

Central Equipment - System Support - Hardware

AE4000 Series

The Questek AE4000 Series Central Equipment System Support Hardware Unit provides the Questek Nurse Call System power supply and the interface between the Computer and the Questek Nurse Call Input Network and the full range of input and output devices. There are a number of options that are added to the basic unit to configure it for each specific application.

LARGE NURSE CALL SYSTEM and DEMENTIA SYSTEMS

SUPPORT HARDWARE

AE4000 Is the basic nurse call system Support Hardware that includes:

- A system power supply.
- A Data Interface Module (DIM) network interface control unit (CNNI) for up to 127 Vigil rooms or 2000 inputs. This unit includes annunciator driver interface unit (RS232 to RS485 converter / driver)

AE4000 series are all housed in a single wall mounted steel case. The case is 268mm wide x 380mm high x 73mm deep. When the number of options ordered exceeds the space in a single case, a second case is supplied.



This picture is the interior of an AE4000 with AE420M paging system module.

The picture shows:
the 150Watt Switch mode power supply on the left,
the paging transmitter at the top,
the paging encoder module in the centre right and
the Communications interface (CNNI) on the bottom right.

The actual modules included in the AE4000 case varies with the requirements of the system.

DESCRIPTION of the BASIC AE4000

The AE4000 houses the nurse call system power supply. The power supply is a 150-watt switch mode unit. It can accept mains inputs from 90VAC to 260VAC from 40 to 70Hz. Its output is 15 volts DC at up to 10 AMPS. In the AE4000 this power supply is adjusted to 13.8 Volts DC to drive the nurse call system and the AE402M battery backup module if that option is selected.

The second unit in the AE4000 is the Nurse Call Communications network interface (CNNI). It is a microprocessor based interface module:

It communicates in bi-directional RS232 Data with the Questek Nurse Call Computer and Interrogates the Questek Data Interface Modules.

It receives annunciator data from the Questek nurse call computer and Communicates in RS422/RS485 data with the Questek Annunciators.

This microprocessor module is the Questek QDI-3 unit. It uses the MC68HC705 processor.

OPTIONAL ADDITIONS TO THE BASIC AE4000 System Unit

2. **AE410M** Expansion module for AE4000 to expand input capability to 250 Vigil rooms or 4000 inputs. This option adds a second Questek QDI-3 module to the AE4000 case.
3. **AE420M** Module adds Questek POCSAG paging system to the Questek Nurse Call System. This option includes a Questek QDI-3 module programmed as a POCSAG paging encoder plus a 4-watt 148.3375MHz transmitter. The AE420M also includes an antenna with 5 metres of coax cable and B&C connector. The paging encoder connects to a serial port on the Questek Nurse Call Computer and communicates in RS232.
4. **AE430M** Is the Medi Dialler Dial-in interface unit for Vigil system. This allows medi-diallers to be connected to the Questek Nurse Call system via the Telstra Public Switched Telephone network. This option includes a modem and QDI-3 processor board. The processor board controls the modem and communicates dial in messages to a serial port on the Questek computer via RS232. The AE430M also includes the software license for software drivers in the Questek Vigil Nurse Call system.
5. **AE440M** Is the interface unit to connect the Visonic (SLC5) Spider IR/RF Duress System to the Questek Nurse Call System. It communicates to a serial port on the Questek Computer. The Spider Duress system uses IR/RF dual mode pendants. This system can be used for Duress and radio nurse call. Includes software license and drivers
6. **AE450M** Is the interface for the Questek RF Personal Pendant System. It is a Questek QDI-3 processor board that provides Interface for APPW30s into the Questek Computer. This system provides pendant identification and limited zone location for Questek Emergency Pendants. These pendants can be nurse call or staff duress. Includes software driver.
7. **AE451M** Is the interface for the Questek RF/IR Personal Pendant Pin-Pointing Duress System. It is a Questek QDI-3 processor board that provides Interface for dual mode pendants into the Questek Computer. This system provides pendant identification via the RF communications and pinpoint location via the IR communications. These pendants can be nurse call or staff duress. Includes software driver.
8. **AE402M** Is the AE4000 Battery backup module. It includes a battery management module and 12 volt 7 AH battery. This module provides the nurse call system with lifeboat mode when mains power from the System UPS is off. (Typically 4 hours).

QUESTEK DATA INTERFACE (Type 3) (QDI-3)

The Questek AE4000 uses the Questek QDI-3 Processor Module in a number of ways to provide the required interface operation.

The QDI-3 has:

1. An MC68HC705C8A microcontroller. This microcontroller is programmed with application specific firmware. No field changeable characteristics are available. In all applications Questek writes the firmware in-house. All enquiries on applications should be addressed to Questek Engineering Department at Questek Head Office.
2. DIP switched and selection jumper fields for selection of operation parameters. These are set in the factory for the selected firmware and are not for field adjustment. All enquiries on settings should be addressed to Questek Engineering Department at Questek Head Office.
3. Two RS232 serial ports. Port 1 includes TX, RX, DTR and CTS. Port 2 has TX, RX and CTS. These ports are for module communications with a computer or external unit depending on the application.
4. One RS422 serial port. This port is used by the module to communicate with systems using RS422. This port is used to communicate with Questek Annunciators in systems where one direction only communications is required.
5. One RS485 serial port. This port is used by the module to communicate with systems using RS485. This port is used to communicate with Questek Alpha-numeric Annunciators in systems where bi-direction communications is required. This port can be used for other applications.
6. One Questek ABus communications port. This port is designed to communicate with the Questek Nurse call Data Interface Modules (DIMs) that are connected in a daisy chain network. This port can directly address up to 126 DIMs.
7. One paging transmitter port. This port controls the Questek Paging Transmitter. It includes +12 Volts DC, Key to enable the transmitter and Data to be transmitted.
8. One Numeric annunciator port. This port is used to send Questek synchronous data to the range of Questek numeric annunciators. This port can also be used where open collector npn transistor output is required to trigger an external device such as a PSTN dialler.
9. A single active low bit input for remote parameter selection. This bit can be used for example to switch from day to night operation in the AE1000 application.
10. A hardware watchdog that monitors for correct processor operation and resets the module if a fault condition is detected.
11. A status indicator 7 segment LED digit. This digit provides various status reports in a variety of applications. The decimal point blinks to display module heartbeat.
12. There are 8 status LEDs. 7 LEDs show the status of the various inputs and the 8th LED shows data being transmitted to the paging transmitter.

The QDI-3 module is:

1. 130mm wide x 98mm high.
2. Double sided thru plated fibreglass printed circuit board.
3. Powered by 12 volts DC and draws between 30 and 50mA depending on the application. The module has its own 5 volt regulated power supply and can operate from 9 volts to 24 volts DC. This input is polarity protected by an input diode. No damage will occur if the module is connected to the wrong polarity. The supply voltage can have considerable hum noise and ripple without effecting the module operation as it has considerable input filtering.
4. Fitted with sockets for all Integrated circuits for easy repair (in the factory).
5. Frequency standard is via a 4 MHz crystal.
6. Connections to all inputs and outputs is via plug on screw terminals. All inputs and outputs are clearly marked on the PCB artwork.

Maintenance or Repairs:

1. There are no user serviceable parts. The module should be considered as a single component.
2. Replace the module if required. Note all QDI-3 modules are the same. The only things that change from one application to another are the firmware in the processor, the setting of DIP switches and the positioning of jumper links. When replacing a QDI-3 make sure that the links and switch settings are transferred to the new module.