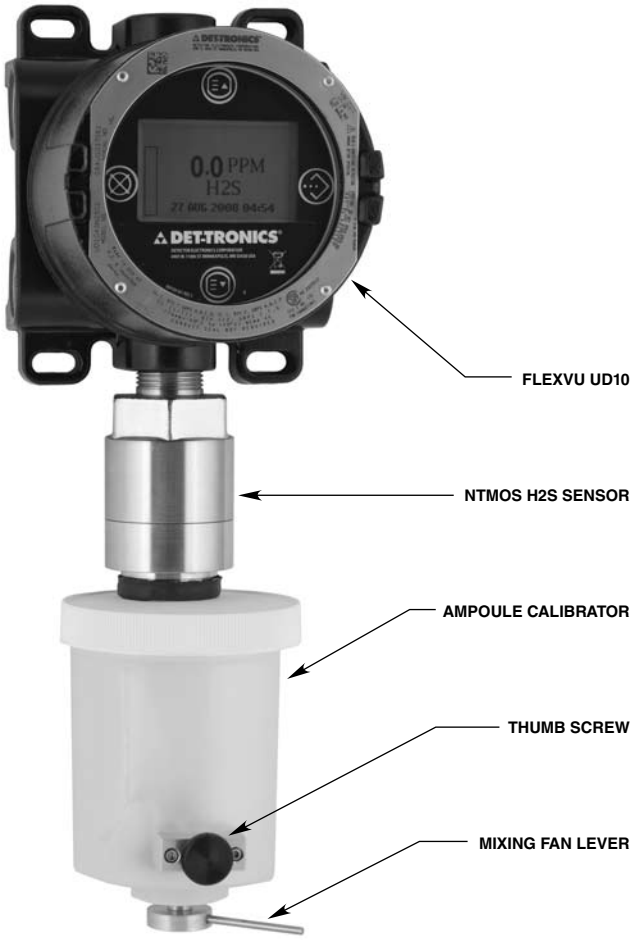
5. Apply the calibration gas to the sensor.

   To operate the Ampoule Calibrator:
   - Remove the cover and insert a 50 ppm H_2S ampoule into the ampoule holder inside the calibrator. Tighten the thumb screw until snug.
   - Place the cover back on the calibrator and connect it snugly to the NTMOS sensor.
   - Tighten the thumb screw until the ampoule breaks.
   - Rotate the mixing fan by slowly turning the mixing fan lever.

6. With 50 ppm H_2S applied to the sensor, the UD10 display will continue to show "Waiting for Gas" and "0.0 PPM" while the span calibration is being performed.

7. When the UD10 Display shows "Remove Cal Gas" the calibration is complete. Remove the calibrator from the sensor.

8. When the gas level falls below the lowest alarm setpoint, the UD10 automatically exits the Calibrate mode and returns to normal operating mode.



Ampoule Calibrator Attached to NTMOS Sensor

MENU STRUCTURE

UD10 with NTMOS H_2S Sensor

Refer to the following menu when using the UD10's LCD display and internal magnetic switches.

When connecting a HART Communicator to the UD10's 4-20 mA output, refer to the "UD10 HART" menu in Appendix A.

MENU HELP

Status menus only allow the user to view the data. The Setup menus allow the user to both view and edit the data.

Main Menu

- Process Vars →
- Display Status →
- Device Status →
- Display Setup →
- Device Setup →
- Device Cal →
- Display Test →

Process Vars

Gas Name	
Gas Value	x.xx
High Alarm	Y/N
Low Alarm	Y/N
Aux Alarm	Y/N
Analog Input	x.xx mA
URV	x.xx
LRV	x.xx
Fault	Y/N

Display Status

- General Info →
- Fault/Status →
- History →
- Display Info →
- RS485 →
- Debug Menu →
- Display Temperature xxxx

Device Status

- Fault/Status →
- Calibration Log →

Fault/Status

High Fault	Y/N
Low Fault	Y/N
Cal Fault	Y/N

Calibration Log

Cal ID	xxxx
Date	xx/xxx/xxxx
Time	xx:xx
Zero	xxxx
Span	xxxx

Display Setup

- Alarm Setting →
- Mode Select →
- HART Option →
- RTC →
- RS485 →
- Input Loop Cal

Alarm Setting

Rst Latch Alarms	
Hgh Alarm Level	xx.xx
Hgh Alarm Latch	Y/N
Low Alarm Level	xx.xx
Low Alarm Latch	Y/N
Aux Alarm Level	xx.xx
Aux Alarm Latch	Y/N

Mode Select

- HART Device
- PIR9400
- C706X
- 505
- NTMOS

HART Option

Tag	xxxxx
Descriptor	xxxxx
Message	xxxxx
Date	xxxxx
Final assy num	xxxxx

RTC

Displayed	Y/N
Seconds	xxxxx
Minutes	xxxxx
Hours	xxxxx
Day	xxxxx
Month	xxxxx
Year	xxxxx

RS485

Baud Rate	→
Parity	→
Poll Address	xxxx

Baud Rate

- 1200
- 2400
- 4800
- 9600
- 19.2K

Parity

- None
- Even
- Odd

Poll Address

Note: settable from 1 - 247

Device Setup

Gas Name	xxxx
Detector Type	→

Detector Type

- NTMOS H2S 50 PPM
- NTMOS H2S 100 PPM

Device Cal

Cal Gas Conc	xxx.xx
Calibration	→

Calibration

- Execute
- Abort

Display Test

- Self Test
- Response Test
- Loop Test →
- D/A Trim →

Loop Test

Set 4-20 mA →

D/A Trim

- Zero Trim
- Gain Trim

Set 4-20 MA

- 3.5 MA
- 4 MA
- 6 MA
- 8 MA
- 10 MA
- 12 MA
- 14 MA
- 16 MA
- 18 MA
- 20 MA

General Info

Manufacturer	→
Model	UD-10
Tag	xxxxx
Descriptor	xxxxx
Date	xxxxx
Message	xxxxx
Final Assy Num	xxxxx
Device ID	xxxxx

DET-TRONICS

6901 West 110th Street
Minneapolis, MN 55438
USA

Fault/Status

Op Mode	xxxxx
Fault	Y/N
Status	Y/N

Fault

CAL FAULT	ON/OFF
START CAL FAULT	ON/OFF
EE FAULT	ON/OFF
ADC REF FAULT	ON/OFF
24V FAULT	ON/OFF
FLASH FAULT	ON/OFF
RAM FAULT	ON/OFF
WDT FAULT	ON/OFF
12V FAULT	ON/OFF
5V FAULT	ON/OFF
3V FAULT	ON/OFF
ADC RANGE FAULT	ON/OFF
O/P LOOP FAULT	ON/OFF
INPUT LOOP FAULT	ON/OFF
FLASH CODE FAULT	ON/OFF
HART COMM FAULT	ON/OFF

Status

Any Fault	ON/OFF
CAL. Active	ON/OFF
Warm Up Mode	ON/OFF
Low Relay Active	ON/OFF
Hi Relay Active	ON/OFF
AUX Relay Active	ON/OFF
Current Fixed	ON/OFF
MB Write Protect	ON/OFF
CAL Line Active	ON/OFF
CAL SW Active	ON/OFF
HART Self Test	ON/OFF
LON Attached	ON/OFF
Response Test	ON/OFF
Manual Self Test	ON/OFF

History

- Display History →
- Event Log →

Display History

Running Hours	xxxx
Max Temp	xx.xx C
Max Temp Time	xxxx
Min Temp	xx.xx C
Min Temp Time	xxxx

Event Log

Event	xxxxx
Date	dd/mmm/yyyy
Time	hh:mm:ss

Display Info

RTC	→
Serial Number	xxxxx
H/W Rev	xxxxx
F/W Rev	xxxxx
Universal Rev	xxxxx
Fld Dev Rev	xxxxx
S/W Rev	xx.xx
Running Hours	xxxxx
Temperature	xx.xx C

RTC

Displayed	Y/N
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

RS485

Baud Rate	xxxxx
Parity	xxxxx
Poll Address	xxxxx

Debug Menu

- HART Errors

Detector Electronics

UD10 NTMOS	March 25, 2009	1.17

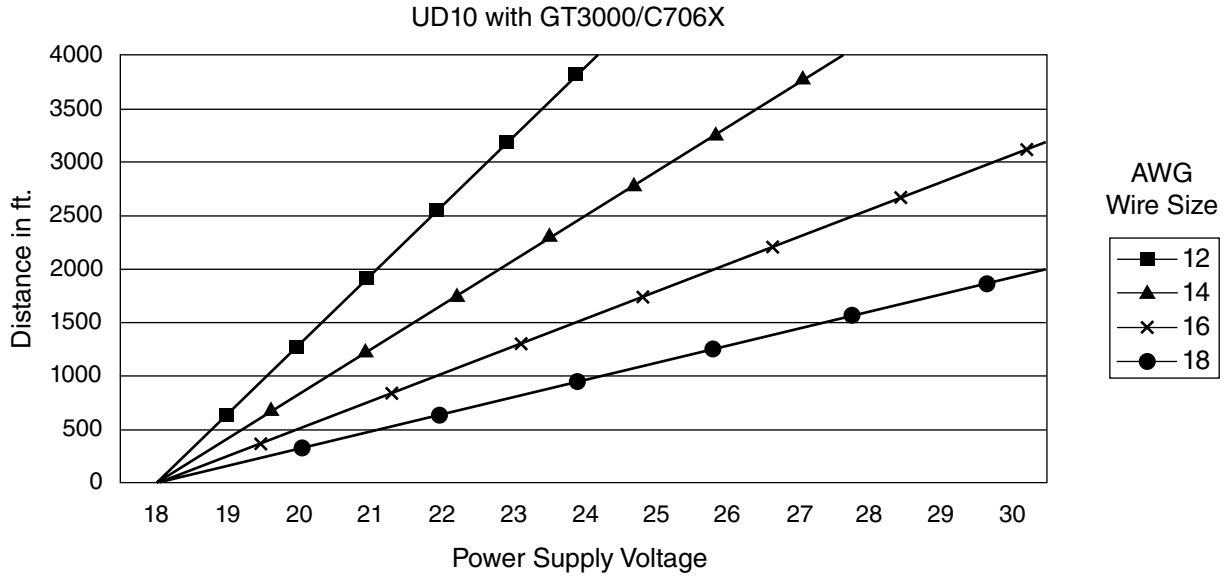
APPENDIX G

UD10 with C706X TOXIC GAS SENSOR

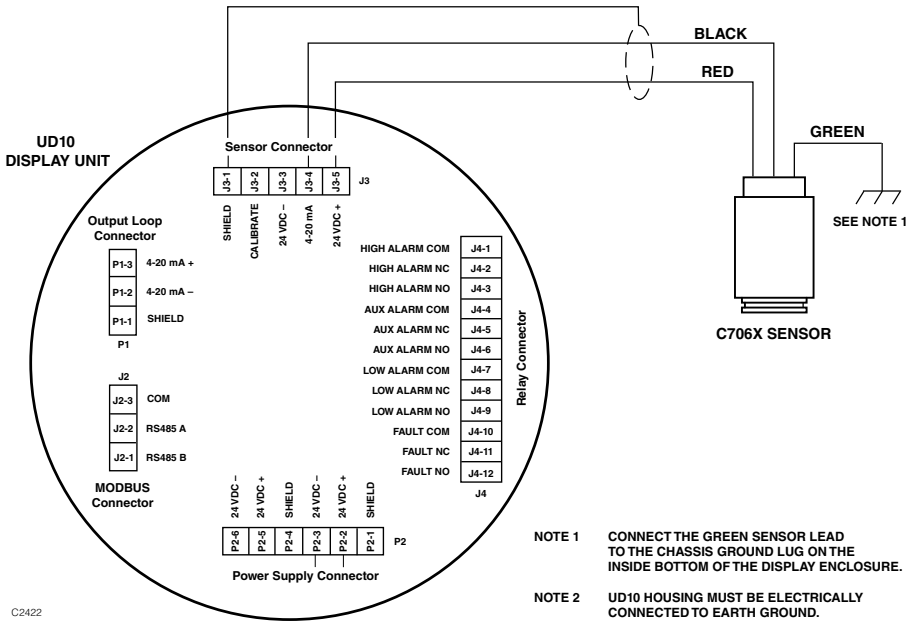
NOTE

For complete information regarding the C7064E H2S Gas Sensor, refer to instruction manual 95-8396. For the C7067E Chlorine Gas Sensor, refer to instruction manual 95-8439.

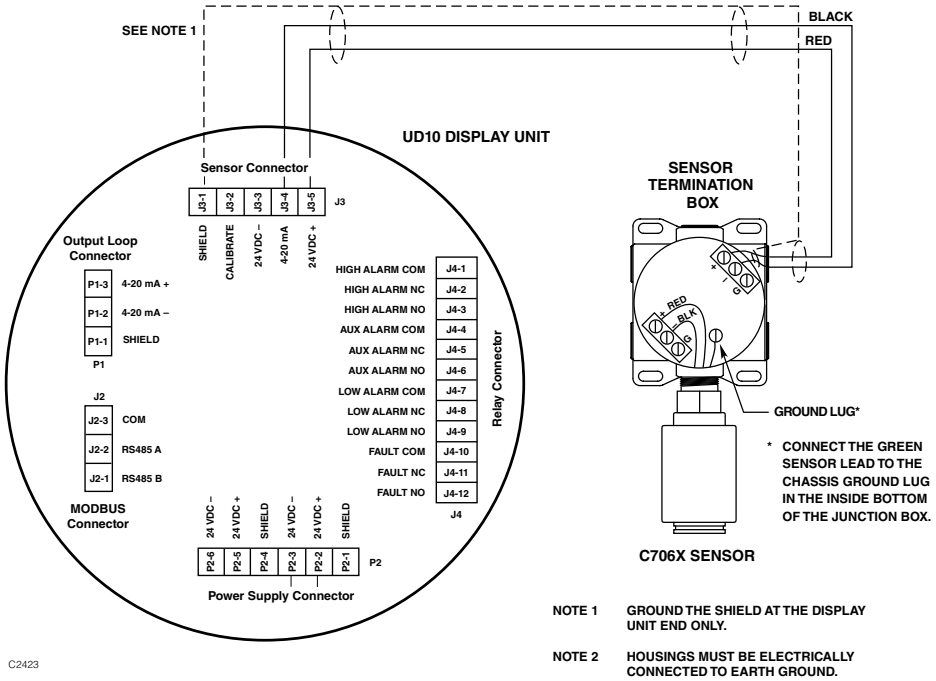
WIRING



Notes: Maximum cable length from power source to UD10 is 2000 feet.
Maximum cable length from UD10 to sensor/STB termination box is 2000 feet.



C706X Sensor Wired Directly to UD10



UD10 Wired to C706X Sensor with STB Termination Box

INSTALLATION

WIRING REQUIREMENTS

The simplest installation involves installing the sensor into one of the UD10 openings and connecting the wiring directly to the UD10. If the installation requires separation of the C706X sensor and the UD10 Display, the sensor can be connected to a STB sensor termination box, and the C706X/STB combination wired to the UD10. In this case, shielded cable is recommended to help protect against interference caused be extraneous electrical "noise." In applications where the cable is installed in conduit, the conduit should not be used for wiring to other electrical equipment whenever possible. If other equipment power wiring is run in the same conduit, the cabling **must** be shielded. The maximum allowable distance between the C706X sensor and UD10 Display Unit is limited by the resistance of the cabling used.

INSTALLATION AND WIRING PROCEDURE

1. Determine the best mounting locations for the detectors.

2. Install the C706X sensor within the proper opening in the UD10 or STB junction box. Mount the UD10/C706X with the sensor oriented vertically and the opening pointing down. The UD10 should be electrically connected to earth ground.

   NOTE

   The electrochemical sensor cell does not need to be installed within the C706X housing while installing and wiring the detector/junction box. It is recommended to keep the sensor in the manufacturer's sealed shipping bag in a cool storage environment until actual power-up and calibration commissioning is performed. This will ensure that the sensor will provide maximum longevity.

3. Terminate all three C706X conductors at the proper terminals. Refer to the appropriate illustration for details.

4. Double check that all wiring is the proper size and type and has been installed correctly. Check operating voltage at the C706X sensor and the UD10 Display Unit.

   NOTE

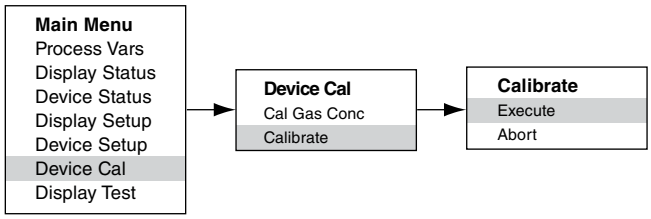
   Do not apply power to the system with the junction box cover removed unless the area has been de-classified.

5. Proceed with startup and calibration.

CALIBRATION

To initiate calibration of the C706X sensor from the UD10 Display:

1. Using the magnet to activate the switches on the UD10 display, navigate to the “Calibrate” menu.



2. Activate “Execute” (Enter/Select) to start calibration.

3. The UD10 will display “Waiting for Zero” on the main display screen as it performs zero calibration.

4. When zero calibration is complete, the UD10 will display “Waiting for Gas” on the screen.

5. Apply calibration gas to the sensor.

6. The UD10 will display “Waiting for Span” on the screen while the span calibration is being performed.

7. When the UD10 displays “Remove Cal Gas” on the screen, remove the calibration gas from the sensor.

8. When calibration is complete, “Remove Cal Gas” is no longer displayed on the screen and the UD10 automatically returns to the normal operating mode.

MENU STRUCTURE

UD10 with C706X Series Sensor

Refer to the following menu when using the UD10’s LCD display and internal magnetic switches.

When connecting a HART Communicator to the UD10’s 4-20 mA output, refer to the “UD10 HART” menu in Appendix A.

MENU HELP

Status menus only allow the user to view the data. The Setup menus allow the user to both view and edit the data.

Main Menu

Process Vars →
Display Status →
Device Status →
Display Setup →
Device Setup →
Device Cal →
Display Test →

Process Vars

Gas Name	
Gas Value	x.xx
High Alarm	Y/N
Low Alarm	Y/N
Aux Alarm	Y/N
Analog Input	x.xx mA
URV	x.xx
LRV	x.xx
Fault	Y/N

Display Status

General Info →
Fault/Status →
History →
Display Info →
RS485 →
Debug Menu →

Device Status

Fault/Status →
Calibration Log →

Fault/Status

High Fault	Y/N
Low Fault	Y/N
Cal Fault	Y/N

Calibration Log

Cal ID	xxxx
Date	dd/mmm/yyyy
Time	hh:mm:ss
Zero	xxxx
Span	xxxx

Display Setup

Alarm Setting →
Mode Select →
HART Option →
RTC →
RS485 →
Input Loop Cal

Alarm Setting

Rst Latch Alarms	
Hgh Alarm Level	xx.xx
Hgh Alarm Latch	Y/N
Low Alarm Level	xx.xx
Low Alarm Latch	Y/N
Aux Alarm Level	xx.xx
Aux Alarm Latch	Y/N

Mode Select

HART Device
PIR9400
C706X
505
NTMOS

HART Option

Tag	xxxxx
Descriptor	xxxxx
Message	xxxxx
Date	xxxxx
Final assy num	xxxxx

RTC

Displayed	Y/N
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

RS485

Baud Rate →
Parity →
Poll Address xxxx

Baud Rate

1200
2400
4800
9600
19.2K

Parity

None
Even
Odd

Device Setup

Gas Name xxxx
Detector Type →

Detector Setup

C7064	H2S	20	PPM
C7064	H2S	50	PPM
C7064	H2S	100	PPM
C7064	CL2	10	PPM
C7064	CO	100	PPM
C7064	CO	500	PPM
C7064	CO	1000	PPM
C7064	SO2	100	PPM
C7064	NO2	20	PPM

Device Cal

Cal Gas Conc xxx.xx
Calibration →

Calibration

Execute
Abort

Display Test

Self Test
Response Test
Loop Test →
D/A Trim →

Loop Test

Set 4-20 mA →

D/A Trim

Zero Trim
Gain Trim

Set 4-20 MA

3.5 MA
4 MA
6 MA
8 MA
10 MA
12 MA
14 MA
16 MA
18 MA
20 MA

General Info

Manufacturer	→
Model	UD-10
Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxxx
Final Assy Num	xxxxx
Device ID	xxxxx

DET-TRONICS
6901 West 110th Street
Minneapolis, MN 55438
USA

Fault/Status

Op Mode	xxxxx
Fault	Y/N
Status	Y/N

Fault

CAL FAULT	ON/OFF
START CAL FAULT	ON/OFF
EE FAULT	ON/OFF
ADC REF FAULT	ON/OFF
24V FAULT	ON/OFF
FLASH FAULT	ON/OFF
RAM FAULT	ON/OFF
WDT FAULT	ON/OFF
12V FAULT	ON/OFF
5V FAULT	ON/OFF
3V FAULT	ON/OFF
ADC RANGE FAULT	ON/OFF
O/P LOOP FAULT	ON/OFF
INPUT LOOP FAULT	ON/OFF
FLASH CODE FAULT	ON/OFF
HART COMM FAULT	ON/OFF

Status

ANY FAULT	ON/OFF
CAL. ACTIVE	ON/OFF
WARM UP	ON/OFF
LOW RELAY ACTIVE	ON/OFF
HI RELAY ACTIVE	ON/OFF
AUX RELAY ACTIVE	ON/OFF
CURRENT FIXED	ON/OFF
MB WRITE PROTECT	ON/OFF
CAL LINE ACTIVE	ON/OFF
CAL SW ACTIVE	ON/OFF
HART SELF TEST	ON/OFF
LON ATTACHED	ON/OFF
RESPONSE TEST	ON/OFF
MANUAL SELF TEST	ON/OFF

History

Display History →
Event Log →

Display History

Running Hours	xxxx
Max Temp	xx.xx C
Max Temp Time	xxxx
Min Temp	xx.xx C
Min Temp Time	xxxx

Event Log

Event	xxxxx
Date	dd/mmm/yyyy
Time	hh:mm:ss

Display Info

RTC	→
Serial Number	xxxxx
H/W Rev	xxxxx
F/W Rev	xxxxx
Universal Rev	xxxxx
Fld Dev Rev	xxxxx
S/W Rev	xx.xx
Running Hours	xxxxx
Temperature	xx.xx C

RTC

Displayed	Y/N
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

RS485

Baud Rate	xxxxx
Parity	xxxxx
Poll Address	xxxxx

Debug Menu

HART Errors

Detector Electronics

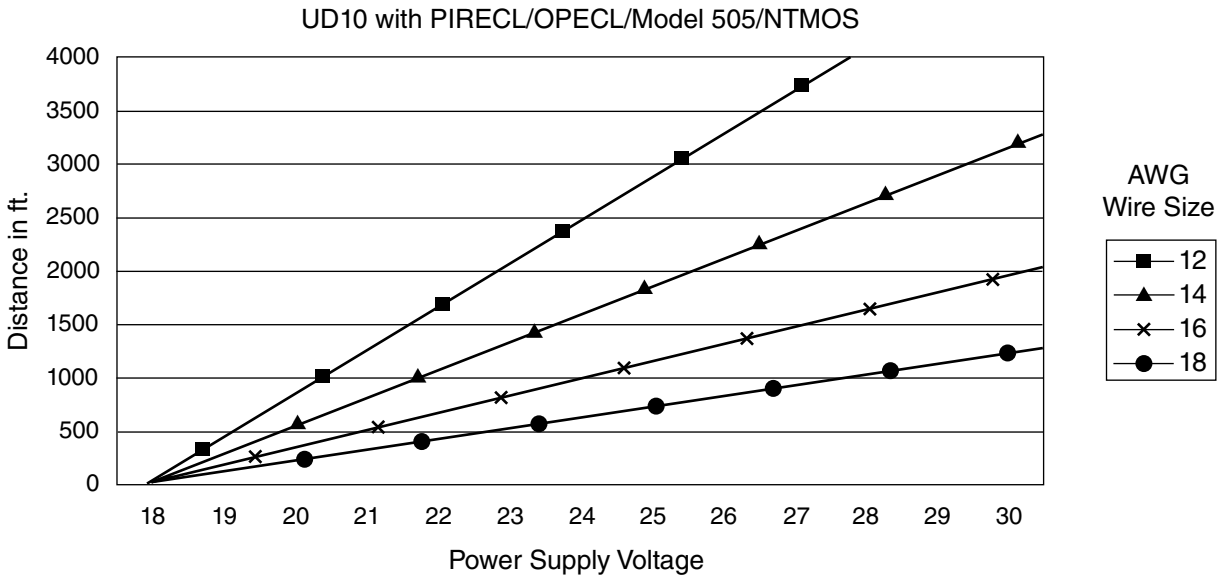
UD10 C706X	March 25, 2009	1.17

APPENDIX H

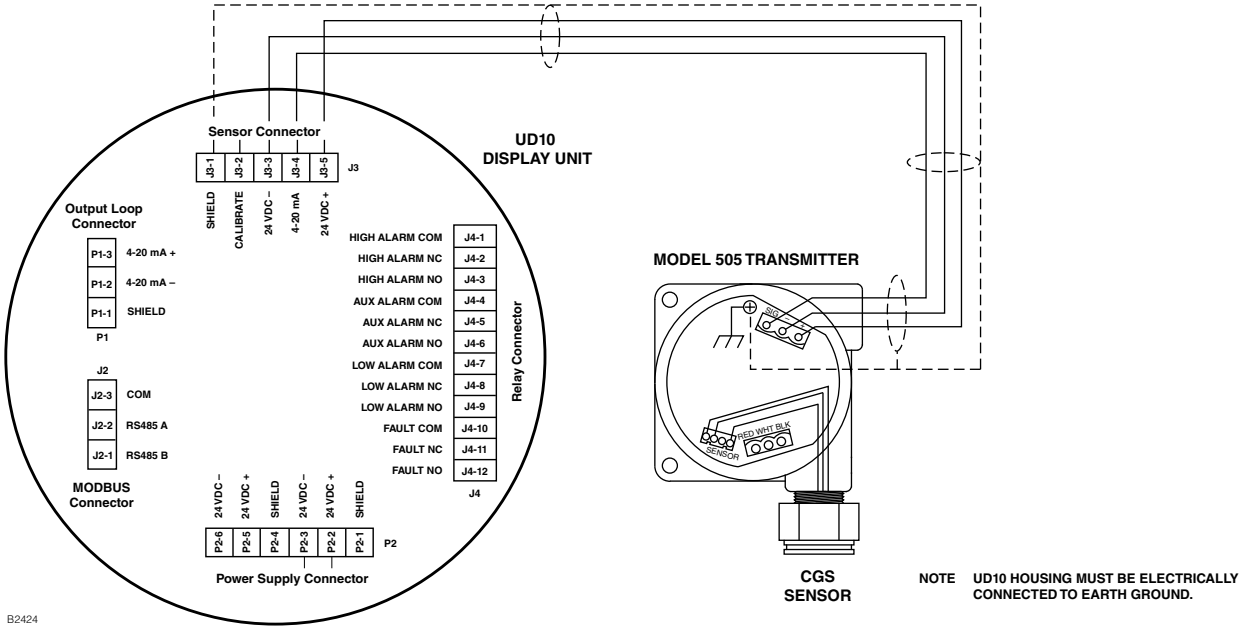
UD10 with MODEL 505 TRANSMITTER / CGS SENSOR

NOTE
For complete information regarding the Model 505 Transmitter, refer to instruction manual 95-8472.

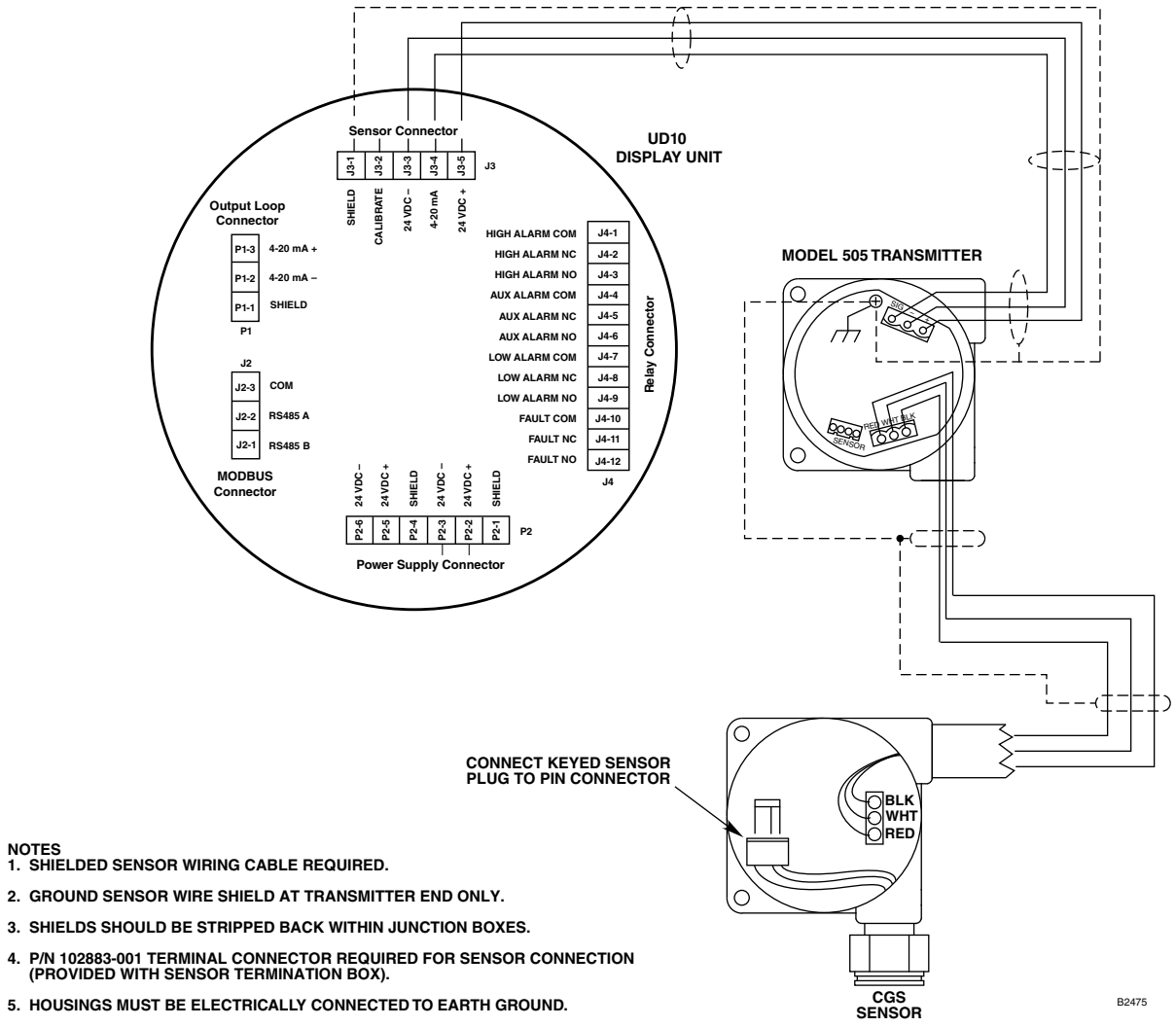
WIRING



Notes: Maximum cable length from power source to UD10 is 2000 feet.
Maximum cable length from UD10 to sensor/STB termination box is 2000 feet.



UD10 Wired to Model 505 Transmitter/CGS Sensor



NOTES
1. **SHIELDED SENSOR WIRING CABLE REQUIRED.**
2. **GROUND SENSOR WIRE SHIELD AT TRANSMITTER END ONLY.**
3. **SHIELDS SHOULD BE STRIPPED BACK WITHIN JUNCTION BOXES.**
4. **P/N 102883-001 TERMINAL CONNECTOR REQUIRED FOR SENSOR CONNECTION (PROVIDED WITH SENSOR TERMINATION BOX).**
5. **HOUSINGS MUST BE ELECTRICALLY CONNECTED TO EARTH GROUND.**

UD10 Wired to Model 505 Transmitter/CGS Sensor Using Sensor Separation Termination Box

INSTALLATION

Refer to the Model 505 Instruction Manual (number 95-8472) for complete information regarding proper installation of the Model 505 with combustible gas sensor.

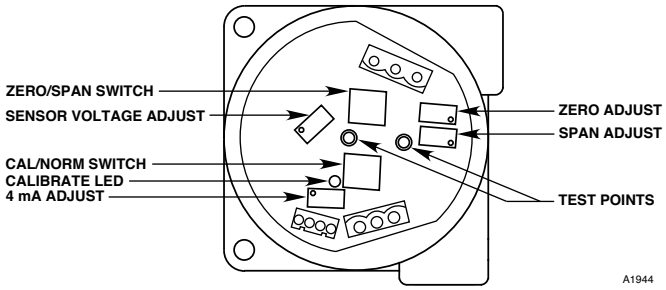
ORIENTATION

The Model 505/CGS must be mounted with the CGS sensor opening pointing down.

CALIBRATION

Model 505

The Model 505/CGS must be calibrated when the system is commissioned as well as when the CGS sensor is replaced. Calibration is performed at the Model 505 using the following procedure. Calibration at the UD10 is not supported.



WARNING *Before removing the junction box cover, verify that no dangerous levels of gas are present.*		
Step	**Switch Position**	**Operator Action**
1	CAL/NORM switch in the CAL position.	1. LED turns on. 2. Connect a digital voltmeter to the transmitter test jacks. 3. Set the meter range to 2 Vdc.
2	ZERO/SPAN switch in the ZERO position.	1. Adjust the ZERO potentiometer to read 0.000 Vdc on the voltmeter. See Note 3 below.
3	ZERO/SPAN switch in the SPAN position.	1. Adjust the 4 mA potentiometer to read 0.167 Vdc on the voltmeter. 2. Apply the 50% LFL calibration gas to the sensor. When the output has stabilized, adjust the SPAN potentiometer for a reading of 0.500 on the voltmeter.
4	ZERO/SPAN switch in the ZERO position.	1. Sensitivity test. The meter must read greater than 0.015 Vdc. See Note 4 below. 2. Remove the calibration gas. 3. When the meter reads 0.002 Vdc or less, remove the test probes.
5	CAL/NORM switch in NORM position.	1. The LED turns off. 2. The calibration is complete. 3. Replace the junction box cover.

NOTES:

1. When the CAL/NORM switch is in the CAL position, the yellow LED turns on and the 4-20 mA output signal goes to 3.4 mA.
2. The voltmeter must be suitable for use in a hazardous location.
3. If the possibility of background gases exists, purge the sensor with clean air prior to the zero adjustment to assure accurate calibration.
4. A typical sensitivity reading with 50% LFL gas applied to the sensor is 35 to 50 millivolts for a new sensor. Sensor replacement is recommended when the sensitivity reading is less than 15 millivolts.
5. If a dust cover or splash shield is used, inspect it to be sure that it is not dirty or plugged. A plugged dust cover can restrict the flow of gas to the sensing element, seriously reducing its effectiveness. For optimum performance, sensor covers/filters should be replaced frequently to ensure that they are not degraded or plugged.

MENU STRUCTURE

UD10 with Model 505 / CGS Sensor

Refer to the following menu when using the UD10's LCD display and internal magnetic switches.

When connecting a HART Communicator to the UD10's 4-20 mA output, refer to the "UD10 HART" menu in Appendix A.

MENU HELP

Status menus only allow the user to view the data. The Setup menus allow the user to both view and edit the data.

Main Menu

Process Vars →
Display Status →
Device Status →
Display Setup →
Device Setup →
Device Cal →
Display Test →

Process Vars

Gas Name	
Gas Value	x.xx
High Alarm	Y/N
Low Alarm	Y/N
Aux Alarm	Y/N
Analog Input	x.xx mA
URV	x.xx
LRV	x.xx
Fault	Y/N

Display Status

General Info →
Fault/Status →
History →
Display Info →
RS485 →
Debug Menu →

Device Status

Fault/Status →
Calibration Log →

Fault/Status

High Fault	Y/N
Low Fault	Y/N
Cal Fault	Y/N

Calibration Log

Cal ID	xxxx
Date	xx/xxx/xxxx
Time	xx:xx
Zero	xxxx
Span	xxxx

Display Setup

Alarm Setting →
Mode Select →
HART Option →
RTC →
RS485 →
Input Loop Cal

Alarm Setting

Rst Latch Alarms	
Hgh Alarm Level	xx.xx
Hgh Alarm Latch	Y/N
Low Alarm Level	xx.xx
Low Alarm Latch	Y/N
Aux Alarm Level	xx.xx
Aux Alarm Latch	Y/N

Mode Select

HART Device
PIR9400
C706X
505
NTMOS

HART Option

Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxxx
Final assy num	xxxxx

RTC

Displayed	Y/N
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

RS485

Baud Rate →
Parity →
Poll Address xxxx

Baud Rate

1200
2400
4800
9600
19.2K

Parity

None
Even
Odd

Poll Address

Note: settable from 1 - 247

Device Setup

Gas Name xxxx
Detector Type →

Detector Type

505 CH4 100 %LFL

Device Cal

Cal Gas Conc xxx.xx
Calibration →

Calibration

Execute
Abort

Display Test

Self Test
Response Test
Loop Test →
D/A Trim →

Loop Test

Set 4-20 mA →

D/A Trim

Zero Trim
Gain Trim

Set 4-20 MA

3.5 MA
4 MA
6 MA
8 MA
10 MA
12 MA
14 MA
16 MA
18 MA
20 MA

General Info

Manufacturer	→
Model	UD-10
Tag	xxxxx
Descriptor	xxxxx
Date	dd/mmm/yyyy
Message	xxxx
Final Assy Num	xxxxx
Device ID	xxxxx

DET-TRONICS

6901 West 110th Street
Minneapolis, MN 55438
USA

Fault/Status

Op Mode	xxxxx
Fault	Y/N
Status	Y/N

Fault

CAL FAULT	ON/OFF
START CAL FAULT	ON/OFF
EE FAULT	ON/OFF
ADC REF FAULT	ON/OFF
24V FAULT	ON/OFF
FLASH FAULT	ON/OFF
RAM FAULT	ON/OFF
WDT FAULT	ON/OFF
12V FAULT	ON/OFF
5V FAULT	ON/OFF
3V FAULT	ON/OFF
ADC RANGE FAULT	ON/OFF
O/P LOOP FAULT	ON/OFF
INPUT LOOP FAULT	ON/OFF
FLASH CODE FAULT	ON/OFF
HART COMM FAULT	ON/OFF

Status

Any Fault	ON/OFF
CAL. Active	ON/OFF
Warm Up Mode	ON/OFF
Low Relay Active	ON/OFF
Hi Relay Active	ON/OFF
AUX Relay Active	ON/OFF
Current Fixed	ON/OFF
MB Write Protect	ON/OFF
CAL Line Active	ON/OFF
CAL SW Active	ON/OFF
HART Self Test	ON/OFF
LON Attached	ON/OFF
Response Test	ON/OFF
Manual Self Test	ON/OFF

History

Display History →
Event Log →

Display History

Running Hours	xxxx
Max Temp	xx.xx C
Max Temp Time	xxxx
Min Temp	xx.xx C
Min Temp Time	xxxx

Event Log

Event	xxxxx
Date	dd/mmm/yyyy
Time	hh:mm:ss

Display Info

RTC	→
Serial Number	xxxxx
H/W Rev	xxxxx
F/W Rev	xxxxx
Universal Rev	xxxxx
Fld Dev Rev	xxxxx
S/W Rev	xx.xx
Running Hours	xxxxx
Temperature	xx.xx C

RTC

Displayed	Y/N
Seconds	xx
Minutes	xx
Hours	xx
Day	xx
Month	xx
Year	xx

RS485

Baud Rate	xxxxx
Parity	xxxxx
Poll Address	xxxxx

Debug Menu

HART Errors

Detector Electronics

UD10 505	March 25, 2009	1.17

X3301 Multispectrum
IR Flame Detector

PointWatch Eclipse®
IR Combustible Gas Detector

Eagle Quantum Premier®
Safety System

Eagle Logic Solver
Safety System

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