



## Protec Algo-Tec™ 6100 Interactive Digital Addressable Fire Control System

# Protec

Protec Fire and Security Group

Protec Algo-Tec™ 6100

INTERACTIVE DIGITAL ADDRESSABLE

FIRE CONTROL SYSTEM

- Cost Effective Single Loop Panel
- High Capacity Loop - 192 Addresses
- Algo-Tec™ 6000PLUS Protocol
- Surface and Recessed Mounting
- Easy to Install
- Reduced False Alarms
- Enhanced Performance
- On Site Flexibility
- Designed to EN 54-2 & 4
- Open Protocol

#### System Features

The Protec Algo-Tec™ 6100 is an interactive digital addressable fire detection and alarm system ideally suited for small and medium sized buildings such as shops, hotels and offices. The control panel is designed and manufactured by Protec to comply with EN 54-2 & 4. The control panel is suitable for surface or recessed mounting with a moulded polycarbonate enclosure finished in storm grey.

#### Loop

The 6100 control panel is equipped with a high capacity Algo-Tec™ digital addressable data loop, with up to 192 addresses. In addition to the Algo-Tec™ 6000PLUS sensors, interfaces and manual call points the loop can also support loop powered SOUNDERS, VISUAL ALARM DEVICES and OPTICAL BEAM DETECTORS. Additionally a 6300 Loop Powered Repeat Display can be connected directly to this loop, resulting in reduced cabling requirements, simplified installation and associated cost savings.

#### Alarms

In addition to loop powered sounders and Visual Alarm Devices (VAD's), 2 fully monitored alarm outputs are provided at the panel for alternative wiring arrangements.

#### Auxiliary Contacts

One set of global fire, and one set of fault changeover contacts.

#### Controls and Display

All the functions of the modern styled Control Panel are accessed by entering the user access code. The controls are SILENCE, SOUND ALARMS, RESET and ACCEPT plus navigation push buttons to enable access to the user menu facilities. The control panel display consists of a 4x20 character liquid crystal display, twin common fire LED indicators, 16 separate zonal fire LED's, power on, pre-alarm, system fault, common fault, test and disablement LEDs.



#### Liquid Crystal Display

The 80 character liquid crystal display will under normal quiescent conditions display the current date and time with the option to also display a 40-character user's message such as site name.

In an alarm or fault condition the LCD will display the device, address and zone number and up to 20 characters of user definable location text, programmable on site using Protec 6100 windows based software.

#### Device Location Text

Windows based text software is supplied free of charge to our clients to enable you to enter the location text on to the disk supplied and hand to our commissioning engineer for loading into the panel during commissioning. This simple process allows you more flexibility enabling you to make any last minute changes and speed up the entire process.

#### Power Supply

The 6100 control panel is supplied with an integral 1A dc switch mode charger and accommodates two 12V 3.3 Ah sealed lead acid battery.

#### On Site Programming

The Protec Algo-Tec™ 6100 system is on site programmable. All of the commissioning configuration data can be entered and/or backed up using the Protec 6100 windows based programming software via a PC. This feature enables the system to be re-configured and checked prior to attending site simplifying commissioning works on site, enabling text amendments to be carried out whilst on site and providing an invaluable remote backup should the need arise.

## Loop Devices

The Protec Algo-Tec™ 6000PLUS protocol utilises FAST™ addressing (Firmware Addressed Secure Technology). Every FAST™ device is manufactured with a unique serial number.

FAST™ addressing ELIMINATES troublesome and time consuming address cards and DIL switching whilst being far more secure than “soft addressing”.

The Protec Algo-Tec™ 6000PLUS sensor range has been developed to incorporate advanced fire sensing technology, electronic sounders, high intensity visual alarm and speech enhanced talking sounder capability, all integrated within the sensor head and powered from the loop.

## Typical Sensor Variants

6000PLUS/OPHT/S = c/w Sounder

6000PLUS/OPHT/VAD = c/w Visual Alarm Device

6000PLUS/OPHT/S VAD = c/w Sounder and Visual Alarm Device

6000PLUS/OPHT/TS = c/w Talking Sounder

6000PLUS/OPHT/TS VAD = c/w Talking Sounder and Visual Alarm Device

### 6000PLUS/HT



**FAST™ Interactive Heat Sensor** - Interactive addressable heat sensor with low thermal mass thermistor, giving fast response to temperature increases. Other Heat Sensor variants include: 6000PLUS/HT/S, 6000PLUS/HT/SVAD, 6000PLUS/HT/TSVAD

### 6000PLUS/OP



**FAST™ Interactive Optical Smoke Sensor** - Interactive addressable high performance optical smoke sensor provide efficient reliable detection using the light scatter sensing principle with rapid response to a fire signal. Other Optical Sensor variants include: 6000PLUS/OP/S

### 6000PLUS/OPHT



**FAST™ Interactive Optical Heat Sensor** - Interactive addressable high performance optical smoke and heat multi-sensor. Other Optical Heat Sensor variants include: 6000PLUS/OPHT/S, 6000PLUS/OPHT/VAD, 6000PLUS/OPHT/SVAD, 6000PLUS/OPHT/TS, 6000PLUS/OPHT/TSVAD

### 6000PLUS/OPHTCO



**FAST™ Interactive Optical Heat CO Sensor** - Interactive addressable high performance optical smoke heat and carbon monoxide multi-sensor. Other Optical Heat CO Sensor variants include: 6000PLUS/OPHTCO/S, 6000PLUS/OPHTCO/VAD, 6000PLUS/OPHTCO/SVAD, 6000PLUS/OPHTCO/TSVAD

### 6000PLUS/BASE



**Low Profile Common Mounting Base** - Compatible with the above range of Algo-Tec™ 6000PLUS Sensors.

### 6000PLUS/FFBASE



**Fast Fixed Base** - Fast fixed recessed base is designed to recess the sensor into a false ceiling to give a lower profile view of the sensor.

### 6000/LOOP/REPEATER

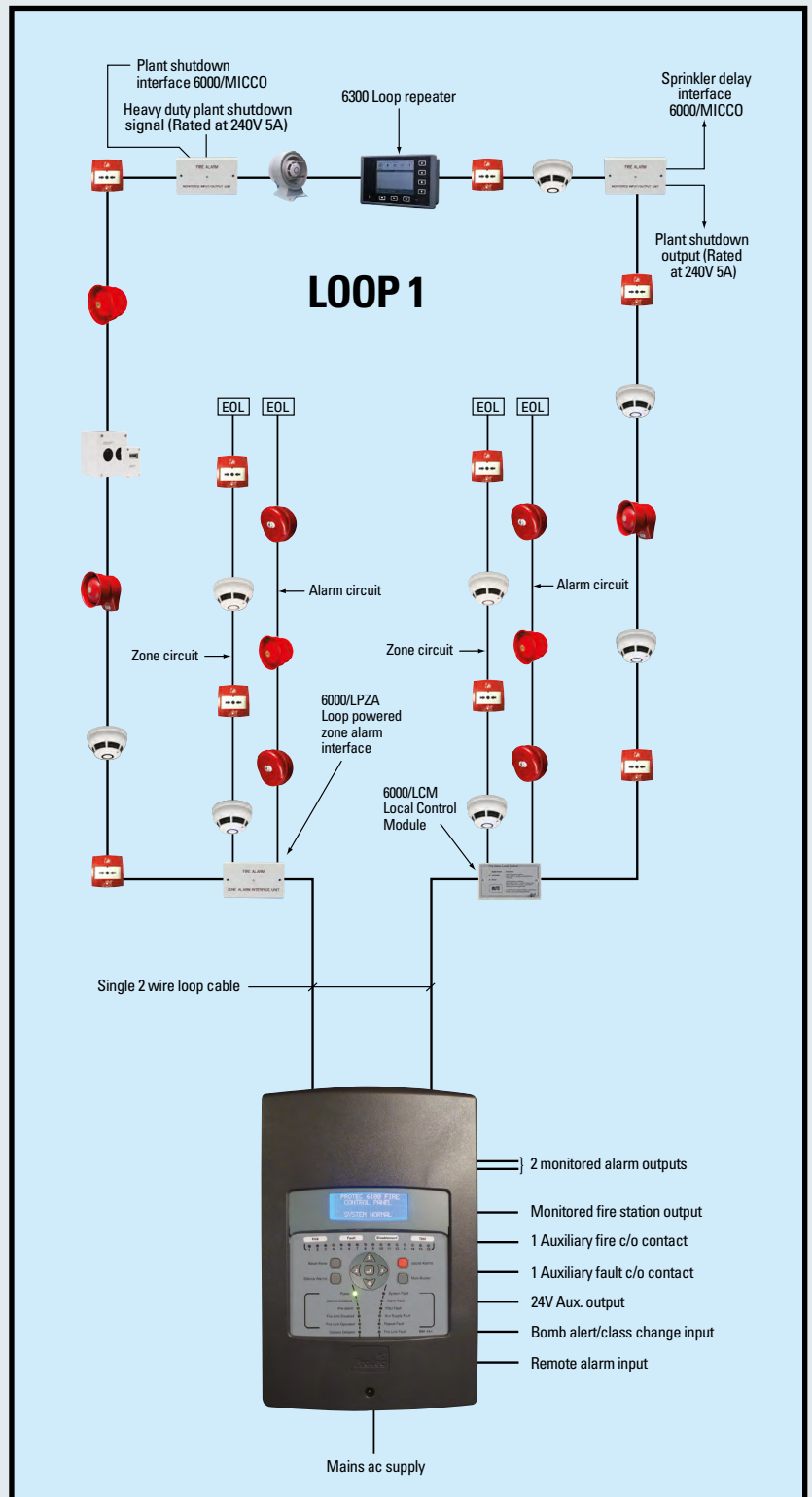


Connected directly to the local data loop and takes up just one address. The repeater's large LCD display provides clear text location of fire and fault events.

### 6000/MCP



**FAST™ Addressable Manual Call Point** - Key operated test facility, a loop short circuit isolator is incorporated.



## KEY:



Heat Sensor



Optical Smoke and Heat Sensor



Optical Smoke, Heat and CO Sensor



Duct Probe Unit c/w Smoke Sensor



Manual Call Point



Beam Detector



Loop Powered Zone Alarm Interface



Local Control Module



Monitored Input CC Output Interface



Electronic Sounder



Electronic Sounder VAD



Visual Alarm Device (VAD)



6000 Loop Repeater

**Guide to loop cable conductor sizing for the Protec 6100 system.**

		Loop Length (Metres)												
		500	550	600	650	700	750	800	850	900	950	1000		
Total Loop Load in Alarm (mA)	50													
	100													
	150													
	200													
	250													
	300													
	350													
	400													
	450													
	500													
	550													
	600													
	650													
	700													
	750													
800														
850														
900														
950														
1000									n/a	n/a	n/a	n/a	n/a	

		Loop Length (Metres)												
		1050	1100	1150	1200	1250	1300	1350	1400	1450	1500			
Total Loop Load in Alarm (mA)	50													
	100													
	150													
	200													
	250													
	300													
	350													
	400													
	450													
	500													
	550													n/a
	600									n/a	n/a	n/a	n/a	n/a
	650						n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	700					n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
	750		n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
800	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
850	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
900	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
950	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	
1000	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a	

The conductor size required as follows:

□ 1.0mm<sup>2</sup>    ■ 1.5mm<sup>2</sup>    ■ 2.5mm<sup>2</sup>

MAXIMUM LOOP RESISTANCE 16 OHMS PER CONDUCTOR

**Table detailing the loop standby and alarm load for typical Algo-tec™ 6000 devices.**

Product	Description	No of Addresses	Loop Standby Load mA	Loop Alarm Load mA
6000/MCP	Manual Call Point	1	0.45	0.85
6000/FIREBEAM	Loop Beam	1	3.65	7
6000/PLUS/HT	Heat Sensor	1	0.2	0.2
6000/PLUS/HT/S	Heat Sensor c/w Sounder	1	0.4	5.4
6000/PLUS/OPHT	Optical Smoke and Heat Sensor	1	0.2	0.2
6000/PLUS/OPHT/S	Optical Smoke and Heat Sensor c/w Sounder	1	0.4	5.4
6000/PLUS/OPHT/SVAD	Optical Smoke and Heat Sensor c/w Sounder and Visual Alarm Device	1	0.55	24
6000/PLUS/OPHT/TSVAD	Optical Smoke and Heat Sensor c/w Talking Sounder and Visual Alarm Device	1	0.55	25
6000/PLUS/OPHTCO	Optical Smoke, Heat, and CO Sensor	1	0.45	0.45
6000/PLUS/OPHTCO/S	Optical Smoke, Heat, and CO Sensor c/w Sounder	1	0.45	5.45
6000/VAD/W	Loop Visual Alarm Device	1	0.8	19
6000/SSR	Loop Sounder	1	0.7	5
6000/SSR/VAD	Loop Sounder Visual Alarm Device	1	0.7	24
6000/LCM	Local Control Module	1	0.7	5
6000/MICCO	Monitored Input CC Output	1	0.55	5

Note: The following Loop Parameters should be observed  
 1) The total number of addressable devices should not exceed 192 per loop.  
 2) Add 20mA to total loop alarm load to allow for fire indicator LED's on devices  
 3) The total loop alarm load should not exceed 600mA per loop.

**6000PLUS/UG4DP** Ventilation Duct Smoke Sensor Assembly - Single pipe air sampling unit for air speeds from 0.5 to 20m per sec. supplied with 6000PLUS/BASE suitable for use with 6000PLUS/OP FAST™ interactive optical smoke sensor.



**6000/FIREBEAM** FAST™ Addressable Loop Powered Beam Detector - Combined transmitter/receiver unit and separate low level controller. With a beam range of 5-100 metres.



**6000/SSR** FAST™ Addressable Loop Powered High Output Electronic Sounder - utilises a Piezo driver unit to enable high sound output and very low current consumption.



**6000/VAD/W/RED** FAST™ Addressable Loop Powered High Intensity VAD - Approved to EN54-23 the wall mounted VAD has a unique lens that distributes the white light in a cuboid pattern to achieve 7.5m x 7.5m coverage @ 2.4m high.



**6000/VAD/C/RED** FAST™ Addressable Loop Powered High Intensity VAD - Approved to EN54-23 the ceiling mounted VAD has a unique lens that distributes the white light in a cylindrical pattern to achieve 7.5m dia coverage @ 3m high.



**6000/SSR/VAD** FAST™ Addressable Loop Powered High Output Electronic Sounder with VAD - Approved to EN54-3, 17 & 23 the wall mounted combined sounder/VAD has a sound output of 100dB(A) @ 1m plus VAD light output of 7m x 7m coverage @ 2.4m high.



**6000PLUS/TSR2** FAST™ Addressable Loop Powered Talking Sounder - The 6000PLUS/TSR2 voice enhanced talking sounder is available with seven voice messages plus 'bell' sound in addition to the three fire alarm tones compatible with the Protec range of electronic sounders.



**6000/FIU** Flush Mounted Short Circuit Isolator Unit - To isolate a short circuit fault on either the incoming or outgoing loop cables. Suitable for a 30mm deep electrical mounting box.



**6000/LPZA** FAST™ Addressable Flush Mounted Loop Powered Zone Alarm Interface Unit - With a monitored detection circuit suitable for use with Protec 3000 series detection devices. Line continuity maintained. Monitored alarm output circuit rated at 24Vdc 50mA max. Suitable for a 45mm deep electrical mounting box. A loop short circuit isolator is included.



**6000/LCM** FAST™ Addressable Flush Mounted Local Control Module - Allows easy integration of Protec addressable fire detection systems into houses of multiple occupancy and offers novel features to reduce false alarms. The interface drives a zone of 3000 series detection devices and provides a supply to a local alarm circuit.



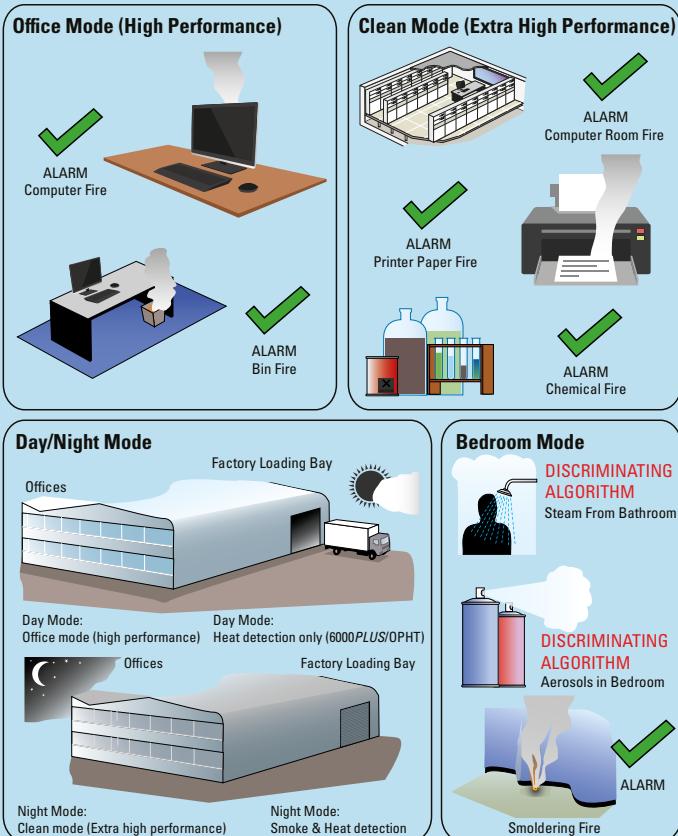
**6000/MICCO** FAST™ Addressable Flush Mounted Loop Powered Monitored Input, Clean Contact Output Interface Unit - With a monitored input circuit suitable for use with simple switch devices and the output is a clean changeover contact 5amp rated at 240V ac. A link can be cut to provide a 7-second delay to the input. Suitable for a 45mm deep electrical mounting box. A loop short circuit isolator is incorporated.



**Multi-way Input/Output Interfaces** - A range of 16 way input/output interfaces are available with monitored alarm outputs or clean changeover contacts. All interfaces are FAST™ addressable.



**Algo-Tec™ 6000PLUS** Interactive Decision Making Algorithms - Typical Applications



NOTE: The above examples give an indication of system reaction to intermittent contaminants and typical fire sources in a correctly designed BS5839 system. They by no means detail the full complexity of the systems decision making algorithms. Examples are for 6000PLUS/OPHT.

**The Protec Algo-Tec™ 6100 Interactive Digital Addressable System unwrapped:**

The Protec Algo-Tec™ 6000PLUS protocol developed by Protec's in-house Research and Development team is utilised by the Protec Algo-Tec™ 6100 interactive digital addressable fire control systems. Immunity to false alarms, more responsive fire detection, and ease of use has all been achieved to develop one of the most reliable systems available.

**Protec Algo-Tec™ 6000PLUS**

The name Algo-Tec™ is a derivative of Protec algorithms. Algorithms are logical mathematical procedures for solving problems. Protec have developed fire detection algorithms coupled with fuzzy logic specifically designed to reduce unwanted fire alarms and to enhance the sensitivity of the system to true fire phenomenon. The Algo-Tec™ algorithms are exclusively utilised by the Protec Algo-Tec™ 6400, 6300 and 6100 Interactive Digital Addressable Fire Control Systems.

**Interactive**

Algo-Tec™ evaluates the data of each fire sensor and is able to learn from the information received. This may simply be to recognise that a sensor is becoming contaminated or in a dirty environment and to automatically increase the alarm threshold to compensate for the background levels (Threshold Compensation).

More complex Algo-Tec™ functions include the ability to discriminate between certain fire and non-fire conditions, filtering out certain environmental stimuli, and increasing the sensitivity of a sensor when an increase in temperature is detected.

The net effect of the interaction between the sensors and the Algo-Tec™ decision making is enhanced performance, through immunity to false alarms and more responsive fire detection.

**Digital Addressable**

The data communication between the sensors and the control equipment is Digital.

The Algo-Tec™ protocol utilised by the 6000PLUS system enables high levels of data to be transferred, providing far more detailed information than was previously achievable with analogue addressable systems. It should however be noted that many analogue addressable systems use digital communication but do not transfer the high levels of data associated with the Algo-Tec™ protocol. Speed, stability, excellent EMC and security all serve to enhance the Algo-Tec™ Digital signalling. Why go analogue addressable when you can now choose Algo-Tec™ Digital Addressable.



**6000 Loop Repeater**

The 6000/LOOP/REPEATER can be connected directly to the local Algo-Tec™ digital addressable data loop and takes up just one address. Events from the main panel are displayed on the repeater's large LCD display, providing system indication of any loop connected location on site. The low power consumption allows numerous repeat devices to be fitted, greatly increasing system visibility.

Loop Load (average at 24v loop):

Panel Normal	1.6mA
Panel Mains Fail	13.1mA (4.7mA after 5min)
Panel in Alarm	12.7mA

Dimensions (mm): 184.50(W) x 109.50(H) x 47(D)

## Technical Specification

### 6100 Control Panel

#### Model:-

Complies with EN54-2 & 4

#### Specification:-

Rated Voltage  
Rated Frequency  
Rated Current  
Working Voltage  
Temperature Range  
Maximum Humidity  
IP Rating  
Battery Type  
Standby Load (Mains Fail Condition)  
Maximum Alarm Load (Mains Fail Condition)

6100 - Single Loop.

Mains 100 to 240V ac rms.  
50 to 60Hz.  
600mA rms.  
21.5 - 29V dc.  
0 - 40°C.  
85% Non-condensing.  
IP30.  
2 x 12V 3.3Ah sealed lead acid.  
22mA.  
56mA panel, 600mA loop, 200mA conventional alarms (100mA per alarm output), 150mA auxiliary 24V output, 20mA fire-link.

Display  
Digital Addressable Loops  
Total Loop Load  
Zones  
Integral Charger  
Integral Battery  
Alarm Outputs

Backlit liquid crystal display 4 lines of 20 characters.  
1 loop, with 192 address capacity. Algo-Tec™ 6000PLUS Protocol.  
600mA including all loop connected devices.  
32 Zones, 16 with LED indication, plus general fire indicator.  
1A dc switch mode, temperature compensated.  
2 x 12V 3.3Ah sealed lead acid.  
2 monitored conventional sounder circuits (100mA per output maximum).  
Up to 192 alarm outputs using loop output devices.  
1 set of non-monitored changeover contacts (1A @ 24V dc) operating on any fire.  
600mA loop, 100mA per conventional alarm output.  
Fully fault monitored to EN 54-2 & 4.  
Single pole changeover contacts (1A rated @ 24V dc).  
24V dc fused at 150mA.  
24V dc fully monitored output (requires end of line module SF4165759).  
USB 2.0 (Type A male to Type B male connection lead required, 2 metres maximum length).  
228(W) x 345(H) x 111(D).  
1.5kg (excluding batteries).  
EN 54-2 : 1997 + A1 : 2006.  
EN 54-4 : 1998 + A1 + A2.

Global Fire Outputs  
Alarm Load  
Fault Monitoring  
Fault Output  
Auxiliary Output Supply  
Common Fire Output (fire station)  
Communications Interface  
Dimensions (mm)  
Weight  
Applicable Standards

#### Programmability

32 Input Groups  
32 Output Groups  
  
Non-Latching  
Coincidence  
Detection Sensitivities  
Sounder Volume  
Day/Night Time  
Sounder Pulsing Time  
Talking Sounder Synchronisation Time  
Fire Link Delay Time  
Walk Test Time  
Windows Software Suite

First 31 groups are available for detection zones, group 32 is reserved for Sound Alarms push button.  
Each output group can have a delay programmed (5 seconds to 10 minutes).  
Each output group can be set as Alarm or Control type.  
Loop addresses may be programmed to be non-latching.  
To EN 54-2 Type C dependency.  
Each detector may have one of two sensitivities programmed.  
Each loop sounder may be programmed to be low, medium or high volume.  
The panel may be programmed into two time zones to run different sensitivities for each detector.  
The sounder on and off times may be programmed from 0.5 sec to 128 sec in 0.5 second increments.  
1 sec to 120 sec in 1 second increments.  
5 seconds to 10 minutes in 5 second increments.  
1 sec to 255 sec in 1 second increments.  
Proprietary software suite designed specifically for the 6100.  
Allows text editing, matrix configuration, setup of all panel parameters.

#### Text

Panel Text  
Device Address Text  
Zone Text

2 lines of 20 character panel text. Displayed when the system is 'normal'.  
20 characters of device address text.  
20 characters of zone text.

#### Language Support

The 6100 supports multiple languages.



KM575025  
0086-CPD-575026  
BS EN54-2:1997  
BS EN54-4:1998