Vigilant® *MX1*
Fire Alarm System

The Vigilant® MX1 analogue addressable fire indicator panel (c.i.e.) incorporates many innovative features and supports up to 500 multi-point devices. Built to the ISO based AS 7240.2 - 2004 standard, it includes an integrated Fire Brigade Panel to AS 4428.3. Its support for Tyco MX TECHNOLOGY®, fuzzy-logic detection algorithms and powerful control functions make it suitable for a wide range of fire protection applications for small to medium size systems.

Features & Options

Design

- Complies with AS 7240.2, AS 7240.4, AS 4428.3 and AS 4428.10[1]
- Alarm Investigation Facility (AIF)
- Alarm Acknowledge Facility (AAF)
- 15U 19 inch rack style cabinet
- Internal mounting for T-GEN 50 or Mini-Gen Occupant Warning Systems

Detection

- Single *MX DIGITAL* loop supporting up to 250 *MX* devices
- Optional second *MX* loop for an additional 250 *MX* devices
- 40-device spurs with 3-port short circuit isolator
- *MX VIRTUAL* multi-sensor analogue addressable detector technology
  — 3oTec triple sensor detector: photoelectric smoke, heat and CO
  — Heat detector programmable as Type A, B, C or D
  — Flame detectors
  — Ex rated detectors and modules
  — *MX* loop addressable VESDA®
- *MX FASTLOGIC* or *SMARTSENSE* fire detection algorithms
- Multi-I/O modules with sub-points using only one loop address
- Sub-points indicate status of individual elements of multi-sensor detectors
- Compatible with wide range of collective (conventional) detectors
- Loop-powered sounder base & beacon

Operator Interface

- Plain English alarm messages on 4-line, 40 character LCD - 99 event alarm list
- Compact zone LED display modules (optional) for up to 192 of the 999 possible zones
- Event logging to internal non-volatile history file
- Built-in clock/ calendar with automatic daylight saving adjustment

Programming

- Windows®- based programming tool
- Dual databases for reduced downtime and increased reliability
- Powerful user-programmable Boolean logic with special functions and timers
- User defined 'Profiles' simplify programming of complex functions
- Day/night Mode, Residential Mode
- Programmable outputs for alarm (warning) devices and ancillary controls

Connectivity

- High level interface for QE90, IO-NET and repeater panels
- Remote access using virtual user interface PanelX PC software
- Event Printer

Power Supply

- Internal 5A p.s.e. / battery charger
- Monitored battery connection
- Internal mains socket for laptop, etc.
- Earth fault monitoring
- Display of p.s.e. voltage and current

MX Detection Technology

The *MX1* supports *MX VIRTUAL* analogue addressable detectors such as the 3oTec 801PC (Smoke, Heat & CO), 814PH (Smoke & Heat) and 814CH (CO & Heat). Each of these detectors support independent sensor modes as well as heat enhancement for faster response to a flaming fire, allowing optimum detection with the best nuisance alarm suppression.

Detection modes include:
- smoke/ CO plus heat detection,
- heat-enhanced smoke/ CO detection
- heat-enhanced smoke/ CO plus heat
- smoke/ CO detection
- heat detection only.

Heat detection can be either fixed temperature, or combined rate-of-rise and fixed temperature.

For specific applications, single-sensor *MX* analogue addressable ionisation and photoelectric smoke detectors, high sensitivity smoke detectors (VESDA), heat-only detectors, flame detectors and Ex rated devices are also available.

Up to 250 *MX* devices may be connected per loop, with each device supporting several sub-points that may be mapped to different zones or control functions.

The *MX DIGITAL* communications protocol used on the addressable loops is designed to provide high reliability and fault tolerance, with operation possible over many cable types. This often permits system upgrades using existing cable.
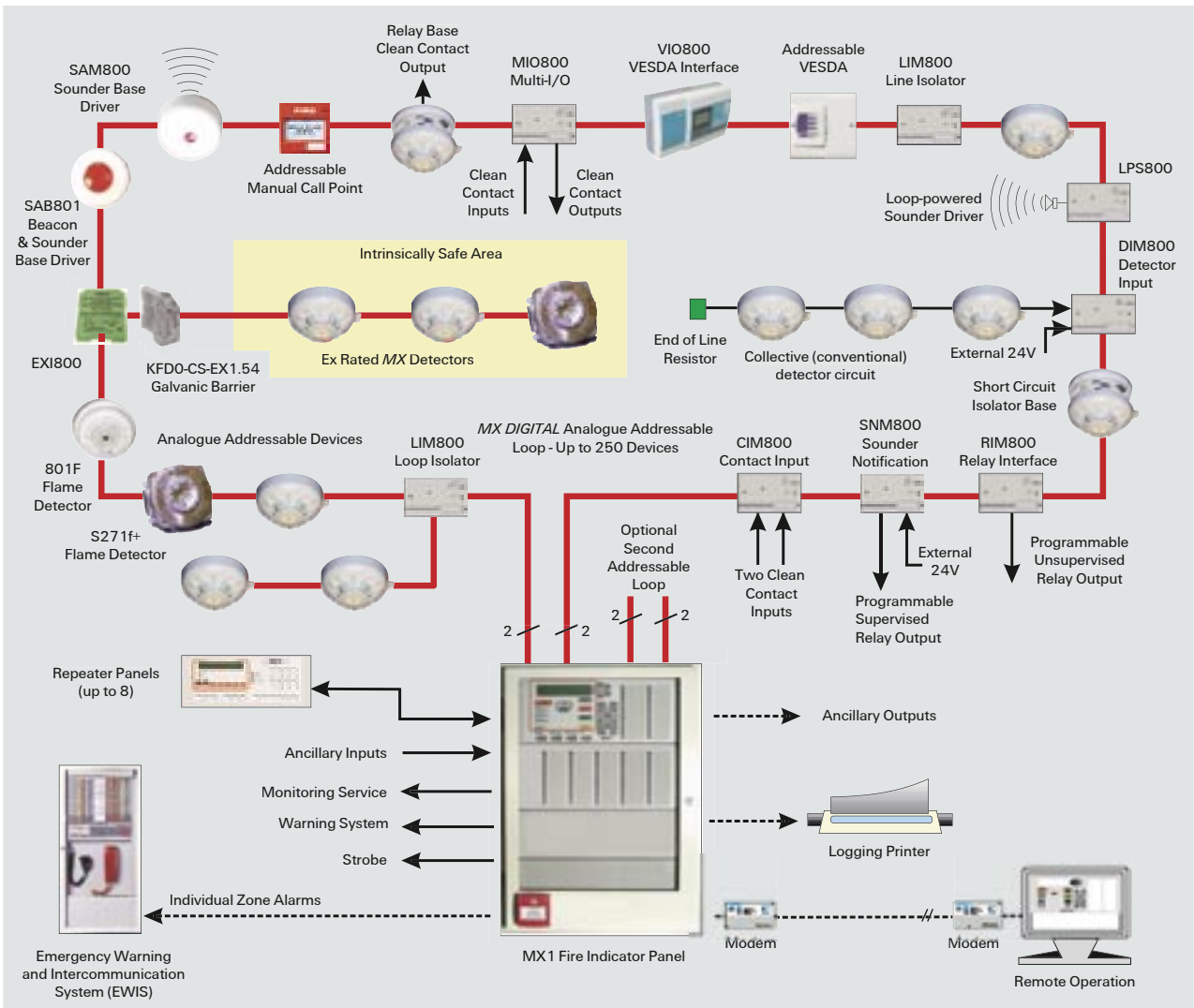
MX1 System Diagram

MX FASTLOGIC Algorithm

By using the LIM800 isolator, spurs off the loop are supported. The loop configuration ensures that communications continues in the event of a loop open circuit fault condition. Up to 250 short circuit isolator detector bases or modules may be fitted around the loop, to limit the effect of a short circuit fault to the devices between isolators.
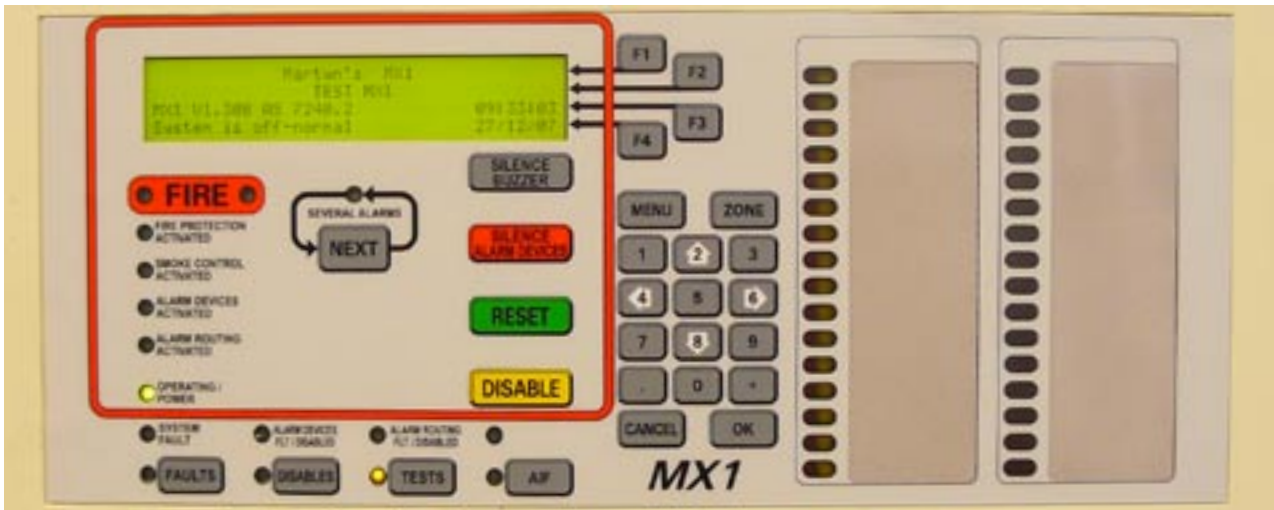
Detection Algorithms

MX FASTLOGIC is a fuzzy-logic expert rule-based algorithm applied to the photoelectric smoke signal with optional heat enhancement. It is designed to discriminate between the smoke and temperature patterns of real fires and typical causes of nuisance alarms.

SMARTSENSE is a field-proven, reliable detection algorithm, providing nuisance alarm reduction, compensation for ambient conditions and a wide range of programmable sensitivity settings.
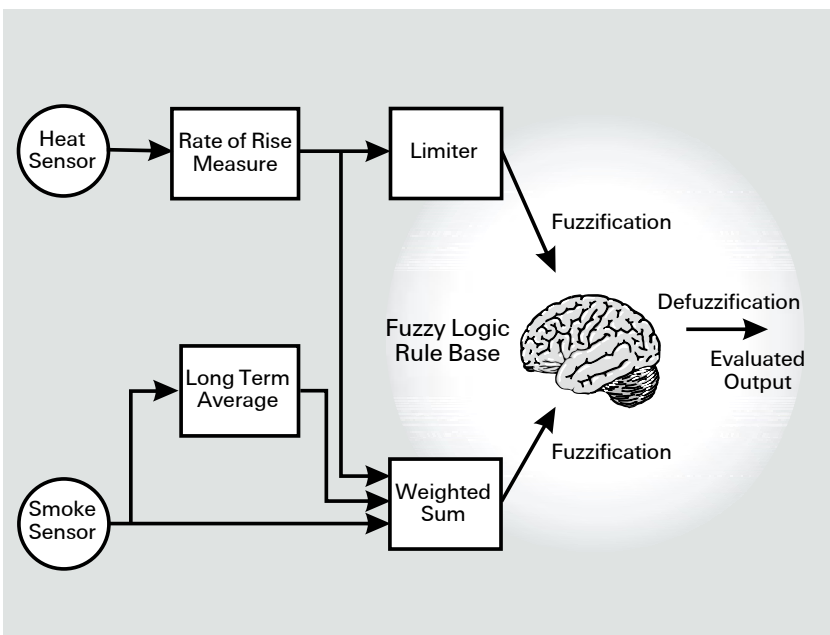
Vigilant *MX1* Fire Alarm System

MX1 Control Panel Layout

Both algorithms provide:

- Detector pre-alarm sensing for early warning of a potential alarm.
- Compensation for soiling and changes in ambient conditions.
- Logging "detector dirty alert" when compensation limits are about to be exceeded, to highlight the need for maintenance to be scheduled.

Easy to Operate

Operation is straightforward with the *MX1*'s AS 4428.3 Fire Brigade Panel keypad and 4 line x 40 character alphanumeric LCD. The LCD displays the zone/point numbers, the type of alarm, and a text description of the alarm location for first and second alarms. Subsequent alarms are displayed by scrolling through the 99 alarm event buffer. Detailed information on each alarm is available with a single keypress.

Current faults, disabled (isolated) zones and points, and tests in progress can also be separately recalled.

An internal, non-volatile history log stores the previous 900 events, and these can be readily recalled to the LCD. The optional plain language printer output provides a 30 character text description of the event, and a date/ time stamp. The printer may be selected to log events for each individual zone and point. "Tandem Mode" enables the *MX1* to be operated from a remote computer running PanelX, for training, diagnostic or remote operation purposes.

Control Facilities

- Fire Brigade Panel to AS 4428.3, with red border, separate 'silence buzzer' and yellow 'disable alarm' control buttons
- Three access levels for front panel use:
  - Level 1 read-only at all times,
  - Level 2 via 003 keyswitch,
  - Level 3 via PIN.

Fully User-Programmable

The *MX1* is programmed quickly and easily using the SmartConfig Windows®-based programming software. The dual database structure of *MX1* allows updated site-specific configurations to be downloaded while still maintaining full operation.

System programming provides a wide range of options including free mapping of points to zones. Powerful control programmability is available through timers (second and minute), day/ night periods, Boolean logic expressions, variables and system state tokens. Text substitutions add meaning to logic expressions to simplify site-specific data maintenance.

The site-specific configuration is stored in non-volatile FLASH memory. The programmed data can be printed or archived for back-up storage.

Easy Maintenance

Whilst the *MX1* requires minimum maintenance, it has been designed to allow the maintenance requirements in AS 1851 to be carried out efficiently and rapidly. The in-built battery testing and voltage & current monitoring will identify battery problems, should they occur. The sensitivity and condition of smoke and CO detectors can be displayed or downloaded to a PC. Outputs can be operated from the keypad to test interfaces to other systems. The in-situ test mode (Auto Reset) allows fire detectors to be tested by one person. Commissioning mode speeds up system testing by bypassing filtering delays and algorithms. Individual detectors can be easily located in the field by forcing the LED indicator on.

Programming Facilities

The following are some of the parameters that can be programmed:

- Point options include:
  - Point Type   - Alarm Type
  - 30 character text name
  - Latching status
  - Detection Profile - includes detection algorithm, sensitivity (alarm, prealarm), temperature enhancement, dirty alert
  - Day/ night profile affecting point operation and sensitivity
  - Point to zone mappings with separate zone mappings for each sub-point (e.g. heat & smoke sensors)
  - Output control by point, zone or logic
  - Logging and event generation

- Zone options include:
  - 30 character zone text name
  - Zone operation selected by profile:
    - Standard Detection
    - Residential   · Multi-hit (n of m)
    - Status only   · Sprinkler
    - AIF   · AAF
    - Flowswitch (for remote testing)
    - Ancillary Control (for output control)
  - Programmable routing to LCD, LED, alarm devices, alarm monitoring service, history & printer

- Output logic programming includes:
  - Variables   - Timers
  - Boolean AND, OR, XOR, NOT, Conditional Jump
  - System state tokens   - Psuedo points
  - Comments in logic for clarity
  - Plain English text substitution for logic programming elements

- System functions include:
  - Auto test times   - Day/night definition
  - User programmable profiles and templates
  - System profile selectable per state, plus custom. Includes daylight saving settings.

Vigilant *MX1* Fire Alarm System

Specifications

System Capacity

Analogue Loop	*MX DIGITAL*, 2-wire, 2km max., O/C tolerant, S/C isolators
Addressable points	Up to 500, with second loop fitted
Zone indications	Optional, up to 32 using control panel, 192 total with extra modules. Separate alarm LEDs, combined Fault/ Disable LEDs Up to 999 zones in total.
Repeater Panels	Up to 8; more if mimic only (i.e. no controls)

Physical

Cabinet Style	15U 19 inch Rack
Cabinet Size (mm)	750H x 550W x 210D
Cabinet Material	Mild steel, zinc coated
Finish	Baked epoxy powdercoat finish Cream Wrinkle BFF998CW
Style	Surface or inset wall mounting. Outer door & window covering keyboard & displays
Shipping Weight	24kg (20kg unpackaged)
Temperature	-5°C to +45°C operating (tested to +55°C, as per AS 7240.2)
Humidity	Up to 95% RH at 40°C (non-condensing)

Power Supply

Mains Supply	230Vac (192-253Vac), 1.2A rms, 50/60Hz
Internal Battery	2 x 12V SLA up to 40Ah
Internal PSU	27.3V (nominal), 5A regulated, temperature compensated
Battery Monitoring	Battery low/ fail, supervision of battery connection and condition
Fused Outputs	3 x +VBF, +VRZDU, +VNBF, all fused 3A (slow-blow), supervised
Current Consumed	150mA (Base panel, system normal)

Inputs

MX Loop	Up to 250 *MX* detectors and input/ output modules.
MX Loop Card	Optional card adds up to 250 *MX* detectors and I/O modules
Other Inputs	Two programmable supervised, transient protected inputs at control panel for sprinkler evacuation etc., unused relay supervision inputs may also be used for external wiring. 16 programmable unsupervised inputs available for internal (cabinet) use.

Outputs

Monitoring Service	Alarm, Fault, Disable: clean-contact changeover relays. ASE port: 2-wire connection to Centaur™ ASE.
Ancil. Relay 1	2A, 30Vdc resistive. Programmable operation; pre-configured for T-GEN 50.
Ancil. Relay 2	2A, 30Vdc resistive. Voltage free changeover contacts or load-supervised switched 24V. Programmable operation.
Ancil. Relay 3	5A, 30Vdc resistive. Voltage free changeover contacts or reverse polarity supervision of diode isolated loads. Up to 3 branches. Programmable operation. Suitable for Occupant Warning System (OWS) with Mini-Gens/Strobe Driver.
GP Output1 & 2	100mA transistor pulldown (1.1V). Transient protected for field wiring. Programmable operation, load supervised. Can also be used for supervised inputs.
Other Outputs	16 x 50mA unsupervised unprotected transistor pulldown (1.1V). Programmable operation for panel indicators or relay outputs.
RZDU Comms	Communications port for connection to repeater panels or HLI to QE90 and/or IO-NET
Printer/ Program	2x RS232, male DB9 configured as DTE

Device Compatibility

MX1 is compatible with the range of Tyco *MX* analogue addressable detectors and I/O modules including:

- 801PC Photo/CO/Heat detector
- 814PH Photo/Heat detector
- 814P Photoelectric detector
- 814CH CO/Heat detector
- 814H Heat detector
- 814I Ionisation smoke detector
- 801F Flame detector
- S271i+ I.S. Triple IR Flame detector
- S271f+ Triple IR Flame detector
- 801Ex series I.S. detectors
- CP840Ex I.S. Manual Call Point
- IF800Ex I.S. Single Input Device
- VLC800MX VESDA Smoke detector
- CP820 Manual Call Point
- CIM800 Contact Input Module
- DIM800 Dual Detector Input Module
- LPS800 Loop Powered Sounder driver
- SAB801 Sounder/Relay base driver with LED Beacon
- SAM800 Sounder/Relay base driver
- MIM800 Mini Input Module
- MIM801 Mini Input Module (NC)
- MIO800 Multi-I/O Module (3 in, 2 out)
- RIM800 Relay Interface Module
- SNM800 Sounder Notification Module
- LIM800 Line Isolator Module (3 port)
- 5BI Isolator base
- 814RB Relay base
- 802SB Sounder base (Loop powered)
- 901SB Sounder base (external power)

Approvals

MX1 is certified to AS 7240.2 - 2004 and AS 7240.4 - 2004: "Fire detection and alarm systems"; AS 4428.3 - 2004: "Fire detection, warning, control and intercom systems - Control and indicating equipment - Fire brigade panel"; and AS 4428.10 - 1998[1]: "Fire detection, warning, Control and intercom systems - Alarm investigation". CSIRO ActivFire Listed afp-2320

1. *MX1* has been assessed to the functional requirements of AS 4428.10-1998.

Simplex
FIRE PRODUCTS

tel: 1300 552 559
simplexfire.au@tycoint.com
www.simplexfire.com.au