DETECTIVE

INSTRUCTION MANUAL

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CONTENTS

QUICK OPERATING GUIDE

TURN ON
Press ON, alarm sequence will be tested, then display either the gas levels or 'MONITORING'.

ALARM
Alarm sounds (warbling tone) and the red LEDs flash, the hazardous gas symbol will flash or the display will read 'GAS HAZARD EVACUATE AREA'

RESET ALARM
Press the unmarked button.

BACKLIGHT
Press the button with the light symbol. It will stay on for 30 minutes unless the button is re-pressed.

LOW BATTERY
A continuous tone is heard.

TURN OFF
Press the ON and unmarked buttons together.

BATTERY CHARGING
Plug charging lead into the socket on the backplate and then plug into mains. Recharge time is 6-8 hours.

GENERAL DESCRIPTION

The Crowcon Detective is a transportable gas detecting unit capable of monitoring up to four gases simultaneously, and provide warning of hazardous levels.

For small area monitoring, while personnel are working a single unit can be used. For protecting a larger area a number of Detectives can be linked together, providing a protective barrier around the work site.

The main body of the unit is made from fire retardent, high impact, UV stabilised ABS plastic and is protected against water and dust ingress to 1P66. The unit is mounted on an epoxy painted steel tripod frame which maximises stability. The frame encircles the unit to add further protection, therefore making it ideal for the most hostile areas.

The sensors are located underneath the body of the unit for protection and a calibration aspirator can be attached for spot sampling. The sealed lead acid batteries provide enough capacity for 24 hours monitoring and half an hour in alarm mode.

When not in use Detective units can be conveniently stacked one on top of the other, or the legs can be removed to minimise longer term storage space. See diagram at back of manual for leg assembly instructions.

OPERATION

To **SWITCH ON**, press the ON button. The instrument will display a 'TESTING ALARM' message and indicate the battery voltage. If this is less than 6.4V the batteries may need recharging. The red LEDs will sequence and the sounder operate. After 5 seconds the display will change to display the gas levels.

DISPLAY
This is dependant on the type of sensors installed. For each sensor the display indicates the gas concentration, units of measurement and the gas name.

The green power LED will flash intermittently to reassure the user that all is well.

ALARMS
When the Detective detects gas above a dangerous level, the red LEDs on top of the unit flash in quick succession and the sounder emits a fast warbling noise. The channel responsible for the alarm flashes on the display. Alarms may be reset by pressing the unmarked button once the gas hazard has passed.

OVERRANGE
If a sensor is out of range, it causes the relevant information on the display to flash, indicating a high gas level or a faulty sensor module. Calibration should then be checked.

BACKLIGHT
This can be activated to illuminate the display be pressing the button marked with the light symbol. It will remain on for 30 seconds unless the button is re-pressed. The backlight will be activated automatically if a gas alarm condition is reached.

CLOCK
This can be displayed by pressing the unmarked button. The display shows the time and the

elapsed time since the instrument was switched on. Pressing the button again, or waiting for 5 seconds returns the display.

SWITCHING OFF
This is done by pressing the ON and unmarked button together, provided the off function is not disabled. This prevents accidental switching off of the instrument.

LINKING TOGETHER
Several Detectives can be connected together via the two four pin DIN sockets located on the back of the instrument. These, and the computer interface socket, are protected to 1P66.

A ten metre long linking cable is supplied with the Detective and other lengths are available on request.

To connect together, undo the cover on one of the *2* sockets, connect one end of the cable to one Detective, and the other end of the cable to the next Detective in the chain. Either of the two sockets can be used. Detectives can be linked in a chain or a continuous loop.

When one Detective goes into alarm it sends all the other Detectives into audible and visual alarm via the linking cables. The Detective which has initiated the alarm can be identified by its own LEDs rotating at a faster speed than the others. The red alarm LED on the front panel will only flash on the unit which has seen gas. If another unit detects gas, it too will flash its front panel LED and rotate its LEDs faster.

SETTING UP

To access the SET UP menu, it is necessary to know the instrument's password. Unless this has been changed by the user (see Terminal Interface), the password is 1,2,3,4 where the left hand button is 1 and the right hand button is 4. After pressing CAL you have 5 seconds to enter the password.

Within the SET UP menu the top line displays the option whilst the lower line defines the key functions of the buttons below.

YES accepts the option
NO moves to the next option
QUIT returns to the previous level
There are 6 options:

OFF MODE
This enables the off to be either ENabled or DiSabled, making it impossible for unauthorised personnel to switch the instrument off.

DISPLAY MODE
This enables the display to be set to

NORMAL: gas measuring
PEAK HOLD: gas levels on display are held at peak values as soon as alarm thresholds are exceeded. Pressing the unmarked button will update the display to the current value if the alarm is reset.

TWA: time weighted average readout on toxic channels
OFF: the display will only indicate 'MONITORING' or 'GAS HAZARD EVACUATE AREA'

ALARM MODE
This enables the instrument to be set to acknowledge different toxic alarm types.

INSTantaneous sets the instrument to alarm as soon as a threshold toxic gas level is reached. TWA causes the instrument to ignore temporary excursions above the instantaneous thresholds, but go into alarm when the SHORT TERM or LONG TERM exposure levels are reached.

ALL ACTIVE enables both TWA and INSTantaneous alarm types.

ZERO ALL
This should only be done when the instrument is in fresh air and a steady output is achieved. On successful zeroing, there is an option to END the set up and return to measuring, or to CONTinue with the set up.

CALIBRATE
Before this can be done the instrument should be zeroed. You will need a Detective aspirator and a supply of Crowcon test gas.

Scroll through the available gas channels and press YES to calibrate the desired channel.

Aspirate gas over the sensors at **Y2** litre/minute, when the reading is stable, press the UP and DOWN options until the reading matches the concentration of the test gas, and then press YES.

On successful calibration there is an option to END and return to measuring or to CONTinue with the set up. Should a CAL FAILED message appear either the gas concentration was not equal to the value set, and calibration should be repeated, or the sensor has deteriorated.

PRINT DATA
Ensure that the instrument is connected to a printer ready to receive XONIXOFF serial data via the four pin connector on the back of the instrument marked, COMPUTER INTERFACE. A full LOG-STATS (see TERMINAL INTERFACE) listing will now be downloaded to the printer.

BATTERY CHARGING

The built-in battery pack has sufficient capacity to power the instrument for 24 hours monitoring and half an hour in alarm mode.

The Detective has a built in two stage charging circuit enabling the instrument to be left on charge indefinitely. The red LED indicates that the instrument is on fast charge and the green LED that it is on trickle charge.

To recharge the instrument locate the charging socket on the back of the Detective and undo the cover. Connect the charging lead between the mains and the Detective. One of the two LEDs will illuminate indicating the charge rate.

The charging lead is supplied for connection to either 110 or 240V, although the Detective must be factory set to the expected voltage. Connect brown-live, blue-neutral, green/yellow-earth.

WARNING: THE INSTRUMENT MUST NOT BE CHARGED IN A HAZARDOUS AREA.

TERMINAL INTERFACE

This section describes how a computer may be used to reconfigure the instrument for a particular application.

An IBM compatible PC or Psion Organiser with an R5232 port can be connected to the Detective via its serial port and the four pin interface socket, located at the back of the Detective (see appendix if not using an IBM compatible PC).

Note: the RS 232 port can only be used when the Detective is plugged into the mains power supply.

Crowcon recommend the use of CROWCOMMS software for easy interfacing between a PC and the Detective. The Detective must be switched on for successful communication and plugged into a mains power socket via the battery charging lead. If the communication link is working properly, keyboard entries are echoed back on the screen and the prompt TPL<software version> appears after <return> or <enter> has been pressed.

Type help <return> to list the available functions.

HELP	...this function
CLOCK.	...read or set the clock
PASSWORD	...set password
SHORT-TIME	...read or set S.T.E.L. calc. period
CAL-DUE	...read or set date for next calibration
CONFIDENCE	...enable or disable confidence tick
ZERO	...zero one or all channels
CALIBRATE	...calibrate gas channel
CHANNEL-INFO	...set channel variables
LOG-CLEAR *	...clear logger memory
LOG-PERIOD *	...read or set logging interval
LOG-STATS *	...statistical display of logged data

LOG-DUMP * ...download of logger readings
LOG-LATEST * ...download of recent logger readings
TWA-REPORT ...read eight hour TWA levels
TWA-RESET ...reset eight hour TWA levels
READ ...read gas channel
SERIAL-NO ... read or set serial number
* See DATA LOGGING for the use of these commands.

Type HELP followed by one of these commands to discover its usage.

ZERO	Zero all channels. Do this BEFORE calibrating

CALIBRATE [chanl[value]Set a specified channel to read a given value. Aspirate known TEST GAS over the sensors, once the sensor has stabilised press <return>

These functions are only available when using the terminal interface.

ZERO Echan]	Set a specific channel to zero.
CLOCK [hour][min][sec][day][month][year]	Set or read the real time clock.
PASSWORD [n1][n2][n3][n4]	Used to set a new password for restricting access to the CALIBRATION MENU. Each of the 4 numbers must be between I and 4 and a space should be inserted between each of the numbers
SHORT-TIME [mins]	Sets the Short Term Exposure Limit which may be set between 5 and 15 mins. 15 mins is the UK standard.
CAL DUE [day][month][year]	Sets the date after which a 'CALIBRATION DUE' message will appear at switch on.

CHANNEL-INFO [chani] To alter the configuration of FACTORY PRE-SET sensor modules. The following prompts are given.

Sensor NAME>
Sensor UNITS>
FALLING ALARM threshold>
RISING ALARM threshold>
SHORT TERM exposure limit>
LONG TERM exposure limit>
Mid Span>
1 oxy, 0 other>
1 toxic, 0 other>
0, 1 or 2 decimal places>

Existing sensor information by be edited or accepted.

NOTE: Certain alarm types are inappropriate for certain sensors and should be disabled be setting unrealistic levels. SHORT and LONG TERM limits may be set to 1 for flammable and oxygen channels, as they are deactivated within the software. Mid span is a sensor specific

constant used by the processor to control calibration. Use default factory values at the end of section.

For channels other than oxygen, there is the option to define the number of decimal places, the extra decimal places are only relevant on low range measurements.

TWA-REPORT	A glance view of the LONG TERM exposure levels.
TWA-RESET	Resets the LONG and SHORT TERM exposure levels.
READ[chan]	View current gas level of specific channel.

MID SPAN values

Oxygen	O2	0.37
Methane	CH4	2.0
Hydrogen Sulphide	H2S	0.8
Carbon Monoxide	CO	6.5
Chlorine	CL2	0.1
Pentane	PEN	4.0

SERIAL-NO [nnnnnn] Enables the factory setting of the serial number into non-volatile RAM. If this is corrupted the default number 0 is loaded, in this case the serial number may be reprogrammed, otherwise only viewing is permitted.

TROUBLE SHOOTING GUIDE

SYMPTOM	DIAGNOSIS	REMEDY/CHECK
Does not switch on	battery flat	recharge battery
Does not switch off	OFF DISabled	alter configuration
Alarm signals, no gas	alarm latched	press unmarked button
Gas reading, no gas	zero drifted	zero instrument in fresh air
Unstable/inaccurate reading	sensor failed	recalibrate/replace sensor
Alarm warbles but LEDs on top are off	battery low	recharge battery

MAINTENANCE AND CALIBRATION

Crowcon recommend monthly gas response checks and a recalibration every 6 months. Flammable sensors will respond to hydrogen and most hydrocarbons, but will only be calibrated for a specific gas.

RECALIBRATING
This may be done using the 'CALIBRATE?' option in the setting up or by the CALIBRATE function in the TERMINAL INTERFACE.

Zero the instrument in fresh air.
Locate the aspirator flowhead under the ledge below the sensors, underneath the instrument, and secure with the two half turn fasteners.

Starting with the flammable gases, then moving onto toxic, connect the cylinder of test gas to the inlet of the flow head via a flow meter. The direction of flow is marked on the flowhead.

Adjust the flowmeter to achieve a flowrate of ½ litre/minute.

Wait until the reading has stabilised on the display before programming in the new level.

Shut off the supply and disconnect the test gas.

Aspirate fresh air through the flowhead using the rubber bulb until the reading has returned to zero.

REPLACING A SENSOR MODULE
Carefully remove the black lamp cover retainer, and remove the lens cover.

Using the box spanner provided, remove the 13m8 nut, and carefully lift off the top half of the case.

Remove the 6pm molex JP9 labelled LAMPS connecting the LEDs to the main board.
Remove the 5 pin molex JP3 labelled BATT connecting the battery to the main board.

Identify the sensor module to be replaced and disconnect the flexible pcb from it by lifting the shroud from the header and gently pulling on the tail.

Remove the two Pozi-drive screws and the old sensor module.

Remove the old gasket/membrane assembly.

Fit the new components according to a reverse of the above, ensuring that the shroud is pushed home over the header to grip the flexible pcb tail securely. Replace the LED lead onto the main board connected JP5.

Replace the battery lead onto the main board connector JP3.

Replace the top half of the case, and tightly screw the *1* 3m8 nut back in place.

Replace the lens and the lamp cover retainer.

Detective sensor modules are supplied precalibrated from the Crowcon factory and will identify themselves to the instrument when it is switched on. It is advisable to check the response to test gas to ensure that no damage has occurred in transit and that installation has been carried out successfully.

REPLACING BATTERY PACK

Carefully remove the black retaining screw and the lamp cover. Using the box spanner provided, remove the 13MB nut, and carefully remove the top half of the case. Remove the 6 pin molex JP5 labelled LAMPS, enabling the top half of the case to be fully removed.

Disconnect all the molex connectors to the main board. Remove the four pozi drive screws holding the metal base plate down.

Carefully lift off the board and metal plate. Remove the old batteries and replace with new ones.

Replace the metal base and main board and screw back in place the four pozi drive screws.

Replace the molex connectors.

Replace the top half of the case, tightly screw the 13MB nut back in place.

Replace the lens and lamp cover retainer.

If any further maintenance is required, contact the Crowcon Service Department.

LIMITATIONS TO USE

	LONG TERM STORAGE LIMITS		OPERATING LIMITS	
	MIN	MAX	MIN	MAX
TEMPERATURE/C	0	20	-10	50
PRESSURE/mB	900	1100	900	3000
HUMIDITY/%RH	15	90	0	90

ACCESSORIES FOR DETECTIVE

Aspirator probe (1 metre)	C01297
Extra aspirator hose (2 metre length)	M04032
Computer interface lead	E07394
Crowcomms Software for computer terminal emulation	C01715

SPARES

Main pcb	S01326
Moulding set	M04385/6
Frame assembly	M0I 461
Membrane switch label	E01468
IP65 sounder	E01160
LED cluster	E01456
Lamp cover	M04289
Sensor plate seal	M04290
Interface socket	E07392
Computer I/F socket	E07393
Charging socket	E07391
Inter-connecting lead, 10 metres	E07397
MB lock nut	M03624
Lamp cover retainer	M04315
Battery pack	C01406
Interconnection lead adaptor	E07413

Sensor assemblies:

o - 100 % LEL methane/flammable	S011375
o - 100 % Vol methane/flammable	S01423
0 - 50 ppm hydrogen sulphide	S0l240
o - 500 ppm carbon monoxide	S01727
0- 10 ppm sulphur dioxide	S01242
0- 5 ppm chlorine	S01829
0- 10 ppm nitrogen dioxide	S01244
0- 100 ppm nitric oxide	S01245
0- 10 ppm hydrogen cloride	S01724
o - 25 ppm hydrogen cyanide	S01725
0 -25 % oxygen	S01248

It is not recommended that sensor assemblies are stored for longer than 6 months prior to use.

APPENDIX

DATA LOGGING

The integral data logger enables accurate historical record keeping of a individual's exposure to hazardous gas. Data logging takes place continuously while the instrument is switched on and readings stored for each channel, at a rate set by LOG-PERIOD. For each channel the maximum level seen that period is recorded. The logged data is kept in battery backed memory when the instrument is switched off. When the memory is full, new data will overwrite the oldest data, therefore it is a good idea to LOG-CLEAR the memory after inspecting it. Inspection is done using LOG-STATS, LOG-DUMP and LOG-LATEST. Data is filed away in reports, (starting at report 0), which may be displayed individually. A report is ended each time the instrument is switched off, or it's memory is inspected. The serial number is displayed at the beginning of data reports.

Configuration of the data logger and access to logged data is via the following TERMINAL INTERFACE commands:

LOG-CLEAR	Clears the data logging memory
LOG-PERIOD [hour][min][secs]	Displays or changes the data logging interval from anywhere between 1 second and 24 hours.

NOTE the logger can store up to 24000 measurements, therefore on a 4 channel instrument 6000 measurements per channel. For most applications a LOG-PERIOD of 1 minute provides a good compromise between duration and resolution, storing 100 hours of data.

LOG-STATS [report]	Shows the mm, mean, max values of all logged data reports, or single report.
LOG-DUMP [report]	Outputs all the logged data by report, or a single report. Every reading is outputted to the terminal screen.
LOG-LATEST [hour][min][sec]	Dumps all data reports logged over the past 30 minutes or requested time period.

All command lines shown in square brackets are optional, if omitted then all reports are outputted or default values used.

NOTE Logged data is formatted and displayed according to current instrument calibration and therefore should be cleared prior to recalibration or sensor alteration.

ALTERATIVE TERMINAL INTERFACE

If terminal interface other than an IBM compatible PC or Psion Organiser is used it must be to the following specification.

Capable of emulating a terminal VT52NTIOO mode
BAUD rate 2400, B data bits, 2 stop bits, no parity.

ALTERNATIVE SOUNDER SELECTION

Detective may be fitted with either a Banshee (grey) sounder or a MEDC (red) sounder, dependent on when it was produced. The MEDC sounder has selectable tone patterns which are determined by rocker switch position settings. To access these switches separate the sounder from its base by twisting the body.

The sounder is preset to give an alarm tone of sweeping 2400-2850Hz at 7Hz with a typical sound output of 114dBA, and a low battery alarm continuous tone at 2850Hz with a typical sound output of 116dBA.

Other tones may be set according to the following table.

Factory set alarm tone - No. 5

No.	Tones	2nd Tone	Code	Description	Typical dBA
1	Alt tones 800/970 at ¼ sec	14	11111		104
2	Sweeping 800/970 at 7Hz	14	11110	Fast sweep	105
3	Sweeping 800/970 at 1Hz	14	11101	Medium sweep	105
4	Continuous 2850	14	11100		116
5	Sweeping 2400/2850 at 7Hz	4	11011	Fast sweep	114
6	Sweeping 2400/2850	4	11010		113
7	Slow whoop	14	11001	Slow whoop	103
8	Sweeping 1200/500 at 1Hz	14	11000	Din Tone	103
9	Alt tones 2400/2850 at 2Hz	4	10111		113
10	Int tone 970 at 1Hz	14	10110	Back-up alarm (LF)	106
11	Alt tones 800/970 at 7/8Hz	14	10101		105
12	Int tone 2830 at 1Hz	4	10100	Back-up alarm (HF)	116
13	970Hz at ¼sec on I sec off	14	10011		102
14	Continuous 970Hz	14	10011		107
15	554Hz for I QOms & 440Hz for 400ms	14	10001	French fire sound	97
16	Int 660Hz ISOms on ISOms off	14	1000	Swedish fire alarm	97
17	Int66OHz 1.8s on IBs off	14	01111	Swedish fire alarm	91
18	Int 660Hz 6.5s on 13s off	14	01110	Swedish fire alarm	90

19	Continuous 660Hz	14	01101	Swedish fire alarm	90
21	Int 660 at 7/8Hz	14	01011	Swedish fire alarm	87
22	In 2850 150ms on 100ms off	14	01010	Pelican crossing	113
23	Sweep 800/970 at 50Hz	14	01001	Low frequency buzz	105
24	Sweep 2400/2850 at 50Hz	4	01000	High frequency buzz	112

NOTE: The second sound is the low battery alarm.

In order to change the sounder tones, gently turn the bottom half of the sounder until it can be removed, taking great care not to damage the wiring.

Locate the set of 5 switches and set to the required combination.

Replace the bottom half of the sounder and the labels.

Test the unit by switching ON.

CERTIFICATION INFORMATION

sira
Certification Service

1 **EC TYPE-EXAMINATION CERTIFICATE**

2 Equipment intended for use in Potentially Explosive Atmospheres Directive 94/9/EC

3 Certificate Number: Sira 03ATEX2102

4 Equipment: Detective and Detective Plus

5 Applicant: Crowcon Detection Instruments Limited

6 Address: 2 Blacklands Way
Abingdon
OX14 1DY
UK

7 This equipment and any acceptable variation thereto is specified in the schedule to this certificate and the documents therein referred to.

8 Sira Certification Service, notified body number 0518 in accordance with Article 9 of Directive 94/9/EC of 23 March 1994, certifies that this equipment has been found to comply with the Essential Health and Safety Requirements relating to the design and construction of equipment intended for use in potentially explosive atmospheres given in Annex II to the Directive.

The examination and test results are recorded in confidential report number R52A9051A.

9 Compliance with the Essential Health and Safety Requirements, with the exception of those listed in the schedule to this certificate, has been assured by compliance with the following documents:

EN 50014:1997
EN 50018:2000
EN 50020:2002

10 If the sign 'X' is placed after the certificate number, it indicates that the equipment is subject to special conditions for safe use specified in the schedule to this certificate.

11 This EC type-examination certificate relates only to the design and construction of the specified equipment. If applicable, further requirements of this Directive apply to the manufacture and supply of this equipment.

12 The marking of the equipment shall include the following:

II 2G
EEx ib d IIC T4

M D Shearman
Certification Manager

Project Number 52A9051
Date 27 June 2003
C. Index 14

Sira Certification Service
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ST&C(Chester) Form 9176 Issue 7

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SCHEDULE

EC TYPE-EXAMINATION CERTIFICATE Sira 03ATEX2102

13 **DESCRIPTION OF EQUIPMENT**

The Detective is a battery powered, transportable, multiple gas detector. It is based on the Crowcon Triple Plus Gas Detector, containing oxygen, toxic, biased toxic, thermal conductivity, flammable and infra-red sensors in any combination. A cluster of LEDs mounted on top of the instrument and an audible sounder provides alarm status. A continuous display is provided on an LCD panel mounted on the side of the instrument. The circuits are housed within an ABS, IP65 enclosure, which is mounted on a steel tripod. The electronic circuits are located on two main circuit boards, with up to four daughter boards located adjacent to the gas sensors. The oxygen and toxic sensors are electrochemical and the thermal conductivity and flammable sensors are flameproof component-certified devices.

The unit is supplied from two internal battery packs each containing two 6 V, lead-acid batteries and has an integral charger that may be connected to a 110 Vac or 240 Vac mains supply, depending on the factory setting of the supply voltage. Charging or replacement of the batteries is only permitted in a non-hazardous area. The mains connection is accessed via a panel on the back of the instrument.

The Detective incorporates a data logger and has an RS232 port for connection to a computer interface for the downloading of data when in the non-hazardous area.

A single unit can be used alone or a number linked together via the two four-pin DIN sockets located on the back of the instrument, thus providing protection for a larger area. The safety description for these interface socket is as follows:

		Second Detective (JP6 1-3)	Third Detective (JP6 4-6)	RS232 (safe area) (JP6 9-12)
U_i	=	7.05 V	7.05 V	±25 V o/c
I_i	=	18 mA	18 mA	
P_i	=	0.028 W	0.028 W	120 mW
C_i	=	0	0	-
L_i	=	0	0	-
U_o	=	7.05 V	7.05 V	-
I_o	=	18 mA	18 mA	-
P_o	=	0.028 W	0.028 W	-

The Detective+ is identical to the Detective except for software and the style of the front label.

Date 27 June 2003

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EC TYPE-EXAMINATION CERTIFICATE Sira 03ATEX2102

14 **DESCRIPTIVE DOCUMENTS**

14.1

Drawing No.	Sheet	Rev.	Date	Title
CUS-2107-A4	1 of 1	3	Jun 03	Fuse encapsulation
DTV-1904-PCA	1 of 1	8	Dec 96	DTV main board solder side
DTV-1904-PCB	1 of 1	8	Dec 96	DTV main board component side
DTV-1904-SS	1 of 1	8	Jun 03	DTV main board silkscreen
DTV-1905-PCA	1 of 1	5	Dec 96	Voltage converter board solder side
DTV-1905-SS	1 of 1	5	Dec 96	Voltage converter board silk screen
DTV-1917-A4	1 of 1	4	Mar 03	Certification label
DTV-1931-A2	1 of 1	3	Oct 95	Battery assembly
DTV-1932-CD	1 to 2	13	Feb 03	P/S & alarm PCB schematic
DTV-1933-CD	1 of 1	7	Apr 03	Voltage converter PCB schematic
DTV-1937-A3	1 of 1	3	May 03	Converter PCB potting
DTV-2332-A3	1 of 1	3	Apr 03	Interface socket label
DTV-3615-A1	1 of 1	1	Mar 03	General arrangement & block diagram
DTV-3616-A4	1 to 2	2	02 Jun 03	Critical parts list
IRSM-5152-A3	1 of 1	1	Dec 02	IR PCB schematic
TRP-1630-PCA	1 of 1	9	Nov 02	Main PCB layer 1 artwork
TRP-1630-PCB	1 of 1	9	Nov 02	Main PCB layer 2 artwork
TRP-1630-PCC	1 of 1	9	Nov 02	Main PCB layer 3 artwork
TRP-1630-PCD	1 of 1	9	Nov 02	Main PCB layer 4 artwork
TRP-1630-SS	1 of 1	9	Nov 02	Main PCB Silk Screen
TRP-1636-CD	1 of 1	10	Nov 02	Main PCB schematic
TRP-1638-CD	1 of 1	3	Nov 02	Explosive PCB schematic
TRP-1639-CD	1 of 1	5	Nov 02	Toxic PCB schematic
TRP-1640-CD	1 of 1	5	Nov 02	Oxygen PCB schematic
TRP-1663-CD	1 of 1	5	Nov 02	Biased toxic PCB schematic
TRP-1688-CL	1 of 1	6	Sept 02	Biased toxic PCB component location
TRP-1688-PCA	1 of 1	6	Sept 02	Biased toxic PCB component side copper
TRP-1688-PCB	1 of 1	6	Sept 02	Biased toxic PCB layer 2 copper
TRP-1688-PCC	1 of 1	6	Sept 02	Biased toxic PCB layer 3 copper
TRP-1688-PCD	1 of 1	6	Sept 02	Biased toxic PCB solder side copper
TRP-2317-CD	1 of 1	4	Nov 02	TCS PCB schematic

14.2 Report No. R52A9051A

15 **SPECIAL CONDITIONS FOR SAFE USE** (denoted by X after the certificate number)

None

16 **ESSENTIAL HEALTH AND SAFETY REQUIREMENTS OF ANNEX II** (EHSRs)

The relevant EHSRs that are not addressed by the standards listed in this certificate have been identified and individually assessed in Report No. R52A9051A.

Date 27 June 2003

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EC TYPE-EXAMINATION CERTIFICATE Sira 03ATEX2102

17 **CONDITIONS OF CERTIFICATION**

17.1 The use of this certificate is subject to the Regulations Applicable to Holders of Sira Certificates.

17.2 Holders of EC type-examination certificates are required to comply with the production control requirements defined in Article 8 of directive 94/9/EC.

17.3 This certificate relies on the following previously-certified products. When used as part of the equipment, the key attributes listed in the table below shall still be maintained by their original certificate.

Product	Certificate no.	Key attributes
MEDC Type DB5 sounder	BAS 00ATEX1259	EEx ia IIC T4 Ui = 28 V, Pi = 0.81 W, Ci = 0, Li = 20 mH +1000 Ω
BEKA LED cluster	BAS 01ATEX1062X	EEx ia IIC T4; Ui = 30 V, Ii = 185.5 mA, Pi = 1.3 W
E2V (formerly Marconi) IR1xxx infra-red sensing head	Sira 99ATEX1121U	EEx d IIC
Flammable Block	Sira 02ATEX1281U	EEx d IIC
Littelfuse 259-series 62mA fuse	BAS 01ATEX1278U	EEx ia IIC
Sensor S01-881	Sira 02ATEX1411U	EEx d IIC

Date 27 June 2003

Sira Certification Service
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Email: exhazard@siratc.co.uk
Sira Certification Service is a service of Sira Test & Certification Ltd

ST&C(Chester) Form 9176 Issue 7


CROWCON DETECTION INSTRUMENTS LTD.
DETECTIVE
II 2G: EEx ib d IIC T4
Cert No. Sira03ATEX2102
CE 1180
XXXX
S/N: XXXXX
Static Hazard - clean only with a damp cloth.
Use only Yuasa NP1.2 or IBT BT1 batteries.
Not to be used in hazardous areas
containing greater than 21% oxygen
INTERCONNECTION SOCKETS TO OTHER
DETECTIVES ARE INTRINSICALLY SAFE
CHARGING Um = 250Vac
DO NOT CHARGE IN HAZARDOUS AREA
Manufactured by
Crowcon, Abingdon, OX14 1DY, UK