HIGH MIST ELIMINATOR DIFFERENTIAL PRESSURE	EFFLUENT FLOW IND. CONTROL / TEST	LOW CAUSTIC TANK LEVEL	CL-2 NO. 2 CHANGE / P.S. NO. 1 HIGH LEVEL / P.S. NO. 2 HIGH LEVEL
HIGH FLUE GAS TEMPERATURE	HIGH SCRUBBER TEMPERATURE	QUADALARM SERIES X12-4000 / BOILER FEED TANK / QUADALARM SERIES X12-4000 / X3-4001	SCRUBBER LEVEL LOW LOW

SOLID STATE ALARM SYSTEMS
## X12 · SERIES

RONAN

BUY RONAN, THE BEST.

The Ronan Series X12 Solid State Annunciator Systems are the most versatile window annunciators on the market. The systems accept a wide variety of inputs such as live or dry contacts, solid-state switches, analog signals such as Thermocouples, RTD's, millivolt or milliampere, externally sourced AC or DC voltages or pulse signals. The inputs, conditioned through modules integral to the system, provide alarm status identification to be displayed on multi-sized conventional windows. The superior mechanical construction and the quality of workmanship, combined with the most reliable electronic designs, have established the X12 Series as the leader in the field of window annunciation. The X12 Series is the solution, from the very basic to your most complex monitor requirement for the best possible value.

These features are also available in the X16 Series Remote Logic configuration, suitable for split architecture layouts. The X16 Series may interface with window lamp displays, graphics, or individual lamp assemblies without compromise to the flexibility of the input and output features.
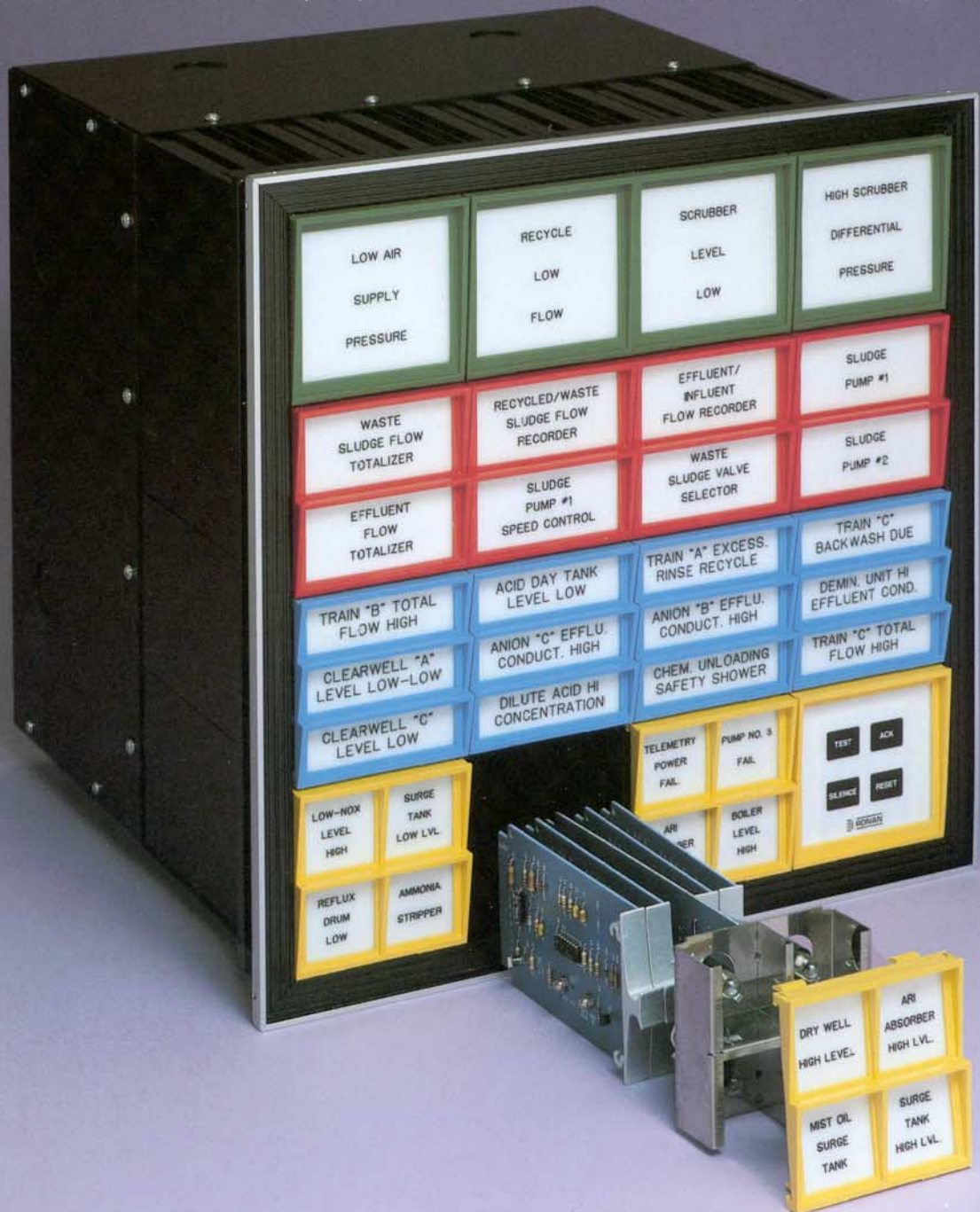
SYSTEM FUNCTIONS

INPUTS

Digital
- Dry Contact — Normally Open/Normally Closed
- Logic Level — Transistor/Silicon Controlled Rectifier/Integrated Circuit
- Voltage — AC/DC, Opto-Isolated

Analog
- Resistance Temperature Devices (RTD) — Cu, Pt, Ni
- Thermocouple (TC) — E, J, K, R, S, T
- Voltage — 0-5 VDC, 1-5 VDC, 0-10 VDC, 0-10 mV, 0-25 mV, 0-50 mV
- Current — 0-1 mA, 4-20 mA, 10-50 mA

Pulse
- Motion Detector

Intrinsically Safe

SEQUENCES

All, per ISA Standard S18.1

Special Custom Designs

Multiple Sequences on a Logic Module

Multiple Sequences in One Chassis

Multiple Input/Reflash

Selectable per Window

OUTPUT FUNCTIONS

Time Delay

Auxiliary Contacts
- Single Pole, Selectable NO/NC
- Double Pole, Selectable NO/NC
- Normally De-Energized
- Normally Energized — Fail Safe
- Follows Field Contact
- Follows Lamp Logic

Common Trouble Alarm (CTA)

Multiple/Selectable Audible

Ground Fault Detection

Loss of Power Alarm

Auxiliary Lamp Drive (Mimic)

FEATURES

Design Technology — CMOS
- High Noise Immunity
- Field Proven
- Available Off-the-Shelf, World-Wide
- No Custom Integrated Circuits

Individual Channel Philosophy
- No Multi-Channel Circuit Functions

- Stand-Alone Alarm Modules — No Shared Circuitry

Expandability
- Up to 300%

Quality Construction
- All Aluminum Extrusions
- Excellent Heatsinking
- Modular Assembly
- Maximum Flexibility in System Sizing
- Easy Panel Mounting
- Rugged Construction

Color Coding
- Eight Bezel Colors
- Color Lenses
- Sandwich Lenses

APPROVALS

CSA — Canadian Standard Association

FM — Factory Mutual

BASEEFA — British Approvals Service for Electrical Equipment in Flammable Atmospheres

UL — Underwriters Laboratory

SERVICES

Custom Designed Systems

Custom Designed Logic

Customer Training

Complete System Documentation

Field Service and Start-Up

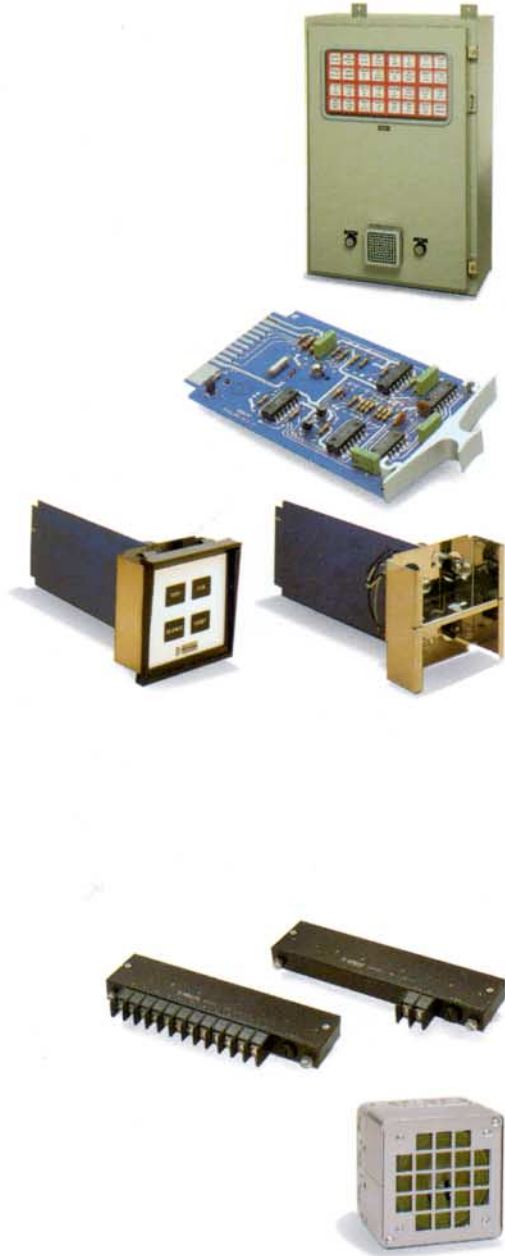## WARRANTY

Three (3) Years

FIELD SERVICE

World-Wide Sales and Service Offices

MANUFACTURING

Complete Facilities in:
- USA: Woodland Hills, California
- Canada: Toronto
- United Kingdom: Washington, Tyne and Wear
- Australia: Sydney

CONTENTS

3-Year Warranty

Ronan warrants equipment of its own manufacture to be free from defects in material and workmanship, under normal conditions of use and service, and will repair or replace any component found to be defective, on its return, transportation charges prepaid, within three years of its original purchase. This warranty carries no liability, either expressed or implied, beyond our obligations to replace the unit which carries the warranty.

Note: Specifications and design subject to change without notice.

SYSTEMS ENCLOSURES

The Ronan enclosures for Annunciators with integral electronics are assembled from basic 3.5 inch (89 mm) by 3.5 inch (89 mm) mechanical modules to overall size requirements specified. This allows the greatest flexibility to adapt to the customer's control panel dimensions. The aluminum extrusion modules provide excellent heat dissipation for a continuously lit annunciator system and feature structural strength required on industrial applications. The enclosures are painted with a black, baked semigloss enamel; custom colors may be supplied optionally.

The flush-mounting NEMA 1 type enclosure, for control panel applications, feeds through a rectangular cutout and attaches to the panel with a number of simple clamping devices supplied with each system. The rear accessible terminals are enclosed within protective side and rear panels. The side panels feature pre-stamped conduit knockout entries for field wiring and power input.

The panel mount enclosure may be enhanced with a NEMA 4 or NEMA 12 door assembly to seal the front of the alarm system against the control panel where it is subject to moisture or a corrosive atmosphere. The door is a clear acrylic window, sealed with a neoprene gasket. Gasketing is supplied for sealing between door frame and control panel.

Note: The panel cutout is the same as specified in the standard flush-mounted alarm systems.

The Ronan alarm systems of various window sizes are available for standard 19 inch (483 mm) or 24 inch (610 mm) relay rack mounting. The five mechanical modules wide unit is suitable for 19 inch (483 mm), and the six modules wide unit for 24 inch (610 mm) rack spacing.

For applications requiring wall mounted annunciators, Ronan provides NEMA 4 and NEMA 12 front accessible enclosures. The integral surface mounted annunciator is available for use in General Purpose or Class I, Division 2 Hazardous Location. The Monalarm, Binalarm, Trialarm and/or Quadalarm displays show through a shatter-proof glass window and the pushbuttons and horn are mounted on the hinged door. All plug-in modules and field terminals are front accessible for installation and ease of service. The cabinet finish is gray, baked semigloss enamel.

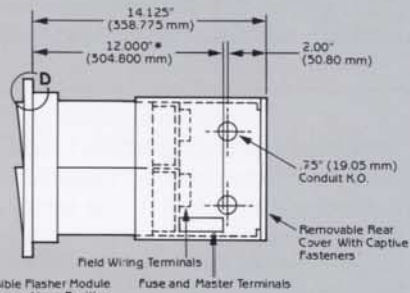*Series X165M Surface Mounted*
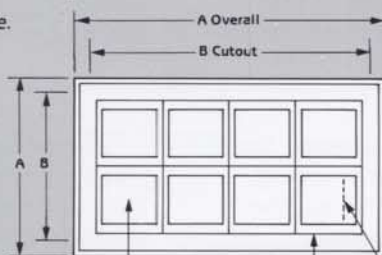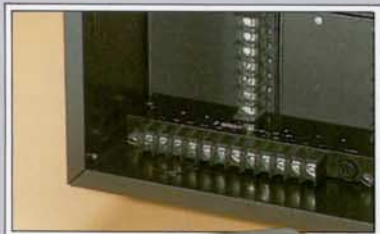
Series X16RR Relay Rack Mounted

For applications where remote mounted alarm indicators such as Lamp Cabinets, Graphics, Bull's-eye or other Lamp Displays are used, the logic modules are housed in rack or surface mounted enclosures. Multiconductor cables or custom wiring provide connection between logic and display.

5

Model X12-1000
Flushmounting Type for Control Panels
Nameplate Size 2.75" (70 mm) × 3.00" (76 mm)

These systems are expandable and intermixable.

A Overall

B Cutout

14.125"
(358.775 mm)

12.000" *
(304.800 mm)

2.00"
(50.80 mm)

D

.75" (19.05 mm)
Conduit K.O.

Removable Rear
Cover With Captive
Fasteners

Field Wiring Terminals

Fuse and Master Terminals

2.75" High × 5" Wide Window
(69.85 mm × 76.20 mm)

Front Accessible Flasher Module
Does Not Occupy Alarm Position

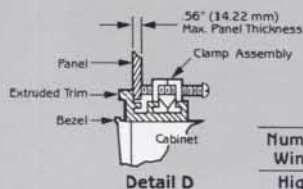Option: Pushbutton Module Standard Position

* Depth With Side and Rear Cover Removed

Note: Standard Finish, Baked Enamel, Black

.56" (14.22 mm)
Max. Panel Thickness

Clamp Assembly

Panel

Extruded Trim

Bezel

Cabinet

Detail D

Number of Windows	A Overall		B Cutout	
High or Wide	In.	mm	In.	mm
1	5.00	127.0	4.38	111.3
2	8.50	215.9	7.88	200.2
3	12.00	304.8	11.38	289.1
4	15.50	393.7	14.88	378.0
5	19.00	482.6	18.38	466.9
6	22.50	571.5	21.88	555.8
7	26.00	660.4	25.38	644.7
8	29.50	749.3	28.88	733.6
9	33.00	838.2	32.50	825.5
10	36.50	927.1	36.00	914.4
11	40.00	1016.0	39.50	1003.3
12*	43.50	1104.9	43.00	1092.2

*Not limited to 12 high or wide.

*Pushbutton Stations

Alarm Module

Lamp Module

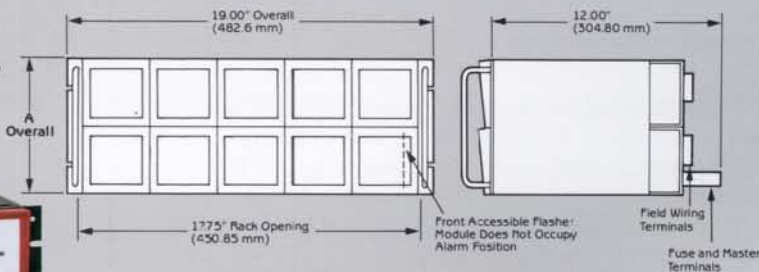Window Bezel

*The integral Pushbutton Station shown is available as an option and will occupy the position as shown.
Pushbutton Stations will operate in conjunction with externally wired pushbuttons. The lower, right hand
position also houses the Flasher/Horn Driver Module.

Model X12RR-1000
Relay Rack Mounting Type
*19 Inch (483 mm) Rack Mounting — Standard
24 Inch (610 mm) Rack Mounting — Optional*

19.00" Overall
(482.6 mm)

12.00"
(304.80 mm)

A
Overall

17.75" Rack Opening
(450.85 mm)

Front Accessible Flasher
Module Does Not Occupy
Alarm Position

Field Wiring
Terminals

Fuse and Master
Terminals

*Not limited to 4 high
**Limited to 5 wide only (19 inch, 483mm rack)
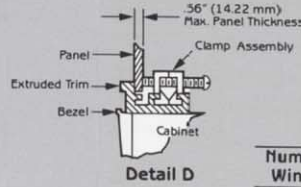Also available 6 wide (24 inch, 610 mm rack)

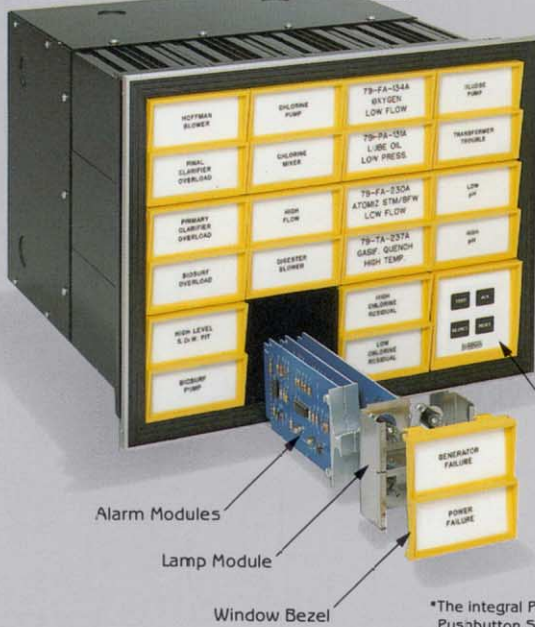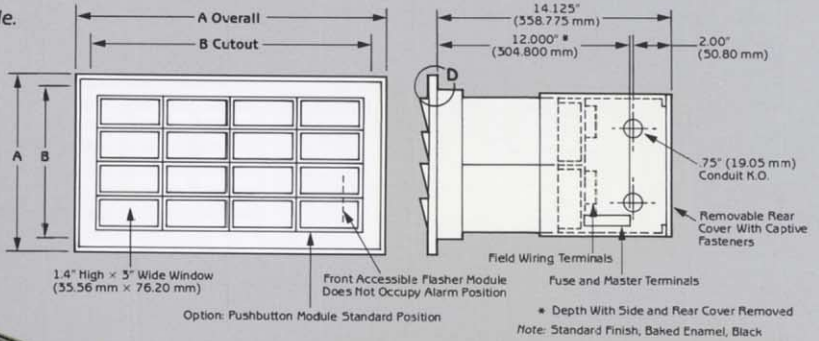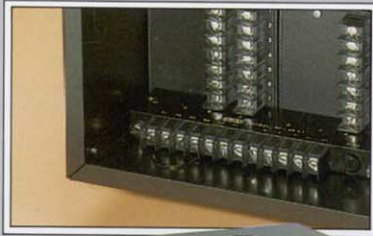| Number of Windows		A Overall	
High	Wide	In.	mm
1	5**	3.5	88.9
2	5	7.0	177.8
3	5	10.5	266.7
4*	5	14.0	355.6

Model X12-2000
Flush Mounting Type for Control Panels
Nameplate Size 1.44" (36 mm) × 3.00" (76 mm)

These systems are expandable and intermixable.

A Overall

B Cutout

14.125"
(358.775 mm)

12.000" *
(304.800 mm)

2.00"
(50.80 mm)

.75" (19.05 mm)
Conduit K.O.

Removable Rear
Cover With Captive
Fasteners

Field Wiring Terminals

Fuse and Master Terminals

1.4" High × 3" Wide Window
(35.56 mm × 76.20 mm)

Front Accessible Flasher Module
Does Not Occupy Alarm Position

Option: Pushbutton Module Standard Position

* Depth With Side and Rear Cover Removed
Note: Standard Finish, Baked Enamel, Black

.56" (14.22 mm)
Max. Panel Thickness

Panel

Clamp Assembly

Extruded Trim

Bezel

Cabinet

Detail D

* Pushbutton Stations

Alarm Modules

Lamp Module

Window Bezel

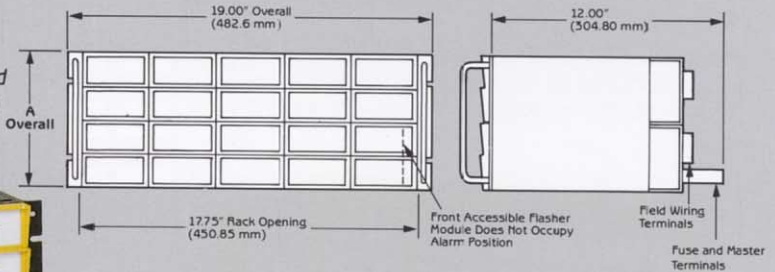| Number of Windows		A Overall		B Cutout	
High	Wide	In.	mm	In.	mm
2	1	5.00	127.0	4.38	111.3
4	2	8.50	215.9	7.88	200.2
6	3	12.00	304.8	11.38	289.1
8	4	15.50	393.7	14.88	378.0
10	5	19.00	482.6	18.38	466.9
12	6	22.50	571.5	21.88	555.8
14	7	26.00	660.4	25.38	644.7
16	8	29.50	749.3	28.88	733.6
18	9	33.00	838.2	32.50	825.5
20	10	36.50	927.1	36.00	914.4
22	11	40.00	1016.0	39.50	1003.3
24*	12*	43.50	1104.9	43.00	1092.2

*Not limited to 24 high or 12 wide.

*The integral Pushbutton Station shown is available as an option and will occupy the position as shown.
Pushbutton Stations will operate in conjunction with externally wired pushbuttons. The lower, right hand
position also houses the Flasher/Horn Driver Module.

Model X12RR-2000
Relay Rack Mounting Type
19 Inch (483 mm) Rack Mounting — Standard
24 Inch (610 mm) Rack Mounting — Optional

19.00" Overall
(482.6 mm)

12.00"
(304.80 mm)

A
Overall

17.75" Rack Opening
(450.85 mm)

Front Accessible Flasher
Module Does Not Occupy
Alarm Position

Field Wiring
Terminals

Fuse and Master
Terminals

*Not limited to 8 high
**Limited to 5 wide only (19 inch, 483 mm rack)
Also available 6 wide (24 inch, 610 mm rack)

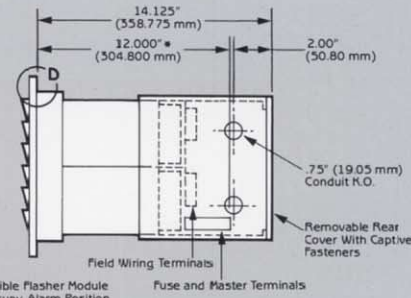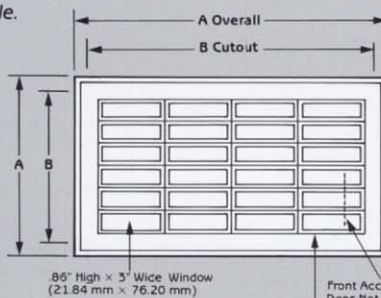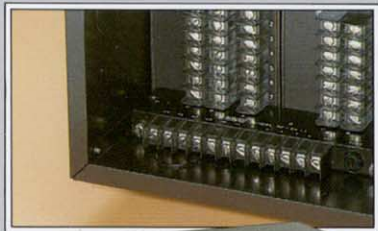| Number of Windows		A Overall	
High	Wide	In.	mm
2	5**	3.5	88.9
4	5	7.0	177.8
6	5	10.5	266.7
8*	5	14.0	355.6

Model X12-4000
Flush Mounting Type for Control Panels
Nameplate Size 1.44" (36 mm) × 1.44" (36 mm)

These systems are intermixable.
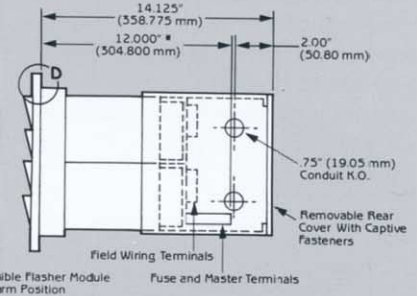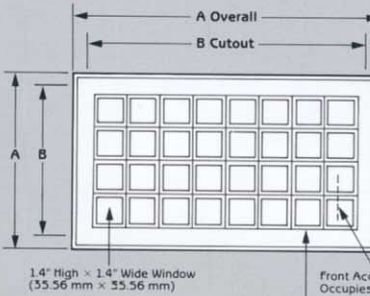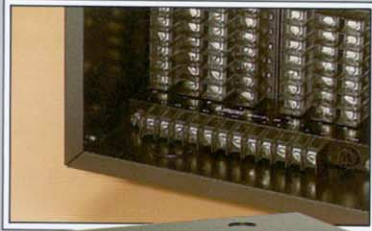
A Overall

B Cutout

14.125"
(358.775 mm)

12.000" *
(304.800 mm)

2.00"
(50.80 mm)

D

.75" (19.05 mm)
Conduit K.O.

Removable Rear
Cover With Captive
Fasteners

Field Wiring Terminals

Fuse and Master Terminals

1.4" High × 1.4" Wide Window
(35.56 mm × 35.56 mm)

Front Accessible Flasher Module
Occupies Alarm Position

Option: Pushbutton Module Standard Position

* Depth With Side and Rear Cover Removed
Note: Standard Finish, Baked Enamel, Black

.56" (14.22 mm)
Max. Panel Thickness

Panel

Clamp Assembly

Extruded Trim

Bezel

Cabinet

Detail D

*Pushbutton Stations

Alarm Modules

Lamp Module

Window Bezel

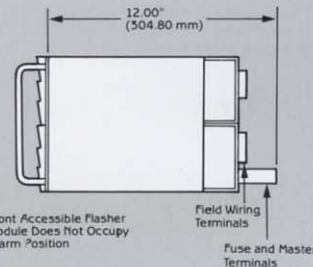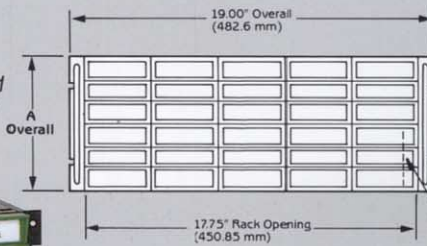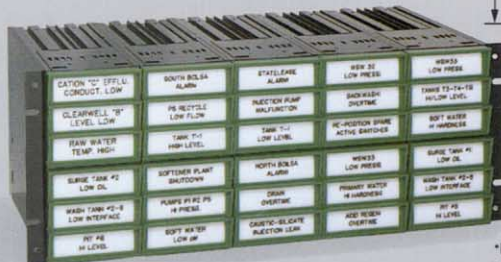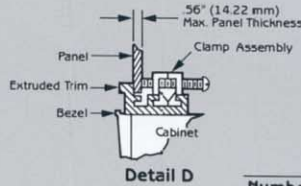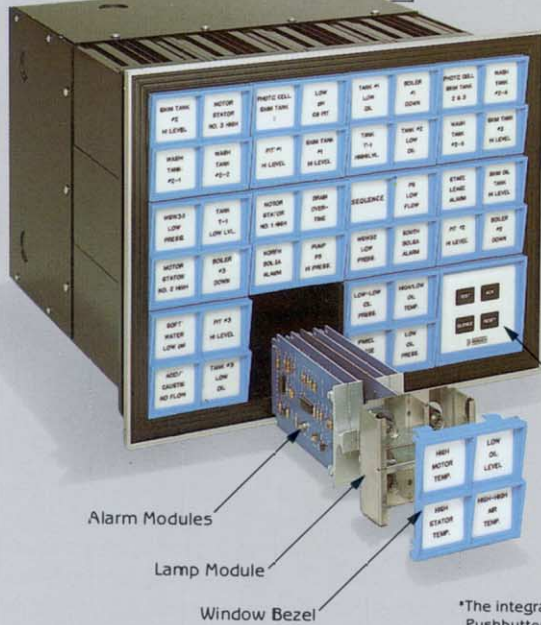| Number of Windows	A Overall		B Cutout	
High or Wide	In.	mm	In.	mm
2	5.00	127.0	4.38	111.3
4	8.50	215.9	7.88	200.2
6	12.00	304.8	11.38	289.1
8	15.50	393.7	14.88	378.0
10	19.00	482.6	18.38	466.9
12	22.50	571.5	21.88	555.8
14	26.00	660.4	25.38	644.7
16*	29.50	749.3	28.88	733.6

*Not limited to 16 high or wide.

*The integral Pushbutton Station shown is available as an option and will occupy the position as shown.
Pushbutton Stations will operate in conjunction with externally wired pushbuttons. The lower, right hand
position also houses the Flasher/Horn Driver Module.

Model X12RR-4000
Relay Rack Mounting Type
19 Inch (483 mm) Rack Mounting — Standard
24 Inch (610 mm) Rack Mounting — Optional

19.00" Overall
(482.6 mm)

12.00"
(304.80 mm)

A
Overall

17.75" Rack Opening
(450.85 mm)

Front Accessible Flasher
Module Occupies Alarm
Position

Field Wiring
Terminals

Fuse and Master
Terminals
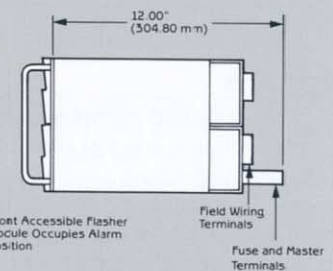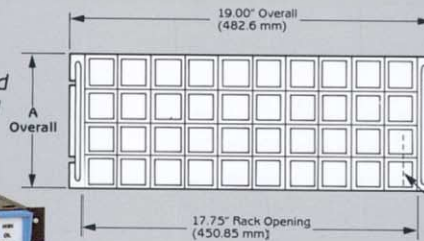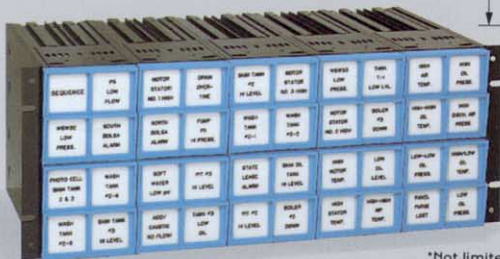
*Not limited to 8 high.
**Limited to 10 wide only (19 inch, 483mm rack)
Limited to 12 wide only (24 inch, 610 mm rack)

Number of Windows		A Overall	
High	Wide	In.	mm
2	10**	3.50	88.9
4	10	7.00	177.8
6	10	10.50	266.7
8*	10	14.00	355.6

The Ronan Series X12 Annunciators may be configured to allow the monitoring of a great variety of input functions by simple selection of the proper signal conditioning/logic modules from the extensive collection available. The availability of these integral Annunciator modules eliminates the requirement for remote mounted signal conditioning modules to convert signals such as analog, frequency, pulse, etc. to contact inputs for the Ronan System. Now, one module can provide functions such as thermocouple, RTD or engineering input conditioning; reference junction compensation; input curve linearization; trip point setting; choice of alarm sequences; output contacts for computer, sequence of events recorder or shutdown circuitries; analog outputs totally isolated from the system's input for control purposes, etc. The special function modules, systems integrally mounted in the system, may optionally be provided for interface requirements not related to the alarm system.

Alarm Sequence Module

The Alarm Sequence Modules, designed with proven state of the art CMOS circuit technology with low power consumption and high noise immunity, are available in all ISA-S18.1 Standard Sequences, as well as a great number of industry standard and Ronan exclusive sequences (see page 28). The Sequence Modules accept dry field contact inputs, interrogated with either 24 VDC or 125 VDC supplied normally by the annunciator system's power supply. If your sequence requirements are unique, Ronan's Engineering Staff can utilize our proven circuit designs as a base to provide a reliable custom design for the application.

Options

The standard alarm sequence modules may be combined with a great number of special functions incorporated into a single logic module as shown below. By combining the various options shown, the individual module becomes uniquely customized to your specific requirement. For input variations choose from standard contact, analog interface for voltage or current loops, thermocouples o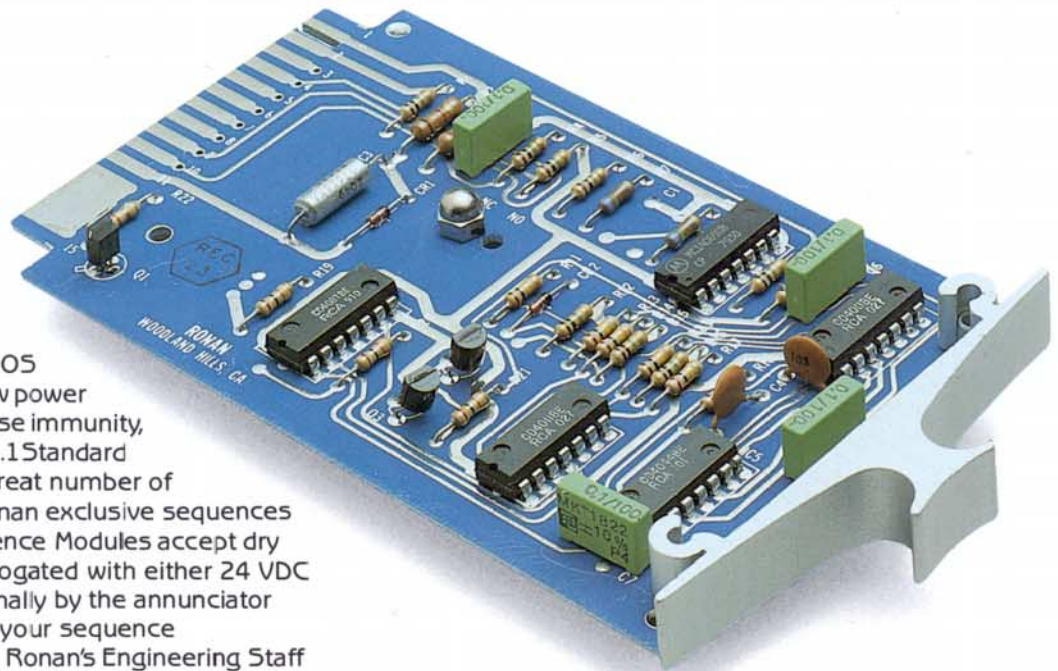r RTD's with input isolation such as opto-coupling or transformer isolation and with or without time delay. For output functions choose Common Trouble Alarm, auxiliary relay contacts, opto-isolated outputs and mimic lamp drivers with or without short circuit proof capability. Whatever your requirements, the Ronan X12 Series alarm logic modules provide the proven high quality performance solution to your requirement.

1. Optical Isolation – Optically coupled input circuitry is available for applications requiring total isolation from outside voltage sources. Thus, existing shared field contacts with interrogation voltages of 5 to 240 VAC or DC may be interfaced with our alarm systems, providing 2500 volt isolation, with highest reliability, without interference with the existing systems. This option is available in the ranges of 10 to 30 volts, 40 to 140 volts and 180 to 250 volts.

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2. Time Delay — The alarm sequence modules are available with either fixed, preset or adjustable time delay for acceptance of the field contact status transfer. The delays to be specified, in ranges from 10 msec to 30 minutes, are adjustable in the field by means of a precision 20-turn potentiometer for highly accurate time setting. The time delay circuits utilize CMOS oscillator, counter techniques for maximum repeatability and ease of setting.
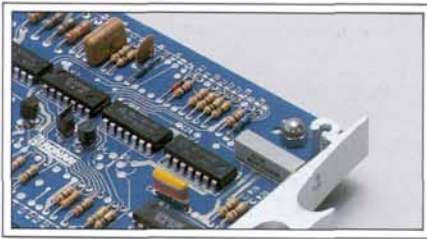
3. Analog Inputs — The fully isolated analog trip circuit, provided on the same logic card as the alarm circuitry, allows direct connection of analog inputs to the window annunciator. You may order alarm modules which interface to 10, 100 or 120 ohm RTD's, all types of thermocouples, and 4-20 mA, 10-50 mA or 1-5 volts, etc., with no extraneous wiring or additional equipment. Where required, the analog circuitry provides total isolation from the 24 VDC system's supply voltage and the sensor input such as thermocouples, etc. The analog circuit utilizes multi-turn precision potentiometers for setpoint and hysteresis and LED indication for ease of setting when the lamp display module is removed from the system.
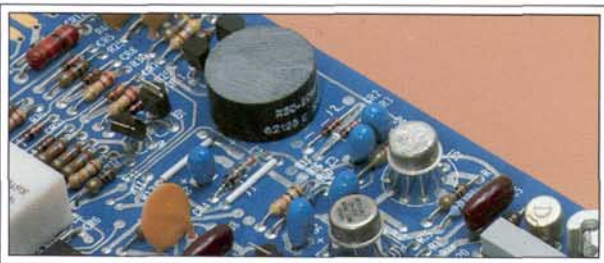
4. Common Alarm Output — The logic modules may be specified with a common trouble alarm output (CTA), where any one point in the system going into alarm will energize a system relay, optionally installed within the system, or externally provided. This output is generally used to indicate the existence of an alarm condition in a remote annunciator on a window in the main control room annunciator.
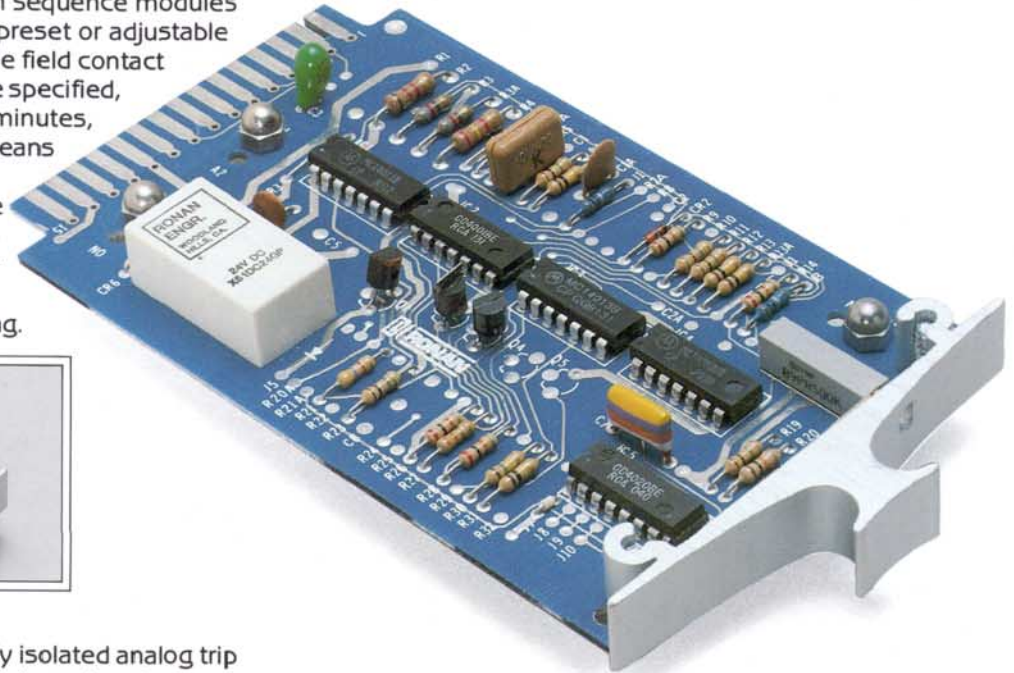
5. Auxiliary Contact — Auxiliary contacts from either general purpose (GP) or hermetically sealed (HS) relays, meeting Class I Division 2 requirements, may be specified as on-board options to the standard logic modules. Each relay contact output is selectable, Form "A" (normally open), or Form "B" (normally closed), and is available either as Normally De-Energized (NDE) (standard) or Normally Energized (NE) (specify at time of order). The auxiliary contacts are used typically for shutdown, repeating of alarms or critical alarm application and may be provided to follow the field contact explicitly, or follow the alarm logic function, where, if the lamps are illuminated, the contact is in the abnormal state.

6. Dual Horn — The alarm logic may be specified to allow selective actuation of two different audible devices. The selection is made by means of a selector switch located on each alarm module. Typical applications are low/high priority, alarm/shutdown, or critical/non-critical alarm indications.

7. Mimic Output — The mimic option provides an output in parallel with the integral window display which drives external lamp indicators, graphic displays, etc. The output drive capability is 6 watts, switching to the minus voltage bus of the system's power supply. Current for the external lamps may be provided by the annunciator power supply or from a remote source.

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SPECIAL FUNCTION MODULES

For applications with special input/output requirements directly related to the window annunciator, or for non-related remote functions, these special modules may be mounted integral to the system. This will greatly reduce the external wiring and remote mechanical housing needs and provide a completely tested, functional system, avoiding costly interface problems.
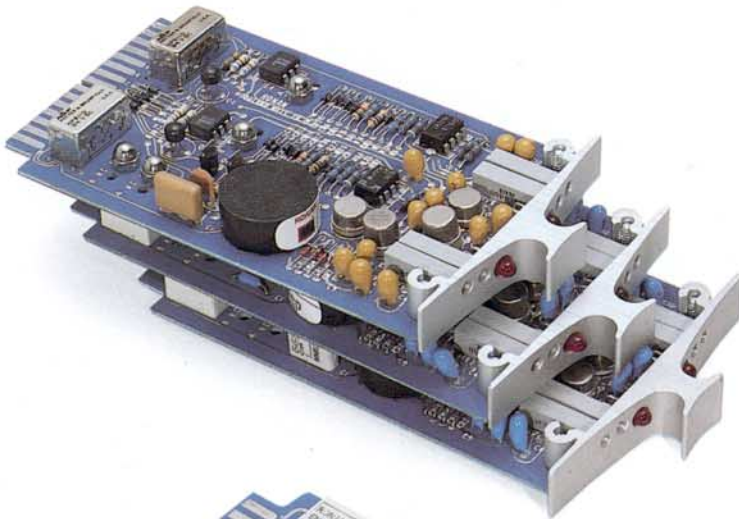
Analog Trip Modules

The Series X50 Analog Trip Modules are available in single or dual setpoint and dual input, single setpoint configurations. The modules provide continuous monitoring of current loop connections, voltage and temperature inputs from RTD's or thermocouples, which are compared against the setpoint, settable by means of precision multi-turn potentiometers. In addition, each module contains hysteresis (dead band) adjust and LED trip indication for each setpoint to allow calibration. If the setpoint is reached, an auxiliary contact and an opto-isolated transistor switch output are activated. All modules provide isolation from the 24 VDC supply voltage for channel integrity via a DC to DC inverter.
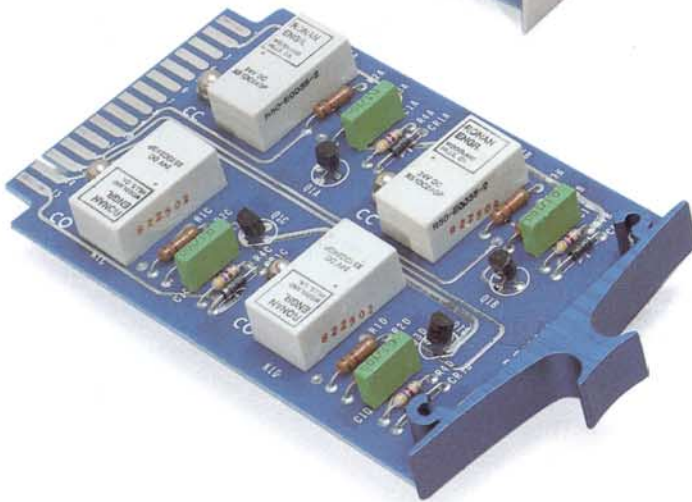
Auxiliary Contact Modules

The auxiliary contact modules provide independent single or multiple auxiliary contact outputs following the field contact status without consideration of alarm logic status. Each input circuit will accept either 24 VDC or 125 VDC, operating either a general purpose or hermetically sealed relay approved for Class I Division 2 areas. The contact is selectable Form "A" (normally open), or Form "B" (normally closed).
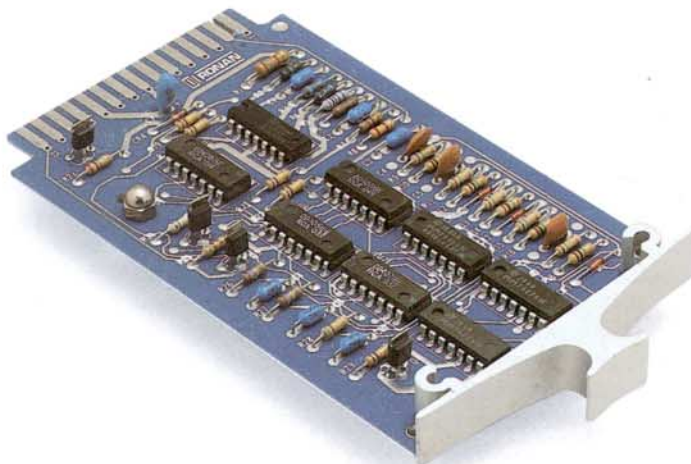
Line Supervisory Module

The Supervisory Module SUPR-800A continuously monitors the status of a process contact and its wiring integrity. The module is designed to distinguish between five possible conditions — Field Contact Normal; Alarm; Open Wiring; Shorted Wiring; and Grounded Wiring. These conditions are annunciated on the associated window by different flash rates and steady light. Typical applications are Entry Protection, Fire Alarms and Critical Process Monitoring Systems, providing, in many cases, insurance cost savings of great significance. The system has Factory Mutual ⟨FM⟩ Approval.
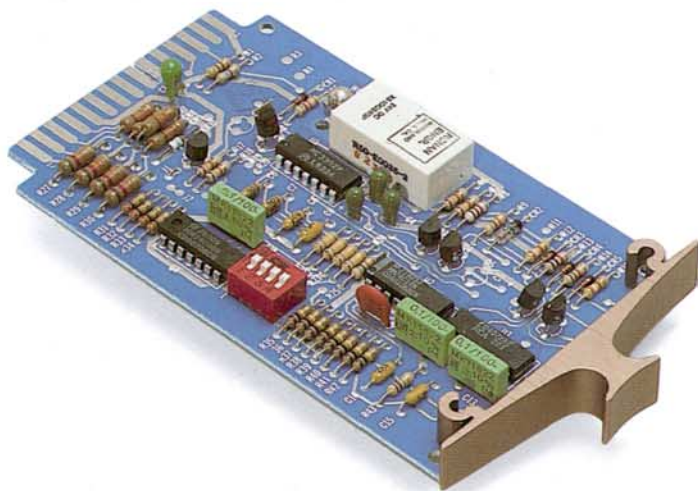
Reflash Module

The Reflash Module, RFL-4, is a multi-contact input monitor, capable to display the alarm condition of a number of inputs on a single window. The Reflash Module recognizes each contact individually and provides a new alarm alert, whenever one of the input contacts enters an abnormal state. Each Reflash Module accepts up to four normally open or normally closed contacts and may be linked with other modules into a group of up to 100 inputs by simple jumper connections on rear panel mounted terminals. The standard module's auxiliary contact output is utilized as the field contact input to the window alarm logic module. An additional open collector transistor output may be provided to actuate the alarm logic, allowing the use of the dry auxiliary contact output for remote annunciation. To allow the alarm window to return to normal, all input contacts assigned to the group are required to return to their normal state.
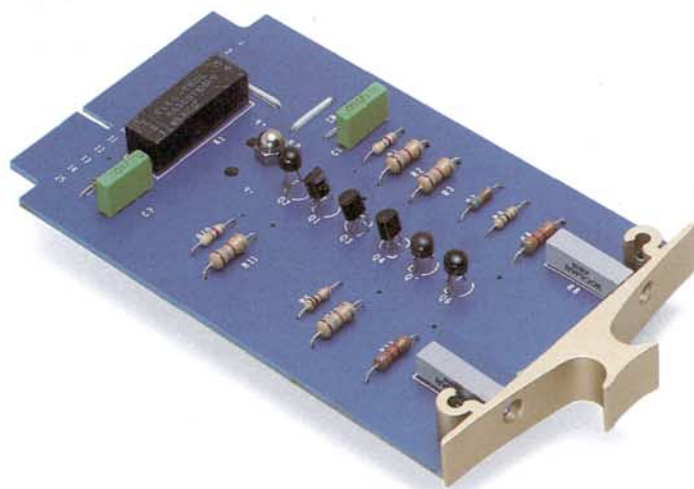
Ground Fault Detector Module

The Ronan Alarm Systems and their power supplies are isolated from ground, allowing the use of a Ground Fault Detection Module to sense field wiring faults. The Ground Fault Detectors are available for both 24 VDC and 125 VDC field contact voltage sensing. If the impedance measured to the system's ground is lower than the fixed or adjustable preset value of 10,000 ohms to 100,000 ohms, a dry contact output transfer may be used to annunciate on a window, or feed an external monitoring instrument.
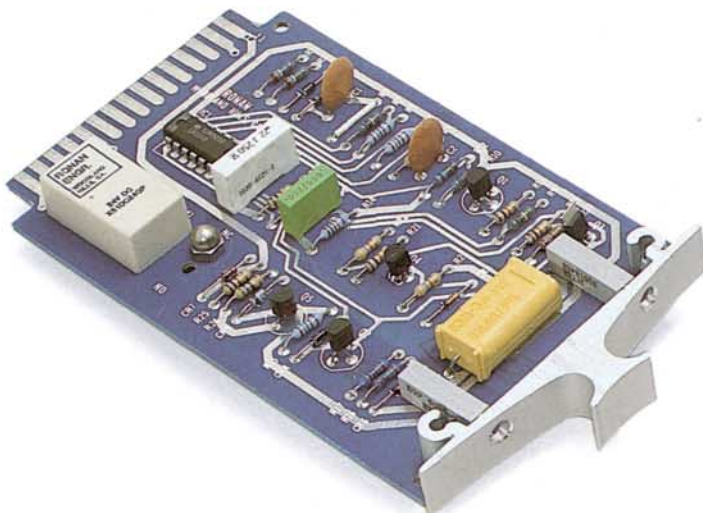
Motion Detector Module

For loss of motion detection in applications such as conveyor belts, vibrating screens, bucket elevators, etc., the Motion Detector Module mounted integral to the alarm system is used to indicate alarm condition, or the shutdown of the process. The module derives its input from the remote, eddy current type sensor head, detecting the loss of motion in critical vibration, or rotating equipment applications. The detector, typically located up to 500 feet from the annunciator, provides pulse inputs to the module where circuitry utilizes multi-turn precision potentiometers to set sensitivity and adjust time delay for recognition of an off-normal condition.

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Sequence A, Automatic Reset (Ronan ID AS)
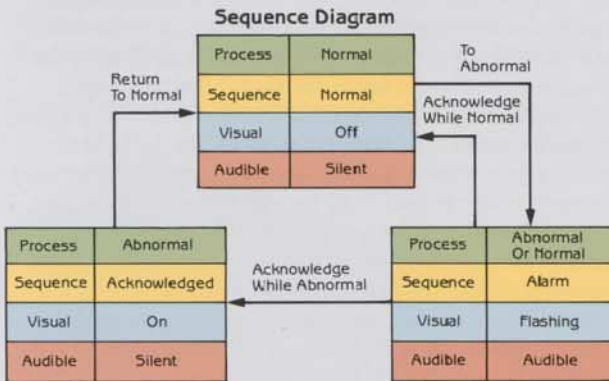
Sequence Diagram

Process	Normal
Sequence	Normal
Visual	Off
Audible	Silent

Return To Normal

To Abnormal

Acknowledge While Normal

Process	Abnormal
Sequence	Acknowledged
Visual	On
Audible	Silent

Acknowledge While Abnormal

Process	Abnormal Or Normal
Sequence	Alarm
Visual	Flashing
Audible	Audible

Sequence Features

1. Acknowledge and Test Pushbuttons.
2. Alarm Audible Device.
3. Lock-In of Momentary Alarms Until Acknowledged.
4. The Audible Device Is Silenced and Flashing Stops When Acknowledged.
5. Automatic Reset of Acknowledged Alarm Indications When Process Conditions Return to Normal.
6. Operational Test.

Sequence F2A, Automatic Reset First Out with No Subsequent Alarm State (Ronan ID FS)

Sequence Diagram

Process	Normal
Sequence	Normal
Visual	Off
Audible	Silent

Return Normal

Subsequent To Abnormal

First To Abnormal

Process	Abnormal
Sequence	Acknowledged
Visual	On
Audible	Silent

Acknowledge While Normal (First Out Reset)

Acknowledge While Abnormal (First Out Reset)

Process	Abnormal Or Normal
Sequence	First Alarm
Visual	Flashing
Audible	Audible

Sequence Features

1. Acknowledge and Test Pushbuttons.
2. Alarm Audible Device.
3. Lock-In Momentary First Alarm Until Acknowledged. No Lock-In of Momentary Subsequent Alarms.
4. Flashing and Audible Indications for First Alarm Only. New Subsequent Alarms Go to the Acknowledged State.
5. First Out Indication Is Reset and the Audible Device Is Silenced When Acknowledged.
6. Automatic Reset of Acknowledged Alarm Indications When Process Conditions Return to Normal.
7. Operational Test.

Sequence F2M-1, Manual Reset First Out with No Subsequent Alarm Flashing and Silence Pushbutton (Ronan ID FSMH)

Sequence Diagram

Process	Normal
Sequence	Normal
Visual	Off
Audible	Silent

Reset While Normal

First To Abnormal

Subsequent To Abnormal

Process	Abnormal Or Normal
Sequence	Subsequent Alarm
Visual	On
Audible	Audible

Silence

Acknowledge

Process	Abnormal Or Normal
Sequence	Acknowledged
Visual	On
Audible	Silent

Acknowledge (First Out Reset)

Process	Abnormal Or Normal
Sequence	First Alarm
Visual	Flashing
Audible	Audible

Process	Abnormal Or Normal
Sequence	First Silenced
Visual	Flashing
Audible	Silent

Acknowledge (First Out Reset)

Silence

Sequence Features

1. Silence, Acknowledge, Reset and Test Pushbuttons.
2. Alarm Audible Device.
3. Lock-In of Momentary Alarms Until Acknowledged.
4. Option 1: Silence Pushbutton to Silence the Alarm Audible Device While Retaining First Out Flashing Indication.
5. Flashing Indication for First Alarm Only. New Subsequent Alarms Have the Same Visual Indication as Acknowledged Alarms.
6. First Out Indication Is Reset When Acknowledged.
7. Manual Reset of Acknowledged Alarm Indications After Process Conditions Return to Normal.
8. Operational Test.

Typical Method of Specifying Alarm Sequences with Options Using ISA Standard Nomenclature

R - 1 - 2 - 9

Basic Sequence Letter ————

———— Option Numbers

F 2 M - 1

Basic Sequence Letter ————

First Out Designation ————

———— Option Number

Sequence F3A, Automatic Reset First Out with First Out Flashing and Reset Pushbutton (Ronan ID F3A)

Sequence Diagram

First Out Reset While Normal

Return To Normal

Process	Normal
Sequence	Normal
Visual	Off
Audible	Silent

First To Abnormal

Acknowledge While Normal — Subsequent To Abnormal

Process	Abnormal Or Normal
Sequence	Subsequent Alarm
Visual	Fast Flashing
Audible	Audible

First Out Reset

Process	Abnormal
Sequence	Subsequent Acknowledged
Visual	On
Audible	Silent

Acknowledge While Abnormal

Process	Abnormal Or Normal
Sequence	First Alarm
Visual	Intermittent Flashing
Audible	Audible

Acknowledge

First Out Reset While Abnormal

Process	Abnormal Or Normal
Sequence	First Acknowledged
Visual	Flashing
Audible	Silent

Sequence Features
1. Acknowledge First Out Reset and Test Pushbuttons.
2. Alarm Audible Device.
3. Lock-In of Momentary Alarms Until Acknowledged.
4. First Out Flashing Different from Subsequent Flashing.
5. First Out Reset Pushbutton to Change the First Out Visual Indication to Be the Same as Subsequent Visual Indications.
6. Automatic Reset of Acknowledged Alarm Indications When Process Conditions Return to Normal.
7. Operational Test.

Basic Sequence Letter	Key Words	Option Number	Key Words
A	Automatic Reset	1	Silence Pushbutton
M	Manual Reset	2	Silence Interlock
R	Ringback	3	First Out Reset Interlock
		4	No Lock-In
		5	No Flashing
		6	No Audible
		7	Automatic Alarm Silence
		8	Common Ringback Audible
		9	Automatic Ringback Silence

First Out Designation	Key Words	Option Number	Key Words
F1	No Subsequent Alarm State	10	No Ringback Audible
F2	No Subsequent Alarm Flashing	11	Common Ringback Visual
F3	First Out Flashing and Reset Pushbutton	12	Automatic Momentary Ringback
		13	Dim Lamp Monitor
		14	Lamp Test

Sequence M, Manual Reset (Ronan ID AM)

Sequence Diagram

Reset While Normal

Process	Normal
Sequence	Normal
Visual	Off
Audible	Silent

To Abnormal

Process	Abnormal Or Normal
Sequence	Acknowledged
Visual	On
Audible	Silent

Acknowledge

Process	Abnormal Or Normal
Sequence	Alarm
Visual	Flashing
Audible	Audible

Sequence Features
1. Acknowledge, Reset and Test Pushbuttons.
2. Alarm Audible Device.
3. Lock-In Momentary Alarms Until Acknowledged.
4. The Audible Device Is Silenced and Flashing Stops When Acknowledged.
5. Manual Reset of Acknowledged Alarm Indications After Process Conditions Return to Normal.
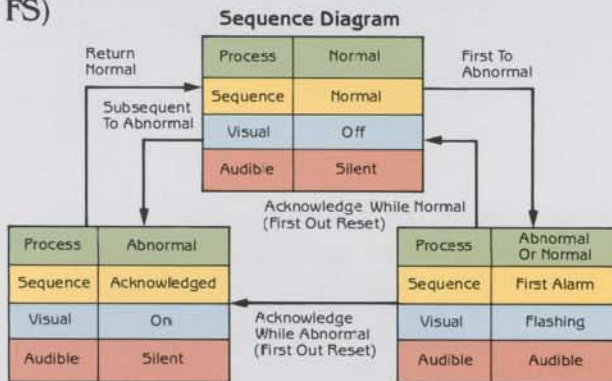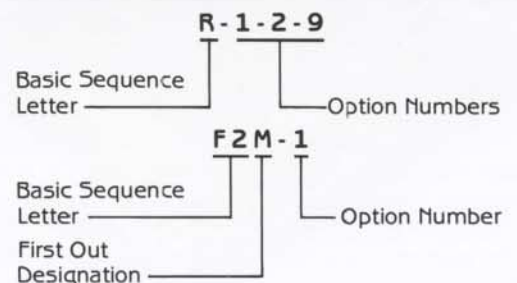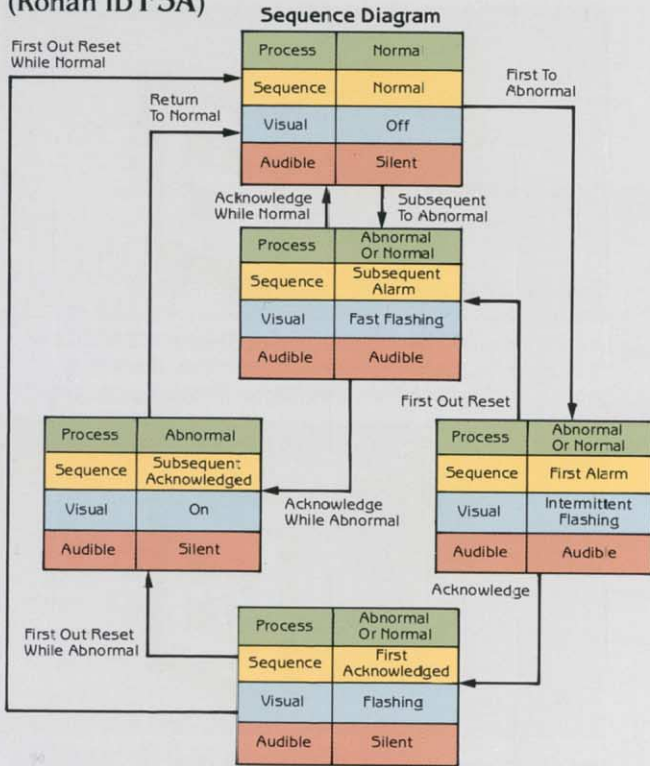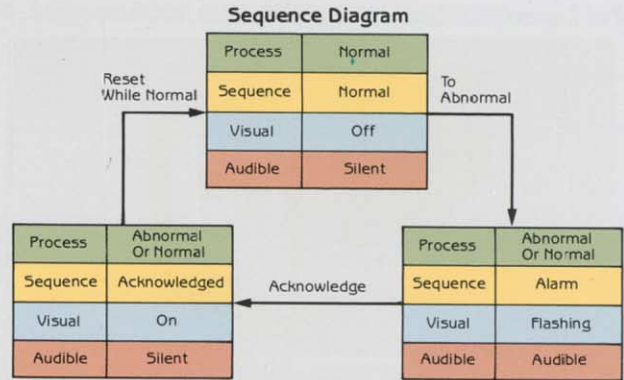6. Operational Test.

Sequence R, Ringback (Ronan ID RD)

Sequence Diagram

Reset

Process	Normal
Sequence	Normal
Visual	Off
Alarm Audible	Silent
Ringback Audible	Silent

To Abnormal

Acknowledge While Normal

Process	Normal
Sequence	Ringback
Visual	Slow Flashing
Alarm Audible	Silent
Ringback Audible	Audible

Return To Abnormal

Process	Abnormal Or Normal
Sequence	Alarm
Visual	Fast Flashing
Alarm Audible	Audible
Ringback Audible	Silent

Return To Normal

Process	Abnormal
Sequence	Acknowledged
Visual	On
Alarm Audible	Silent
Ringback Audible	Silent

Acknowledge While Abnormal

Sequence Features
1. Acknowledge, Reset and Test Pushbuttons.
2. Alarm and Ringback Audible Devices.
3. Lock-In of Momentary Alarms Until Acknowledged.
4. The Audible Device Is Silenced and Fast Flashing Stops When Acknowledged.
5. Ringback Visual and Audible Indications When Process Conditions Return to Normal.
6. Manual Reset of Ringback Indications.
7. Operational Test.

Plug-In Pushbutton Modules
For Series X12-1000, X12-2000, X12-3000 and X12-4000 Alarm Cabinets

Model 12P2
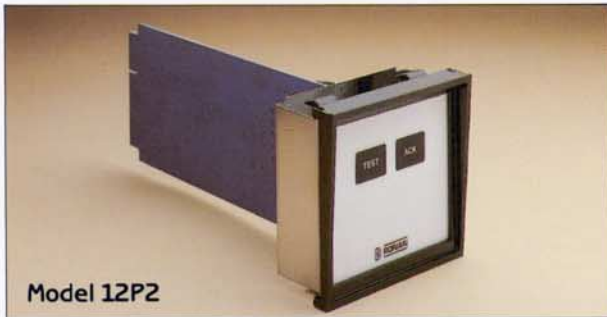
Use with Standard, Sequence A; First Alert, Sequence F1A

Model 12P3A
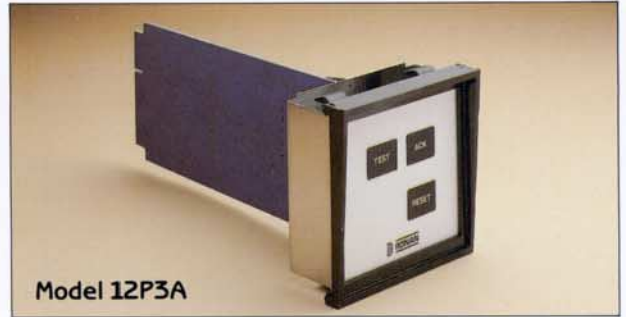
Use with Manual Reset, Sequence M; Ringback with Dual Flash Rate, Sequence R; First Alert with Dual Flash Rate, Sequence F3A; First Alert with Manual Reset, Sequence F2M

Model 12P3B

Use with Standard, Sequence A-1; Resettable Horn, Sequence A-1; First Alert with Resettable Horn, Sequence F1A-1

Model 12P4
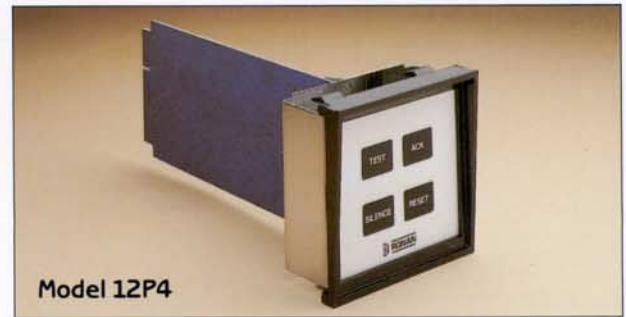
Use with Manual Reset with Resettable Horn, Sequence M-1; First Alert with Manual Resettable Horn, Sequence F2M-1

Plug-In Lamp Modules All models are available with incandescent or LED type lamps. See Page 31 to specify.

Model LM1
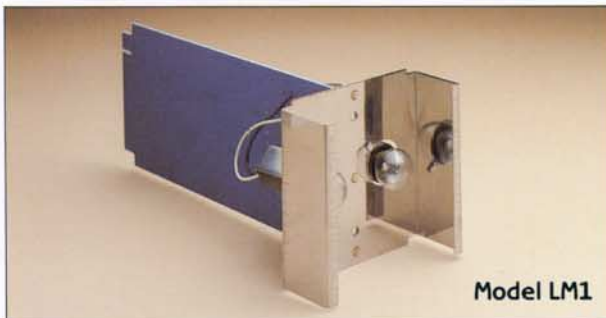
Alarm Series X12-1000

Model LM2
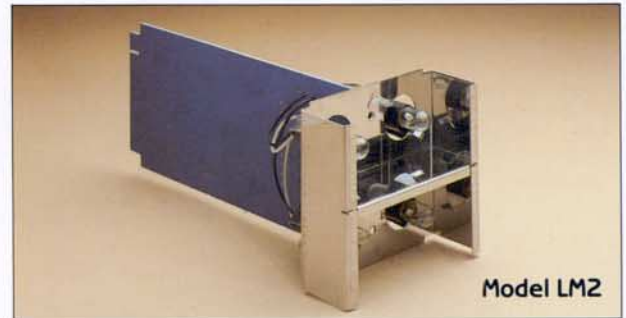
Alarm Series X12-2000

Model LM3

Alarm Series X12-3000

Model LM41

Model LM42

Alarm Series X12-4000

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SYSTEM EXPANDABILITY

Series X12-1000, X12-2000 and X12-3000 Alarm Cabinets

The Standard Annunciators, Series 1000, 2000 or 3000, normally not equipped for expansion, may be ordered initially for expansion by adding the suffix"E" in front of desired maximum size identifier. The code 8.10X12-1000-E3000 calls for an eight (8) window high by ten (10) window wide Monalarm Series in which each original window may be field expanded to three (3) windows, thus effecting a three-fold increase in available alarm windows. To allow this future expansion, each physical module is equipped and wired to accommodate the additional alarm modules up to the specified expandability.

The above specified system can be custom expanded to twice as many windows by removing the Bezel (WB1-0) and Lamp Module (LM1), adding one Alarm Module per physical cabinet module, and completing the simple task by insertion of a Binalarm Lamp Module (LM2) and a Binal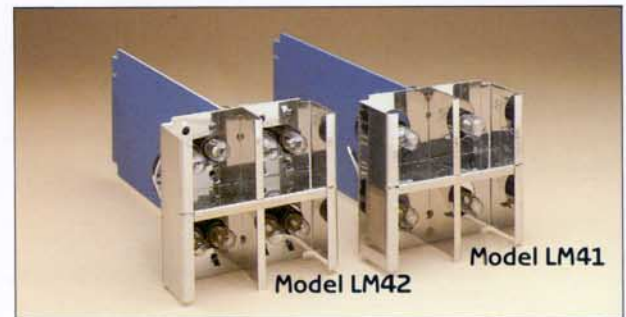arm Bezel (WB2-0). If maximum expansion is desired, an additional alarm module, a Trialarm Module (LM3) and a Trialarm Bezel (WB3-0) are required.

The nominal cost addition for the expansion capability makes this feature highly justifiable, if the number of required windows may increase during the life of the alarm system. An allowance will be made on undamaged Lamp Modules and Bezels returned, when converting to the expanded system during the warranty period.
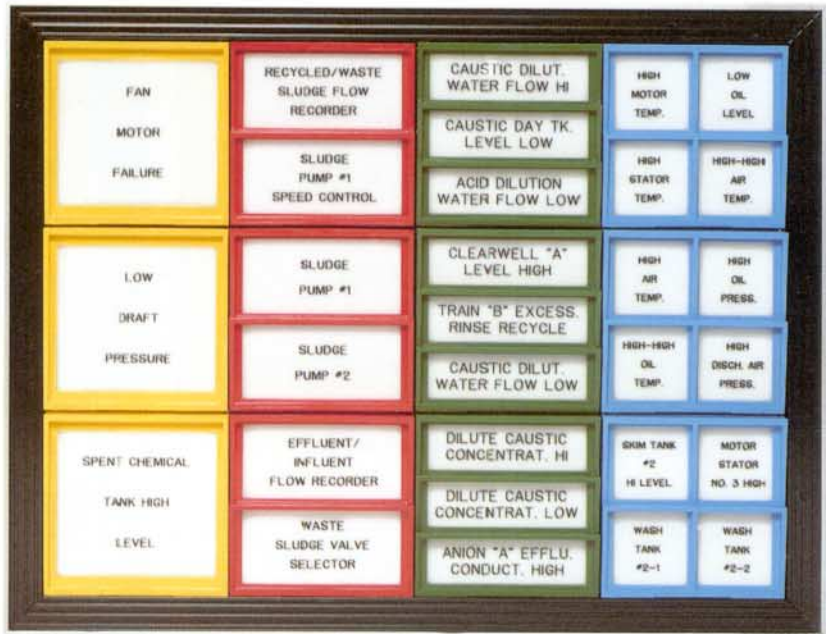
| X12-1000 | X12-2000 | X12-3000 | X12-4000 |

SYSTEM COLOR CODING

Display and Nameplates

Ronan's Window Annunciator may be color coded to designate plant or process function with colored bezels and solid color or sandwich type nameplates.

Bezels

The Bezels are available in eight (8) colors without additional cost, allowing very distinct differentiation between groups of internal system's function, e.g., same sequence, analog or digital inputs, etc., or plant and process groups of similar functions.

Colored Nameplates

The Nameplates may be supplied in five distinct standard colors to identify functions such as fire alarm, shutdown, etc.

Sandwich Nameplates

Sandwich Nameplates, an option exclusive to the Ronan Visual Annunciator, are generally supplied with white front lens and colored rear lens. This lens combination displays all windows white in non-lit status, changing to the selected color in the off-normal lit condition.

Front Lens White
Translucent WL2B-W1

Rear Lens Red
Transparent WL2B-R2

Front Lens White
Translucent WL2B-W1

Rear Lens Green
Transparent WL2B-G2

Typical Bezel WB2-0

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NAMEPLATE ENGRAVINGS

Letter Size (inches)   Characters per Line   Number of Lines

Actual Size

1/4 RONAN 11/6

3/16 RONAN 14/7

5/32 RONAN 17/8

1/8 RONAN 22/10

Monalarm Series 1000 — Model WB1-( )*

1/4 RONAN 11/3
3/16 RONAN 14/3
5/32 RONAN 17/4
1/8 RONAN 22/5

1/4 RONAN 11/3
3/16 RONAN 14/3
5/32 RONAN 17/4
1/8 RONAN 22/5

Binalarm Series 2000 — Model WB2-( )*

1/4 RONAN 11/2

3/16 RONAN 14/2

5/32 RONAN 17/2
1/8 RONAN 22/3

Trialarm Series 3000 — Model WB3-( )*

| 1/4 RONAN 4/3 | 3/16 RONAN 6/3 |
| 5/32 RONAN 8/4 | 1/8 RONAN 10/5 |
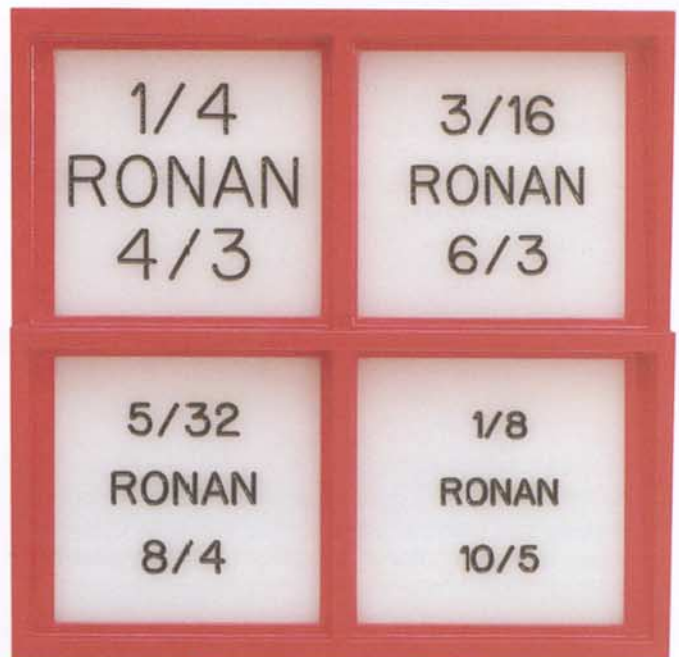
Quadalarm Series 4000 — Model WB4-( )*

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Bezel Colors Available:

Color	Code		Color	Code
Black (0)			Red (2)	
White (9)			Green (5)	

| Yellow (4) | Grey (8) |
| Brown (1) | Blue (5) |

*Color Code
Typical Bezel Ordering Information: WB3-(0) (Black Bezel for Trialarm Series)

POWER SUPPLIES/INVERTERS

Your Alarm System may be powered from 115 VAC, 60 Hz; 220 VAC, 50 Hz; 48 VDC or 125 VDC sources by using a power supply or converter generating a nominal 24 VDC unregulated voltage (18-28 VDC) for the logic and lamps, and 24 VDC or 125 VDC for field contact interrogation.

Power Requirement

To specify the correct power supply, count the number of active and future alarm modules you would like to power from the supply. Calculate the total requirement as follows:

Total Watts = Number of Alarm Modules × Factor (F)

F = 6.5 for X12-1000

F = 4.5 for X12-2000 or X12-3000

F = 3.5 for X12-4000

F = .5 plus Remote Lamp Wattage for X16 Series

For auxiliary relays add one (1) watt per point used. Match the total wattage with the next higher power rating of the listed Power Supply or Converter.

AC - DC Power Supplies

115 - 24	- 125	
115 - 24	- 250	
115 - 24	- 375	
115 - 24	- 500	
115 - 24	- 750	
220 - 24	- 125	
220 - 24	- 250	
220 - 24	- 375	
220 - 24	- 500	
220 - 24	- 750	
115 - 24/125	- 125	
115 - 24/125	- 250	
115 - 24/125	- 375	
115 - 24/125	- 500	
115 - 24/125	- 750	
115 - 24	- 250DA	
115 - 24	- 375DA	
115 - 24	- 500DA	
115 - 24	- 750DA	

Diode Gated Output
Power Output Watts
DC Voltage Out
AC Voltage In

DC - DC Converters

Features: Power Failure Contact Output, Circuit Breaker, Power On Light, Diode Gated Outputs.

125 - 24/125 - 150SCP
125 - 24/125 - 300SCP
125 - 24/125 - 600SCP
48 - 24/125 - 150SCP
48 - 24/125 - 300SCP

Power Output Watts
DC Voltage Out
DC Voltage In
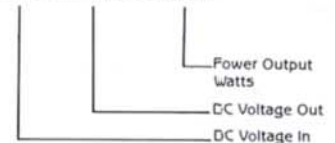
GENERAL SPECIFICATIONS

Systems Voltage:
Logic, Field Contact, Lamps: 24 VDC ±20%
Field Contact: 125 VDC or 48 VDC ±20% Optional

Power Sources:
Systems External Power Supplies or Converters Available for: 120 VAC ±20%, 60 Hz; 240 VAC ±20%, 50/60 Hz; 24, 48 or 125 VDC ±20%

Temperature Range:
Storage: −40° to +85°C (−40° to +185°F)
Operating: −40° to +60°C (−40° to +140°F)
Special High Temperature Systems Available: −40° to +85°C (−40° to +185°F) Operating Temperature

Response Time:
10 msec Nominal. Time Delays Available from 10 msec to 30 min

Controls:
Integral or Remote: Silence, Acknowledge, Reset, Test; Momentary Pushbutton, Single Pole, Normally Open

Inputs:
Contact: Normally Open or Normally Closed. Systems Internal Contact Interrogation Voltage 24 VDC Standard, 48 or 125 VDC Optional
120 VAC: Two Wires, Opto-Isolated

Logic Voltage Open Collector: From Computer, Programmable Controller, Instruments. Specify Type of Interface
Analog Level: Thermocouple, RTD's, 0-1 mA, 40-20 mA, 10-50 mA, 0-5 VDC, 1-5 VDC, 0-10 VDC, 0-10 mV, 0-25 mV, 0-50 mV. For other requirements consult factory.

Outputs:
Light: Fast Flash, Slow Flash, Steady On, Intermittent Fast Flash
Alarm: Single Audible, Selectable Dual Audible, Ringback Audible
Auxiliary Relay: Form "A" or Form "B" Contact Selectable. Standard — Normally De-Energized; Optional — Normally Energized. Rating 2 Amp 28 VDC, 1 Amp 115 VAC
Audible-, Retransmit-, Common Trouble Alarm Relay Optional: DPDT, Rating 10 Amp 28 VDC, 10 Amp 120 VAC

Systems Size:
Multiple of Cabinet Module: 3.5 in. (89 mm) × 3.5 in. (89 mm). See pages 6 thru 9.

Systems Weight:
Per Cabinet Module: 3.5 lbs. (1.59 kg) Not including Power Supply

Surge Withstand Capability (SWC):
All Logic Tested to: IEEE 472 - 1974 and ANSI/IEEE C37-90 - 1978

Rear Terminal Arrangement
Panel Mount Type

Standard and First Out Sequence
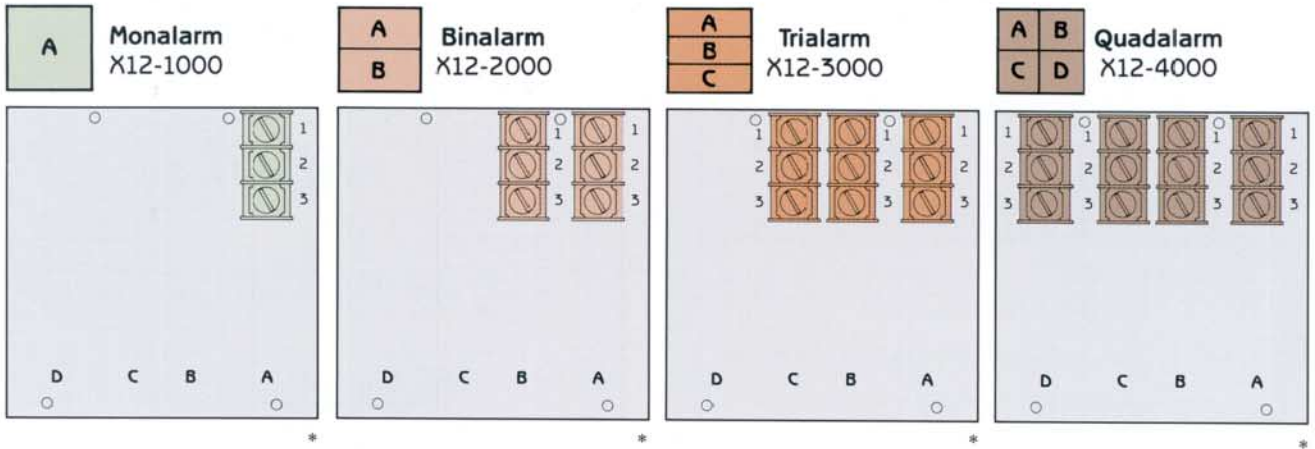
A	Monalarm X12-1000
A / B	Binalarm X12-2000
A / B / C	Trialarm X12-3000
A B / C D	Quadalarm X12-4000

Standard and First Out Sequences with Auxiliary Contact Output

A	Monalarm X12-1000
A / B	Binalarm X12-2000
A / B / C	Trialarm X12-3000
A B / C D	Quadalarm X12-4000
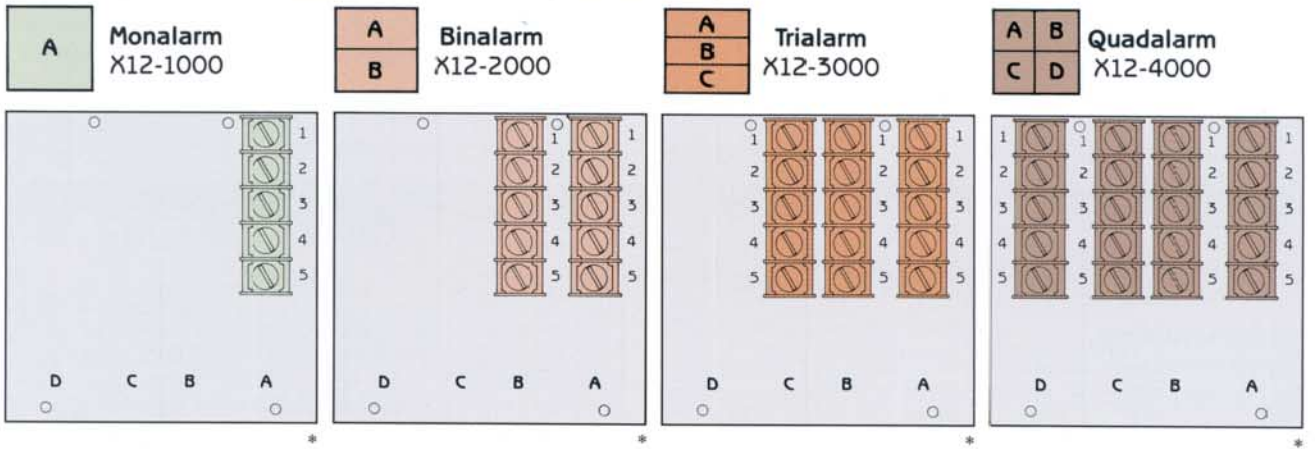
Standard and First Out Sequences with Auxiliary Contact Output and Analog Input

A	Monalarm X12-1000
A / B	Binalarm X12-2000
A / B / C	Trialarm X12-3000
A B / C D	Quadalarm X12-4000

20
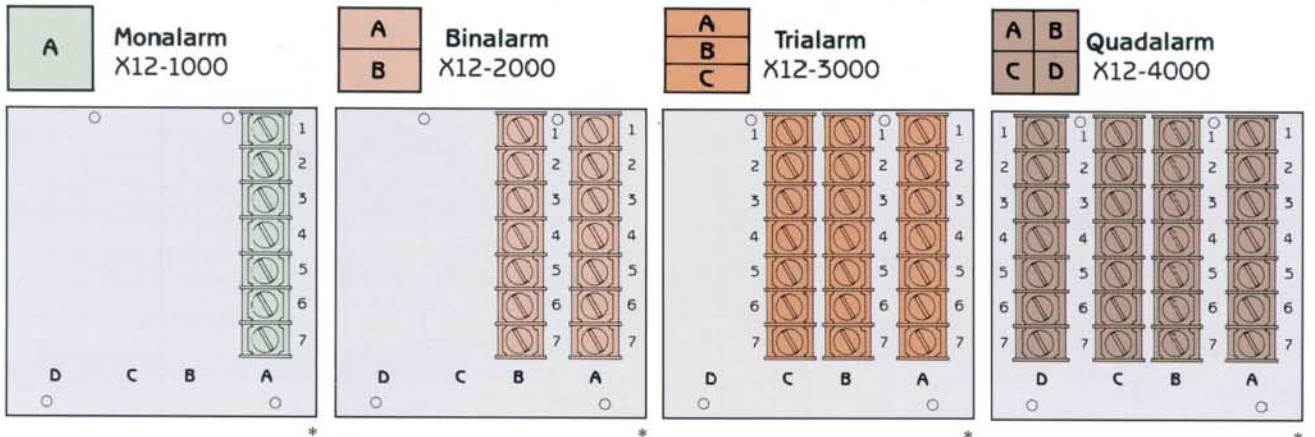
*B, C and D positions may be available for Auxiliary Function Modules if not used for Sequence Modules on Monalarm, Binalarm or Trialarm.

SPECIAL MOUNTING

Type I — Wall Mounting

Surface mounted on plate in Nema 4 or Nema 12 enclosure. Also available in fiberglas enclosure.

Type II — Wall Mounting

Surface mounted on plate (no enclosure).

Enclosure and Plate Dimensions

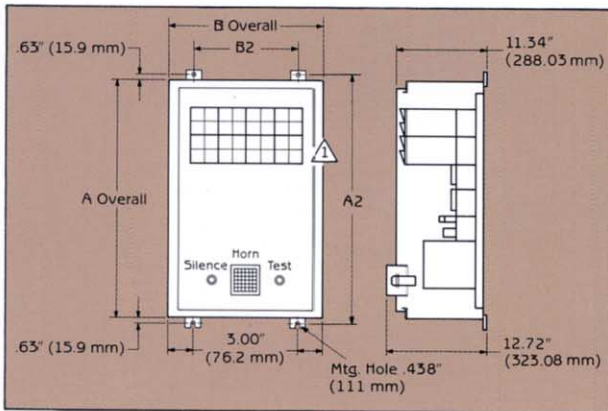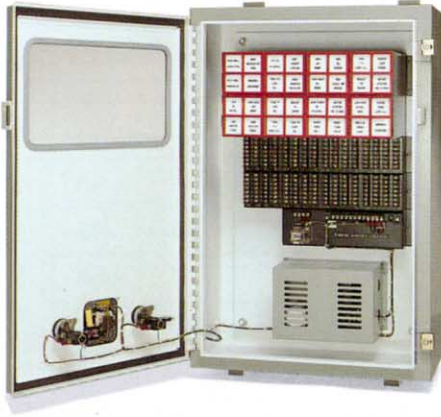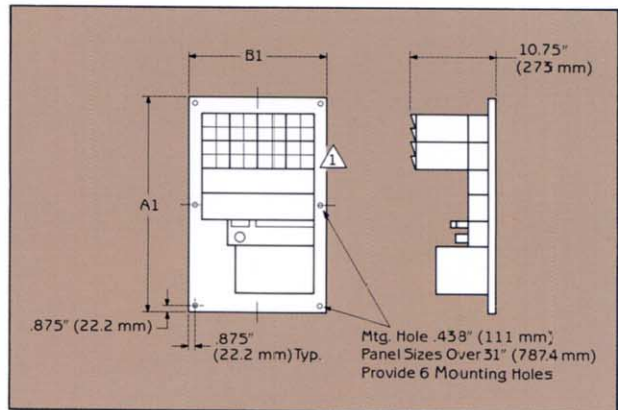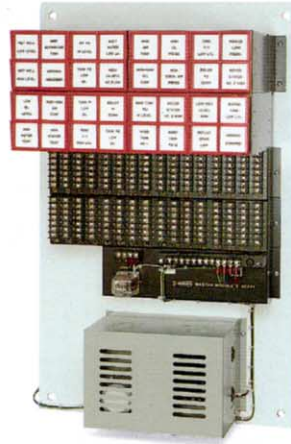| NEMA Enclosure														X12SM-1000 Monalarm[1]		X12SM-2000 Binalarm[2]		X12SM-3000 Trialarm[3]		X12SM-4000 Quadalarm[4]	
A Overall Dimensions		B Overall Dimensions		A1 Panel Dimensions		B1 Panel Dimensions		A2 Dimensions		B2 Dimensions				Maximum Number of Windows		Maximum Number of Windows		Maximum Number of Windows		Maximum Number of Windows	
In.	mm	In.	mm	In.	mm	In.	mm	In.	mm	In.	mm			High	Wide	High	Wide	High	Wide	High	Wide
24.00	609.6	20.00	508.0	21.00	533.4	17.00	431.8	25.25	641.4	14.0	355.6			1	4	2	4	3	4	2	8
24.00	609.6	24.00	609.6	21.00	533.4	21.00	533.4	25.25	641.4	18.0	457.2			1	5	2	5	3	5	2	10
30.00	762.0	20.00	508.0	27.00	685.8	17.00	431.8	31.25	793.8	14.0	355.6			2	4	4	4	6	4	4	8
30.00	762.0	24.00	609.6	27.00	685.8	21.00	533.4	31.25	793.8	18.0	457.2			2	5	4	5	6	5	4	10
36.00	914.4	24.00	609.6	33.00	838.2	21.00	533.4	37.25	946.2	18.0	457.2			3	5	6	5	9	5	6	10
36.00	914.4	30.00	762.0	33.00	838.2	27.00	685.8	37.25	946.2	24.0	609.6			3	7	6	7	9	7	6	14
42.00	1066.8	30.00	762.0	39.00	990.6	27.00	685.8	43.25	1098.6	24.0	609.6			4	7	8	7	12	7	8	14
42.00	1066.8	36.00	914.4	39.00	990.6	33.00	838.2	43.25	1098.6	30.0	762.0			4	9	8	9	12	9	8	18
48.00	1219.2	30.00	762.0	45.00	1143.0	27.00	685.8	49.25	1251.0	24.0	609.6			5	7	10	7	15	7	10	14
48.00	1219.2	36.00	914.4	45.00	1143.0	33.00	838.2	49.25	1251.0	30.0	762.0			5	9	10	9	15	9	10	18
60.00	1524.0	36.00	914.4	57.00	1447.8	33.00	838.2	61.25	1555.8	30.0	762.0			7	9	14	9	21	9	14	18

[1]Nameplate Size: 2.75" (69.9 mm) H × 3.00" (76.2 mm) W
[2]Nameplate Size: 1.4" (35.6 mm) H × 3.00" (76.2 mm) W
[3]Nameplate Size: .86" (21.8 mm) H × 3.00" (76.2 mm) W
[4]Nameplate Size: 1.4" (35.6 mm) H × 1.4" (35.6 mm) W

⚠ Last "D" alarm position not available; reserved for Flasher/Horn Driver Module.

Notes: Larger units available on special order. Enclosure depth: 10" (254.0 mm).
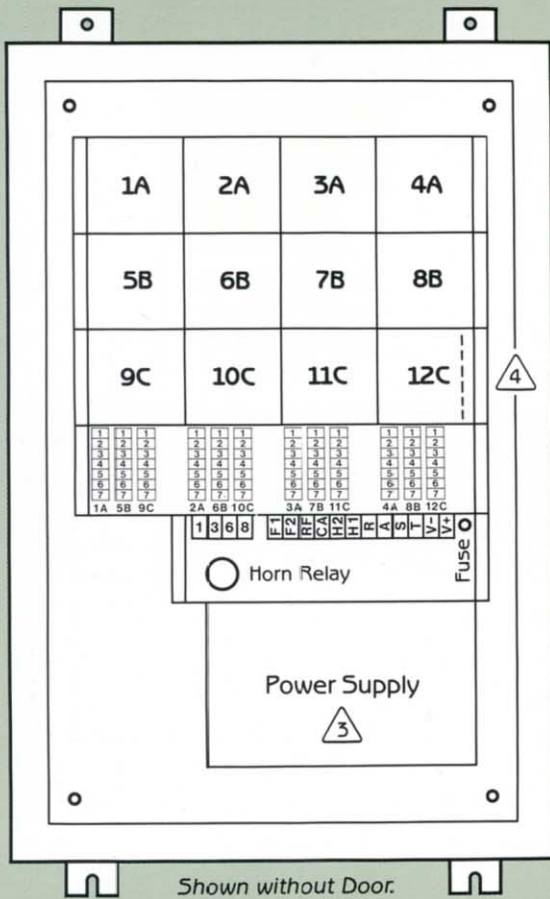Surface Mount Annunciator must be mounted on a mounting plate as a Type I or Type II only.

Type III — Door Mounting

Mounted in the door of an enclosure. Recommended for sizes up to 4 high × 5 wide systems only.

A. To establish proper enclosure size required add two cabinet modules to annunciator system width (for door swing clearance).

B. Enclosure depth: 16 inches.

Wall/Surface Mount
Monalarm X12SM-1000

1A	2A	3A	4A
5B	6B	7B	8B
9C	10C	11C	12C

Horn Relay

Power Supply ③

Shown without Door.
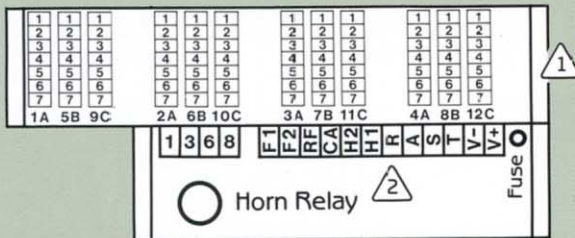
Wall/Surface Mount
Binalarm X12SM-2000
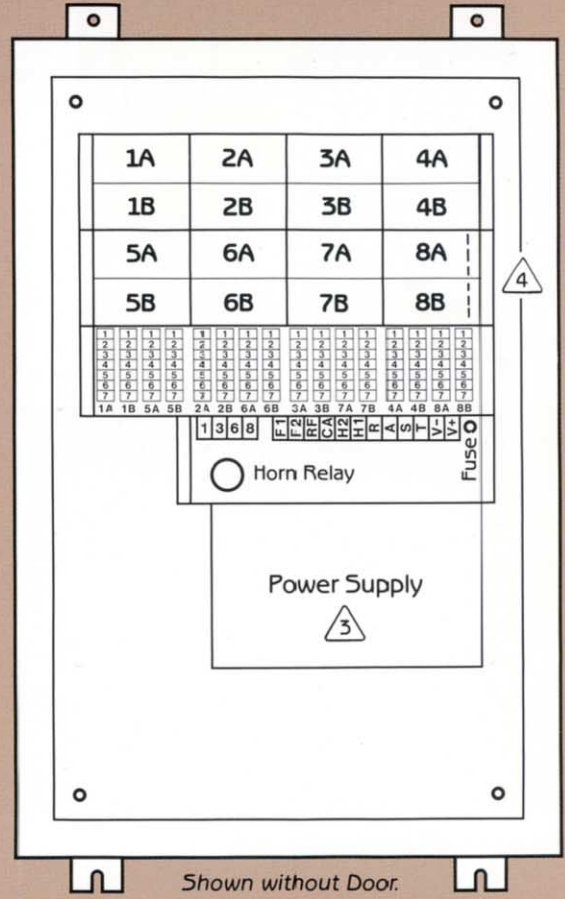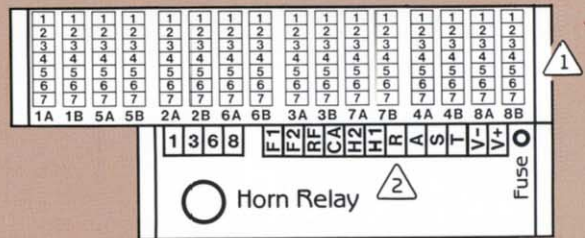
1A	2A	3A	4A
1B	2B	3B	4B
5A	6A	7A	8A
5B	6B	7B	8B

Horn Relay

Power Supply ③

Shown without Door.

Detail of Terminal Arrangement*
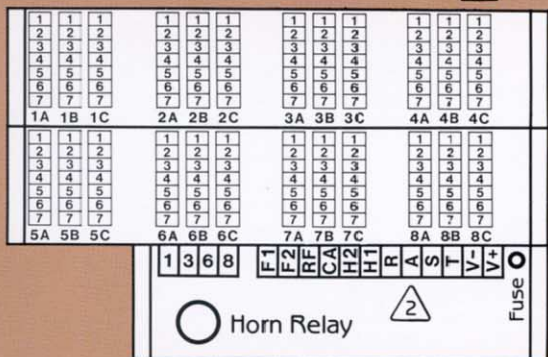
Detail of Terminal Arrangement*
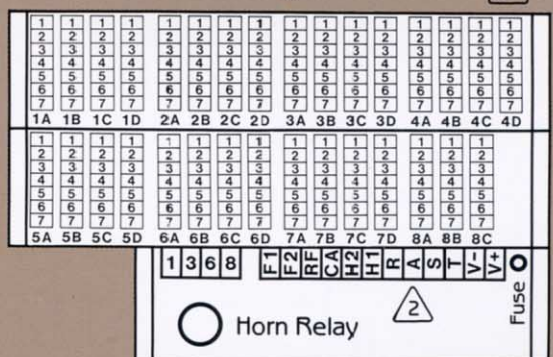
22

Notes:

① Each Alarm Point Supplied with 3, 5 or 7 Terminals Dependent on Alarm Sequence and/or Auxiliary Functions Supplied

② For Systems Support Wiring Refer to Page 24

③ For Power Supplies Sizing See Page 19

④ Flasher/Horn Driver Located in the "D" Alarm Module Position. Horns and Pushbuttons Mounted on the Front Door and Supplied Prewired.

*Terminal arrangements shown are typical and may vary depending on number of alarms and terminals required.

TERMINAL ARRANGEMENTS

Wall/Surface Mount
Trialarm X125M-3000

Shown without Door.

Horn Relay

Power Supply

Detail of Terminal Arrangement*

Horn Relay

Wall/Surface Mount
Quadalarm X125M-4000

Shown without Door.

Horn Relay

Power Supply

Detail of Terminal Arrangement*

Horn Relay

23

Notes:

1. Each Alarm Point Supplied with 3, 5 or 7 Terminals Dependent on Alarm Sequence and/or Auxiliary Functions Supplied

2. For Systems Support Wiring, Refer to Page 24

3. For Power Supplies Sizing See Page 19

4. Flasher/Horn Driver Located in the "D" Alarm Module Position. Horns and Pushbuttons Mounted on the Front Door and Supplied Prewired.

*Terminal arrangements shown are typical and may vary depending on number of alarms and terminals required.
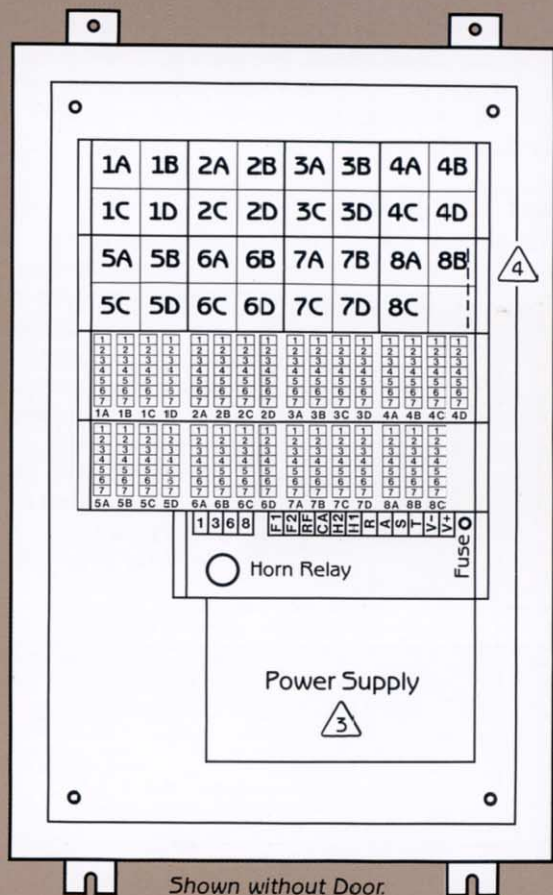
Flasher Module

The dual frequency flashing signal generator and the pushbutton/audible alarm interface is furnished by the flasher module. The flasher is master/slave selectable to allow synchronization of flash rates in multi-system applications. The module is designed to drive up to 150 points of alarm and for convenience purposes is always located behind the lower right hand module of the system.
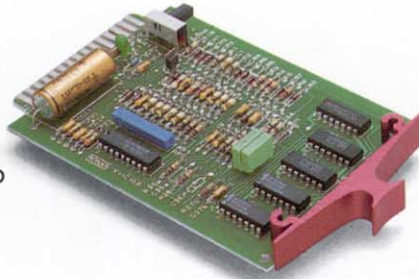
Master Terminals

The remote pushbuttons, audible alarm and power wiring are terminated at the Master Terminal
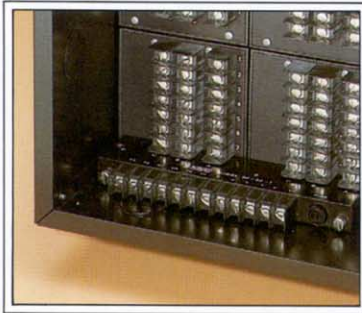
Assembly located on the rear of the system's chassis. Polarity protection, for reverse power hook-up, and a system's fuse, are an integral part of the Master Terminal Assembly.

Filter Module

All remotely located pushbuttons and DC power input lines are fed to the system via integral filter modules, servicing up to 50 alarm points (36 points for 1000 Series). For larger systems, use additional RF-24-2 Filter Modules.

X12-RF-24-1

X12-RF-24-2

Systems Support Wiring

F1 F2

To Additional Annunciators Requiring Flash Sync.
Note: −V of All Systems Must Also Be Common

Reset
Acknowledge
Silence
Test

− +
Power Supply or Converter
24 VDC ±20%

125 VDC or 48 VDC Field Contact Applications

The lower left alarm module position, terminal row D, is utilized for applications with 125 VDC field contact sensing voltage. Module to module connections are internally provided. (Other optional field contact sensing voltages such as 48 VDC are available).

Chassis Ground

+125 VDC (+48 VDC)

D

Notes:

1. K4 Only Used on Systems with Modified Reflash Capability

2. K3 Only Used on Systems Equipped with Common Alarm Output

3. K2 Only Used for Dual Horn or Ringback Systems

4. K1 and K2 Are Not Required if Ronan X36 Electronic Horns Are Utilized. X36 Horns May Be Direct Connected with Red Wire to +V and Blue Wire to H1 or H2 Respectively.

5. Reset Pushbutton Utilized for Manual Reset, Ringback or First Out Reset Sequences Only

6. Silence Pushbutton Utilized for Horn Silence Sequences Only

7. All Relay Coils Must Be 24 VDC, 250 mA (Max.) 5PDT or DPDT Contacts as Required. Standard Relay KRP24DC for GP and KR7272 for Hermetically Sealed.

8. Horn Relay K1 Internally Wired on Surface Mount Models as Follows:

Horn Voltage

Alarm Sequence Modules

Standard and First Out Sequence

```
1  H (+V)
2  FC
3  ME
```
Field Contact
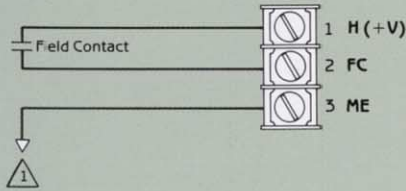
Standard and First Out Sequence
With Thermocouple Input and Auxiliary Contact Output

```
1
2  +IN
3  ME
4  C      Auxiliary
5  NO/NC
6  -IN
7  REF
```
T/C

Auxiliary Contact Output
NO/NC Selectable
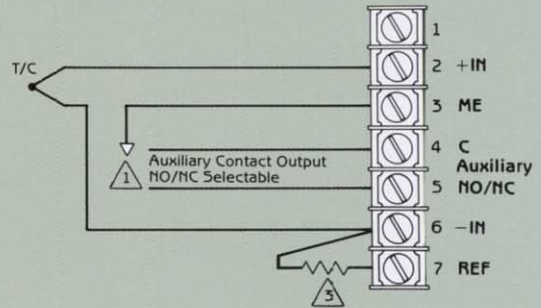
Standard and First Out Sequence
With Auxiliary Contact Output

```
1  H (+V)
2  FC
3  ME
4  C
5  NO/NC
```
Field Contact

Auxiliary Contact Output
NO/NC Selectable
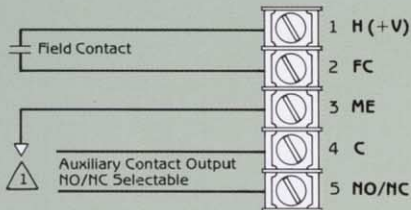
Standard and First Out Sequence
With RTD Input and Auxiliary Contact Outputs

```
1
2  +IN
3  ME
4  C      Auxiliary
5  NO/NC
6  -IN
7  Common
```
RTD

Auxiliary Contact Output
NO/NC Selectable
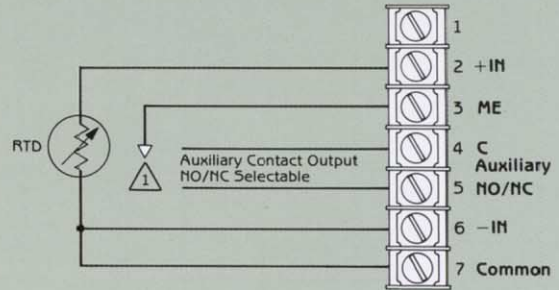
Standard and First Out Sequence
With Analog Input and Auxiliary Contact Output

```
1
2  +IN
3  ME
4  C      Auxiliary
5  NO/NC
6  -IN
7
```
Analog
Input

Auxiliary Contact Output
NO/NC Selectable
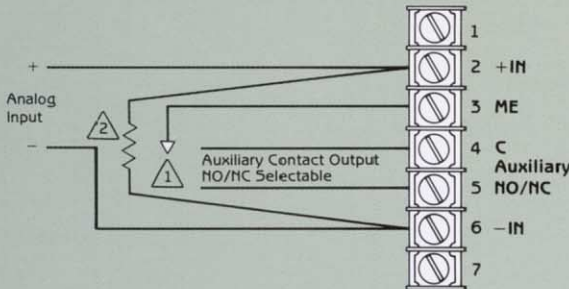
Standard and First Out Sequence
With Dual Auxiliary Outputs

```
1  H
2  FC
3  ME
4  C
5  NO/NC
6  C
7  NO/NC
```
Auxiliary Contact Output 1
NO/NC Selectable

Auxiliary Contact Output 2
NO/NC Selectable
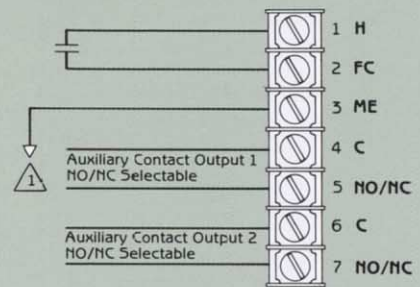
Standard and First Out Sequences
With Transistor Input Negative Logic
(Use Open Collector Input Modules)

Max. Leakage Current 1 mA

```
1
2
3
```
Customer
Supplied

To Ronan Power Supply −V Terminal
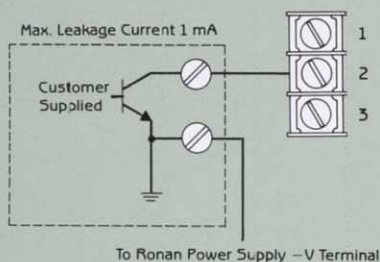
Standard and First Out Sequences
With Transistor Input Positive Logic
(Use Standard 24 VDC Input Modules)

Customer
Supplied

```
1
2
3
```

−V +V
To Ronan Power Supply Terminals 24 VDC

25
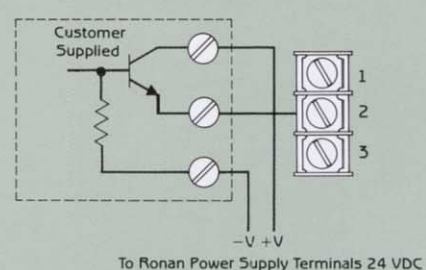
Auxiliary Function Modules without Integral Alarm Sequence

Trip Module mV, mA — X50 Series
Analog Input — Auxiliary Contact Output

```
Analog Input
mV, mA, V              1  + IN
                       2  – IN
       ⟋⟍⟍⟍⟍           3
       ⟋2⟍             4
Auxiliary Contact Output    Setpoint A
NO/NC Selectable       5
                       6
Auxiliary Contact Output    Setpoint B
NO/NC Selectable       7
```

Trip Module — X50T Series
T/C Input — Auxiliary Contact Output

```
T/C                    1  + IN
                       2  – IN
       ⟋⟍⟍⟍            3  REF
Auxiliary Contact Output    Setpoint A
NO/NC Selectable       4
                       5
Auxiliary Contact Output    Setpoint B
NO/NC Selectable       6
                       7
```
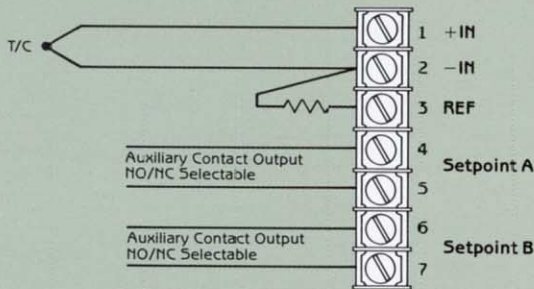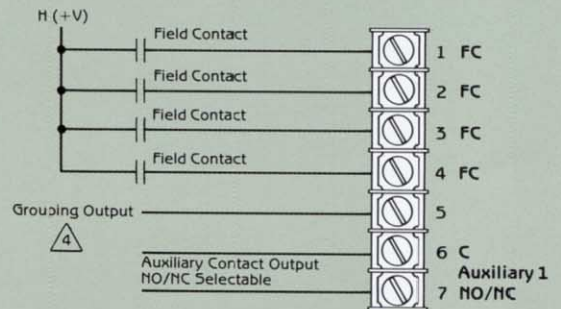
Trip Module X50R Series
RTD Input — Auxiliary Contact Output

```
RTD                    1  + IN
                       2  – IN
                       3  Common
Auxiliary Contact Output    Setpoint A
NO/NC Selectable       4
                       5
Auxiliary Contact Output    Setpoint B
NO/NC Selectable       6
                       7
```
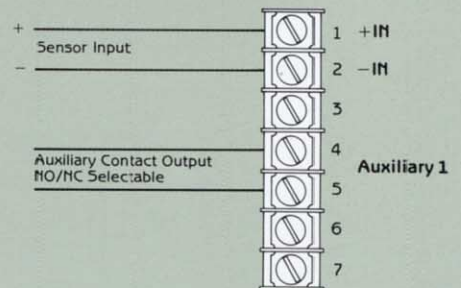
Dual Auxiliary Contact Module — X1216TC-2
With External Field Contact Connections

```
                       1  H (+V)
Field Contact          2  FC
Field Contact          3  FC
Auxiliary Contact Output 1   4  C
NO/NC Selectable             Auxiliary 1
                       5  NO/NC
Auxiliary Contact Output 2   6  C
NO/NC Selectable             Auxiliary 2
                       7  NO/NC
```

Tri Auxiliary Contact Module — X1216TC-3
With System Internal Field Contact Connections

```
                            1  H (+V)
                            2  C
Auxiliary Contact Output 1     Auxiliary 1
NO/NC Selectable            3  NO/NC
                            4  C
Auxiliary Contact Output 2     Auxiliary 2
NO/NC Selectable            5  NO/NC
                            6  C
Auxiliary Contact Output 3     Auxiliary 3
NO/NC Selectable            7  NO/NC
```

Reflash Module — RFL-4

```
H (+V)
          Field Contact      1  FC
          Field Contact      2  FC
          Field Contact      3  FC
          Field Contact      4  FC
Grouping Output              5
  ⟋4⟍
Auxiliary Contact Output     6  C
NO/NC Selectable                Auxiliary 1
                             7  NO/NC
```
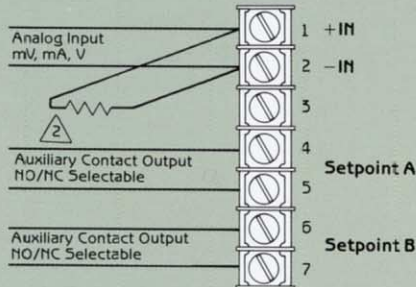
Motion Detector Module — SS 2137

```
+                            1  + IN
    Sensor Input
–                            2  – IN
                             3
Auxiliary Contact Output     4
NO/NC Selectable                Auxiliary 1
                             5
                             6
                             7
```

Notes:
Used with First Alert Alarm Sequences

⟋1⟍	Connect to All ME Terminals of Points Desired in a First Alert Group
⟋2⟍	Resistor Factory Installed for Current Loop Input Only
⟋3⟍	Cold Junction Compensation Resistor for T/C Input Only (Factory Installed)
⟋4⟍	Connect Grouping Terminals of RFL Modules Desired in the Same Group (Expands Groups in Increments of 4 Inputs).
REF	Thermocouple Reference Junction Input
+ IN	Plus Analog Voltage
– IN	Minus Analog Voltage
Common	Common Return
H	+24 VDC
FC	Field Contact Return
ME	First Out Grouping Terminal
C	Common of Auxiliary Contact
NO/NC	Normal Open/Normal Closed Contact
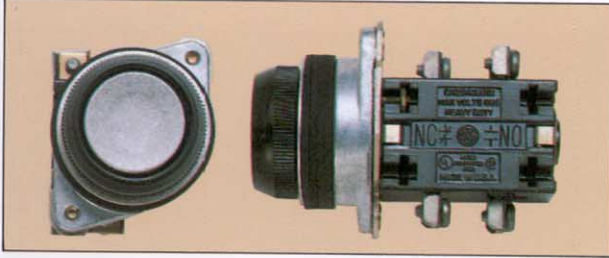
Pushbuttons

General Purpose

Type	Contact	Rating
202B Oil Tight	1NO 1NC	
203B Pushbutton	2 NO 2NC	24VDC, 5 Amp.
202S Oil Tight	1NO 1NC	125VDC, 2 Amp.
203S Switch	2NO 2NC	

Mercury Type — Class I Div. 2 Locations

Type	Contact	Rating
X13P ( ) ( ) P.B.	Up to	24VDC, 10 Amp.
X13S ( ) ( ) Switch	4NO or NC	125VDC, 5 Amp.

    └── NO or NC
    └── Number of Contacts
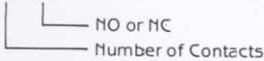
Horn Relays

General Purpose

Model	Voltage	Contact Rating
KRP-24VDC	24VDC	10 Amp.

Hermetically Sealed — Class I Div. 2

Model	Voltage	Contact Rating
KR7272	24VDC	10 Amp.

Socket

Model 146-103 to be mounted by customer.

Power Supplies

(For Details see Page 19)

Water Tight Doors

( ) ( ) X12-1022N12, Nema 12
( ) ( ) X12-1022N4, Nema 4

    └── Cabinet Modules Wide
    └── Cabinet Modules High

Horns — Vibrating Type

Model	Description
350N-115 VAC	Class I, Division 2 or General Purpose
450N-(Voltage)	General Purpose — Specify 125VDC or 24VDC
350W-115 VAC	Class I, Division 2 or General Purpose
450W-(Voltage)	General Purpose — Specify 125VDC or 25VDC
350F-115 VAC	Class I, Division 2 or General Purpose
450F-(Voltage)	General Purpose — Specify 125VDC or 24VDC
351N-115 VAC	Class I, Division 2 or General Purpose
451N-(Voltage)	General Purpose — Specify 125VDC or 24VDC
351W-115 VAC	Class I, Division 2 or General Purpose
451W-(Voltage)	General Purpose — Specify 125VDC or 24VDC
8140-115 VAC	Explosion Proof Class I, Division 1
8141-(Voltage)	Explosion Proof Class I, Division 1, 125VDC or 24VDC
300XB-(Voltage)	Explosion Proof Class I, Division 1, 24VAC, 125VDC or 24VDC
8130-115 VAC	Explosion Proof Class I, Division 1
8131-24VDC	Explosion Proof Class I, Division 1

*Choose voltage from description column.

Bells

Model	Description
504N-115 VAC	General Purpose, 4 Inch Diameter
506N-115 VAC	General Purpose, 6 Inch Diameter
510N-115 VAC	General Purpose, 10 Inch Diameter
604N-125 VDC	General Purpose, 4 Inch Diameter
606N-125VDC	General Purpose, 6 Inch Diameter
610N-125VDC	General Purpose, 10 Inch Diameter
504W-115 VAC	Weatherproof, 4 Inch Diameter
506W-115 VAC	Weatherproof, 6 Inch Diameter
510W-115 VAC	Weatherproof, 10 Inch Diameter
604W-125VDC	Weatherproof, 4 Inch Diameter
606W-125VDC	Weatherproof, 6 Inch Diameter
610W-125VDC	Weatherproof, 10 Inch Diameter

Chimes — Single Stroke

X12-1128-115VAC
X12-1128-125VDC
X12-1128-24VDC
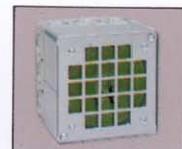
Horns — Electronic

X36-24VDC
X36-48VDC
X36-115VAC
Sonalert-24VDC
Sonalert-115VAC

27

Ronan Sequence Logic Module Selection

Note: Additional options (not shown) available. Not all options available on all sequences. Please contact factory to discuss your specific requirements.

Ronan ID	Description	ISA
AS	Automatic Reset	A
AM	Manual Reset	M
AH	Audible Silence	A-1
AMH	Manual Reset/Audible Silence	M-1
ASL	No Flash/No Audible (Status)	A-4-5-6
AMC	Red — Alarm; Green — Return-to-Normal	
FS	First Out-Fast Flast/Subsequent Steady ON/Automatic Reset	F2A
FSM	First Out-Fast Flash/Subsequent Steady ON/Manual Reset	F2M
FSH	FS with Audible Silence	F2A-1
FSMH	FS with Audible Silence/Manual Reset	F2M-1
F3A	First Out/Ack. Intermittent Sub. Slow	F3A-3
FD	First Out-Fast Flash/Sub. Slow Flash	*
FD/AS	Selectable	
FDH/AH	Selectable with Audible Silence	
FDH	FD with Audible Silence	
FDHI	FD with Audible Silence/Alarm Inhibit	
FRDK	First Out/Ringback/Dual Audible	
FRDH	First Out/Ringback/Intermittent Flash	F3R-1-3
FDRW	Red-First/White-Subsequent/Ringback	
RD	Ringback	R
RDSH	Ringback with Audible Silence/Interlock	R-1-2
RDK	Ringback with Dual Audible	
RACD	Automatic Ringback Flash	
SUPR	Supervised Field Contact Wiring	
AND	Multiple AND Gates	
OR	Multiple OR Gates	
INV	Multiple Inverter Gates	
DEL	Multiple Time Delays	
OS	Multiple One-Shots	
FF	Multiple Flip-Flops	
MD	Motion Detector	

* Similar to F3A-3 (No Intermittent)

Code	Special Options
00	None
26	Time Delay 0-.5 sec.
01	Time Delay 1-45 sec.
17	Time Delay 1-30 sec.
02	Time Delay 2.5-90 sec.
03	Time Delay 5 sec.-3 min.
04	Time Delay .1-6 min.
18	Time Delay 6 sec.-15 min.
13	Time Delay 12 sec.-30 min.
05	Time Delay .5 sec.
23	Time Delay 1 sec. Fixed
11	Time Delay 60 sec. Fixed
14	Time Delay 1-45 sec. and Dual Horn
22	Time Delay 1-45 sec., Lamp Dim
21	Time Delay .5 sec., Lamp Test Only
25	Time Delay 1-30 sec., Operation from 125 VDC Power Source
06	Lamp Test Only
07	Short Circuit-Proof Lamp Driver
08	CTA/Follow F/C
09	ISA Option 1, 2, 3
10	Lamp Dim
12	Dual Setpoint (Analog)
15	Dual Color, Two Wire
16	Individual Audible Output per Window
19	Dual Audible
20	Short Circuit-Proof Lamp Driver, Dual Audible
24	Operation from 125 VDC Power Source
27	Individual Audible per Window, Lamp Test Only
28	No Audible

__ - 0 0 0 0

Code	Input
0	24 VDC FC Voltage
P	48 VDC FC Voltage
1	125 VDC FC Voltage
2	125 VDC FC (Live 40-140 DC)
6	Open Collector
7	24 VDC Opto-Coupled (10-30 VDC)
X	115 VAC FC, Triac Input - 3 mA Leakage
N	0-1 mA
4	4-20 A
M	10-50 mA
F	0-10 mV
G	0-25 mV
H	0-50 mV
L	0-5 V
5	1-5 VDC
9	9 Ohms RTD
A	10 Ohms RTD
B	100 Ohms RTD
C	120 Ohms RTD
D,E,J,K, R,S,T	T/C Types
8	FC Wiring Monitored

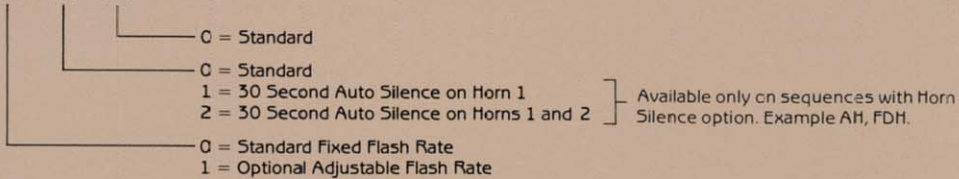| Code	Output
0	Standard
1	Aux. Contact GP, NE, FC Follower
2	Aux. Contact GP, NDE, FC Follower
3	Aux. Contact GP, NE, Lamp Follower
4	Aux. Contact GP, NDE, Lamp Follower
5	Aux. Contact HS, NE, FC Follower
6	Aux. Contact HS, NDE, FC Follower
7	Aux. Contact HS, NE, Lamp Follower
8	Aux. Contact HS, NDE, Lamp Follower
K	Aux. Contact GP, NDE, Follows Acknowledge
D	Dual Aux. Contact GP, NDE, FC Follower
E	Dual Aux. Contact HS, NDE, FC Follower
N	Dual Aux. Contact HS, NE, FC Follower
M	Dual Aux. Contact HS, NDE, Lamp Follower
A	Common Trouble Alarm, FC Follower
F	Common Trouble Alarm, Lamp Follower
G	Aux. Contact GP, NDE and CTA, Lamp Follower
H	Aux. Contact GP, NDE, FC Follower, Relay Test Only
L	Aux. Contact GP, NDE, and Individual Aux. Audible
9	Dual Audible, Selectable
J	Dual Audible, Aux. Relay GP, NE, FC Follower
B	Positive Logic (AND, OR, INV. Logic Cards)
C	Dual Color, One Wire

NE   Normally Energized   Aux. Auxiliary — Typically a Repeater
NDE Normally De-Energized   Contact Integral on Alarm Module
FC   Field Contact   GP   General Purpose
CTA Common Trouble Alarm   HS   Hermetically Sealed

Support Modules

Flasher/Horn Driver Module

FHD24 - ( ) - ( ) - ( )

- 0 = Standard
- 0 = Standard
  1 = 30 Second Auto Silence on Horn 1 ⎤ Available only on sequences with Horn
  2 = 30 Second Auto Silence on Horns 1 and 2 ⎦ Silence option. Example AH, FDH.
- 0 = Standard Fixed Flash Rate
  1 = Optional Adjustable Flash Rate

1. Module drives up to 150 points.
2. Module occupies one position in lower right hand cabinet module.
3. Master/Slave selectable to synchronize flash rate in multiple chassis or module application.
4. Automatic Silence, Acknowledge and Reset on power up.
5. Horn Driver sized to drive KRP-24VDC Relay or X36 Electronic Horn.

Filter Module

RF-24-1: Main Filter Module. Power capacity — 10 Amp. Use additional filters (RF-24-2) for systems larger than 50 alarm points (36 points for 1000 Series).
RF-24-2: Additional Filter Modules. Power capacity — 10 Amp.
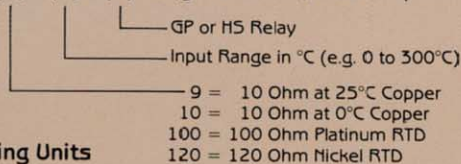
Auxiliary Function Modules

Analog Trip Modules
- Thermocouple

X50T-(E) - ( ) - ( ) Type E, Single Channel, Single Setpoint
X50T-(J) - ( ) - ( ) Type J, Single Channel, Single Setpoint
X50T-(K) - ( ) - ( ) Type K, Single Channel, Single Setpoint
X50T-(T) - ( ) - ( ) Type T, Single Channel, Single Setpoint
X50T-(DE)- ( ) - ( ) Type E, Single Channel, Dual Setpoint
X50T-(DJ)- ( ) - ( ) Type J, Single Channel, Dual Setpoint
X50T-(DK)- ( ) - ( ) Type K, Single Channel, Dual Setpoint
X50T-(DT)- ( ) - ( ) Type T, Single Channel, Dual Setpoint

- GP or HS Relay
- Input Span: 0-10, 0-25 or 0-50 mV
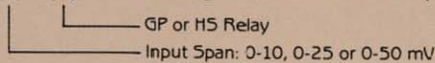
- RTD — Resistance Temperature Devices

X50R - ( ) - ( ) - ( ) Single Channel, Single Setpoint
X50DR - ( ) - ( ) - ( ) Single Channel, Dual Setpoint

- GP or HS Relay
- Input Range in °C (e.g. 0 to 300°C)
- 9 = 10 Ohm at 25°C Copper
  10 = 10 Ohm at 0°C Copper
  100 = 100 Ohm Platinum RTD
  120 = 120 Ohm Nickel RTD

- Engineering Units

X50S - ( ) - ( ) Single Channel, Single Setpoint with Adjustable Hysteresis
X50SS - ( ) - ( ) Dual Channel, Single Setpoint with Adjustable Hysteresis
X50D - ( ) - ( ) Single Channel, Dual Setpoint with Adjustable Hysteresis

- GP = General Purpose Trip Relay
  HS = Hermetically Sealed Trip Relay
- 01 = 1-5 mA Input
  04 = 4-20 mA Input
  10 = 10-50 mA Input
  1V = 0-1 Volt Input
  5V = 0-5 Volt Input
  10V = 0-10 Volt Input

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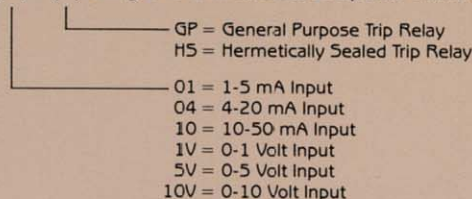
Reflash Modules

RFL4 - ( ) - ( )   4 Input Reflash Module, Contact Output
RFL4 - ( ) - ( ) - (1) 4 Input Reflash Module with Contact and Transistor Switch Output
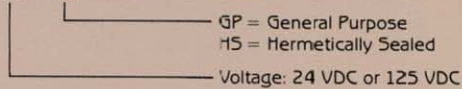RFL4 - ( ) - ( ) - (2) 4 Input Reflash Module with Contact Output, Manual Reset Output
RFL4 - ( ) - ( ) - (3) 4 Input Reflash Module with Contact Output, Open Collector Input

                GP = General Purpose
                HS = Hermetically Sealed
                Voltage: 24 VDC or 125 VDC

Auxiliary Contact Modules

X1216TC-1GP	1 Output Contact, General Purpose
X1216TC-2GP	2 Output Contacts, General Purpose
X1216TC-3GP	3 Output Contacts, General Purpose
X1216TC-4GP	4 Output Contacts, General Purpose
X1216TC-1HS	1 Output Contact, Hermetically Sealed
X1216TC-2HS	2 Output Contacts, Hermetically Sealed
X1216TC-3HS	3 Output Contacts, Hermetically Sealed
X1216TC-4HS	4 Output Contacts, Hermetically Sealed

Ground Fault Detector Module

GD - ( ) - ( ) - 1   P.C. Board Type Ground Detector

                GP = General Purpose
                HS = Hermetically Sealed
                Voltage: 24 VDC or 125 VDC
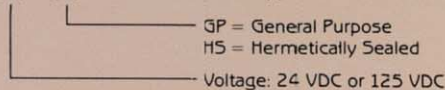
Motion Detector Modules

SS2137-GP	Loss of Motion Detection Module with Adjustable Time Delay and Sensitivity, GP Relay Contact Output
SS2137-HS	Same as above with HS Relay

Special System Requirements

Hazardous Areas

The Ronan Series X12 Alarm Systems are available with UL or CSA approval for use in Class I, Division 2, Groups A, B, C, D hazardous area classifications. These systems do not require purging for use in these areas. Contact the factory for assistance in specifying these systems.

Intrinsically Safe Systems

Ronan has a complete line of intrinsically safe X57 Barriers which may be integrated into X12 Systems. Contact the factory for assistance specifying these systems.
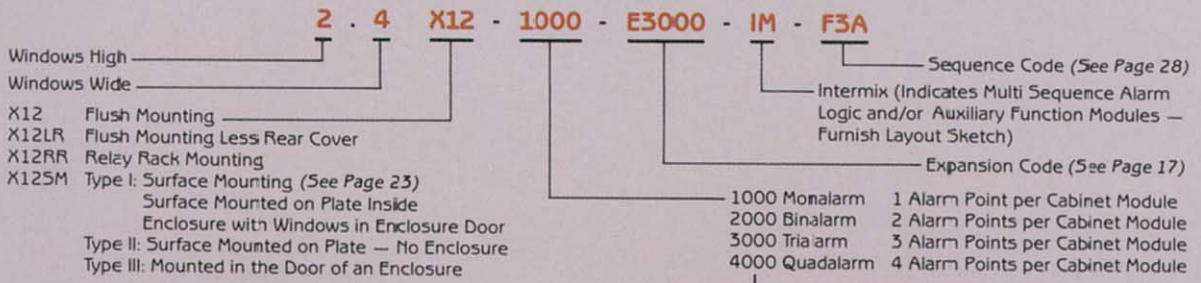
High Temperature Systems – X12-HT

A special Series X12 Alarm System is available for applications in extremely hot environments. Thorough testing and years of extended service in desert and oil field environments have shown that these systems operate reliably in ambient temperatures of up to 185°F (85°C). The X12HT Series features teflon insulated wiring, hermetically sealed ceramic integrated circuits, special high temperature electronic components, gold plated printed circuit board connectors and anti-fungus coating on all P.C. boards. High temperature hermetically sealed Military Specification type relays with operating ambient temperature range of up to 257°F (125°C) are utilized. All model numbers need HT identifier to assure compliance with the high temperature requirement.

TYPICAL ORDERING INFORMATION

X12 Series Window Model

QTY	

2 . 4 X12 - 1000 - E3000 - IM - F3A

Windows High ──────┐
Windows Wide ──────┐

X12   Flush Mounting
X12LR   Flush Mounting Less Rear Cover
X12RR   Relay Rack Mounting
X12SM   Type I: Surface Mounting *(See Page 23)*
        Surface Mounted on Plate Inside
        Enclosure with Windows in Enclosure Door
        Type II: Surface Mounted on Plate — No Enclosure
        Type III: Mounted in the Door of an Enclosure

Sequence Code *(See Page 28)*

Intermix (Indicates Multi Sequence Alarm Logic and/or Auxiliary Function Modules — Furnish Layout Sketch)

Expansion Code *(See Page 17)*

1000 Monalarm	1 Alarm Point per Cabinet Module
2000 Binalarm	2 Alarm Points per Cabinet Module
3000 Trialarm	3 Alarm Points per Cabinet Module
4000 Quadalarm	4 Alarm Points per Cabinet Module

System Details

Cabinet Modules *(See Page 23)*

( ) . ( )X12SM-( )	Nema (4 or 12) Enclosure (Specify Accessories Mounted Integral) *(See Page 27)*
LM ( )-24	Lamp Module (1-4 Alarm Points per Module) *(See Page 16)*
LM ( )-24-(Color)	LED Lamp Module (1-4 Points per Module). Specify Color: Red, Green or Amber

Support Modules

FHD24-( )-( )-( )	Flasher/Horn Driver Module (Order One per 150 Points) *(See Page 29)*
RF-24-1	Filter Module (Order One per 50 Points, One per 36 Points 1000 Series)
RF-24-2	Additional Filter Module (Order One per 50 Points, One per 36 Points 1000 Series)

Alarm Modules

Alarm Sequence Module *(See Pages 14, 15 and 28)*

Auxiliary Function Modules

X50 __ ( )-( )-( )	Analog Trip Module *(See Page 29)*
RFL4-( )-( )-( )	Reflash Module *(See Page 30)*
X1216TC-( )	Auxiliary Contact Module *(See Page 30)*
GD-( )-( )-1	Ground Fault Detector Module *(See Page 30)*
552137-( )	Motion Detector *(See Page 30)*

Accessories

X12P ( )	Integral Pushbutton (One Station per Cabinet)

2, 3A, 3B or 4 (Test, Silence, Acknowledge, Reset) *(See Page 16)*

202B	Pushbutton — External or Nema Enclosure Mounted — General Purpose *(See Page 27)*
X13P1NO	Pushbutton — External or Nema Enclosure Mounted — Class I, Division 2 *(See Page 27)*
KRP-24	Horn Relay — General Purpose Type *(See Page 27)*
KR-7272	Horn Relay — Class I, Division 2 *(See Page 27)*
146-103	Socket for Horn Relay *(See Page 27)*
	Horns *(See Page 27)*
	Bells *(See Page 27)*
	Chimes *(See Page 27)*
	Power Supply/Inverter (Order as Required) *(See Page 19)*
	Enclosure — Specify Size and Type *(See Page 21)*
	Watertight Door — Specify Size and Type *(See Page 27)*

Options

- Gold Plated Printed Circuit Connectors
- Fungus-Proof Coating
- Sandwich Lenses (Specify Colors)
- Color Lenses (Specify Colors)
- Ground Fault Isolation Switch
- System Air Purge
- Intrinsically Safe Inputs (FM Approved) *(See Page 30; Also See Catalog 15-Systems)*
- Special High Temperature System (185°F/85°C) *(See Page 30)*
- Electrical Classification — Cl. I, Div. 2, Gr. A, B, C, D

![RONAN logo]