



# Omni16R Rack Mount Alarm System

Model C1680A 19inch Rack Mount Alarm Annunciator System.

DATASHEET

## Features

- Compact 19 inch rack construction
- Up to 320 alarm points in a single 3U rack
- Up to 960 alarm points in a single system
- Dual 24Vdc Powered with failure detection
- SIL certified for safety critical alarms
- Fully "DIP" Switch Configurable
- 21 Standard Sequences
- Additional advanced software configuration options
- Volt-free contact inputs
- Four function Group Alarm output contacts
- Motor Alarm Sequence and Timer options
- Optional internal repeat relay outputs
- Optional Serial Port - Modbus/PLC compatible



### SIL Rated Rack based Alarm Annunciator

The Omni16R alarm annunciator builds on the successful Omni16C by offering a repackaged version of this field proven annunciator for 19 inch rack mount applications.

Combined with the C1670A series remote displays, the Omni16R allows high density SIL rated alarm systems to be constructed for safety related applications.

### Flexible Configuration

The inputs accept potential free contacts and are individually DIP switch configured for N.O. or N.C. operation. Inputs and outputs are wired to terminals at the front or rear of the annunciator, depending upon the configuration selected. The alarm sequence for the inputs is also configured by DIP switch with a choice of 21 standard sequences in groups of 8.

### Flexible Alarm Groups and Repeat Contacts

Up to 64 Omni16R 16 point Alarm Cards may be connected to a Common Services Card, providing four Group Alarm relays, control pushbutton interface and serial port interface. Any number of Common Services Cards may be fitted to a system to suit the grouping of alarms required.

Input/Alarm repeat output contacts can be provided, available on terminals on the front or rear of the 19 inch rack, as required.

### No Master Module

Each Omni16R Alarm Card is a complete stand-alone 16 point alarm annunciator in its own right with its own watchdog and alarm processor. This reduces single points of failure in the system and increases system reliability.

### Field Proven SMART Annunciator Technology

The technology in the Omni16R is identical to the Omni16C, providing the benefit of years of field experience and a qualified reliability rating unsurpassed in the world.

By utilising the identical "SMART Alarm" technology proven and certified in the industry standard Omni16C, the Omni16R provides the only SMART rack based alarm annunciator in the world certified to IEC61508 for safety critical alarms.

### Proven Upgrade Path to Legacy Systems

The flexibility of configuration and mounting make the Omni16R an ideal upgrade solution for your legacy alarm systems, such as the Highland MPAS90, Robinson and Rochester Alarm Systems.

IEC 61508 precludes the use of equipment in safety critical applications that are passed their design life cycle, and continuing to operate such equipment places such safety systems at risk.



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## SPECIFICATIONS

### Power Supply

Voltage	24Vdc $\pm$ 15%
Current	Current Requirements are calculated as follows: 0.1 Amps per 16 point Alarm Logic Card 0.17 Amps per 16 point Repeat Relay Card 0.2 Amps per Common Services Card Add Current required per Alarm Window
Current Max	16 Amps Maximum allowed per Alarm Rack
Redundancy	Dual Supply inputs with monitoring allow dual redundant power supply system configurations for high reliability and availability

### 19 inch Rack Configuration

3U Sub-Rack Option	<b>C1679A(-0)</b>	<b>C1679A-1</b>
Mounting	19 inch Rack **	Surface mount
Terminal Access	Front &/or Rear	Front Only
Number of Cards	21 Card Slots per 3U sub-rack	
Slot Allocation	Any card type can be fitted in any slot. See system configuration guide for slot allocation when designing a system.	

### Alarm Inputs

Quantity and Type	16 Inputs per Alarm Logic module
using C1688A-1 T/Board	Potential Free Contact Inputs (Front)
using C1690A T/Board	Potential Free Contact Inputs (Rear)
using C1691A T/Board	Common Positive Inputs (Rear)
using C1691A-0 T/Board	Common Negative Inputs (Rear)
Open circuit Voltage	28Vdc Maximum
Closed circuit Current	4mA per input circuit nominal
Max. Loop Resistance to detect closed contact	200 ohms
Min. Loop Resistance to detect open contact	100 kohms
Fault Protection	With default common positive inputs, the system is designed to fail safe with input earth fault condition: The faulted input will alarm, and no other alarm input will be affected.
Isolation: PSU to inputs	None as standard. Opto-isolated inputs available using Model C1692A terminal board.
Input Scan Rate	4 milliseconds
Pulse Rejection	<4ms pulses guaranteed to reject
Pulse Detection	>8ms pulses guaranteed to detect
Connections	Via Local Terminals (using terminal boards front or rear mounting) Or via 20 Way Ribbon Cable to remote terminal boards

### Lamp Outputs

Voltage	24Vdc nominal
Current	63mA maximum per window (maximum of 320 windows per rack)
Polarity	Positive Common – switch to 0V
Type	Model C1670A Remote Display recommended

### Control Pushbuttons

Quantity	Four per Common Services Card
Functions	Silence; Acknowledge; Reset; Test

Max. Open cct Voltage	28Vdc
Closed Circuit Current	4 mA per input circuit nominal
Type	Switch to 0V to activate

### Group Alarm Relay Outputs

Quantity	Four per Common Services Card
Functions	1. Watchdog (Form A) 2. Horn (Form A) 3. Group Alarm (selectable) (Form C) 4. Group Alarm (selectable) (Form C)
Contact Rating	1A 30Vdc
Isolation	250Vac Test Voltage (30Vdc operating)
Max. Number of Alarms	Up to 64 Alarm Cards per Common Services Card.

### Repeat Relay Contact Outputs

Contact Type	Potential free normally Open (Form A) Switch to common per alarm card.
Contact Rating	0.25A 30Vdc
Isolation	250Vac Test Voltage (30Vdc operating)

### Temperature Range

Operating Temperature	0°C – 60 °C (+32°F – 140°F)
Storage Temperature	-10°C – 70 °C (+14°F – 158°F)

### Weight

C1679A Rack (empty)	2.3kg
Plug-in Modules	Approximately 150g per module.

### Compliance to Standards

Safety	EN 60950:1995
Emissions	EN55011:1997 Grp I Class A
Immunity – ESD	IEC 61000-4-2:2001, level 3
Immunity – RF Fields	IEC 61000-4-3:2003, level 3
Immunity – Fast Transients	IEC 61000-4-4:2004 2 kV – DC power port 1 kV – input/output lines
Supply Variations	IEC 61000-4-7 : 24 V dc +15% -10%
Vibration	IEC60068-2-6 : 10-150Hz. 1g

### Sequence Options

Seq No.	Sequence Description
1	LAMP FOLLOWS INPUT
2	MOMENTARY (FLEETING) ALARM, MANUAL RESET
3	ALARM ONLY (NON-LATCHING INPUTS) AUTO RESET
4	MOMENTARY ALARM, MANUAL RESET WITH ALARM RINGBACK
5	FIRST OUT, MULTIPLE GROUPS, MANUAL RESET
6	FIRST OUT, MANUAL RESET, AUTO RESET ON SUBSEQUENT ALARMS
7	FIRST OUT, SINGLE GROUP, MANUAL RESET, FIRST OUT CONTINUOUS FLASH
8	FIRST OUT, MANUAL RESET, SUBSEQUENT ALARMS WITHOUT HORN
9	MOMENTARY ALARM, MANUAL RESET, AUTO SILENCE AFTER TIME DELAY.
10	MOMENTARY ALARM, MANUAL RESET, REALARM AFTER TIME IF STILL ABNORMAL.
11	MOMENTARY ALARM, MANUAL RESET, CONSTANT FLASH (FOR MOTOR ALARMS).
12	MOMENTARY ALARM, MANUAL RESET, CONSTANT FLASH (FOR MOTOR ALARMS).
13	MOMENTARY ALARM, MANUAL RESET, CONSTANT FLASH (FOR MOTOR ALARMS).
18	MOMENTARY ALARM, AUTO RESET, TIME DELAY ON RETURN TO NORMAL.
21	PULSE MONITORING ALARM; MANUAL RESET
23	MOMENTARY ALARM, AUTO RESET
24	FIRST OUT, MULTIPLE GROUPS, AUTO RESET
25	FIRST OUT, SINGLE GROUP, AUTO RESET, FIRST OUT CONTINUOUS FLASH
26	FIRST OUT, AUTO RESET, SUBSEQUENT ALARMS WITHOUT HORN
27	MOMENTARY ALARM, AUTO RESET, AUTO SILENCE AFTER TIME DELAY.
28	MOMENTARY ALARM, AUTO RESET, REALARM AFTER TIME IF STILL ABNORMAL.
30	MOMENTARY ALARM, AUTO RESET, CONSTANT FLASH (FOR MOTOR ALARMS)
31	PULSE MONITORING ALARM, AUTO RESET

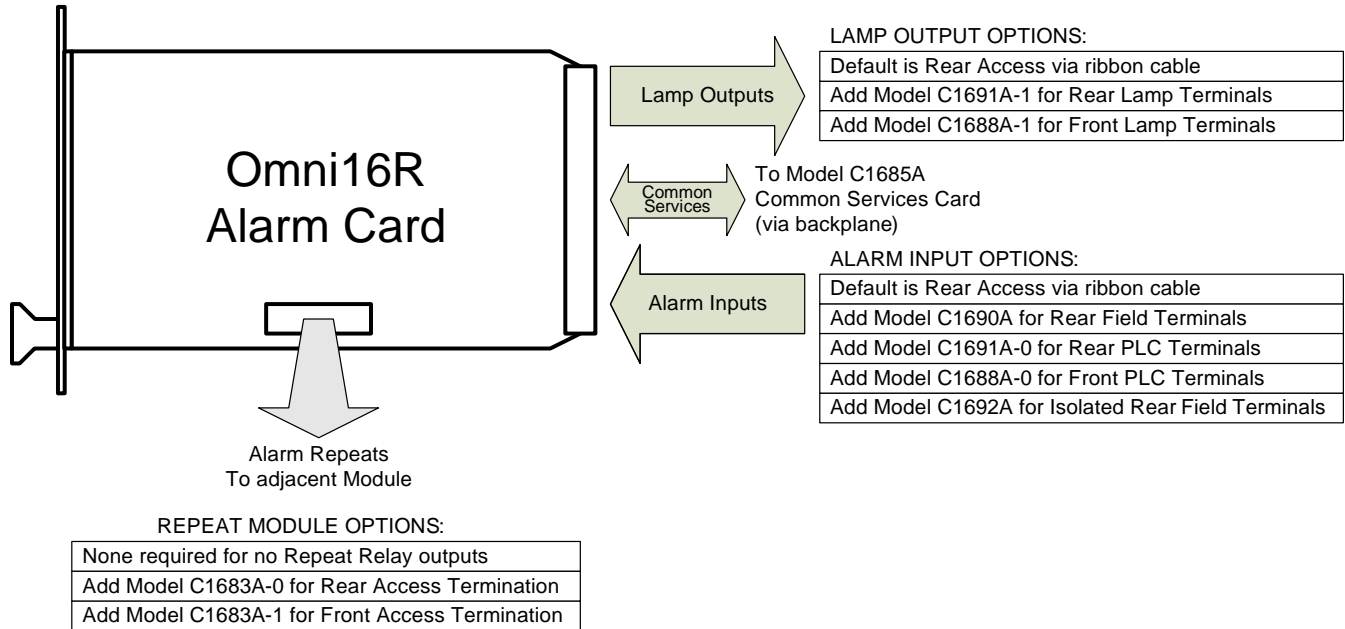


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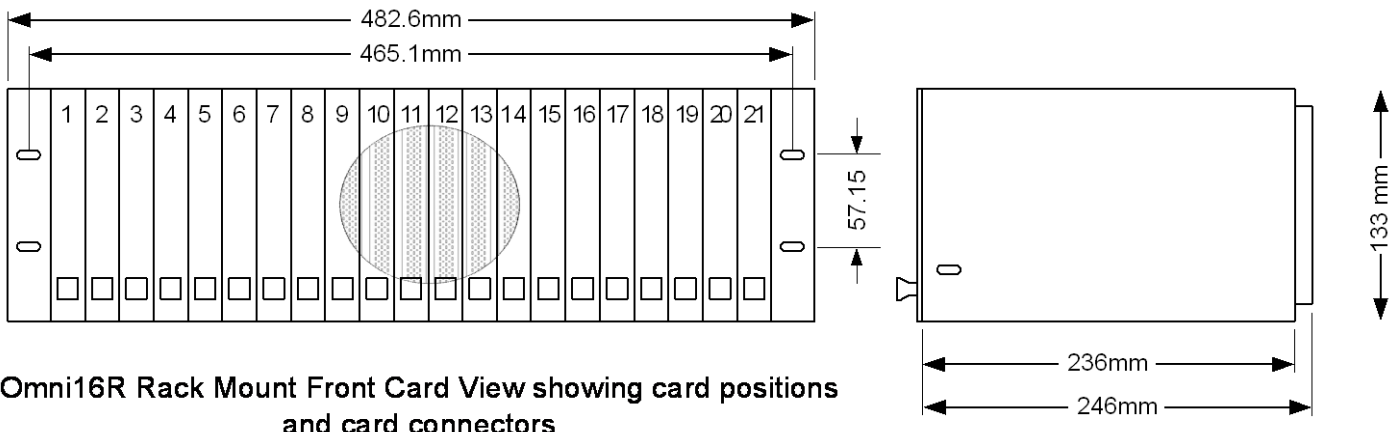
Model C1680A 19inch Rack Mount Alarm Annunciator System.

## SYSTEM ARCHITECTURE

Each Omni16R system is designed around multiple C1680A 16 Way Alarm Cards:



## MECHANICAL CONFIGURATION – RACK MOUNT

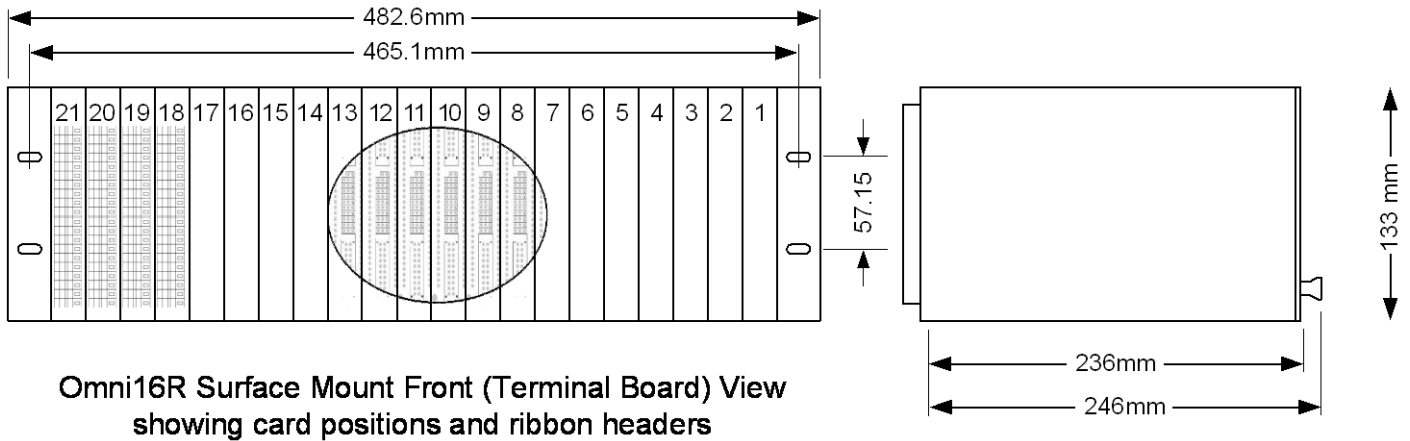




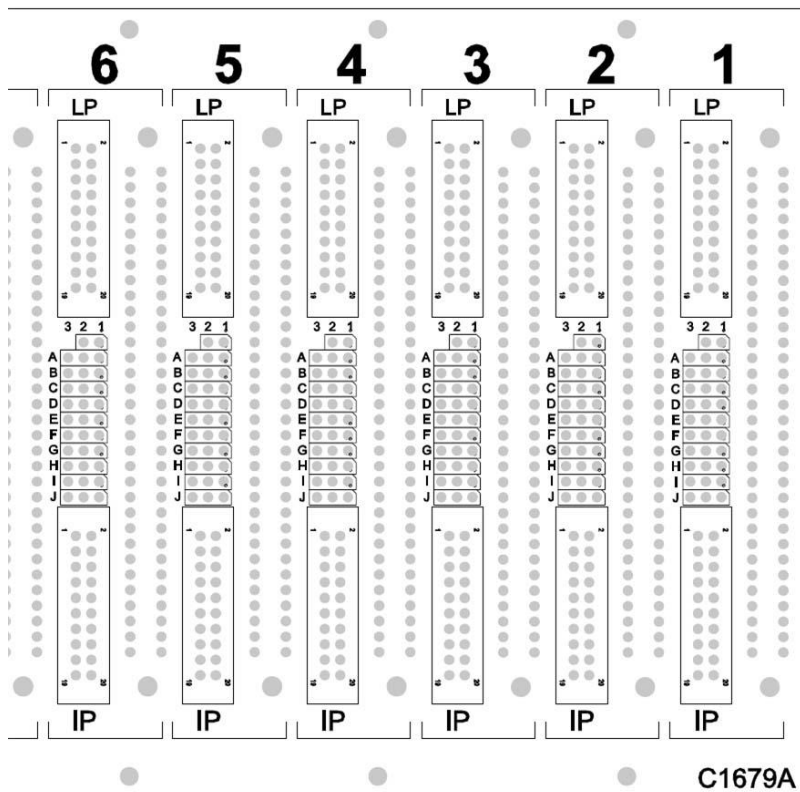
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## MECHANICAL CONFIGURATION – SURFACE MOUNT



## MOTHERBOARD LAYOUT (RACK MOUNT REAR VIEW / SURFACE MOUNT FRONT VIEW)



Motherboard Rack Mount Rear View / Surface Mount Front View showing Input (IP) and Lamp (LP) 20 Way Ribbon Terminations, and link field for option selections for each card slot.



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OMNI16R SYSTEM MODULE LIST		
Model	Description	Comments
<b>19 inch Sub-Racks</b>		
C1679A-0	Omni16R 19 inch sub-rack	<ul style="list-style-type: none"> <li>Mounts in an IEC60297 19 inch Rack.</li> <li>Sub-rack required 3U rack space, although it is common to allow space above and/or below the sub-rack for cabling access.</li> </ul>
C1679A-1	Omni16R surface-mount sub-rack	<ul style="list-style-type: none"> <li>This is identical to the C1679A-0 sub-rack for 19 inch rack mounting, but the side plates are reversed to provide the ability to surface mount the sub-rack.</li> <li>Typical surface-mount systems use front only access to terminals, although access to input and lamp ribbon cables on the rear of the sub-rack is still possible where remote termination is required.</li> </ul>
OMNI16R SYSTEM MODULE LIST (continued)		
Model	Description	Comments
<b>3U Cards</b>		
C1680A	Omni16R 16 Way Alarm Card	<ul style="list-style-type: none"> <li>One required for every 16 alarm points</li> </ul>
C1683A-0	Omni16R 16 Way Repeat Relay Card with rear access	<ul style="list-style-type: none"> <li>Adds 16 Repeat Relay outputs to a C1680A Alarm Card.</li> <li>Occupies the slot directly to the right of the Alarm Card.</li> <li>Relay Contacts available through the rear of the sub-rack.</li> </ul>
C1683A-1	Omni16R 16 Way Repeat Relay Card with front terminal access	<ul style="list-style-type: none"> <li>Adds 16 Repeat Relay outputs to a C1680A Alarm Card.</li> <li>Occupies the slot directly to the right of the Alarm Card.</li> <li>Relay Contacts available through plug-in terminals on the front handle of the card and through the rear of the sub-rack.</li> <li>Relay contacts share a single common terminal per 8 relays.</li> </ul>
C1685A	Omni16R Common Services Card	<ul style="list-style-type: none"> <li>One required for every Pushbutton Group and Group Alarm group. Up to 64 Omni16R Alarm Cards can be connected to a single Common Services Card.</li> <li>Use with Model C1695A or C1687A Terminal Boards.</li> </ul>
C1686A	Omni16R 16Way Front Access Power Input Termination Card	<ul style="list-style-type: none"> <li>Brings Power Input Termination to the front of the sub-rack</li> <li>Occupies one card slot.</li> </ul>
C1687A	Omni16R 16Way Front Access Common Services Termination Card	<ul style="list-style-type: none"> <li>Brings Common Services Termination to the front of the sub-rack</li> <li>Occupies one card slot.</li> </ul>
C1688A	Omni16R 16 Way Front Access I/O Termination Card	<ul style="list-style-type: none"> <li>Brings I/O termination to the front of the sub-rack</li> <li>Occupies one card slot.</li> <li>Provides 16 I/O terminals plus two common terminals.</li> <li>Common terminals can be +24Vdc or 0V for inputs or +24V only for outputs.</li> </ul>
<b>Terminal Boards</b>		
C1690A	Omni16R Input Terminal Board	<ul style="list-style-type: none"> <li>Two terminals provided per input (two columns of 16)</li> <li>Designed for potential free contact inputs.</li> <li>Occupies two card slots equivalent width on rear (40.6 mm).</li> <li>This is the standard input terminal board.</li> </ul>
C1691A-0	Omni16R Input Terminal Board (negative common)	<ul style="list-style-type: none"> <li>One terminal provided per input with two 0V common terminals.</li> <li>Occupies one card slot equivalent width on rear (20.3 mm).</li> <li>Use this terminal board with PLC outputs that switch to 0V.</li> </ul>
C1691A-1	Omni16R Input/Output Terminal Board	<ul style="list-style-type: none"> <li>One terminal provided per input/output and two +24V terminals.</li> <li>Use this terminal board with PLC outputs that switch to +24V or</li> <li>Use for lamp outputs, with common connected to +24Vdc</li> <li>Occupies one card slot equivalent width on rear (20.3 mm).</li> </ul>





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C1692A	Omni16R Isolated Input Terminal Board (Special Order Only)	<ul style="list-style-type: none"><li>○ One terminal provided per input and two +24V terminals.</li><li>○ Each input individually isolated</li><li>○ Use this terminal board with PLC inputs that switch to +24V or 0V</li><li>○ Occupies two card slots equivalent width on rear (40.6 mm).</li></ul>
C1695A	Omni16R Common Services Terminal Board	<ul style="list-style-type: none"><li>○ One required per Common Services Card.</li><li>○ Brings all common services functions to the terminals.</li><li>○ Occupies one card slot equivalent width on rear (20.3 mm).</li></ul>
C1696A	Omni16R Power Supply Terminal Board	<ul style="list-style-type: none"><li>○ One required per Model C1679A 19inch sub-rack.</li><li>○ Provides dual power input terminals</li><li>○ Provides one DB9 connector for RS485 communications</li><li>○ Occupies one card slot equivalent width on rear (20.3 mm).</li></ul>