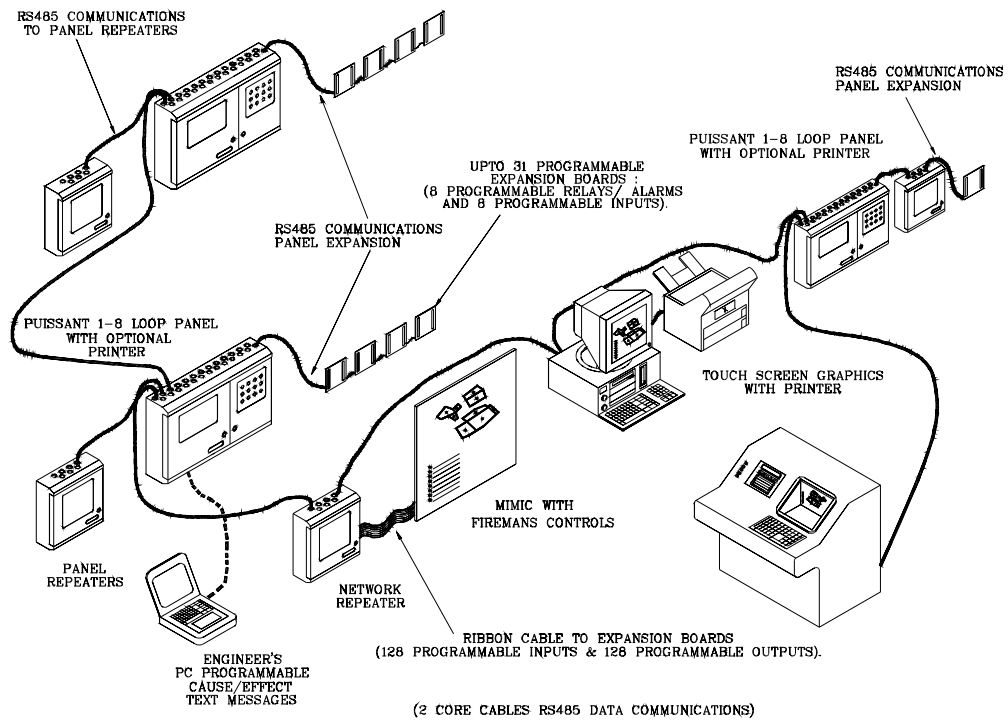


Konex Networking System

Application Guide

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1.0 Typical Network Illustration



2.0 Introduction

The Konex network system has the facility to monitor, indicate and control the functions of a fire alarm system installation thus allowing signals to be distributed around a large site.

The Konex network system operates as a global communication system and does not require a master panel or computer. This approach reduces cost and no single panel/equipment failure will disable the entire system.

Each node is programmed independently to listen, respond to or ignore any or all of the messages sent by the other nodes on the network.

Konex uses RS 485 data communication. Up to a total network cable length of 5km is possible. All panels will continue to function in stand-alone mode, even if the network fails.

Each item of equipment connected to the network is referred to as a node (see glossary). Each node can be either active or passive. Up to 15 active nodes plus an additional 17 passive repeaters may be connected .

The use of a networking system will allow individual parts of the site to be installed and commissioned prior to connection to the network.

The operation of the network is such that each node has total stand alone capability in that its local operation is not directly affected by its connection to or disconnection from the network. The ability of a local control panel to observe events means that it can be programmed to respond to events elsewhere on the network. The effect of this capability is that any control panel is able to respond to any sensor device connected anywhere on the network. This provides a possible effective 120 loop control panel distributed around a single site as a number of smaller units. Network repeater panels provide the ability to observe and control elements of the network via a compact unit which may be conveniently mounted at manned control points and still provide all essential display and control facilities.

Network communication takes place over a single pair of wires providing a link to all nodes. No individual node is regarded as a 'master'. All active nodes which are connected at any time establish their own network communication sequence.

The overall concept can be described as 'all talk - selective listen', which means that every event that occurs on any node is transmitted into the network.

Each node then decides (via programming) whether or not it is required to take any action.

During quiescent conditions all active nodes signify their presence on the network by generating default messages.

3.0 Hardware Specification

Currently there are three types of node: Control panel node
 Repeater node
 Computer node

3.1 Control Panel Node

A control panel node is a self contained fire detection control panel (Nexus A1557, 1-8 loop or Duplex A1520, 1-2 loop). The control panel monitors and controls analogue/addressable detection loops and can also control output signals. The Nexus panel has the ability to control up to 1024 network programmable cause/effect groups. The Duplex panel does not have network cause and effect capability.

Each panel requires the addition of network interface card and can only be configured as an active node.

Please refer to the relevant panel application guides.

3.2 Repeater Node

A repeater node is primarily a display and user control interface (network repeater). The repeater node has the capability to drive up to 240 output signals and monitor up to 128 input signals via additional expansion boards. The Konex network repeater has the ability to control up to 1024 network programmable cause/effect groups.

The repeater can also drive an optional printer. The repeater may also be configured as a passive node which allows only the ability to display network events. No cause/effect or network controls are available in this mode. However the Buzzer Silence and Test LEDs controls are enabled.

Note: A passive repeater may also drive up to 240 network programmable outputs. However the passive repeater is not monitored on the network and loss of output capability will not be indicated.

3.3 Computer Node

A computer node can communicate with the network as either an active or passive node. Its primary function is usually as an alarm management graphics controller which provides detailed information regarding the event information of the fire alarm system. Events may be viewed graphically to assist the user in managing a complex site system.

Please refer to the “Alarm Management System Manual” for further details.

The computer may also be configured as a passive node whereby the user does not have Network Silence, Test or Isolate functions.

4.0 Network Configuration

A maximum of 15 active nodes plus an additional 17 passive nodes may be connected together as a network. Each active node has an address allocated to it.

The maximum number of loops that can be connected on a network is 120.

The output signals driven by a network repeater node (128 inputs and 240 *unique* outputs per network repeater) are referred to as network outputs. Each network output can be duplicated on more than one repeater.

A maximum of 1024 cause / effect control groups may be configured per active node.

4.1 Node Names

Every node in the network must be given a name. This name can be a maximum of 20 characters long. The name will then be used on all display, printer and memory functions. The node name is also displayed on line two of the display when the node is in quiescent condition.

4.2 Software Specification

A control panel or repeater node has standard user controls available and also provides a number of functions accessible via the engineer's menus. The controls detailed below send output messages to the network when they are operated. The responses of the originating node and other nodes is determined by the individual programming of the node.

4.3 User Functions

- | | |
|-----------------------|---|
| Silence alarms | This function is available only when a fire condition is present on the network. A message will be sent into the network causing all other control panel or repeater nodes to silence alarms (if programmed to do so). This function is not available if the repeater is configured as a passive node. |
| System reset | This function is available only when the network is in a fire condition and the silence alarms switch has been operated. A message will be sent into the network causing all other control panel or repeater nodes to reset (if programmed to do so). This function is not available if the repeater is configured as a passive node. |
| Test alarms | This function causes a message to be sent into the network which will cause any nodes programmed to accept the message to sound the external alarms local to that node. Releasing the switch also sends a message into the network causing all alarms to silence. This function is not available if the repeater is configured as a passive node. |

Evacuate Operation of this switch causes a message to be sent into the network, the display will show '*Manual Evacuate* AT', the name of the node, the fire buzzer and the alarms local to that node will sound. Any nodes that are programmed to accept the message will also display the message, including the name of the node originating the message, the fire buzzer and the alarms local to that node will sound. This function is not available if the repeater is configured as a passive node.

Operation of the silence alarms switch will cause the alarms to silence and the node to return to its quiescent state, depending upon the programming of each node, this operation may silence all nodes on the network.

Any node printers will print the originating node identification letter, the name of the originating node and the time and date (when configured to do so).

Silence buzzer This switch has a local function only. See panel application guide.

Test display This switch has a local function only. See panel application guide.

More data (Scroll) This switch has a local function only. See panel application guide.

Clear display This switch has a local function only. See panel application guide.

Engineer This switch requests entry into the engineer's function menus.

Access is controlled by entering the correct four digit code. Details of the engineers functions are shown below:

5.0 Control Panel Node

Each control panel node records and displays information in 3 ways:-

- a) Display
- b) Printer
- c) Memory

The response to every input from the other nodes may be in 3 ways:-

- a) Full information - Specific device location
- b) Node name only - 20 character message
- c) No information or response

Input causes may be the following:-

- a) Fire
- b) Alert
- c) Fault
- d) Silence alarms
- e) System reset
- f) Test alarms
- g) Evacuate
- h) General input from repeater node

Note: *Local node events will print out a detailed message unless the function is disabled.*

6.0 Additional Functions At Repeater Node

A repeater node has standard user controls and engineer's functions listed above but also provides the additional facilities described overleaf. The user controls are membrane push buttons on the display panel and push buttons on a numeric keypad are used for entering access codes. The numeric keypad is mounted inside the repeater enclosure as standard.

6.1 Input / Output Facilities

Each repeater node has the capability to monitor up to 128 open collector inputs and drive 240 open collector outputs via 16 way input / output expansion cards.

6.1.1 Input Facilities

Inputs may be used for fireman's controls, switch monitoring or other purposes and are configured as follows:-

Non - monitored	A non-monitored input is a single input that is treated as an indication signal in allocating responses to it elsewhere.
Fire	A fire input is allocated as a pair of inputs, the first of which is the fire input itself and the second is its associated fault input. This fault input is fixed, so a subsequent move to the next valid input will actually move on two input numbers.

6.1.2 Output Facilities

An output capability at the repeater nodes is provided. A maximum of 240 output signals can be specified via expansion boards. Any of these outputs can be programmed via cause and effect network programming.

These outputs can be used for driving LEDs (for example on a mimic), however they can be used for other purposes (for example switching a relay). If it is required that some are used for driving LEDs, while others are used for relays for example, then the LED driving outputs must be specified. This is so that only the outputs that are driving LEDs will operate when the 'Test Display' switch is operated.

Note: *A passive repeater may also drive up to 240 network programmable outputs. However the passive repeater is not monitored on the network and loss of output capability will not be indicated.*

6.2 Isolate/De Isolate

Any sensor/input or group of sensors/inputs anywhere on the network may be isolated or de-isolated from any active repeater node.

6.3 Sensor Status

The status of any sensor on any panel on the network may be viewed from an active repeater node.

The information available is:-

- a) Analogue values
- b) Isolated/de isolated

7.0 System Installation

The installation of the network system should be in accordance with the current editions of the following:

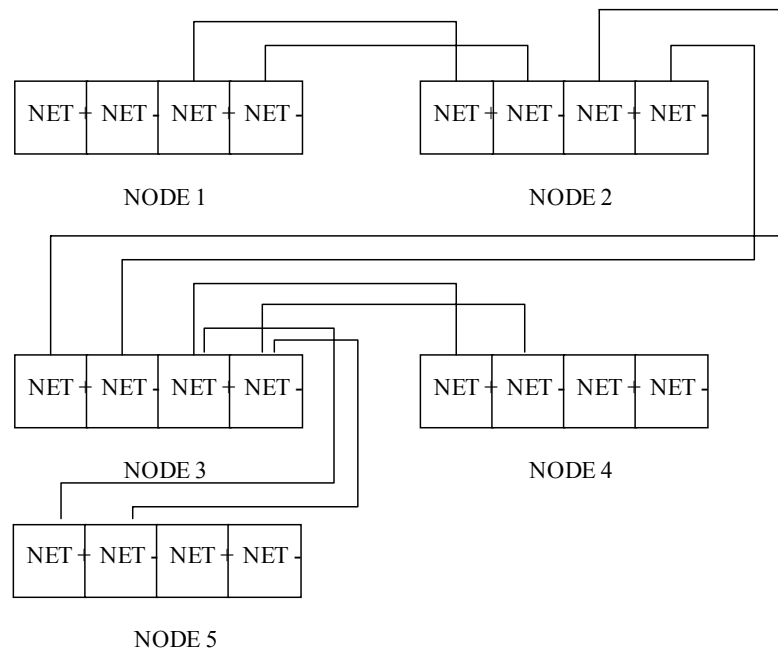
- a) The IEE wiring regulations
- b) BS 5839 Part 1

Particular care must be taken not to install cables in the proximity of high voltage cables or in areas likely to induce electrical interference. Junction boxes should be avoided where possible

The types of cable suitable for interconnection of the network are detailed in the document "Wiring Recommendations".

7.1 Connection

Cables between each node may be connected as illustration below:



Note: *The drain wire should be continuous throughout and connected to the MAINS EARTH at one point.*

8.0 Using the Konex Network with the Duplex (A1520) 1-2 loop panel

The Duplex 1-2 loop panel may be connected to the Konex network with or without Nexus panels, Network Repeaters or Alarm Manager Systems. However some functions are very limited or not supported by the Duplex panel. These are listed below:-

Incoming Signals	No response to cause / effect signals from the network. No detail of device, zone or text signals from the network. No alarm or relay operation in response to an incoming signal from the network. The Duplex panel will report on the LED display a Common Fire, Alert or Fault from another node on the network with the internal buzzer only operating. The Duplex panel will also respond to Silence alarms, Reset, Test Alarms and Evacuate signals received from the network.
Outgoing Signals	The Duplex panel will send device, zone and panel details to other panels on the network. If the receiving panel(s) are Nexus then this detail will be displayed. The Nexus panel will also respond to alarm and cause / effect programming, even if the transmitting panel is a Duplex. If the receiving panel(s) are Duplex then a response as “Incoming Signals” above only will be possible.

9.0 Glossary of Terms

Network	A number of items of equipment connected together by a single pair of wires along which messages are transmitted.
Node	An item of equipment connected to a network.
Active Node	An item of equipment configured to transmit and receive messages on a network.
Passive Node	An item of equipment only configured to receive messages on a network.
Control Panel	An item of control equipment that has the capability to monitor and control analogue/addressable detection loops, monitor inputs and control outputs. The control equipment has full cause and effect programmability and is equipped with a display and print facility and a set of user controls.
Network Repeater	An item of control equipment that can provide a display and print facility and a set of user controls plus the ability to monitor inputs and control outputs. The repeater cannot directly monitor analogue/addressable detection loops because it does not have its own loop or alarm circuits. Open collector panel input and output programming is possible with the addition of expansion cards.
Computer	A computer fitted with a network interface card has the capability to transmit and receive messages on a network. The computer has the capability to run an alarm management system (see below).
Alarm Management System	<p>A computer fitted with a network interface card and installed with alarm management software can monitor and control the network and display events in a graphic format.</p> <p>Various options are possible, for example, showing maps to pinpoint the exact location of an alarm, giving instructions to security personnel, logging events on the network, providing user controls for silencing and resetting alarms.</p>
Sensor	A device connected to an analogue/addressable detection loop that can either detect fire, monitor inputs or control outputs (relays, alarm circuits etc.). These include detectors, call points, outstations and loop powered sounders.
Loop	A wiring circuit, usually in the form of a loop (spurs are allowed) that can connect a maximum of 126 sensors.
Node Name	A 20 character text message which identifies the name of a node on a network.