

**FA-300 SERIES  
DSP/MICROPROCESSOR BASED  
LCD FIRE ALARM CONTROL**

**ENGINEERING SPECIFICATIONS**

**Mircom Technologies Limited  
Printed in CANADA**

## **PART 1 B GENERAL**

### **DESCRIPTION 1.1**

The fire alarm system shall include, but not be limited to, a Mircom FA-300 series DSP (Digital Signal Processor)/microprocessor based LCD Fire alarm control panel consisting of system cabinet(s), main chassis with power supply, with or without UDACT dialer, stand-by batteries, initiating and indicating, optional city tie/reverse polarity module, optional relay modules, detection and signaling devices, and any auxiliary modules, remote annunciator assemblies, and miscellaneous peripheral devices that may be required. The system and all associated equipment shall be fully approved and listed by both Underwriters= Laboratories (UL) and Underwriters= Laboratories of Canada (ULC).

### **OPERATION 1.2**

The initial configuration of the panel shall incorporate the use of various button presses and LCD menu programming in conjunction with the panel=s microprocessor in order to set type of initiating and indicating circuits, correlations of input and output circuits, operation of timers, auxiliary disconnect, number of annunciators, operation of relays, and all other system parameters. This fire alarm panel may also be configured using a PC or Lap Top computer with direct connection or remote connection using modem.

Operation shall be as follows:

- .1 In normal mode, only the green AAC ON≅ indicator at the Mircom FA-300 series panel and annunciator(s) shall be lit.
- .2 Upon activation of a fire alarm detection device (pull station, heat detector, smoke detector, sprinkler waterflow device), the Mircom FA-300 series fire panel shall:
  - c) Indicate the alarm condition by lighting the red Acommon alarm≅ indicator at the panel control.
  - d) Log the event for reference using menu selection.
  - e) Light the appropriate red common alarm LED on the remote annunciator(s).
  - f) Cause the alarm signal devices to sound throughout the building until silenced.
  - g) Cause any visual signal devices, if required on plans, to activate.
  - h) Activate the common alarm contacts in order to signal the monitoring agency for Fire department notification.
  - i) Activate any programmed auxiliary relays that may be specified on plans for fan shutdown, elevator recall, etc.

- .3 The audible signal appliances shall continue to sound during alarm until manually or automatically silenced. The manual silencing, via the signal silence switch on the panel or remote annunciator, shall be delayed during the first minute of alarm. The automatic silencing shall be set to  $A_{\infty}$  (i.e. signal appliances will NOT silence automatically) unless specified otherwise.
- .4 A subsequent alarm shall cause all audible devices to sound again.
- .5 The alarm condition shall be cleared only upon activation of the FA-300 series panel's  $A_{\text{reset}}$  switch, assuming also that the device that initiated the alarm has been cleared or restored.
- .6 Upon activation of a supervisory field device (i.e. a sprinkler tamper valve, low pressure switch, etc.), the panel shall:
  - j) Indicate the supervisory condition by lighting the  $A_{\text{common supervisory}}$  indicator at the panel.
  - k) Sound at a fast flash rate tone at the panel's buzzer and steady at any remote field buzzer.
  - l) Light the appropriate  $A_{\text{common supervisory}}$  indicator on the remote annunciator(s). Systems other than the Mircom FA-300 series that require blanking out of red indicators, unapproved removal of red indicators in order to replace them with amber, etc. in order to comply with the supervisory annunciation requirements shall not be acceptable.
  - m) Activate the common supervisory contact at the panel. This contact shall be capable of connecting independently to the monitoring agency's equipment in order to transmit a distinct supervisory condition or it may be tied with the common trouble contact (see the description for trouble conditions following) to transmit a generic trouble.
- .7 Systems other than the Mircom FA-300 series that rely on a user programmed supervisory contact, NOT located on the main control module (creating the potential of  $A_{\text{forgetting}}$  to provide a supervisory contact) shall NOT be acceptable.
- .8 The panel and remote buzzers shall be silenced by operation of the buzzer silence button.
- .9 A system trouble condition shall :
  - n) Sound the panel buzzer and any remote buzzer in either an intermittent manner depending upon the type of trouble as described following.

- o) Activate the common trouble contact on the panel control in order to transmit the trouble condition to the monitoring agency.
- p) Log the trouble for reference using menu selection.
- q) Light the amber common trouble indicator and the appropriate additional trouble indicator as described following:

- xiv. Open circuit fault in the field wiring of detection, supervisory or signal zone or a short on a signal zone (causes intermittent buzzer and common trouble to flash amber).
- xv. Failure involving the remote annunciator shall be logged as Remote Failure and cause an intermittent (trouble flash) buzzer sound.
- xvi. Disconnection or failure of the battery pack shall be logged as battery trouble and cause an intermittent buzzer sound.
- xvii. A ground condition on a field wire shall be logged as a ground fault and cause an intermittent buzzer sound.
- xviii. Failure of the main 120vac power shall extinguish the green AC power indicator and cause an intermittent buzzer sound.

.10 The panel and remote buzzers shall be silenced by operation of the buzzer silence switch. The trouble conditions shall clear from the panel when the cause is rectified.

.11 Control Switches

- r) Reset switch---- As mentioned previously, the reset switch shall clear the panel of alarm or supervisory conditions once the field device is restored.
- s) Signal silence--- Again , as mentioned previously , the signal silence switch shall silence the audible signals during alarm (normally delayed for one minute)
- t) Buzzer silence---- As described silences panel and remote buzzers.
- u) Lamp test ---- Tests operation of all panel indicators.
- v) Fire Drill---- If operated, sounds all audible devices.
- w) Auxiliary disconnect-- Prevents operation of common alarm and common supervisory contacts.

**AGENCY & REGULATORY REQUIREMENTS 1.3**

.12 System:

- x) Must comply with applicable National and/or Provincial Building code recognized at time of installation.
- y) Must comply with the CAN-ULC-S524 or NFPA 101 70, 72 fire alarm installation standard recognized at time of installation.
- z) The system verification (see section 3.2 of this specification) must comply with the CAN-ULC-S537 verification standard recognized at time of test.
- aa) Installation must comply with requirements of Local Authority Having Jurisdiction.

.13 Devices & Control equipment:

Equipment described in Part 2 following must be listed under the current issue of the standard indicated:

- bb) Manual fire alarm stations: CAN-ULC-S528
- cc) Heat detectors: CAN-ULC-S530, UL-521
- dd) Smoke detectors (system type): CAN-ULC-S529, UL 268 268A
- ee) Audible signal devices: CAN-ULC-S525, UL-464
- ff) Control & related equipment: CAN-ULC-S527, UL-864
- gg) Visual Signals: CAN-ULC-S526, UL 1638

#### **SUBMITTALS 1.4**

Submittal of shop drawings to include:

- .14 Electrical and mechanical specifications of control equipment and alarm devices.
- .15 Sequence and description of operation.

#### **OPERATION MANUAL 1.5**

Operation manual shall include:

- .1 Installation instructions for use by installing contractor.
- .2 Operational instructions or manual for use by building personnel, including name and phone number of service representative.
- .3 Maintenance instructions as required for use by building personnel.
- .4 Copy of approved shop drawings.

## **PART 2 BEQUIPMENT**

### **CONTROL PANEL 2.1**

#### **.1 Main Chassis (Basic system unit)**

The main chassis shall be a Mircom model FA-301-12DDR (12 amp) as required to meet the specific load requirements. The chassis shall provide the main power supply and all common control and display indicators for system operation and up to 12 zone circuits. The chassis shall provide initially 12 class B (style B) initiating circuits with space for one additional (optional) adder module RM-312 Twelve relay module or RM-306 Six relay module. The initiating circuits shall be capable of being configured as alarm, verified alarm, latching or non-latching supervisory, waterflow, or trouble only circuits. The chassis shall also provide 4 class B (style Y) indicating circuits that may be configured as silenceable or non-silenceable as well as operating in continuous, temporal, California, or March Time code patterns. The main chassis shall also provide one A4 wire≅ resettable smoke power supply outputs (300mA max) and auxiliary relay contacts for common alarm, supervisory, trouble and auxiliary second alarm conditions.

A UDACT (if provided) shall be used if a dial up /data transmission signal is required to a remote monitoring agency to signify a system alarm and/or trouble condition. Uses Ademco Contact ID and SIA-DCS Protocols.

#### **.2 Adder Modules**

The relay circuit adder module shall be a Mircom model RM-312 module (twelve form >C= relay contacts) programmable relays and shall occupy one adder space within the FA-301-12DDR main chassis. The contacts shall be power limited for use with FPL, FPLR, or FPLP power limited cable, and shall be capable of being disconnected via LCD menu control. The circuits shall be configurable as described in the AMain chassis≅ section using jumpers on board.

The other relay circuit adder module shall be a Mircom model RM-306 module (six programmable relays) and shall occupy one adder space within the FA-301-12DDR main chassis. The circuits shall be configurable as described in the AMain chassis≅ section using jumpers on board. The relays may be disconnected via LCD menu control.

The end of line resistor value for all class B (style B) initiating and indicating zones shall be fixed at 3.9K ohms, 2 watt. For the initiating zones there is an option of using Active End of Line resistors.

The Fire panel cabinet shall be Mircom model FA-301-12 (accommodates 12 input main chassis), or FA-300-6 (accommodates 6 input main chassis) as required to suit the required number of zones and circuits. All cabinets are to be made of 16GA cold rolled steel painted white and black. Trim rings shall be available to allow semi-flush mounting of cabinets if indicated on plans and drawings (Mircom FA-UNIV-TRB and FA-300TRB respectively). Each cabinet shall also provide mounting for a battery pack (up to 12AH for FA-301-12 and 4AH for FA-300-6).

### .3 Batteries

The battery pack shall be comprised of two 12volt gel-cell batteries (Mircom BA series), each of equal ampere-hour (AH) capacity; sized from 4AH to 24AH depending upon Mircom=s calculated requirements for the specified project.

### .4 Auxiliary Modules

The module described here may be added to the system and shall perform the functions indicated:

- Model PR-300 shall provide specialized monitoring outputs (beyond the conventional alarm contacts within the panel); specifically a City Tie connection rated at 24vdc, 300mA maximum and a Polarity Reversal output (24vdc, 8.5 mA max., switching polarity on alarm; an option also exists for Azero≡ volts on a system trouble).

## REMOTE ANNUNCIATION 2.2

- .6 The Mircom FA-300 series Fire alarm controls shall incorporate as their standard remote annunciator system the model RAM-300LCD series annunciator. The maximum number of annunciators per system is six. The annunciator shall also incorporate common controls and indicators such as System Reset, Signal Silence, Fire Drill, Buzzer Silence, and Lamp Test.
- .7 The annunciator system shall connect to the FA-300 panel using an RS-485 communication protocol, with wiring consisting of simply one pair for 24vdc power and a twisted shielded pair for data communication.
- .8 The annunciator chassis comes mounted in it own enclosure.

## DETECTION DEVICES 2.3

### .1 Pull Stations

The alarm pull station shall be a Mircom series MS-400. Model MS-401 single stage, single action shall be used for standard applications. For systems requiring an additional alarm contact within the pull station (i.e. for door release or some other type of auxiliary function) models MS-405 (single stage with additional N.O. switch) or MS-407 (single stage with additional N.C. switch) shall be used as appropriate. The MS-400 series pull station shall be constructed of red finished aluminum and shall be mounted on a standard single gang box. Reset of the station shall be accomplished via a 1/8" screwdriver inserted from the front

### .2 Heat detectors

The heat detector shall be a Mircom series MIR-600. One or more of models MIR-601 (135F, RR & fixed), MIR-602 (200F, RR & fixed), MIR-603 (135F, fixed only) or MIR-604 (200F, fixed only) shall be chosen as specified on project plans. Each model shall be of a low profile design with a neutral white finish.

### .3 i3 photoelectric detectors

The i3 photoelectric smoke detectors are special detectors which can be used with the FA-300 series of fire panel to provide additional trouble performance reporting. The i3 detector is capable of providing the following troubles: open circuit, communication trouble, dirty device, out of sensitivity and freeze trouble. i3 2-wire detector models such as C2W-BA and C2WT-BA are supported with base models C4W-BA and C4WT-BA.

### .4 Smoke detectors

The smoke detector shall be one of the models listed below as required and as specified on the project plans:

- \_ Model MIR-1400A 2-wire direct smoke detector, ionization type
- \_ Model 1451A plug-in type (requires one of the B400 series bases), ionization type
- \_ Model MIR-525 2-wire with detachable terminals, photoelectric type
- \_ Model MIR-2400A 2-wire direct smoke detector, photoelectric type
- \_ Model 2451A plug-in type (requires one of the B400 series base), photoelectric type

Series 400 bases (for use with plug-in type smoke detectors described above):

- Model B401B standard 2-wire base
- Model B402B standard 4-wire base, provides form-A and form-C alarm contacts if required on project plans
- Model B406BA 2-wire base, provides form-A alarm contacts if required on project plans

#### .4 Duct smoke detectors

The duct smoke detector, if required on project plans, shall be a model DH100LPA 2-wire photoelectric duct smoke detector or, if the detector is required to perform local fan control etc., a model DH100ACDCLPA 4-wire photoelectric detector with auxiliary relay contacts shall be used. Also available is model DH100ACDCIA 4-wire ionization duct smoke detector.

The sampling tubes shall be ST series in 3, 5, or 10-foot lengths as required. If a remote indicator light is required, it shall be a model RA400Z designed to mount to a single gang box. An A77-716BA supervisory relay shall be used to monitor each 24vdc-power circuit required for the DH100ACDC 4-wire duct detectors.

#### .5 Audible devices

##### .1 Bells

The fire alarm bells shall be models BL-6 (six inch) or BL-10 (ten inch) motorized bells as indicated on plans. The bells shall be finished in red and designed to mount on a standard 4" square box.

##### .2 Alarm horns

The fire alarm horns shall be Wheelock model MT-12/24 multi-tone type (red finish for common areas, white finish within residential units if applicable) or System Sensor model MA-12/24DA multi-tone (red only). Either type shall be capable of flush or surface mounting as specified using the required mounting boxes or plates, etc. (flush mounting shall be used in all finished areas).

##### .3 Mini-horns

The fire alarm mini-horns shall be Mircom model MH-25R (red), MH-25W (white) or MH-S24R (red) silenceable mini-horn or MH-S24W (white) silenceable mini-horn as required; surface mount (unfinished areas) with BB-300 red or BB-300W white single gang surface mounting box or

flush mount (finished areas) to single gang box.

## **PART 3 -INSTALLATION & TESTING**

### **INSTALLATION 3.1**

- .1 System shall be installed in accordance with the current issue of CAN/ULC-S524 or NFPA 101 70, 72.
- .2 All wire shall be FAS type, approved for use with fire alarm systems.
- .3 Wire gauge shall be as determined by Mircom to comply with the specific project requirements, however, as a guideline, detection wiring will typically be 18 AWG (under no circumstances will wire be smaller than 22 AWG, assuming electrical code and Mircom approve this size wire) while signal wiring will typically be 14 to 16 AWG (under no circumstances will signal wire be less than 18 AWG).
- .4 All wiring, conduit and box installation, and other aspects of construction shall comply with all applicable building and electrical codes.
- .5 All wiring must adhere to the zone schedule and system riser as shown on the project plans.

### **VERIFICATION TESTING 3.2**

- .1 All verification testing to be performed in accordance with the CAN/ULC-S537 standard recognized by the local authority at the time of testing.
- .2 All devices, including sprinkler alarm and supervisory devices, to be tested as per the standard and the results recorded on the verification report forms.
- .3 All panel and annunciator tests to be performed as per the standard and the results recorded.
- .4 During verification, compliance with the approved project plans shall be confirmed.
- .5 A verification certificate, along with the report, shall be issued only upon compliance with the CAN/ULC-S537 standard and the project plans.