

QE20

Emergency Warning System

Consultant Specification



DOCUMENT: LTXXXX

Issue 1 1 March 2023

QE20 is a product of

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Some of the operation of QE20 Emergency Warning System as described in this manual is dependent on site-specific configuration performed by the field engineer. If the configuration is not well-designed, then operation may differ from this manual and compliance to local installation standards may be invalidated.

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| - W A R N I N G - This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures. |

# General Requirements

The EWCIE and EICIE shall be a Vigilant QE20 system or equivalent product.

The Emergency Warning Control and Indicating Equipment (EWCIE) shall generate and control audible warning signals via dedicated amplifiers and loudspeakers covering each level, or zone of a building. Supplementary Visual Alarm Devices (VAD – flashing beacons) shall be located in areas where the background noise levels are high or hearing-impaired people are often present. The EICIE shall provide Warden phone communication and manual emergency activation via MCPs.

The EWCIE and EICIE design shall allow for 10% additional capacity.

The EWCIE shall use D class amplifiers. Support for a range of standby amplifier arrangements shall be available - from one standby amplifier for all zones in the panel, to each zone having its own standby amplifier.

The EWCIE, as standard, shall provide AS 4428.16 audible Alert and Evacuate tones, recorded messages and signals. The system shall be capable of selecting different Alert and Evacuate signals (messages) for each zone using a range of audio file formats Up to 200 messages, totalling ~120 minutes of audio storage, shall be available.

Automatic evacuation phasing sequences shall be provided to AS 4428.16. Customer-preparable evacuation sequences shall be definable using Microsoft Excel and importable into the configuration. The cascade and EWCIE operation shall be testable on a simulator prior to site installation to avoid disruption of site occupants.

The EWCIE shall be capable of accepting hard contact FIP alarm signals for low quantities of zones, as well as high-level zone alarm triggering from a co-located Simplex 4100ESi or Vigilant *MX1* Fire Alarm Control Panel.

The EWCIE shall be capable of being programmed for alarm delays for each emergency warning zone before entering the emergency condition as per AS4428.16.

Manual control shall be provided as per AS4428.16 for:

* Activating individual or All zones for Alert, Evacuation and PA Speech
* Individual warden phones, All Call, All Manned, and All Clear.
* Disabling and enabling zones
* Silencing of emergency warning tones and outputs
* Testing alarm input signals and manual controls for emergency zones. Facilities to speed up the phasing shall be available.

Combining a MX1 or Simplex Fire Alarm Control Panel with the EWCIE and EICIE shall be possible if the design permits.

Shallow cabinet EWCIE shall be installed as indicated on the drawings for secondary control points. Full control and indication shall be included to provide a backup control and indication facility.

The system shall be non-proprietary, allowing different contractors to be engaged for the installation and service of the system, and shall come with a 3-year manufacturer’s warranty subject to the manufacturer’s terms and conditions.

The system shall have full manufacturer’s support for installation, spares, upgrades, and programming as required.

The installation contractor shall provide, install, test, program, and commission the EWCIE as specified herein and as shown on the tender drawings. The system shall include all required hardware, interconnecting wiring and configuration to accomplish the requirements of this specification and the tender drawings, whether itemised or not.

# Applicable Standards

The EWCIE components and related field devices shall meet the requirements of a grade 1 system in accordance with the following standards as applicable to the system design.

* AS1670.4 2018 Fire Detection, Warning, Control and Intercom Systems – System design installation and commissioning. Part 4: Emergency Warning and Intercom Systems.
* NZS4512 Fire Detection and Alarm Systems in Buildings (New Zealand installations)
* AS4428.16 Emergency Warning CIE
* AS4428.4 Emergency Intercom CIE
* AS7240.4 PSE Power Supply
* AS7240.23 Visual Alarm Devices
* AS7240.24 Fire Alarm Loudspeakers
* AS7240.11 Manual Call Points, White in Colour
* IEC62368-1 Audio Video information and communication technology equipment-

Part 1 Safety Requirements

* AS/NZS 60950-1 Information Technology equipment Safety, Part 1 General Requirements
* AS1851 Maintenance of Fire Protection Equipment
* AS3000 Electrical Installations
* NCC National Construction Code of Australia

Certification of compliance to the applicable standards for all CIE and related field equipment by an approved listing authority shall be provided.

# System Components

The EWCIE and EICIE shall consist of:

* The System in modular, Titania colour, 19” rack mounting cabinets, of either 28U or 40U rack-mounting capacity with the specific combination of cabinets and modules selected to meet the site requirements. The modules shall be mounted on mounting frames fastened to the rear wall of the cabinet, but removeable to allow field wiring cables to be run behind.

The cabinet shall contain a Fan Cooling Module if the total load of all amplifiers in the cabinet requires this. The Fan Cooling Module shall not occupy any rack or module space.

* The Master User Interface (MUI) containing a master keyboard and LED indicators for the System, including All-Zones controls and indications along with a touchscreen for user functions, diagnostics, and recall of system information. Recalls to display the current faults, up to 10000 time-tagged history events, current status, system details, and module firmware versions shall be available. The volume of each 100V amplifier output shall be changeable on site, with the results stored in non-volatile storage and automatically incorporated in the site configuration when this is next changed. Activation of a test tone for each amplifier output shall be available. Eight user buttons and indicators shall be available for configuration of specific functions, like activation of lockdown signals, test messages, and background music. Programmable functions for each zone shall be available for message activation, background music control, etc.
* User Interface Extender Modules shall be used to provide individual zone Alert, Evac, Speech and Disable controls, Alarm, and Fault indications. Also at least 3 WIP controls and indications, along with Zone Manned and Zone Cleared Controls and indications, shall be available for each zone. The arrangement of the zone controls shall be configurable to match a building layout (zone order up, down, or random, with zone & WIP controls combined or separated).
* The Controller or Master CPU shall provide the following external connections:
  + Four audio inputs with pre-programmed background music and paging functions.
  + One RS232 and one RZDU port for high-level zone alarm triggering from co-located Simplex 4100ESi or Vigilant *MX1* Fire Alarm Control Panels.
  + A port for connection of up to 16 external paging or PC-paging consoles.
  + One normally-energised Fault relay (reconfigurable for other functions)
  + One normally-energised general purpose relay configurable for its function
  + Four non-isolated inputs with 4-states each for general purpose functions.
  + Four non-isolated open-collector outputs with optional load supervision for programmable functions.
  + A serial port for a Modbus master (RS422, RS485 or Modbus over TCP shall be available).
* Amplifier choices of 25, 60, 120, and 240 Watt RMS D-class amplifier modules. Multiple amplifiers may be allocated to individual zones for greater power. Each amplifier shall have the ability to be independently fed audio from:
  + The four common audio inputs, local PA microphone, PA from another networked panel.
  + Local audio input(s) on the amplifier module itself.
  + Stored digitised audio files on the amplifier module.

Each amplifier output shall include a general purpose programmable output, providing as default 24V DC to fail-safe volume attenuators, switching off when the amplifier output is activated, except for background music.

Synchronisation of the Alert, Evacuate and other emergency signals shall be available for all amplifiers in the EWCIE and for selected signals transmitted over the network.

* 100V Output Splitter Modules to split an amplifier’s 100V Output into 4 short-circuit isolated 100V loudspeaker feeds for different areas of an evacuation zone. Multiple modules shall be capable of being daisy-chained so that more than 4 speaker feeds are available.
* WIP/Input Modules each providing up to twenty (20) input circuits, each of which may be used for:
  + Connecting field Warden phones (WIPs) – with optional “Manned” pushbutton or alarm-activating manual call point (MCP)
  + Alarm-activating MCPs
  + FIP alarm inputs for activation of the EWCIE, or
  + General purpose 4-state inputs available for programmable logic.

Specific inputs shall be programmable for the Master WIP on the EICIE and for connection of an “intercom” WIP that allows voice communication between two locations over the network.

* Relay Output Modules (ROM) providing dual-polarity, switched 24V 1A, supervised outputs to control Visual Alarm Devices (VADs) and clean contact on/off relay outputs. Each ROM shall be capable of providing 8 VAD outputs and 8 clean-contact relay outputs configurable for normally-open (NO) or normally-closed (NC) operation. Unused VAD outputs shall be configurable for relay operation if not needed as VAD outputs. The flashing of the VADs on each output shall be synchronised.

# Networking

Networking shall be provided if required by the design or shown on the drawings.

Networking shall be used for linking multiple EWCIE and/or EICIE panels or remote equipment racks together. The contractor shall provide a basic block diagram or network plan of the panels showing locations, interconnecting wiring, and contents of each panel.

Each networked panel or equipment rack shall retain local control of its own facilities and shall continue to operate if network communication is lost due to a break or other faults.

Network cabling shall be:

* Copper- Fire-rated screened (preferably twisted) maximum cable length 1200m.
* Multi-mode fibre with SC connectors up to 3km between EWCIE or
* Single-mode fibre with SC connectors up to 50km between EWCIE.

Each network module shall provide

* + two isolated RS485 ports with 4-wire (separate TX/RX) / 2-wire connections and optional earth fault supervision, wired in a ring configuration.
  + Two network audio connections for Speech and WIP audio, wired as two busses between panels and providing redundancy for each other.
  + Two non-isolated GP inputs and open collector outputs for general functions.

The network architecture and wiring shall be capable of supporting:

* 64 network nodes intercommunicating with each other
* Up to 255 nodes to a Modbus master or colour graphics system on a fibre ring.

The network shall be connectable to “Vigilant” Panel-Link compatible fire alarm panels or EWCIE.

# Peripherals

The EWCIE and EICIE shall be compatible with a range of peripheral devices such as loudspeakers, Warden Intercom Points (WIP), Manual Call Points (MCPs), and Visual Alarm devices (VADs).

Speakers

The quantity of speakers used shall be sufficient to meet the speech intelligibility requirements of AS1670.4 in each applicable zone.

Speakers shall be 100V rated with adjustable power tapping to suit the required location and SPL. Wiring to each speaker zone shall be supervised using an End Of Line (EOL) device. Wiring as two speaker branches shall be available.

VADs

VADs shall be installed in areas designated for persons with hearing impairment, if the background noise is greater the 85 dB, if hearing protection devices are generally worn, or if audio warning cannot be used as per AS 1670.4

Alert and Evacuate VADs shall be capable of being wired on the same cable pair, with one polarity for Alert and the other polarity for Evacuate. VADs that flash white shall be used for Alert and that flash red for Evacuate.

WIPs

Warden Intercom Point phones complying to AS4428.4 shall be installed as shown on the drawings

The WIP shall be located to enable the warden to readily control the evacuation of the building occupants in an emergency. The location of the WIP shall be as designated on the drawings or as defined in AS 1670.4.

Wiring shall be fire rated and use screened cable to prevent interference. The polarity of the wiring shall be maintained, and the EOL device shall be fitted at the WIP.

MCPs

White MCPs (complying with AS 7240.11 other than being red) shall be wired on the same cable pair as the WIP. The MCPs shall be used to create a non-fire emergency alarm condition. The MCP shall be co-located with the WIP and the EOL device fitted inside the MCP.

# Specifications – EWCIE/EICIE

The EWCIE/EICIE shall meet these specifications at a minimum.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Panel Size: | 28U | 40U | Double 28U | Double 40U |
| Height (mm) | 1330 | 1863 | 1330 | 1863 |
| Width (mm) | 575 | 575 | 1150 | 1150 |
| MECP Depth (mm) | 388 | 388 | - | 388 |
| SECP Depth (mm) | 213 | 213 | 213 | 213 |
| Maximum number of zones with: | |  |  |  |
| 25W RMS Amps | 28 | 40 | - | 80 |
| 60W RMS Amps | 20 | 32 | - | 64 |
| 120W RMS Amps | 10 | 16 | - | 32 |
| 240W RMS Amps | 5 | 8 | - | 16 |
| WIP Zones (max) | 56 | 56 | 120 | 120 |
| SECP Zones (max) | 56 | 56 | 120 | 120 |

Number of Zones 224 zones on User Interface – up to 600 zones internally

Number of Network Nodes 64

Operating Temperature -5°C to 45°C, up to 95% RH non-condensing

Cabinets 28U, 40U 19” Rack mounting, body 1.6mm m/s

Depth 388mm standard, 213mm shallow

Colour, finish Dulux Titania Ripple, 288 1235Z

Power Supply Mains Supply; 230-240V AC 50Hz; 4.2A per PSE

DC Output per PSE 26V @ 27A peak, non-continuous.

Charging Current 2.5A nominal per PSE

Battery Capacity Up to 150AHr per cabinet (with 4 PSE)

Heat Generation (max quiescent) 28U: 150W; 40U: 250W

Audio Inputs 4 on Controller, up to 4 per Amplifier Module

Input Type Balanced; transformer / capacitor isolated

Input Level 315mV rms; 1.4V rms max.; 10K input impedance

Common Mode Rejection >33dB

Emergency Speech Microphone Noise-cancelling, front panel mounted

Automatic Level Control 30dB dynamic range

Amplifier modules Quad 25W, Quad 60W, Dual 120W, 240W

Max Number 56 modules per panel

Output Voltage 100V rms @ 1kHz sine wave

Efficiency >70%

100V Line Supervision 56K/100K EOL Single / Dual branch

Max Capacitive Load 200nF

Frequency Response 215Hz – 8400Hz (+-3dB)

Signal To Noise (SNR) >75dB(A)

Total Harmonic Distortion <0.25%

Message Storage

Total Message Storage 200 messages totalling ~120 minutes

Play Capability Any message to any zone output

GP Inputs 20 per WIP/Input; 4 on Controller; 2 on each RS485 /Net, 4 on MUI

Input Range; EOL 0-30Vdc; 10k, 4 states

GP Outputs 4 on Controller; 2 on each RS485 Network; 4 on MUI

Output Current 100mA < 1V on; 30Vdc off; Load supervised > 12V

Relay Outputs 2 on Controller, up to 16 on Relay Output Module

Rating NO/NC relay contact; 2A @ 30V dc resistive

Amplifier GP Outputs 4 x Amplifier Module

Output Voltage 24Vdc @ 100mA; Optional load Supervision

Visual Alarm Outputs 8 x Relay Output Module

Rating 24V Dual Polarity 1A max; 2k7 EOL supervised

WIPs up to 320 WIPs (20 per WIP/Input Module; up to 16 modules)

WIP Handset Vigilant FP0938

Ring Volume >80 dB(A)

Co-located Input Parallel wired MCP or “Zone manned” switch

Supervision 10k EOL

Wiring 1km of screened cable

FIP Inputs Use WIP/Input Modules

High Level Links Vigilant RZDU, Vigilant Panel-Link, Simplex 4100ESi Computer Port

Max Input Points 320 via WIP/Input; 528 via RZDU, no practical limit via Panel-Link; 600 via Computer Port Protocol