



Biosystems Instrument Repair

Honeywell



ToxiPro/ToxiLTD



Honeywell

- CO or H₂S
- Life Cycle
 - Up to 6 months of shelf life
 - 2 Years of Continuous Operation
 - 7 Extra Days - Shut Down Mode
- Display
 - Large and Easy to read Display
 - Real-time Readings optional
 - Time of Day
 - Maximum Reading
- Housing
 - Alarms and memory
 - Event Logger: Last 20 Alarms including:
 - Maximum Level/Average Level/Duration/Start & End
 - 2 alarms: Warning/ Danger (102 dB)



Display

- Large and Easy To Read Display
- Real-time Readings
- Time of Day
- Maximum Reading
- STEL and TWA Calculations

Replaceable Battery and Sensor, Housing

- 9000 Hours of Continuous Operation
- Single Replaceable Lithium Battery
- Very Rugged IP67 dust and water rating

Alarms and Memory

- 4 Alarms: Warning/ Danger/ TWA/ STEL (102 dB)
- Datalogger, Event Logger



Event Logger Standard

- Automatic Recording of Last 100 Alarms
- Records
 - Maximum and Average Levels, Duration, Start and End Time and Sensor Type
- Downloads to PC via IrDA

ToxiPro Event List - (Serial #: 110069759 Sensor Type: CO)

	Event Start	Event End	Duration	CO Peak (ppm)	CO Avg (ppm)
1	06/06/2010 19:08:19	06/06/2010 19:09:43	1 min 24 sec	999	897
2	06/06/2010 17:56:41	06/06/2010 17:57:35	54 sec	29	26
3	06/06/2010 17:52:35	06/06/2010 17:53:07	32 sec	39	30
4	06/06/2010 17:17:29	06/06/2010 17:19:12	1 min 43 sec	46	38
5	06/06/2010 17:01:19	06/06/2010 17:01:49	30 sec	40	31
6	06/06/2010 13:43:45	06/06/2010 13:44:46	1 min 01 sec	35	30
7	06/06/2010 13:40:03	06/06/2010 13:40:40	37 sec	26	24
8	06/05/2010 21:22:33	06/05/2010 21:23:32	59 sec	39	34
9	06/05/2010 16:50:19	06/05/2010 16:50:42	23 sec	28	25
10	06/05/2010 15:13:28	06/05/2010 15:13:51	23 sec	33	27
11	06/04/2010 14:30:02	06/04/2010 14:30:20	18 sec	33	29
12	06/04/2010 14:30:17	06/04/2010 14:30:50	33 sec	56	39
13	06/01/2010 17:51:05	06/01/2010 17:52:17	1 min 12 sec	36	33
14	06/01/2010 17:50:13	06/01/2010 17:50:30	17 sec	28	24
15	06/01/2010 17:47:27	06/01/2010 17:48:54	1 min 27 sec	34	31
16	06/01/2010 17:15:06	06/01/2010 17:15:17	11 sec	42	35
17	06/01/2010 15:52:48	06/01/2010 15:53:09	21 sec	40	31
18	06/01/2010 15:48:31	06/01/2010 15:48:53	22 sec	30	27
19	06/01/2010 15:47:50	06/01/2010 15:48:14	24 sec	24	24

Export Print OK

Datalogger

- Near 135 Hours at 1 minute increments
- Records
 - Date, Time, Low and Temperature peak, Maximum/ Minimum Level, Average Level
- Downloading to PC via IrDA or via IQ Express Dock

ToxiPro Rapport de Session - ToxiPro-#89842_2010-02-04_17:17:17

File

Session Summary Information

Session 4 of 7

Serial #: 89842

Peak Temp: 77.0 °F 25.0 °C

Low Temp: 73.0 °F 22.8 °C

PW Version: 7.90

Session Time

Instrument On: 16/12/2009 09:28:14

Completed: 16/12/2009 09:44:51

Interval: 1 min 00 sec

Available Data: 25 min 00 sec

Available Points: 25

Sensor Information

Sensor	Serial #	Peak	Low	STEL	TWA	Average	Last Zero	Last Span
CO		22 ppm	-1 ppm	N/A	N/A	6 ppm	02/04/2010	02/04/2010

Comments: Downloaded By TP IQ Express Dock 05/08

Events... Alarms... Table... Next >>

Print... Graphs... << Previous

18:53

	Runtime	Time	CO Peak	CO Min	CO Avg
233	03:53:00	01/06/10 05:39:49	4	0	3
234	03:54:00	01/06/10 05:40:49	1	0	3
235	03:55:00	01/06/10 05:41:49	1	0	3
236	03:56:00	01/06/10 05:42:49	8	0	3
237	03:57:00	01/06/10 05:43:49	4	0	3
238	03:58:00	01/06/10 05:44:49	3	0	3
239	03:59:00	01/06/10 05:45:49	31W	3W	3
240	04:00:00	01/06/10 05:46:49	34W	30W	4
241	04:01:00	01/06/10 05:47:49	33W	13W	4
242	04:02:00	01/06/10 05:48:49	28W	17W	4
243	04:03:00	01/06/10 05:49:49	36W	16W	4
244	04:04:00	01/06/10 05:50:49	35W	6W	4
245	04:05:00	01/06/10 05:51:49	7	5	4
246	04:06:00	01/06/10 05:52:49	4	3	4
247	04:07:00	01/06/10 05:53:49	4	0	4
248	04:08:00	01/06/10 05:54:49	2	1	4
249	04:09:00	01/06/10 05:55:49	2	1	4

Available Sensors

- Oxygen (O_2)
- Carbon Monoxide (CO)
- Carbon Monoxide with H_2 filter (CO-H)
- Hydrogen Sulfide (H_2S)
- Sulfur Dioxide (SO_2)
- Chlorine (Cl_2)
- Nitrogen Dioxide (NO_2)
- Hydrogen Cyanide (HCN)
- Phosphine (PH_3)
- Ammonia (NH_3)



ToxiPro Operating Modes

Starting Sequence

- Displays
 - All segments
 - Software version
 - Serial Number
 - dL dataLogger
 - Different alarm level :
 - Warning, Danger, (STEL, TWA)
 - Cal due reminder (if enabled)
 - Numeric readings and Gas
 - ... or ... NEED CAL



ToxiPro™ Operating Modes

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Push once for

- Backlight,
 - Max, (Peaks during session)
 - Clock
 - Cal due reminder (if enabled)
 - STEL, (only after a quarter of hour)
 - TWA, (only after a quarter of hour)
 - Return to normal display
- Push and hold to switch unit off



Toxi Pro / Ltd will not perform “Auto Calibration”

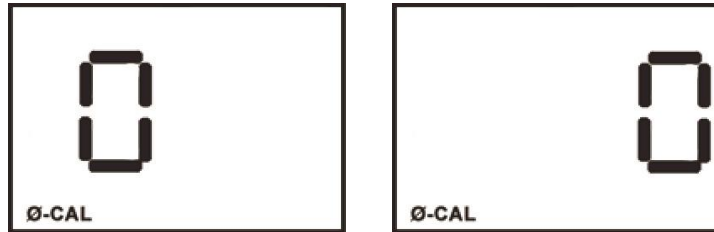
- **Unit will not allow “Auto Calibration” to occur if instrument suspects atmosphere may be contaminated**
 - “Fresh Air” Calibration should only be performed in a known clean environment

ToxiPro Calibration

Honeywell

Fresh Air/Zero Calibration

- Fresh air/zero calibration
 - From operating screen
 - Press MODE three times within two seconds
 - Briefly displays “CAL” and begins 5-second countdown with 0-CAL icon lit
 - Press MODE before end of 5-second countdown to begin
 - Calibration successfully initiated when display alternates between following two screens:



- Fresh air/zero calibration complete when a second 5-second countdown for span calibration begins
 - If span cal is not required, allow countdown to reach 0 without pressing MODE
- Maximum reading value (MAX) automatically reset following a successful fresh air/zero calibration
- Fresh air/zero calibrations only be performed in atmosphere known to contain 0 PPM toxic gas
 - Performing fresh air/zero calibrations in atmosphere not comprised of 0 PPM toxic gas may lead to inaccurate and potentially dangerous readings
- **Unit will not allow “Zero Calibration” to if instrument suspects atmosphere may be contaminated**

Functional (bump) testing for toxic gas sensor equipped units

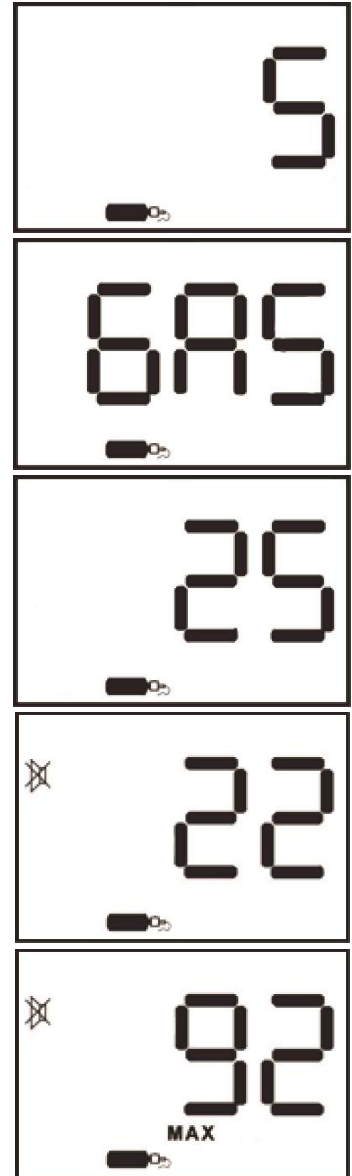
- Accuracy with a toxic gas sensor may be verified at any time by functional (bump) test
- To perform functional (bump) test
 1. Turn unit on wait at least three minutes to allow readings to stabilize
 2. Make sure instrument is located in fresh air
 3. Perform fresh air/zero calibration and allow instrument to return to normal operation.
 4. Apply the calibration gas as shown
 5. Wait for readings to stabilize
 - Forty-five seconds to one minute is usually sufficient
 6. Note readings
 - Readings considered accurate Between 90%* and 120% of expected value
 - » If readings considered accurate instrument may be used without further adjustment
 - » If readings considered inaccurate, instrument must be span calibrated before further use



ToxiPro Calibration

Span Calibration for ToxiPro with Toxic Gas Sensor

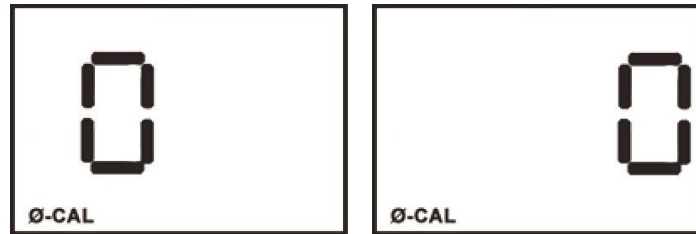
- Prior to span calibration, perform fresh air/zero calibration
- After successful fresh air/zero calibration
 - Instrument begins five-second countdown with calibration gas bottle icon highlighted
- 1. Press MODE before countdown complete to initiate span calibration
 - Display alternates between “GAS” and cal gas concentration
- 2. Apply calibration gas as shown
 - Once calibration gas is detected, display changes to show gas reading
 - Note negated horn symbol shown indicating alarms are not operating in calibration mode
- 3. Calibration fully automatic from this point
 - When instrument successfully completes span calibration
 - » Emits three short beeps
 - » Display maximum span calibration adjustment value for two seconds
 - Maximum span calibration adjustment value shown indicates relative health of sensor
 - As sensor loses sensitivity, maximum adjustment level approaches calibration gas concentration, illustrating sensor is losing sensitivity
- 4. Instrument returns to normal operation



Forced Fresh Air/Zero Calibration

- If fresh air/zero calibration fails in atmosphere known to be fresh unit can be forced to fresh air calibrate

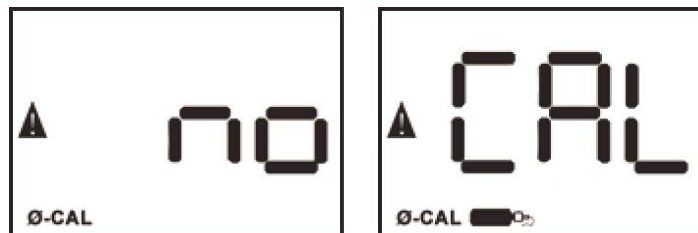
1. Begin fresh air/zero calibration sequence
2. As soon as alternating right and left 0's are shown
 - Press and hold MODE



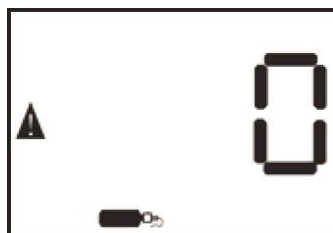
3. Forced fresh air/zero calibration is complete when
 - Instrument emits three short beeps
 - Units equipped with oxygen sensor return to gas detection mode
 - Units equipped with toxic gas sensor move to span calibration procedure
- Performing forced fresh air/zero calibration in contaminated atmosphere may lead to inaccurate and potentially dangerous readings

Sensor Out of Range (no CAL)

- If sensor response is not within range to calibrate
 - Span calibration will fail and “no” and “CAL” screens alternately displayed



- Instrument returns to current gas readings
 - Warning symbol and calibration bottle icon displayed – signifies instrument failed last span attempt



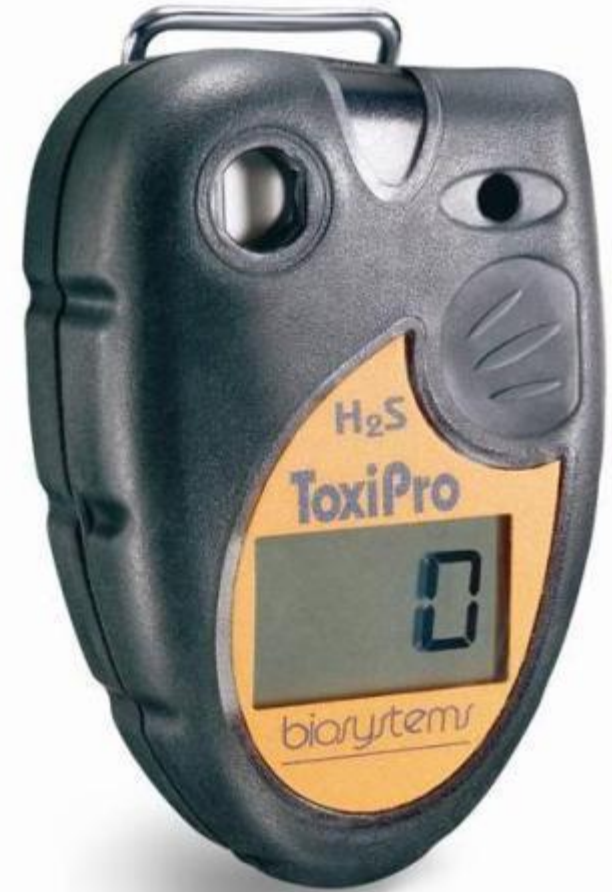
- Note: If Calibration Due Lockout is enabled, unit powers off following a failed calibration attempt

ToxiPro Diagnostics

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To enter Diagnostics mode

- With unit off, push and hold down mode until bars appear on display $\equiv \equiv \equiv$
- Tap MODE once
- Display is across 2 screens $(123 / 456) = 123456$



ToxiPro NG Diagnostics

Honeywell

To enter Diagnostics mode

- With unit off, push and hold down mode until “DIAG” appears on display
- Tap “MODE” once
- Firmware version and gas reading displayed
- Display is across 2 screens (123 / 456) = 123456



ToxiPro Diagnostics

Honeywell

								
MODE	Toxic	800	➡	1100		-200	➡	200
	O2 Sensor	2400	➡	3700		8400	➡	9700
MODE	Battery Voltage							
	Pro	2500		14500	➡	18000		
	Ltd	2900		16500	➡	18000		
MODE	Temperature (@20°C)	1700		53000	➡	55000		
MODE	All display segments light up							
MODE	Back light							
MODE	Audible alarm							
MODE	Vibe Motor Test							
MODE	QC test (no field application)							
MODE	Unit switch off							

ToxiPro Configuration

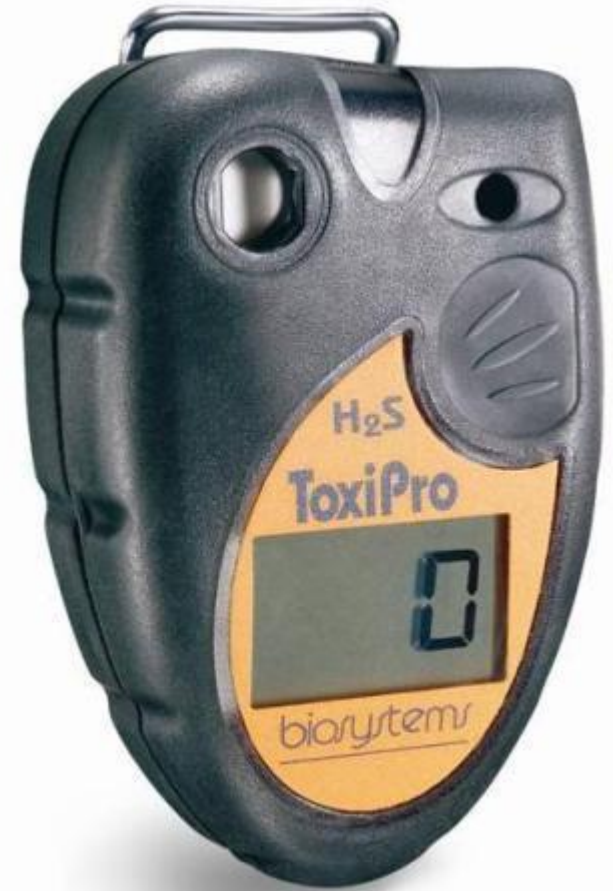
Honeywell

Push and hold “MODE”

- Bars appear ≡≡≡
- Tap Mode 3 times
- Unit displays OPT
- Tap mode button

Configure options

- Toggle STEL, TWA
- Set Date / Time



ToxiPro NG Configuration

Honeywell

Push and hold “MODE”

- When unit displays OPT,
- Release and tap mode button once

Configure options

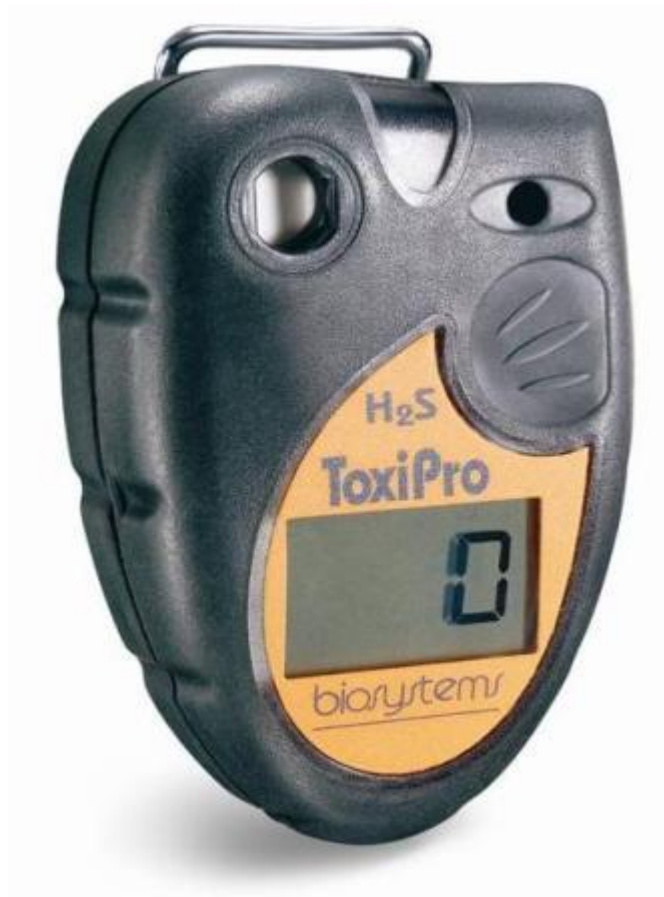
- Peaks - on or off
- STEL - on or off
- TWA - on or off
- Set Date and Time



ToxiPro Configuration

Honeywell

- Complete configuration can be done easily with Biotrak



ToxiPro/Ltd Configuration via Biotrak

ToxiPro NG Configuration Settings (Serial #: 011112936 - Datalogger)

File

Alarms | Datalogger | Features | Auto Calibration | Calibration History

CO- Sensor

Danger
100 ppm

Warning
35 ppm

Alarm Type
Trill

☒ Vibrator Installed ☐ Enable STEL Alarms/Readings ☐ Silence TOX Warning and Vibrating Alarms
☒ Enable Peak Readings ☐ Instrument Cannot Be Turned Off ☐ Silence Warning Alarm except for Visual Alarm
☐ Enable TWA Alarms/Readings ☐ Low Power Mode

Turn Off **Print...** **Upload...** **Cancel**

Configuration from Instrument

ToxiPro/Ltd Config via Database Manager

- Create a special Template and assign it to requested unit

Template Configuration - 'Villers'

Instruments Calibration **Alarm Levels** Features Latching / Custom Alarms Datalogger Screens General

O2	Warning (High) No Change*	Danger (Low) No Change*		
LEL	Warning (Low) No Change*	Danger (High) No Change*	STEL No Change*	TWA No Change*
CH4(IR)	No Change*	No Change*	No Change*	No Change*
CO2(IR)	No Change*	No Change*	No Change*	No Change*
CO	No Change*	No Change*	No Change*	No Change*
CO-	No Change*	No Change*	No Change*	No Change*
CO+	No Change*	No Change*	No Change*	No Change*
H2S	5,0	10,0	10,0	5,0
SO2	No Change*	No Change*	No Change*	No Change*
NH3	20,0	35,0	35,0	20,0
CL2	No Change*	No Change*	No Change*	No Change*
ClO2	No Change*	No Change*	No Change*	No Change*
NO	No Change*	No Change*	No Change*	No Change*
NO2	No Change*	No Change*	No Change*	No Change*
HCN	2,0	10,0	10,0	2,0
PH3	No Change*	No Change*	No Change*	No Change*
H2		No Change*		
HC	No Change*	No Change*		
VOC	No Change*	No Change*	No Change*	No Change*

Warning Alarms No Change*

VOC Selection
No Change**
Factor

* = 'Use Default' option will restore the default alarm level stored in the sensor's eeprom.
** = 'No Change' will leave the current alarm level in the instrument unchanged.

OK Cancel

ToxiPro/Ltd Config via Database Manager

Honeywell

Template Configuration - 'New Template'

Instruments Calibration Alarm Levels **Features** Latching / Custom Alarms Datalogger Screens General

Alarm Type: No Change**

Never Turn Off: No Change**

Vibrating Alarm (if installed): No Change**

Language: No Change**

Operating Mode: No Change**

Security Beep (sec): 90 01 min(s) 30 sec(s)

STEL Calculation Time: No Change** min(s)

TWA Calculation Time: No Change** hour(s)

Peak Reading Display: Enabled

Average Reading Display: Enable/disable display of Peak Readings screen

STEL Display / Alarms: No Change**

TWA Display / Alarms: No Change**

STEL/TWA Alarm Acknowledge: No Change**

Service Reminder: No Change**

Fresh Air Cal on StartUp: No Change**

Enter User/Loc on StartUp: No Change**

Use Large Clamp: No Change**

Low Power Mode (Pro Only): No Change**

Gas Indicator Mode (LTD Only): No Change**

Use Clamping: No Change**

Decimal Point

O2: No Change*

LEL: No Change*

HC: No Change*

CO: No Change*

CO-: No Change*

CO+: No Change*

H2S: Enabled

S02: No Change*

NH3: No Change*

CL2: No Change*

CL02: No Change*

NO: No Change*

N02: No Change*

HCN: No Change*

PH3: No Change*

H2: No Change*

* = 'Use Default' restores defaults values defined by Honeywell Analytics.
** = 'No Change' will leave the current value in the instrument unchanged.

OK Cancel

ToxiPro Initialization

Honeywell

1. Remove Battery (ToxiPro) Remove Jumper (ToxiLTD)
 2. When all display segments light up
 3. Tap Mode button 5 times
 4. Unit displays "Def"
 5. Tap "MODE" 3 times
 6. Unit displays "INI"
 7. Tap "MODE" 1 time
 8. Unit completes start up
- Once initialized unit requires complete calibration



ToxiPro NG Initialization

Honeywell

1. With unit off
 2. Push and hold Mode button until “Def” appears on display
 3. Release mode and tap it 5 times
 4. Unit displays “INI”
 5. Unit initialized and powers off
- Once initialized unit requires complete calibration



ToxiPro/Ltd Error Messages

- F1 – No Sensor Installed
- F2 – Bad Unit data read from flash
 - Unit will re-initialize
- F3 – Bad Sensor data read from flash
 - Sensor data will re-initialize
- F4 – Bad Flash memory erase
 - Unit turns off and will not turn back on again
- F5 – Bad Flash memory write
- F6 – No vibrator installed
 - Vibrator installed and not working
- F7 – ToxiPro only bad software installed
 - (“B” version for O₂, CL₂ and NO₂ “A” version for all other sensor types)

ToxiPro Disassembly

- Remove screws on unit back



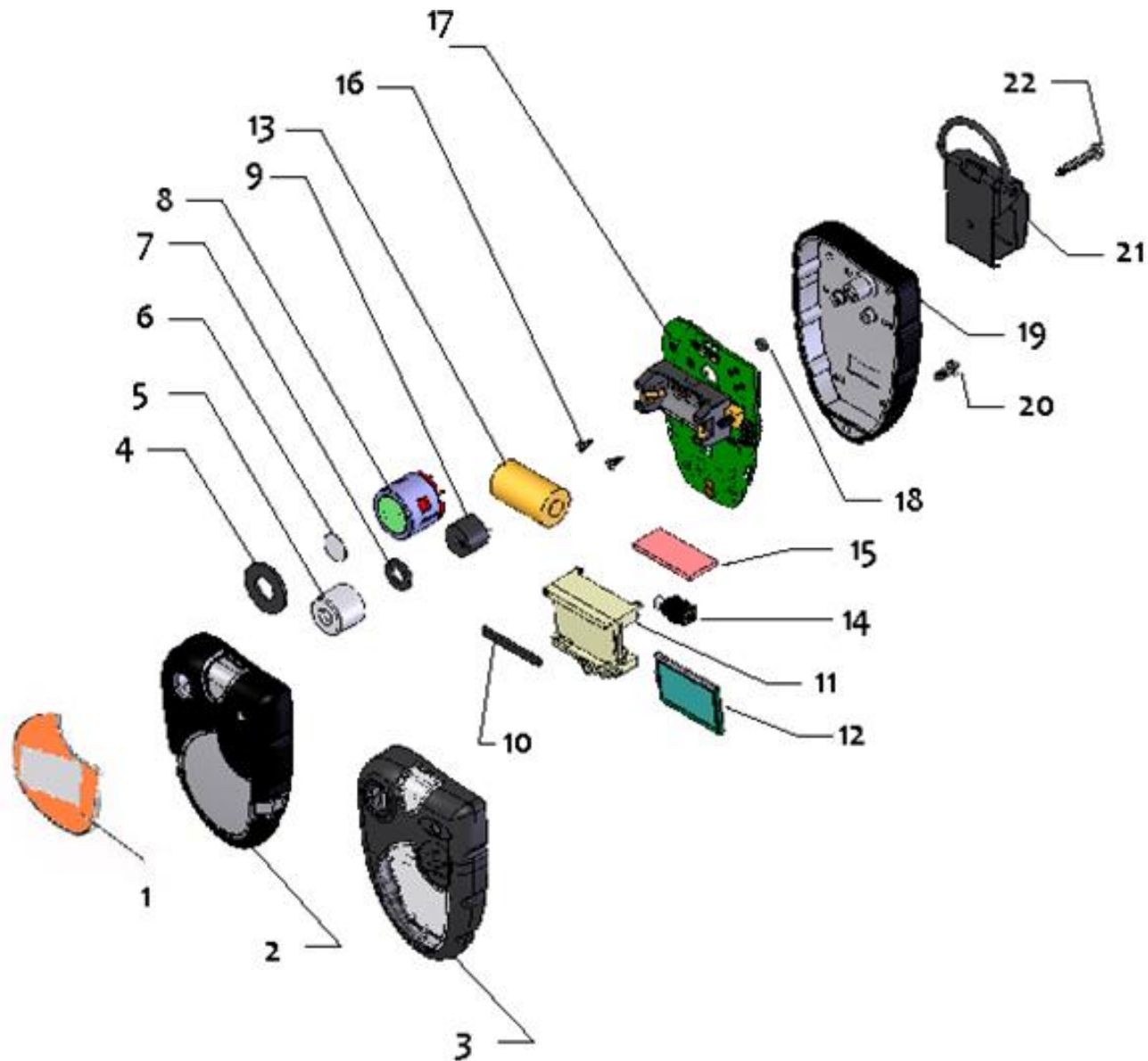
- Open instrument carefully
 - Do not lose O-ring



ToxiPro Disassembly

- Turn unit Off
- Toxi Pro Only
 - Remove battery
 - Remove 2 Philip screws from below battery
 - Lift main board assembly from unit





Item	ToxiPro NG	JDE Part Number
1	Front label ToxiPro CO	31-334-CO
	Front label ToxiPro H2S	31-334-H2S
	Front label ToxiPro O2	31-334-O2
	Front label ToxiLtd CO-	31-336-CO-
	Front label ToxiLtd H2S	31-336-H2S
	Front label ToxiLtd O2	31-336-O2
2	HOUSING TOP, L&R SIDE LENS	10-551
3	HOUSING TOP NO SIDE LENS	10-553
4	GASKET SENSOR	34-065
5	BUSHING ALARM	10-570
6	FILTER HYDROPHOBIC	56-502
7	ALARM GASKET	34-112
8	SENSOR	
9	ALARM	56-514
10	GASKET LCD	34-120
11	LCD SUPPORT	10-546

Item	ToxiPro NG	JDE Part Number
12	LCD	47-036
13	BATTERY 3V	49-034
14	VIBRATOR MOTOR	64-006
15	ZEBRA STRIP	09-416
16	SCREW	05-1281
17	MAIN BOARD	35-0946
18	O-RING	17-036
19	HOUSING BOTTOM	10-549
20	SCREW	05-1342
21	CLIP, CLOTHES	05-1289
22	SCREW	05-1340

ToxiPro Instrument Reassembly

Honeywell

- Replace main board
 - Do not overtighten



ToxiPro Instrument Reassembly

Honeywell

- Position the audible alarm in correct holes
 - Don't forget bushing and gasket



ToxiPro Instrument Reassembly

- Replace Battery
 - + near button



ToxiPro Instrument Reassembly

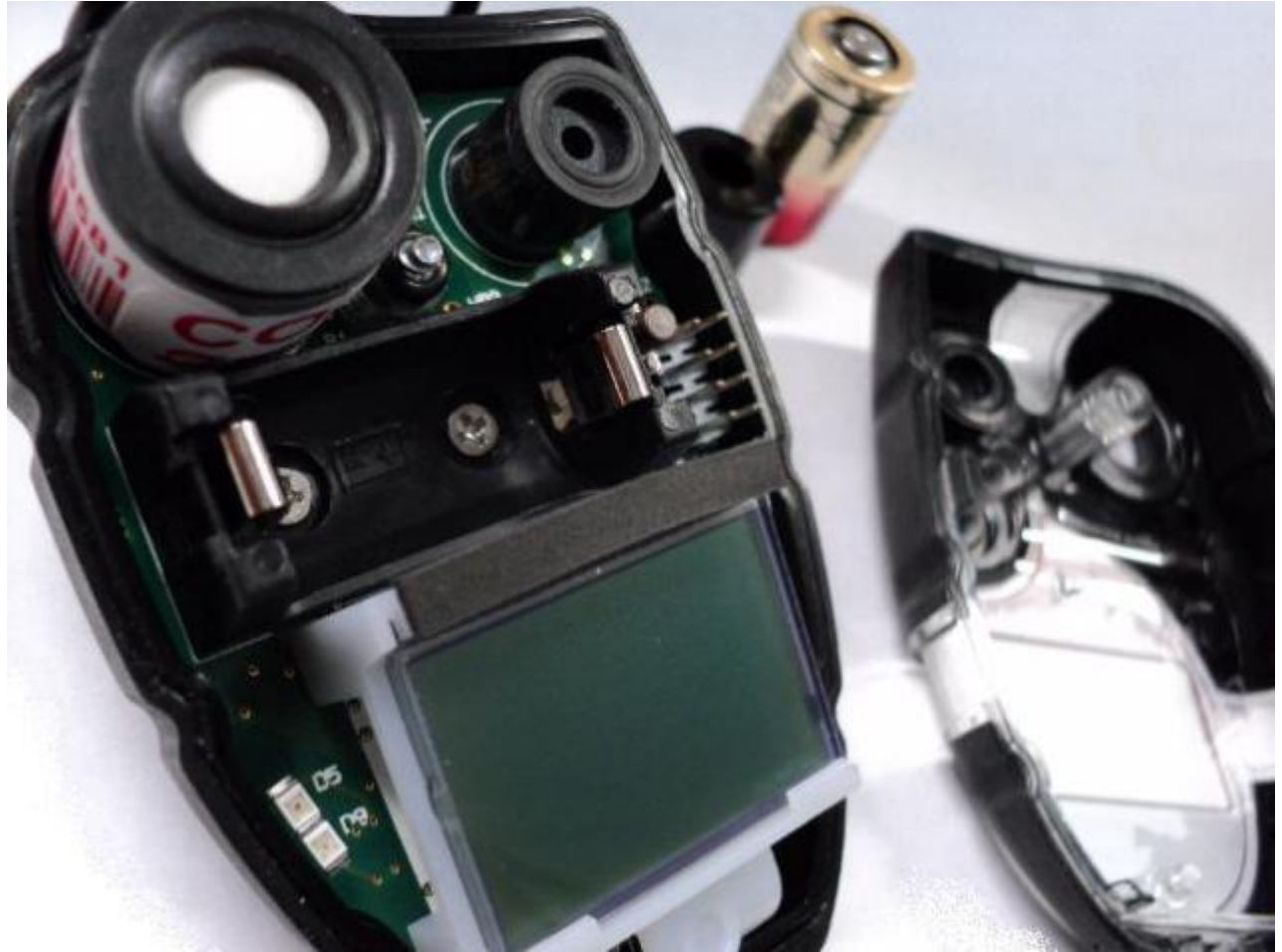
- ToxiPro will start automatically
 - F0 displayed
 - Clock (push button to adjust)
 - Hrs – min
 - Date
 - Month – Day – Year
 - Starting sequence



ToxiPro Instrument Reassembly

Honeywell

- Verify all gaskets are installed



ToxiPro Technical Data Sheet

Housing									
Weight	3.5oz (99 grams)								
Size	3.325 in. (8.44cm) x 2.19 in. (5.56 cm) x 1.16 in. (2.95 cm)								
Case Material	Clear polycarbonate with TPE overmold								
Environmental Ratings									
Dust and Water Resistance Rating	IP66/IP67								
RF Immunity	Conforms to EN 50270								
RF Emissions	Conforms to IEC 61000-6-4								
ESD Immunity	Conforms to IEC 61000-4-2								
Approvals									
	UL Class I, Div 1, Group A,B,C,D T4; UL Class II, Div 1, Group E,F,G CSA Class I, Div 1, Group A,B,C,D T4; CSA Class II, Div 1, Group E,F,G ATEX (DEMKO) II 1 G Ex ia IIC T4 IECEx Ex ia IIC T4 Ga CE Mark CQST (China) Ex ia IIC T4								
Backlight Type	Multi-color LED Backlight								
Gas Types									
Available Sensors	CO, CO-H, H2S, O2, SO2, PH3, NH3, CL2, HCN, NO2								
Alarm Levels (default)									
	CO / CO-H	H2S	O2%	SO2	CL2	NH3	NO2	PH3	HCN
Warning alarm (ppm)	35	10	23.5	2	0.5	25	1	0.3	4.7
Danger alarm (ppm)	100	20	19.5	5	1	35	5	1	4.7
TWA alarm (ppm)	35	10	n/a	2	1	35	1	1	4.7
STEL alarm (ppm)	35	15	n/a	5	0.5	25	1	0.3	4.7

ToxiPro Technical Data Sheet

Honeywell

Ranges				Resolution			
CO	0-999	CL2	0-20	CO	1 ppm	CL2	0.1 ppm
CO-H	0-999	NH3	0-100	CO-H	1 ppm	NH3	1 ppm
H2S	0-200	NO2	0-20	H2S	1 ppm	NO2	0.1 ppm
SO2	0-100	HCN	0-100	SO2	0.1 ppm	HCN	0.1 ppm
O2	0-30	PH3	0-20	O2	0.1%/Vol	PH3	0.01 ppm

Battery

Battery Life	9000 hrs
Shelf Life	4000 hrs
Type	Lithium Manganese Dioxide
Battery Replaceable	Yes
Reverse Battery Protection	Yes

Datalogging

Number of Sessions	Up to 100
Number of Intervals	Up to 8100
Number of Events	100
Blackbox Datalogger	Up to 8100 intervals at 1 minute. Can be upgraded to a full datalogger at any time. Activation code and BioTrak PC software required.

Instrument

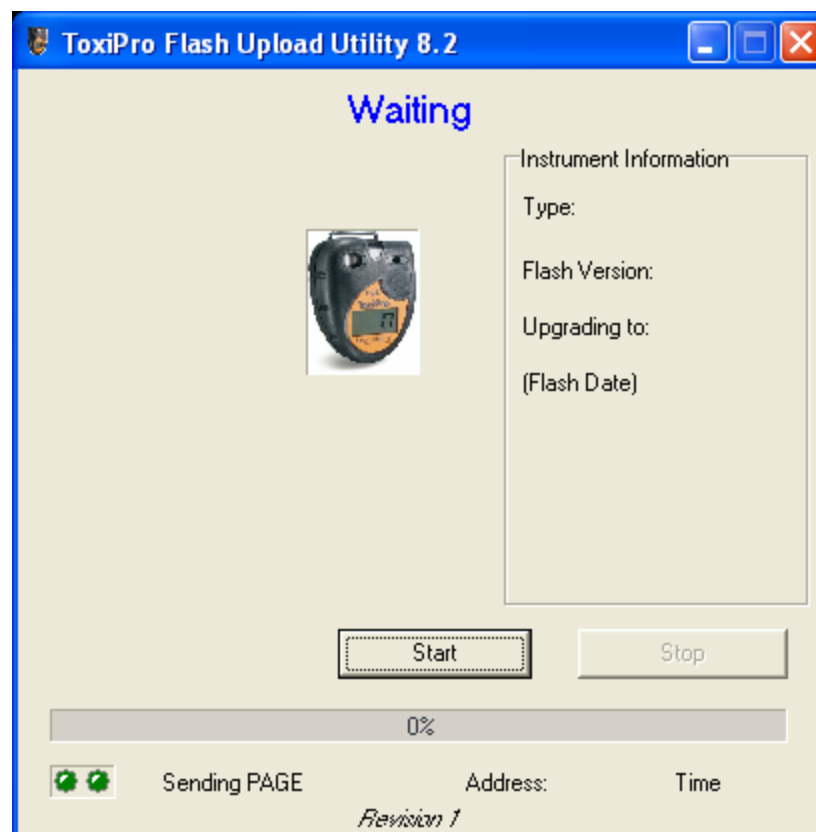
Temperature Range	(Continuous — storage) 0 to 110°F (-18 to 43°C) (Intermittent <30 minutes; H2S) -40 to 140°F (-40 to 60°C) (Intermittent <30 minutes; Others) -20 to 120°F (-29 to 49°C)
Humidity Range	15 - 95% RH, non-condensing (0 - 95% RH ≤ 4 hours)
Alarm Sound Levels	(Two Tone) 100+ dB @ 10cm

ToxiPro/Ltd Firmware Update

- Flash Upload Utility software
 - IR connector
 - IQ Express software
 - IQ Express docking station

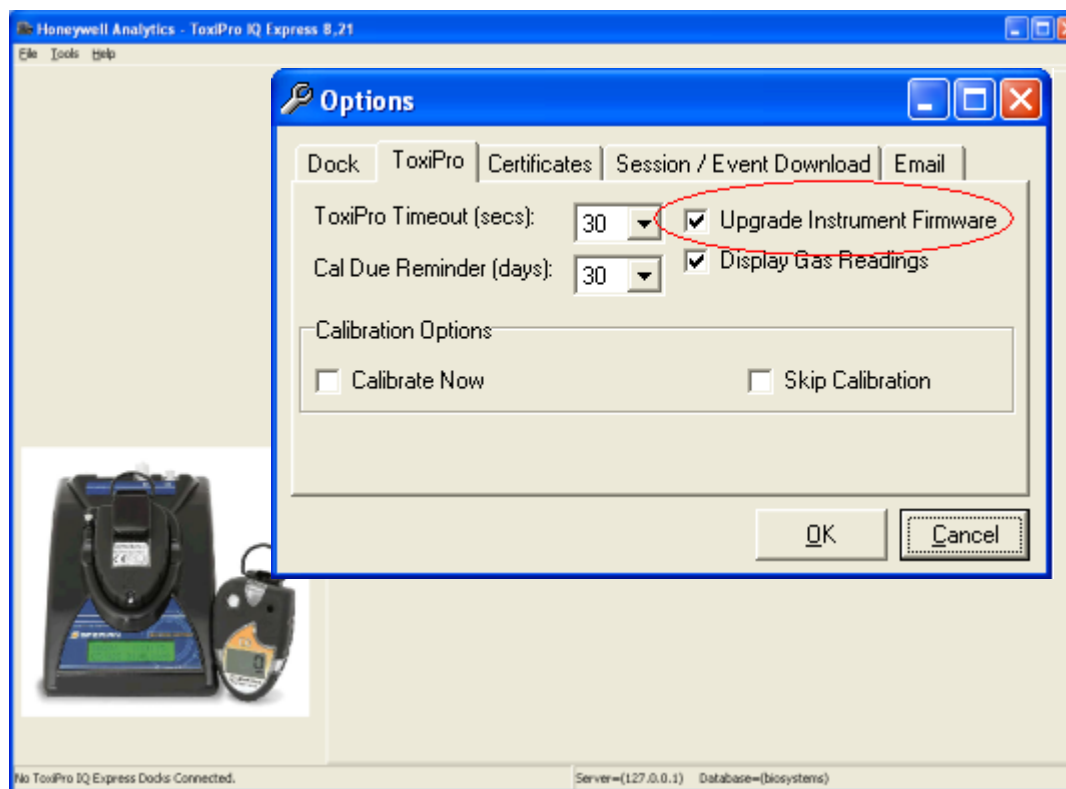
ToxiPro/Ltd Update w/Flash Upload Utility

- Click on “start” and follow instructions
 - IR connector



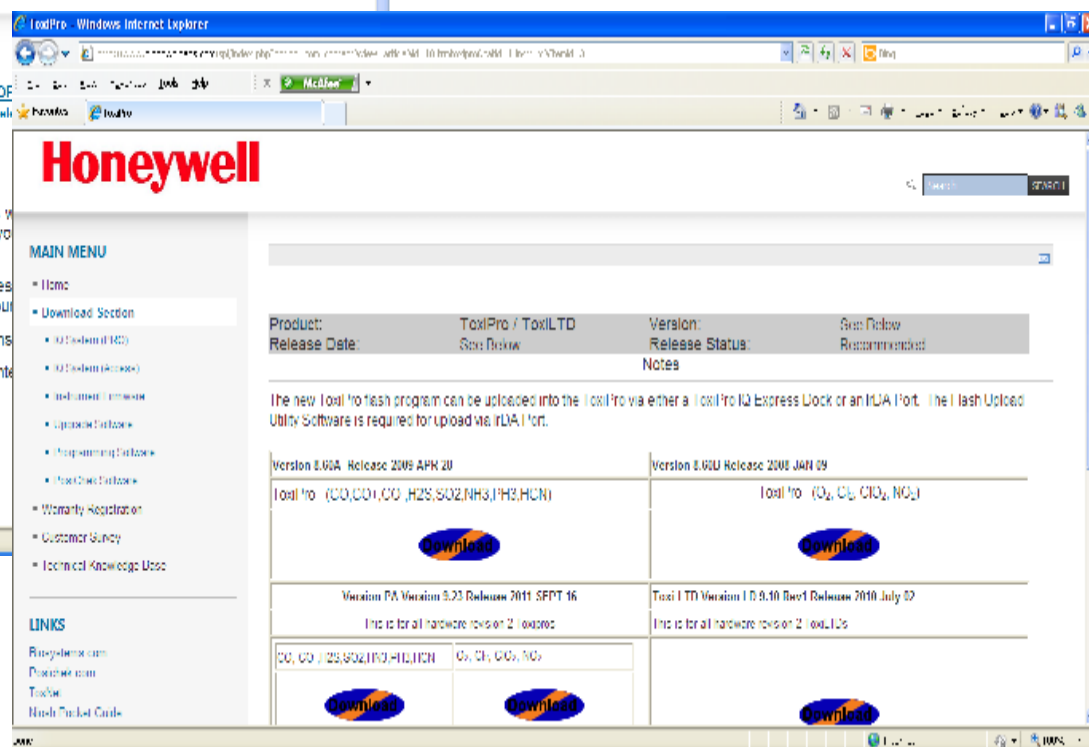
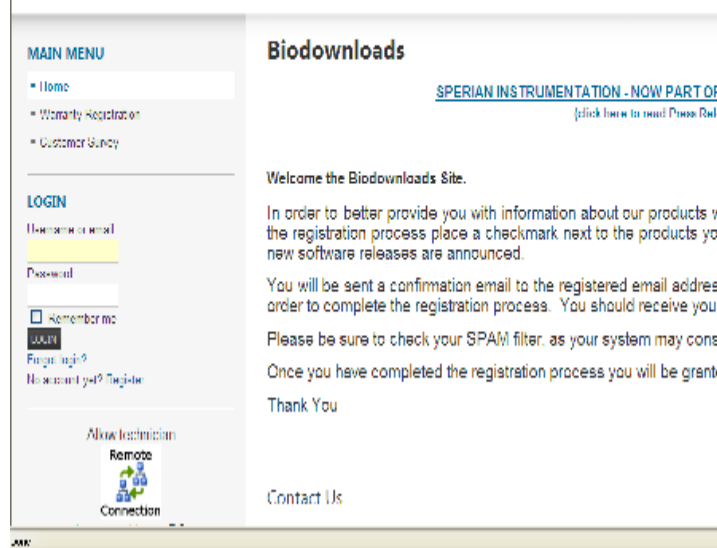
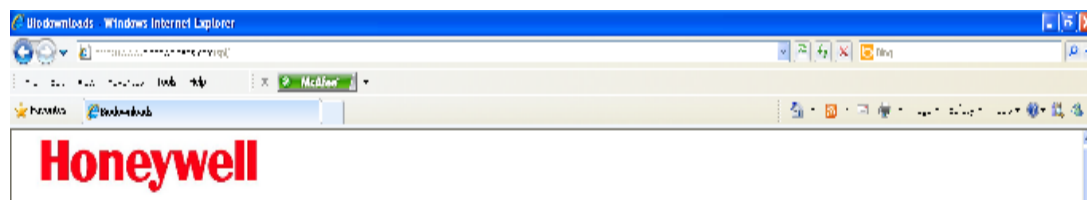
ToxiPro/Ltd Update with IQ Express

- Under “Tools” “Options” select “Upgrade Instrument Firmware”
 - IQ Express docking station



ToxiPro/Ltd Firmware Update

- Register at <http://www.Biodownloads.com>
 - To download latest software/firmware version
 - Automatic notification (if you choose) of latest software releases



Questions?

HA University



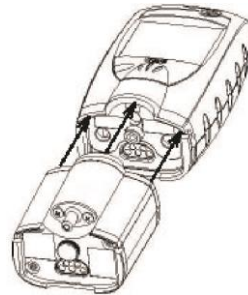
MultiPro



Honeywell

- Features

- Alkaline Batteries
- Li-Ion Batteries
 - Rechargeable
- IP65 Environmental Rating
 - 6 = dust proof
 - 5 = commercial hose down water resistant
- Optional External Pump
- One Button Operation
- Blackbox or Active Datalogging
 - >40 Hours of storage
- Event Logger
 - 20 last events (with alarm on)
 - Includes sensor type, max, average, time and duration



MultiPro Sensors

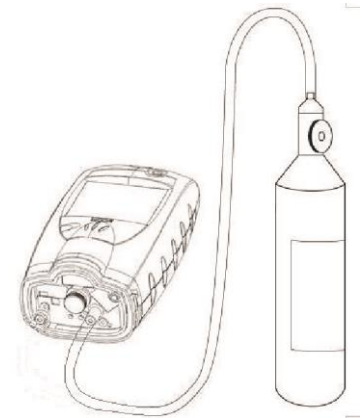
Honeywell

Sensor	Brand	Range	Resolution
	LEL	KNC or City	0-99 %LEL
	H ₂ S	City Technology	0-200 ppm
			1 ppm 0,1 ppm on demand
CO	City Technology	0-999 ppm	1 ppm
	CO/H ₂ S	City Technology	CO 0-999 ppm
		City Technology	H ₂ S 0-200 ppm
	O ₂	Alphasense	0-30.0% vol
			0.1% vol

- MultiPro will not perform “Auto Calibration”
 - **Unit will not allow “Auto Calibration” to occur if instrument suspects atmosphere may be contaminated**
 - “Fresh Air” Calibration should only be performed in a known clean environment

Functional (Bump) Testing

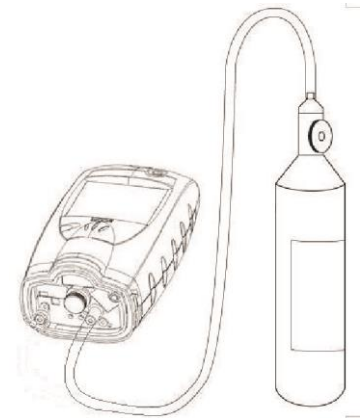
- Unit accuracy may be verified at any time by simple functional (bump) test
- To perform a functional (bump) test
 1. Power unit and wait at least three minutes to allow readings to fully stabilize
 - If any sensors have just been replaced
 - » New sensor(s) must be allowed to stabilize prior to use
 2. Make sure instrument in fresh air
 3. Verify current gas readings match concentrations present in fresh air
 - O₂ sensor should read 20.9%/vol. (+/-0.2%/vol.)
 - LEL sensor should read 0% LEL
 - If readings deviate from expected levels in fresh air, perform fresh air calibration adjustment then proceed to step 4
 4. Attach calibration adapter and connect the calibration cylinder to unit as shown
 - Flow gas
 5. Wait for readings to stabilize
 - Forty-five sec - one minute sufficient



Functional (Bump) Testing (cont'd)

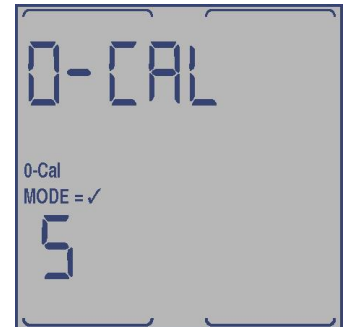
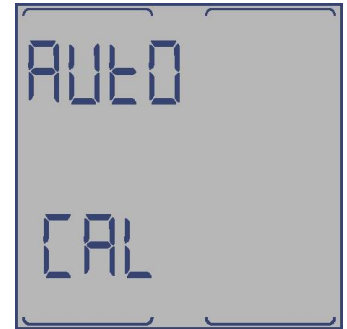
5. Note readings

- Toxic and LEL sensor readings considered accurate in bump test if between 90%* and 120% of the expected reading as shown on cal gas cylinder
- If readings considered accurate
 - Instrument may be used without further adjustment
- If readings do not fall within 90%* and 120% - considered inaccurate
- If readings considered inaccurate
 - Perform gas calibration
- Safety Systems multi-calibration gas mixtures contain approximately 18% oxygen
 - During bump test oxygen sensor should read within +/- 0.5% of cal gas level



Fresh Air/Zero Calibration

- To initiate
 1. Press MODE three times within two seconds to begin
 - Briefly display AUTO CAL and then begin 5-second countdown
 2. Press MODE before end of 5-second countdown to begin fresh air/zero cal
 - Fresh air/zero calibration initiated when “Calibrating” displayed
 3. Unit indicates when fresh air/zero calibration is complete
 - Proceeds to second 5-second countdown for gas calibration
 - If gas calibration not required -
 - » Allow countdown to reach 0 without pressing MODE

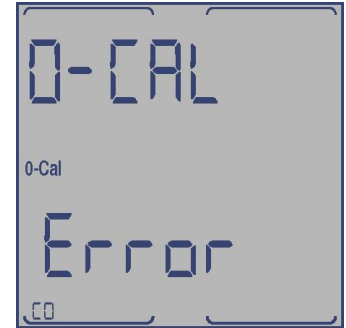


MultiPro Calibration

Honeywell

Fresh Air Calibration Failure

- Alarms are activated and instrument displays
- Sensor(s) that fail zero calibration are shown
- After 3 sec, unit returns to current gas readings screen
 - Visual and audible alarms stop
- When cal due, warning symbol and span bottle icon displayed on status bar
- Fresh air calibration not performed prior to instrument shut down
 - Unit notes Fresh Air Calibration is due during instrument start up



Possible Causes and Solutions

1. Last calibrated in contaminated atmosphere
2. New sensor has just been installed.
3. Instrument dropped or banged since last powered
4. Significant temperature since last use



Recommended Action

- Perform zero adjustment again in known contaminant-free area
 - If fresh air/zero fails to correct problem, perform manual fresh air / zero calibration

Forced Fresh Air Calibration

- Unit designed with safeguards to prevent fresh air calibration in contaminated environments
 - If standard fresh air calibration fails a second time
 - Unit may be “forced” to accept fresh air calibration by performing manual fresh air calibration
- Fresh air calibration in a contaminated atmosphere may lead to inaccurate and potentially dangerous readings
 1. Initiate standard fresh air/zero calibration by pressing MODE three times in rapid succession
 - 5-second countdown will begin
 2. Press MODE before end of countdown
 3. Hold MODE for 3 beeps while zeros flash side to side on display.
 4. Fresh air/zero calibration complete when unit begins another 5-second countdown for span calibration
 - If span calibration not required, allow countdown to reach 0 without pressing MODE
 - If unit fails to calibrate after this procedure, contact service

MultiPro Calibration

Honeywell

Gas Calibration

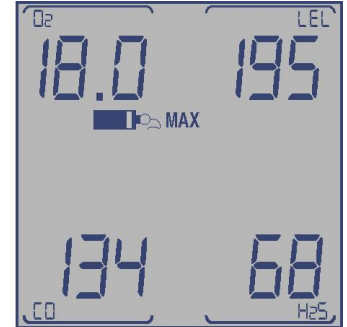
- When zero calibration is successful
 - Unit automatically proceeds to automatic gas calibration countdown screen
 - Press MODE before countdown complete to initiate
 - Screen immediately displays “APPLY GAS”
 - Then lists sensors for calibration and expected levels of calibration gas
- Apply calibration gas
 - Readout changes to numerical display
 - Shows current readings
 - Oxygen sensor is tested for response to diminished oxygen levels during gas calibration
 - Safety Systems multigas calibration cylinders contain approximately 18.0% oxygen
 - To pass gas calibration, unit must register oxygen reading below 19.5% during calibration
 - If unit fails to register reduced oxygen levels during the gas calibration, shows “Check O2 Sensor Response”
 - Press MODE to acknowledge



MultiPro Calibration

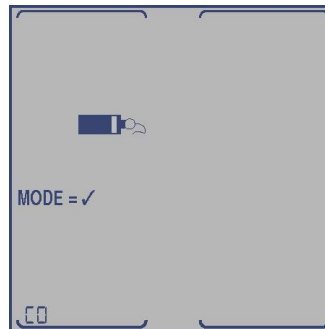
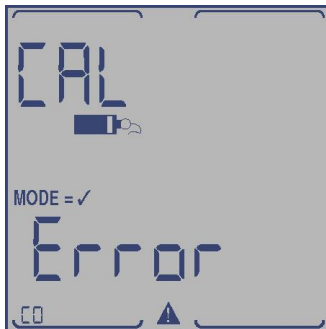
Gas Calibration (cont'd)

- Calibration is fully automatic from this point on
- Upon successful calibration of a sensor
 - Unit beeps
 - Shows adjusted reading for the calibrated sensor
 - Move to next sensor
- When calibration of all sensors is successfully completed
 - MultiPro briefly shows maximum adjustment values
 - Maximum adjustment values for LEL and toxic sensors give indication of remaining sensor sensitivity
 - As sensitivity decreases, maximum possible adjustment decreases to approach expected concentration of calibration gas
- When calibration cycle complete
 - Unit automatically turn itself off
 - Disconnect calibration assembly prior to repowering instrument



Span Calibration Failure: Toxic and LEL Sensors

- Displays “CAL Error” and failed sensor
 - “no GAS” displayed
- If unit fails to recognize correct type or concentration of cal gas
 - “no GAS” displayed
- When span cal is due
 - Warning symbol displayed
 - Intermittent display of calibration bottle in gas readings screen
 - Also display “Needs Cal” message
 - For any sensors due for calibration during instrument start-up



Span Calibration Failure: Oxygen Sensors

- Safety Systems Instrumentation's multi calibration gas cylinders contain approximately 18.0% oxygen
 - Reduced oxygen level allows testing of oxygen sensor's response in same manner as toxic and LEL sensors
 - If O2 sensor fails to register a reading below 19.5% during span calibration,
 - "O2 Too Low" displayed
 - "O2 CAL Error" follows
 - Press MODE to acknowledge warning and turn instrument off
 - Sensor should be retired from service immediately



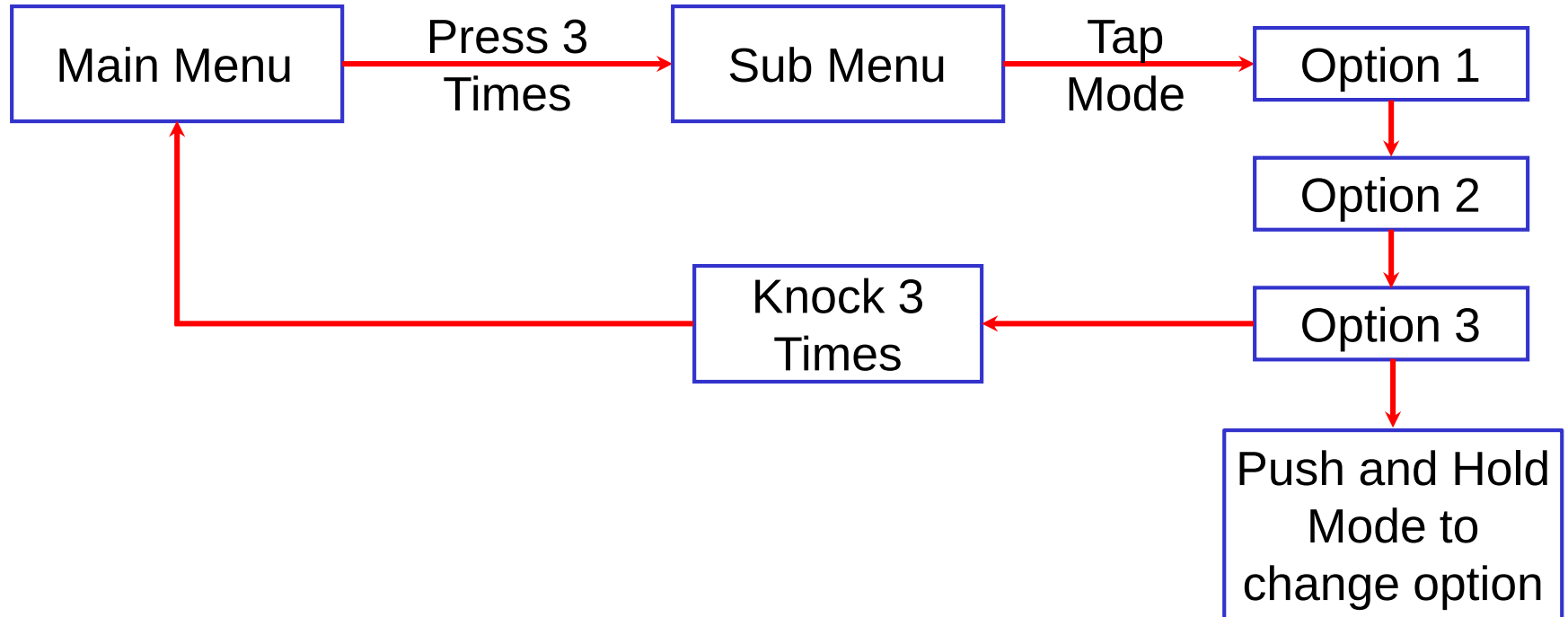
MultiPro Configuration

- Unit configuration may be done via Mode button
 - Only certain settings permitted
 - Only certain values permitted for those options
- Complete configuration is allowed through the PC port
 - Biotrak
 - Database Manager

MultiPro Configuration

- Power unit “OFF”
- Push and hold “Mode” until
 - Unit displays “Release button” - keep holding
 - Unit displays “PC connect” - keep holding
 - Until unit displays “Config” – hold for 10 sec then
 - Press “Mode” 3 times to enter Configuration Mode

MultiPro Configuration



Set Options

- STEL
 - Display STEL ON/OFF
 - Default - Off
- TWA
 - Display TWA ON/OFF
 - Default - Off
- SecBeeP
 - Security Beep ON/OFF
 - Default - Off
 - Default - 1 minute interval
- Latch
 - Alarm Latch ON/OFF
 - Default - Off
- Cal Due Use
 - Prevents use if calibration is due
 - On = Useable if cal due
 - Off = Must be calibrated before use
 - Default - On
- Upload Cal
 - Work with IQ Link
 - Default - Off
- H2S dEC Pt
 - Display H2S decimal point
 - Default - Off

MultiPro Configuration

- Set Time
 - Set instrument time - 24 hour Clock
- Set Date
 - Set instrument date
- Set Alarms
 - Set alarm values
 - Values are limited via menus
- Set Cal Gas
 - Set Cal gas value
 - Values are limited via menus
- Set Cal Due
 - Set cal due interval

MultiPro Configuration

- Once configuration is completed
 - Push and hold “Mode”
 - Unit displays “Release Button”
 - Unit will then display “Store Setup” and count down
- To SAVE changes
 - Tap “Mode” before countdown end
- To ABORT changes
 - Allow timer to run out

MultiPro Diagnostic Mode

- To Enter Diagnostic Mode
 - Power unit off
 - Push and hold “Mode” until
 - Unit displays “Release button” - keep holding
 - Unit displays “PC connect” - keep holding
 - Unit displays “Config” - keep holding
 - Unit will display “DiaG” - approx 15 seconds
- Release “Mode” to enter Diagnostics

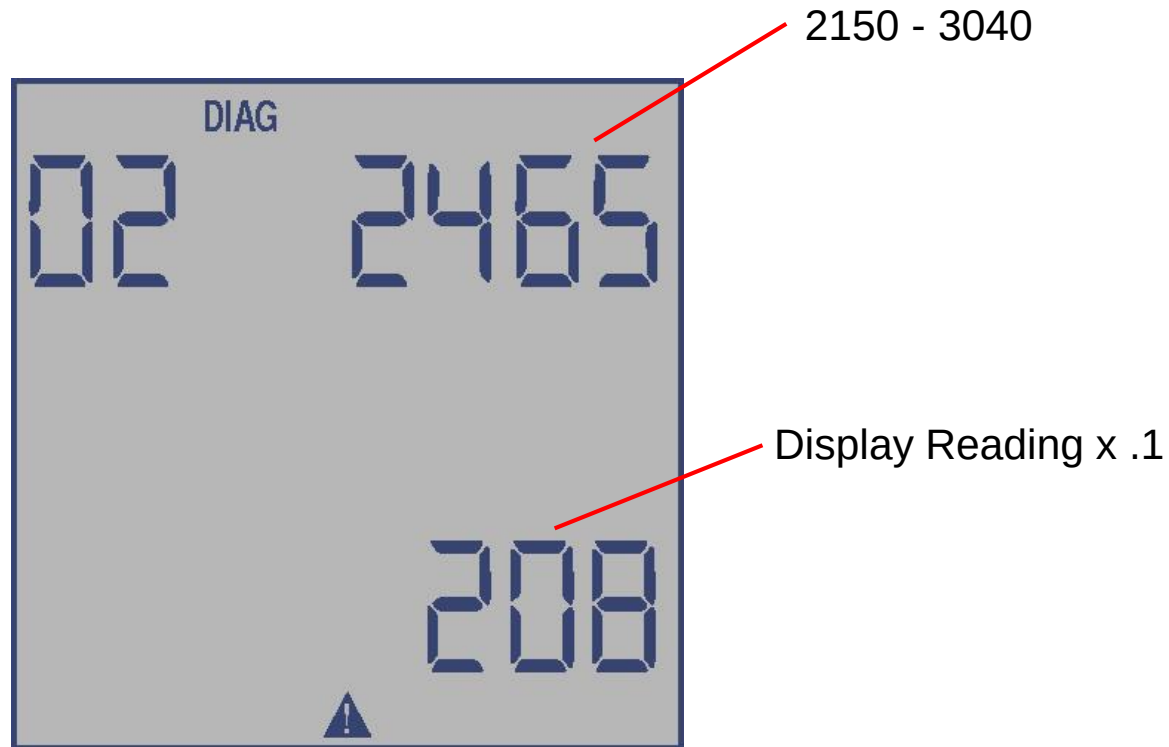
MultiPro Diagnostic Mode

Diagnostic Counts

Test Item	Min	Max
O2	2150	3040
LEL	450	1145
CO	800	840
H2S	800	840
PU (pump ON)	2500	4095
PU (pump OFF)	0	100
Bat (rechargeable)	3150	3350
Bat (alkaline)	3225	3900
Te	2500	2750

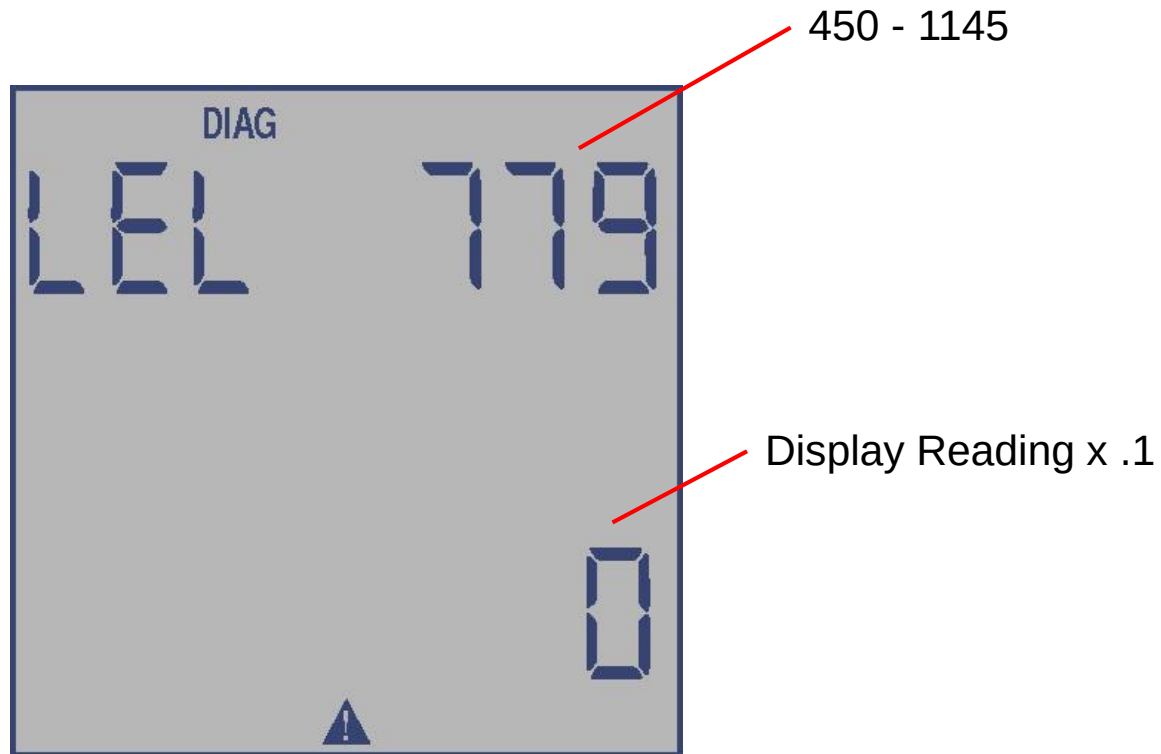
MultiPro Diagnostic Mode

Honeywell



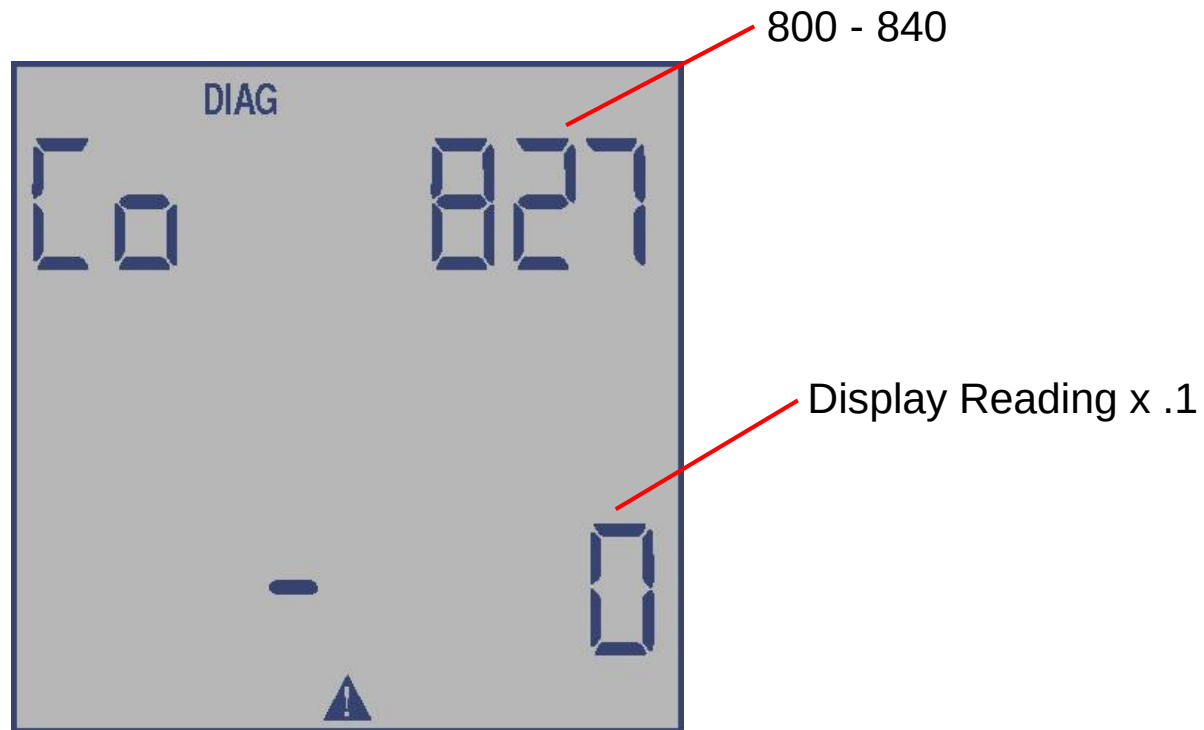
MultiPro Diagnostic Mode

Honeywell



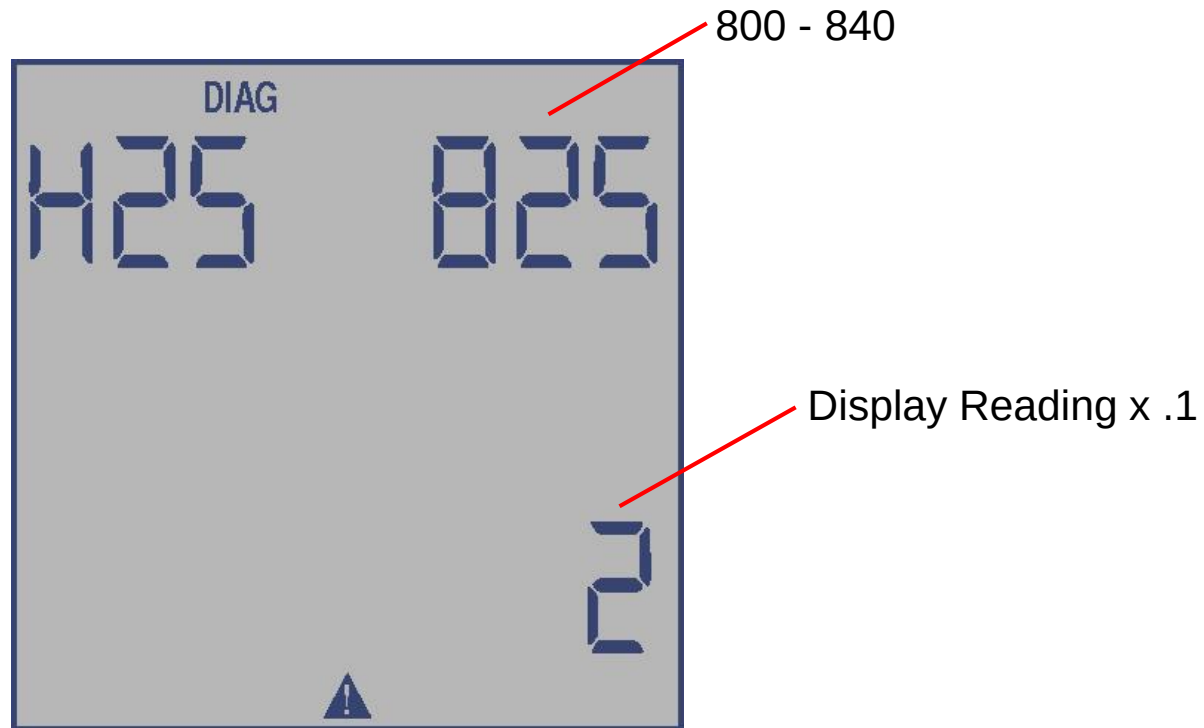
MultiPro Diagnostic Mode

Honeywell



MultiPro Diagnostic Mode

Honeywell



MultiPro Diagnostic Mode

Honeywell

- O2 sensor Diagnostics
 - If counts below range
 - Sensor needs to be replaced
 - If counts above allowable range
 - 1) Check sensor for physical damage
 - 2) Sensor has not had enough time to warm up (20 minutes)



MultiPro Diagnostic Mode

Honeywell

- LEL Sensor Diagnostics
 - If counts far above or below
 - Sensor needs to be replaced – physical damage
 - In some special configurations, Apply Calibration gas counts should increase by a minimum of 50
 - 50% Propane Equivalent
 - Damage
 - Damage to combustible gas sensors by acute or chronic exposure to known sensor poisons such as volatile lead (aviation gasoline additive), hydride gases such as Phosphine, and volatile silicone gases emitted from silicone caulks/sealants, silicone rubber molded products, laboratory glassware greases, spray lubricants, heat transfer fluids, waxes & polishing compounds (neat or spray aerosols), mold release agents for plastics injection molding operations, waterproofing formulations, vinyl & leather preservatives, and hand lotions which may contain ingredients listed as Cyclomethicone, Dimethicone and Polymethicone (at the discretion of Sperian Instrument Service department) void Sperian Instrumentation's Standard Warranty as it applies to the replacement of combustible gas sensors



- Toxic Sensor Diagnostics
 - If Counts far above or below
 - remove sensor from board
 - If counts return to normal
 - Sensor needs to be replaced
 - May have board problem
 - Note
 - Common situation is CO sensor diagnostic counts are 3600, usually sign unit was used to test exhaust gas (car, truck, forklift)
 - CO sensor is designed to handle 1000 ppm
 - Typical car vehicle exhaust is between 2 - 4 % (20 000 – 40 000 ppm).

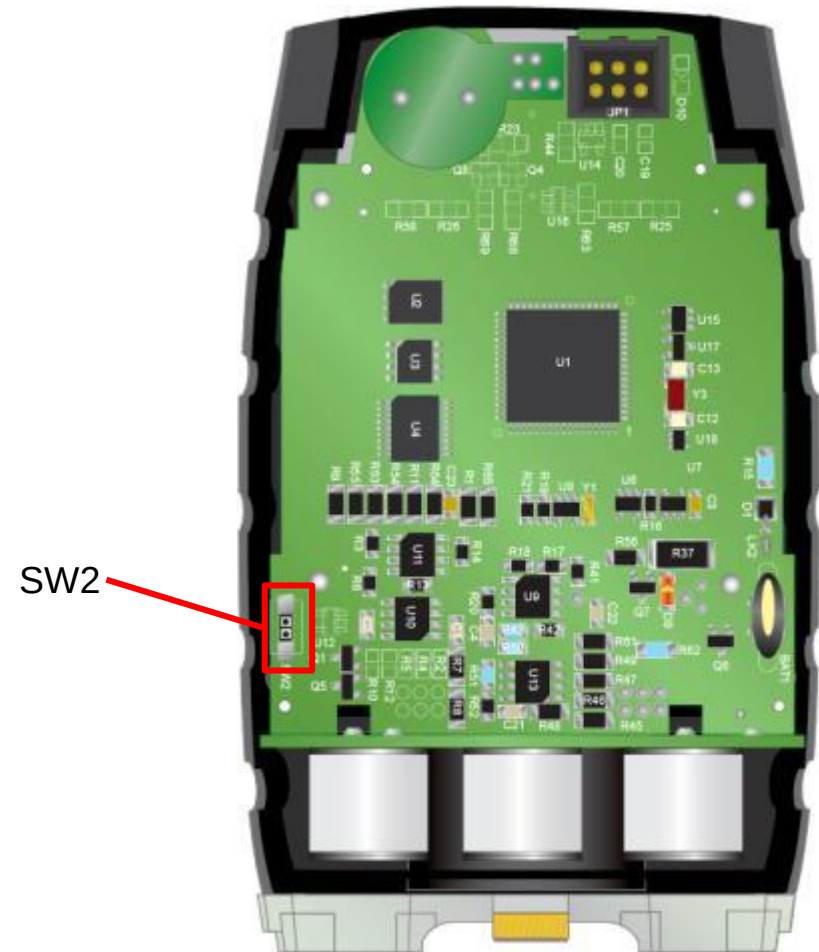
MultiPro Initialization

To enter Instrument Initialization mode

- Power unit off
- Press and hold “Mode” until
 - Unit displays “PC Connect”
 - Unit displays “Config”
 - Unit displays “Diag”
 - Continue Holding
 - Unit displays “INI” (approx 30 seconds)
 - Release “Mode” and push three times quickly
 - Unit will initialize (show CO/H2S)
 - Then unit shuts off

MultiPro Initialization

- Initialization
 - Locate solder pads for SW2
 - Short connection
 - Use tweezers or needle nose pliers
 - Reconnect main battery
 - Unit starts up



MultiPro Configuration with Biotrak

MultiPro Configuration Settings (Serial #: 40715)

File

Alarms | Datalogger | Features | Auto Calibration | Calibration History

O2/LEL Sensors

LEL Ceiling Alarm: 20 %

LEL Warning Alarm: 10 %

CO Sensor

Ceiling Alarm: 100 ppm

Warning: 35 ppm

STEL Alarm: 100 ppm

TWA Alarm: 35 ppm

H2S Sensor

Ceiling Alarm: 20 ppm

Warning: 10 ppm

STEL Alarm: 15 ppm

TWA Alarm: 10 ppm

Installed Sensor: CO/H2S

CF Value: 0

Restore Alarm Defaults

☒ Vibrator Installed ☒ Enable STEL Alarms/Readings ☐ Silence TOX Warning and Vibrating Alarms

☒ Enable Peak Readings

☒ Enable TWA Alarms/Readings

Print... **Upload...** **Cancel**

Configuration modifiée par l'utilisateur

MultiPro Error Codes

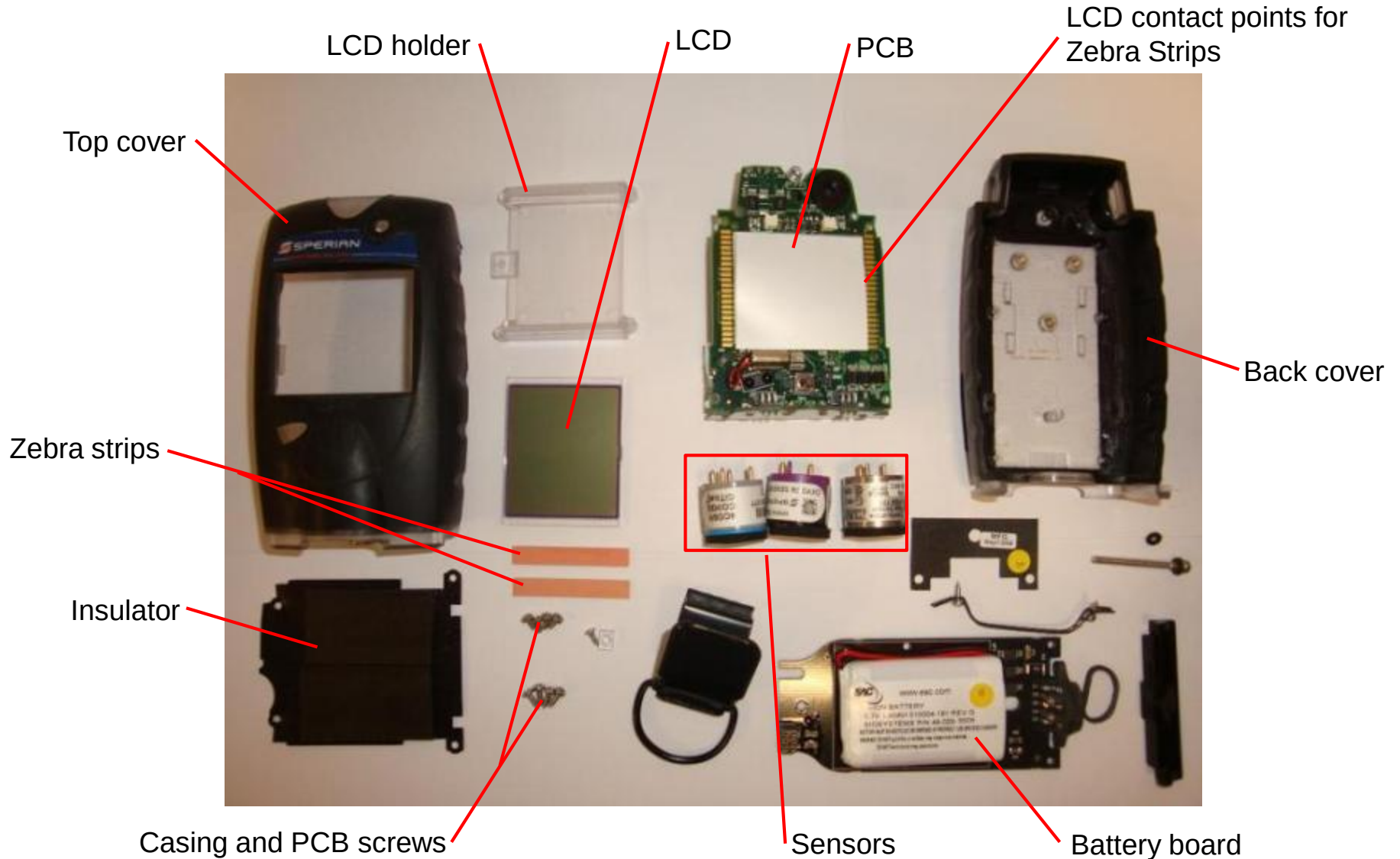
Error Type	Display Number
O2 not installed	1
LEL not installed	2
Unit memory	3
O2 memory	4
LEL memory	5
CO memory	6
H2S memory	7
Datalogger CRC	8
Invalid memory type	9
No sensors installed	10
Invalid type	11
Bad temperature sensor	12
No Batteries - message will not be displayed	13
Vibrator enabled but not installed	14

MultiPro Disassembly



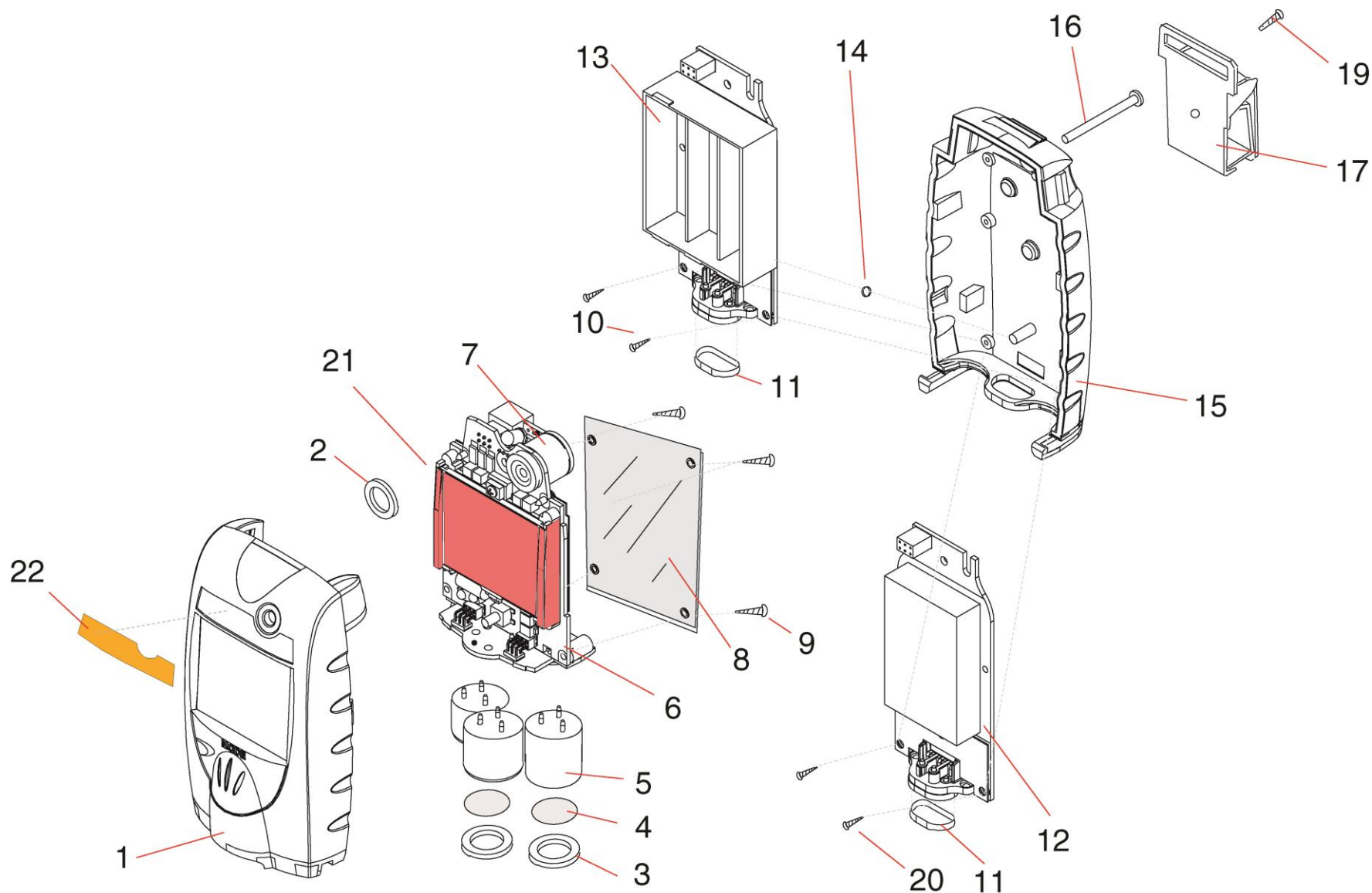
MultiPro Discrete Parts

Honeywell



MultiPro Disassembly

Honeywell



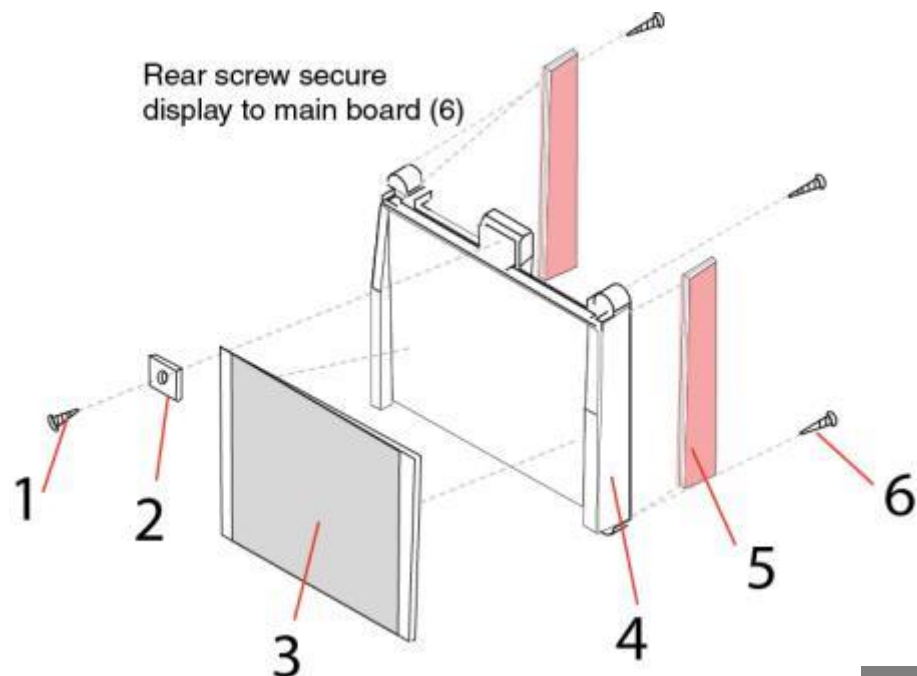
MultiPro Disassembly

Item	Description	JDE Part Number
1	HOUSING, TOP, OVERMOLDED	10-497
2	GASKET, AUDIBLE ALARM	34-086
3	GASKET, SENSOR, MULTIVISION	34-078
4	FILTER, HYDROPHOBIC MEMBRANE	56-102
5	MultiPro Duo-Tox Sensor	54-49-14
	MultiPro LEL Sensor	54-49-80C
	MultiPro O2 Sensor	54-49-90
6	ASSY, VIB, MAIN, SNSR, ALARM BOARDS	35-0644
7	ASSEMBLY, ALARM BOARD,	35-0622
8	TAPE, COATED VINYL FOAM 1/16	21-065
	INSULATOR, MAIN BOARD	22-187
9	SCREW, #2 X 1/4, PH PN HD	05-1118
10	SCREW, PH FL HD, #2 X 1/4	05-1281
11	GASKET, CONTACT BLOCK	17-068
12	ASSEMBLY, LI-ION BATTERY CKT	35-0613

Item	Description	JDE Part Number
*	Complete LI-ION Battery Pack (Not Shown)	54-49-007
13	ASSEMBLY, ALKALINE BATTERY CIRCUIT	35-1062
*	Complete Alkaline Battery Pack (Not Shown)	54-49-106
14	SUPPORT, BATTERY HOLDER	10-511
15	HOUSING, BOTTOM, OVERMOLDED	10-500
16	ASSEMBLY, PRESS FIT HEAD, BATTERY	35-0656
	O-RING, 004 SIZE, BUNA-N	17-036
17	CLOTHES CLIP	05-1372
19	CLOTHES CLIP SCREW	05-213
20	BATTERY BOARD SCREW	05-1218
21	BATTERY, 3V LITHIUM, 48 MAH	49-032
22	OVERLAY, GRAPHIC, MULTI PRO	31-341

MultiPro Display Assembly

Honeywell

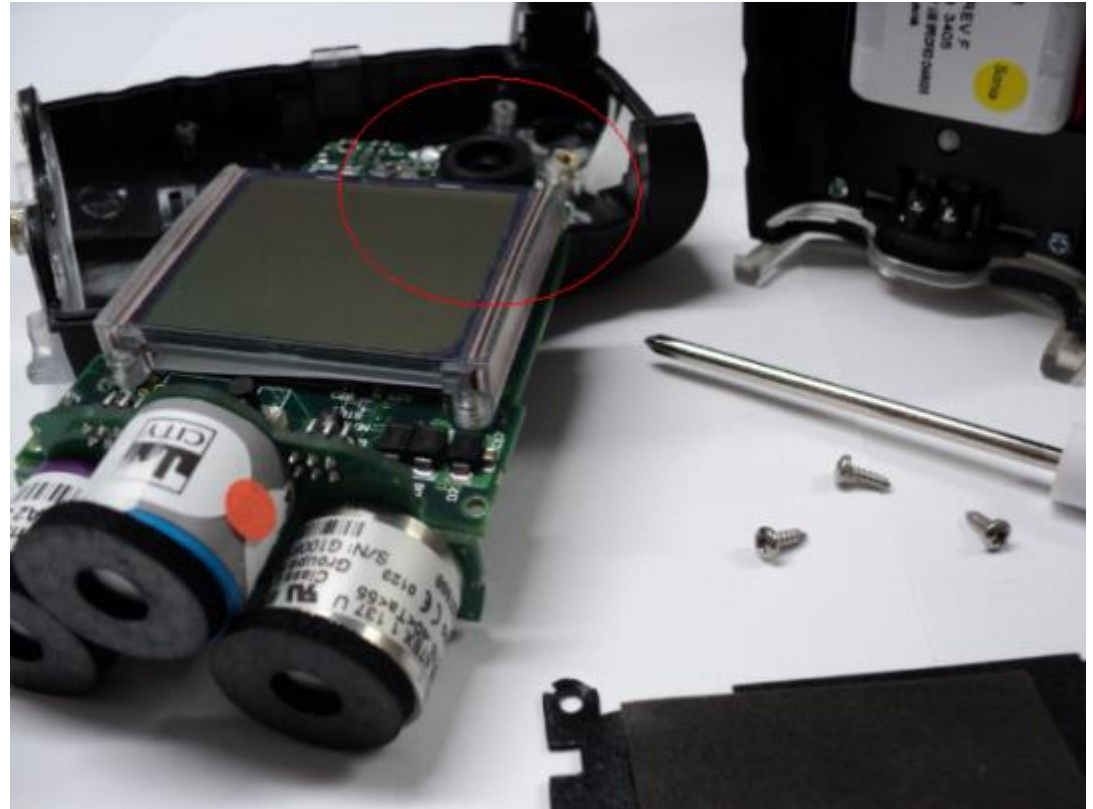


Item	Description	JDE Part Number	SAP Part Number
1	SCREW, PH FL HD, #2 X 1/4	05-1281	
2	BLOCK, HOLDER, LCD	10-499	
3	LCD, MULTIPRO	47-030	1026640
4	HOLDER, LCD	10-498	1028921
5	CONNECTOR, ZEBRA STRIP	09-369	
6	SCREW, #2 X 3/16	05-1218	

MultiPro Re-Assembly

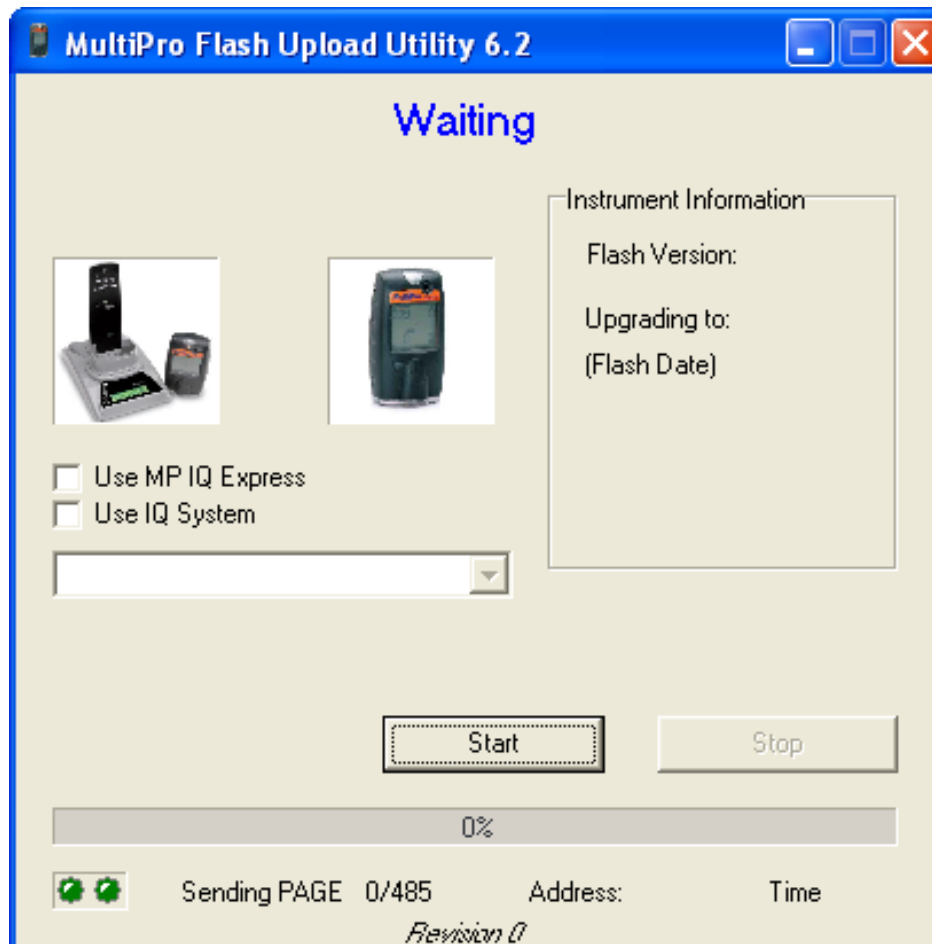
Honeywell

- Note two different length screws used
 - Short screws used for attaching display to main board
 - Long screws hold main board and insulator to case top
- Verify all gaskets are installed



MultiPro Firmware Update

- Flash Upload Utility, select start and follow instructions
 - IR connector or docking station is required



MultiPro Technical Data Sheet

Honeywell

Housing	
Material	Polycarbonate with tough rubber overmold
Weight	(Alkaline) 9.9 ounces (280 grams); w/pump: 13.1 ounces (370 grams) (Lithium-Ion) 7.8 ounces (220 grams); w/pump: 10.9 ounces (310 grams)
Dimensions	4 1/2" (11.4 cm) H x 2 11/16" (6.8 cm) W x 1 11/16" (4.3 cm) D
w/pump installed	6 3/4" (17.1 cm) H x 2 11/16" (6.8 cm) W x 1 11/16" (4.3 cm) D
Power	
Type	Type Rechargeable Lithium Ion or Alkaline (3 x AA size) battery pack options
Environmental Ratings	
Water Resistance	IPX5
RF Immunity	Conforms to EN 50270
RF Emissions	Conforms to IEC 61000-6-4
ESD Immunity	Conforms to IEC 61000-4-2
Approvals (All certifications include chargers and IQ docks (with approved chgr bds).	
	UL Class I, Division 1, Groups A,B,C,D Temp Code T4 UL Class II, Division 1 Groups E,F,G UL Class III CSA Class I, Division 1 Groups A,B,C,D Temp Code T4 ATEX (DEMKO) Ex ia d IIC T4 IECEx Ex ia d IIC T4 CE Mark CQST (China) Ex ia d IIC T4
Capabilities	
Controls	One button operation. Single "Mode" button switch controls all common operations
Sensor Channels	One to three channels. 4 gases can be monitored when the DuoTox (CO/H2S) sensor is installed

MultiPro Technical Data Sheet

Honeywell

Available Sensors	O2, LEL, CO, H2S, DuoTox (CO/H2S)			
Alarms				
User adjustable alarms	Oxygen: Low/High Combustible: Warning/Danger Toxic: TWA/STEL/Ceiling - Warning/Danger level for each Toxic alarm			
Calibration	Fully automatic “zero” and “span” calibration adjustment			
Calibration dates	Datalogging instruments automatically retain the most recent calibration date and time			
Motorized pump	Optional motorized sample draw pump module is available			
Security Beep	User enabled			
Latching	Peak Alarms User enabled			
Datalogging	Blackbox datalogger that can be upgraded to a full datalogger at any time Activation code and BioTrak PC software required			
Datalogging capacity	2500 records, 12 sessions. (For example, a 1 minute logging interval results in a 41 hour 40 minute capacity.)			
Logging interval	Adjustable from 1 second to 60 minutes.			
Computer Interface	Wireless via PC IrDA port			
Event Logger				
	20 events including gas type, max, average , time and duration			
Sensors				
Gas	LEL	O2	CO	H2S
Ranges	0-99 %	0-30 % by vol	0-999 PPM	0-200 PPM
Resolution	1%	0.10%	1 PPM	1 PPM
Default Alarm Levels				
Gas	LEL	O2	CO	H2S
Warning	10%	19.5% (danger low)	35 PPM	10 PPM
Danger	20%	23.50%	100 PPM	20 PPM

MultiPro Technical Data Sheet

Honeywell

Alarms	
	Visual Bright red LED alarm visible from top and sides Audible Two tone, 92 dbA @ 1 foot (30.5 cm) Vibrating Optional
Battery Life	
	Alkaline @ 70°F/22°C (hours) 22 hours Li-ion @ 70°F/22°C (hours) 22 hours Pump added to above subtract approx 6 - 8 hrs
Shelf Life	
	Alkaline 240 days (while shut down) Li-ion (Days) 180 days
Instrument	
Temperature range	Operating 0 to 110°F/-18 to 43°C, Intermittent -20 to 120°F/-29 to 49°C
Humidity Range	15 to 95% RH, non-condensing (0 to 95% RH for up to 4 hours)
Pump Flow Rate	3/8 LPM
Pump Tubing length	Up to 50ft. (15m)
UL Charge	@ 68°F (20°C) Up to 5.5 Hours
Display	Front mounted LCD simultaneously displays readings for all gases being monitored Backlight Bright white LED backlight (Activated by Mode button)

- Questions?



PhD6



Honeywell

PhD6 Features

Honeywell

- Alkaline or Li-Ion Batteries
- IP 65 Environmental Rating
- External Pump (optional)
- One Button Operation
- Blackbox or Active Datalogging
- Event Logger
- Exotic Sensor Capability
- Multiple Language
- PID Sensor Capability
- NDIR Sensor Capability CO₂ / CH₄



PhD6 Features

Honeywell

Batteries

- Easily Interchangeable battery packs
 - Alkaline
 - Lithium Ion rechargeable
 - 6 hour charge time
- Battery Life

Battery Type and Model	Temperature		
	70°F	0°F	110°F
Alkaline	17hr	6hr	17hr
Alkaline w/pump	11hr	1hr	11hr
Alkaline w/PID and LEL	13hr	n/a	n/a
Alkaline w/PID, LEL and pump	7hr	n/a	n/a
Li-ion	22hr	16hr	18hr
Li-ion w/pump	16hr	10hr	12hr
Li-ion w/PID and LEL	15.5hr	n/a	n/a
Li-ion w/PID, LEL and pump	9.5hr	n/a	n/a



PhD6 Operating Modes

One Mode of Operation

- After start sequence, displays numeric readings at all times
- Unit can display
 - Peaks
 - Average
 - STEL
 - TWA

O_2 20.9	LEL 0
Ibutyln 0	SO_2 0
CO 0	H_2S 0
13:42	



PhD6 will not perform “Auto Calibration”

- **Unit will not allow “Auto Calibration” to occur if instrument suspects atmosphere may be contaminated**
 - “Fresh Air” Calibration should only be performed in a known clean environment

Functional (Bump) Testing

- Unit accuracy may be verified at any time by simple functional (bump) test
- To perform a functional (bump) test
 - Power unit and wait at least three minutes to allow readings to fully stabilize
 - If IR or PID sensor is in use, wait until stabilization period ends before proceeding
 - If any sensors have just been replaced
 - » New sensor(s) must be allowed to stabilize prior to use
 - Make sure instrument in fresh air
 - Verify current gas readings match concentrations present in fresh air
 - O₂ sensor should read 20.9%/vol. (+/-0.2%/vol.)
 - LEL sensor should read 0% LEL
 - PID, NDIRCH₄ and toxic sensors should read 0 PPM in fresh air
 - NDIRCO₂ sensor should read carbon dioxide level between 0.03% and 0.10%
 - If readings deviate from expected levels in fresh air, perform fresh air calibration adjustment then proceed to step 4
 - Attach calibration adapter and connect the calibration cylinder to unit as shown
 - Flow gas
 - Wait for readings to stabilize
 - Forty-five sec - one minute sufficient



Functional (Bump) Testing (cont'd)

- Note readings
 - Toxic, VOC and combustible gas sensor readings considered accurate in bump test if between 90%* and 120% of the expected reading as shown on cal gas cylinder
- If readings considered accurate
 - Instrument may be used without further adjustment
- If readings do not fall within 90%* and 120% - considered inaccurate
- If readings considered inaccurate
 - Perform gas calibration
- Safety Systems multi-calibration gas mixtures contain approximately 18% oxygen
 - During bump test oxygen sensor should read within +/- 0.5% of cal gas level

Fresh Air/Zero Calibration

- NDIR-CO2 sensor may not be zero calibrated in fresh air
- Fresh air/zero calibrations may only be performed in an atmosphere that is known to contain 20.9% oxygen, 0.0% LEL and 0 PPM toxic gas
- To initiate
 - Press MODE three times within two seconds to begin
 - Briefly display AUTO CAL and then begin 5-second countdown
 - Press MODE before end of 5-second countdown to begin fresh air/zero cal
 - Fresh air/zero calibration initiated when “Calibrating” displayed
 - Unit indicates when fresh air/zero calibration is complete
 - Proceeds to second 5-second countdown for gas calibration
 - If gas calibration not required
 - » Allow countdown to reach 0 without pressing MODE

Fresh Air
Calibration

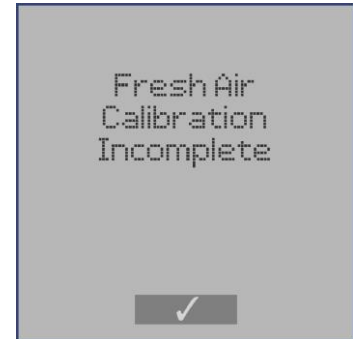
Press MODE to
Start 5

Fresh Air
Calibration

Calibrating

Fresh Air Calibration Failure

- Alarms are activated and instrument displays
- Sensor(s) that fail zero calibration are shown
- After 3 sec, unit returns to current gas readings screen
 - Visual and audible alarms stop
- When cal due, warning symbol and span bottle icon displayed on status bar
- Fresh air calibration not performed prior to instrument shut down
 - Unit notes Fresh Air Calibration is due during instrument start up



Possible Causes and Solutions

- Last calibrated in contaminated atmosphere
- New sensor has just been installed.
- Instrument dropped since last powered
- Significant temperature since last use

Recommended Action

- Perform zero adjustment again in known contaminant-free area
 - If fresh air/zero fails to correct problem, perform manual fresh air / zero calibration

Forced Fresh Air Calibration

- Unit designed with safeguards to prevent fresh air calibration in contaminated environments
 - If standard fresh air calibration fails a second time
 - Unit may be “forced” to accept fresh air calibration by performing manual fresh air calibration
- Fresh air calibration in a contaminated atmosphere may lead to inaccurate and potentially dangerous readings
 - Initiate standard fresh air/zero calibration by pressing MODE three times in rapid succession
 - 5-second countdown will begin
 - Press and hold down arrow key then press MODE before end of countdown
 - Continue to hold down arrow
 - Fresh air/zero calibration complete when unit begins another 5-second countdown for gas calibration
 - If gas calibration not required, allow countdown to reach 0 without pressing MODE
 - If unit fails to calibrate after this procedure, contact Honeywell

Fresh Air Calibration In Contaminated Atmosphere

- Connect cylinder of “zero air” to unit and flow gas
 - Containing 20.9% oxygen and no contaminants
- Perform fresh air calibration

Gas Calibration

- When zero calibration is successful
 - Unit automatically proceeds to automatic gas calibration countdown screen
 - Press MODE before countdown complete to initiate
 - Screen immediately displays “APPLY GAS”
 - Then lists sensors for calibration and expected levels of calibration gas
- Apply calibration gas
 - Readout changes to numerical display
 - Shows current readings and expected calibration gas value
 - If multiple cylinders are required to complete calibration
 - Unit prompts to apply next cylinder as needed
 - As sensors are calibrated, unit shows reserve values for each sensor
 - Reserve values give an indication of remaining sensor sensitivity
 - When reserve value for a specific sensor reaches 0%, replace sensor

Gas Calibration
Press MODE to
Start 5

Reading	Cal	to
O2	19.1	
LEL	15	50
CO	11	50
H2S	16	25

Gas Calibration
Apply Multi Gas

Next Gas

Gas Calibration (cont'd)

- Oxygen sensor is tested for response to diminished oxygen levels during gas calibration
 - Safety Systems multi-gas calibration cylinders contain approximately 18.0% oxygen
 - To pass gas calibration, unit must register oxygen reading below 19.5% during calibration
 - If unit fails to register reduced oxygen levels during the gas calibration, shows “Check O2 Sensor Response”
 - Press MODE to acknowledge

CO2 Sensor True Zero

- To determine if CO2 sensor requires zero calibration
 - Connect unit to cylinder of 0.00% CO2 calibration gas while in normal operation
 - If reading shows 0.00% CO2
 - CO2 sensor does not require zero calibration
 - Disconnect the cylinder from the PHD6
 - If reading shows anything other than 0.00% CO2
 - Leave calibration gas on
 - Press MODE three times within two seconds to initiate zero cal
 - Press MODE when prompted to begin zero calibration
 - Units with a CO2 sensor will automatically show the message “Press MODE if applying Zero Air” with another 5-second countdown
 - Press MODE again to begin true zero calibration and follow on screen instructions
 - When zero calibration is complete
 - Remove zero air and proceed to the gas calibration (if necessary)

Special Calibration Instructions for NDIR-CH4 Sensor

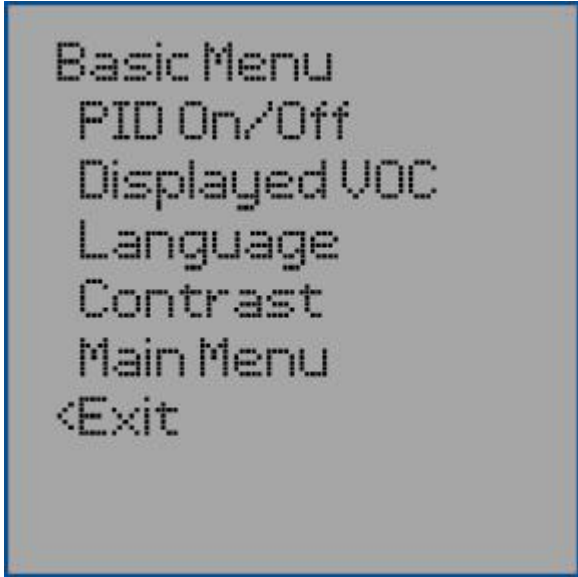
- Sensor must be calibrated with methane to the exact amount shown on the calibration gas cylinder
 - Default calibration gas value for NDIR-CH4 sensor is 50% LEL
 - Calibration gas level for 50% LEL default calibration gas setting is 2.50%/vol. CH4
- Use of inappropriate calibration gas may lead to inaccurate and potentially dangerous readings

Menu Options

- Operating firmware includes two menu options
 - Basic Menu
 - Main Menu

Basic Menu

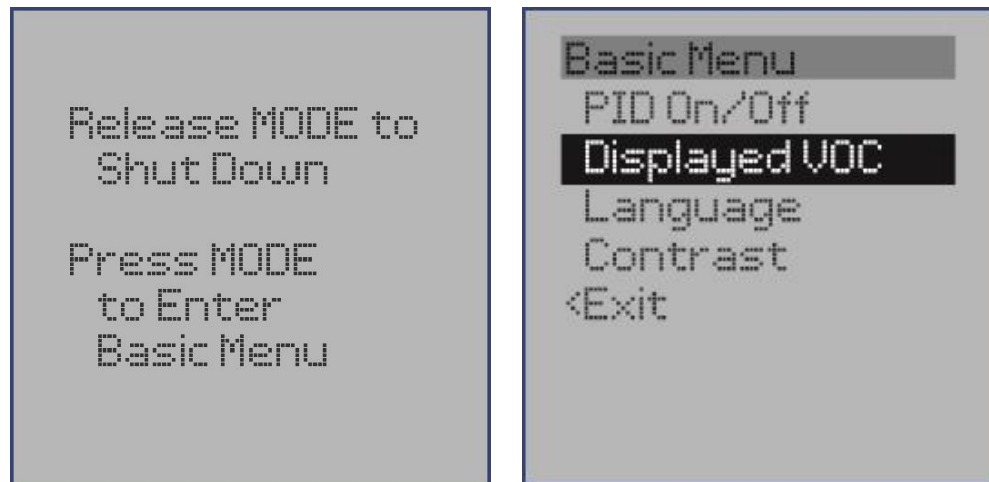
- Shortened version of Main Menu offering immediate access to a few key functions including:
 - PID On/Off
 - Enable or disable PID sensor
 - Displayed VOC
 - Select target gas for VOC sensor
 - Display Contrast
 - Main Menu access

A screenshot of the PhD6 Basic Menu display, showing a list of options in a monospaced font. The options are: Basic Menu, PID On/Off, Displayed VOC, Language, Contrast, Main Menu, and <Exit. The text is displayed on a dark background with a light border.

```
Basic Menu
PID On/Off
Displayed VOC
Language
Contrast
Main Menu
<Exit
```

Accessing Basic Menu

- With unit powered and current gas readings screen displayed
 - Hold MODE down until unit beeps four times and “Release MODE to Shut Down” is shown and “Hold mode to enter Basic menu”
 - Continue to hold MODE until “Release button” is shown
- To navigate through menu options
 - Use up and down arrows to highlight desired submenu
 - Press MODE to enter submenu

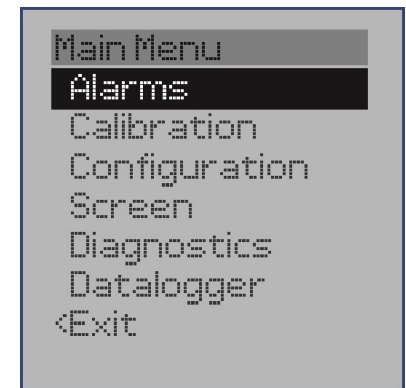
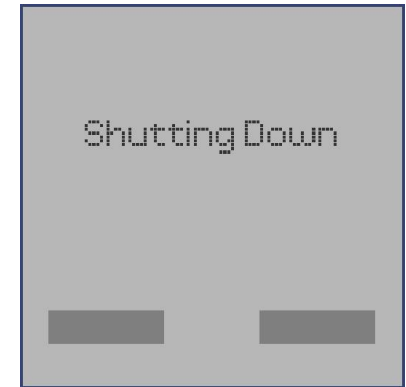


Main Menu

- Unit is fully configurable through Main Menu
 - Contains 6 sub menus leading to controls for individual
 - instrument functions
 - To navigate menu options
 - Use up and down navigation arrows
 - Press MODE to enter submenu

Entering Main Menu

- Two paths into main menu
 - If unit is powered
 - Press and hold MODE for three seconds until “Shutting Down” displayed
 - Release MODE
 - Screen shows “Shutting Down” with two black blocks at screen bottom
 - Press and hold both arrow keys while two blocks are shown
 - If unit is off
 - Press MODE to power instrument
 - When “Starting Session, Resetting Averages” displayed with two black blocks
 - Press and hold both arrow keys while two blocks are shown



Alarms Menu

- Current Alarms
 - Select any sensor to view current sensor alarm settings
 - Select any current sensor alarm to make changes
- Default Alarms
 - Scroll to view default sensor alarms for each recognized sensor
 - Option to Set Default Alarms for all sensors
- Alarm Latch
 - Set on or off
 - Alarms are self-resetting unless enabled
 - When latch enabled
 - Audible and visible alarms continue to sound after hazard has cleared
 - Press MODE to reset alarms
 - If latch disabled
 - When alarm condition is no longer present, instrument automatically returns to normal operation
 - Visible and audible alarms cease without user input

Alarms Menu (cont'd)

- Temp Alarms
 - Enable/disable high and low temperature alarms
 - If operating temperature falls outside of the operating range
 - Instrument goes into alarm and thermometer icon displayed
- Event History
 - Use up/down arrows to scroll through saved alarm events
 - Includes time, duration and peak and average sensor readings during event
- Vibrator (if equipped)
 - Enable/disable vibrating alarm

Calibration Menu

- Fresh Air Cal
 - Initiates Fresh Air Calibration sequence
- Gas Calibration
 - Initiates Gas Calibration sequence
 - Calibration gas required
- O2 Gas Cal
 - Initiates true O2 Zero Calibration sequence
 - Procedure requires 0.0% oxygen calibration gas
- Gas Values
 - Select any sensor to view or change current calibration gas values
 - If equipped with oxygen sensor
 - » O2 gas setting can be used to enable/disable oxygen sensor check during gas calibration with multi calibration gas
 - » To disable oxygen sensor check, select “No”.
 - » Disabling oxygen sensor check may result in failure to recognize oxygen deficient atmosphere

Calibration Menu (cont'd)

- Reminders/Lock
 - Controls access to submenus below
- Cal History
 - Scroll through recent calibrations, includes span reserve listing
 - Allows for predictive maintenance

Calibration Menu (cont'd)

– Reminders/Lock Submenus

- Cal on Startup
 - Enable/disable
 - » When enabled, calibration automatically initiated whenever instrument is powered
 - » Calibration can be bypassed (unless Cal Due Lock is enabled) by letting clock run out and proceeding to current gas readings screen
 - » Usually disabled on new instruments and must be user enabled
- Cal Reminder
 - Adjust between every day and every 180 days
 - Default factory setting for standard instruments is 30 days
 - To disable cal reminder, set value to 0
- Cal Lock
 - Enable/disable
 - » Enable to require calibration when Cal Reminder is on
 - Unit automatically shuts down if Cal Lock is enabled, and calibration is due but not performed
 - Usually disabled on new instruments and must be user enabled

Calibration Menu (cont'd)

- Reminders/Lock Submenus (cont'd)
 - Bump Reminder
 - Enable/disable and adjust between every day and every 30 days
 - Used exclusively with IQ6 Dock
 - Reminds user to process instrument in dock
 - To disable set value to 0
 - Usually disabled on new instruments and must be user enabled
 - Service Interval
 - Enable/disable and adjust between every day and every 730 days (2 years)
 - Reminder that tells user when instrument is due for service
 - Usually disabled on new instruments and must be user enabled
 - Service Done
 - Reset service date
 - Used to reset service interval following instrument service

Configuration Menu

- Security Beep
 - Enable/disable
 - When enabled
 - Unit emits a short audible beep and give a short flash on the LEDs at user-defined interval
 - Notify user instrument is powered and running
 - Usually disabled on new instruments and must be user enabled
- Basic Passcode
 - Enable/disable and change passcode
 - Enable to require entry of a passcode to access Basic Menu
 - Usually disabled on new instruments and must be owner enabled
 - To permit access to Basic Menu, and restrict it from Main Menu
 - Basic Passcode must differ from Main Passcode
- Main Passcode
 - Enable/disable and change passcode
 - Enable to require entry of a passcode to enter Main Menu
 - Usually disabled on new instruments and must be owner enabled
 - Can be used to enter Main and basic Menu
- “Backdoor” Password
 - 6457

Configuration Menu (cont'd)

- Display Formats
 - Submenus for sensor readings, sensor clamping and temperature
- Language
 - Select English, French or Spanish
 - Most PHDs factory configured in English unless the customer requests otherwise
- Date/Time
 - Set time and date
- Main Menu
 - Return to main menu

Configuration Menu (cont'd)

- Display Formats Submenu
 - Sensor readings
 - Toxic gases select PPM (XX) or tenths-of-a-PPM (X.X) for sensors with this capability (such as H₂S)
 - For NDIR-CH₄ choose between LEL and CH₄
 - » CH₄ reading will display in %/Vol.
 - Sensors that cannot be adjusted will show “Fixed”
 - Temperature
 - Select display in Celsius or Fahrenheit
 - Most PHDs factory configured to read temperature in Fahrenheit unless customer requests otherwise

Screen Menu

- Contrast
 - Screen contrast setting
- Orientation
 - Shifts display to be viewable from top or bottom of instrument
- Backlight Mode
 - Select continuous, Timed Off or Time Auto
 - Select Continuous to have backlight on at all times
 - Select Timed Off to require a MODE press or an alarm condition to activate backlight
 - Factory setting for most new PHD6 instruments is turn backlight off after 20 sec
 - Select Time Auto to enable automatic backlight for low light conditions
- Backlight Time
 - Set time before backlight turns off in Time Off Mode
- Enable Screens
 - Select screens accessible by sequentially pressing MODE button including: Peak, Average, STEL and TWA screens
- Main Menu
 - Return to main menu

Information Menu

- Versions
 - View instrument serial number, software version, and time and date of instrument manufacture
- Service Info
 - View phone contact numbers
- Main Menu
 - Return to main menu

Datalogger Menu

- Interval
 - Set datalogger interval between 1 second and 1 hour)
 - Samples continuously, so data stream must be broken into intervals to be recorded
 - Defines frequency of breaks in data stream
 - Menu option only not available in Black Box Datalogger versions
 - May be set anywhere between one second and one hour by using navigation arrows
 - Default datalogging interval is 1 minute
 - PHD6 will log minimum of 63 hours of data before oldest data is overwritten by newer data
- Sessions
 - View datalogger session data including date, time, interval, temperature and sensor minimum and maximum readings
- Clear Datalog
 - Clears all information from datalogger
- Select User
 - User name saved in session data
 - Users' names must be entered in BioTrak II to appear in user list

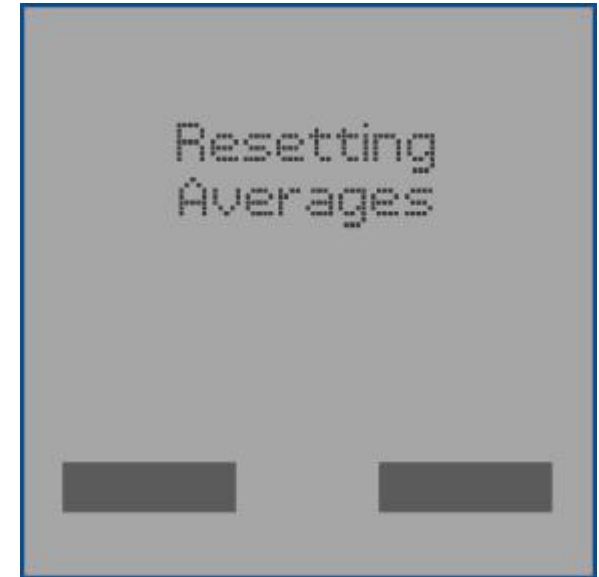
Datalogger Menu

- Select Location
 - Name saved in session data
 - Names must be entered in BioTrak II to appear in location list
- User on Startup
 - Enable/disable a prompt to select user and location at startup
 - User and location names must be entered into instrument via BioTrak II before option can be enabled

PhD6 Factory Mode

To access Factory Mode

- Power unit
 - Unit goes through startup sequence
- When unit displays black bars
 - Press UP and Down arrows
 - Unit enters Main Menu
 - Select “Exit”
 - Tap MODE then hold UP & DOWN & MODE
- Unit enters Factory Menu



Factory Menu

Initialization
Burn/Prove
Duo-Tox Cal
Audio Freq
Diagnostics
<Exit

- Initialization
 - Initialize unit and sensors
- Burn/Prove
 - Factory use ONLY - not for field use
- Duo-Tox Cal
 - Calibrates X-Sense
- Audio Freq
 - Tune alarm Frequency
- Diagnostics
 - Enters Diagnostic Mode
- Exit
 - Shuts down

Initialization

- Performs initialization of sensor or instrument data
- Low Level Initialization
 - Press and hold UP and DOWN when unit displays “Checking Sensor”
 - Select sensor from list

Initialize Menu

Instrument

O2

EX1

EX2

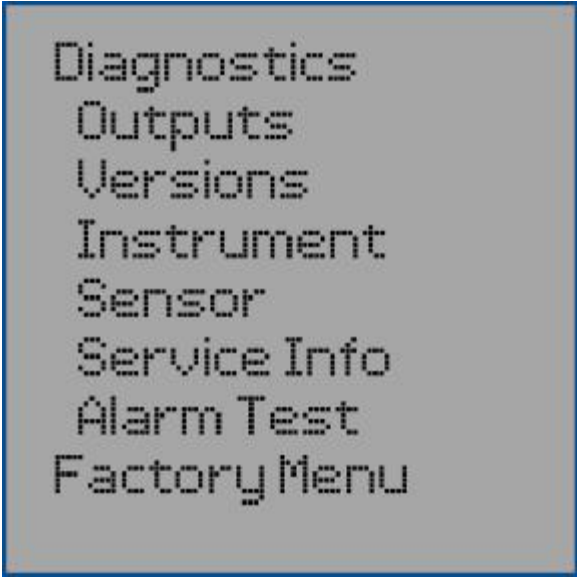
TOX1

TOX2

Factory Menu

Outputs

- Left LED
- Top LED
- Right LED
- Vibrator
- Backlight
- Left Alarm
- Right Alarm



Diagnostics
Outputs
Versions
Instrument
Sensor
Service Info
Alarm Test
Factory Menu

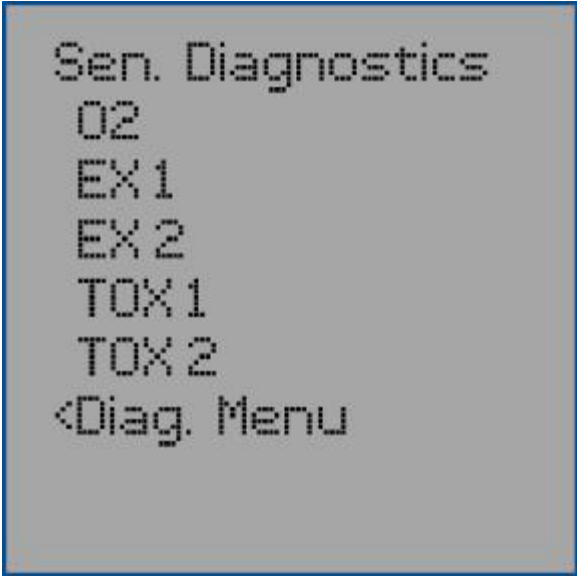
Instrument

- BatType
 - <200 Alk >=200 Li-Ion
- Light
 - >150 Bright <100 Dark
- Pump
 - 50 – 250 No Pump
 - >900 On
 - Press Up Arrow
- Temp
 - Use lower reading

```
BatType      911
Light        165
Battery      681
Pump         161
Temp         525
PID Cur      789
80°F 3.99V
Run          16:49 h
```

Sensor Diagnostics

- O2 Raw Cnts
 - From 24000 to 38000
- LEL Raw Cnts
 - From - 4000 to 4000
- VOC
 - From 2000 to 4000
- All Toxics
 - From -100 to 100



Sen. Diagnostics
O2
EX1
EX2
TOX1
TOX2
<Diag. Menu

Sensor Diagnostics (cont'd)

- O2 Sensor diagnostics
 - If counts below allowable range
 - Replace sensor
 - If counts above allowable range
 - 1) Check sensor for physical damage
 - 2) Sensor has had enough time to warm up (20 minutes)

Sensor Diagnostics (cont'd)

- LEL Sensor Diagnostics
 - If Counts far above or below
 - Replace sensor - physical damage
 - Apply Calibration gas
 - Counts should increase by a minimum of 50
- Most Common Damage
 - Physical
 - Dropped
 - Abuse
 - Poisoning
 - Silicones
 - Chlorinated Hydrocarbons

LEL Sensor Diagnostics

– Damage

- Damage to combustible gas sensors by acute or chronic exposure to known sensor poisons such as volatile lead (aviation gasoline additive), hydride gases such as phosphine, and volatile silicone gases emitted from silicone caulks/sealants, silicone rubber molded products, laboratory glassware greases, spray lubricants, heat transfer fluids, waxes & polishing compounds (neat or spray aerosols), mold release agents for plastics injection molding operations, waterproofing formulations, vinyl & leather preservatives, and hand lotions which may contain ingredients listed as cyclomethicone, dimethicone and polymethicone (at the discretion of Sperian's Instrument Service department) void Sperian Instrumentation's Standard Warranty as it applies to the replacement of combustible gas sensors.

Toxic Sensor Diagnostics

- All analog signal conditioning and A/D conversion is done on sensor
 - Best way to test channel is with a different sensor

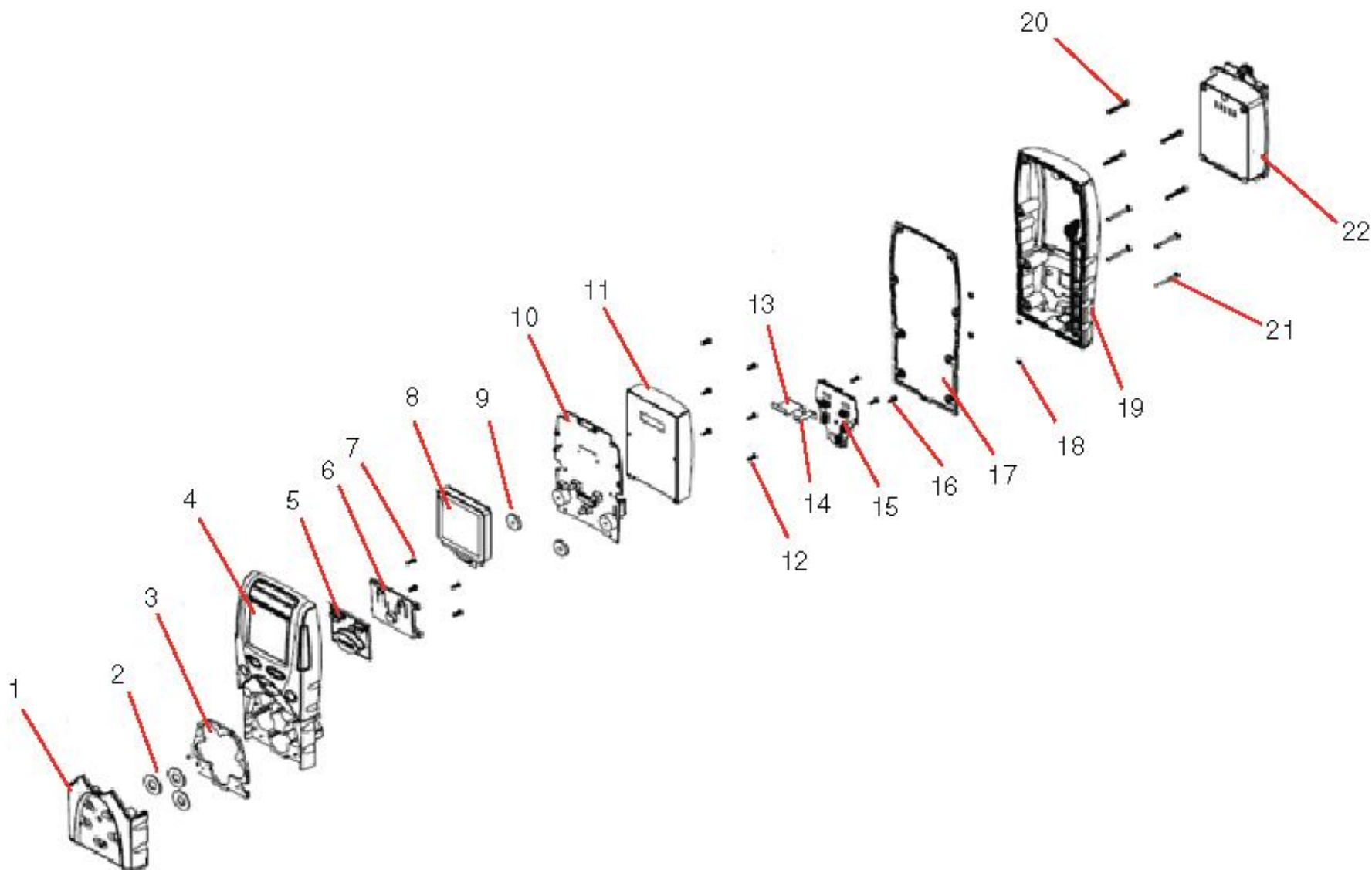
PhD6 Disassembly

Honeywell



PhD6 Disassembly

Honeywell



PhD6 Disassembly

Item No	P/N	Description	Item No	P/N	Description
1	10-535	Cover - Sensor Front	11	22-195	Insulator - Battery Compartment
2	34-125	Gasket - Sensor Face (excluding IR & PID Sensors)	12	05-1320	Screw - Plastite - PHPNHD
	34-130	Gasket - Sensor Face (IR & PID Sensors)	13	02-203	Cable - FFC - 30 Cond - 0.5mm
3	34-098	Gasket - Sensor Cover	14	02-202	Cable - FFC - 10 Cond - 0.5mm
Not Shown	56-509	Sensor Filter	15	35-0763	Assembly - Sensor Interface
4	10-532	Housing - Instrument Front	16	05-1320	Screw - Plastite - PHPNHD
5	10-537	Keypad - Santoprene	17	34-099	Gasket - Instrument Housing
6	10-538	Keypad Actuator	18	05-1133	Washer - #2 Nylon
7	05-1320	Screw - Plastite - PHPNHD	19	35-0883	Assembly - Case Bottom
8	47-032	LCD - Graphic - 128 x 128 - COG	20	05-1125	Screw - 4-40 x 3/4 - SS
9	34-104	Gasket - Alarm Face	21	05-1331	Screw - PHNPNHD - Captive
10	35-0761	Assembly - Main PCB - Phd6	22	54-54-107	Assembly - Li-ION Battery - PhD6
10	35-1075	Complete Main Board Assy (Main, Sensor, Display) (Alternate Option)	23	54-54-106	Assembly - Alkaline Battery - PhD6

PhD6 Reassembly

Honeywell



- Questions?

HA University



MultiVision

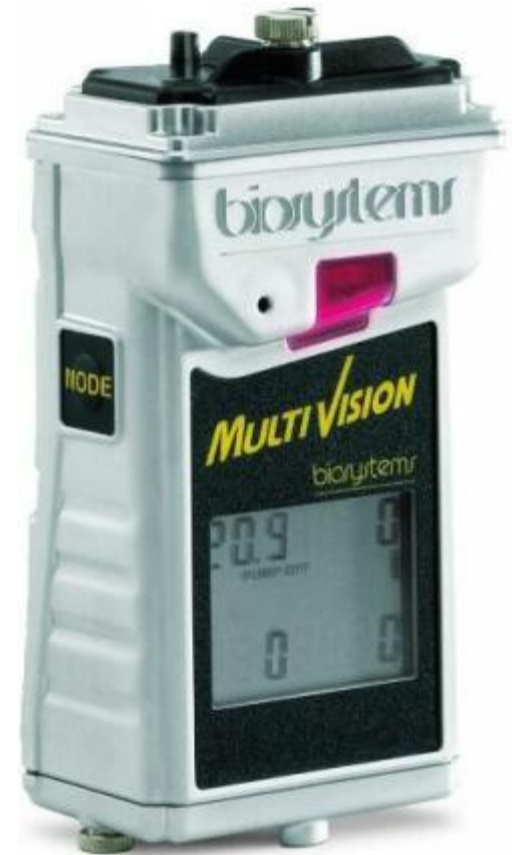


Honeywell

MultiVision Features

Honeywell

- Alkaline or NiMh Batteries
- IP65/IP67 Environmental Rating
- Internal Pump (optional)
- One Button Operation
- Blackbox Datalogging

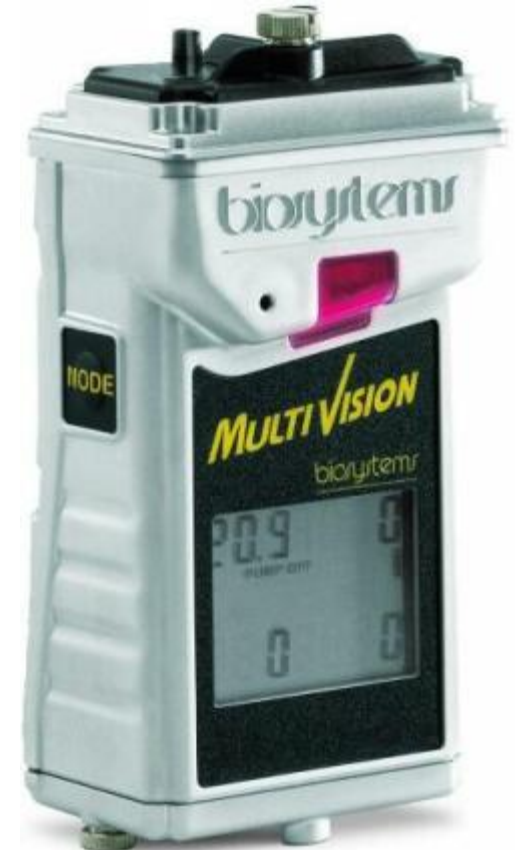


MultiVision Operating Modes

Honeywell

One Mode of Operation

- After start sequence, displays numeric readings at all times
- Unit can display
 - Peaks
 - TWA



- **MultiVision will not perform “Auto Calibration”**
 - **Unit will not allow “Auto Calibration” to occur if instrument suspects atmosphere may be contaminated**
 - “Fresh Air” Calibration should only be performed in a known clean environment

Functional (Bump) testing

- Unit accuracy may be verified at any time by a simple functional (bump) test.
- To perform a functional (bump) test
 - Power unit and wait at least three minutes to allow readings to fully stabilize
 - If any sensors have just been replaced,
 - » New sensor(s) must be allowed to stabilize prior to use
 - Make sure the instrument is located in fresh air
 - Verify current gas readings match the concentrations present in fresh air
 - O₂ sensor should read 20.9% (+/-0.2%/vol.)
 - LEL sensor should read 0%
 - LEL and toxic sensors should read 0 PPM in fresh air
 - If readings deviate from expected levels in fresh air perform fresh air calibration adjustment then proceed to step 4
 - Attach calibration adapter and connect calibration cylinder to unit as shown
 - Flow gas
 - Wait for readings to stabilize
 - Forty-five sec - one minute sufficient



Functional (Bump) testing (cont'd)

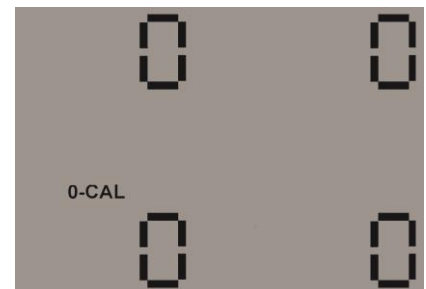
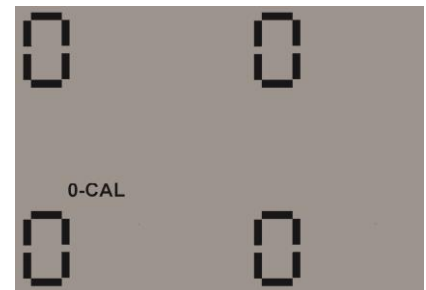
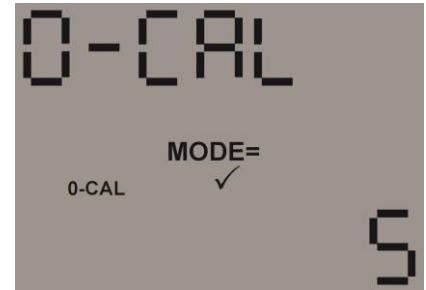
- Note readings
 - Toxic and LEL sensor readings considered accurate in bump test if between 90% and 120% of expected reading as shown cal gas cylinder
- If readings considered accurate
 - Instrument may be used without further adjustment
- If toxic and LEL readings do not fall within 90% and 120% - considered inaccurate
- If readings considered inaccurate
 - Perform span calibration
- Honeywell's multi-calibration gas mixtures contain approximately 18% oxygen
 - During bump test oxygen sensor should read within +/- 0.5% of cal gas cylinder

MultiVision Calibration

Honeywell

Fresh Air/Zero Calibration

- Fresh air/zero calibrations may only be performed in an atmosphere known to contain 20.9% oxygen, 0.0% LEL and 0 PPM toxic gas
- To initiate
 - Press MODE three times within two seconds to begin
 - Briefly displays 0-CAL and then begins 5-second countdown
 - Press MODE before end of 5-second countdown to begin fresh air/zero cal
 - Fresh air/zero cal initiated when display alternates between following two screens:
 - Unit indicates when fresh air/zero calibration is complete
 - Proceeds to second 5-second countdown for gas calibration
 - If gas calibration not required
 - » Allow countdown to reach 0 without pressing MODE



MultiVision Calibration

Honeywell

Fresh Air Calibration Failure

- Alarms are activated and instrument displays:
 - Three times intermittently with current gas readings screen
 - After third display of 0-CAL Error screen
 - Instrument returns to current gas readings screen
 - Visual and audible alarms cease
- Warning symbol and 0-CAL message shown intermittently in current gas readings screen until successful fresh air calibration performed
- If fresh air / zero calibration not performed prior to instrument shut down
 - O2 sensor identified as needing calibration during instrument start up



Possible Causes and Solutions

- Last calibrated in contaminated atmosphere
- New sensor has just been installed
- Instrument dropped or banged since last powered
- Significant temperature since last use

Fresh Air Calibration Failure - Recommended Action

- Perform zero adjustment again in known contaminant-free area
 - If fresh air/zero fails to correct problem, perform manual fresh air / zero calibration

Manual Fresh Air / Zero Calibration

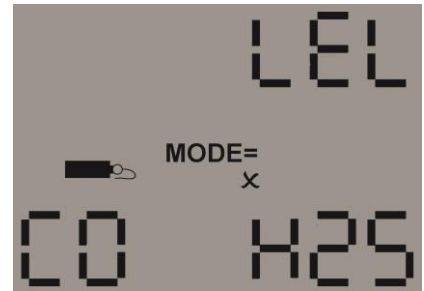
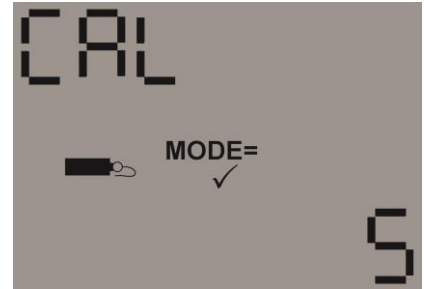
- Unit designed with safeguards to prevent fresh air calibration in contaminated environments
 - If standard fresh air calibration fails a second time
 - Unit may be “forced” to accept fresh air calibration by performing manual fresh air calibration
- Fresh air calibration in a contaminated atmosphere may lead to inaccurate and potentially dangerous readings
 - Initiate standard fresh air/zero calibration by pressing MODE three times in rapid succession
 - 5-second countdown will begin
 - Press and hold down arrow key then press MODE before end of countdown
 - Continue to hold down arrow
 - Fresh air/zero calibration complete when unit begins another 5-second countdown for gas calibration
 - If gas calibration not required, allow countdown to reach 0 without pressing MODE
 - If unit fails to calibrate after this procedure, contact Honeywell

MultiVision Calibration

Honeywell

Span Calibration

- When zero calibration is successful
 - Unit automatically proceeds to automatic span calibration countdown screen
 - Instrument ready for span calibration when screen is shown
- Press MODE before countdown complete to initiate
- Screen immediately displays “APPLY GAS”
 - Then lists sensors for calibration
- Apply calibration gas
 - Readout changes to numerical display
 - Alternates with sensor screen



Span Calibration (cont'd)

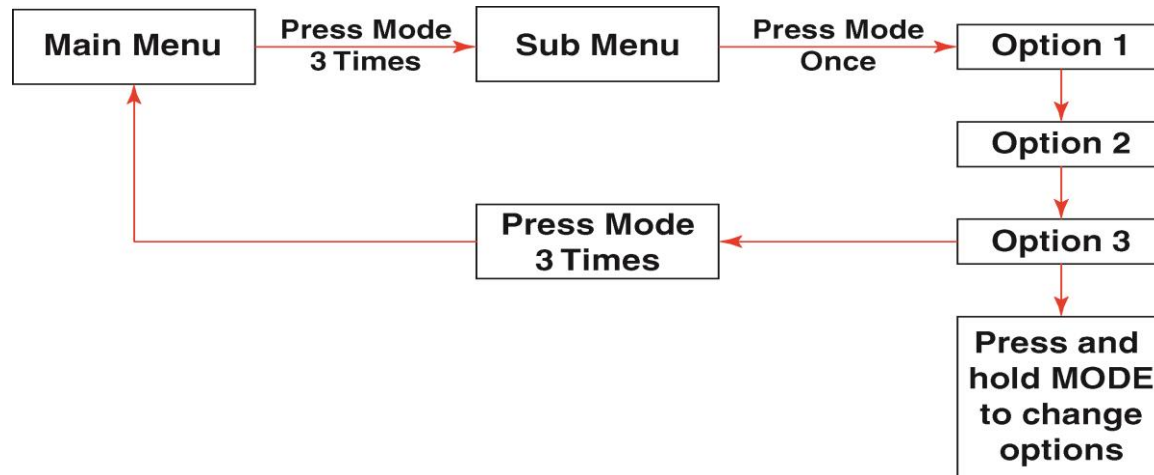
- Actual oxygen sensor calibration to 20.9% occurs during fresh air calibration
 - Oxygen sensor tested for response to diminished oxygen levels during span calibration
 - Honeywell calibration gas cylinders contain approximately 18.0% oxygen
- To pass span calibration
 - Unit must register oxygen reading below 19.5% during span calibration
- **Calibration is fully automatic from this point**
- Upon successful calibration of a sensor
 - Unit beeps
 - Displays adjusted reading for calibrated sensors
 - Moves on to next sensor
- Once all sensor calibrations successfully completed
 - Unit briefly shows lowest oxygen reading obtained during span calibration
 - Maximum adjustment values for LEL and toxic sensors
- Maximum adjustment values for LEL and toxic sensors give indication of remaining sensor sensitivity
- When calibration cycle is successfully completed
 - Unit automatically turns itself off
 - Disconnect calibration assembly

Unit Configuration

- MultiVision configuration may be done through via Mode button
 - Only certain options are allowed to be configured
 - Only certain values are allowed to be selected for those options
- Complete configuration is allowed through PC port

To configure unit

- Unit turned “OFF”
 - Press and hold “Mode” until unit displays “Config” (~30 Seconds)
 - Press “Mode” 3 times to enter Configuration Mode
- From Main Menu



Configuration Menu

- TWA
 - Display TWA ON/OFF
 - Factory set to ON
- SecBeep
 - Set Security Beep ON/OFF
 - 1 minute default
 - Factory set to OFF
- Latch
 - Alarm Latch ON/OFF
 - Factory set to OFF
- Cal Due Use
 - Calibration Due lockout
 - ON = Unit is useable when Cal due
 - OFF = Unit must be Calibrated before use
 - Factory set to ON
- Upload Cal
 - Enable/Disable cal information via IQ Link
 - Factory set to Off

Configuration Menu (cont'd)

- Set Time
 - Set instrument time - 24 hour clock
- Set Date
 - Set instrument date
- Set Alarms
 - Set alarm values
 - Settings limited through menus
- Set Cal Gas
 - Set Cal gas value
 - Settings limited through menus
- Set Cal Due
 - Set Cal Due Interval

Configuration Menu (cont'd)

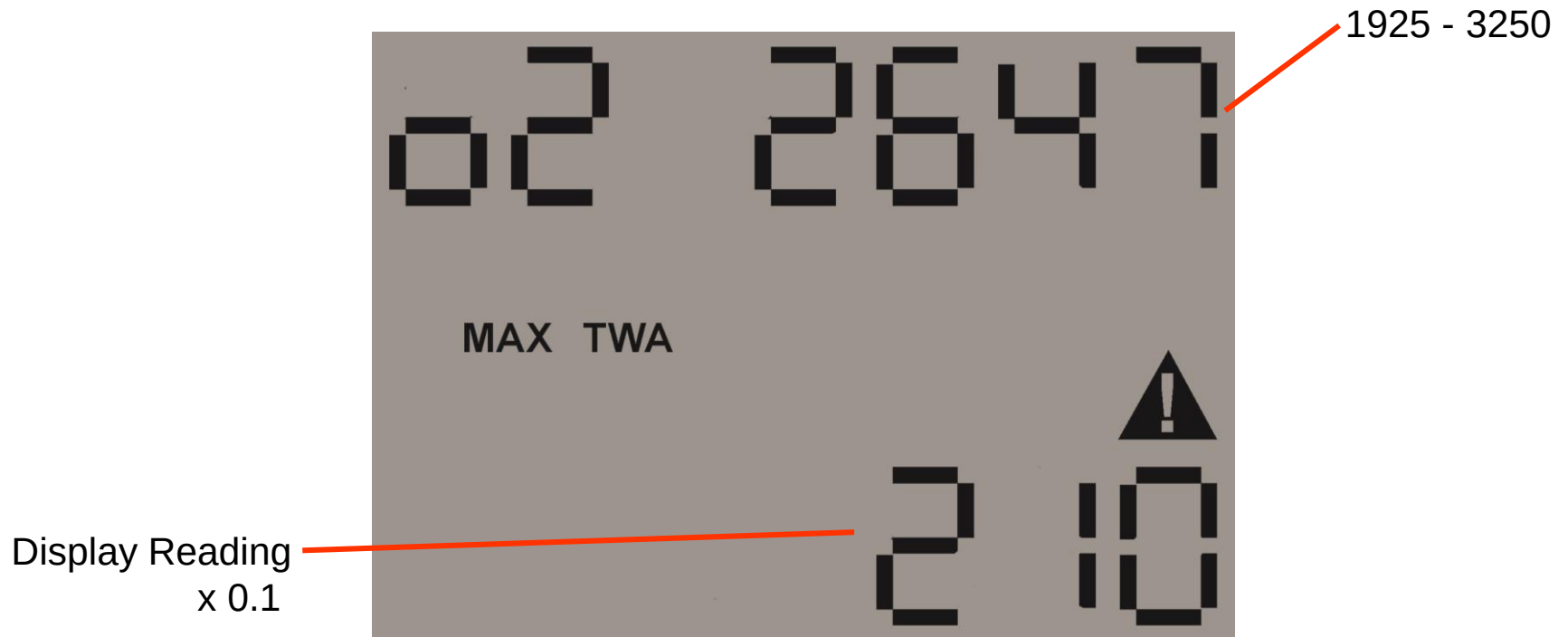
- When configuration is complete
 - Push and hold “Mode”
 - Unit displays “Release Button”
 - Unit then displays “Store Setup” and count down
- To SAVE changes
 - Tap “Mode”
- To ABORT changes
 - Allow timer to run out

Diagnostic Mode

- To Enter Diagnostic Mode
 - Begin with unit turned off
 - Press and hold “Mode”
 - Unit displays “Config” then “Diag” (~ 40 seconds)
 - Press “Mode” three times within 2 second to enter Diagnostics

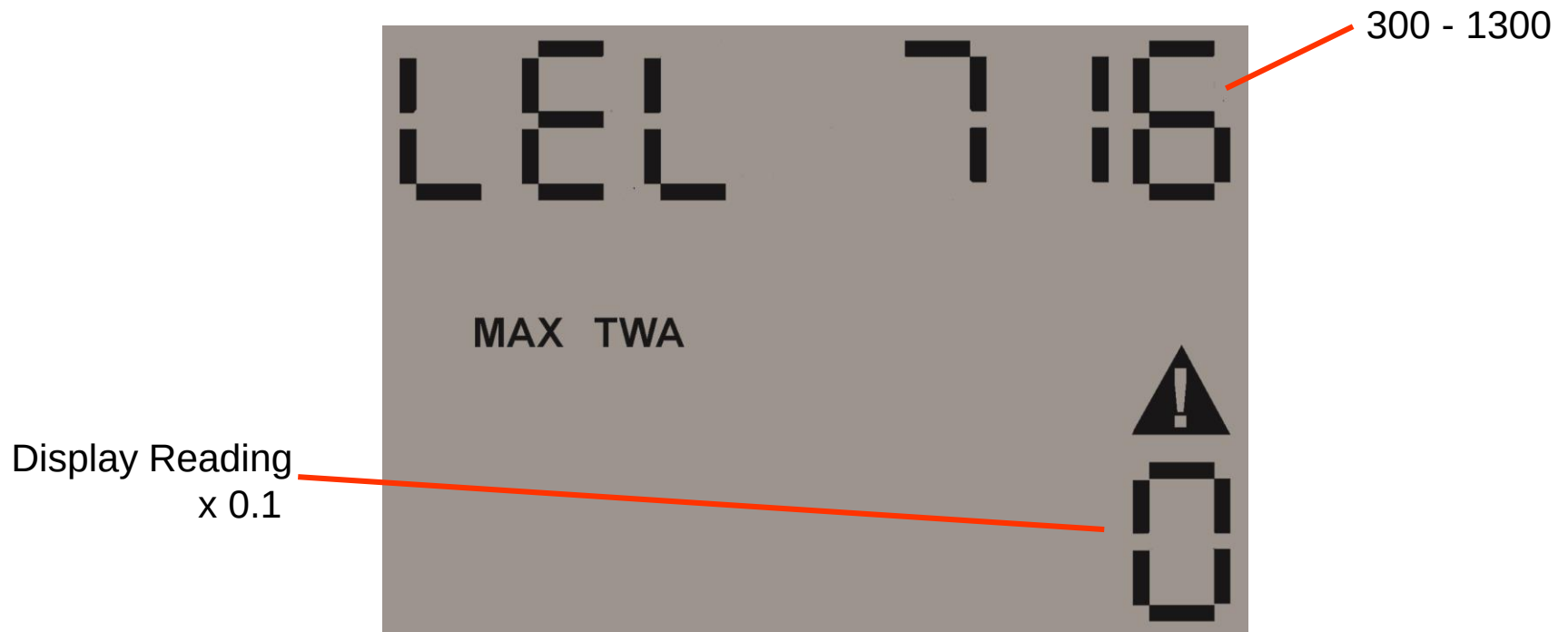
Diagnostic Mode – O2 Sensor Diagnostics

- Counts should be between 1925 and 3250
- Counts outside range will prevent Zero cal



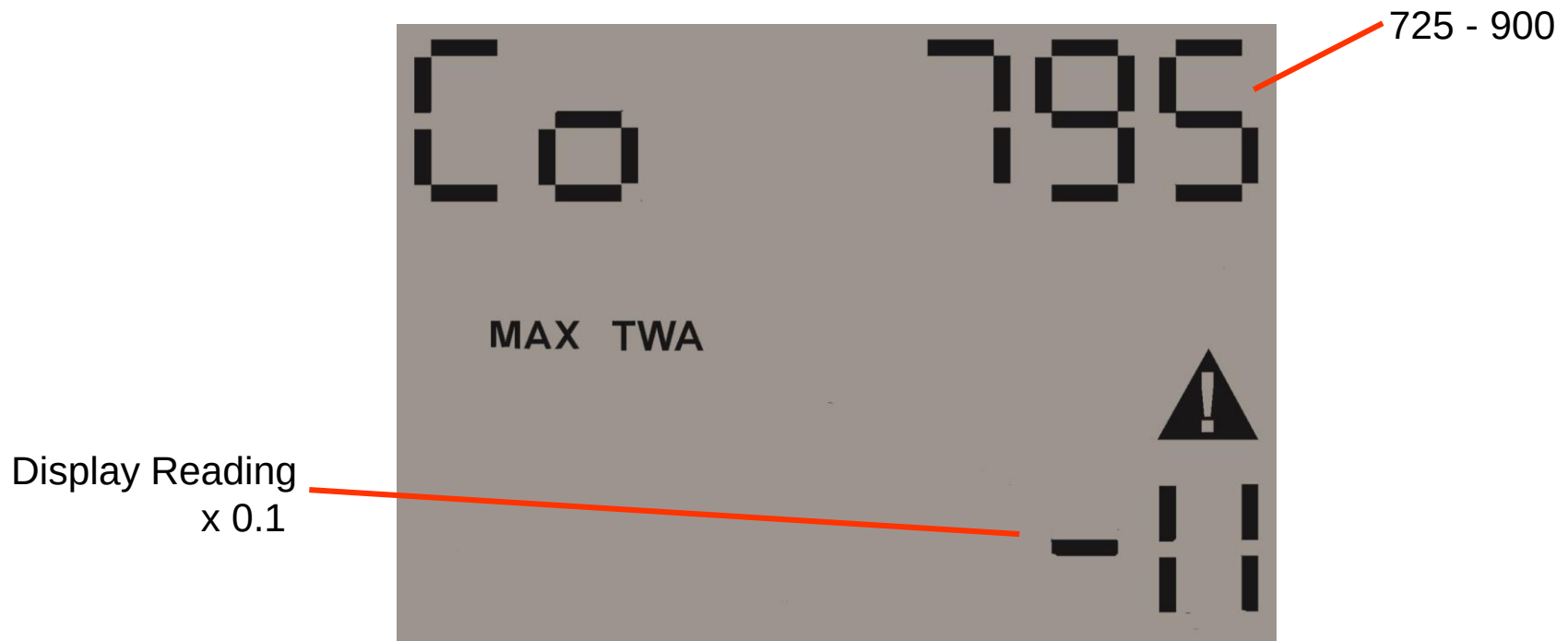
Diagnostic Mode – LEL Sensor Diagnostic

- Counts should be between 300 and 1300
- Counts outside range will prevent Zero cal



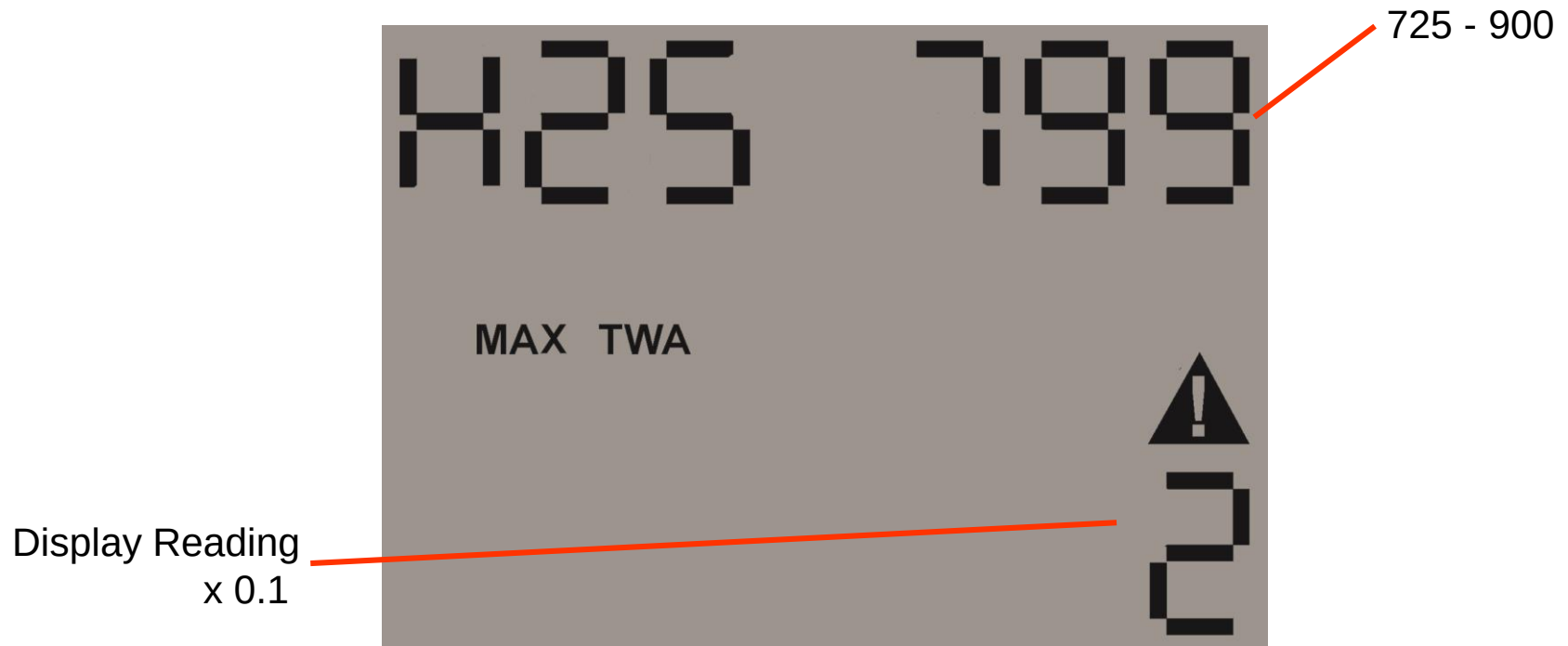
Diagnostic Mode – CO Sensor Diagnostic

- Counts should be between 725 and 900
- Counts outside range will prevent Zero cal



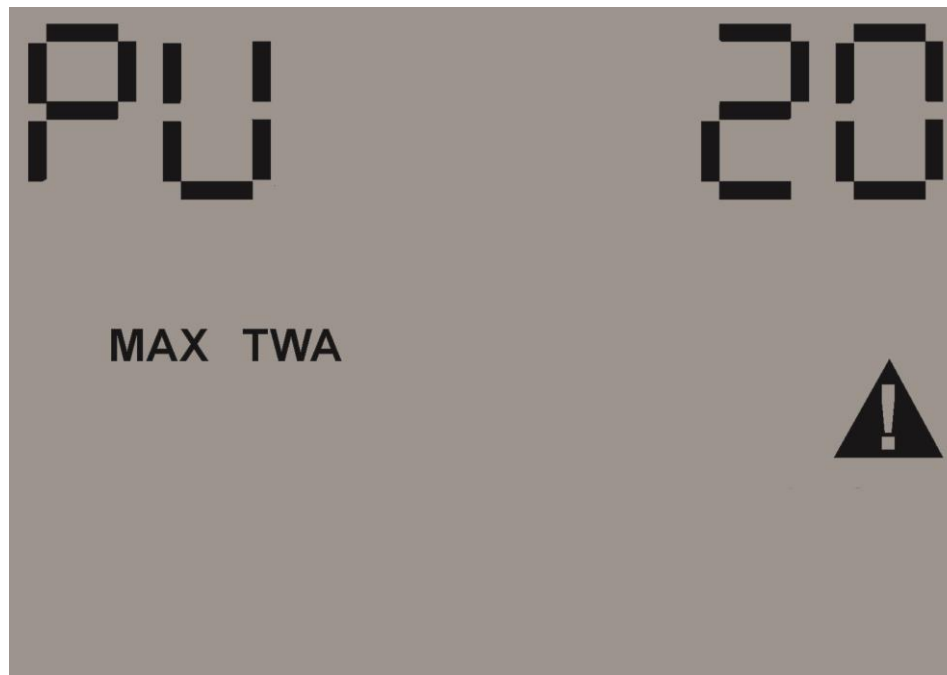
Diagnostic Mode – H2S Sensor Diagnostic

- Counts should be between 725 and 900
- Counts outside range will prevent Zero cal



Diagnostic Mode – Pump Diagnostic

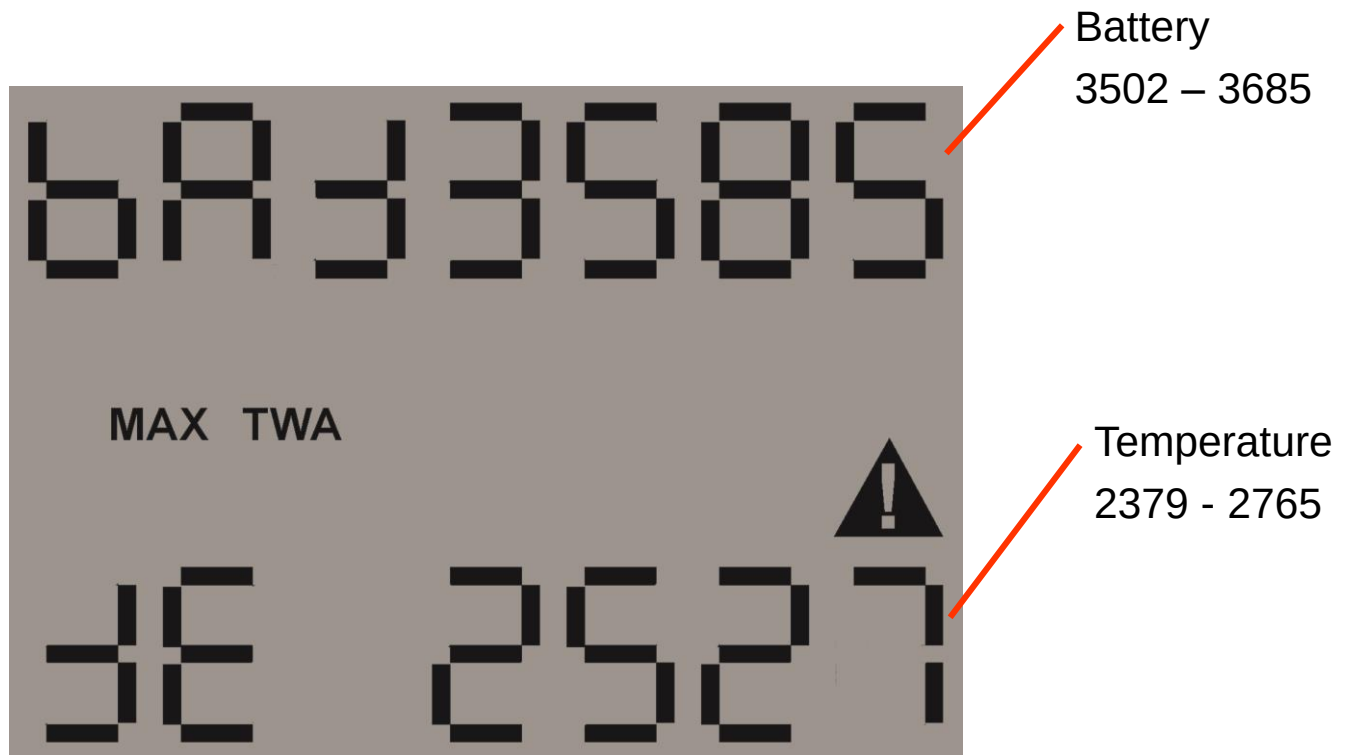
- “ON” Counts should be between 1540 and 3768
- “OFF” Counts should be between 0 and 30



On - 1540 -3768
Off - 0 - 30

Diagnostic Mode – Battery and Temperature Diagnostic

- Battery Counts should be between 3502 and 3685 w/backlight off
- Temperature Counts should be between 2379 and 2765 (95° to 59°F)



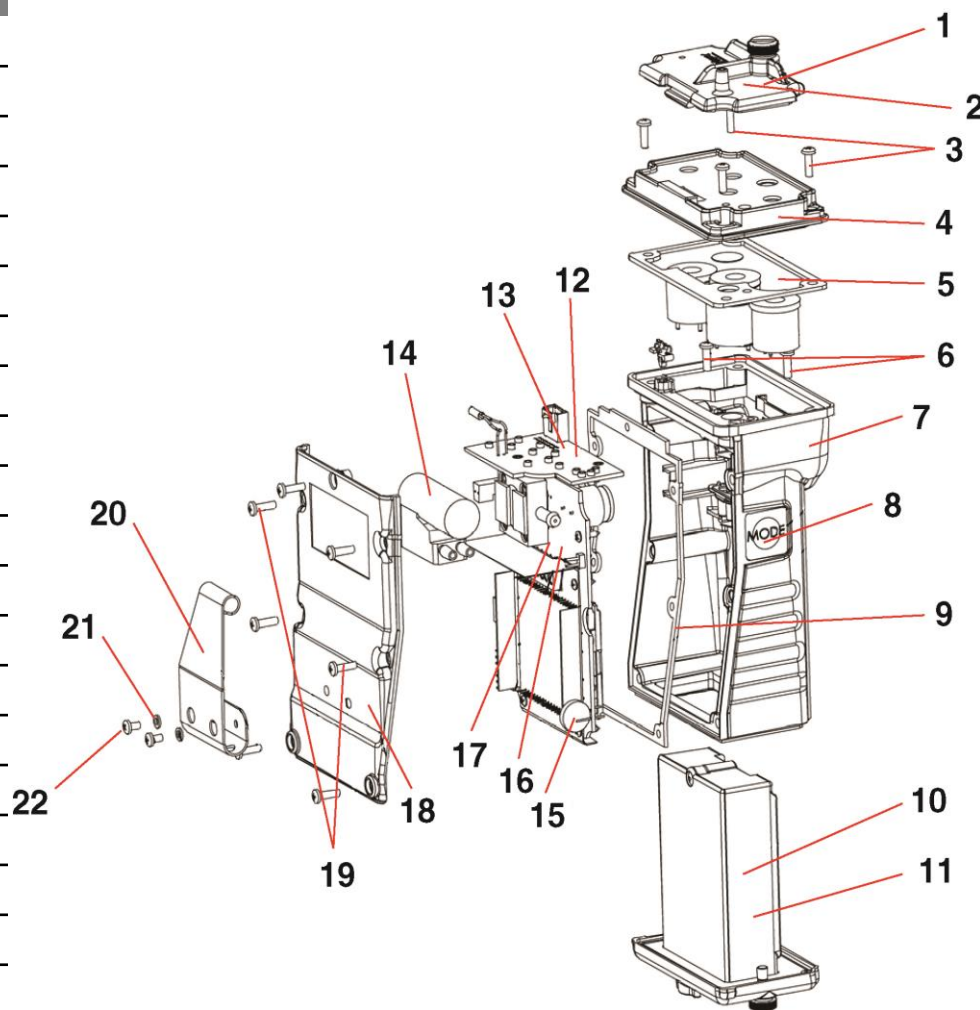
Instrument Initialization

- To enter Instrument Initialization mode
 - Begin with unit turned off
 - Press and hold “Mode”
 - Unit displays “Config” then “Diag”... Keep Holding...
 - Unit then displays “INI” (~45 seconds)
 - Press “Mode” three times within 2 second to enter Initialization
 - Unit displays “INI CO H2S”
 - Then unit will shut down

MultiVision Disassembly

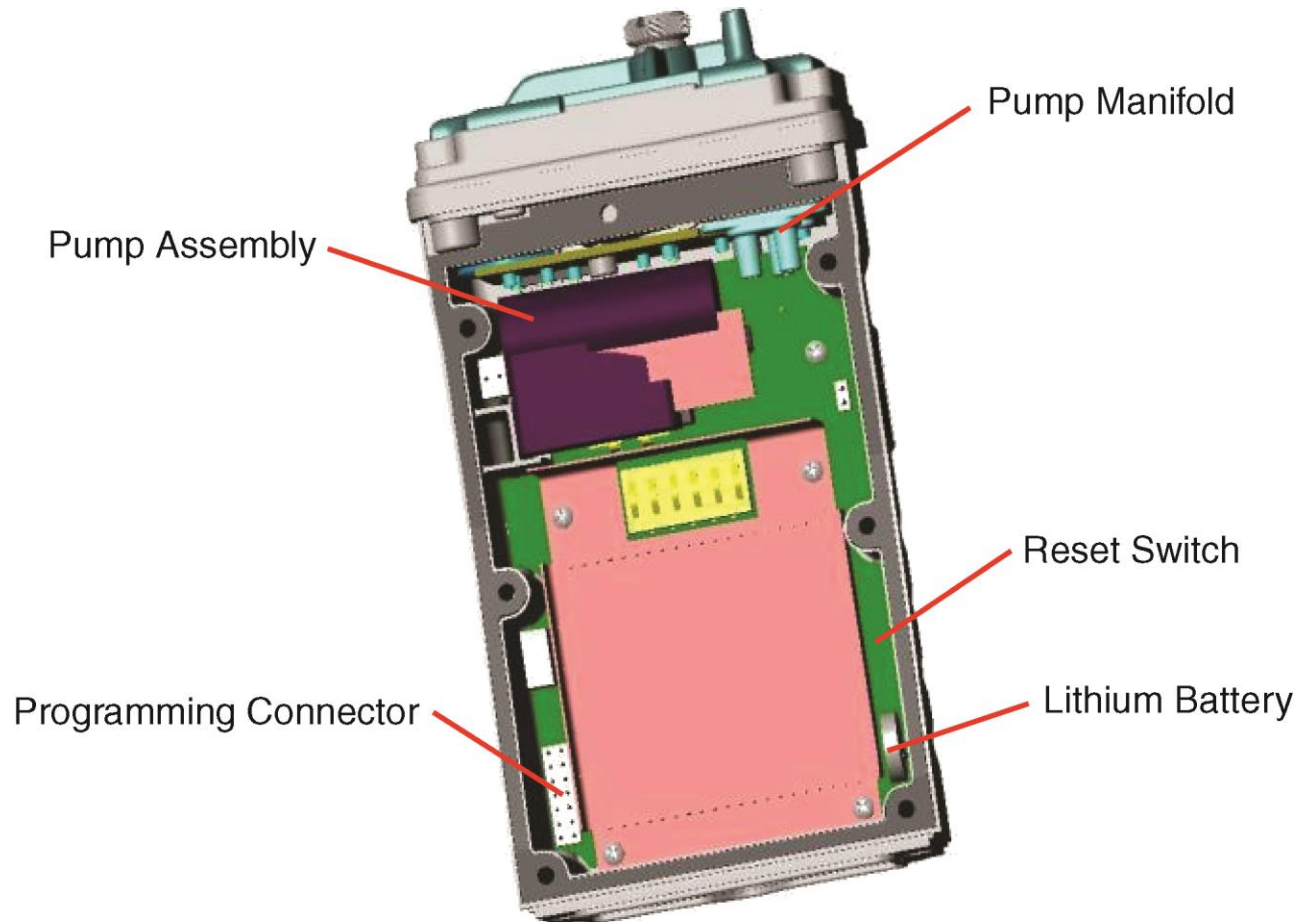
Honeywell

Item No	P/N	Description
1	54-41-001	Calibration Adapter
2	54-41-003	Pump Adapter
3	05-1147	Sensor Cover Screw (4)
4	10-438	Diffusion Sensor Cover
5	34-072	Sensor Cover Gasket
6	05-1147	Sensor Interface Board Screw (2)
7	10-434	Main Housing
8	31-303	MODE Keypad Membrane
9	35-0470	Main Housing Gasket
10	35-0488	Alkaline Battery Pack
11	35-0489	NiMH Battery Pack
12	35-0487	Sensor Board Assembly w/o Pump
13	35-0492	Sensor Board Assembly w/Pump
14	35-0490	Pump Assembly
15	49-026	Lithium RAM Battery
16	35-0486	Main Board w/o Pump
17	35-0491	Main Board w/Pump
18	10-435	Back Cover
19	05-1147	Back Cover Screws (7)
20	55-396	Belt Clip
21	05-213	Washer (2)
22	05-35_P4	Belt Clip Screw



MultiVision Disassembly

- Remove Battery Pack
- Remove 7 Philips screws from back cover



MultiVision Reassembly

Honeywell



- Questions?



Cannonball 3



Honeywell

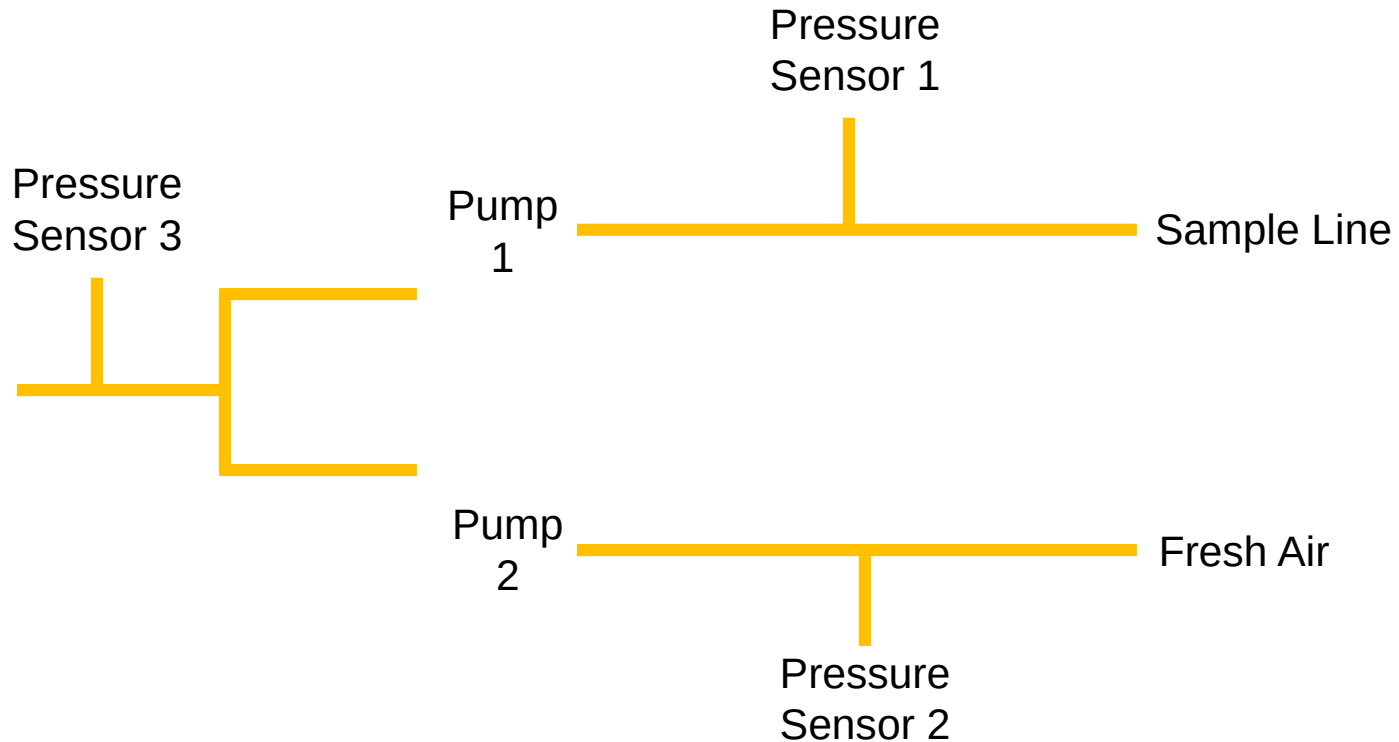
Features

- Alkaline or NiMh Interchangeable Batteries
- Exotic Sensor Capability
- Easy to use Menu Driver Operation
- Blackbox Data Recorder (100 hrs)
- Dilution Sampling mode
- IP 65 Environment ratings
- Field replaceable sample draw pump



Cannonball 3

- Dilution Sampling allows instrument to be used in nitrogen purged environment



Operating Modes

- Basic Mode
 - Numeric Display
 - Peak Readings
 - Summary Screen
- Text Only Mode
 - Displays “OK” for clean environment, Numeric display when in alarm
 - Summary Screen
- Technician Mode
 - Numeric Display
 - Peak Readings
 - S.T.E.L Readings
 - T.W.A. Readings
 - Summary Screen
- Cannonball 3 instruments are shipped in Basic Mode

One button auto calibration

- After self test is completed
 - Press “MODE” button three times within two seconds.
- “Fresh air calibration”
- “MODE = Adjust ...5”
 - Press “MODE” button before counter reaches Zero
- Unit counts down and performs a fresh air calibration
- If Equipped with dilution pump turn the pump “ON” and perform a fresh air calibration again
- If fresh air calibration fails use “left arrow” key to force a MANUAL ZERO calibration

Cannonball3 will not perform “Auto Calibration”

- **Unit will not allow “Auto Calibration” to occur if instrument suspects atmosphere may be contaminated**
 - “Fresh Air” Calibration should only be performed in a known clean environment

Auto Zero Calibration Limits

- LEL sensor reading ≥ 5 will cause
 - “LEL to High to Zero” appear
- CO sensor reading of ≥ 17 will cause
 - “CO to High to Zero” to appear
- In both cases a “Manual Zero” Calibration must be performed

Cannonball3 Menus

To enter menu system

- Press “MODE” to enter summary screen
- Press and hold “Left” arrow key until “EXIT” appears
- Press “Down” to highlight menu
 - “MODE” to enter Main Menu
- Using arrow keys
 - Highlight ALARMS from main menu and press “MODE”

INFORMATION		
Date	11 Jun 01	
Time of Day	21:19	
Runtime	00:05	
Points Logged	10	
Temperature	86F	30C
Dilution Pump	ON	
Battery		5.3V
Exit		
MENU		

Cannonball3 Menus

Main Menu – No Datalogger

MAIN MENU	
SCREEN	CALIBRATION
VIEW	ALARMS
TIME	OPTIONS
ID INFO	EXIT

Main Menu – with Datalogger

MAIN MENU	
SCREEN	CALIBRATION
VIEW	ALARMS
DATALOGGER	OPTIONS
ID INFO	EXIT

Cannonball3 Menus

Screen Submenu

- Contrast
 - Sets Display Contrast
- Backlight
 - Set duration backlight remains on after mode button is pressed

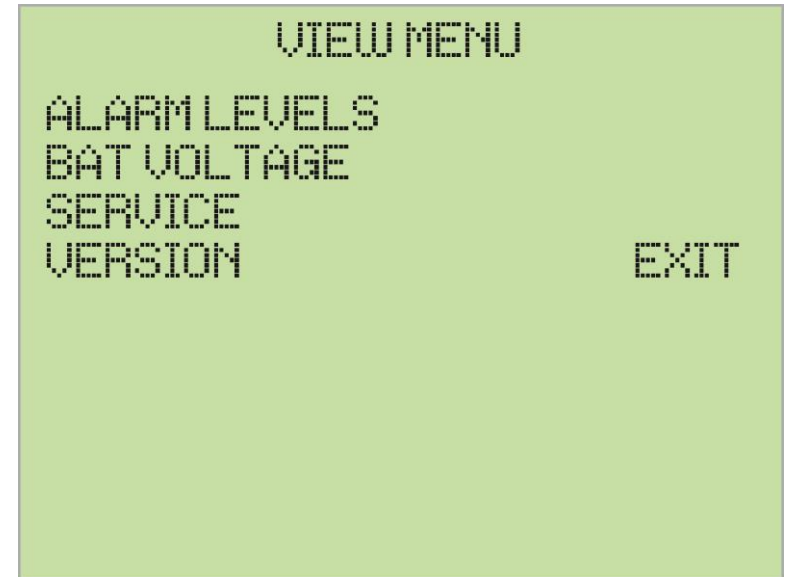
A screenshot of a green screen displaying a menu in a pixelated font. The text is centered and reads: SCREEN MENU, CONTRAST, BACKLIGHT, and EXIT, each on a new line.

SCREEN MENU
CONTRAST
BACKLIGHT
EXIT

Cannonball3 Menus

View Menu

- Alarm_levels
 - View current alarm settings
- Bat_Voltage
 - Displays current battery voltage
- Service
 - Displays Service direct phone number
- Version
 - Displays current software version



Cannonball3 Menus

Datalogger Menu

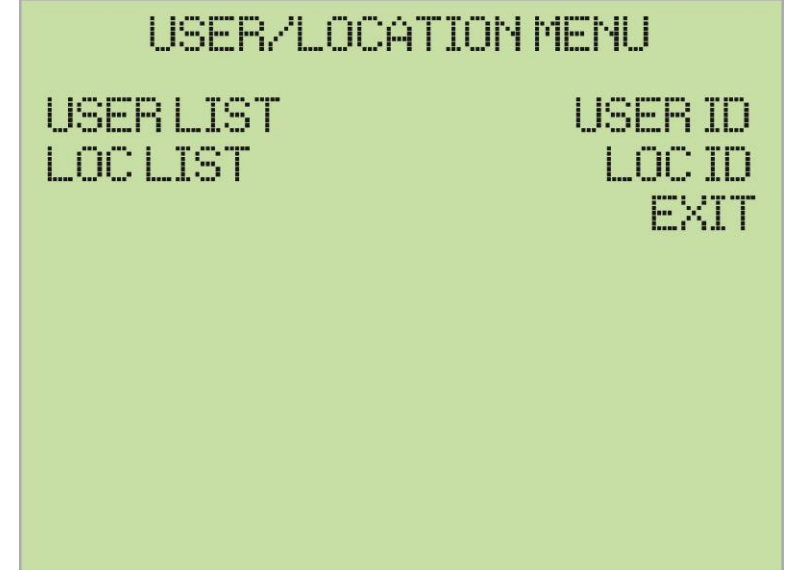
- Interval
 - Sets interval at which data is stored
 - 1 second to 1 hour
- Time/Date
 - Set System Time and Date
- Serv_Date
 - Set service due date for installed sensors
- Clear_DL
 - Clears entire datalogger memory
- Sessions
 - View session summary information
- Comm
 - Put unit into Communication Mode



Cannonball3 Menus

ID_INFO (User/Location Menu)

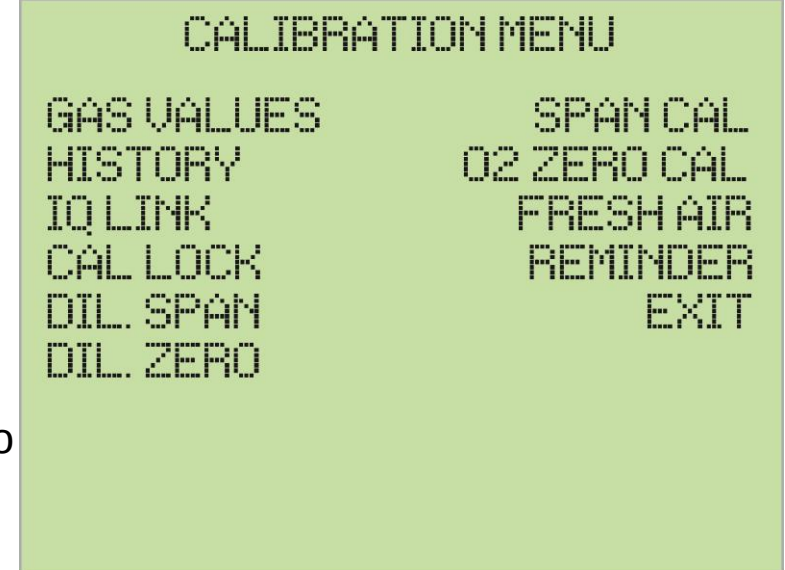
- USER LIST
 - Select or modify user list
- LOC LIST
 - Select or modify location list
- USER ID
 - Edit or select current user
- LOC ID
 - Select or modify current location



Cannonball3 Menus

Calibration Menu

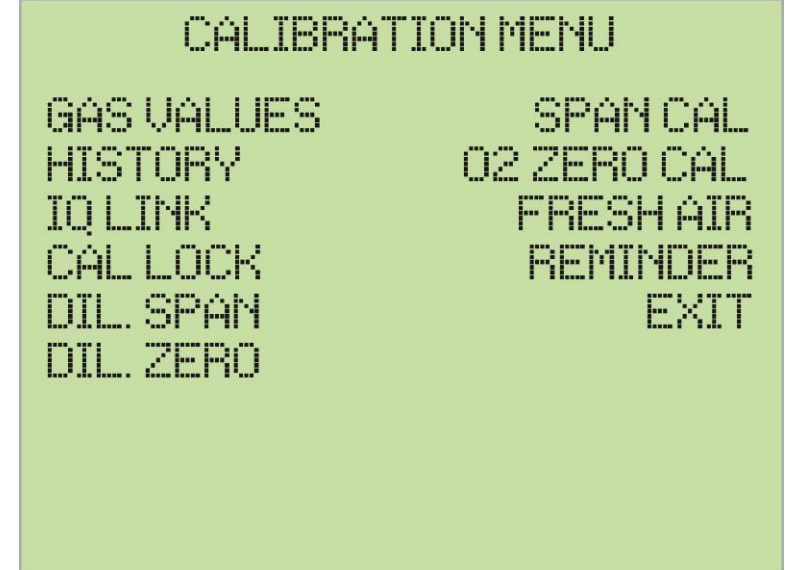
- Gas Values
 - Set instrument Auto-Calibration gas values
- History
 - Viewing last calibration dates
- IQ Link
 - Enable connection to IQ Data link after auto
 - calibration
- Cal Lock
 - Lock out if calibration due
- Dil. Span
 - Manual span calibration with dilution pump active
- Dil. Zero
 - Manual zero calibration with dilution pump active
- Span Cal
 - Manual Span calibration dilution pump disabled



Cannonball3 Menus

Calibration Menu (cont'd)

- O2 Zero Cal
 - True zero calibration of O2 sensor
- Fresh Air
 - Manual fresh air calibration dilution pump disabled
 - Overrides safety lockouts
- Reminder
 - Sets calibration reminder interval



Calibration Submenus

- LEL = Lower Explosive Limit
 - Measure gas combustibility neutrally over range of gasses (0 – 100% LEL)
- CH4 = Percent by Volume Methane
 - Compares combustible gas reading to methane combustibility scale (0 – 5%)

Alarms Menu

- Custom
 - Customize alarm settings
- Default
 - Set alarms to “Factory Default”
- Latch
 - OK Latch
 - Acts as a peak hold when unit is used in
 - “TEXT ONLY” mode
 - Alarm Latch
 - Latches alarm conditions until “MODE” is pressed
- Warnings
 - Enable, Adjust values, or set Time out values
- Temperature
 - Low Temp Alarm (Enable/Disable)
 - Allows instrument to operate below recommended temp range
 - High Temp Alarm
 - Allows instrument to operate above recommended temp range

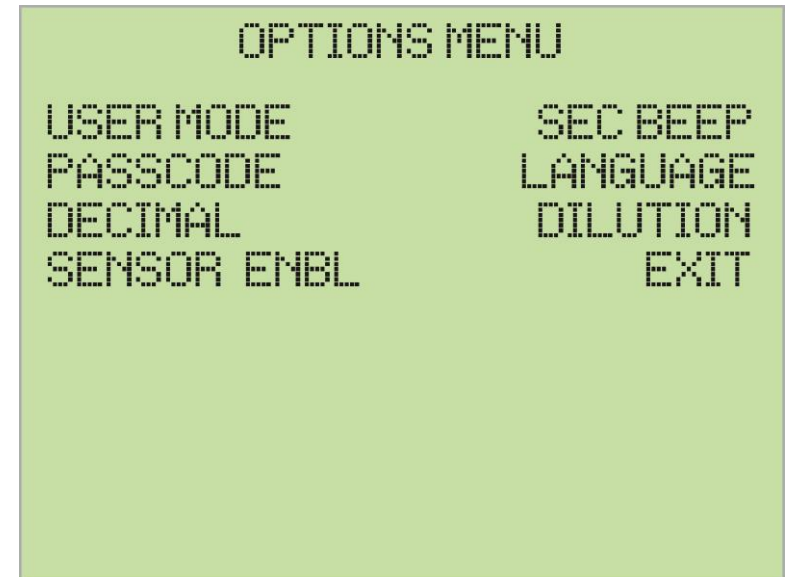


Cannonball3 Menus

Honeywell

Options Menu

- User Mode
 - Select mode unit will be in next powered
- Passcode
 - Set access code
 - Prevent unauthorized access to unit
- Decimal
 - Enables instrument to display x.x gas readings
- Sensor Enable
 - Enable / Disable Sensors
- Sec_Beep
 - Sets duration, at which will cause unit to beep to indicate it is still running
- Language
 - Select preferred operating language
 - English, Espanol, Portugues, Francais
- Dilution
 - Enable / Disable dilution pump



Backdoor passcode = 6457

Cannonball3 Diagnostics

To enter Diagnostic mode

- Select “EXIT” from main menu
- Select “YES”
- Push “MODE”
- Then push and hold “LEFT” arrow key
- Hidden Menu appears
- Select Diagnostics then press “MODE”



Cannonball3 Diagnostics

Honeywell

O2 Raw Count
34500-53200

LEL Raw Count
3000-13700

Diagnostics	O2	LEL
Raw Counts	39014	6653
Voltage	2048	-866
Reading	207	0
Uncor. Rdg.	207	-7
Zero Cal	40	-835
Span Cal	2072	1827
Dilution	206/0	238/58
In Sam	300 (245 - 332)	307
122 Dil	123 (65 - 150)	130
SAM. HIGH	DIL. OFF	PMP 0

Inlet
50-250 (Norm)
900-1023 (BLK)

Dilution Pump
270-480(Norm)
0 - 230 (BLK/OFF)

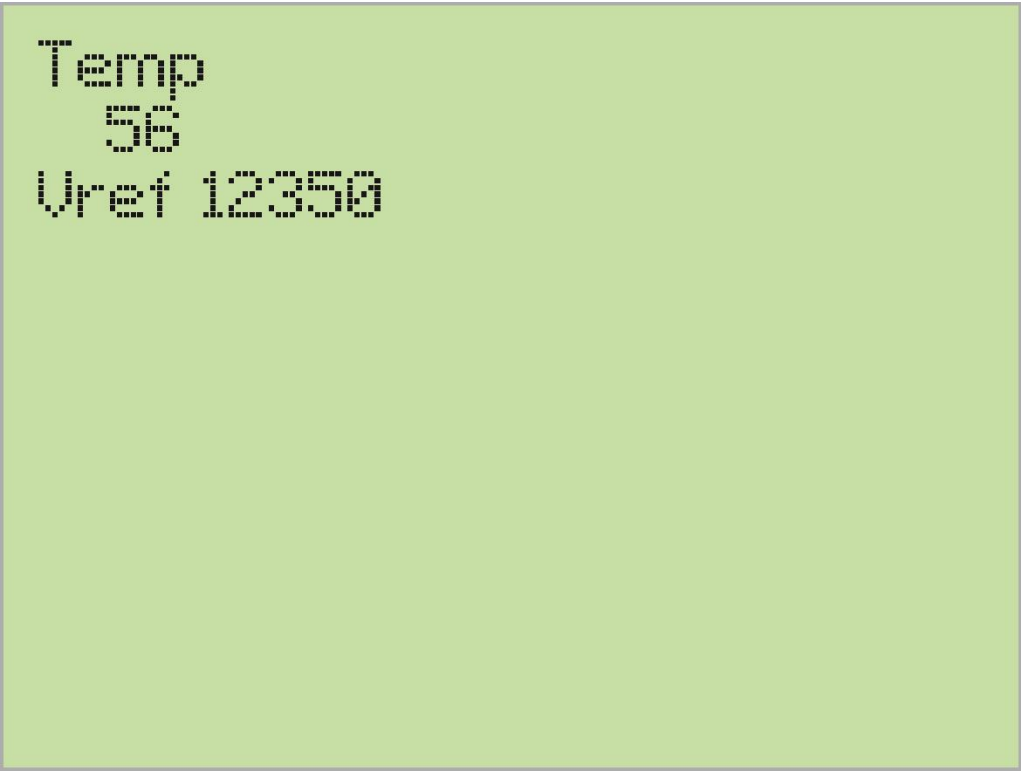
Sample Pump
270-450(Norm)
0 - 230 (BLK)

Cannonball3 Diagnostics

Diagnos.	CO	H2S	XXX	
Raw Cnt	26595	26551	26559	26200-27900
Voltage	12175	12151	0	12000-12770
Reading	0	0	0	
Uncor.	-3	-5	0	
0 Cal	12184	12185	0	
Sp Cal	189	560	0	
Dil sp	207	224	256	
Dil 0	-3	-1	2	
XR XX	Samp	1	Dil	1
SAM. HIGH	DIL. OFF	PMP	0	

Cannonball3 Diagnostics

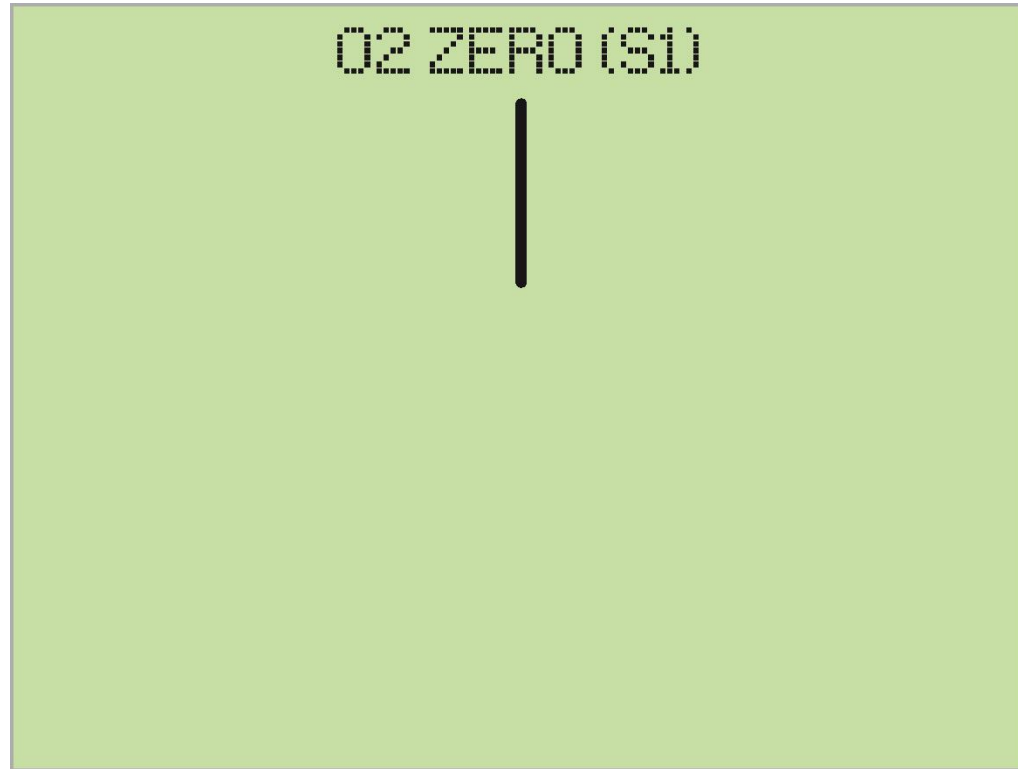
Honeywell



Temp
56
Uref 12350

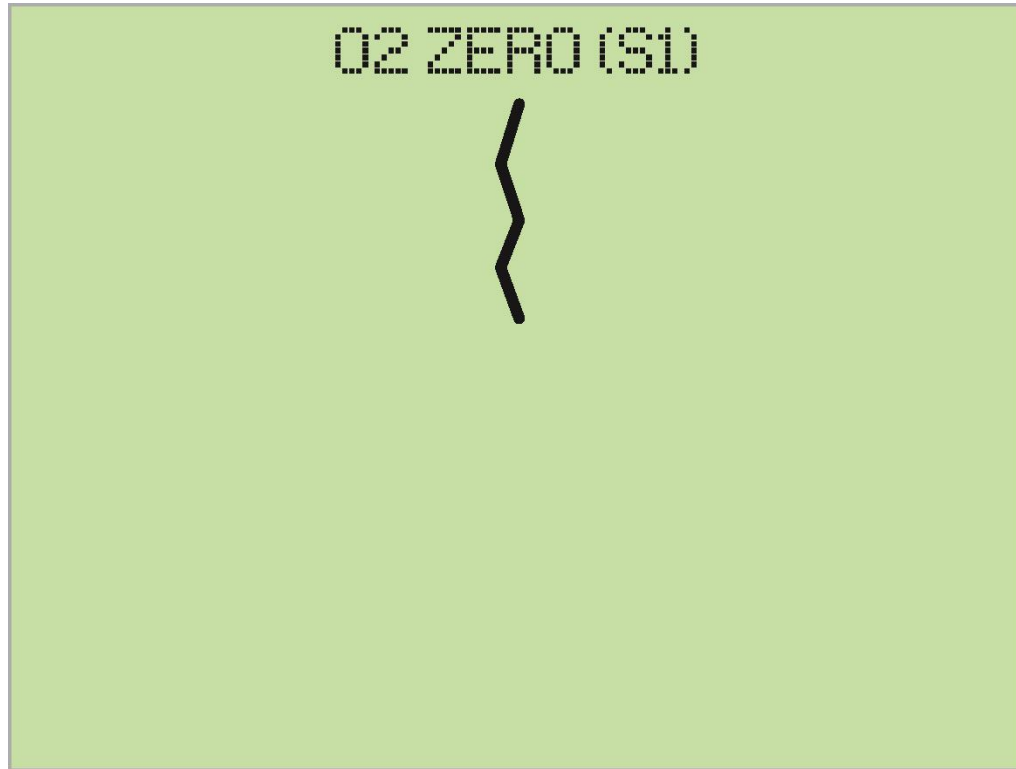
Cannonball3 Diagnostics

- Straight lines are factory defaults



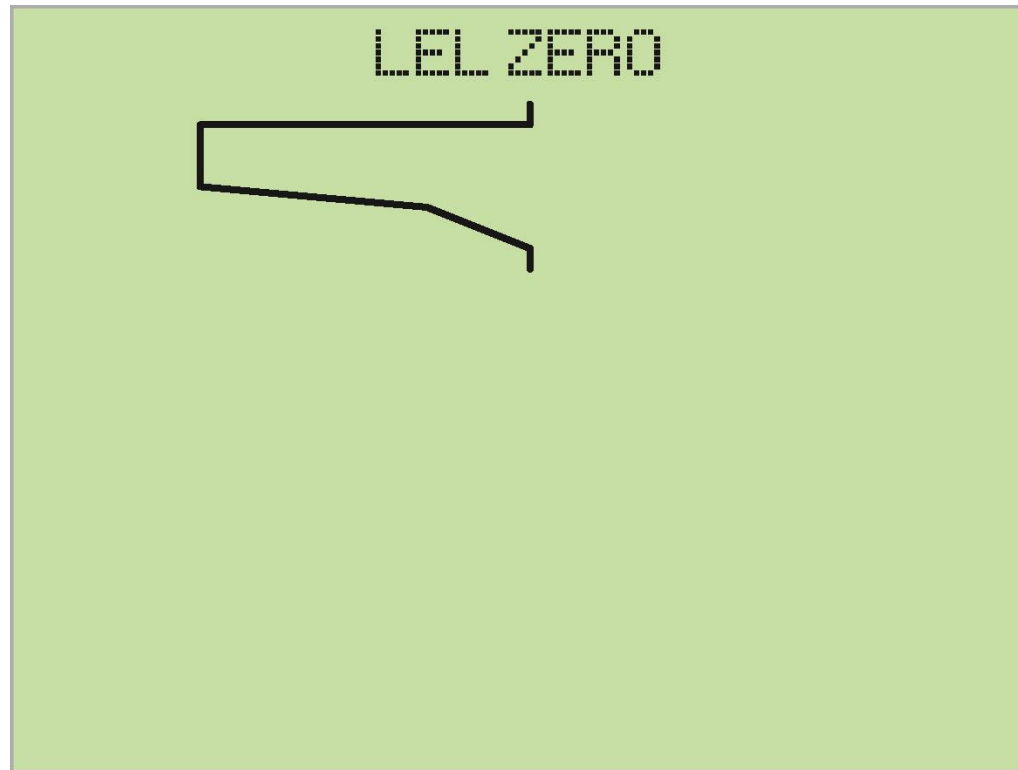
Cannonball3 Diagnostics

- These are normal compensation curves



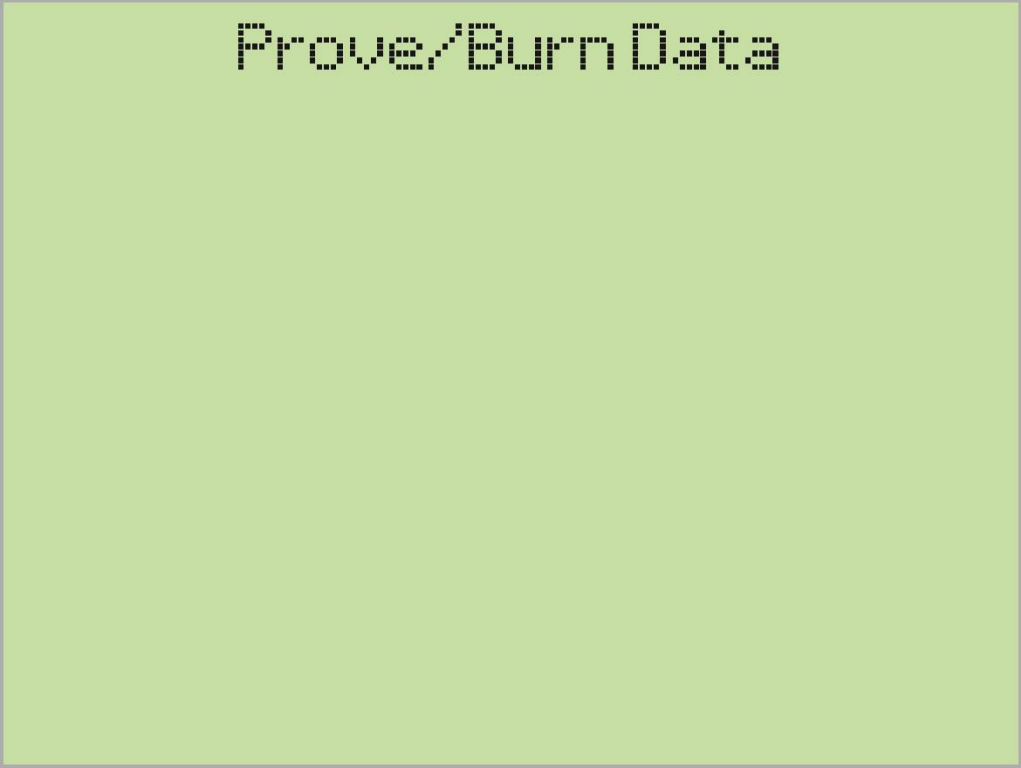
Cannonball3 Diagnostics

- If a customer complains of drifty sensor or sensor will not calibrate and curves look like this...
 - You need to initialize sensor



Cannonball3 Diagnostics

- No useful field information



Prove/Burn Data

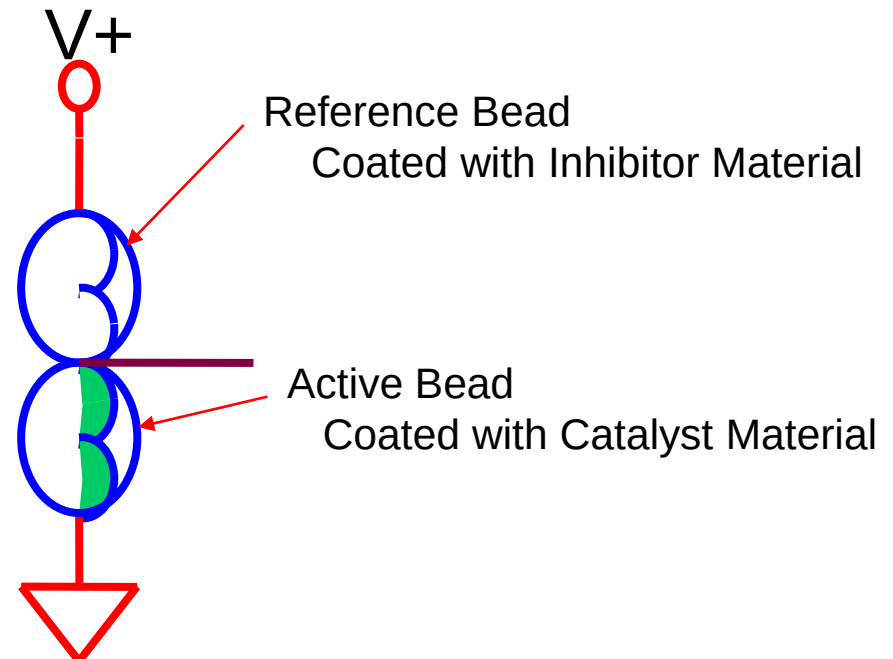
Cannonball3 Diagnostics

Press	
Nav keys	Exit
Filter Constant	100
Total Run time	30:55
Backlight	170
Batt Count	468
Batt Volt	519
Batt Type	0

- O2 sensor Diagnostics
 - If counts below ranges
 - Replace sensor
 - If counts are above allowable range
 - 1) Check sensor for physical damage
 - 2) Sensor has had enough time to warm up (20 Minutes)

Cannonball3 Diagnostics

- LEL Sensor Diagnostics
 - If counts far above or below
 - Replace sensor – physical damage
 - Most Common Damage
 - Physical
 - Dropped/Abuse
 - Poisoning
 - Silicones
 - Chlorinated Hydrocarbons



Toxic Sensor Diagnostics

- If counts far above or below
 - Remove sensor from board
- If counts return to normal
 - Replace sensor
 - May have a board problem

Note

- Common situation
 - CO sensor diagnostic counts are over 64800
 - Usually a sign unit was used to test exhaust gas - car, truck, forklift
- CO sensor designed to handle 1000 ppm
 - Typical vehicle exhaust between 2 - 4 % (20000 - 40000 ppm).

Canonball3 Diagnostics

Honeywell

Unit Initialization

- In Diagnostic mode
 - Select Initialization then press “MODE”
 - Select “SENSOR”



SENSOR
MISC
EXIT

Cannonball3 Diagnostics

Honeywell

Initialize sensor

- Select correct sensor from list

INIT SENSOR MENU

O2	TOX1
LEL	TOX2

INIT MISC MENU

- Inst
 - Initializes main configuration settings
- Unit
 - Initializes main unit EEPROM
- **This is a LAST RESORT**



Other initializations must have fixtures to be completed
Do not do these in the field

Cannonball3 Disassembly

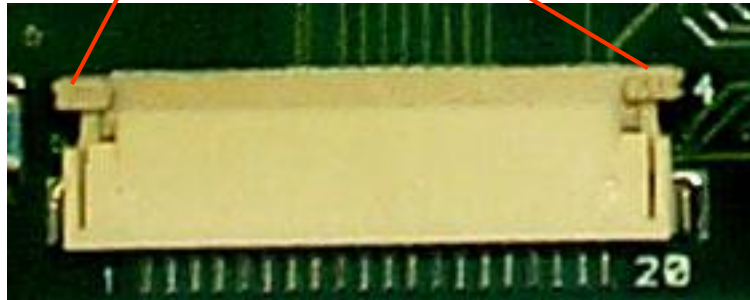
- Remove 6 Philips head screws
- Remove 4 5/16 standoffs
- Remove 1 Philips head screw from center of board
- Lift main board up and away from upper case
- Disconnect display board connector and alarm connector



Cannonball3 Disassembly

- To release display and keypad ribbon cables
 - Push up on locking tabs and slide cable from connector

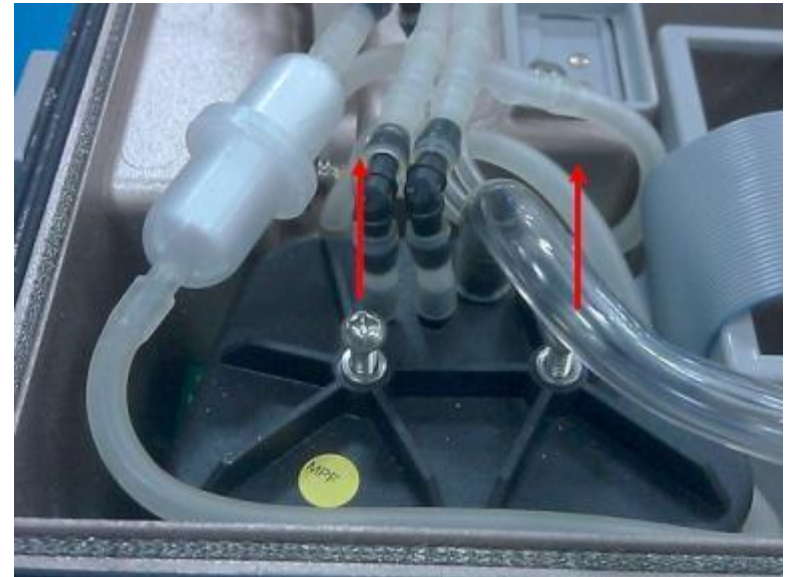
Locking Tabs



Canonball3 Sensor Replacement

Honeywell

- Remove 2 Phillips screws and 3 tubes from sensor cover
- Remove sensor cover by lifting straight up
- Replace sensors as needed
 - Pull old sensor straight up
 - Align sensor pins properly before pressing straight down
 - Proper sensor placement printed on sensor board



Cannonball3 Pump Replacement

Honeywell

- Turn unit on back side
- Loosen two flat head machine screws holding the pump assembly.
 - Locate notches, use small flat head screwdriver to pry out pump assembly
 - Pull pump assembly out of unit.
- Install new O-ring into designated shelf
- Install new pump assembly
 - Line up inlets and electrical connections
 - Ensure O-ring stays properly seated
 - Use body weight on a stable surface to press pump assembly down as flush as possible with back housing
- Tighten flat head machine screws
 - Alternate sides as tightening
- Activate unit and ensure pump passes self test



Cannonball3 Battery Replacement

- Alkaline Batteries
 - Loosen retainer screw and remove battery
 - Remove any batteries already installed
 - Insert 5 D cell batteries
 - Replace battery cover and hand tighten battery cover retainer screw
 - Verify proper voltage on each contact
 - Far left contact is ground
 - Each contact should produce 8 volts or greater



Positive Contacts

Ground Contact

Cannonball3 Filter Replacement

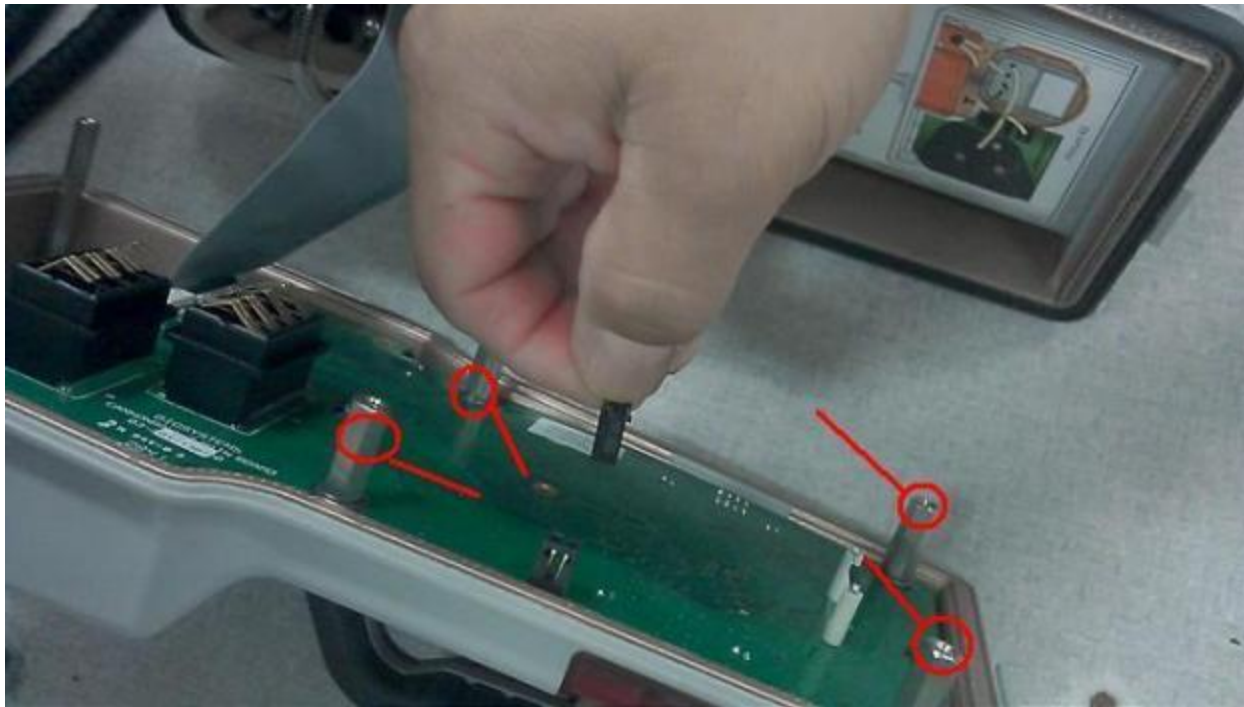
Honeywell

- Loosen and remove filter cover retainer
- Pull 2 particulate filters (60-077) and 1 hydrophobic filter (61-078) from both filter inlets.
- Inspect O-rings (17-057) on filter cover (10-404)
 - Replace if cracked or damaged
- Replace 2 particulate filters (60-077) and 1 hydrophobic filter (61-078)
- Reinstall clear filter cover
 - Make sure to press both sides down equally to seat O-rings
 - Filter cover must be flush with housing
 - Retighten captive screw



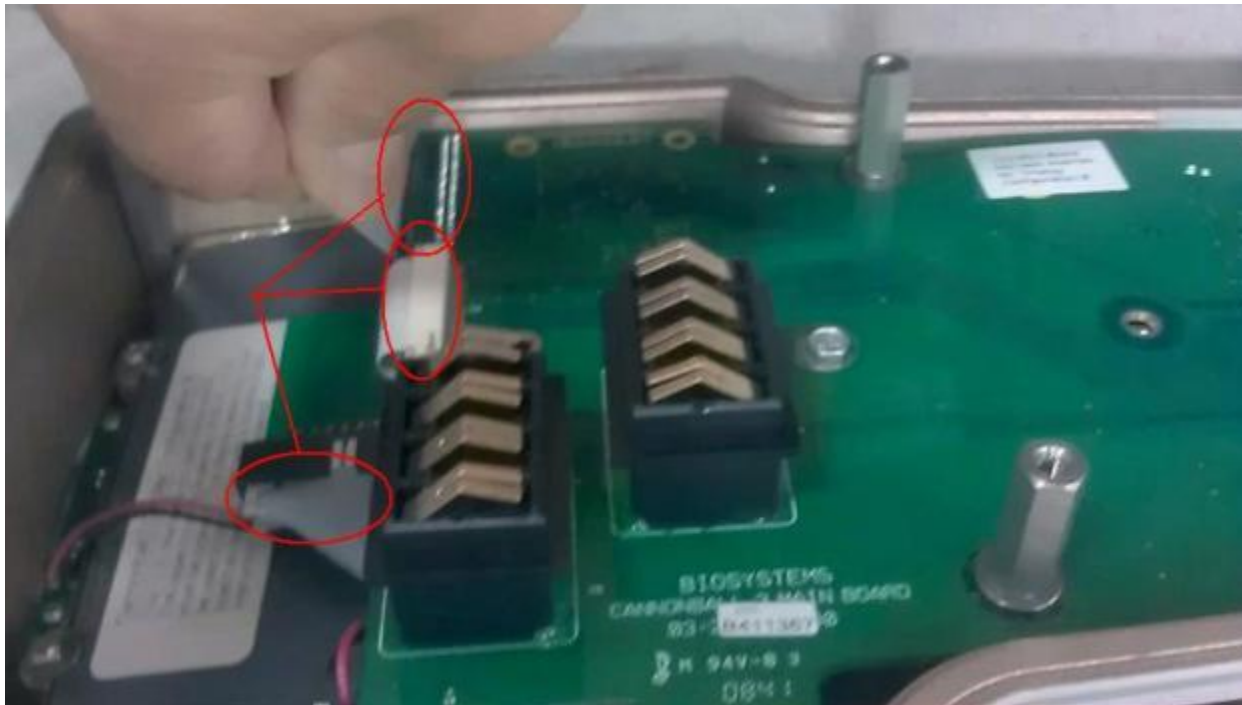
Cannonball3 Reassembly

1. Connect alarm LED and display ribbon cables
2. Screw in 4 standoffs loosely
 - Install center screw tightly then fully engage 4 standoffs



Cannonball3 Reassembly

3. Reconnect sensor board ribbon cable
 - Carefully align pins
 - Ensure connectors are fully seated to prevent malfunction



Cannonball3 Reassembly

Honeywell

4. Reconnect alarm cable to main board



Cannonball3 Reassembly

5. Place top and bottom case halves together



Cannonball3 Reassembly

Honeywell

6. Ensure inlet and exhaust tubing are not pinched when placing halves together
 - Verify tubing placement with instrument's internal instruction label.

Note:

Improper tubing placement will result in pump malfunction



Cannonball3 Reassembly

Honeywell

7. Ensure front and rear D-Rings are placed properly before closing unit fully



Cannonball3 Reassembly

Honeywell

8. Install case bottom screws loosely then hand tighten starting in the center and working towards edges.

Note

Do NOT overtighten case screws

Case screw bosses and internal standoff damage will result



Cannonball3 Calibration

- Turn Unit On
- Wait 2 minutes
- Press “Mode” button 3 times in 2 seconds
 - Unit displays “One Button Auto Calibration”
- Press “Mode” before 5 second countdown reaches zero
 - Unit displays “Zero Calibration *Please Wait*”
 - Unit displays “Zero Calibration Completed”
- When display reads “Span Calibration”
 - Press “MODE”
 - Unit displays “Apply Gas”
 - Unit performs Auto-Calibration then shuts down

Questions?



IQ-Series Database Installation

Honeywell

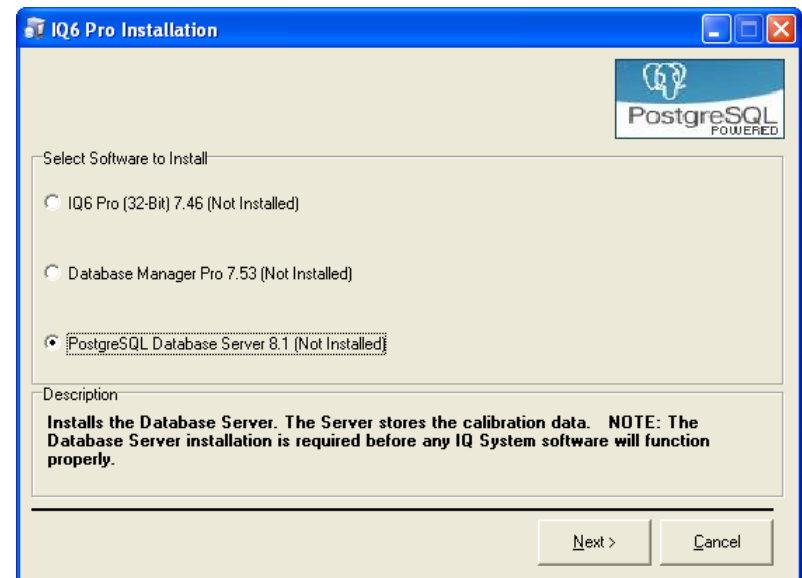
- IQ Administrator Pro
 - Installs and controls PostgreSQL Database Server
- IQ Database Manager Pro
 - Controls access to data and settings in database
- IQ Express Pro
 - Provides interface and control of IQ docking stations
- PostgreSQL Database Server
 - Database used to store all data and setting from instruments
- IQ DataLink
 - Data management program automatically uploads instrument and calibration information from gas detectors into IQ Database
- BioTrakII
 - Data management program designed for use with docking stations
 - Used to
 - Store and view data from session downloads
 - Program specific user requirements into gas detectors

Caution

- This part most difficult
 - Allow 20-30 minutes for basic install
- Do NOT plug docks in prior to software installation

Postgre SQL Server

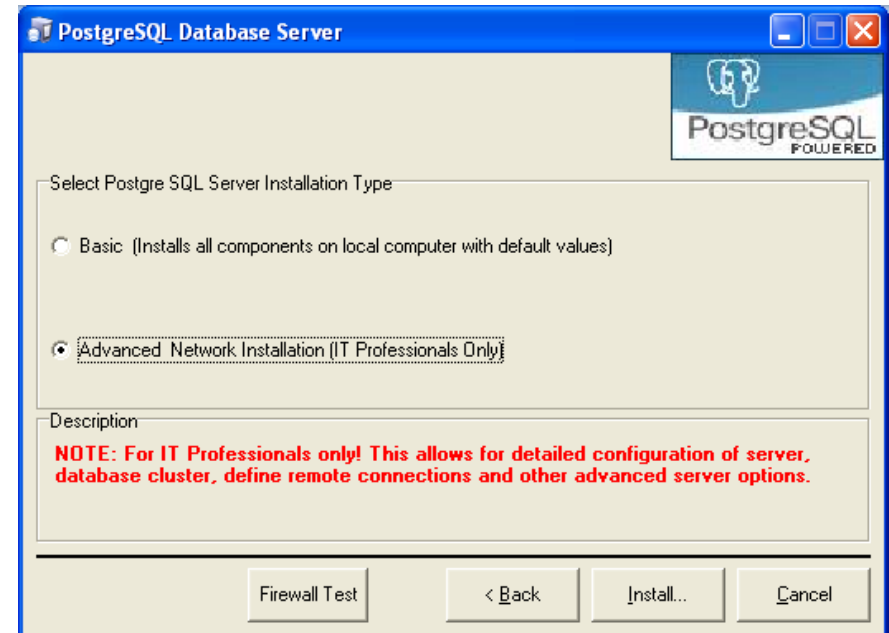
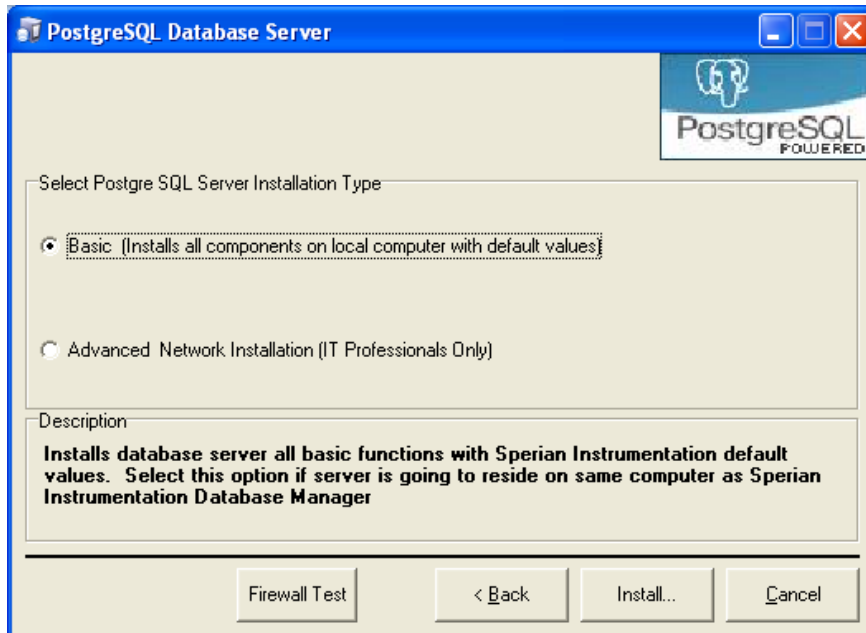
- Administrator-level system access required to implement some changes necessary to install database server
 - Do not begin installation without administrator level system access
 - Database server must be installed from PC or network server's console
 - Server may not be installed remotely
1. Place IQ Software disk into CD drive
 - Screen shown when CD boots up – differs slightly for each IQ Pro program
 2. Select PostgreSQL Database Server
 - Click “Next”



Installation

Select Installation Type

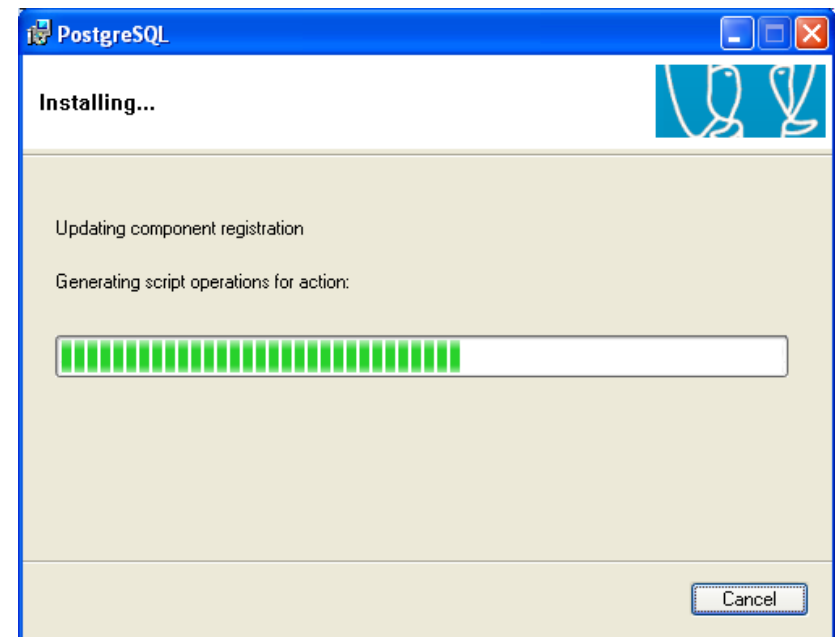
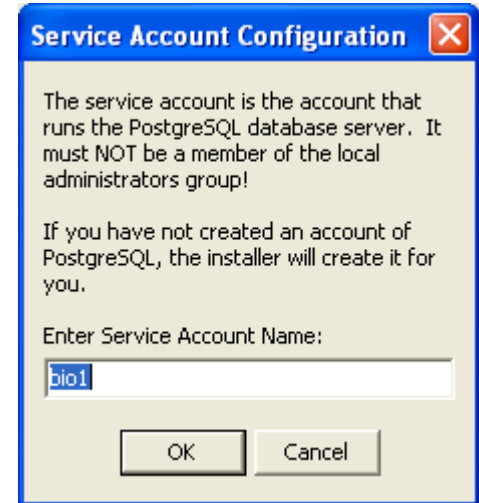
- Single PC - Basic Installation
- Network server - Advanced Network Installation



Installation

Basic Installation

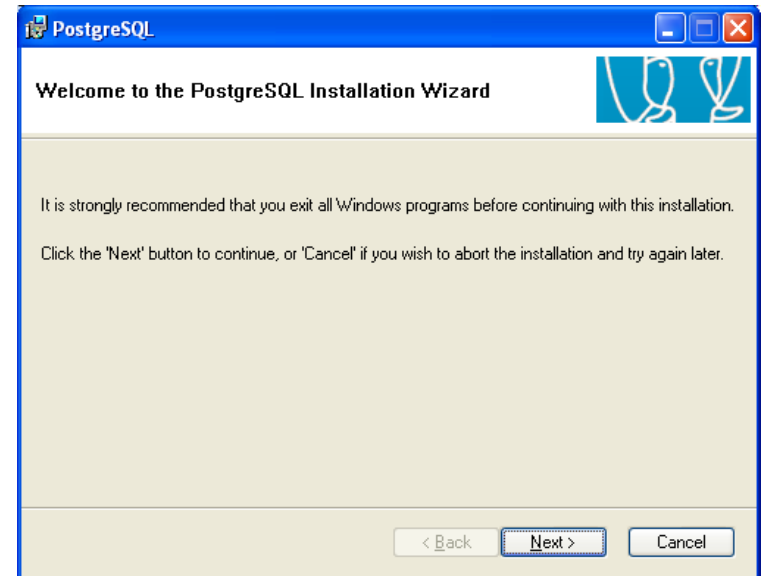
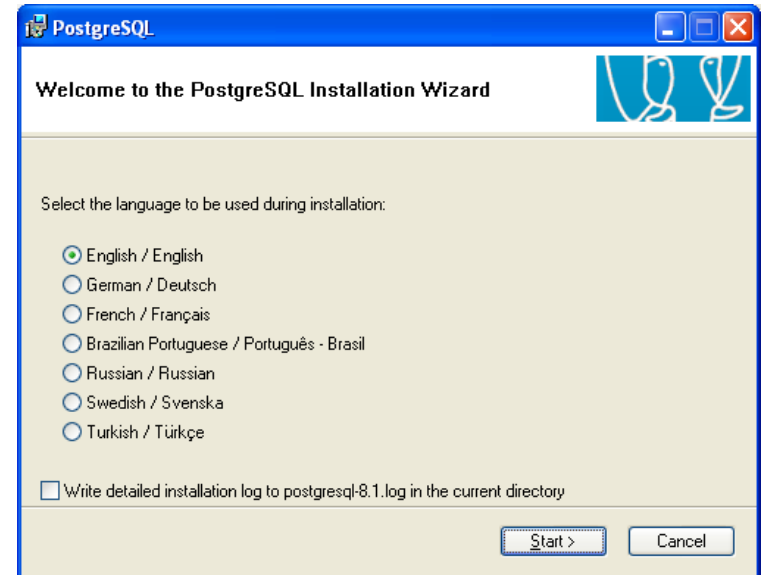
- Click “Install”
- Service Account Configuration screen shown
 - Prompts for Service Account Name
 - Service account is account running database server
 - Must not be same name as a local administrator
 - Default Service Account Name “bio1”
 - Generally used
- Postgre SQL database now installed



Installation

Advanced Network Installation

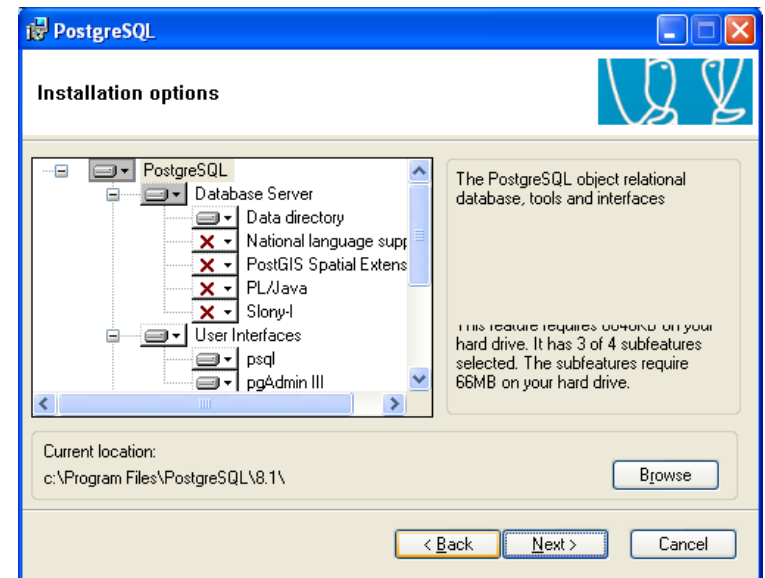
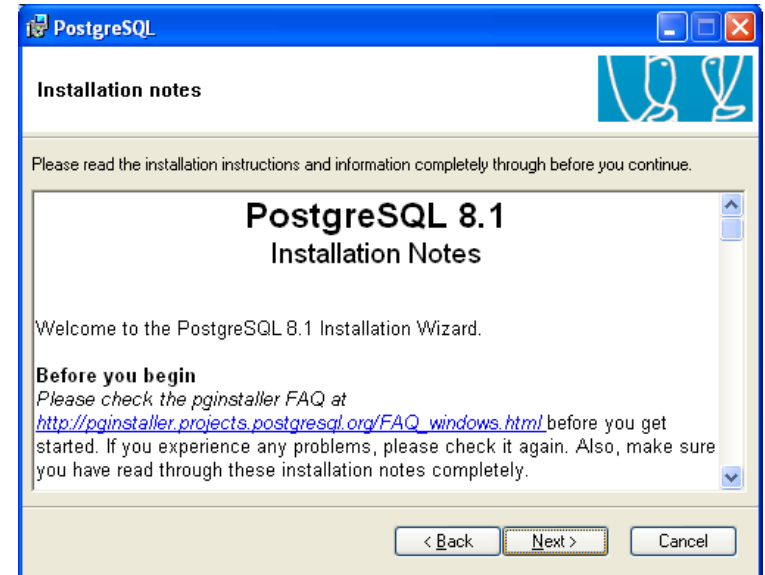
1. 2. Click “Install”
 - Installation language screen displayed
2. Select language to be used during installation
 - Click “Start” to begin
3. Close all programs currently running then click “Next”
 - Installation Notes shown



Installation

Advanced Network Installation (cont'd)

4. Installation Notes contain information on the legal status of the PostgreSQL software and an FAQ link
5. Installation Options displayed
 - Use “Browse” to select database location
 - Install user interfaces and data directory on same machine
 - Data directory should be backed up regularly
 - When complete Service Configuration screen shown

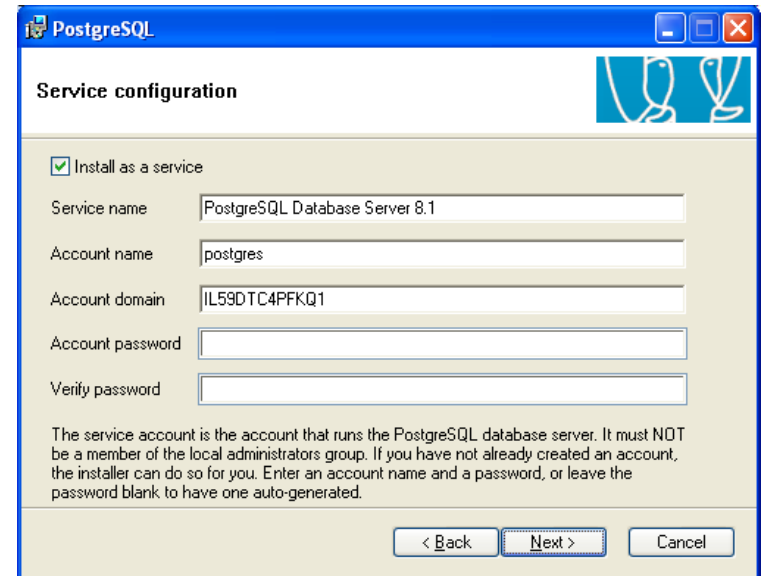


Installation

Advanced Network Installation (cont'd)

6. Account domain may be automatically generated by your network
 - Enter an account name and a password
 - Name and password are used to run database server
 - Choose a password that meets your company guidelines

- Enter password again in “Verify Password”



The image shows the PostgreSQL Service configuration window. The title bar is blue with the PostgreSQL logo and the text 'PostgreSQL'. The window has a standard Windows XP-style title bar with minimize, maximize, and close buttons. The main area is titled 'Service configuration' and contains a checkbox labeled 'Install as a service' which is checked. Below this are five text input fields: 'Service name' (containing 'PostgreSQL Database Server 8.1'), 'Account name' (containing 'postgres'), 'Account domain' (containing 'IL59DTC4PFKQ1'), 'Account password' (empty), and 'Verify password' (empty). At the bottom of the window are three buttons: '< Back', 'Next >', and 'Cancel'. A small icon of three people is in the top right corner of the main area.

PostgreSQL

Service configuration

☒ Install as a service

Service name: PostgreSQL Database Server 8.1

Account name: postgres

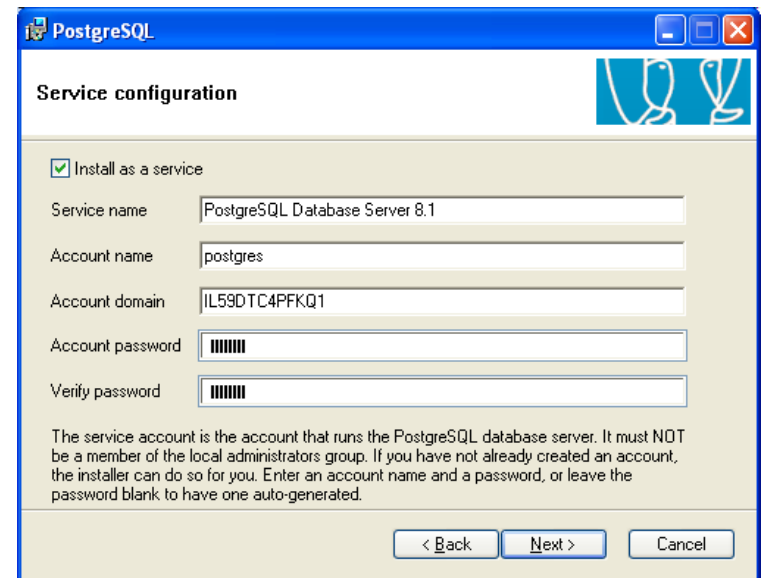
Account domain: IL59DTC4PFKQ1

Account password:

Verify password:

The service account is the account that runs the PostgreSQL database server. It must NOT be a member of the local administrators group. If you have not already created an account, the installer can do so for you. Enter an account name and a password, or leave the password blank to have one auto-generated.

< Back Next > Cancel



This image is identical to the one above, but the 'Account password' and 'Verify password' fields are now filled with eight asterisks (password masking). The rest of the window, including the title bar, buttons, and text, remains the same.

PostgreSQL

Service configuration

☒ Install as a service

Service name: PostgreSQL Database Server 8.1

Account name: postgres

Account domain: IL59DTC4PFKQ1

Account password:

Verify password:

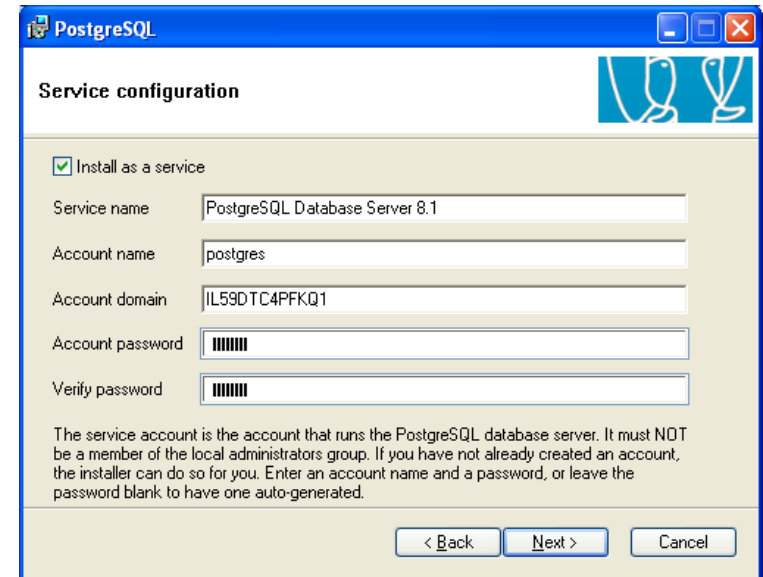
The service account is the account that runs the PostgreSQL database server. It must NOT be a member of the local administrators group. If you have not already created an account, the installer can do so for you. Enter an account name and a password, or leave the password blank to have one auto-generated.

< Back Next > Cancel

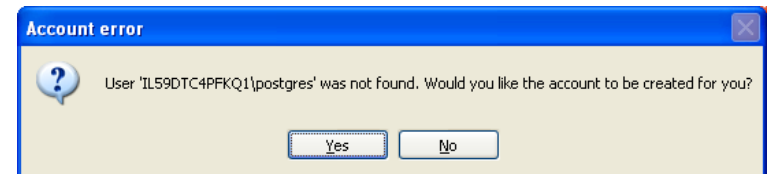
Installation

Advanced Network Installation (cont'd)

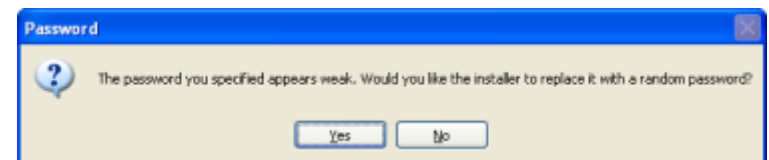
7. When password has been verified, press “Next”
 - The following two screens may be shown depending on the configuration of your network and your password choice.



8. Click “Yes” to create database account



9. Click “Yes” if you prefer to use a system generated password

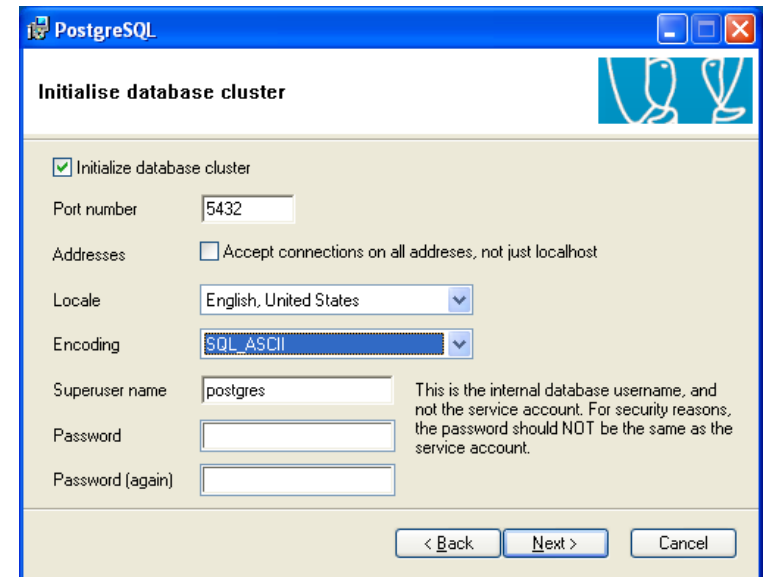
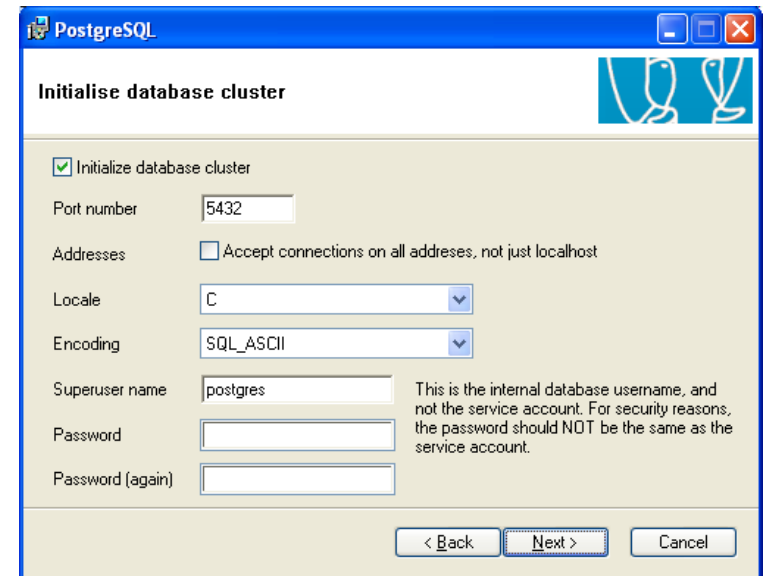
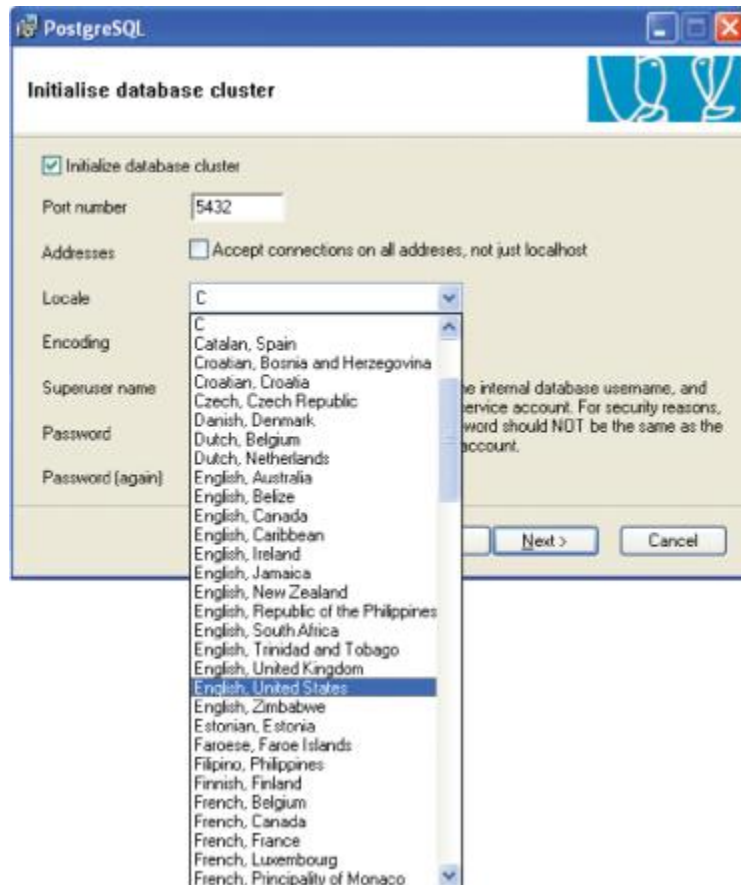


Installation

Advanced Network Installation (cont'd)

10. Installing the database cluster.

- Select appropriate locale

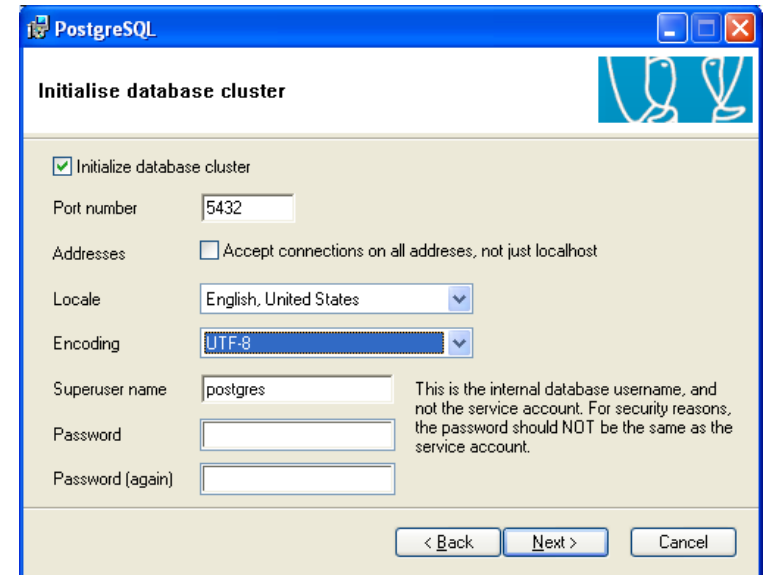
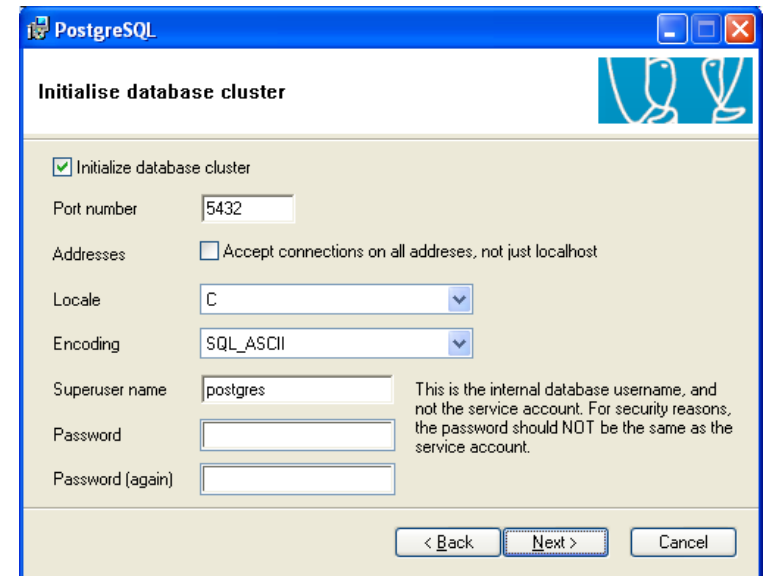
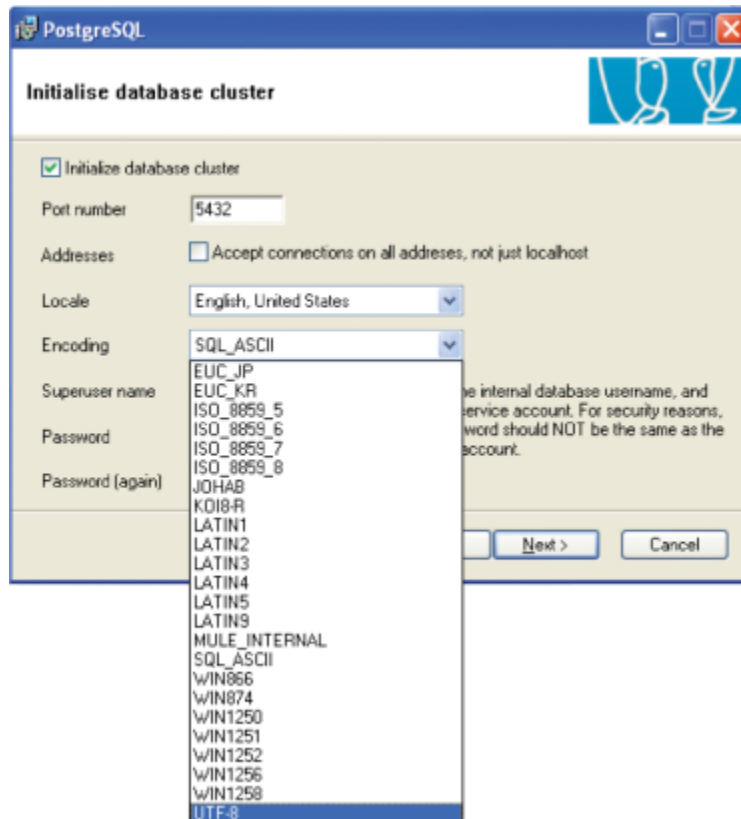


Installation

Advanced Network Installation (cont'd)

11. Click "Encoding" and change to UTF8

- Defaults to SQL ASCII



Installation

Advanced Network Installation (cont'd)

12. Enter a password then enter it again in to verify it

- Password used later in installation

13. To access database from external addresses

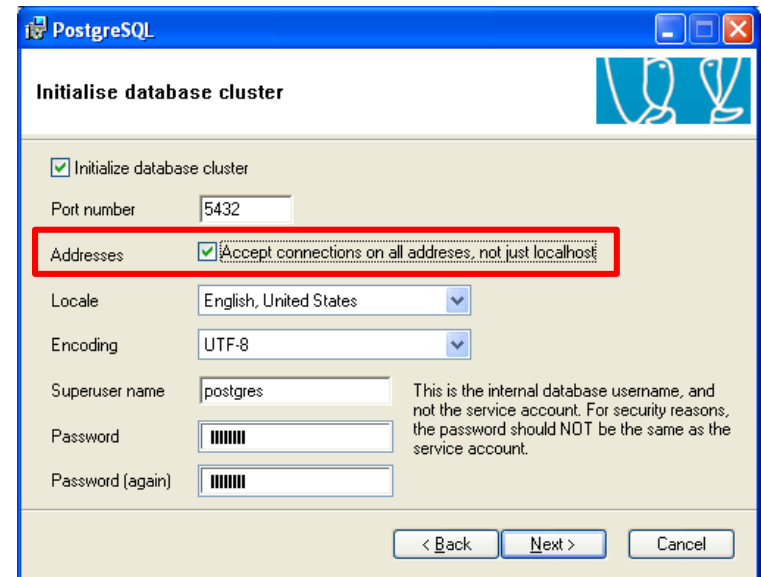
- Click checkbox next to Addresses
- When allowing external address access to database, particular modifications are necessary
- Will be covered in detail



The image shows the 'PostgreSQL' window titled 'Initialise database cluster'. It contains the following fields and options:

- ☒ Initialize database cluster
- Port number: 5432
- Addresses: ☒ Accept connections on all addresses, not just localhost
- Locale: English, United States
- Encoding: UTF-8
- Superuser name: postgres
- Password: [masked]
- Password (again): [masked]

At the bottom right, there is a note: 'This is the internal database username, and not the service account. For security reasons, the password should NOT be the same as the service account.' Navigation buttons at the bottom are '< Back', 'Next >', and 'Cancel'.



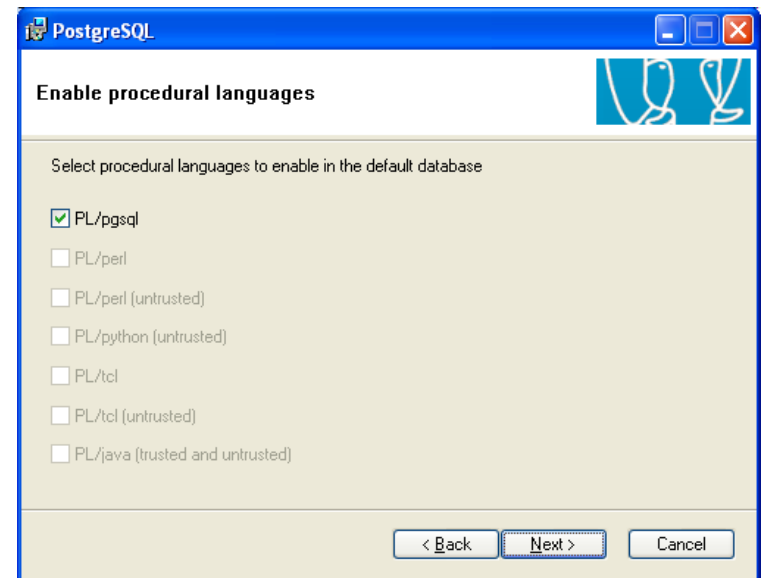
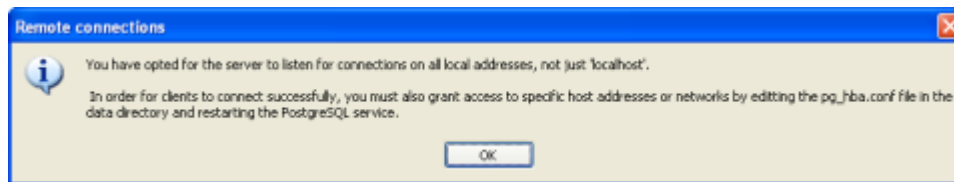
This image is identical to the one above, but the 'Addresses' row is highlighted with a red rectangular box to emphasize the selection of 'Accept connections on all addresses, not just localhost'.

Advanced Network Installation (cont'd)

14. Click OK

- Procedural language settings shown

15. Click “Next” with “PL/pgsql” selected



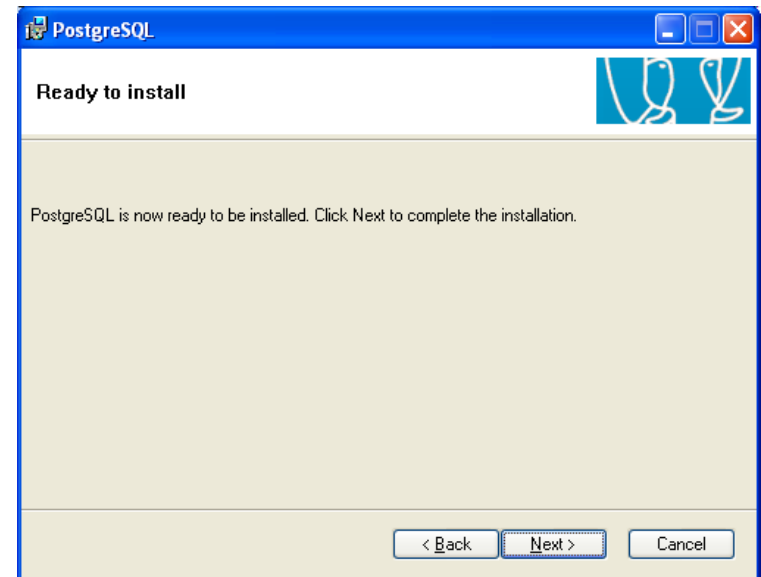
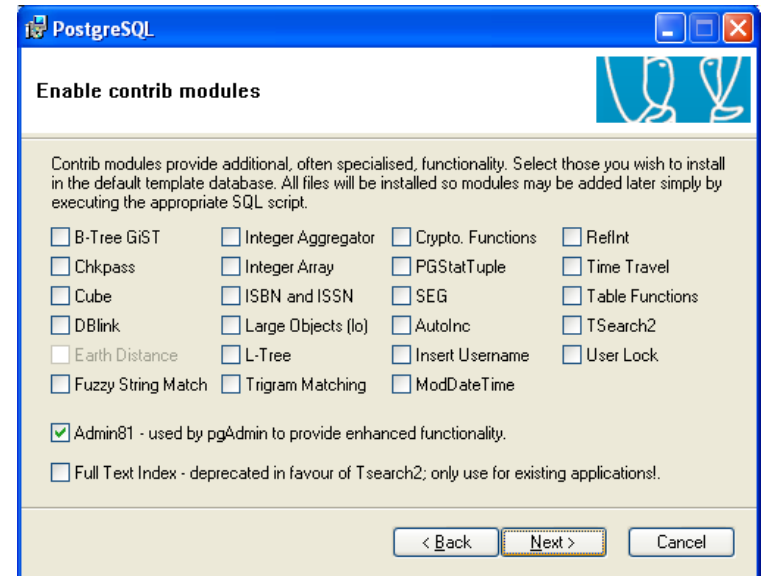
Installation

Advanced Network Installation (cont'd)

16. Contrib modules do not need to be enabled

- Click “Next” with Admin01 only enabled selection
- Ready to Install screen shown

17. Click “Next” to install



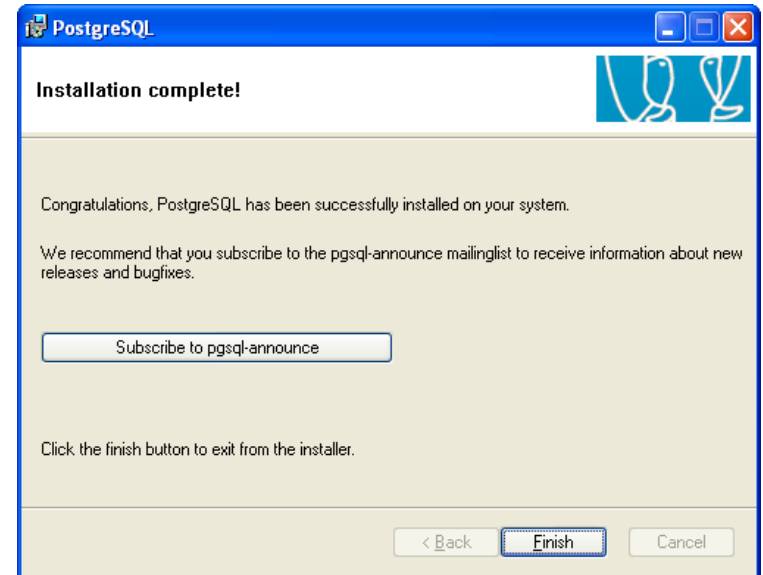
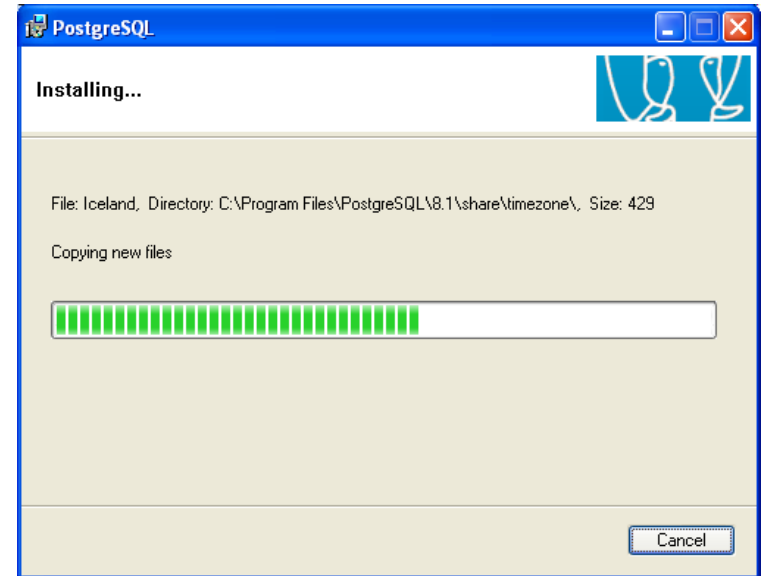
Installation

Advanced Network Installation (cont'd)

- Installation progress displayed
- When installation is complete window displayed

18. Click “Finish” to complete installation

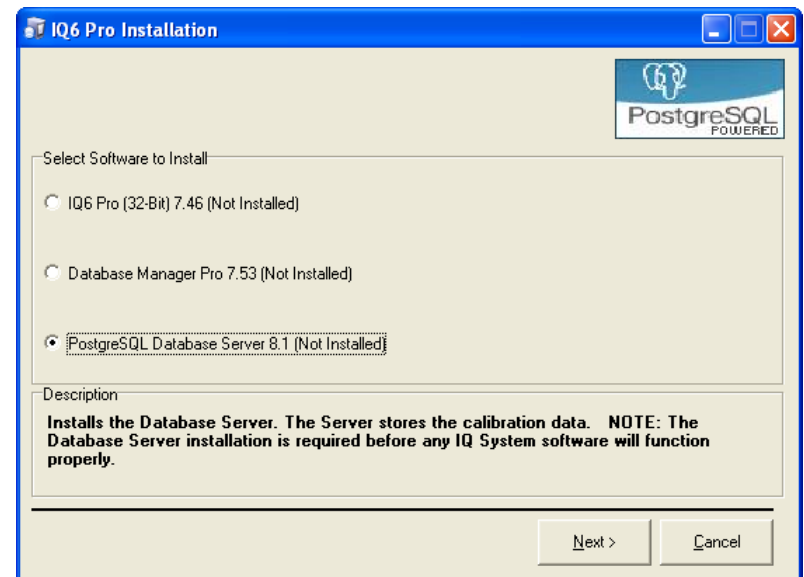
- Click on “Subscribe to pgsql-announce” to receive announcements on new releases and bug fixes – optional.



Advanced Network Installation (cont'd)

19. Returns to software installation screen

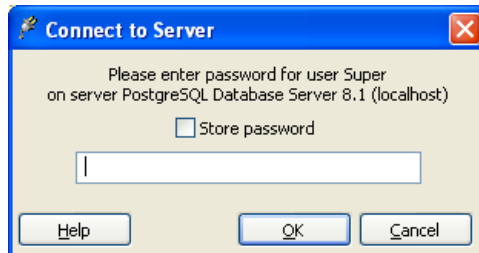
- Postgre's client access settings must be configured prior to use



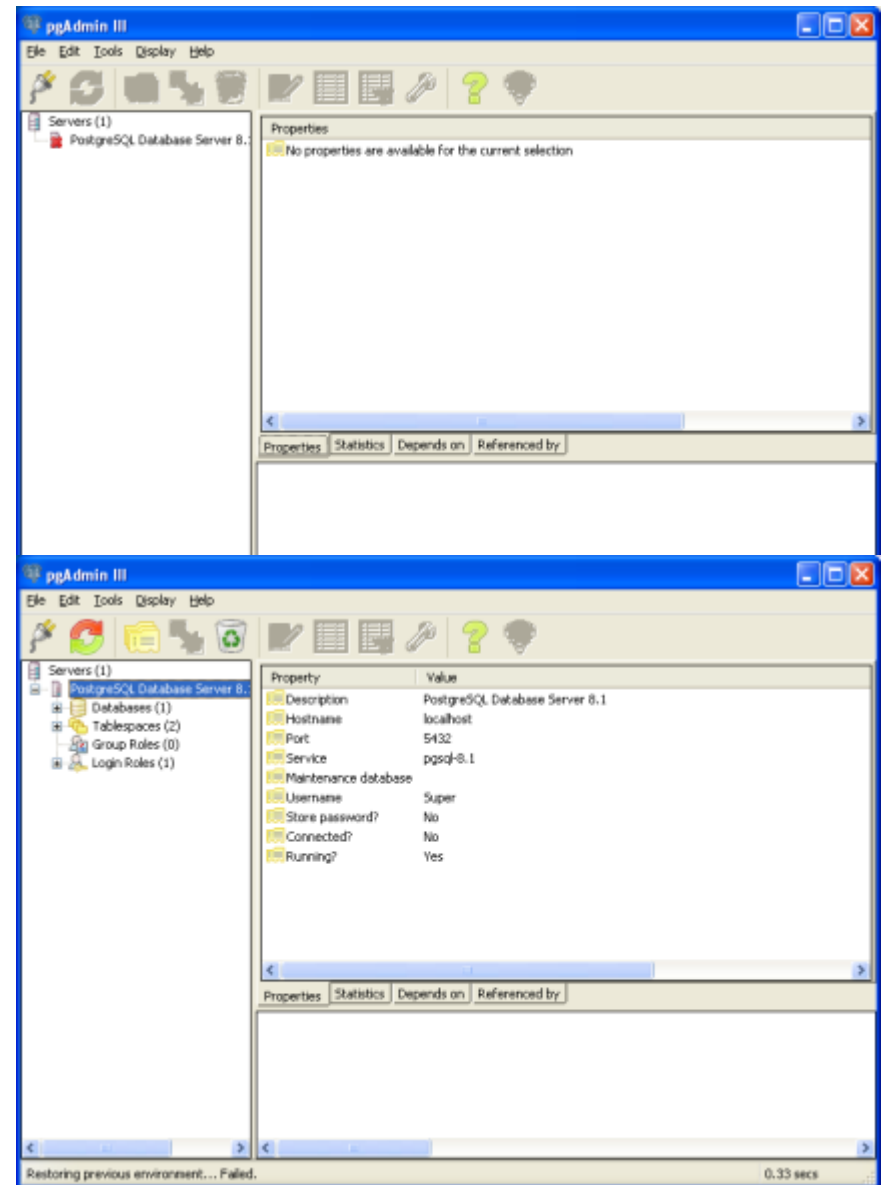
Client Access Configuration

Client Access Settings

- Controls database access when located on a network
 - Configuration options under: All Programs / PostgreSQL 8.1 / pgAdmin III
1. Under “Servers”, double-click “PostgreSQL Database Server 8.1”
 - Password required - enter Database User password



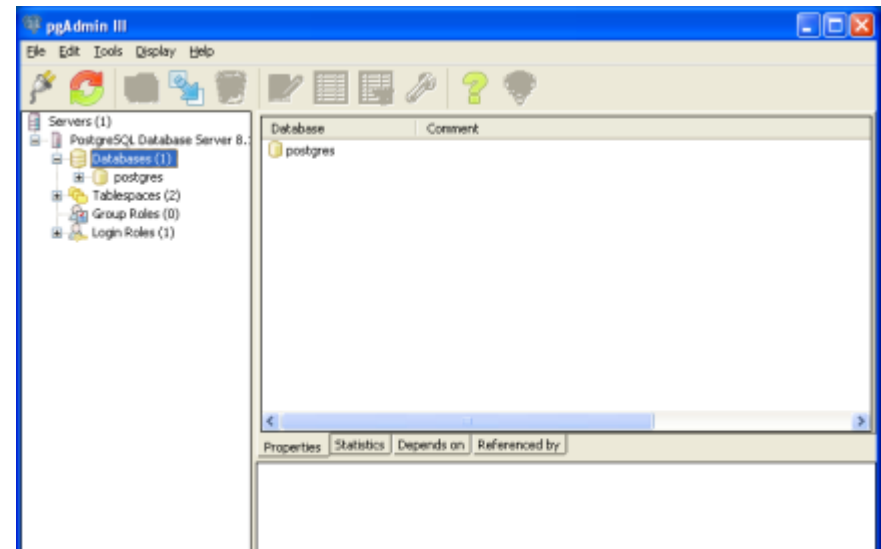
2. Press OK
 - Config Screen shown



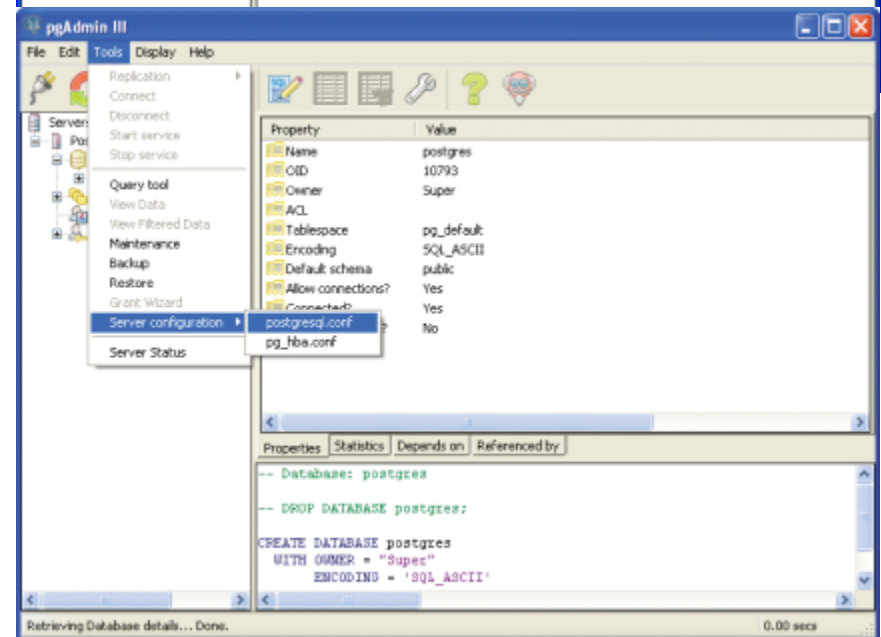
Client Access Configuration

Client Access Settings (cont'd)

3. Click on “Databases” then specific database to configure



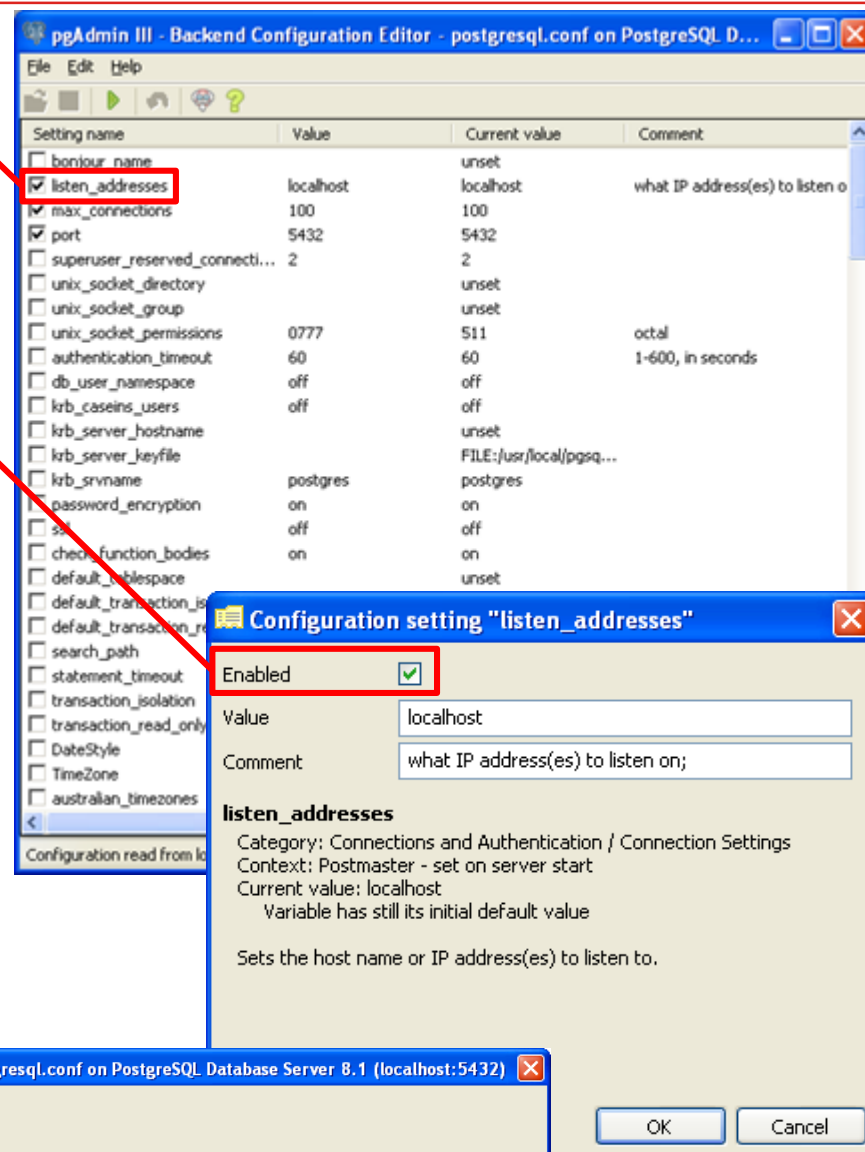
4. From “Tools” menu
 - “Server Configuration / postgresql.conf” to access configuration settings



Client Access Configuration

Client Access Settings (cont'd)

5. In “Backend Configuration Editor”, double click on “listen_addresses”.
 - Config settings for listen addresses shown
6. Click enabled box
 - Default entry for Value “localhost”
 - Change to an asterisk (“*”)
 - “localhost” value limits database access to PC creating database only
 - “*” allows PC creating database to continue to access database
 - “*” allows database access from other computers
 - Click OK
 - Close “Backend Configuration Editor” using “Exit” from “File” menu
 - Make no other changes

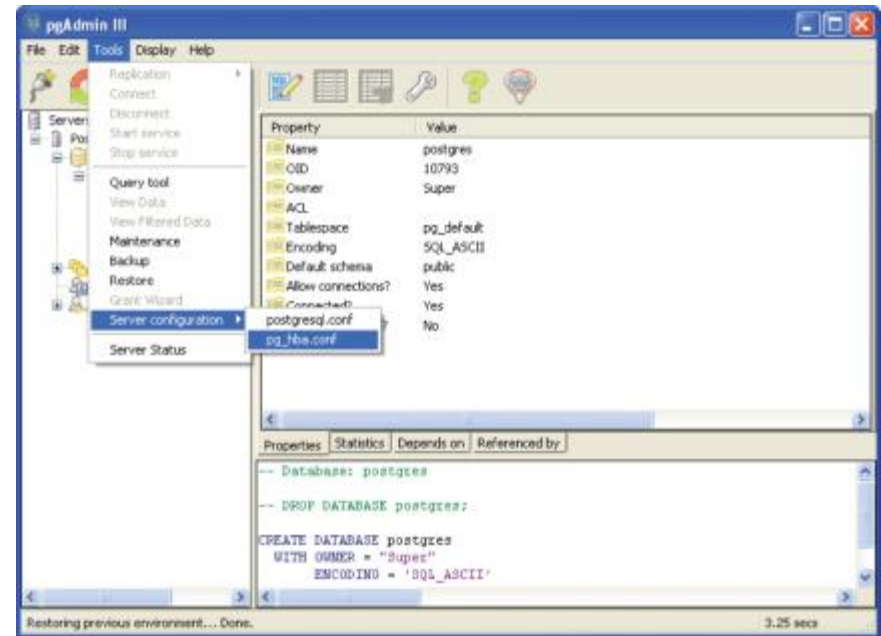


Client Access Configuration

Client Access Settings (cont'd)

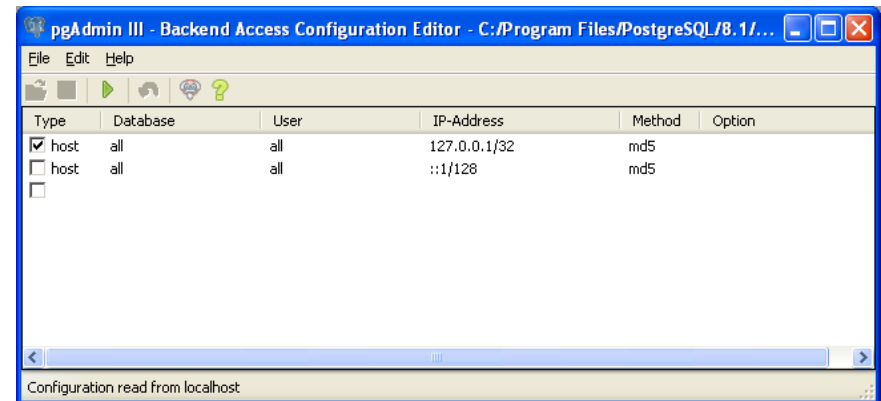
7. From “Tools” menu

- Select “Server configuration / pg_hba.conf” to access Backend Access Configuration Editor



8. Three options shown at initial launch

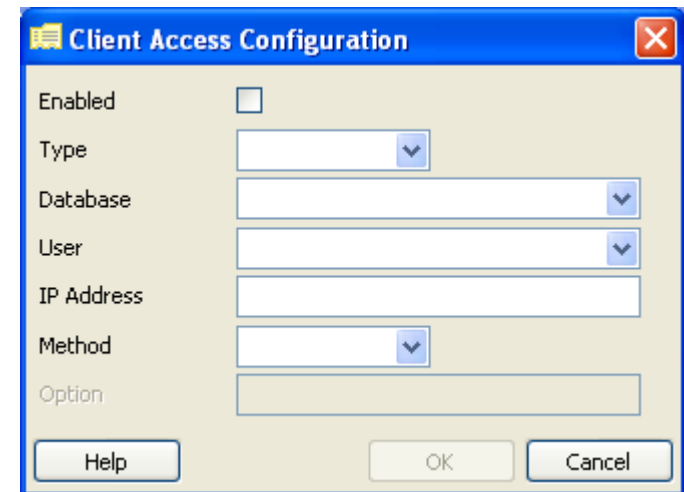
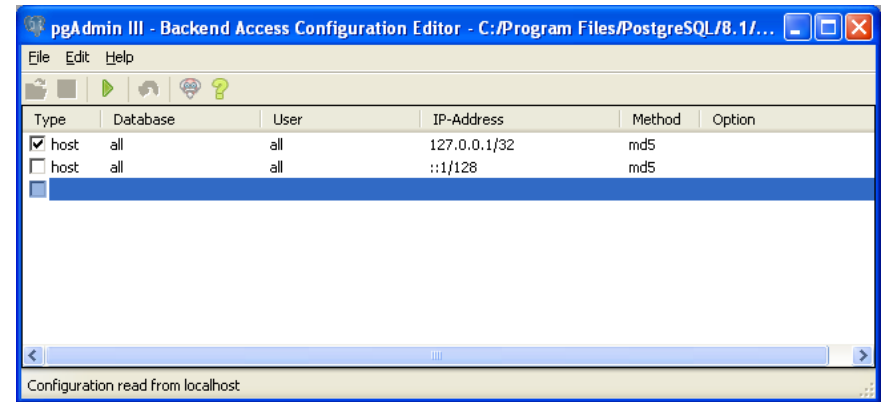
- Upper two options may or may not be enabled depending on network configuration
 - Leave upper two options as they are
- Unchecked, final option configured for IQ System’s client access



Client Access Configuration

Client Access Settings (cont'd)

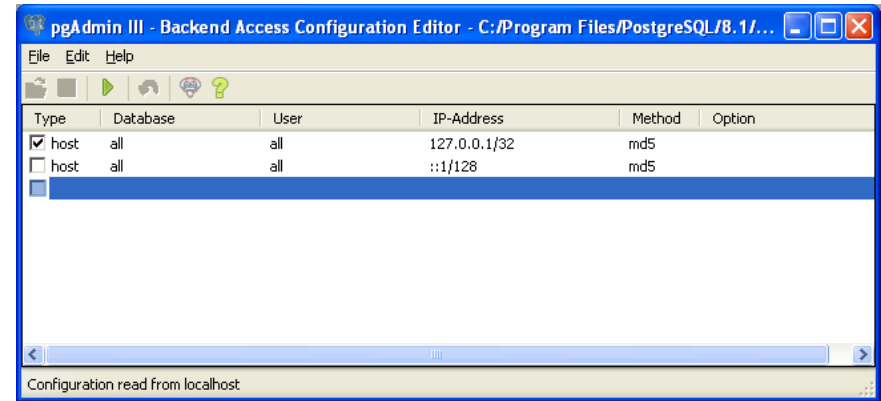
9. Double-click bottom option to configure client access settings
 - Client Access Configuration window shown
 - Allows user to control access to IQ Pro database through PostgreSQL server
 - Specify parameters to be met for client (external) to access database(s) (internal)
10. Click “Enabled” to set up client access
11. Set “Type” to “host”
12. Under Database, select database accessible by client or leave it set to “All”
 - To limit client’s access to only PostgreSQL database(s), select “postgres”



Client Access Configuration

Client Access Settings (cont'd)

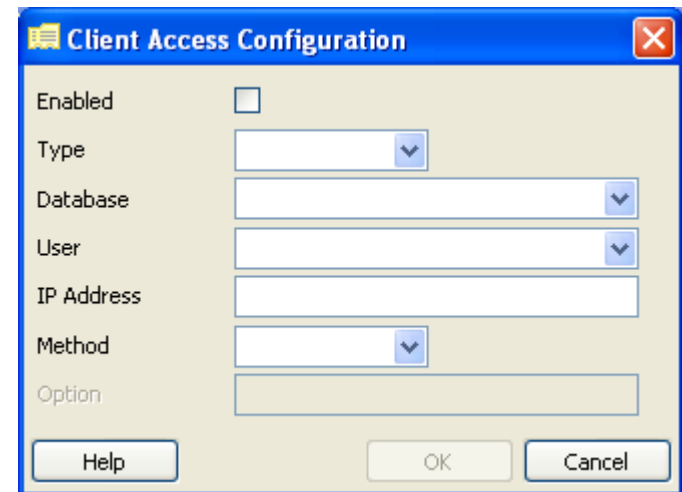
13. Under User, enter a specific user name a recognized by network
14. Enter IP Address specification for user or user group



An **Internet Protocol address (IP address)** is a numerical label assigned to each device (e.g., computer, printer) participating in a computer network that uses the Internet Protocol for communication. An IP address serves two principal functions: host or network interface identification and location addressing. Its role has been characterized as follows: "*A name indicates what we seek. An address indicates where it is. A route indicates how to get there.*"

IP addresses are binary numbers, but they are usually stored in text files and displayed in human-readable notations, such as 172.16.254.1

The Internet Assigned Numbers Authority manages the IP address space allocations globally and delegates five regional Internet registries to allocate IP address blocks to local Internet registries and other entities.



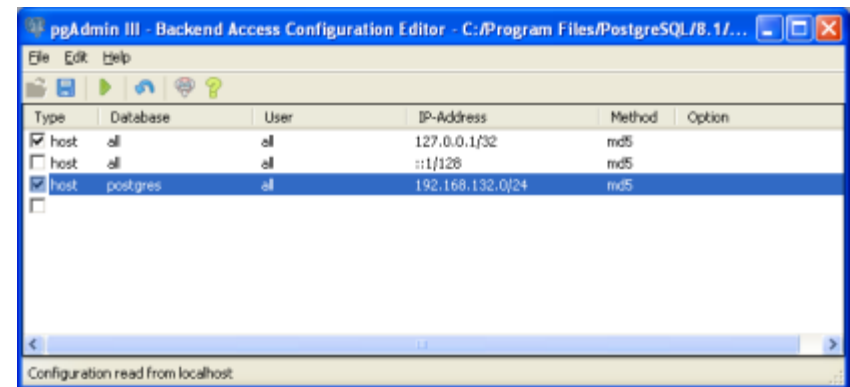
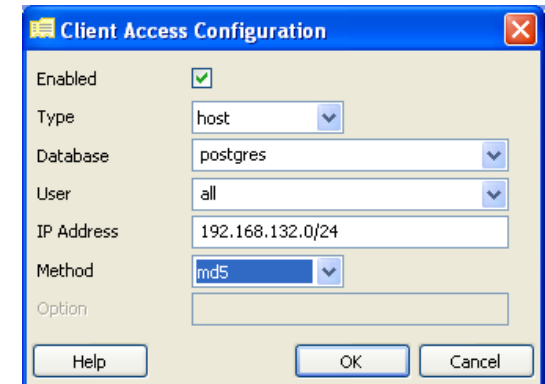
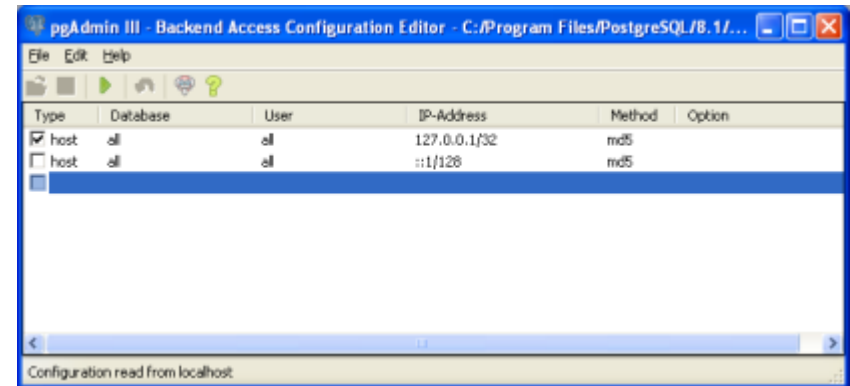
Client Access Settings (cont'd)

- Entry made under IP Address
 - A filter server uses to control access to users whose PC matches stated requirements
- IP address is comprised of 4 sets of between 1 and 3 digits each
 - Between 0 and 255
 - Dot separates groupings
- IP address followed by slash and two digit number
 - First 6 digits typically specify a local network
 - Next 3 digits specify subgroup on local network
 - Last 3 digits specify unique PC within subgroup on local network
- Two digit number following slash specifies how many digits of IP address checked by server to control database access
 - /16 - verification of first two sets of 3 numbers in IP address
 - Potentially large number of users will have database access
 - /24 - verification of first three sets of 3 numbers in IP address
 - Smaller number of potential users will have database access - 256 users max
 - /32 - verification of all four sets of 3 numbers in IP address
 - Only specific PC with matching IP address will have database access

Client Access Example 1

Task

- Grant access to the PostgreSQL databases for all company Industrial Hygienists
 - All own PC's with IP address starting with "192.168.132"
- Be sure configuration setting for listen addresses
 - Set to enabled
 - Value is set to asterisk ("*") before proceeding
- a) From Backend Access Configuration Editor open unused option
- b) At Client Access Configuration window
 - Click "Enabled"
 - Change database setting to postgres
 - Set IP address filter to 192.168.132.0/24
 - Set "Method" to "md5"
 - Click OK
- c) New configuration shown in window



Client Access Example 2

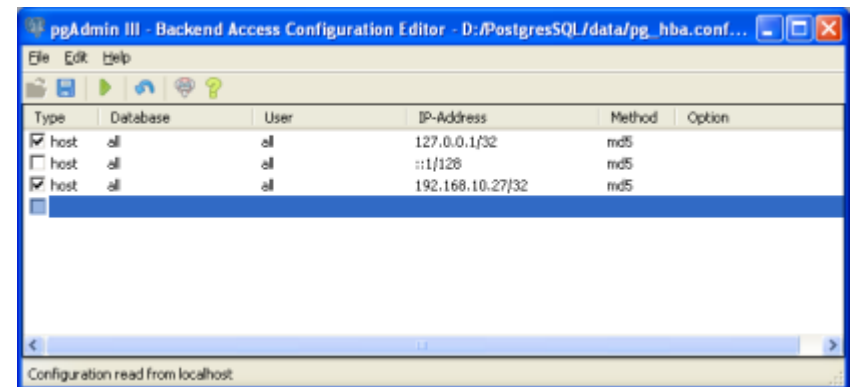
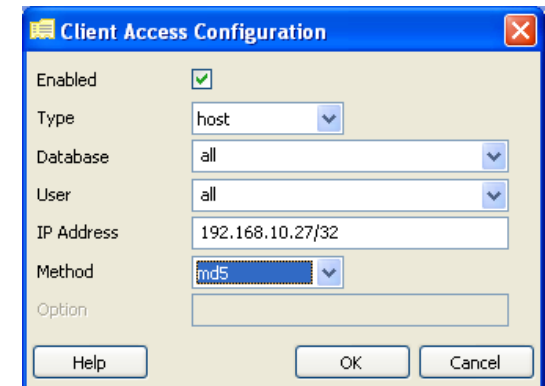
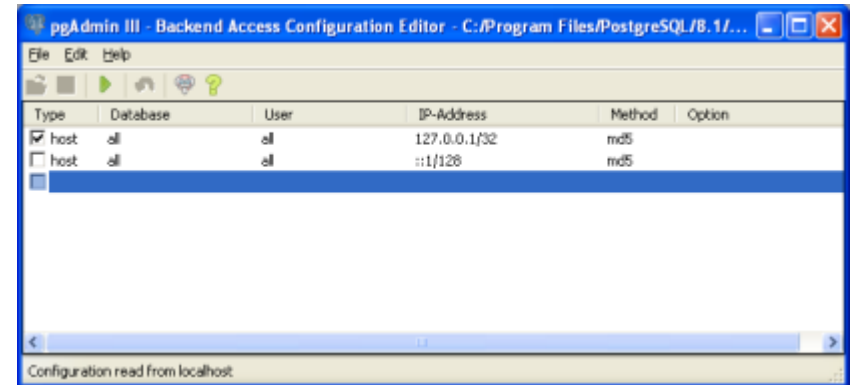
Task

- Grant access to all databases to two specific PC's
 - IP addresses 192.168.10.27 and 192.168.10.28
- Be sure configuration setting for listen addresses
 - Set to enabled
 - Value is set to asterisk (“*”) before proceeding

a) From server configuration window open lowest unused option

b) At Client Access Configuration window

- Click “Enabled”
- Set Type to “host”
- Set Database to “all”
- Set User to “all”
- Set IP address to 192.168.10.27/32
- Set Method to “md5”
- Click OK



Client Access Example 2 (cont'd)

Repeat process for second PC

c) From server configuration window open unused option

d) At Client Access Configuration window

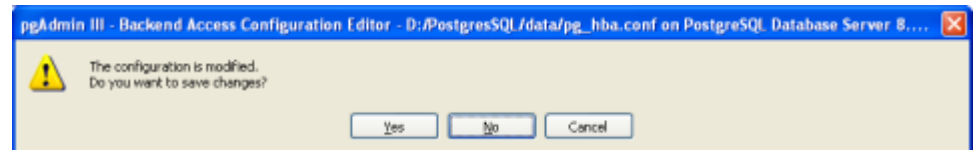
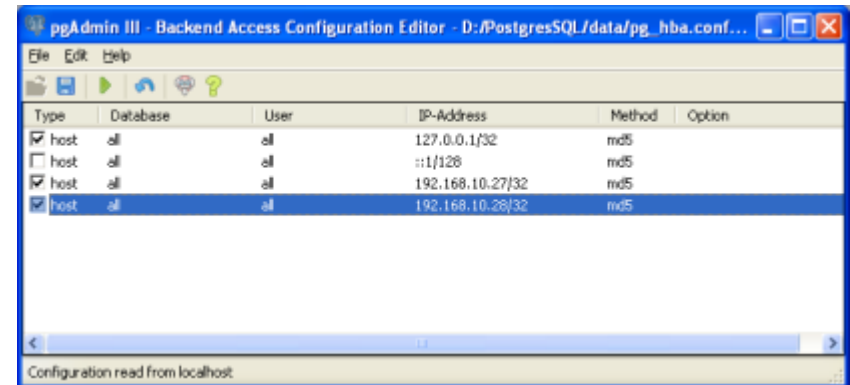
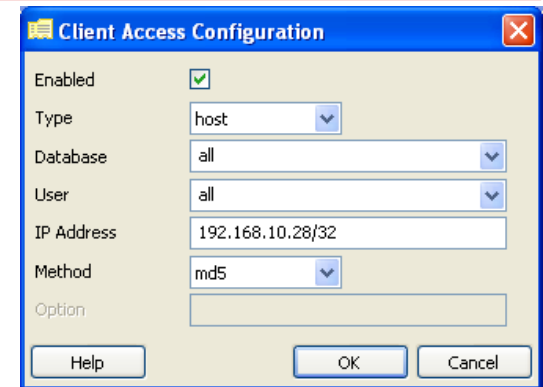
- Click “Enabled”
- Set Type to “host”
- Set Database to “all”
- Leave user field blank
- Set IP address to 192.168.10.28/32
- Set method to “md5”
- Click OK

e) New configuration displayed

f) Select “File” > “Exit” or close window

- Screen displayed as safeguard to prevent unauthorized changes to client access settings

g) Click “Yes” to save settings



IQ Database Manager

- Provides user access to IQ Databases
 - Used by IQ Express, MultiPro IQ Express, IQ Controller and IQ DataLink Systems
 - Maintains instrument and calibration data
 - IQ Calibration Stations rely on user-defined templates to determine operations to perform on instruments as they interface with docks
 - To maximize flexibility, IQ allows programming of multiple templates through Database Manager program
 - Each instrument must be assigned to a specific template
 - New instruments are automatically assigned to “Generic (No Change)” template unless a default template has been set up for instrument type

PC Requirements

- Pentium Processor 1.0GHz or better or equivalent
- 512MB RAM
- Windows XP Pro / Server 2003 and 2008 /Vista / Windows 7
- 50MB hard drive disk space.
- Note: See specific Reference Manual included with purchased IQ System for details on Detector Firmware Requirements

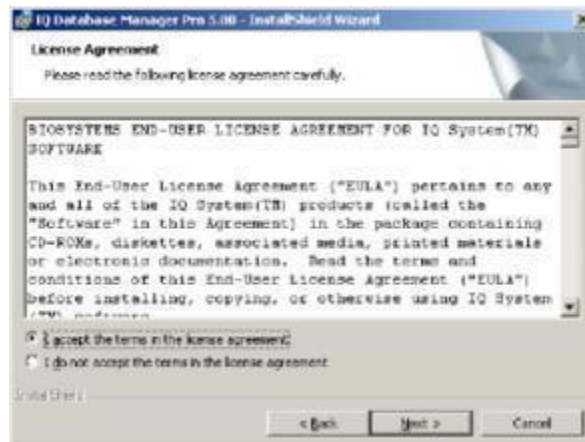
Database Manager Pro Installation

- To upgrade existing installation of Database Manager
 - Only Database Manager may need to be installed
 - An additional upgrade to calibration system desktop software may be required
- Warning
 - PostgreSQL database installation should only be performed once.
 - Removing PostgreSQL without proper data backup could result in data loss.

Database Manager Pro Installation

PostgreSQL database should already be installed

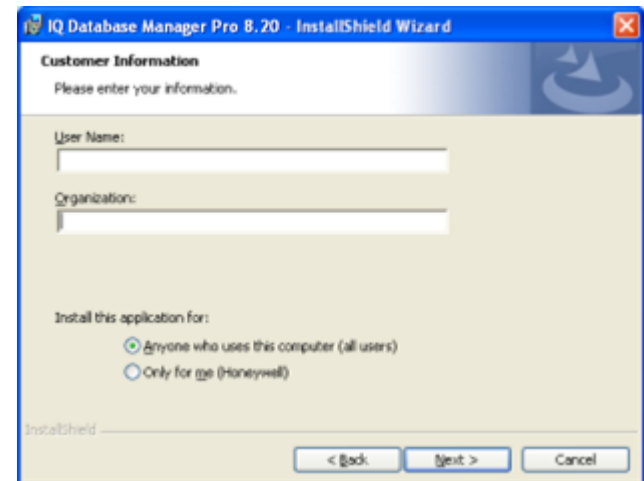
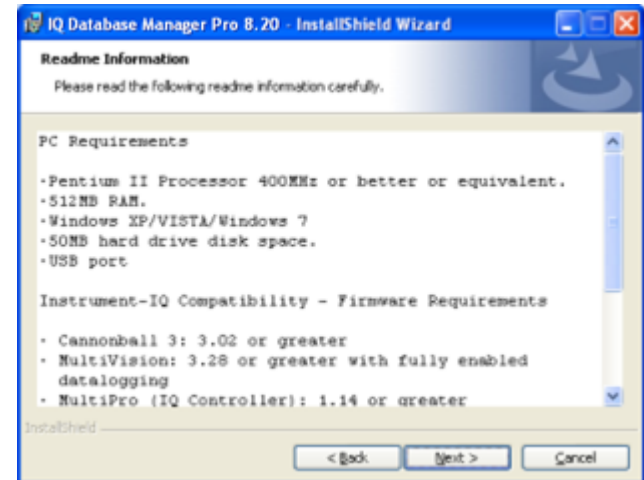
1. Place IQ Installation CD into computer CD
 - Installation screen appears
2. Select Database Manager and click Install
 - Screen indicating preparing to install appears
3. Click “Next”
 - License Agreement screen displayed
 - If terms acceptable select “I accept.....”
 - If terms not acceptable click Cancel to terminate



Database Manager Pro Installation

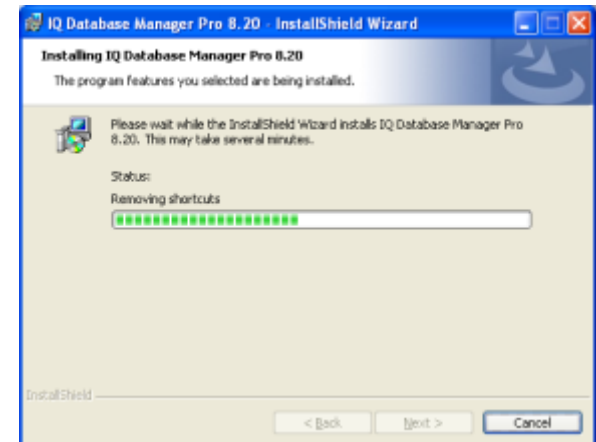
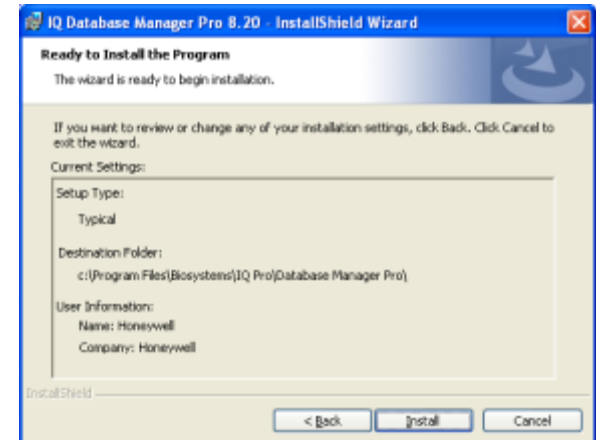
Honeywell

4. PC requirements listed
 5. Click “Next”
 - Customer Information screen shown
 6. Enter User Name and Organization
 - Choose whether application is available to any user or only for one user
- Software prompts for setup type
- Honeywell recommends “Typical”
 - Advanced users can select selecting minimal or custom



Database Manager Pro Installation

- In Typical and Minimal Database Manager Pro installed to
 - C:\Program Files\Biosystems\IQ Pro\Database Manager Pro
 - To install to different location
 - Select Custom click “Change” to relocate
- Click “Next”
- Verify settings for
 - Setup
 - Destination folder
 - User information
 - Click “Install”
 - Click “Back” to modify parameters
 - Program installed
- Click Finish



Database Manager

- First Launch

- Clicking on Database Manager icon



- Can also be accessed by clicking

- Start / All Programs / Biosystems / IQ Pro / Database Manager Pro / Database Manager Pro

- Always opens to login screen

- Enter User ID and password



- First time login

- Use “setup” as User ID and “iq” as Password

- Administrative level user ID

- Recommended to be deleted after new administrative level user is created

Database Manager

- Database Manager's main interface shown

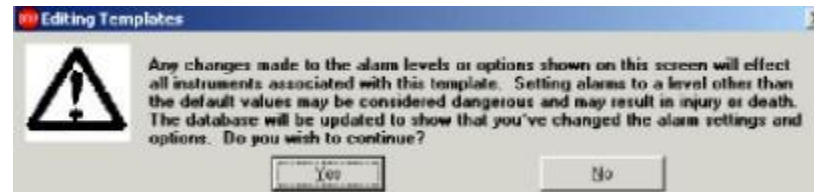
The screenshot displays the 'IQ Database Manager Pro V5.00' window. The interface is divided into several sections:

- Instrument Section:** Contains fields for 'Serial Number' (10484), 'Config Template' (standard), 'Last Full Calibration' (12/26/2004 5:09:20 PM), 'Next Calibration Due' (1/29/2005 5:09:20 PM), and 'Downloaded By' (Control Unit).
- Administrative Section:** Includes fields for 'User Name' (Action Operations), 'Manager' (wilton), 'Owner' (Action Operations), and 'Email Address' (chet.canova@honeywell.com).
- User Defined Section:** Includes 'Placed in Service' (6/22/2004), 'Location' (Lab), and 'Department' (Action Operations).
- Instrument Details Section:** Includes a 'Review History' button.
- Service Information Section:** Includes tabs for 'Service Information', 'Span Graph', 'Calibration History', 'Service History', 'Comments', and 'Last Download'. The 'Service Information' tab is active, showing 'Date/Time' (1/12/2005 8:28:00 AM), 'Result' (PASS), and 'Attempted By' (488).
- Log Section:** A large text area displaying a log of events, including 'Processing PHD 5 @ Dock 1', 'Loading version completed', 'Configuration Downloaded', 'Installed Sensors G2 LEL CO SO2 H2S', 'Configuring Instrument Settings', 'Assigned Template standard', 'Checking Calibration', 'Calibration Not Due', 'Next Cal Due 1/29/2005 @ 17:00', 'PHD 5 Complete', and 'IQ Instrument Notification PHD 5 S/N 10484 Dock ID84062'. It also lists email addresses for reporting.
- Navigation and Status Section:** Includes buttons for '<< Fast', '< Previous', 'Next >', 'Last >>', 'Edit', 'Delete', 'OK', and 'Cancel'. The status bar at the bottom shows 'Setup IQ Setup', 'PHD 5 2 of 12', 'iq_database', and the time '2:16 PM'.

- New Database Users
 - To maintain data security
 - IQ System requires user to log in with user name and password
 - Each user given specific clearance level
 - Ranges from General Use to Administrator
 - IQ System uses templates to determine specific functions to perform when an instrument interfaces with system
 - When user modifies a template
 - User name saved to “Last Modified By” file
 - » Can be accessed through Setup / Template / General Tab

- New Instrument Users
 - List of instrument users can be created to allow an instrument to be assigned to a specific user
 - Assignment allows IQ system to track instrument usage and exposures levels by user or instrument
- New Instrument Location
 - List of instrument locations can be created to allow an instrument to be assigned to a location
 - Assignment allows IQ system to track instrument usage and exposures levels in a particular location

- Templates
 - IQ Systems rely on user-defined templates to determine specific functions to perform when an instrument interfaces with system
 - IQ System allows for programming of multiple templates
 - Each instrument automatically assigned to “Generic (No Change)” template
 - Until reassigned to another template by user or new Default template is created
 - Default templates may be set up by instrument type
 - As new instruments are introduced to system instrument is automatically assigned to template specified in advance by user
 - Whenever changes are made to template
 - Database logs user name currently logged in
 - User must acknowledge change by clicking “Yes” on Editing Templates warning screen



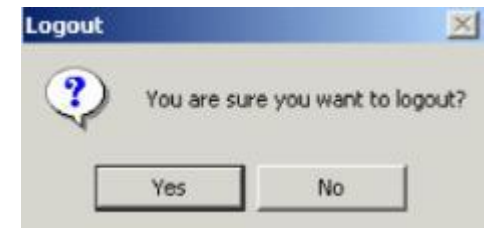
- At first opening of Database Manager
 - Default template only template available

Database Manager

- Log out
 - To maintain security within database
 - Users should log out when they are finished
 - To log out of system
 - Click on Setup menu followed by Users / Logout



- Logout screen shown
 - Click “Yes” to log out
 - Click “No” to return to program
- Click “Yes”
 - Window shown advising user has been logged out



- Current Record
 - Database Manager opens to main screen
 - Displays single record representing data from an individual gas detector
 - Automatically opens to recordset consisting of all of the records for a certain detector type
 - Data controls at screen bottom can be used
 - To move through current recordset one record at a time
 - To move directly to first or last record in recordset
 - To change recordset to a different set of detectors
 - Use Lookup menu
 - Note
 - If instrument data is currently being added to database over a network
 - It will not appear on other PCs that are also on network while Database Manager Program is running on those PCs
 - To update screen
 - Close program and re-open it
 - Press the F5 key to refresh

Database Manager

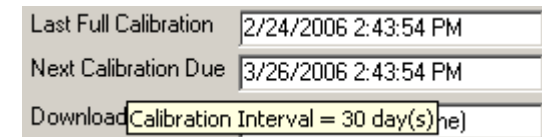
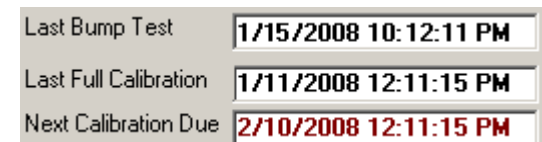
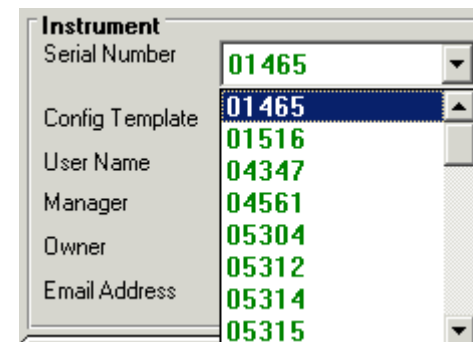
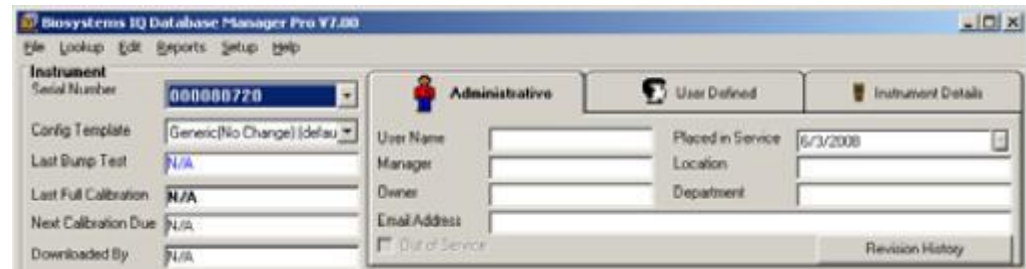
- Main screen contains information about specific detector
 - Serial number shown in green at upper left
 - On first launch fields will be empty
- Screen divided into 3 sections
 - Upper section
 - Specific detector information
 - Middle section
 - Detailed data on sensors, calibrations, service and downloading
 - Control bar at bottom contains data controls

The screenshot shows the Bussystems IQ Database Manager Pro V7.00 application window. The interface is divided into three main sections as described in the text:

- Upper section:** Contains specific detector information. The 'Instrument' tab is active, showing fields for 'Serial Number' (00000720, highlighted in green), 'Config Template' (Generic (No Change) (default)), 'Last Bump Test' (N/A), 'Last Full Calibration' (N/A), 'Next Calibration Due' (N/A), and 'Downloaded By' (N/A). To the right, there are tabs for 'Administrative', 'User Defined', and 'Instrument Details'. The 'Administrative' tab is active, showing fields for 'User Name', 'Manager', 'Owner', 'Email Address', 'Placed in Service' (6/3/2008), 'Location', and 'Department'. There is also a 'Revision History' button.
- Middle section:** Contains detailed data on sensors, calibrations, service, and downloading. It has tabs for 'Sensor Information', 'Span Graph', 'Cal History', 'Service History', 'Comments', and 'Last Download'. The 'Sensor Information' tab is active, showing a 'Date/Time' field, a 'Result' field (N/A), and an 'Attempted By' field (N/A). Below these fields is a large empty text area.
- Control bar at bottom:** Contains data controls. It includes navigation buttons ('<< First', '< Previous', 'Next >', 'Last >>'), action buttons ('Add', 'Edit', 'Delete', 'OK', 'Cancel'), and a status bar at the very bottom showing 'Setup (IQ Setup)', 'PH06 1 of 3', 'iqdb', and the time '3:28 PM'.

Database Manager

- Instrument section
 - Section serves as information overview of specific detector
 - Serial number shown at upper left in green
 - To access a different record
 - Use control bar at bottom to scroll through current recordset
 - If instrument serial number is known
 - Click on arrow next to current serial number and select new serial number from list
 - Instrument must be in current recordset to appear in list
 - In left column of upper section
 - Last bump test date
 - Full calibration
 - Next calibration due date
 - When due for calibration
 - Next calibration due date shown in dark red
 - To view calibration due reminder interval
 - Roll mouse over Next Calibration Due date – date appears in pop up



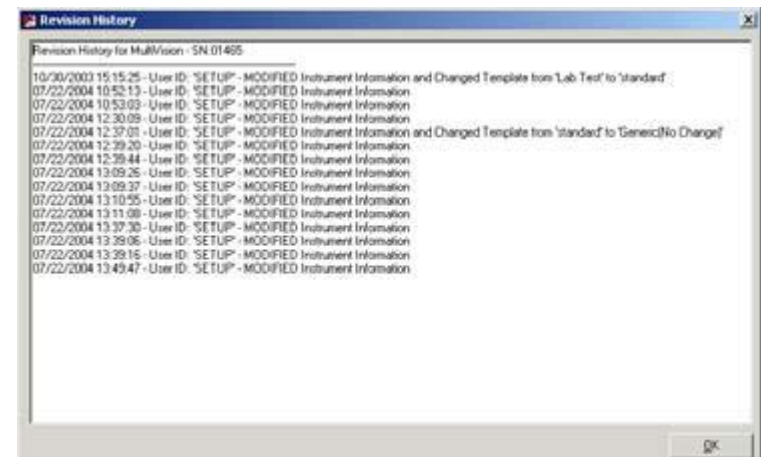
Database Manager

Honeywell

- At the right center
 - Three tabbed sections
 - Administrative
 - User- Defined
 - Instrument Details
- Administrative tab
 - Shows specific instrument information
 - User name
 - Manager
 - In-service date
 - To mark instrument out of service
 - Select Out of Service option at lower left
 - Removed from Bump and Calibration Status reports
 - Added to Out of Service report
- To view instrument revision history
 - Click Revision History button



The screenshot shows the 'Administrative' tab of the Database Manager interface. It features three main sections: 'Administrative' (selected), 'User Defined', and 'Instrument Details'. The 'Administrative' section contains fields for 'User Name', 'Manager', 'Owner', and 'Email Address'. The 'User Defined' section contains fields for 'Placed in Service' (showing '6/3/2008'), 'Location', and 'Department'. At the bottom left, there is a checkbox labeled 'Out of Service'. At the bottom right, there is a button labeled 'Revision History'.



Database Manager

- Sensors and Service
 - Center screen section
 - Comprises 6 tabbed pages
 - Span Graphs
 - Calibration History
 - Service Histories
 - Comments
 - Last Download
 - Defaults to sensor information

Sensor Information	Span Graph	Calibration History	Service History	Comments	Last Download
Serial Number	02	LEL	CO	H2S	
01912	01912	01912	01912	01912	
Manufacture Date	N/A	N/A	N/A	N/A	
Warranty Expiration	N/A	N/A	N/A	N/A	
Danger Alarm	19.5%	20%	100 ppm	20.0 ppm	
Warning Alarm	23.5%	10%	35 ppm	10.0 ppm	
STEL Alarm	N/A	N/A	100 ppm	15.0 ppm	
TWA Alarm	N/A	N/A	35 ppm	10.0 ppm	
Last Zero Date	2/23/2005 4:21:30 PM	2/23/2005 4:21:30 PM	2/23/2005 4:21:30 PM	2/23/2005 4:21:30 PM	
Last Span Date	N/A	2/23/2005 4:22:23 PM	2/23/2005 4:22:23 PM	2/23/2005 4:22:23 PM	
Auto Span Cal Val.	N/A	50%	50.0 ppm	25.0 ppm	
Calibrated From	17.8%	48%	32.8 ppm	30.7 ppm	
Calibrated To	20.9%	50%	50.0 ppm	25.0 ppm	
Max Possible Span	29.7%	94%	64.4 ppm	61.5 ppm	

Database Manager

- Sensor Information Tab
 - Displays all available sensor information for current

Sensor Information	Span Graph	Calibration History	Service History	Comments	Last Download
	O2	LEL	CO	H2S	
Serial Number	01912	01912	01912	01912	
Manufacture Date	N/A	N/A	N/A	N/A	
Warranty Expiration	N/A	N/A	N/A	N/A	
Danger Alarm	19.5%	20%	100 ppm	20.0 ppm	
Warning Alarm	23.5%	10%	35 ppm	10.0 ppm	
STEL Alarm	N/A	N/A	100 ppm	15.0 ppm	
TWA Alarm	N/A	N/A	35 ppm	10.0 ppm	
Last Zero Date	2/23/2005 4:21:30 PM	2/23/2005 4:21:30 PM	2/23/2005 4:21:30 PM	2/23/2005 4:21:30 PM	
Last Span Date	N/A	2/23/2005 4:22:23 PM	2/23/2005 4:22:23 PM	2/23/2005 4:22:23 PM	
Auto Span Cal Val	N/A	90%	90.0 ppm	25.0 ppm	
Calibrated From	17.8%	48%	32.8 ppm	30.7 ppm	
Calibrated To	20.9%	90%	90.0 ppm	25.0 ppm	
Max Possible Span	29.7%	94%	64.4 ppm	61.5 ppm	

Database Manager

Honeywell

- Span Graph Tab

- Click tab to access graphs for each sensor

- For multi-sensor instruments

- Click Select Graph
 - Choose sensor to view graph

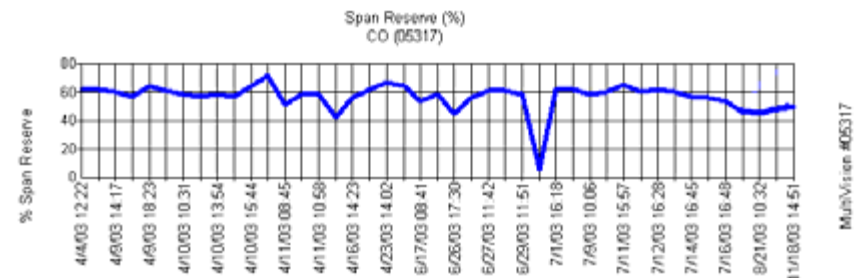
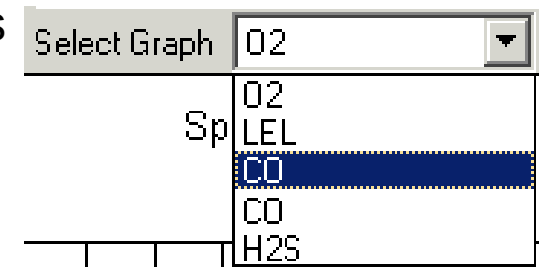
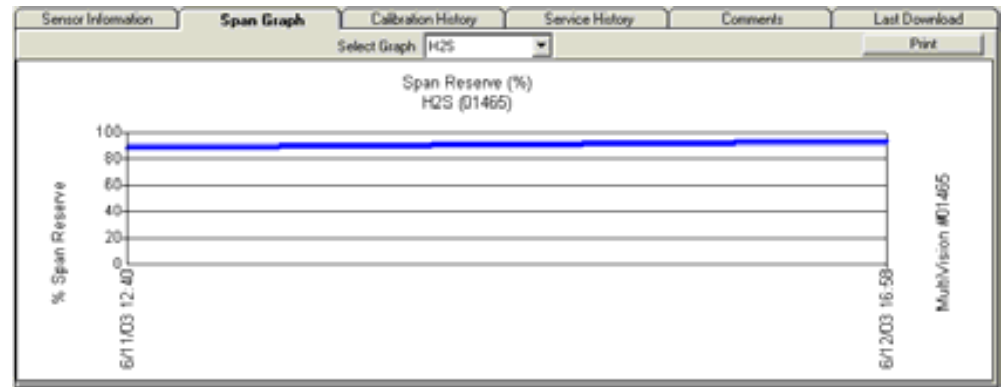
- PHD6 and Cannonball3 equipped with smart sensors

- Database Manager creates new sensor file when it recognizes a new sensor in these instruments
 - Even if replacement sensor is same type as sensor replaced

- Each individual sensor has unique data and will be shown in pull down list

- MultiPro, Toxi Pro and Toxi Ltd

- Unable to recognize when a sensor is replaced with another of same type
 - As a result, only one span graph per sensor type
 - Sensor change often results in drastic shifts in graph



Database Manager

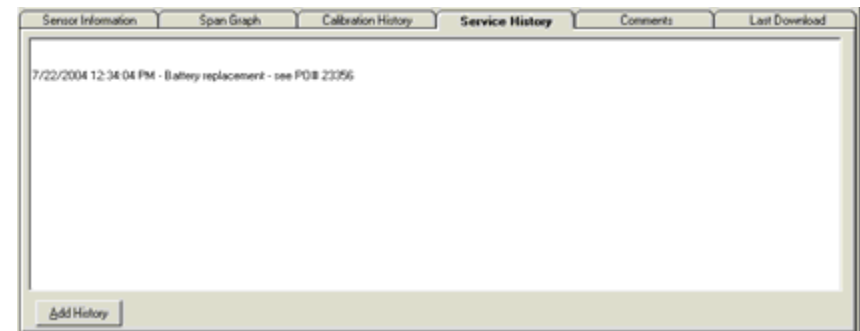
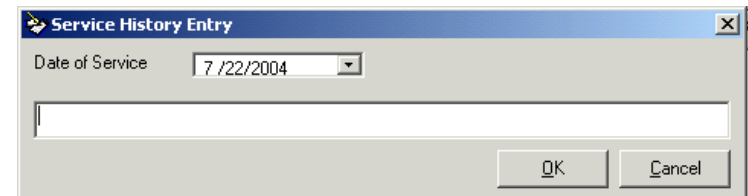
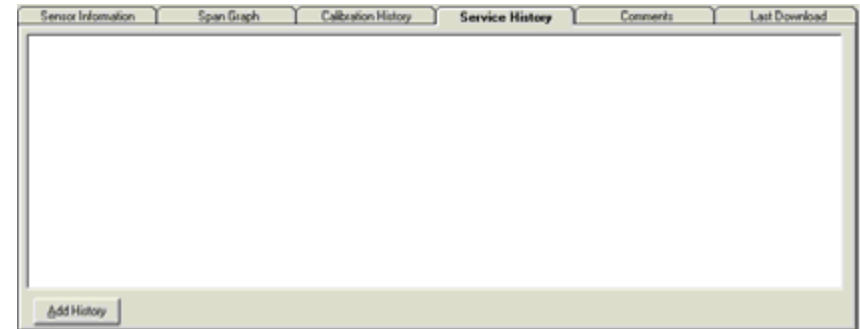
- Calibration History Tab
 - Contains calibration history of current instrument
 - Columns displayed represent individual data fields from database
 - Data fields may be selected by user
 - To add/delete columns from Calibration History
 - Right click anywhere in columns shown to access complete list of data fields
 - Click on desired field to select or deselect
 - Selected data fields shown with check mark
 - When appropriate options checked
 - Press “OK” to return to Calibration History
 - If instrument appears in more than one database
 - Calibration history may not be complete in any one database

Sensor Information	Span Graph		Calibration History	Service History	Comments	Last Download
Calibrations: 5	H2S					
Bump Only: 1	00099					
Date	Max Span	Cal Gas Lot #	Auto Span Cal Value	Calibrated From	Last Zero	Last Span
7/13/2004 11:02:50 AM	45.2 ppm	79322	31.0 ppm	25.4 ppm	6/23/2004 2:11:42 PM	7/13/2004 11:03:39 AM
7/13/2004 11:52:05 AM	54.5 ppm	79322	25.0 ppm	30.2 ppm	6/23/2004 2:11:42 PM	7/13/2004 11:52:54 AM
7/13/2004 1:17:57 PM	54.7 ppm	79322	25.0 ppm	31.4 ppm	6/23/2004 2:11:43 PM	7/13/2004 1:18:45 PM
7/13/2004 1:18:10 PM	54.7 ppm	79322	25.0 ppm	31.4 ppm	7/13/2004 1:18:10 PM	7/13/2004 1:18:10 PM
7/13/2004 3:25:38 PM	44.9 ppm	79322	31.0 ppm	25.4 ppm	6/23/2004 2:11:43 PM	7/13/2004 3:25:56 PM
7/13/2004 3:25:26 PM*	44.9 ppm	79322	25.0 ppm	25.4 ppm	6/23/2004 2:11:43 PM	7/13/2004 3:25:56 PM

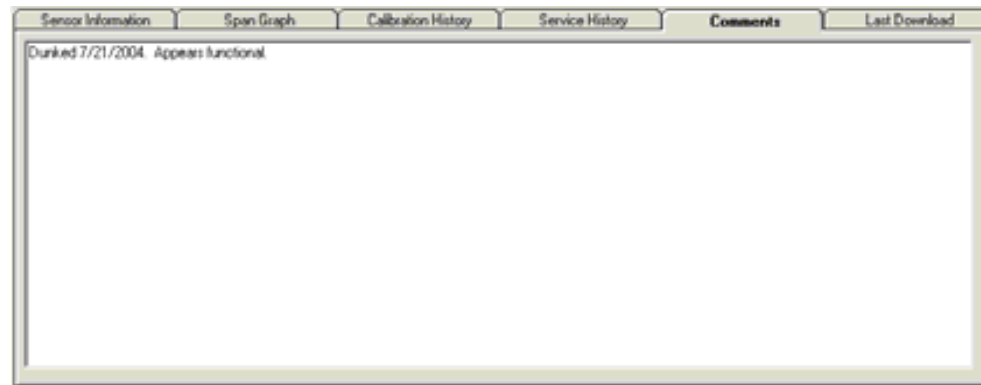
- **Service History Tab**
- Click on the Service History tab to access the service history input box, which will appear blank until the user enters information.
- To make an entry, first click edit on the control bar (near the bottom of the window)
- . The “Add History” button will then be enabled
- . Click on “Add History” to make an entry
- . The “Service History Entry” window will then be shown
- . Type the entry into the input box at the center of the window
- . The date will be automatically entered into the file along with the entry.
- Once the entry has been made, click “OK”
- . The entry will then appear in the Service History section.
- **Once an entry is made in the Service History section, it may not be retracted.**
- **Comments Tab**
- Click on the Comments tab to enter comments

Database Manager

- Service History Tab
 - Click tab to access service history input box
 - Blank until information is entered
 - To make entry
 - Click “Edit” on control bar at window bottom
 - “Add History” button enabled
 - Click “Add History” to make entry
 - “Service History Entry” window shown
 - Type entry into input box
 - Date automatically entered along with entry
 - Click “OK”
 - Entry then appears in Service History
 - Once entry made in Service History, it may not be retracted



- Comments Tab
 - Click tab to enter comments about detector
 - To enter a comment
 - Press “Edit” on control bar
 - Unlike Service History
 - Entries in Comments section do not automatically include a date
 - May be retracted in future
 - When comment is entered, press “OK” to enter into record



- Last Download
 - Contains details of last file download
 - Does not contain actual download results
 - BioTrak or BioTrakII required to view instrument readings and other data downloaded from a detector

The screenshot shows the 'Last Download' tab in the Database Manager. The interface includes a header with tabs for 'Sensor Information', 'Span Graph', 'Calibration History', 'Service History', 'Comments', and 'Last Download'. Below the tabs, there is a 'Date/Time' dropdown menu set to '2/24/2006 2:43:54 PM', a 'Result' field showing 'PASS', and an 'Attempted By' field showing 'IQ Express Dock 01072'. A large text area contains the following information:

NOTE: The following Test Record was logged in the IQ Express Dock in Standalone mode.
The logged options for the ToxPro set to defaults and may not reflect the settings in the instrument.

*** Testing Details ***
Test Date: 2/24/2006 2:43:54 PM
IQ Express PC: 5.0.0.4
Dock Firmware: 5.00
Instrument Type: ToxPro
Serial #: 18096
Instrument Version: 6.30
Sensor Type: H2S
Danger Alarm: 20.0 ppm
Warning Alarm: 10.0 ppm
STEL Alarm: 15.0 ppm
TWA Alarm: 10.0 ppm
Battery: 3.1v
Bump Time: 9
Bump Response: 10.0 ppm (Range: 32.5 ppm(130%) to 22.5 ppm (90%))
Filter Size: 1R 7 mm

Database Manager

- Control Bar
 - Located at bottom of main screen
 - To scroll through individual database files
 - Use “<<First”, “<Previous”, “Next>” and “Last>>” controls on left side of upper section
 - Edit and Delete options appear on right of upper section.
 - “Session/Events” appears when selected instrument has session or event data stored in database
 - Selecting opens BioTrak II to display session and event data
 - Lower section displays
 - Current user name
 - Recordset name
 - File number within recordset
 - Database name.



Database Manager

- Edit Current Record

- To edit information on screen
 - Press Edit button in control bar
 - Modifiable fields shown in red
 - Calibration data can not be modified
- IQ Calibration Stations rely on user-defined templates to determine operations to perform on instruments
 - Each detector assigned to specific template
- Detector's current template shown in field immediately below Serial Number next to "Config Template"
- To change template applied to detector
 - Click arrow next to template name
 - Current template choices shown
 - When template selected
 - Press "OK" button in control bar to continue

The screenshot shows the 'Biosystems - IQ Database Manager Pro 95.00' window. It has a menu bar (File, View, Edit, Reports, Setup, Help) and a toolbar. The main area is divided into three tabs: 'Instrument', 'Administrative', and 'User Defined'. The 'Instrument' tab is active, showing fields for Serial Number (10484), Config Template (standard), Last Full Calibration (12/30/2004 5:09:20 PM), Next Calibration Due (1/29/2005 5:09:20 PM), and Downloaded By (Controller 466). The 'Administrative' tab is also visible, showing fields for User Name (Action Operations), Manager (Wilson), Owner (Action Operations), Email Address (chet.canova@honeywell.com), Placed in Service (6/22/2004), Location (Lab), and Department (Action Operations). A 'Revision History' button is at the bottom right.

The screenshot shows a dropdown menu for the 'Config Template' field. The current selection is 'Generic(No Change)'. The dropdown list shows the following options: 'Download Data', 'Generic(No Change)', 'Jamie', 'Lab Test' (highlighted), 'Lab Test 2', 'Matt', 'Paul', and 'standard'.

- Instrument User Assignment
 - User assignment shown next to “Instrument User” and “User ID”
 - To change the user assignment
 - Click on arrow next to the current assignment
 - List of instrument user names shown
 - Instrument user names created using user and location manager functions
 - When appropriate user selected
 - Press “OK” in control bar to save changes



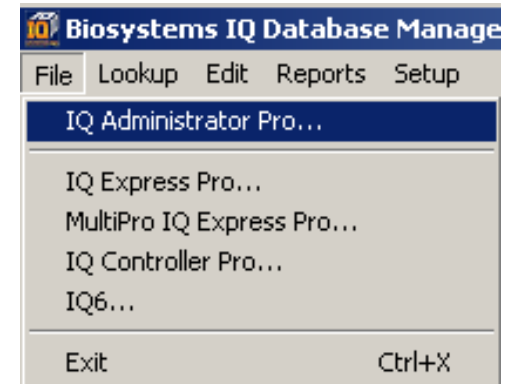
Administrative	
User ID #	TSmith782
Instrument User	Smith, Trent
Manager	

- Instrument Location Assignment
 - Current location assignment shown below “Location”
 - To change location assignment
 - Click arrow next to current assignment
 - List of locations shown
 - When appropriate location selected
 - Press “OK” in control bar to save changes.
 - Locations are created using the user and location manager functions
 - Template changes may affect detector functionality

Location	Instrument Service
Department	Quality Control

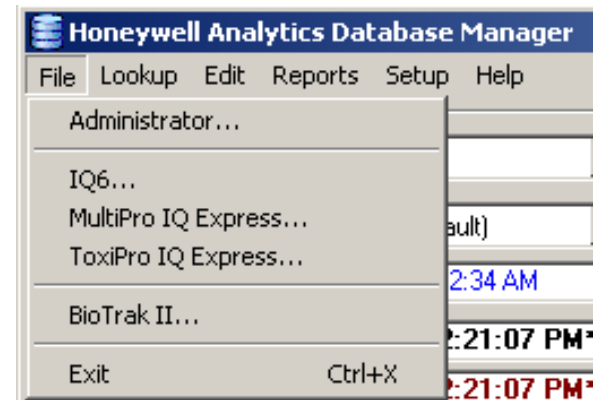
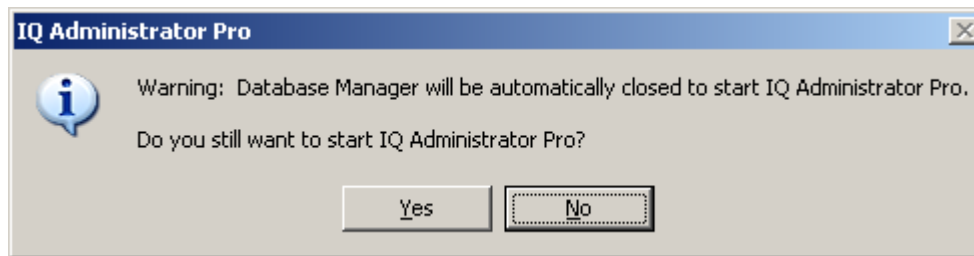
Database Manager Menu Options

- File Menu
 - Controls access to other IQ applications installed
 - IQ Administrator is required in order to run any IQ application
 - IQ6
 - IQ Express
 - MultiPro IQ Express
 - Can be used to set default database to store information
 - IQ applications Installed displayed in File menu
 - Can be launched from here

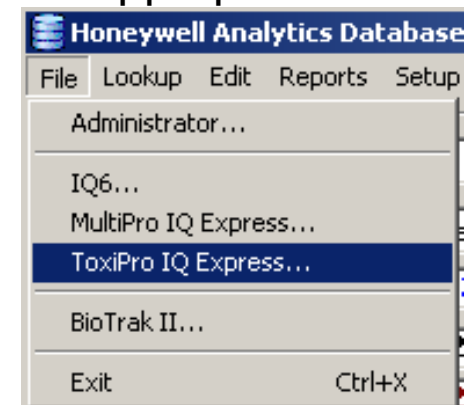


Database Manager Menu Options

- Open IQ Administrator
 - To open click File / IQ Administrator
 - Database Manager automatically closes
 - Prompt to open IQ Administrator program
 - Click “Yes” to proceed



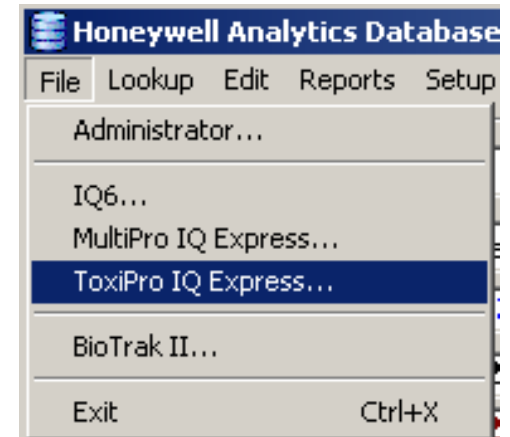
- Launch IQ Software
 - To launch IQ Software from Database Manager, click on the appropriate program in the File Menu.



Database Manager Menu Options

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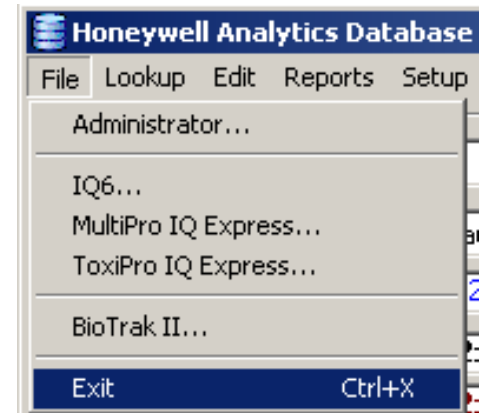
- Launch IQ Software
 - To launch IQ Software
 - Click on program in File Menu



Database Manager Menu Options

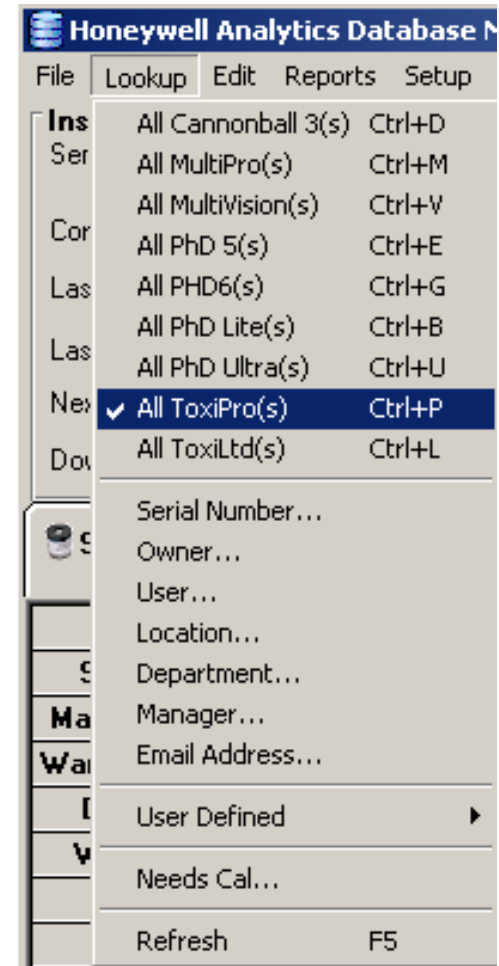
Honeywell

- **5.1.3 Exit**
 - To close Database Manager program
 - Select Exit from File Menu
 - Automatically closes open database



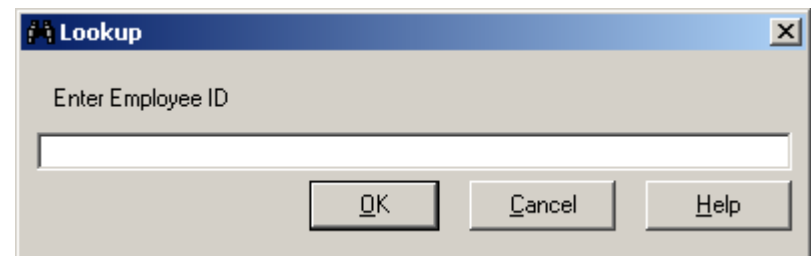
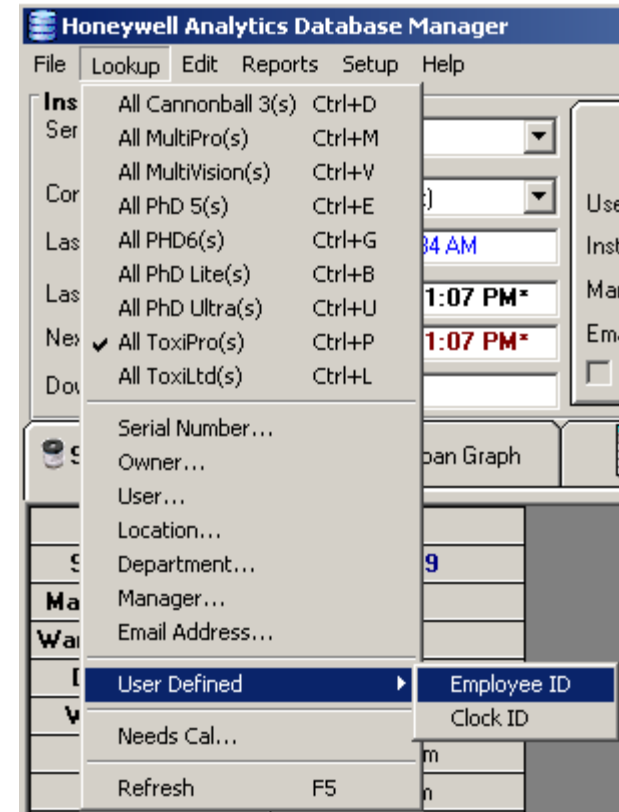
Database Manager Menu Options

- Lookup Menu
 - Designed to create and implement a search query to locate specific instruments
 - Detector type checked in upper box
 - Specific search options within designated recordset located in lower sections
 - Includes searches by specific information
 - By serial number,
 - By user-defined fields
 - Instruments needing calibration
 - Session data must be accessed through BioTrak or BioTrak II
 - When menu is first accessed
 - Instruments in current recordset are indicated with a check mark



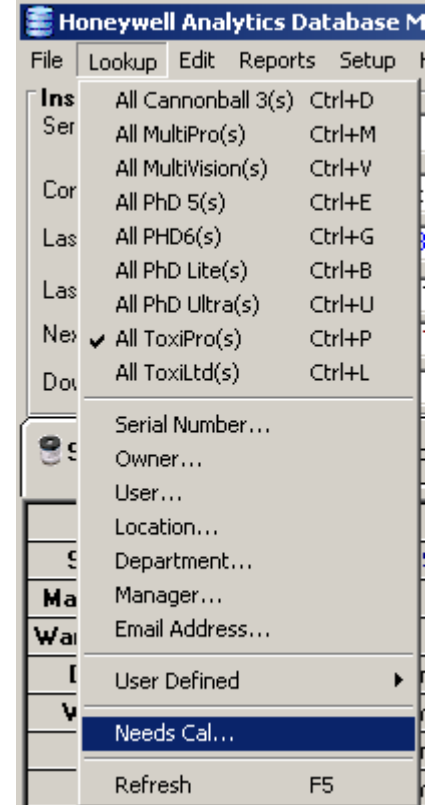
Database Manager Menu Options

- Search by User-Defined field
 - When user-defined fields have been set up through the Setup / Options menu
 - New fields may be used to search database
 - To view the user-defined fields
 - Click on Lookup menu
 - Drag mouse over “User Defined”
 - User-defined options shown
 - Select appropriate option
 - Lookup input window shown
 - Enter information press “OK” to execute search
 - Information entered into Lookup input window must match database entry exactly for search to work properly



Database Manager Menu Options

- Search by Needs Cal...
 - To search for instruments of selected type needing calibration
 - Click Lookup / Needs Cal
 - Since “All ToxiPro(s)” is selected in upper window
 - Only ToxiPros needing calibration listed in report



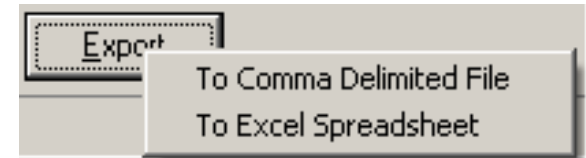
Database Manager Menu Options

- Print Needs Cal Report

- Press “Export” at bottom left of calibration due screen to create Needs Cal Report for current recordset

- Two options are available

- Comma Delimited File (.csv)
 - Excel spreadsheet (.xls)



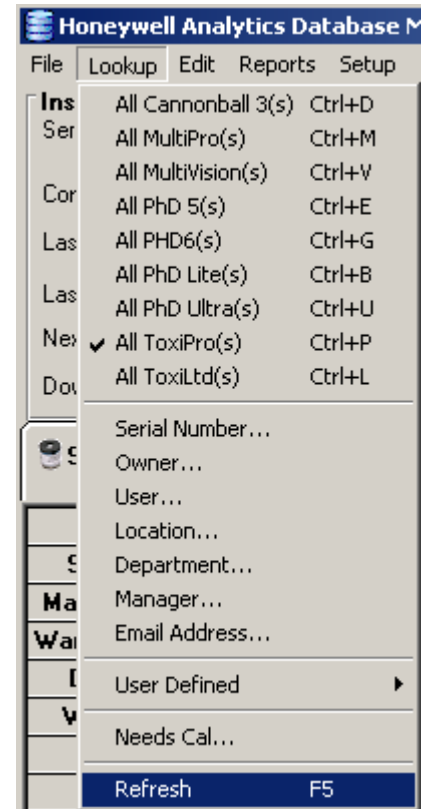
- Excel program automatically launched if “To Excel Spreadsheet” is chosen
 - From Excel, select Print from File Menu to print report

A screenshot of a Microsoft Excel window titled 'Microsoft Excel - Book1'. The spreadsheet contains a table with 7 columns: A (Index), B (Type), C (Serial Number), D (Overdue), E (Last Full Cal), and F (Cal Interval). The data is organized into 12 rows. The status bar at the bottom indicates 'Ready' and 'NUM'.

	A	B	C	D	E	F
1		Type	Serial Number	Overdue	Last Full Cal	Cal Interval
2	1	PhD 5	4674	903 days	4/14/2003 12:32	10
3	2	PhD 5	4675	939 days	3/4/2003 16:41	15
4	3	PhD 5	5463	922 days	3/6/2003 16:21	30
5	4	PhD 5	5464	901 days	4/16/2003 9:39	10
6	5	PhD 5	5471	841 days	6/15/2003 13:34	10
7	6	PhD 5	5472	925 days	4/1/2003 9:35	1
8	7	PhD 5	6991	922 days	3/6/2003 14:03	30
9	8	PhD 5	7254	841 days	6/15/2003 13:49	10
10	9	PhD 5	9138	923 days	4/3/2003 8:33	1
11	10	PhD 5	9251	918 days	4/8/2003 10:58	1
12	11	PhD 5	9268	845 days	6/11/2003 13:46	10

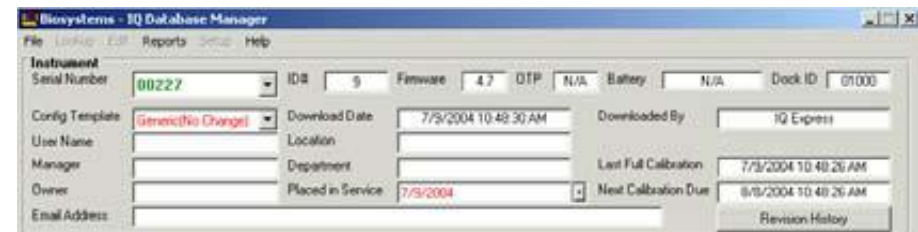
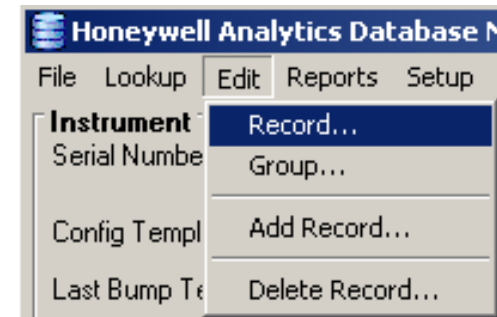
Database Manager Menu Options

- Refresh
 - Used for network database update where multiple PCs are able to access database simultaneously
 - To refresh screen, click Lookup / Refresh
 - May also be accomplished by pressing F5 key



Database Manager Menu Options

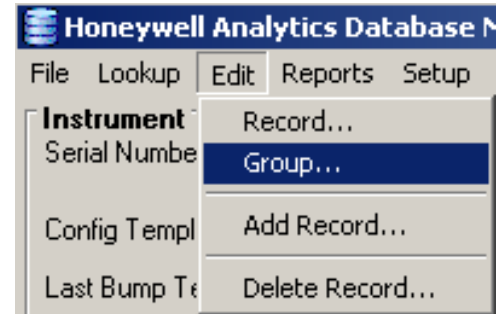
- Edit Menu
 - Option allows user to edit or delete instrument information
 - Edits may be performed to current individual record or to current group of records (recordset)
 - Calibration records and certain other types of data may not be modified by user
- Edit Record
 - To edit instrument record currently shown
 - Select Edit / Record
 - Information can be added to input boxes in upper section of form
 - Information that can be changed will appear in red
 - Most blank fields will also accept information
 - Once updated
 - Press “OK” at lower right to save changes



Database Manager Menu Options

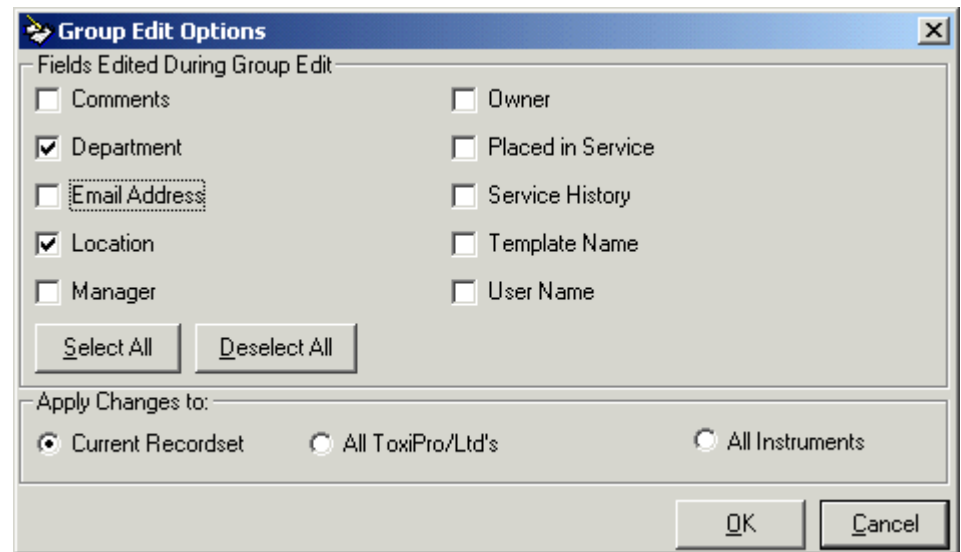
Honeywell

- Edit Group
 - To edit current recordset, select Edit / Group
 - Changes to any fields through Edit / Group option will be made to every instrument in current recordset
 - Once selected, enter information into input boxes as needed in upper form section
 - Information that can be edited appear in red
 - Most blank fields will also accept information.
 - Once fields have been updated
 - Press “OK” at lower right
 - Group Edit Options screen shown
 - Requires confirm of group edit

A screenshot of the Biosystems - IQ Database Manager application window. The form displays various fields for instrument information. The 'Serial Number' field is highlighted in green and contains the value '00227'. Other fields include 'ID# 9', 'Firmware 4.7', 'OTP N/A', 'Battery N/A', and 'Dock ID 01000'. The 'Config Template' dropdown is set to 'Generic (No Change)'. The 'Download Date' is '7/3/2004 10:49:30 AM' and 'Downloaded By' is 'IQ Express'. The 'User Name' field is empty. The 'Manager' field is empty. The 'Owner' field is empty. The 'Email Address' field is empty. The 'Placed in Service' date is '7/3/2004'. The 'Last Full Calibration' is '7/3/2004 10:40:26 AM' and the 'Next Calibration Due' is '8/10/2004 10:40:26 AM'. There is a 'Revision History' button at the bottom right.

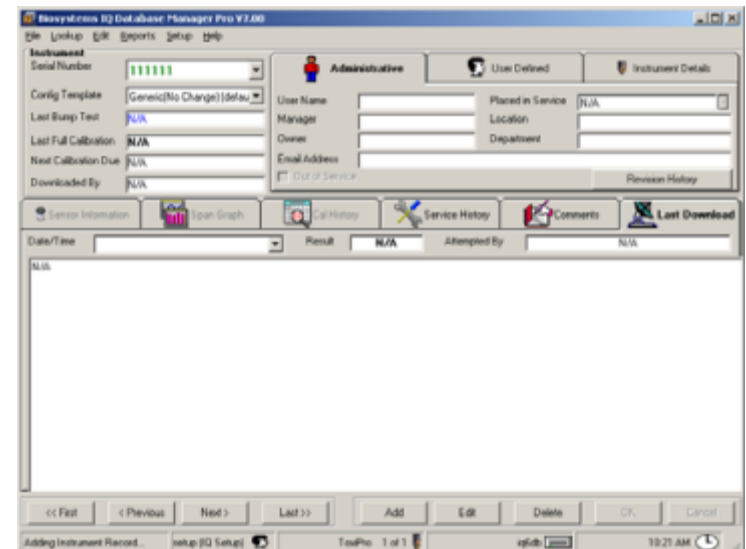
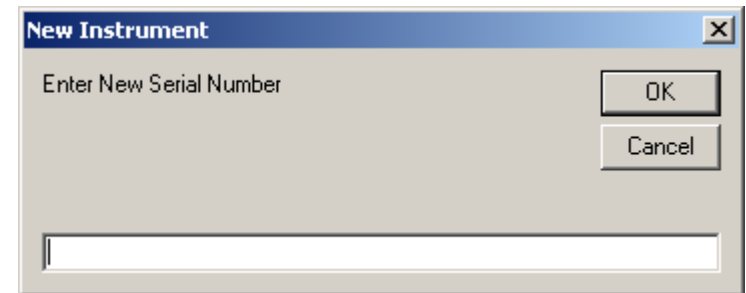
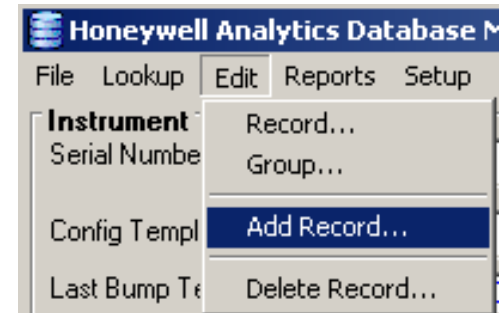
Database Manager Menu Options

- Group Edit Options screen designed to prevent accidental mass replacements of database information
 - Forces acknowledgment of specific changes and instruments to which changes should be applied
 - Window divided into two sections
 - Upper section contains information fields that may have been modified during edit
 - Select fields modified during edit that should be applied to recordset
- Lower section allows user to decide whether changes should be applied to
 - Current recordset
 - All instruments of current type
 - All instruments in general
- Click appropriate selection
- Once fields and recordset for changes have been selected
 - Click “OK” to continue
 - Changes will be implemented
- Example
 - Entries made in “Department” and “Location” will be entered into every record in current recordset



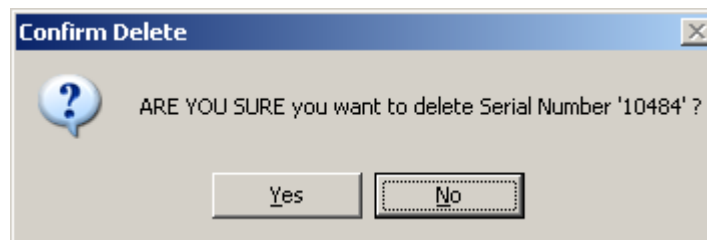
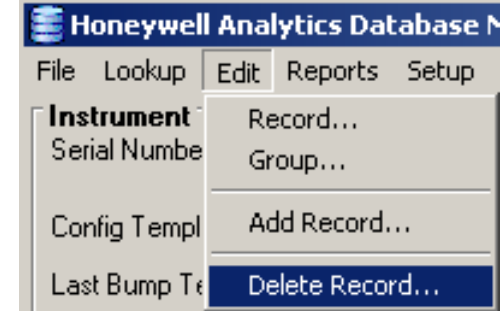
Database Manager Menu Options

- Add Record
 - Allows user to enter information for an instrument
 - Can add instrument serial number before instrument interfaces with an IQ System
 - To add a record
 - Select Edit / Add Record
 - Prompts for new instrument serial number
 - Record shown on main screen
 - Click Edit in lower control bar to make changes to record
 - Fields that have information in them that can be edited appear in red
 - Most blank fields will also accept information



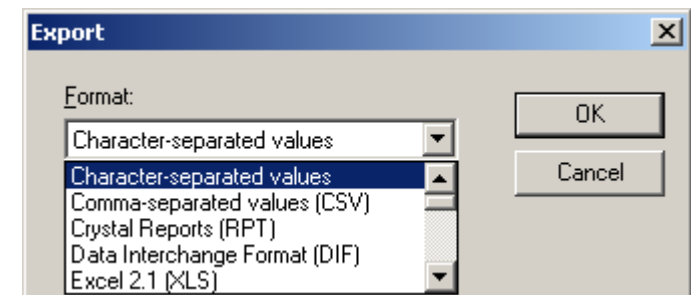
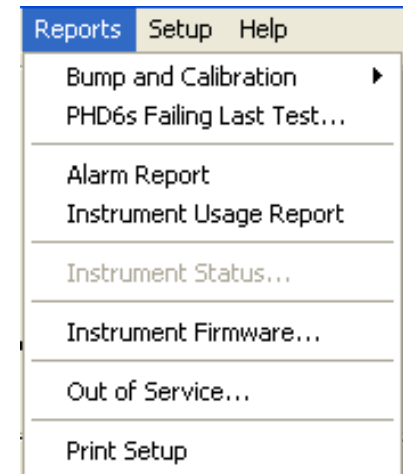
Database Manager Menu Options

- Delete Record
 - To delete current instrument record shown
 - Select Edit / Delete Record
 - Prompts to confirm deletion
 - Record may not be retrieved once deleted
 - Instead of deleting instrument
 - Take it out of service
 - Instrument can be taken out of service by checking box on Administrative tab while editing instrument record
 - Click “Yes” to delete record



Database Manager Menu Options

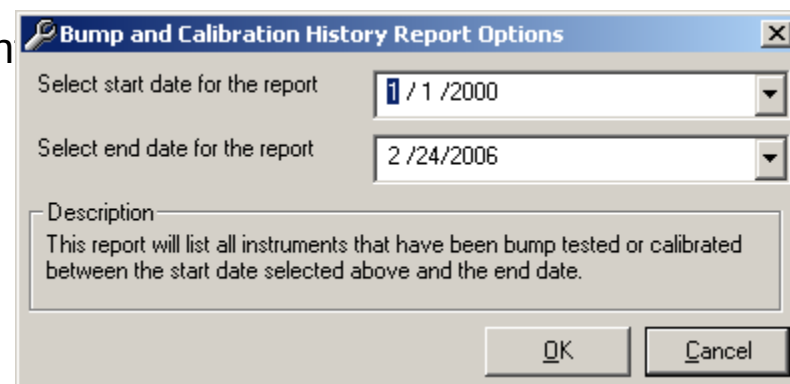
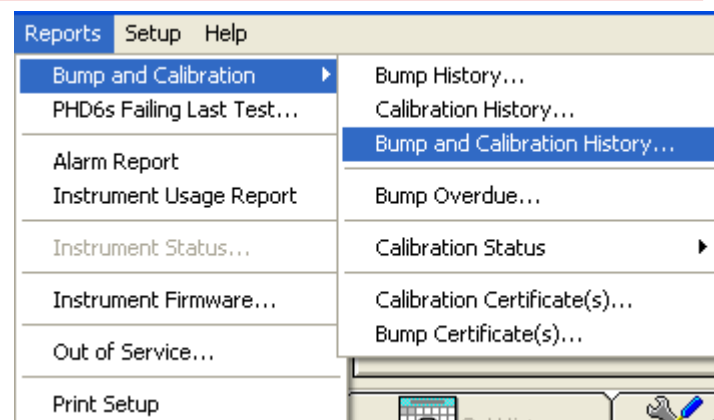
- Reports Menu
 - Report options and controls located in Reports menu
 - When report option is selected and report is generated
 - Report may be printed or exported as needed
 - Controls for printing and exporting located near top of screen
 - Reports may be exported in a variety of forms
 - When export key clicked, options window appears.



Database Manager Menu Options

Honeywell

- Bump and Calibration Histories
 - Allows user to print specific reports about current recordset
 - Bump Reports may not be available for certain instruments.
 - Report options window shown
 - Specify start and end dates for report
 - Select report for current record (1 instrument)
 - For current recordset (all instruments)
 - Report shown



ToxiPro Calibration History

Report Generated as of

08/12/2004

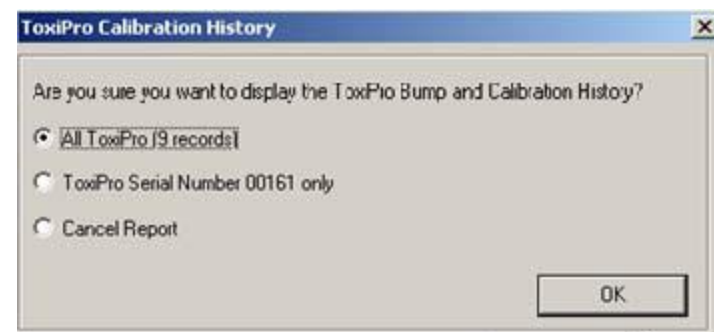
1:28:38PM

Serial#	00161	Last Full Cal	7/13/2004 1:55:18PM
Current Temp Unit	standard	Placed In Service	7/13/2004
User	Your Name	Manager	Your Manager
Department	Employee Safety	Owner	Your Owner
Location	Page 1022		
	Email		YourName@YourCompany.com

Date	Detest	Response	Detestable Name	Detest ID	Control ID	Unit	Cal Date P2/Then	Cal Date S2/Then
7/13/2004 1:40:43PM	802	30 Page	80A	01014	12 Report Desk 01014	12 Report	04/04/02	7/13/04
7/13/2004 1:44:20PM	802	36 Page	80A	01013	12 Report Desk 01013	12 Report	04/04/02	7/13/04
7/13/2004 1:53:57PM	802	37 Page	80A	01009	12 Report Desk 01009	12 Report	04/04/02	7/13/04

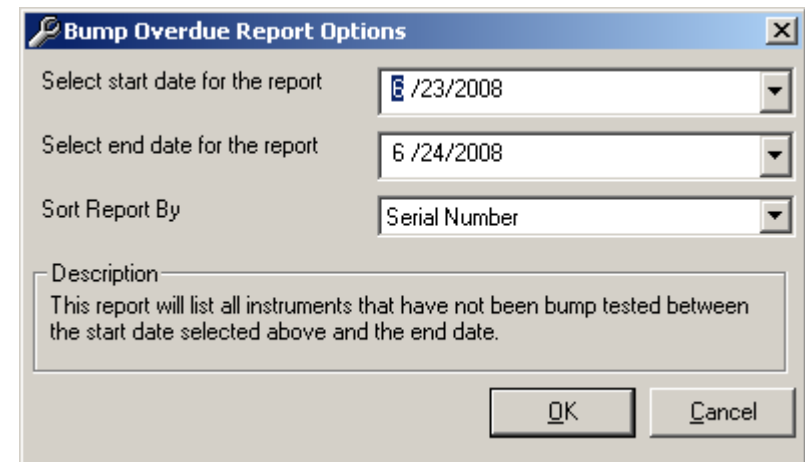
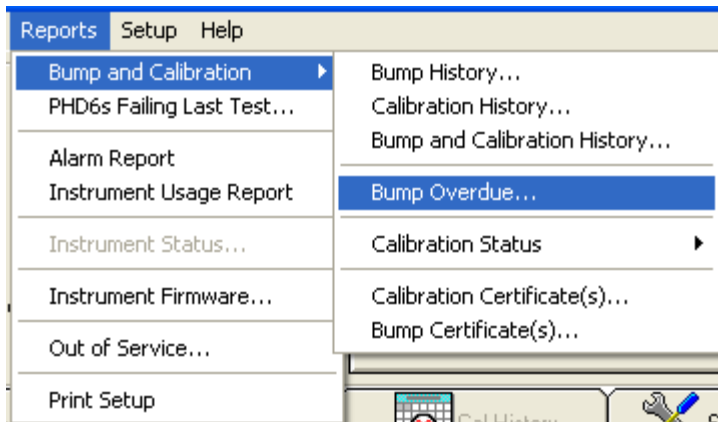
Serial#	00281	Last Full Cal	7/13/2004 1:43:46PM
Current Temp Unit	standard	Placed In Service	7/13/2004
User	Your Name	Manager	Your Manager
Department	Employee Safety	Owner	Your Owner
Location	Page 1022		
	Email		YourName@YourCompany.com

Date	Detest	Response	Detestable Name	Detest ID	Control ID	Unit	Cal Date P2/Then	Cal Date S2/Then
7/13/2004 1:34:51AM	02	31.4%	80A	01008	12 Report Desk 01008	12 Report	04/04/02	7/13/04
7/13/2004 1:32:39PM	02	30.2%	80A	01008	12 Report Desk 01008	12 Report	04/04/02	7/13/04
7/13/2004 1:44:08PM	02	30.0%	80A	01008	12 Report Desk 01008	12 Report	04/04/02	7/13/04



Database Manager Menu Options

- Bump Overdue Report
 - Report lists all instruments in current recordset overdue for bump test
 - Bump Overdue option not available for all detector types
 - Options window shown
 - Select start and end dates
 - Change sort method if necessary and press “OK”
 - Report generated
 - Shows any instruments overdue for a bump test during specified timeframe



Database Manager Menu Options

- **Calibration Status Report**

- To generate Calibration Status Report for current recordset

- Select Calibration Status from Reports Menu

- Three options

- Brief
 - Detailed
 - Needs Cal

- Brief Status Report

- Lists instruments in current recordset
 - Shows current calibration interval and status

- Detailed Status Report

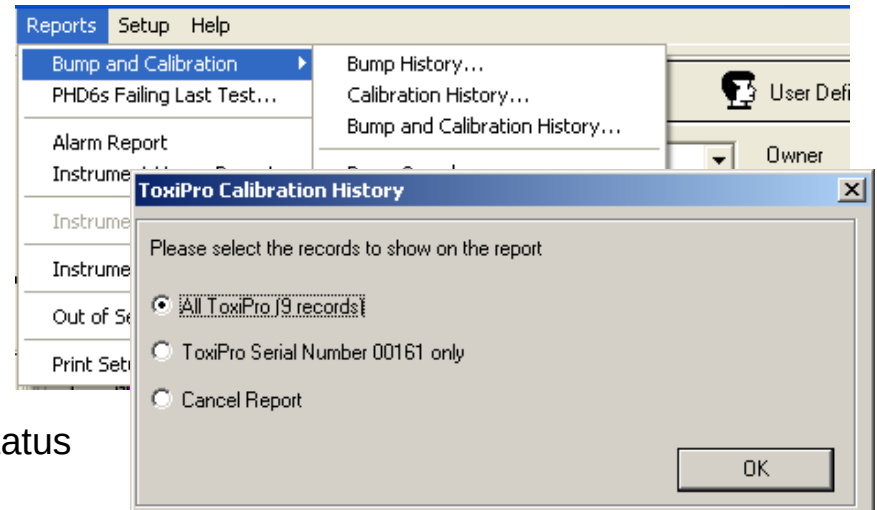
- Creates a separate report with full calibration history for each instrument in current recordset

- Needs Cal Report

- Lists all instruments in current recordset past calibration due date

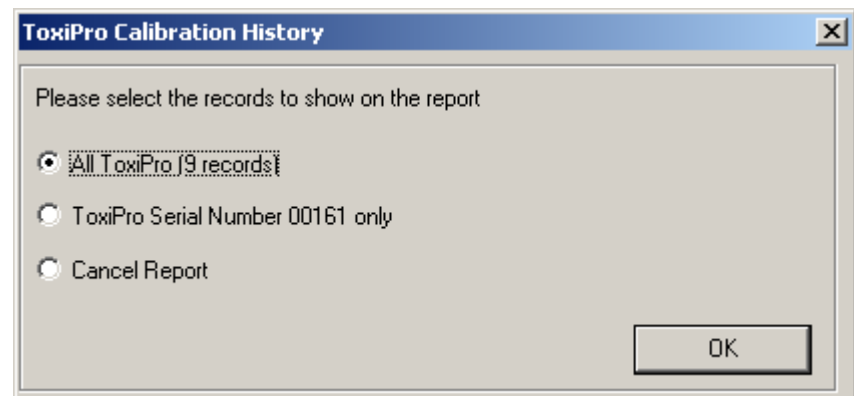
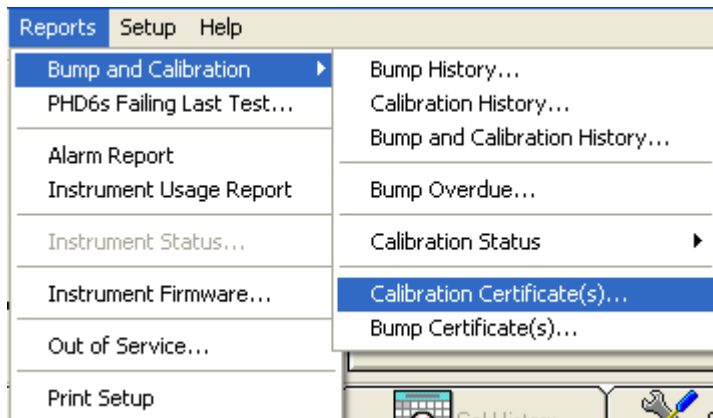
- Once report is selected

- Select either current recordset or current record
 - Select appropriate report, or Cancel Report and click “OK”



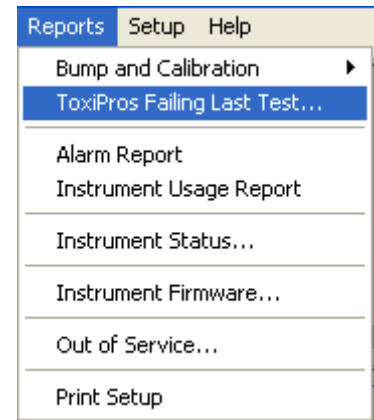
Database Manager Menu Options

- Calibration and Bump Certificates
 - To view or print bump or calibration certificates
 - Select appropriate choice from Reports menu
 - Once selected
 - Select either current recordset or current record
 - Select appropriate report and click “OK” to view report
 - Calibration Certificates may be viewed on screen, printed directly or exported as needed



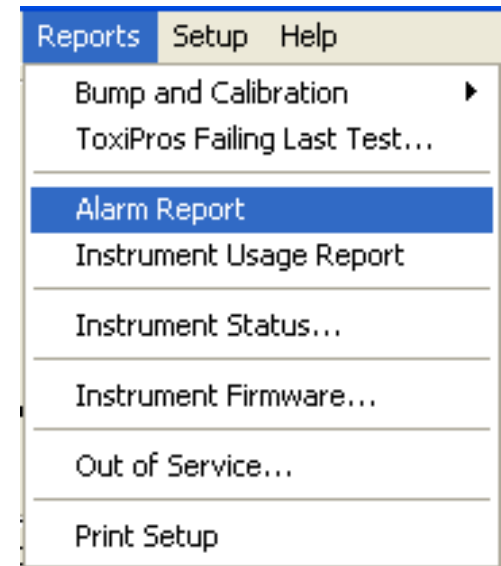
Database Manager Menu Options

- Instrument Failing Last Test Report
 - List of instruments failed testing last time instrument was placed in dock
 - Report is constrained to selected instrument type



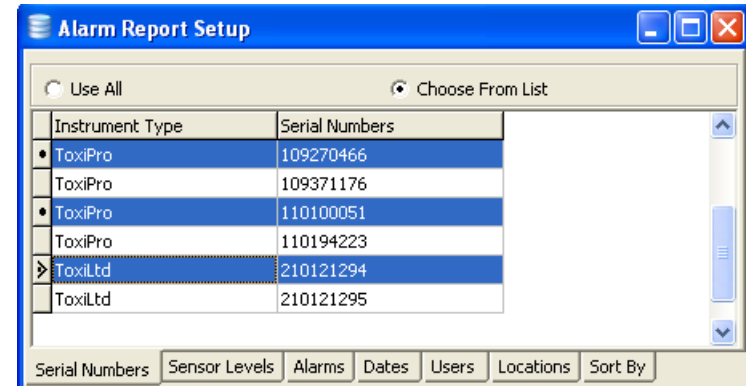
Database Manager Menu Options

- Alarm Report
 - List of alarms occurring during defined time interval
 - Report can be defined by a number of parameters and sorting criteria
 - Instrument user
 - Location
 - Instrument serial number
 - Sensor type
 - Alarm type
 - Date range.
 - Parameters selected by series of tabs
 - Tab selections saved and are default parameters next time report is selected
 - Blue flag indicates limiting parameters are selected



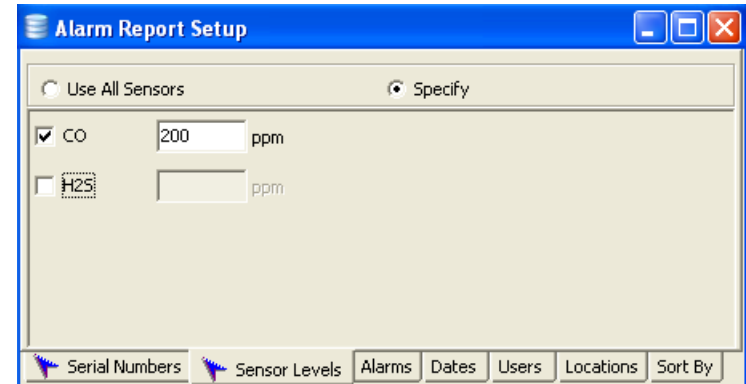
Database Manager Menu Options

- Alarm Report (cont'd)
 - Serial Number tab
 - Limits instrument serial numbers included in report
 - Multiple instruments can be selected by holding the CTRL key while selecting instruments
 - Sensor Level tab
 - Limits report based on sensor type and alarm level
 - Alarm level typed in text box
 - Alarms tab
 - Limits report based on alarm type.



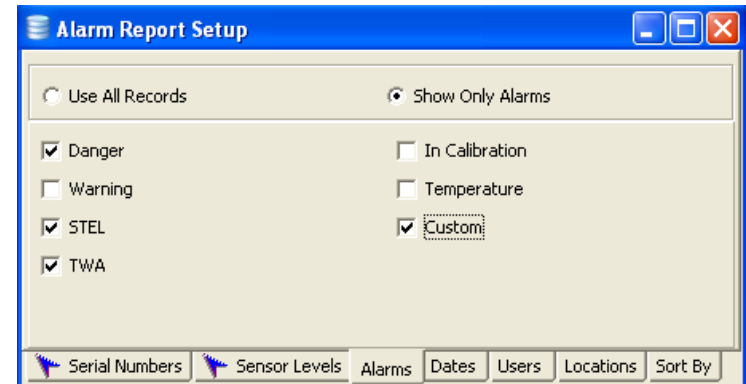
The 'Alarm Report Setup' window shows the 'Serial Numbers' tab selected. It features a radio button for 'Use All' and a selected radio button for 'Choose From List'. Below is a table with two columns: 'Instrument Type' and 'Serial Numbers'. The table contains six rows, with 'ToxiPro' and 'ToxiLtd' instruments listed. The 'ToxiLtd' row is highlighted. At the bottom, there are tabs for 'Serial Numbers', 'Sensor Levels', 'Alarms', 'Dates', 'Users', 'Locations', and 'Sort By'.

Instrument Type	Serial Numbers
ToxiPro	109270466
ToxiPro	109371176
ToxiPro	110100051
ToxiPro	110194223
ToxiLtd	210121294
ToxiLtd	210121295



The 'Alarm Report Setup' window shows the 'Sensor Levels' tab selected. It features a radio button for 'Use All Sensors' and a selected radio button for 'Specify'. Below is a list of sensors with checkboxes and input fields for alarm levels. 'CO' is checked with a value of '200' ppm. 'H2S' is unchecked with an empty input field. At the bottom, there are tabs for 'Serial Numbers', 'Sensor Levels', 'Alarms', 'Dates', 'Users', 'Locations', and 'Sort By'.

Sensor	Alarm Level	Unit
☒ CO	200	ppm
☐ H2S		ppm

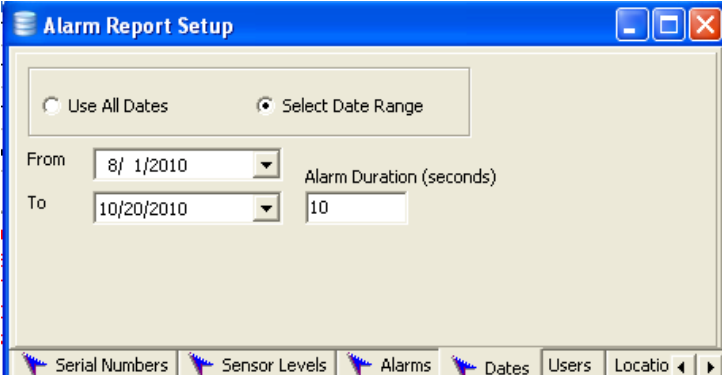


The 'Alarm Report Setup' window shows the 'Alarms' tab selected. It features a radio button for 'Use All Records' and a selected radio button for 'Show Only Alarms'. Below is a list of alarm types with checkboxes. 'Danger', 'STEL', and 'TWA' are checked. 'Warning', 'In Calibration', and 'Temperature' are unchecked. 'Custom' is checked. At the bottom, there are tabs for 'Serial Numbers', 'Sensor Levels', 'Alarms', 'Dates', 'Users', 'Locations', and 'Sort By'.

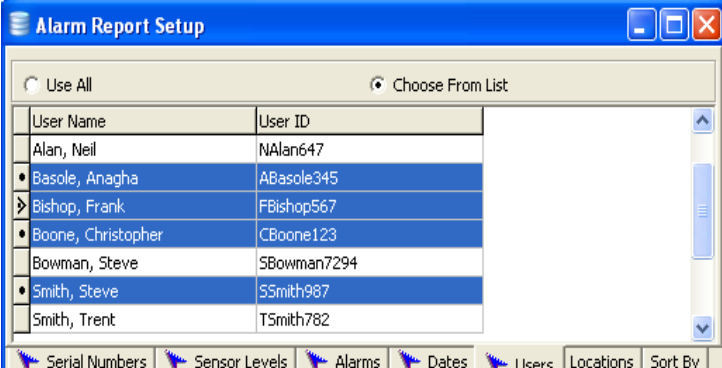
Alarm Type	Selected
☒ Danger	Yes
☐ Warning	No
☒ STEL	Yes
☒ TWA	Yes
☐ In Calibration	No
☐ Temperature	No
☒ Custom	Yes

Database Manager Menu Options

- Alarm Report (cont'd)
 - Dates tab
 - Limits report based on date range and alarm duration
 - Dates selected from drop down calendar control
 - Alarm duration typed in text box
 - Users tab
 - Limits report based on instrument user
 - Locations tab
 - Limits report based on instrument location
 - Report can be sorted by instrument serial number, date, instrument user or location.

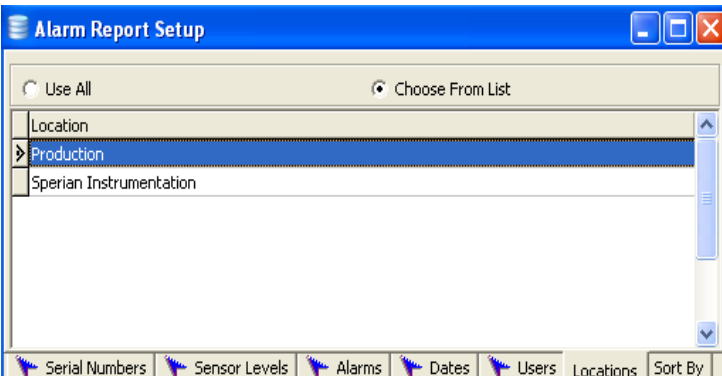


The screenshot shows the 'Alarm Report Setup' window with the 'Dates' tab selected. It features two radio buttons: 'Use All Dates' (unselected) and 'Select Date Range' (selected). Below these are two date pickers: 'From' (8/ 1/2010) and 'To' (10/20/2010). To the right is a text box for 'Alarm Duration (seconds)' with the value '10'. At the bottom is a tab bar with 'Serial Numbers', 'Sensor Levels', 'Alarms', 'Dates' (selected), 'Users', and 'Locations'.



The screenshot shows the 'Alarm Report Setup' window with the 'Users' tab selected. It features two radio buttons: 'Use All' (unselected) and 'Choose From List' (selected). Below is a table with two columns: 'User Name' and 'User ID'. The table contains several rows, with 'Basole, Anagha' and 'Smith, Steve' highlighted. At the bottom is a tab bar with 'Serial Numbers', 'Sensor Levels', 'Alarms', 'Dates', 'Users' (selected), and 'Locations'.

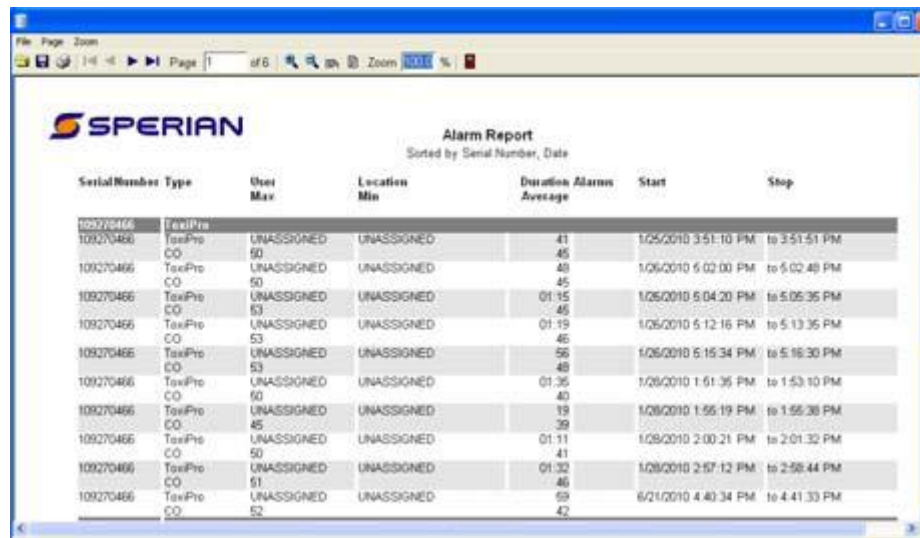
User Name	User ID
Alan, Neil	NAlan647
• Basole, Anagha	ABasole345
› Bishop, Frank	FBishop567
• Boone, Christopher	CBoone123
Bowman, Steve	SBowman7294
• Smith, Steve	SSmith987
Smith, Trent	TSmith782



The screenshot shows the 'Alarm Report Setup' window with the 'Locations' tab selected. It features two radio buttons: 'Use All' (unselected) and 'Choose From List' (selected). Below is a list box containing 'Location', 'Production' (highlighted), and 'Sperian Instrumentation'. At the bottom is a tab bar with 'Serial Numbers', 'Sensor Levels', 'Alarms', 'Dates', 'Users', 'Locations' (selected), and 'Sort By'.

Database Manager Menu Options

- Alarm Report (cont'd)
 - “Defaults” button on bottom of form restores limiting parameters to program defaults
 - Blue flags cleared
 - Select “Preview” at bottom of form to view results
 - Report can be printed from preview screen
 - Select “PDF” to create a PDF formatted version of report



Serial Number	Type	User	Max	Location	Min	Duration	Alarms	Average	Start	Stop
109270466	TestPro	UNASSIGNED	UNASSIGNED			41			1/25/2010 3:51:10 PM	to 3:51:51 PM
109270466	CO	50				45			1/26/2010 5:02:00 PM	to 5:02:40 PM
109270466	TestPro	UNASSIGNED	UNASSIGNED			45			1/26/2010 5:04:20 PM	to 5:05:35 PM
109270466	CO	53				01:15			1/26/2010 5:12:16 PM	to 5:13:35 PM
109270466	TestPro	UNASSIGNED	UNASSIGNED			01:19			1/26/2010 5:15:34 PM	to 5:16:30 PM
109270466	CO	53				46			1/26/2010 1:51:35 PM	to 1:53:10 PM
109270466	TestPro	UNASSIGNED	UNASSIGNED			01:36			1/26/2010 1:55:19 PM	to 1:56:38 PM
109270466	CO	50				40			1/26/2010 2:00:21 PM	to 2:01:32 PM
109270466	TestPro	UNASSIGNED	UNASSIGNED			19			1/26/2010 2:57:12 PM	to 2:58:44 PM
109270466	CO	45				39			6/21/2010 4:40:34 PM	to 4:41:33 PM
109270466	TestPro	UNASSIGNED	UNASSIGNED			01:11				
109270466	CO	50				41				
109270466	TestPro	UNASSIGNED	UNASSIGNED			01:32				
109270466	CO	51				46				
109270466	TestPro	UNASSIGNED	UNASSIGNED			59				
109270466	CO	52				42				

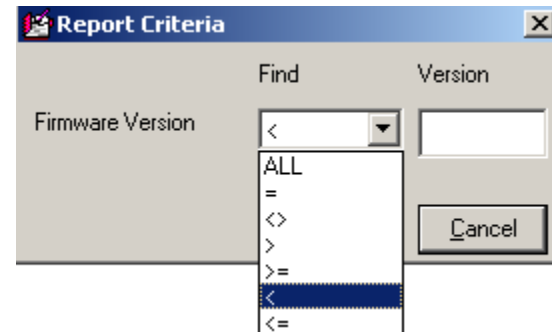
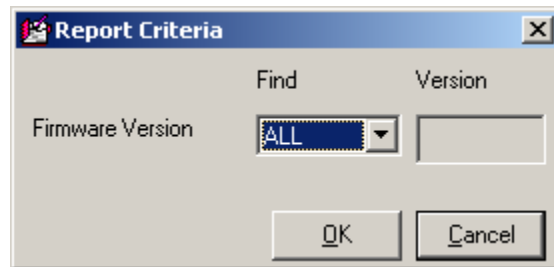
Database Manager Menu Options

- Instrument Usage Report
 - Report lists instrument usage by user
 - Uses same selection and sorting criteria as Alarms Report
- Instrument Status Report
 - Lists current status of each instrument and sensors
 - Report lists general information about instrument grouping
 - How many are overdue for bump testing and calibration
 - How many sensors need replacing
 - Report lists status details for each instrument
 - Once a report is selected
 - Select all instruments
 - Instruments with Low Span Reserve
 - Current instrument
 - Report displayed

 Instrument Status Report for ToxiPro(s)		Report Printed on
ToxiPro Serial Number 109270466		10/22/2018 10:42:08AM
Status Summary		
1 ToxiPro(s)	1 Sensors	
0 Overdue Calibration	0 Need Replacement Soon	
1 Overdue Bump	0 Need Replacement Now	
Status Details		
Serial # 109270466 Bump Overdue	Total Cals 2 Last Full Cal 10/13/2018 2:00:36 PM Days Since Last Cal 9 day(s) Avg. Days Between Cal 8 Days Cal Reminders 0 days Next Cal 11/12/2018 2:00:36 PM	Total Bumps 2 Last Bump 10/13/2018 2:00:40 PM Days Since Last Bump 9 day(s) Avg. Days Between Bump 8 Days Bump Reminders 1 day Next Bump Overdue
	Total Tests 4 Template DLEvents Version 9.01 Placed In Service 10/13/2018	
Select CO Normal		

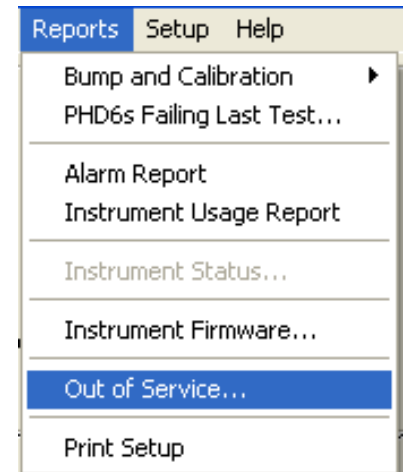
Database Manager Menu Options

- Instrument Firmware Report
 - List of instruments in current recordset along with versions of instrument firmware
 - To generate instrument firmware report
 - select Instrument Firmware from Reports Menu
 - Search Criteria window allows recordset search to be narrowed to specific instruments
 - Select All or use built-in search mechanism to narrow results



Database Manager Menu Options

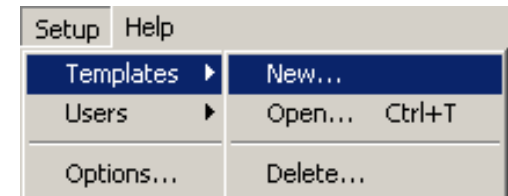
- Out of Service Report
 - Instruments may be marked “Out of Service” on Administrative Tab
 - Instruments marked “Out of Service” will not appear in generated reports
 - To view instruments in current recordset currently marked out of service
 - Click “Out of Service” in Reports Menu
- Print Setup
 - To access print controls for reports menu
 - Click Reports / Print Setup
 - Standard print settings window shown
 - Information will vary according to operating system and available printers and options



Database Manager Menu Options

- Setup / Templates

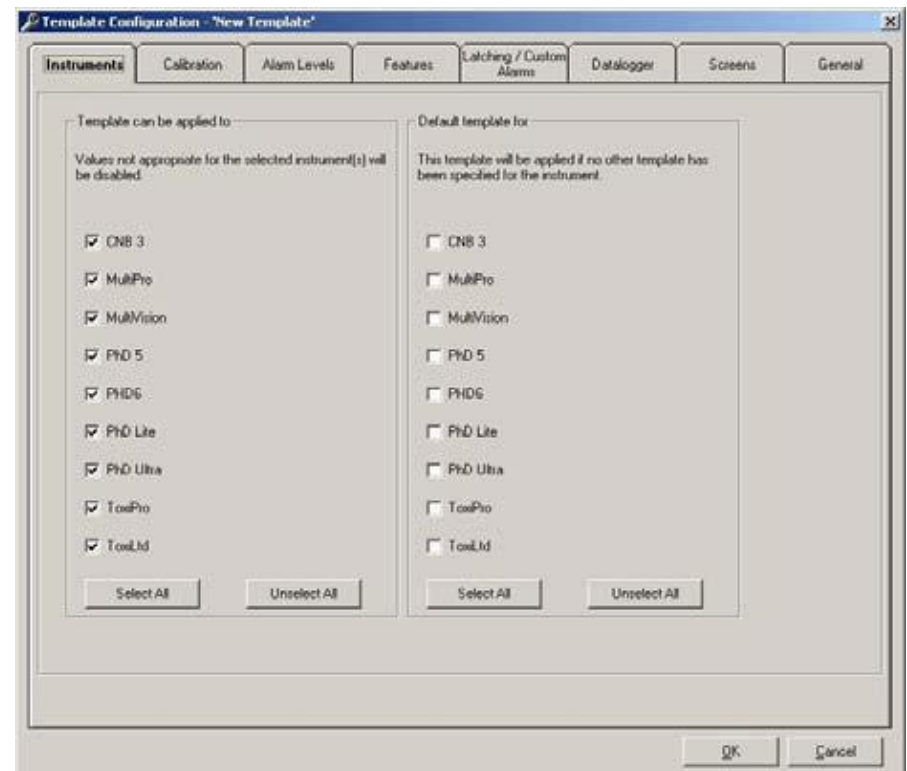
- Templates used to control operations associated with specific instruments
- Template comprises eight tabbed pages
 - Access modifiable operating information for any gas detector assigned to that specific template
- To create new template
 - Click Setup / Templates / New
 - New templates automatically opened when created
- To open existing template
 - Click Setup / Templates / Open
 - Select template from list
 - Any changes made to template will only be applied to current open template
- To delete template
 - Click Setup / Templates / Delete
 - Select template from list



- Setup / Templates (cont'd)
 - Some selections have drop down lists or a value can be set by specifying a value (alarm levels, calibration gas value, etc)
 - Common values in drop down lists
 - 'No Change'
 - Normal default for all selections
 - Selection is not modified from its current setting
 - 'Use Default'
 - Setting returned to factory default
 - 'Enabled'
 - Setting enabled
 - 'Disabled'
 - Setting disabled
 - Changes made to a template automatically uploaded to all instruments assigned to that template
 - Some changes will directly affect detector functionality

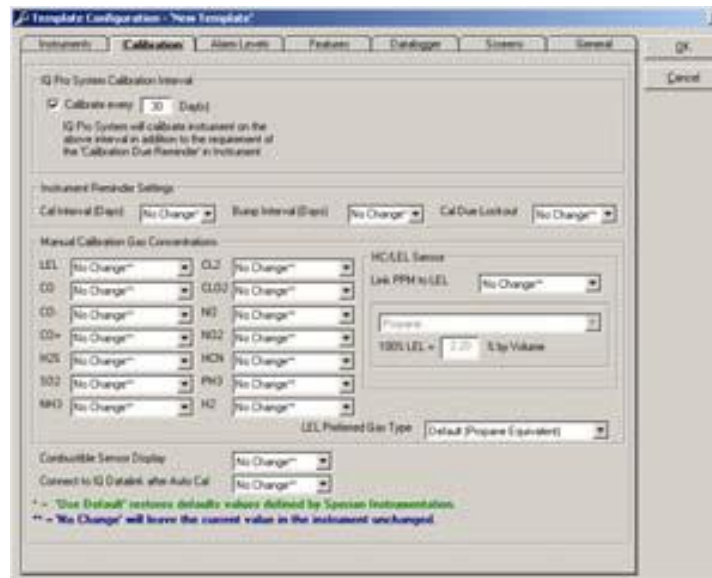
Database Manager Menu Options

- Instruments Tab
 - Once template is opened, Instruments tab shown
 - Instruments tab contains two columns
 - Left column shows instruments current template can be applied to
 - Selections made here appear in main screen as options in Configuration Template selection for instrument listed
 - Right column shows instruments using this template or will be default template
 - Example
 - If template named “standard” is applied to ToxiPro and new ToxiPro is detected in system, “standard” template will automatically be assigned to that ToxiPro
 - Instrument must be selected in left column - instruments template can be applied to - before it can be selected in right column – instruments using this as default template



Database Manager Menu Options

- Calibration Tab
 - Calibration template has controls for
 - Calibration interval
 - Calibration due reminder
 - Calibration gas concentrations
 - Combustible sensor display setting



Database Manager Menu Options

- Calibration Tab (cont'd)
 - For IQ Calibration Stations
 - Calibration interval
 - Controls interval controller will automatically initiate calibrations
 - Checkbox must be checked to be enabled
 - Calibration due interval can be set
 - Interval in days - 1 to 180 days
 - Never
 - No Change
 - “Never” effectively disables calibration due reminder interval
 - “No Change” leaves interval setting in instrument as is

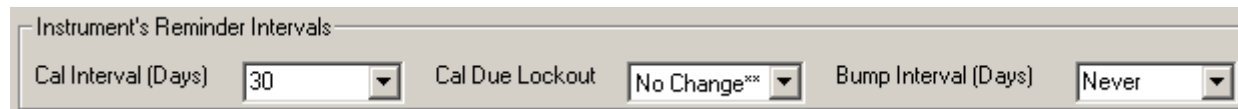
Interval

☒ Calibrate every 30 Day(s)

Controller will calibrate instrument on the above interval in addition to the requirement of the 'Calibration Due Reminder' in Instrument

Database Manager Menu Options

- Calibration Tab (cont'd)
 - Instrument Reminder Intervals shown in middle of calibration tab
 - Cal and bump test reminder intervals can be set from 0 and 180 days
 - To cal and/or bump every time an instrument assigned to template is placed in dock
 - Set interval to 0 days



The screenshot shows a dialog box titled "Instrument's Reminder Intervals". It contains three settings, each with a label and a dropdown menu:

Label	Value
Cal Interval (Days)	30
Cal Due Lockout	No Change**
Bump Interval (Days)	Never

- Calibration Tab (cont'd)
 - Cal Due Lockout
 - Automatically initiate calibration procedure if turned on when calibration is due
 - If calibration is not performed with Cal Due Lockout enabled
 - Instrument automatically shuts down
 - For more information on calibration due lockout function
 - See instrument reference manual
 - Instrument firmware must support Bump Interval and Cal Due Lockout function for these to be active in software

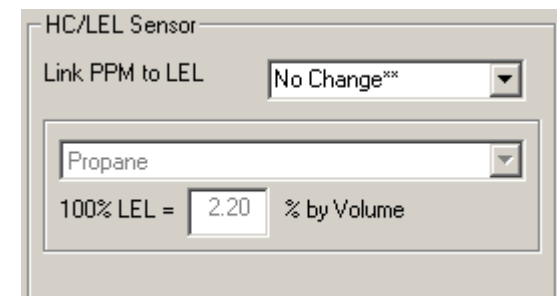
Database Manager Menu Options

- Calibration Tab (cont'd)
 - Calibration gas concentration settings only apply to manual calibrations
 - Settings can be numeric value, “No Change” or “Use Default”
 - Calibration gas concentrations entered will be automatically uploaded to instruments
 - Will be used in subsequent calibrations until user changes them
 - Calibration gas concentration settings must match actual calibration gas values to ensure accurate gas detector calibration
 - Nonmatching calibration gas and calibration gas values may lead to dangerously inaccurate readings.
 - Numeric entries automatically uploaded to instrument once linked to IQ System
 - “Use Default” setting
 - Restores factory-programmed value
 - “No Change”
 - Leaves existing value programmed into instrument
 - IQ Calibration Station software contains its own calibration gas concentration values for gases used
 - Concentrations listed in IQ Controller software automatically adopted whenever IQ Controller performs a calibration

LEL	No Change**	ClO2	No Change**
CO	Use Default*	NO	No Change**
H2S	No Change**	NO2	No Change**
SO2	No Change**	HCN	No Change**
NH3	No Change**	PH3	No Change**
Cl2	No Change**		

Database Manager Menu Options

- Calibration Tab (cont'd)
 - Combustible sensor display
 - Controls whether combustible gas reading is shown as %LEL or %CH4 by volume
 - “Use Default”
 - Restores to factory-programmed value
 - “No Change”
 - Leaves existing value programmed into instrument
 - Not all instruments offer ability to modify combustible sensor display settings
 - At screen far right
 - Settings for HC/LEL sensor - only available in Cannonball3
 - See Cannonball3 Reference Manual prior to changing HC/LEL sensor settings



Database Manager Menu Options

- Alarm Levels Tab
 - Contains controls for instrument's gas level alarms
 - Modifications to alarm settings may cause detector to fail to respond to potentially dangerous atmospheric conditions
 - Changes made to template automatically uploaded to all instruments assigned to that template when instrument linked to IQ System
 - One danger and one warning alarm included for instruments equipped with oxygen or LEL sensors – including HC sensor
 - Toxic gas sensors include up to 4 alarms
 - Warning
 - Danger
 - STEL
 - TWA

Template Configuration - New Template

Instrument Calibration Alarm Levels Features Catalogue Systems General

Warning (High) Danger (Low) Warning (Low) Danger (High)

O2 [No Change] [No Change] [No Change] [No Change]

LEL [No Change] [No Change] [No Change] [No Change]

HC [No Change] [No Change] [No Change] [No Change]

CO [No Change] [No Change] [No Change] [No Change]

CO+ [No Change] [No Change] [No Change] [No Change]

H2S [No Change] [No Change] [No Change] [No Change]

SO2 [No Change] [No Change] [No Change] [No Change]

BH3 [No Change] [No Change] [No Change] [No Change]

CL2 [No Change] [No Change] [No Change] [No Change]

CL02 [No Change] [No Change] [No Change] [No Change]

NO [No Change] [No Change] [No Change] [No Change]

NO2 [No Change] [No Change] [No Change] [No Change]

HCN [No Change] [No Change] [No Change] [No Change]

PHO [No Change] [No Change] [No Change] [No Change]

H2 [No Change] [No Change] [No Change] [No Change]

VOC [No Change] [No Change] [No Change] [No Change]

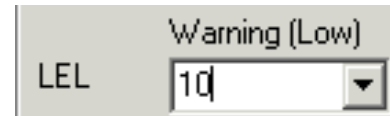
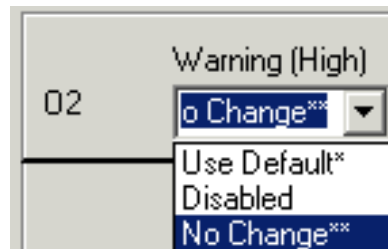
VOC Selection: [No Change]

Factor: 1.00

* = "Use Default" option will restore the default alarm level stored in the sensor's memory.
** = "No Change" will leave the current alarm level in the instrument unchanged.

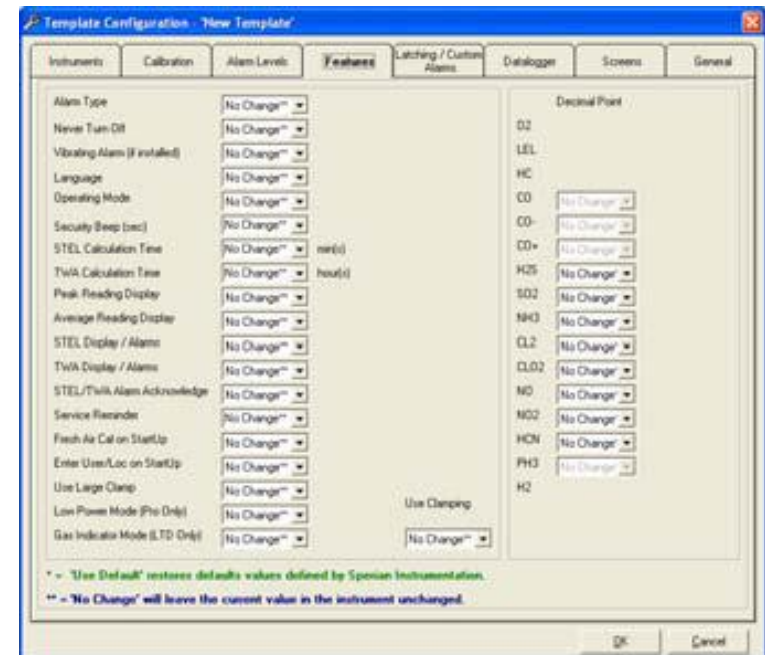
Database Manager Menu Options

- Alarm Levels Tab
 - Default configuration for alarm settings is “No Change”
 - For fields marked “No Change”, instrument alarms will not be changed during interface
 - Other options include “Use Default” and “Disabled”
 - “Use Default” sets instrument’s default setting
 - Select “Disabled” to disable alarm entirely.
 - Final option type new alarm level
 - Select alarm setting and type in new value
 - Press “OK” at window bottom once alarms have been modified



Database Manager Menu Options

- Features Tab
 - Contains controls for
 - Operating Mode
 - Security Beep
 - Latching Alarm
 - OK Mode Alarm Latch
 - Language settings
 - Decimal point settings for all sensors with optional decimal point and many others



Database Manager Menu Options

- “Alarm Type” selectable on some instruments
 - Use “Alarm Type” control to
 - Select alarm type
 - Use factory default
 - Don’t change it
 - If “Never Turn Off mode” is enabled
 - Instrument will not be able to be turned off by user
 - This option can be enabled, disabled, use factory default or not changed
 - If instrument has vibrator installed
 - Option can enable or disable vibrator, or not change current setting

Alarm Type	No Change**
Never Turn Off	Two Tone
Vibrating Alarm (if installed)	Trill
	Use Default*
	No Change**

Never Turn Off	No Change**
Vibrating Alarm (if installed)	Disabled
	Enabled
Language	No Change**

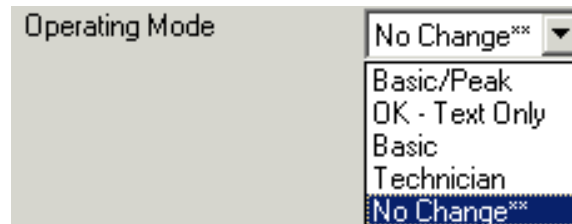
Vibrating Alarm (if installed)	No Change**
Language	Disabled
	Enabled
Operating Mode	No Change**

Database Manager Menu Options

- Some instruments support language selection
 - Use language settings control to select instrument operating language
 - If language is selected is not supported detector will revert to operation in English



- “Operating Mode” setting can be set to any operating mode available for specific instrument or not changed



Database Manager Menu Options

- “Security Beep” can be set to
 - Specific interval in seconds, disabled or not changed
 - To enter a new interval (in seconds), type new interval into text box
- “Peak Readings Display”
- “Average Readings Display”
- “STEL Display / Alarms”
- “TWA Display / Alarms”
- “STEL/TWA Alarm Acknowledge”
- “Fresh Air Cal on StartUp”
- “Enter User/Loc on StartUp”
- “Use Large Clamp”
- “Low Power Mode”
- “Gas Indicator Mode”
 - All can be enabled, disabled, set to factory default or not changed

Security Beep (sec)	No Change**
	Disabled
	No Change**

Security Beep (sec)	30
---------------------	----

Peak Reading Display	No Change**
Average Reading Display	Disabled
STEL Display / Alarms	Enabled
	Use Default*
	No Change**

Average Reading Display	No Change**
STEL Display / Alarms	Disabled
TWA Display / Alarms	Enabled
	Use Default*
	No Change**

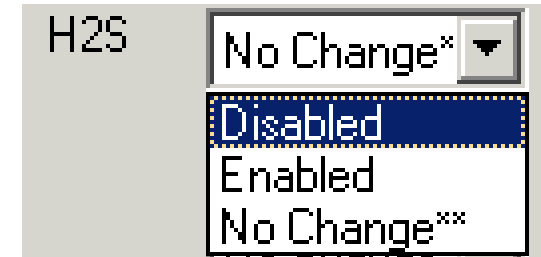
STEL Display / Alarms	No Change**
TWA Display / Alarms	Disabled
STEL/TWA Alarm Acknowledge	Enabled
	Use Default*
	No Change**

TWA Display / Alarms	No Change**
STEL/TWA Alarm Acknowledge	Disabled
Service Reminder	Enabled
	Use Default*
	No Change**

STEL/TWA Alarm Acknowledge	No Change**
Service Reminder	Disabled
Fresh Air Cal on StartUp	Enabled
	Use Default*
	No Change**

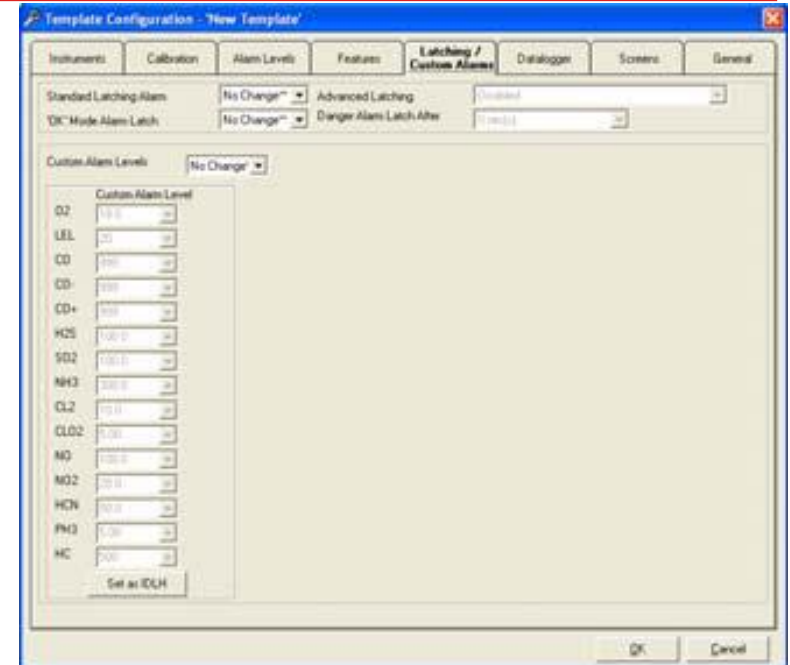
Database Manager Menu Options

- Sensor decimal point settings at right side of screen
 - Each sensor type decimal point may be enabled, disabled, set to factory default or not changed.
- Changes made to template automatically uploaded to all instruments associated with template when the instrument is linked/docked in IQ System
 - Changes will directly affect detector functionality



Database Manager Menu Options

- Latching / Custom Alarms Tab
 - Contains controls to set
 - Standard and advanced latching
 - OK Mode
 - Alarm latch
 - Enabling, disabling or defining a custom alarm level
 - Refer to instrument manual to determine custom alarm support
 - Standard Latching Alarm can be set
 - “Enabled”, “Disabled” or no change
 - If “Standard Latching Alarm” is enabled, “Advanced Latching” cannot be used



Database Manager Menu Options

Honeywell

- Latching

- OK Mode Alarm Latch can be set
 - “Enabled”, “Disabled” or to “No Change”
- To use “Advanced Latching”, “Standard Latching” must be set to disabled
- Advanced Latching can be set
 - “Disabled”, “Latch Enabled – Dock/Instrument Reset”, “Latch Enabled – Dock Reset Only” or set to “No Change”
- “Latch Enabled – Dock/Instrument Reset”
 - Allows Advanced Latch to reset by pressing Mode button or by inserting into a dock
- “Latch Enabled – Dock Reset Only”
 - Allows Advanced Latch only to be reset by inserting instrument into a dock
- “Danger Alarm Latch After”
 - Allows user to define minimum duration of a danger alarm before instrument latches alarm
 - Duration selectable from drop down list

Standard Latching Alarm	No Change**
'OK' Mode Alarm Latch	Disabled
	Enabled
	No Change**

'OK' Mode Alarm Latch	No Change**
	Disabled
	Enabled
	No Change**

Advanced Latching	Disabled
Danger Alarm Latch After	Disabled
	Latch Enabled - Dock/Instrument Reset
	Latch Enabled - Dock Reset Only
	No Change**

Danger Alarm Latch After	0 sec(s)
	0 sec(s)
	15 sec(s)
	30 sec(s)
	45 sec(s)
	1 min
	1 min 30 sec(s)
	2 min
	2 min(s) 30 sec(s)

Database Manager Menu Options

- Custom Alarm
 - User defined alarm above Danger alarm
 - Can be defined for each sensor type
 - Custom Alarm selections are “Disabled”, “Enabled” or “No Change”
 - To use Custom alarm
 - Danger alarm must first be defined for each sensor type
 - Danger alarm defined on Alarm Levels tab
 - After Danger alarm is defined for a sensor type
 - Custom alarm becomes available under “Custom Alarm Level”
 - Custom Alarm level can be set to specific level, disabled or not changed
 - After level is entered
 - Validated to ensure is above sensor Danger alarm level
 - “Set as IDLH”
 - Sets alarm level to IDLH level for sensor type
 - If Custom alarm level is reached
 - Alarm is automatically latched
 - Can only be reset by dock insertion
 - Event and session data automatically downloaded

Custom Alarm Levels

02 Custom Alarm Level

18.0

No Change*
Disabled
Enabled
No Change**

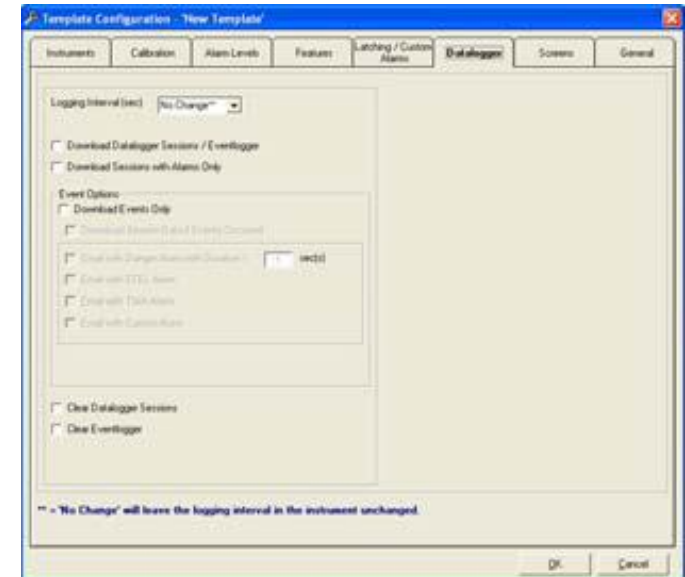
Custom Alarm Level

O2	18.0
LEL	20
CO	1100
CO-	Disabled No Change**
CO+	999
H2S	100.0
SO2	100.0
NH3	300.0
CL2	10.0
CL02	5.00
NO	100.0
NO2	20.0
HCN	50.0
PH3	50.0
HC	500

Set as IDLH

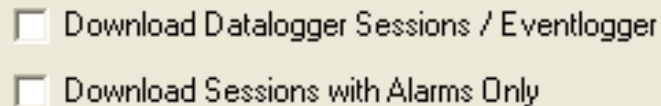
Database Manager Menu Options

- Datalogger Tab
 - Logging Interval setting
 - Download Datalogger / Eventlogger control options
 - Datalogger samples continuously
 - Data stream must be broken into intervals to be recorded
 - Datalogging interval defines frequency of breaks in data stream
 - Interval may be set from one second to one hour
 - 60 second interval most common
 - For further details on sampling interval, see detector's reference manual

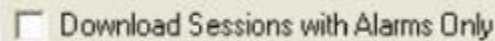


Database Manager Menu Options

- Directly beneath datalogging interval setting
 - Two check boxes
 - Controls whether IQ System automatically downloads and clears datalogger during instrument configuration
 - To automatically extract instrument data whenever docked
 - Click "Download Datalogger"
 - If "Download Datalogger" is not clicked
 - Data is extracted from detector and may be overwritten by new data as it is generated



- PHD6 has additional option to download only session data containing alarms



- Note: Instrument readings and other session data downloaded from detector are stored in IQ database and must be accessed through BioTrak II
 - See BioTrak II Reference Manual for details

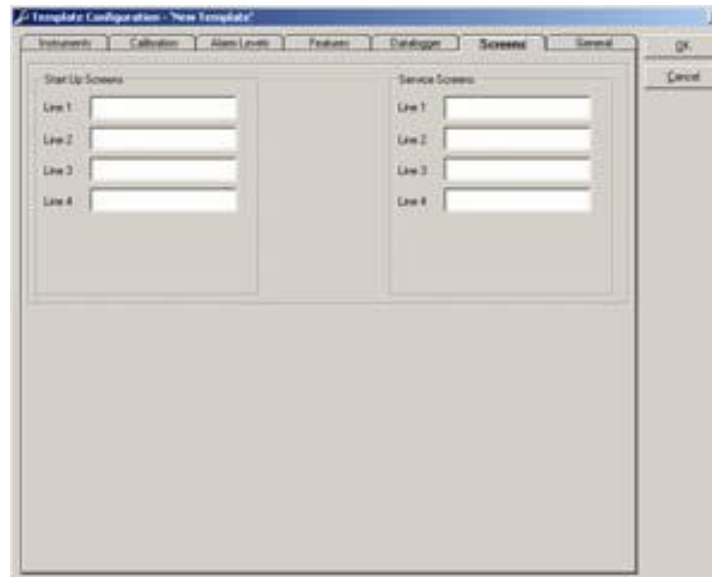
Database Manager Menu Options

- Event Options
 - Allow downloading of an instrument events
 - Allow system to make some downloading and email decisions
- Select "Download Events Only" to enable options
- "Download Session Data if Events Occurred"
 - Option forces docking program to download session data if any new events are detected
 - "new event" is event already in database
- Email options for Danger, STEL, TWA and Custom alarms
 - When selected force docking applications to generate email when new event of selected type occurs
 - Email with for Danger alarm has additional parameter to specify length of alarm before email is generated
 - Email is configured on Email tab of Options screen

The screenshot shows a dialog box titled "Event Options". It contains several checkboxes and a text input field. The "Download Events Only" checkbox is checked. The "Download Session Data if Events Occurred" checkbox is also checked. Below these, there is a section for email options. The "Email with Danger Alarm with Duration >" checkbox is checked, and next to it is a text input field containing the number "1" followed by the unit "sec(s)". Below this, there are three unchecked checkboxes: "Email with STEL Alarm", "Email with TWA Alarm", and "Email with Custom Alarm".

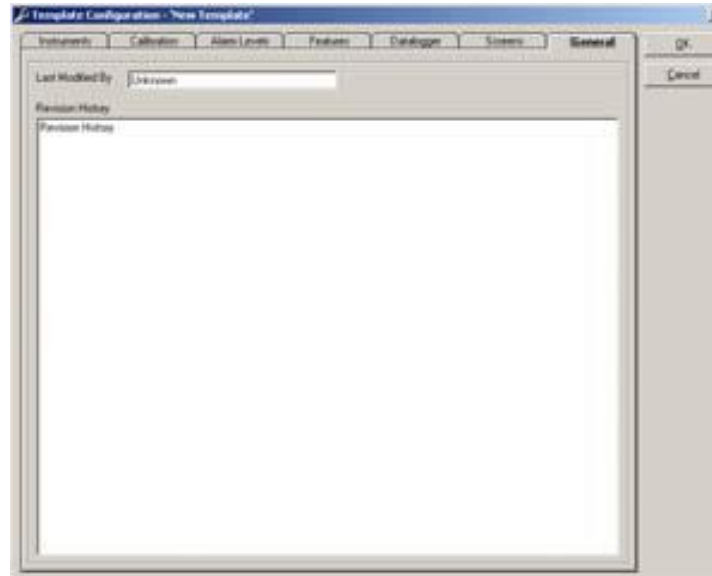
Database Manager Menu Options

- Screens Tab
 - Shown for instruments with user-configurable opening and service screens
 - At this time PHD6 only detector capable of this function
 - Entries made in right column shown on instrument startup
 - Entries made in left column shown when service screens are accessed via PHD6 Main Menu



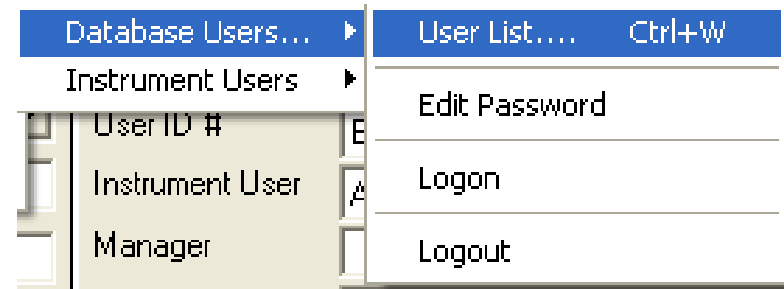
Database Manager Menu Options

- General Tab
 - General Tab contains a record of individual logged in when template was last modified and template revision history

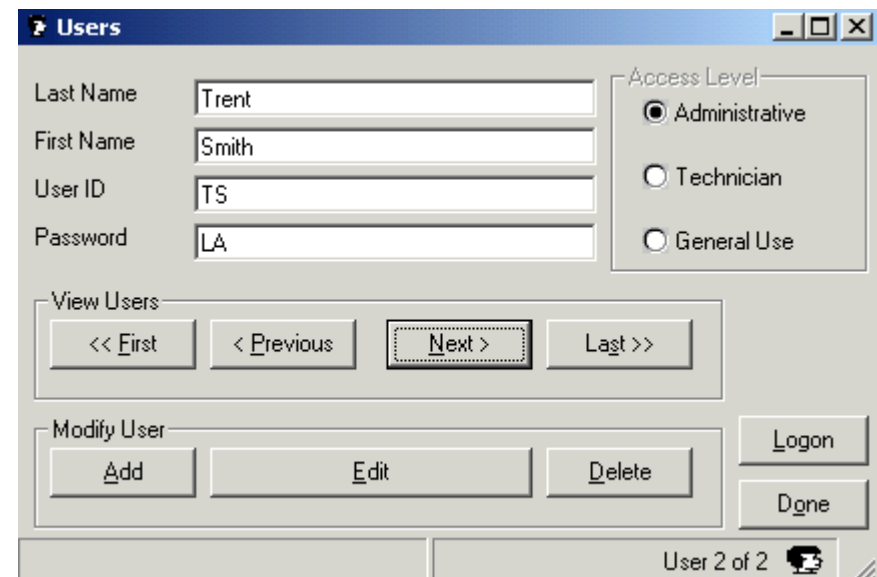


Database Manager Menu Options

- Setup / Database Users
 - Database user information entered through Setup / Database Users/ User List menu



- User List
 - Displays all information associated with registered system users
 - To access user list
 - Select Setup / Database Users / User List
 - Users window shown
 - Information from one user will be shown
 - Programmed user information appears at screen top
 - Includes user's first name, last name, ID, password and access level



Database Manager Menu Options

- Access Level is a three-tiered system.
 - “Administrative” grants individual entire system access
 - Both user and template information can be modified
 - “Technician”
 - Grants access to template information, but denies access to user information
 - “General Use”
 - Allows individual to use IQ system, but denies access to both user and template information
- Four buttons in screen center used to scroll through user list
- Only one user’s information will be shown at a time

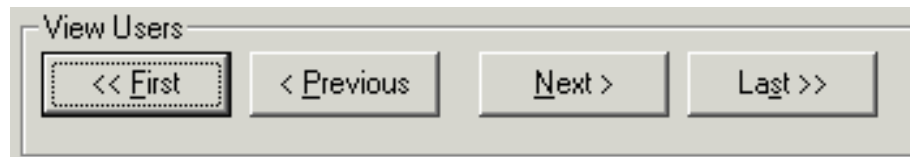


Access Level

☒ Administrative

☐ Technician

☐ General Use



View Users

<< First

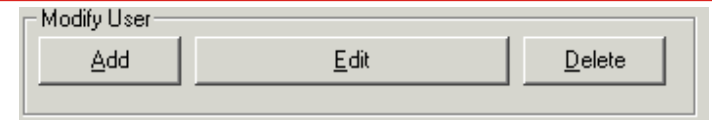
< Previous

Next >

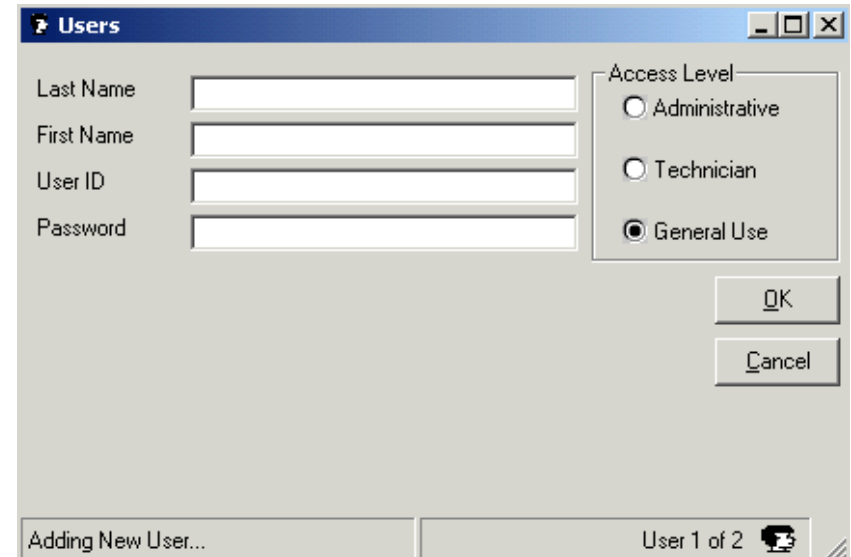
Last >>

Database Manager Menu Options

- Add, Edit and Delete Users
 - Modify User section
 - Enter new users
 - Delete existing users
 - Modify existing user information
 - To add a new user
 - Press “Add”
 - Blank user screen shown
 - Enter first name, last name, user ID, password and access level
 - Then press “OK”
 - To edit user data
 - Locate user using View Users controls at screen center
 - When located, press Edit and make any necessary changes then press “OK”



A dialog box titled "Modify User" with three buttons: "Add", "Edit", and "Delete".



A dialog box titled "Users" with the following fields and controls:

- Last Name: [Text Field]
- First Name: [Text Field]
- User ID: [Text Field]
- Password: [Text Field]
- Access Level:
 - ☐ Administrative
 - ☐ Technician
 - ☒ General Use
- OK button
- Cancel button

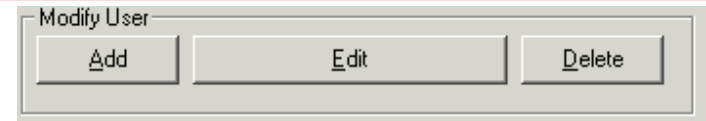
At the bottom, there is a status bar with "Adding New User..." on the left and "User 1 of 2" with a user icon on the right.

Database Manager Menu Options

- Add, Edit and Delete Users (cont'd)

- To delete a user

- Locate user information
 - When located, press delete
 - Prompt for confirmation of deletion
 - Press “Yes” to confirm delete
 - Note: user currently logged in may not be deleted
 - Note: To maintain IQ System security
 - User name “Setup” with password “IQ” should be deleted once a new administrative user is entered into system



Database Manager Menu Options

- Setup / Instrument Users

- A list of instrument users can be created to allow an instrument to be assigned to a specific user

- Assignment allows IQ system to track instrument usage and exposure levels by user or instrument
 - Instrument user information entered through Setup / Instrument Users/ User List menu option



The 'Instrument Users' window displays a table with the following data:

First Name	Last Name	User ID	Employed	Email	Department
Neil	Alan	NAlan647	Yes	NAlan647@acme.com	Software Engineering
Anagha	Basole	ABasole345	Yes	ABasole345@acme.com	Software Engineering
Frank	Bishop	FBishop567	Yes	FBishop567@acme.com	Software Engineering
Christopher	Boone	CBoone123	Yes	CBoone123@acme.com	Software Engineering
Steve	Bowman	SBowman729	Yes	SBowman729@acme.com	Regional Sales
Trent	Smith	TSmith782	Yes	TSmith782@acme.com	National Sales

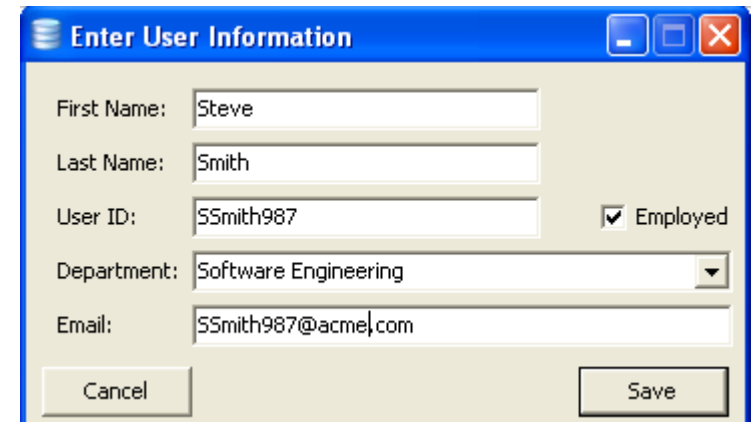
Below the table are buttons for 'Insert', 'Edit', 'Delete', 'Report', and 'Exit'. The status bar at the bottom shows 'Server = localhost, Database = susers', 'Version 8.0 Build 9', and '4 Records'.

Database Manager Menu Options

- Add, Edit and Delete Instrument Users
 - “Insert” used to enter new instrument user
 - “Edit” allows user editing
 - “Delete” allows user deletion

- Add User

- Select “Insert”
- Enter first name, last name, user ID, department, email and employee status
- Select ‘Save’
- New user appears in list



Enter User Information

First Name: Steve

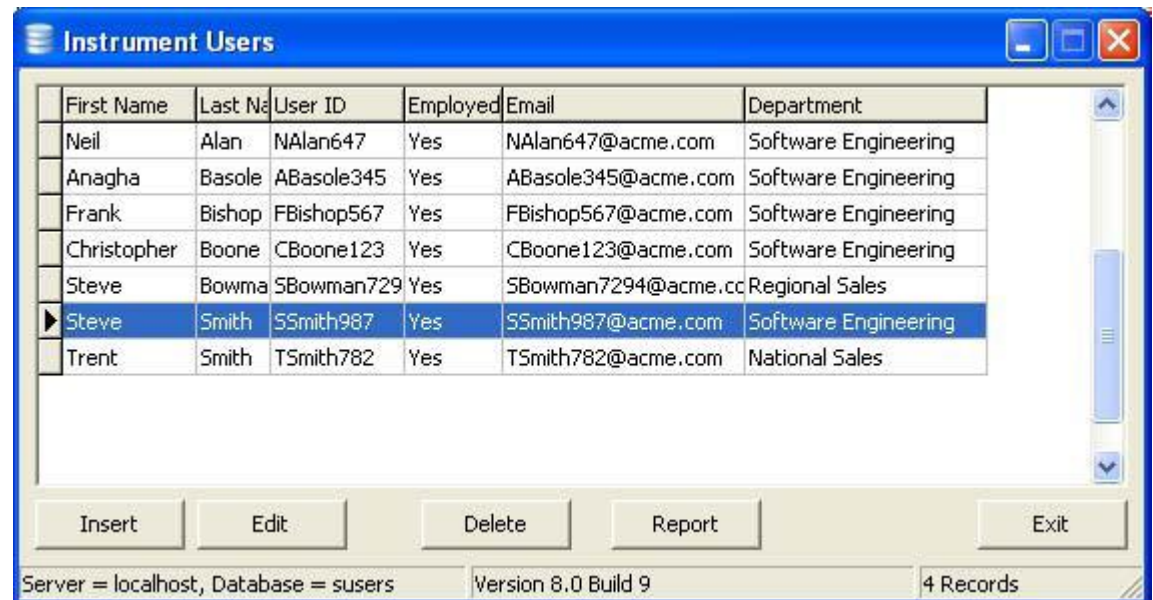
Last Name: Smith

User ID: SSmith987 ☒ Employed

Department: Software Engineering

Email: SSmith987@acme.com

Cancel Save



Instrument Users

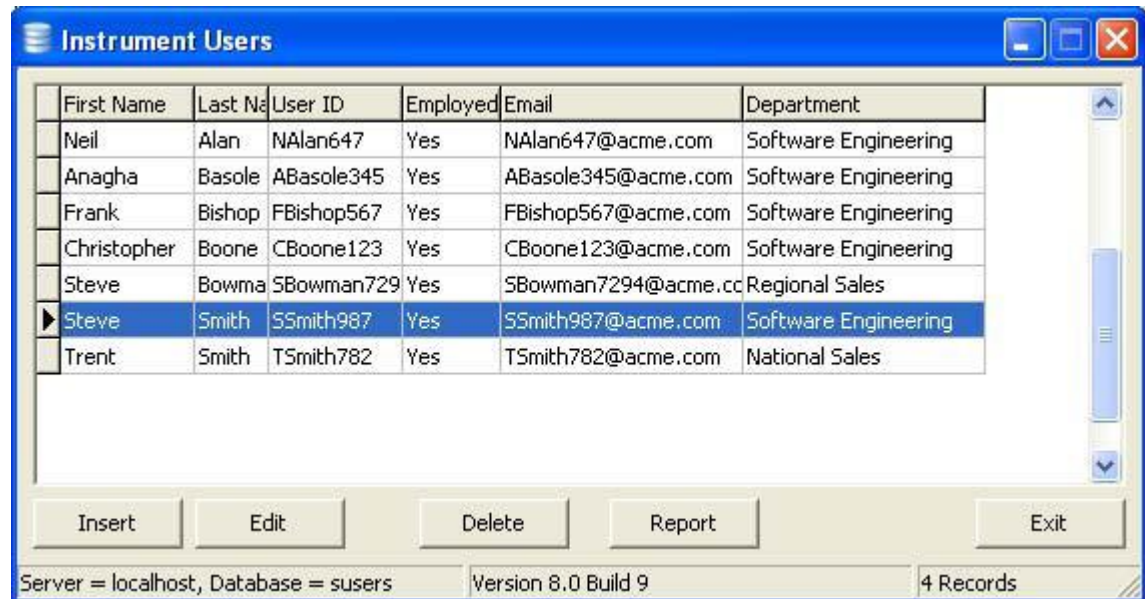
First Name	Last Name	User ID	Employed	Email	Department
Neil	Alan	NAlan647	Yes	NAlan647@acme.com	Software Engineering
Anagha	Basole	ABasole345	Yes	ABasole345@acme.com	Software Engineering
Frank	Bishop	FBishop567	Yes	FBishop567@acme.com	Software Engineering
Christopher	Boone	CBoone123	Yes	CBoone123@acme.com	Software Engineering
Steve	Bowman	SBowman729	Yes	SBowman7294@acme.com	Regional Sales
Steve	Smith	SSmith987	Yes	SSmith987@acme.com	Software Engineering
Trent	Smith	TSmith782	Yes	TSmith782@acme.com	National Sales

Insert Edit Delete Report Exit

Server = localhost, Database = susers Version 8.0 Build 9 4 Records

Database Manager Menu Options

- Edit User
 - Select “Edit” and modify information
 - Select “Save” to save changes or “Cancel” to abandon
- Delete User
 - Select user from list and click “Delete”
 - Note: It is better practice to mark instrument user as unemployed by removing “employed” check mark rather than to delete user.
- User List
 - Report listing all users can be created and printed by selecting “Report”



The screenshot shows a window titled "Instrument Users" with a table of user data. The table has columns for First Name, Last Name, User ID, Employed status, Email, and Department. The row for Steve Smith is selected. Below the table are buttons for Insert, Edit, Delete, Report, and Exit. The status bar at the bottom indicates the server is localhost, the database is susers, the version is 8.0 Build 9, and there are 4 records.

First Name	Last Name	User ID	Employed	Email	Department
Neil	Alan	NAlan647	Yes	NAlan647@acme.com	Software Engineering
Anagha	Basole	ABasole345	Yes	ABasole345@acme.com	Software Engineering
Frank	Bishop	FBishop567	Yes	FBishop567@acme.com	Software Engineering
Christopher	Boone	CBoone123	Yes	CBoone123@acme.com	Software Engineering
Steve	Bowman	SBowman729	Yes	SBowman7294@acme.com	Regional Sales
Steve	Smith	SSmith987	Yes	SSmith987@acme.com	Software Engineering
Trent	Smith	TSmith782	Yes	TSmith782@acme.com	National Sales

Insert Edit Delete Report Exit

Server = localhost, Database = susers Version 8.0 Build 9 4 Records

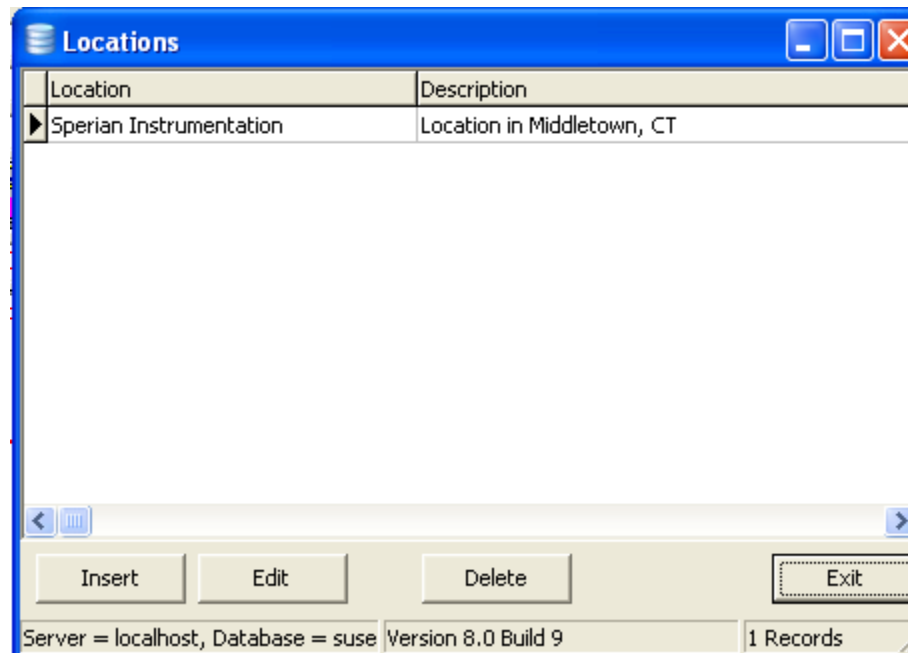
Database Manager Menu Options

Honeywell

- Setup / Instrument Locations

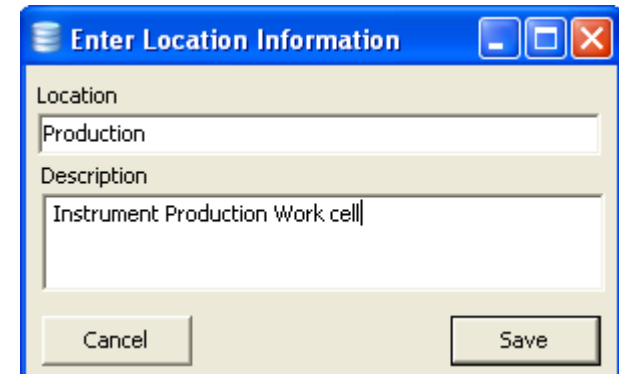
- List of instrument locations can be created to allow an instrument to be assigned to a specific location

- Assignment allows IQ system to track instrument usage and exposure levels by location
 - Instrument location information entered through Setup / Instrument Users/ User List menu option



Database Manager Menu Options

- Add, Edit and Delete Locations
 - “Insert” used to enter new instrument location
 - “Edit” allows location editing
 - “Delete” allows location deletion
- Add Location
 - Select “Insert”
 - Enter location name and description then select ‘Save’
 - New location appears in list
- Edit Location
 - Select “Edit” and modify information
 - Select “Save” to save changes or “Cancel” to abandon
- Delete Location
 - Select location from list and click “Delete”
 - Note: Best practice is not to delete location
 - Location history remains available if needed

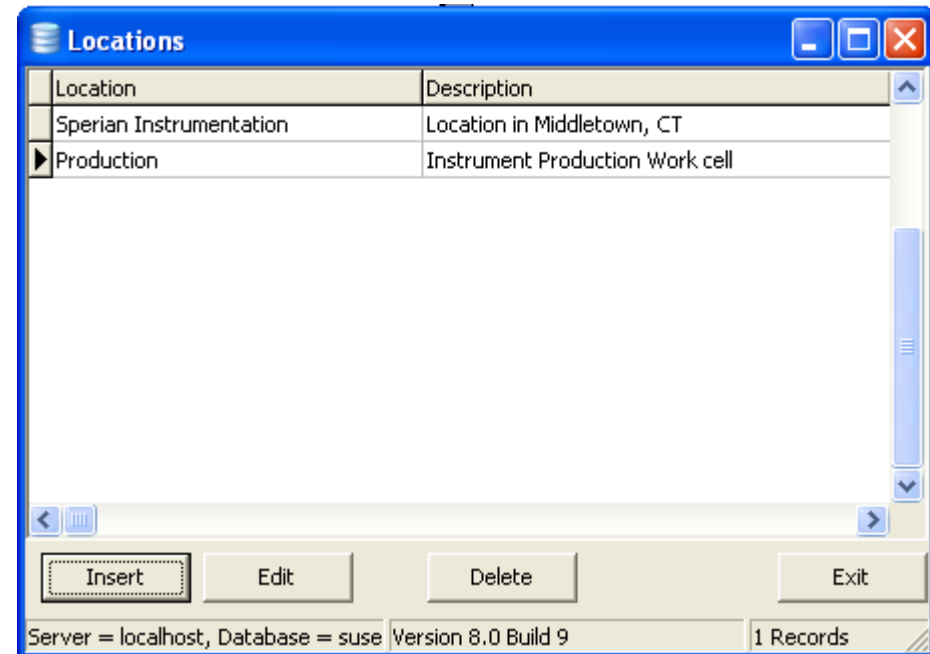


Enter Location Information

Location
Production

Description
Instrument Production Work cell

Cancel Save



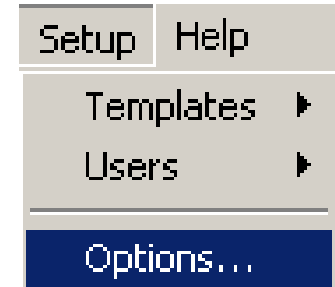
Location	Description
Sperian Instrumentation	Location in Middletown, CT
Production	Instrument Production Work cell

Insert Edit Delete Exit

Server = localhost, Database = suse Version 8.0 Build 9 1 Records

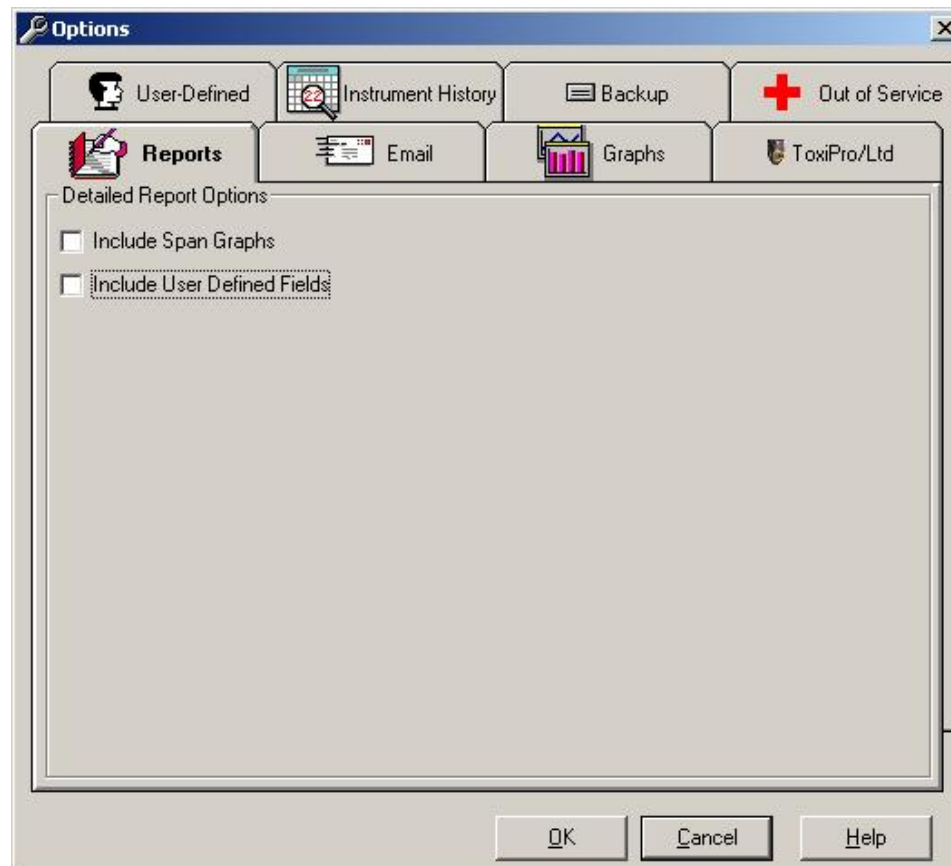
Database Manager Menu Options

- Setup / Options
 - Contains controls for file backup, email, graphing and reports
 - Click “File / Options...” to access Options screen.
 - Options screen comprised of tabbed pages for
 - Reports
 - Email
 - Graphs
 - ToxiPro/Ltd
 - User-Defined
 - Calibration History
 - Database Backup
 - Out of Service



Database Manager Menu Options

- Reports Options
 - Tab controls whether span graphs and/or user defined fields are included in system generated
 - Click checkbox to include span graphs and/or user-defined fields as appropriate



Database Manager Menu Options

- Email Options
 - Tab in Setup Options Menu contains all necessary internal system controls to configure and use IQ's email function
 - Options when to send emails are set on Datalogger tab of Templates screen

The screenshot shows the 'Options' dialog box with the 'Email' tab selected. The dialog has a title bar with a key icon and the word 'Options'. Below the title bar are four tabs: 'User-Defined', 'Instrument History', 'Backup', and 'Out of Service'. The 'Email' tab is active, showing a list of email events to monitor: 'Faults', 'Successful Calibrations', 'System StartUp/Shutdown', and 'Calibration Due Instruments'. A checkbox 'Email Support Enabled for IQ System' is checked. Below this, there are fields for 'Type(s)', 'Days Before Due' (set to 0), 'Controller ID' (set to N/S), and 'Time of Day' (set to 3 am). To the right, there are fields for 'Setup', 'SMTP IP Address' (10.15.5.14), 'User Name' (Main), 'Password' (masked with x's), 'Sender email address' (IQTermTest@sperian.com), and 'Additional Text in Message (50 characters)'. At the bottom, there is a list of 'Recipient email address(es)' with one entry: 'custserv@sperian.com'. The dialog ends with 'OK', 'Cancel', and 'Help' buttons.

Options

User-Defined Instrument History Backup Out of Service

Reports **Email** Graphs ToxiPro/Ltd

☒ Email Support Enabled for IQ System

Type(s)

☐ Faults
☐ Successful Calibrations
☐ System StartUp/Shutdown
☐ Calibration Due Instruments

0 Days Before Due

Controller ID N/S

Time of Day 3 am

Setup

SMTP IP Address 10.15.5.14

User Name Main

Password xxxxxx

Sender email address

IQTermTest@sperian.com

Additional Text in Message (50 characters)

Recipient email address(es) (IQ6 \ ToxiPro IQ Express \ MultiPro IQ Express Support 1st Rec

custserv@sperian.com

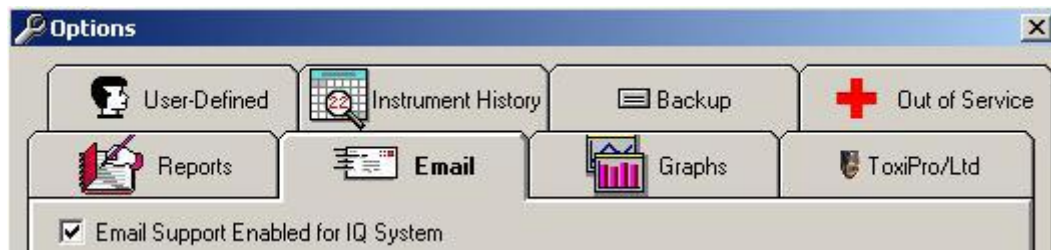
OK Cancel Help

Database Manager Menu Options

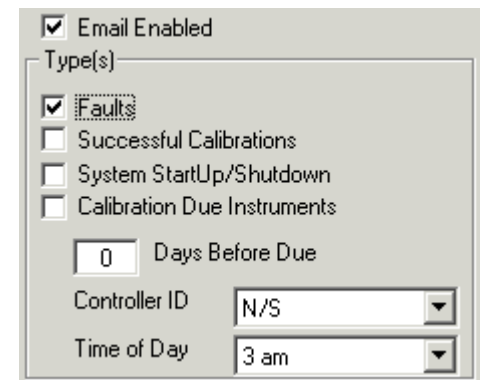
- Mail server's SMTP listener task must be enabled for IQ System to send email
 - Contact email system administrator for further details
 - Although full range of email options is supported by IQ Controller, IQ Express systems are limited to sending email for system faults to single address listed first in upper left corner of "Recipient email addresses"
- IQ System can be programmed to send email to list of up to ten email addresses
 - For variety of reasons, from confirming calibrations to notification of system problems

Database Manager Menu Options

- To set up IQ System email function
 1. If Email Enabled option is not selected, click on box next to “Email Enabled”
 - Notice remaining options in window are enabled
 - Directly below Email Enabled check box are qualifiers PC will use to determine when email will be sent



- Any combination may be checked
- 2. To have system send email when system fault detected click check box next to “Faults”
 - Faults can be triggered by any of following
 - Instrument fails calibration for any reason
 - Empty calibration gas cylinder
 - Note: Steps 3-6 may be disregarded if the IQ Database Manager program will only be used with IQ Express Systems - IQ Express Systems are only capable of sending email for faults
 - Faults option must be checked to create email



Database Manager Menu Options

– To set up IQ System email function (cont'd)

3. To send email following every successful calibration click check box next to “Successful Calibrations”
 - Note: Choosing to send email following successful calibrations means each recipient receive an email whenever a detector is calibrated
4. To send email whenever IQ System is turned on or shut down, click check box next to “System StartUp/Shutdown”
5. To send email when IQ System determines an instrument is due for calibration click check box next to “Calibration Due Instruments”
6. Directly beneath “Calibration Due Instruments” are three controls that apply only to calibration due reminder emails
 - IQ Controller program assesses calibration status of all instruments in database once per day
 - Controller emails calibration reminder for all instruments due for calibration within number of days specified in “Days Before Due” box

This screenshot shows the 'Email Enabled' configuration window. The 'Type(s)' section has four checkboxes: 'Faults' (unchecked), 'Successful Calibrations' (checked), 'System StartUp/Shutdown' (unchecked), and 'Calibration Due Instruments' (unchecked). Below these is a 'Days Before Due' field set to '0'. At the bottom, 'Controller ID' is set to 'N/S' and 'Time of Day' is set to '3 am'.

This screenshot shows the 'Email Enabled' configuration window with 'Calibration Due Instruments' selected. The 'Type(s)' section has four checkboxes: 'Faults' (unchecked), 'Successful Calibrations' (unchecked), 'System StartUp/Shutdown' (unchecked), and 'Calibration Due Instruments' (checked). Below these is a 'Days Before Due' field set to '3'. At the bottom, 'Controller ID' is set to '7894' and 'Time of Day' is set to '3 am'.

Database Manager Menu Options

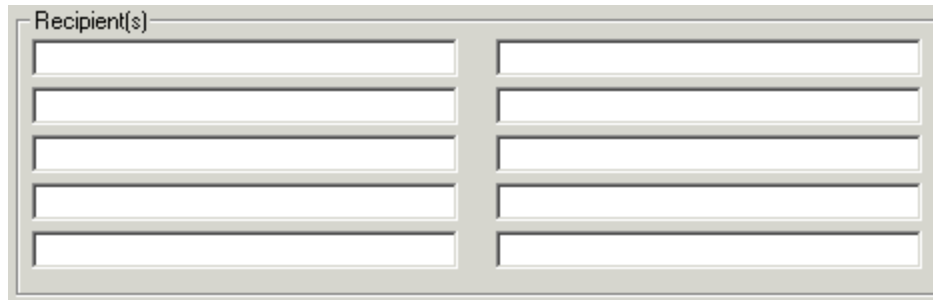
- To set up IQ System email function (cont'd)
 - Database Manager has to interface with an IQ Controller to send email
 - For standalone IQ Systems - systems with only one IQ Controller, Controller ID will default to only controller detected
 - For Networked IQ Systems where multiple controllers are online with a single database
 - Select Controller ID sending email for all instruments needing calibration
 - Time of day setting determines when calibration reminder is sent
- 7. To right of email type options are set up controls
 - SMTP IP Address
 - Unique code representing email server on World Wide Web or within your network
 - Consult IT department to get this number
 - Enter SMTP IP address of email server in appropriate box
 - Standard Internet format for SMTP IP address is 8-12 digit number with three decimal points (e.g. 000.000.000.000)
 - Some email systems require User Name and Password enter information in appropriate boxes
 - Box beneath “Sender” appears in email as originator of the email
 - » Enter “IQ System” or something identifies system
 - » Enter any additional text you would like to be included in email in next box

The screenshot shows a 'Setup' window with the following fields and controls:

- SMTP IP Address**: A text input field.
- User Name**: A text input field.
- Password**: A text input field.
- Sender email address**: A text input field with the text 'Not Tested' in red to its right.
- Additional Text in Message (50 characters)**: A text input field.
- Send Test Email**: A button located at the bottom right of the form.

Database Manager Menu Options

- To set up IQ System email function (cont'd)
 - 8. If Database Manager to be used with IQ Controller
 - Enter up to 10 email addresses in ten boxes below recipients
 - Addresses should be in standard email format (e.g. me@thiscompany.com)

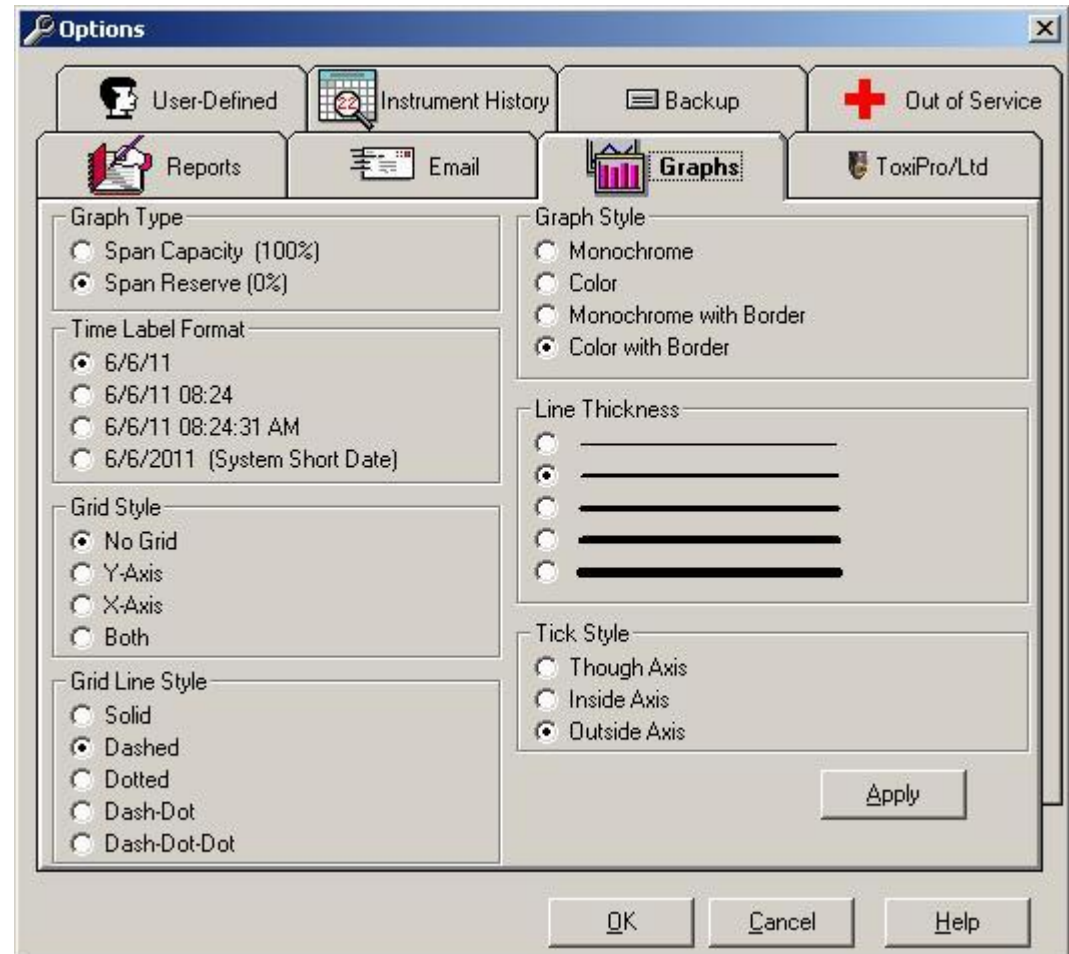


The screenshot shows a window titled 'Recipient(s)' with a light gray border. Inside, there are two vertical columns of five empty text input boxes each, separated by a thin vertical line. The boxes are intended for entering email addresses.

- As previously mentioned
 - IQ Express Systems will only use email address in upper left corner of recipient options
- 9. Click “Test” to test email system
- If test is successful
 - Red “Not Tested” line will change to green and show “Tested”
 - System is then ready for use.
 - Note: Clicking “Test” initiates contact with IQ Controller
- System must be tested before any email can be sent

Database Manager Menu Options

- Graphing Options
 - Contains all controls for sensor performance graphs
 - Time Label formatting options are located directly below Graph Type
 - Style options
 - Grid layout
 - Line style and thickness
 - Graph style
 - Can be modified to meet personal tastes

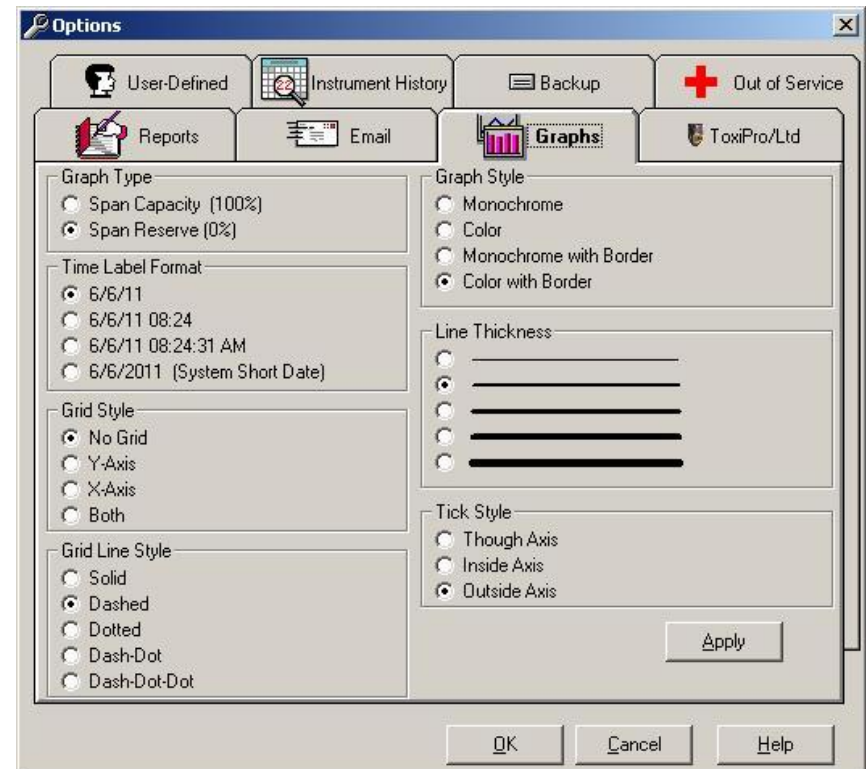


Database Manager Menu Options

- Graphing Options (cont'd)

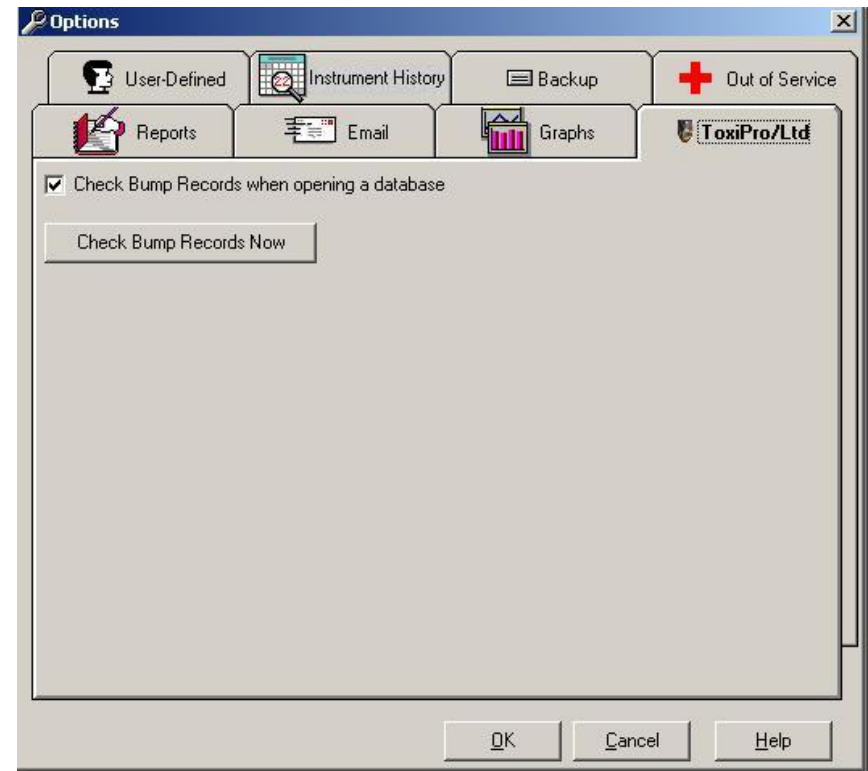
- Graph Type option

- Can be set to Span Capacity or Span Reserve
 - Controls baseline placement – either 0% or 100% - for sensor span graph
 - Baseline represents sensor's low capacity limit
 - Indicator of relative sensor health
 - Setting Graph Type to Span Capacity
 - Causes baseline of graph to be set at 100% on graph
 - In this case, observed span reserve indicated as function of 100% baseline
 - If sensor is healthy, span reserve value is above 100%
 - Sensors to be replaced when span reserve dips below 100% baseline value on graph
 - Setting Graph Type to Span Reserve shifts graph baseline to 0% on graph
 - In this case, observed span reserve indicated as a function of 0% baseline
 - If the sensor is healthy, span reserve value is positive
 - Sensors showing negative span value to be replaced
 - Once changes have been made press "Apply"



Database Manager Menu Options

- ToxiPro/Ltd Options - “Check Bump Records now”
 - Option designed to address ToxiPro instrument firmware issue in versions prior to 5.73
 - Click “Check Bump Records Now” to compare bump test dates recorded for instrument against those recorded for sensor
 - If discrepancy is found, software updates instrument date to match sensor date
 - Option should be disabled once all ToxiPro instruments are running on firmware version 5.73 or newer.



Database Manager Menu Options

- User Defined Options
 - Allows user to set up distinct fields to be used to identify instrument in database searches
 - Fields can be used in instrument search algorithm
 - Can be shown on instrument reports by checking appropriate box on Reports Options tab
 - Values in user defined fields may be viewed and edited on user defined tab of instrument section of main screen
 - To activate a field
 - Click activate checkbox to right of field's input box
 - Field may also be renamed as needed

- Example

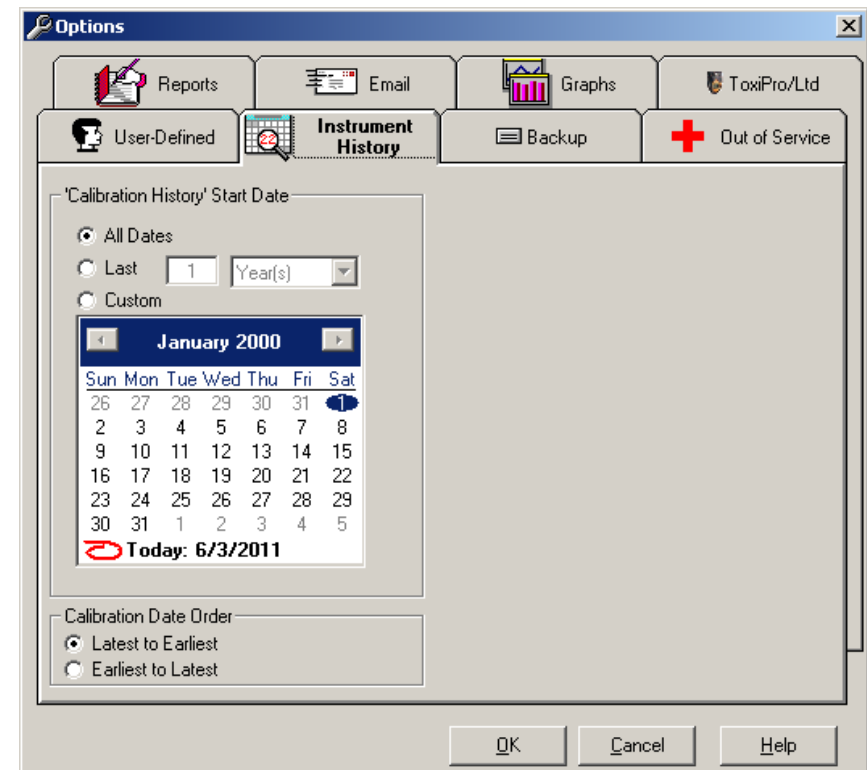
- Following fields added
 - Employee Name Manager, Employee ID Number and Location
- Once created they will be shown in Lookup Menu under User-Defined



	Field Description	Active		Field Description	Active
1	Employee Name	☒	2	Manager	☒
3	Employee ID Number	☒	4	Location	☒

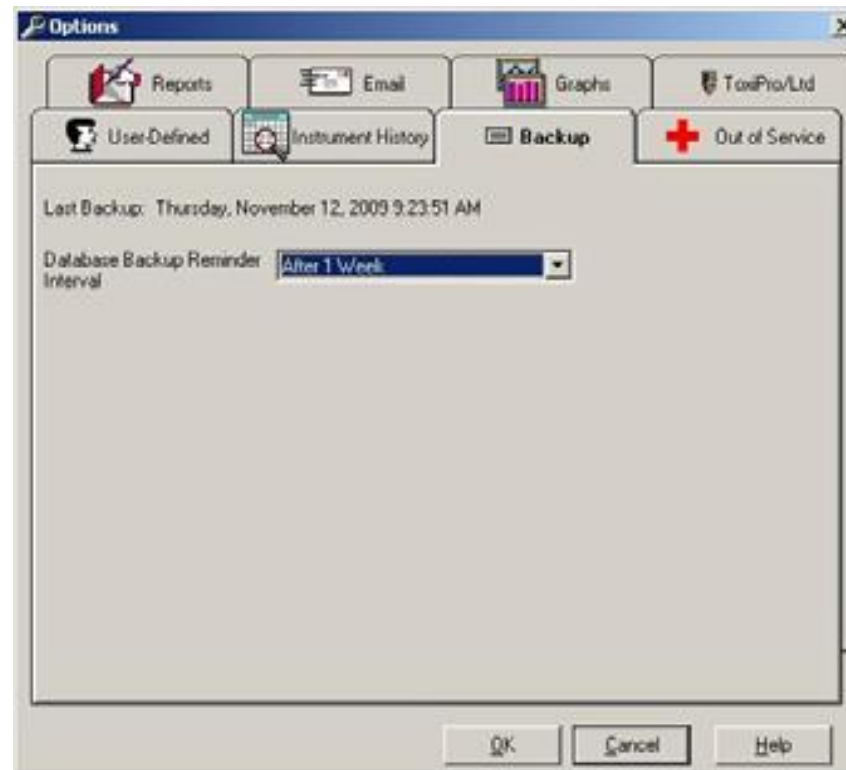
Database Manager Menu Options

- Instrument History
 - Calibration History Start Date set on this tab controls records shown on Calibration History tab
 - Only records with date equal to or later than date set will be shown
 - Calibration History Start Date also used as default start date for all reports generated
 - To view all calibration records, select “All Dates”
 - Calibration History start date set to earliest calibration date in database
 - Use arrow at upper right and left of calendar to select month and year
 - Click appropriate day and select Set First Cal Date
 - Calibration history may also be modified to list from latest to earliest or earliest to latest by making appropriate selection under Calibration Date Order



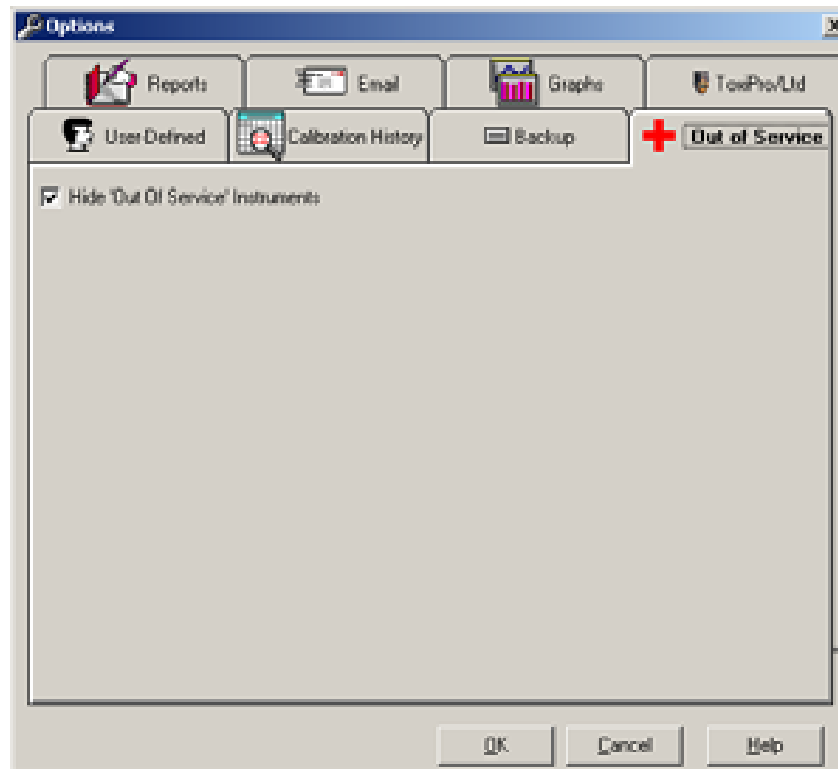
Database Manager Menu Options

- Backup
 - Contains single control determines database backup reminder
 - Options range from never to whole number increments between 1 and 6 weeks



Database Manager Menu Options

- Out of Service
 - Allows user to delist instruments marked out of service
 - Does not appear in standard reports but will appear in Out of Service reports
 - Select “Hide Out of Service Instruments” to delist these instruments
 - Instruments can be taken out of service by checking checkbox on Administrative tab of Instrument section of main screen while editing instrument record

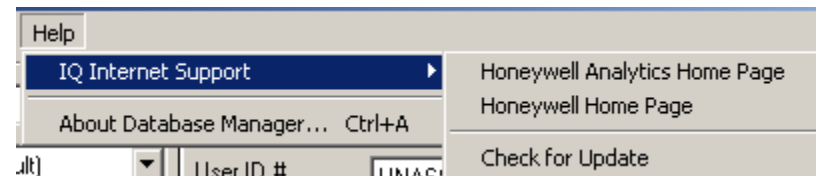


Database Manager Menu Options

- Help Menu
 - Four options



- Contents and Search
 - Access Database Manager's internal help file



- IQ Internet Support
 - Provides links to various web sites operated by Honeywell
 - Check for Update links to Honeywell Analytics software download website at <http://www.biodownloads.com>

IQ DataLink

- Data management program automatically uploads instrument and calibration information from gas detectors into IQ Database
- All IQ Pro Systems utilize PostgreSQL database server
 - Database typically housed on a local hard drive
 - May also be housed on a network drive
 - Allow multiple controllers to access and store information in same place
- Database information can only be accessed through Database Manager
- Instrument information concerning sensors and calibrations can be downloaded to PC automatically when instrument interfaces with PC
 - For IQ Calibration Stations, occurs when instrument is placed in dock
 - IQ DataLink connects to gas detector through standard Docking Cradle or Infrared interface dependent on gas detector
- Automatic datalogger download function must be enabled for automatic download
- **Note:**
 - **Instrument readings and other session data downloaded from detector may not be accessed through Database Manager program**
 - **Session data must be accessed through BioTrakII program**

PC Requirements

- Pentium Processor 1.0GHz or equivalent or better
- 256MB RAM
- Windows 2000 Pro / XP Pro / Server 2003 / Vista
- 50MB hard drive disk space
- Note
 - See IQ device Reference Manual for details on Detector Firmware Requirements

Questions?

Honeywell

Questions?



Answers.