

P/N 1705-2583
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Specifications Subject to Change

Dual Range Methane Monitor

MDU 420



GUARANTEED.
FOR LIFE.

1001 Oakdale Road, Oakdale, PA 15071-1500
(412) 788-4353 Toll Free 1-800-DETECTS
FAX 412-788-8353

INDUSTRIAL SCIENTIFIC
CORPORATION

Instruction
Manual

OUR MISSION

*Design - Manufacture - Sell:
Highest quality products
for the preservation of
life and property.*

*Provide:
Best customer service
available.*

Dear Valued Customer:

Thank you for buying and using Industrial Scientific's Model MDU420 Dual Range Methane Monitor.

Your MDU420 can be relied upon for dependable service, day after day. It has been designed, manufactured, tested and proven under the most scrutinizing conditions possible. With the minimal care and maintenance described in this Instruction Manual, it will provide you with years of reliable monitoring.

I am most concerned that you be pleased with the performance of your MDU420 in the months and years ahead. I urge you to call us with any questions or comments you may have. Often times a phone call and a question can save you hours of frustration. Please never hesitate to contact me at 1-800-DETECTS (338-3287).

All of us at Industrial Scientific appreciate the opportunity to serve you.

Yours very truly,

A handwritten signature in black ink, appearing to read "Kent D. McElhattan". The signature is stylized and cursive.

Kent D. McElhattan
President & CEO
Industrial Scientific Corporation

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1. WARNINGS AND CAUTIONARY STATEMENTS

Certain conditions or failure to observe certain necessary procedures will impair the performance of the instrument. For maximum safety and performance while using this instrument, please read and understand the conditions and procedures outlined below.

- ▲ Read and fully understand the instruction manual before operating or servicing the MDU420.
- ▲ Substitution of components may impair intrinsic safety and cause an unsafe condition.
- ▲ The MDU420 must be operated with an Industrial Scientific filtered sampling probe or inline filter. Filtering is required to ensure proper instrument operation. Contamination of the sensor or supply tubing will affect reading accuracy and shorten pump life. Condensing vapors within the sensor may cause inaccurate readings.
- ▲ Sudden changes in temperature may cause temporary fluctuations in instrument reading.
- ▲ An increase or decrease in atmospheric pressure may cause an increase or decrease in the measured gas concentration.
- ▲ The MDU420 may be set to display values between 0 and 5% volume methane in their corresponding percentage of LEL or as the actual percent methane. Verify display setting during instrument start-up.
- ▲ The MDU420 alarm may either be enabled or disabled. Verify the alarm condition during instrument start-up.
- ▲ The MDU420 audible and visual alarms may be configured as non-latching or latching. Verify alarm type during instrument start-up.
- ▲ Use the RS-232 data logging port only in a non-hazardous location.
- ▲ Tested for intrinsic safety in explosive gas/air (21% oxygen) mixtures only.
- ▲ Conditions of safety certifications must be maintained to ensure the safety of the user.
- ▲ MDU420 is not for use in areas where volatile dust may accumulate.
- ▲ Any indication of a low flow condition cautions the user that air sampling is inadequate. User should ensure that the MDU420 has adequate air flow before continuing use.
- ▲ Failure to comply with all warnings, cautionary statements, and any directions with respect to operation, service or calibration may void the warranty and intrinsic safety certification of the MDU420 and may remove any right of claim against Industrial Scientific Corporation relating to product liability or consequential damage to any third party.

2. UNPACKING

The shipping box label indicates which items should have been included with the instrument. Account for each item before discarding containers.

QUANTITY	PART NUMBER	DESCRIPTION
1	1810-2247	MDU420 0-100% Methane Monitor
1*	1810-2384	Data Logging Kit (PC Board 1705-1327 is located within the instrument)
1	1705-2583	MDU420 Instruction Manual
1	1810-2307	18-inch Polycarbonate Probe
	or 1810-2311	Bar Hole Probe
	or 1810-2305	Flue Gas Probe
	or 1810-2418	100 ft Tubing w/Inline Filter
1	1704-2946	Maintenance Tool
1*	1810-2308	Leather Carry Case

NOTE: * Items are optional, refer to purchase order.

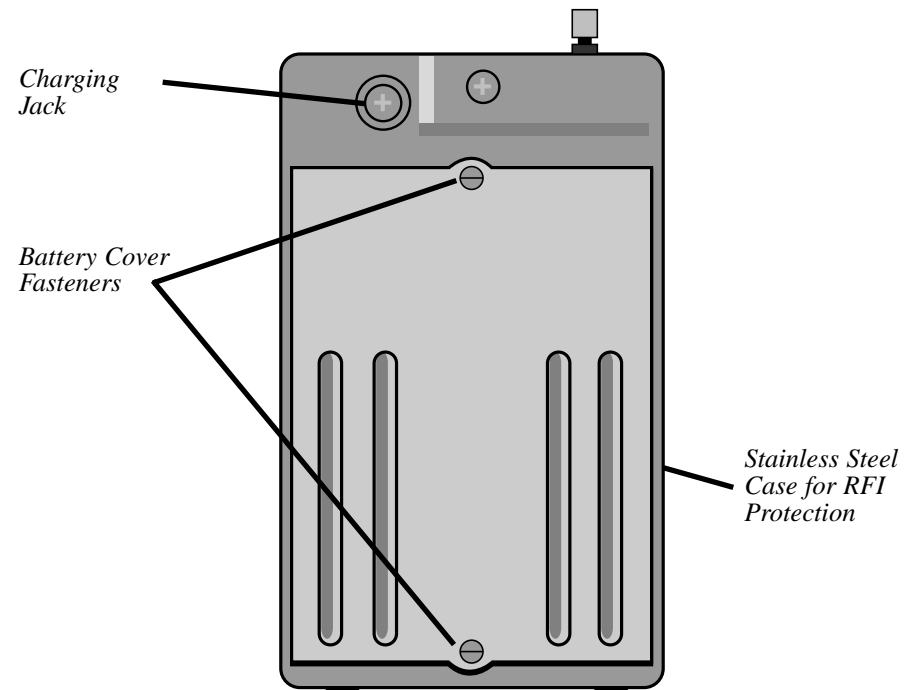
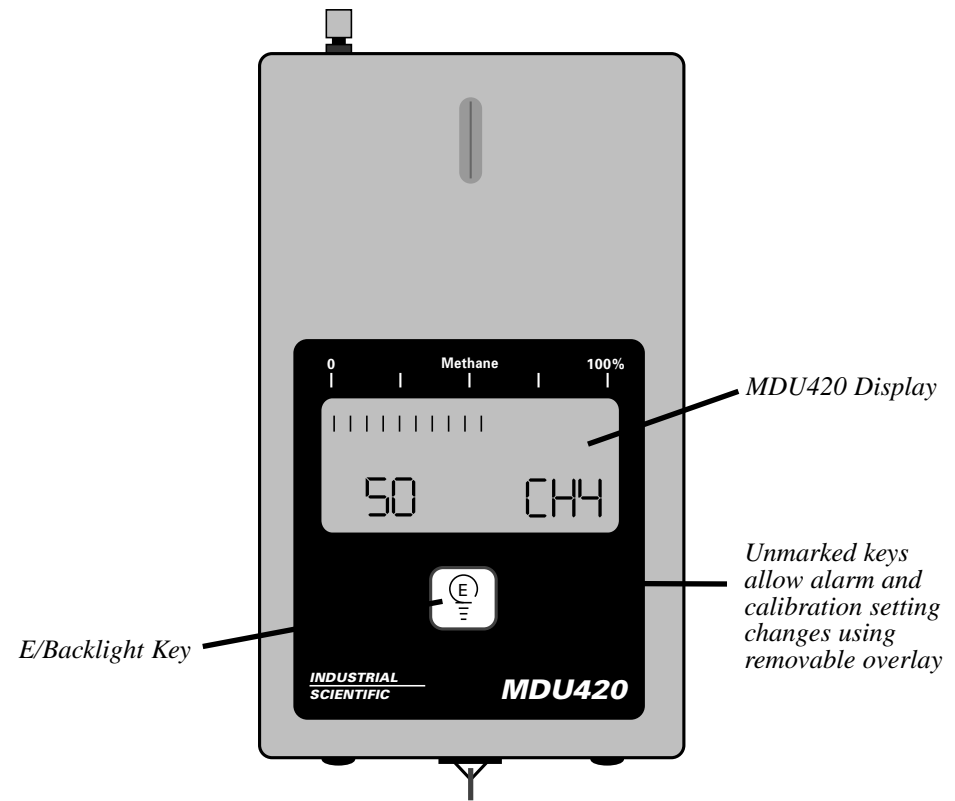
NOTE: Instrument probes are shipped in a separate container.

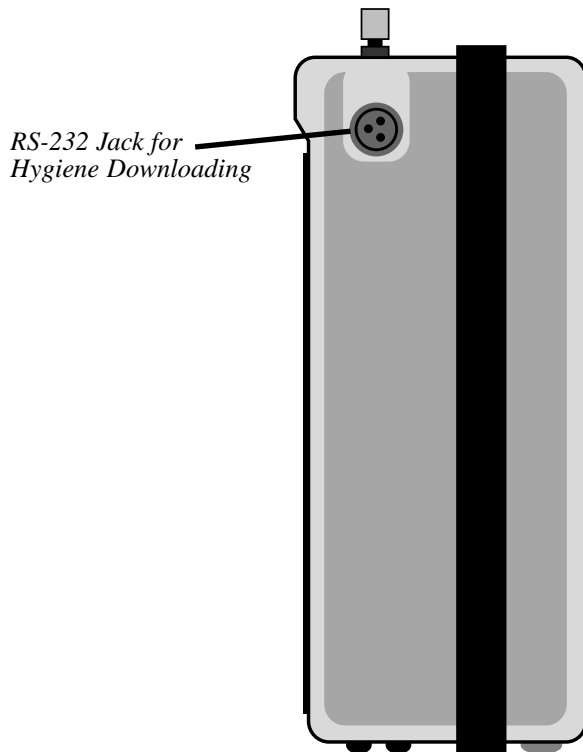
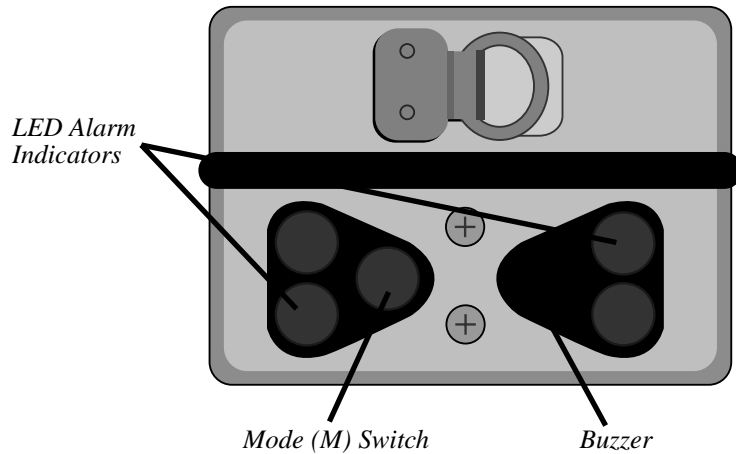
If any listed item is not found, contact either your local distributor of Industrial Scientific products, or call Industrial Scientific Corporation at 1-800-DETECTS (338-3287) in the United States and Canada, or (412) 788-4353.

3. MDU420 FEATURES

The Industrial Scientific Model MDU420 0-100% Methane Monitor measures the percentage by volume of methane gas present in a gas sample.

- The infrared methane sensor does not require oxygen to measure the methane concentration and is not poisoned by other gases.
- All control and calibration keys are located externally for easy access. The MODE key located on the bottom end of the instrument switches the instrument ON/OFF and selects display modes. The embossed (E) key located on the faceplate is used for activating the backlight, and for setting instrument values. Two unmarked (+) and (-) keys are used to enter values into the instrument. There are no potentiometers to adjust.





- Microprocessor controlled calibration sequence for accurate calibration.
- Illuminated display for viewing in low light conditions. The backlight is turned on whenever an alarm is activated, or by pressing the (E) key.
- Automatic calibration check when instrument Zero function is performed.
- Digital and analog display indication of methane gas concentration on 0-100% of volume scale.
- User selectable display scale from 0-5% methane as percent of volume or percent of LEL.
- User enabled audible and visual alarms.
- User selectable latching or non-latching alarms.
- Round-the-clock monitoring capability using the interchangeable nickel-cadmium rechargeable or replaceable lithium battery packs.
- Three levels of alarm notification; Low LEL Warning, High LEL Alarm, and Above UEL Warning.
- User selectable access code for security of calibration and instrument settings.
- Press and hold power switch to prevent accidental turn on or turn off.
- Optional data logging to store up to sixty hours of continuous data.

The MDU420 is certified as intrinsically safe - or pending classification - by the following agencies:

- Underwriters Laboratories (UL)
- Canadian Standards Association (CSA). The Canadian Standards Association has assessed only the combustible gas portion of this instrument for performance.
- The MDU420 complies with European EMC Directives 89/336/EEC, 92/31/EEC and 93/68/EEC.

4. INSTRUMENT OPERATION

4.1 CHARGING THE BATTERY

Before using the MDU420 with a rechargeable nickel-cadmium battery pack, fully charge the battery.

NOTE: *To fully charge battery, the instrument must be turned OFF while charging.*

Refer to Section 10, Options and Ordering Information, for a complete listing of available chargers.

When charging the battery pack in the instrument, turn OFF the instrument and place it on the battery charger. To charge the battery pack out of the instrument, remove the pack from the instrument and place it on the charger (See Section 7.2, Changing the Battery).

A fully charged battery pack should operate the instrument for 7 hours. When the instrument is in the normal viewing mode, the battery status indicator can be accessed by pressing the MODE key. Each segment of the battery indicator represents about one hour of normal operating time. When the battery is fully discharged, the instrument will show "BATTERY FAIL" and emit a short beep once a second. Turn off the instrument and recharge or replace the battery pack.



Charging the MDU420 with no battery pack or with the lithium battery pack installed will void the instrument warranty and intrinsic safety certification and may cause an unsafe condition.



Use only chargers manufactured by Industrial Scientific when recharging the MDU420 or the nicad battery pack.



Recharge the nicad battery pack or replace the lithium battery pack only in non-hazardous locations.



The MDU420 is intended to be a portable battery powered device only. Do not use the instrument while connected to a battery charger.



A low battery indication by the MDU420 cautions the user that the battery pack does not hold an adequate charge.

4.2 MDU420 SAMPLING PROBES

The MDU420 must be used with an approved probe or sampling line with in-line filter. Failure to use an appropriate filtered sampling device may result in contamination and malfunction of the instrument sampling pump or the infrared methane sensor, and will void the instrument warranty. Use of other than approved devices will void the CSA approval of the instrument. For a list of approved sampling probes, See Section 10, Options and Ordering Information.

The MDU420 sample port will be closed with no sample line in place and a low pump flow condition will result. The low flow condition will be cleared when the sampling line is connected to the instrument.

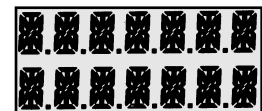
To attach the sampling probe to the instrument, insert the male fitting on the sampling line into the quick connect coupling on the top of the MDU420. The sampling line will automatically lock into place. To remove the sampling line, gently pull down the collar of the quick connect coupling on the top of the instrument. The sampling line will be released.

Sampling probes contain a flow indicator within the probe handle. Proper flow should be verified by holding the probe vertically as shown on the handle and verifying that the flow indicator ball is visible.

To replace the filter element in high capacity in-line filters, unscrew the cap from the probe handle or in-line filter. Unscrew the filter element from the cap assembly. Replacement filter elements are available from Industrial Scientific or your local distributor of Industrial Scientific products. See Section 10, Options and Ordering Information, for a list of replacement filter elements.

4.3 TURNING THE MDU420 ON AND OFF

- Press and hold the MODE key. All segments of the display are activated to verify proper operation.
- The HOLD screen appears and the instrument sounds a beep approximately once per second.
- Hold the MODE key until the screen shows RELEASE. (Stop here if turning the instrument off.)
- After the instrument is turned ON, the following startup screens will be displayed:





DISPLAY TYPE. Indicates low range display setting as percent of LEL or percent volume CH₄.



ALARM STATE. Indicates if MDU420 alarms are set ON or OFF.



ALARM TYPE. Indicates MDU420 alarm type as LATCHED or UNLATCH.



BATTERY. Instrument display indicates battery status as OK or LOW and shows a 8-segment visual status indicator.



DATALOG. If a data logging module is installed, the user may start a new data logging session by pressing the enter (E) key during this screen.



MEM LOW. This screen appears if the data logging memory is full or if less than eight hours of data logging space is available. The MDU420 Data Logging software is required to clear the instrument.



WARMING UP. This screen indicates the amount of time remaining until the MDU420 begins normal operation. During this screen, instrument settings are accessed by pressing the hidden (+) and (-) keys together.

4.4 DISPLAY BACKLIGHT

The backlight is automatically switched ON when the MDU420 is in an alarm condition. To manually switch ON the backlight, press the (E) key and the backlight will remain ON for 15 seconds. For added convenience, a feature has been molded into the center of the key to ensure easy identification under low light conditions.

4.5 MDU420 OPERATING MODES

The MDU420 offers different operating modes for accessing various instrument features. To scroll through the operating modes, press and release the MODE key. The operating modes will be accessed in the following sequence:



4.5.1 NORMAL

The instantaneous methane concentration is continuously displayed both numerically and graphically. The bar graph display has a resolution of 1 tick per 5% methane.

4.5.2 BATTERY

This screen shows if the battery is “OK” or “LOW” and displays a graphical representation of the remaining operating time. Each segment is equivalent to about one hour of operation.



4.5.3 ZERO

This mode allows the user to zero the instrument and calibrate the infrared methane sensor. Refer to Section 5, Calibrating the MDU420, for instruction on the use of the instrument’s automatic zero and calibration functions.



4.5.4 PUMP

This mode will allow the user to turn off the internal sampling pump between readings and conserve instrument battery power.



- Press MODE to access the PUMP screen.
- Press enter (E) to turn the pump off. The instrument will display the message PUMP OFF.
- Press enter (E) again to resume normal pump operation.



4.5.5 PEAK

This mode will display the highest level of methane gas measured since the peak reading was last cleared.



4.5.6 PEAK CLEAR

This mode allows the user to clear the previous peak reading from the instrument memory.



- Press MODE until the screen shows PK CLR.
- Press enter (E) to clear the peak reading. The peak reading screen appears to verify that the peak value has been cleared properly.

NOTE: *If the peak reading is zero, the peak clear screen will not appear; instead the alarm control screen is accessed.*

4.5.7 ALARM

This mode allows the user to temporarily turn ON or OFF the audible and visual alarms.



To turn the instrument alarms ON or OFF:

- Press MODE to access the ALARM screen.
- Press enter (E) to toggle between alarms ON and OFF.

CALDATE
103196

4.5.8 CAL DATE

This mode displays the last date the MDU420 was calibrated (Month/Day/Year).

4.6 MDU420 ALARM INDICATORS

4.6.1 LOW ALARM

When a methane gas concentration reaches the Low LEL alarm level, the instrument emits a short beep approximately every 1.2 seconds.

4.6.2 HIGH ALARM

When the methane gas concentration reaches the High LEL alarm level, the instrument emits a high-pitched warbling tone, the four bright red LED's flash and the unit's indicator blinks. The display backlight will be activated continuously to aid viewing in low light conditions.

NOTE: *The MDU420 uses the high alarm type when the methane concentration is between the High LEL alarm value and the UEL warning value.*

4.6.3 LOW FLOW ALARM

A pump flow alarm will occur if the sample flow is blocked or if no sample line is in place. When the sample flow is too low, the MDU420 will emit a short beep approximately every 1.2 seconds and the instrument display will indicate PUMP FLO ALM.

The pump flow alarm will be cleared automatically when the sample line is connected to the instrument or when the blockage is removed.

4.6.4 LOW BATTERY WARNING

With approximately 30-90 minutes of run time remaining, the MDU420 will emit a short beep once every 15 seconds to indicate the low battery condition.

NOTE: *Length of warning time will increase when the optional lithium battery pack is used.*

4.6.5 BATTERY FAILURE

When the battery has insufficient charge to operate the instrument, BATTERY FAIL is displayed. The instrument stops monitoring and emits a short beep once every second.

When BATTERY FAIL appears, immediately turn OFF the instrument and recharge or replace the battery.

BATTERY
FAIL

5. CALIBRATING THE MDU420

The MDU420 utilizes an automatic calibration system and has the ability to detect when calibration is necessary. The calibration will be checked each time the instrument ZERO function is performed. Unless the instrument calibration warning is activated after a normal ZEROING function, there is no need for regular calibration of the MDU420.


Zeroing and calibration will be most accurate when the instrument has been at a consistent temperature for at least one hour before calibrating.

NOTE: *For best accuracy, use a calibration gas concentration that is closest to the value of methane that you expect to measure. Calibration gas flow rate should be between 0.5 and 1.0 liter per minute.*

 **Ensure that ventilation is adequate when calibrating the MDU420.**

5.1 ZEROING THE INSTRUMENT

The MDU420 may be zeroed without accessing the calibration system.

 **Zero the instrument only in clear air.**

- From the NORMAL reading mode, press MODE to access the ZERO operating mode.
- Press enter (E) to start the ZEROING function.
- If the instrument detects a need for calibration when the ZEROING function is complete, the GO-CAL prompt will remain on the display and the instrument will emit a short beep once a second until the MODE or enter (E) key is pressed.

ZERO
PRESS

ZEROING

5.2 CALIBRATING THE INSTRUMENT

The MDU420 span calibration function may be entered immediately after the ZEROING function has been performed.

 **Calibration of the MDU420 should be performed only by trained and authorized personnel.**

To calibrate the MDU420:



- Press enter (E) when the instrument display shows GO CAL along with the scrolling prompt PRESS (E) TO START.

NOTE: *If the instrument access code is set to a value other than zero (00), the user will be prompted to enter the appropriate code value. For information on entering and changing the access code, see Section 6.*



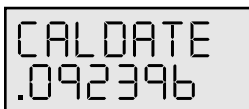
- When the GO CAL prompt has been acknowledged, the MDU420 display will indicate the calibration gas value which was used for the last calibration. The instrument will wait for three minutes to sense that calibration gas has been applied. Calibration will begin automatically once 50% of the required gas concentration has been sensed by the instrument.



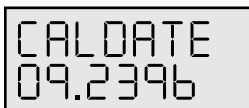
- When calibration has begun, the instrument will display the message SETTING CAL along with the time remaining in seconds until the calibration is complete.
- If the instrument calibration is not successful, the display will show the prompt CAL FAIL until the MODE key is pressed to exit the calibration function.



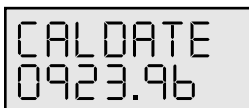
- If calibration is successful, the instrument will emit a short beep and the display will step to the CALDATE screen. If a data logging module is installed in the instrument, the current date will be obtained from the datalogging module and be indicated automatically. If no datalogging module is present, the calibration date must be entered manually.



- Use the hidden (+) and (-) keys to set the current month. The month position will be indicated in the position to the left of the decimal point in the display.



- Press (E) to enter the month and move the decimal point to the day position.



- Use the hidden (+) and (-) keys to set the current day.
- Press (E) to enter the day and move the decimal point to the year position.



- Use the hidden (+) and (-) keys to set the current year.
- Press (E) to enter the year and move the decimal point to the right most position.
- If the calibration date is correct as shown, press (E) to enter the date into memory. Otherwise press (+) to return and edit the date.

6. CHANGING INSTRUMENT SETTINGS

Instrument settings, including alarm values, calibration gas concentrations, alarm latch, display setting and security code may only be accessed and changed during the instrument startup sequence.

A keypad overlay is supplied to reveal the location of the hidden keys used for changing instrument settings. Remove the overlay from the protective backing and place it over the instrument faceplate. The clear portion of the overlay will cling to the display window of the faceplate and may be reused.

To access the instrument settings menus:

- Turn the MDU420 OFF and back ON again.
- When the display indicates WARMING UP, press the (+) and (-) keys simultaneously.

If the instrument security code has been set to a value other than '00', the CODE screen will be displayed along with the scrolling prompt PRESS (+) TO STEP (E) TO SET. Use the (+) and (-) keys to input the correct security code value and press (E). When the correct code has been entered successfully, the instrument will immediately enter the settings mode. If the correct code has not been entered within the warm-up time, the instrument will enter the normal operating mode.

The setting mode consists of three main functions in the following order:

ALARMS
CODE
DEFAULT

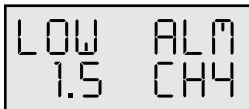
The scrolling prompt, PRESS (+) TO STEP (E) TO SET, appears on each screen. Press (+) to step through the list and (E) to select any of the main functions. Pressing the MODE key at any one of the main function headings will cause the instrument to return to the normal operating mode.

6.1 ALARMS

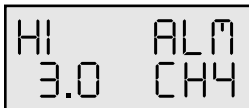


ALARMS
PRESS

- Press (E) to enter the ALARMS function. The display will show the low LEL alarm value and the prompt LOW ALM.
- Press (+) or (-) keys to change the alarm value. The low LEL alarm may be set to a maximum of 60% LEL (3.5% CH₄).
- Press (E) to enter the displayed value and step to the next screen.



LOW ALM
1.5 CH₄



HI ALM
3.0 CH₄

- The high LEL alarm value will be displayed along with the prompt HI ALM. Press (+) and (-) to change the alarm value. The maximum high alarm value is 60% LEL (3.5% CH₄).
- Press (E) to enter the displayed value and step to the next screen.



UEL WRN
60 CH₄

- The UEL warning value will be displayed along with the prompt UEL WRN. Press (+) or (-) to change the value. The adjustable range of the UEL warning is 15% to 100% CH₄.
- Press (E) to enter the displayed value and advance to the CODE function.

6.2 CODE



CODE
PRESS

- Press (+) from the ALARMS screen to step to the CODE screen.
- Press (E) to enter the CODE function. The present code value will be displayed along with the prompt PRESS (+) or (-) TO SET (E) TO ENTER.
- Press (+) or (-) to change the code value. Any code value may be entered from '00' to '999'.

NOTE: *Before entering a new access code, record the new code number in the space at the left. Once the secured menus have been exited, access cannot be regained without entering the correct code.*

- Press (E) to enter the new code. The display will advance to the DEFAULT screen.

6.3 DEFAULT

- Press (+) from the CODE screen to step to the DEFAULT screen.
- Press (E) to enter the DEFAULT function. The instrument will indicate the DISPLAY screen.
- Press (+) to toggle between DISPLAY AS CH₄ and DISPLAY AS LEL to set the instrument display range from 0-5% methane as percent of LEL or percent of volume CH₄.
- Press (E) to enter the display setting and step to the alarms ON/ OFF screen.
- Press (+) to toggle between ALARMS SET ON and ALARMS SET OFF to enable or disable the instrument alarm functions.
- Press (E) to enter the setting and step to the LATCH screen.
- Press (+) to toggle between the LATCHED and UNLATCH settings. In the LATCHED state the instrument alarm indication will continue after the alarm condition has been cleared until the user acknowledges the alarm by pressing (E).
- Press (E) to enter the setting and step to the CAL GAS screen. The instrument will display the current value of calibration gas in percent of volume CH₄.
- Press (+) or (-) to change the calibration gas value.
- Press (E) to enter the calibration gas setting.
- Press MODE to exit the instrument settings menus and resume normal operation.



DEFAULT
PRESS



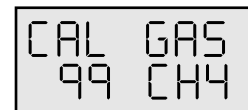
DISPLAY
AS CH₄



ALARMS
SET OFF



ALARMS
UNLATCH



CAL GAS
99 CH₄


7. MAINTENANCE


7.1 INSTRUMENT CLEANING


Wipe the outside of the instrument with a soft, clean cloth. Never use solvents or cleaning solutions of any type.


7.2 CHANGING THE BATTERY

- Hold the instrument with battery cover facing up.
- Turn the battery cover latches counter-clockwise one quarter of a turn using the maintenance tool supplied or a small flat blade screwdriver to release the cover.
- Gently press down on the bottom of the battery pack to release the top contacts.
- Grasp the battery along the edges and lift out.
- Insert replacement battery, and replace battery cover.
- Turn the latches one quarter turn in the clockwise direction to secure the battery cover.

 **Observe all local laws and regulations with regard to battery disposal.**

 **Replace battery with nicad battery pack (p/n 1810-1872) or lithium battery pack (p/n 1810-9889) only.**


 **Replace lithium battery cells with two Duracell 3.0 volt DL123A, Sanyo 3.0 volt CR123A or Panasonic 3.0 volt CR123A battery cells only. Do not mix battery types from different manufacturers.**


 **Attempting to remove the cells from the sealed nicad battery pack will void the warranty and intrinsic safety certification and may cause an unsafe condition.**




7.3 OPENING THE INSTRUMENT FOR SERVICE

- Remove the battery cover and battery pack.
- Remove the three screws that secure the instrument case halves.
- Grasp the bottom half of the instrument with one hand. Using the other hand, lift the top until it clears the sensor.
- Unplug the keypad flex cable from the circuit board by pulling straight up on the flex cable.


 **Disassemble or service the MDU420 only in non-hazardous locations to avoid risk of explosion.**

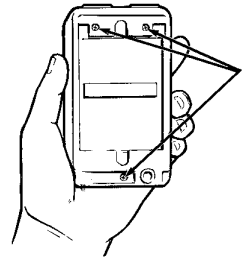
 **Service and repair by agents unauthorized by Industrial Scientific Corporation may void the warranty and intrinsic safety certification and may result in an unsafe condition.**

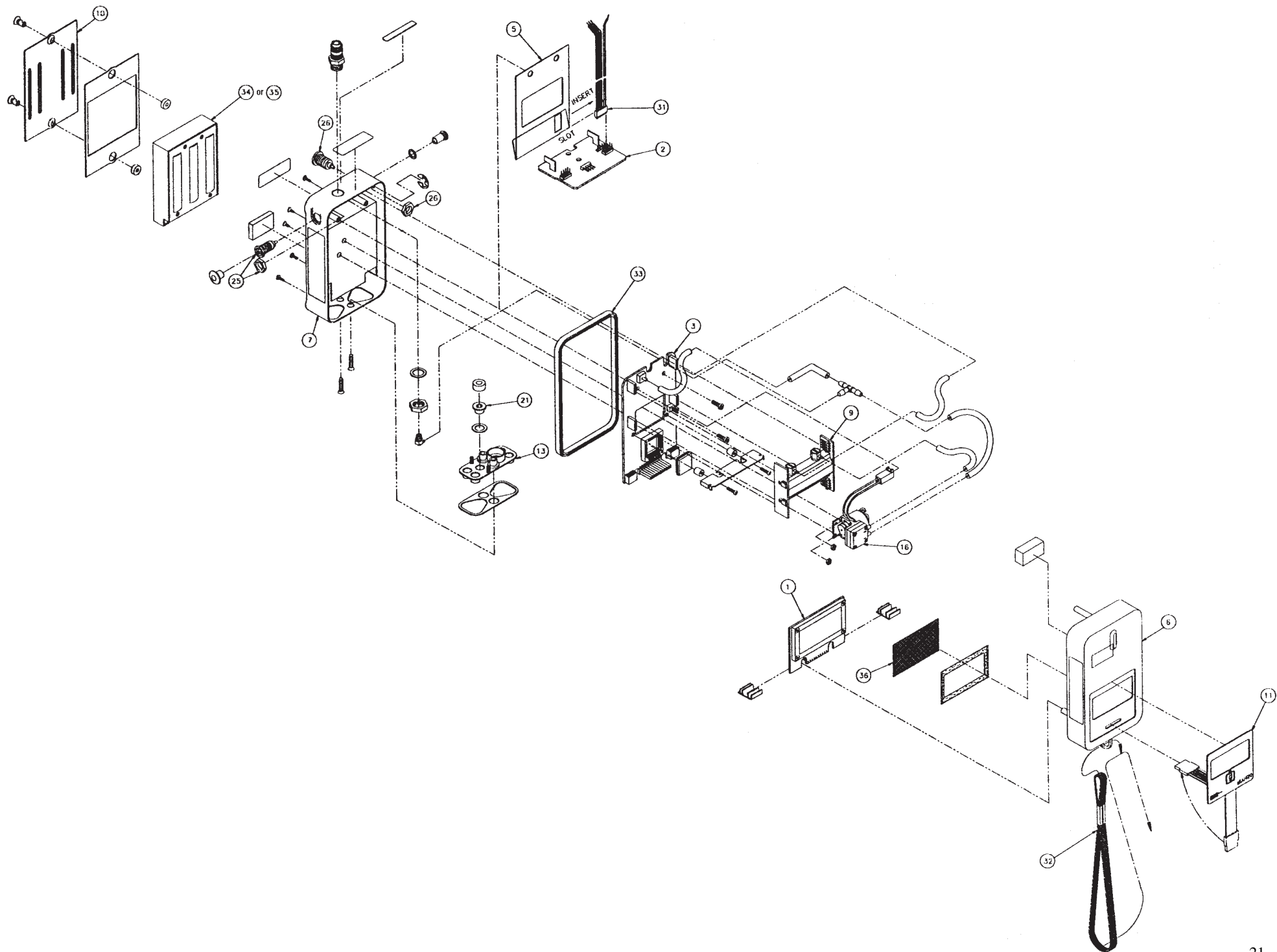
 **Use only approved Industrial Scientific replacement parts when servicing the MDU420.**

7.4 SENSOR REPLACEMENT/SERVICING

Replacement of the sensor must be made by our Service Department authorized service center.

 **DO NOT DISASSEMBLE THE SENSOR. Any servicing that requires opening the sensor may alter the characteristics and accuracy of the sensor.**





8. REPLACEMENT PARTS

ITEM	PART NUMBER	DESCRIPTION (QTY)
1	1704-2680	Display P.C. Board Assembly (1)
2	1705-0660	Alarm P.C. Board Assembly (1)
3	1705-1242	Main P.C. Board Assembly (1)
5	1705-2444	Main Board Insulator (1)
9*	1705-0550	%CH ₄ Sensor Assembly (1)
10	1703-7169	Battery Case Cover (1)
11	1705-1604	Keypad/Faceplate (1)
13	1703-7045	Alarm Bezel (1)
16	1705-1703	Pump Assembly with Leads (1)
21	1704-8927	Mode Button (1)
25	1703-8134	RS-232 Receptacle, 3 Contact (1)
26	1704-2151	Charging Jack (1)
31	1704-1823	5 Conductor Cable (1)
32	1704-9876	Instrument Strap (1)
33	1703-1782	RFI Case Gasket (1)
34 or	1704-1872	Nicad Battery Pack (1)
35	1704-9889	Lithium Battery Pack (1)
36	1705-0295	RFI Screen (1)

* Factory Replaceable Part.

9. SPECIFICATIONS

MEASURING RANGE:

0-100% by volume methane

RESOLUTION: 1% LEL, 0-100% LEL mode
0.1% CH₄, 0-5% CH₄
1.0% CH₄, 6-100% CH₄

ACCURACY (@ TEMP OF CALIBRATION):
± 5% of applied gas or 2 counts (whichever is greater)

ACCURACY (OVER TEMPERATURE RANGE):
± 15% of applied gas or 4 counts (whichever is greater)

ALARM SET POINTS: Low LEL 1.5% CH₄
High LEL 3.0% CH₄
UEL WRN 60% CH₄

CASE MATERIAL: Stainless steel (type 304) case

DIMENSIONS: 4.75"L x 2.75"W x 2"H
(121 X 70 X 51 mm)

WEIGHT: ≤ 30 ounces (≤ 850 g)

SENSOR TYPE: Infrared absorption methane sensor

DISPLAY: Alpha-numeric liquid crystal

POWER SOURCE: Rechargeable nickel-cadmium battery pack or replaceable lithium pack

INSTRUMENT OPERATING TIME (CONTINUOUS RUN TIME AT ROOM TEMPERATURE, NON-ALARMING OPERATION):

7 hours minimum with rechargeable nickel-cadmium pack

14 hours minimum with replaceable lithium pack

OPERATING TEMP. RANGE:

-15°C to 45°C (5°F to 113°F)

OPERATING HUMIDITY RANGE:

15% to 90% RH (non-condensing)

Specifications subject to change without notice.



All performance claims are based on the MDU420 having adequate battery charge and air flow.

10. OPTIONS & ORDERING INFORMATION

PART NUMBER	DESCRIPTION
1810-2247	MDU420 Chassis (w/o battery pack or probe)
1704-1872	Rechargeable Nickel Cadmium Battery Pack
1704-9889	Replaceable Lithium Battery Pack
1810-2307	18 inch Polycarbonate Probe
1810-2311	Bar Hole Probe
1810-2305	Flue Gas Probe
1810-2418	100 ft Tubing w/Inline Filter
1810-2384	MDU420 Data Logging Module
1810-2308	Leather Carrying case for MDU420
1810-2145	12 VDC Compact Economy Charger
1810-1816	115 VAC Compact Economy Charger
1810-2255	115VAC Four Unit Dual Rate Charger
1810-2517	230VAC Four Unit Dual Rate Charger
1810-2558	115VAC Two Unit Dual Rate Charger
1810-2566	230VAC Two Unit Dual Rate Charger
1810-2491	Calibration Kit, 99% Methane w/Flow Regulator
1810-1378	Cylinder, Cal. Gas, 2.5% Methane (103 liters)
1810-2312	Cylinder, Cal. Gas, 99% Methane (34 liters)
1810-1584	Cylinder, Cal. Gas, Free Air (103 liters)
1810-1766	Flow Regulator with Pressure Gauge (for 103 liter cylinders)
1810-0933	Flow Regulator w/Pressure Gauge (for 34 liter cylinders)
1810-2509	Demand Flow Regulator (for 103 liter cylinders)
1705-1840	Replacement Probe Filter (muffler w/ water stop)
1705-8694	Replacement Probe Filter (Gortex membrane)

11. WARRANTY

Industrial Scientific portable gas monitoring instruments are warranted to be free from defects in material and workmanship for as long as the instrument is in service.

The above warranty does not include sensors, battery packs, internal pumps or filters, all of which are warranted to be free from defects in material and workmanship for eighteen months from the date of shipment, or one year from the date of first use, whichever occurs first, except where otherwise stated in writing in Industrial Scientific literature accompanying the product.

All other Industrial Scientific products are warranted to be free from defects in material and workmanship for a period of eighteen (18) months from the date of shipment, or one (1) year from the date of first use, whichever occurs first, except where otherwise stated in writing in Industrial Scientific literature accompanying the product.

LIMITATION OF LIABILITY

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