

PRONET NETWORKING SYSTEM

APPLICATION GUIDE

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INTRODUCTION

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

The Pronet network system operates as a global communication system and does not require a master panel or computer. This approach reduces cost and no single point of failure will disable entire system.

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

The Pronet uses RS 485 data communication. Up to 5 Km transmission is possible , panels are not affected by short circuit.

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 16 passive repeaters may be connected .

The use of a networking system will allow individual sections 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 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 64 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 which provides 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.

GLOSSARY OF TERMS

Network pair	A number of items of equipment connected together by a single 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 and and	An item of control equipment that has the capability to monitor control addressable or analogue/addressable detection loops, monitor inputs and control outputs. The control equipment has full cause and effect programmability and is equipped with a display print facility and a set of user controls.
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 monitor addressable or analogue/addressable detection loops or accommodate cause and effect programming.
Computer	A computer fitted with a network interface card having 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	A computer fitted with a network interface card and installed with software that can monitor and control the network and display events in a graphic format. 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.
Sensor detectors, call	A device connected to an addressable or analogue/addressable detection loop that can either detect fire, monitor inputs or control outputs (relays, alarm circuits etc.). These include 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, all node names are loaded into all items on a network.

HARDWARE SPECIFICATION

Currently there are three types of node:

- a) Control panel node
- b) Repeater node
- c) Computer node

a) Control panel node

A control panel node is a self contained fire detection control panel (either a Puissant, Prelude, Proton or R3 control panel) . The control panel monitors and controls addressable or analogue/addressable detection loops and can also control and monitor input and output signals.

Each panel requires the addition of network interface card.

Please refer to the relevant panel application guides.

b) Repeater node

A repeater node is primarily a display and user control interface (Global repeater), the repeater node has the capability to drive up to 255 output signals and monitor up to 128 input signals.

The repeater can also drive an optional printer.

c) 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 status of the fire alarm system.

Please refer to the **Pronet Alarm Management** application guide for further details.

Network configuration

A maximum of 15 active nodes may be connected to a network, but a maximum of 32 nodes may be connected in total. Each node has an address allocated to it:

The maximum amount of loops that can be connected to a network is 64.

The output signals driven by a repeater node are common to all repeater nodes and are referred to as network outputs, each network output can be duplicated on more than one repeater.

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 its quiescent condition.

SOFTWARE SPECIFICATION.

A control panel or repeater node has standard user controls available and also provides a number of functions accessible via the engineers 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.

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).
- 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).
- 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.
- 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 node will the message, the fire buzzer and the alarms local to that sound.

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..

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 engineers function menus.

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

ENGINEER FUNCTIONS

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 alarms will print out a detailed message unless the function is disabled.

ADDITIONAL FUNCTIONS AT REPEATER NODE

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

INPUT / OUTPUT FACILITIES

Each repeater node has the capability to drive up to 128 open collector inputs plus 255 open collector outputs via 16 way input / output expansion cards.

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.
Monitored and the input is fixed, so a actually move on two	A monitored input is allocated as a pair of inputs, the first of which is the monitored input itself, an indication type of signal second being its associated fault input. This fault subsequent move to the next valid input will input numbers.

Fire The fire input is similar to the monitored input but its monitored input is treated as a fire signal rather than an indication.

OUTPUT FACILITIES

An output capability at the repeater nodes is provided, a maximum of 255 output signals (via expansion boards) can be specified. Any of these outputs can be implemented at any repeater node. Control of these outputs is only possible via the cause and effect programming of the control panel nodes.

These outputs can be used for driving LED's (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 LED's, while others are used for relays for example, then the LED driving outputs require specifying.

This is so that only the outputs that are driving LED's will operate when the 'Test Display' switch is operated.

The outputs must be specified in groups of 16, with the outputs that are driving LED's specified first, up to a maximum of 240 LED's operated off the 'Test Display' switch.

ISOLATE/DE ISOLATE

Any device or group of devices anywhere on the network may be isolated or de isolated from any repeater node.

SENSOR STATUS

The status of any sensor on any panel on the network may be viewed.

The information available is:-

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

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) B. S. 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 type of cable used for interconnection of the network should be one of the following

Alpha 2421

Alpha 5471

Belden 8760

Belden 9501

BICC H8093

Brand Rex BI 56760

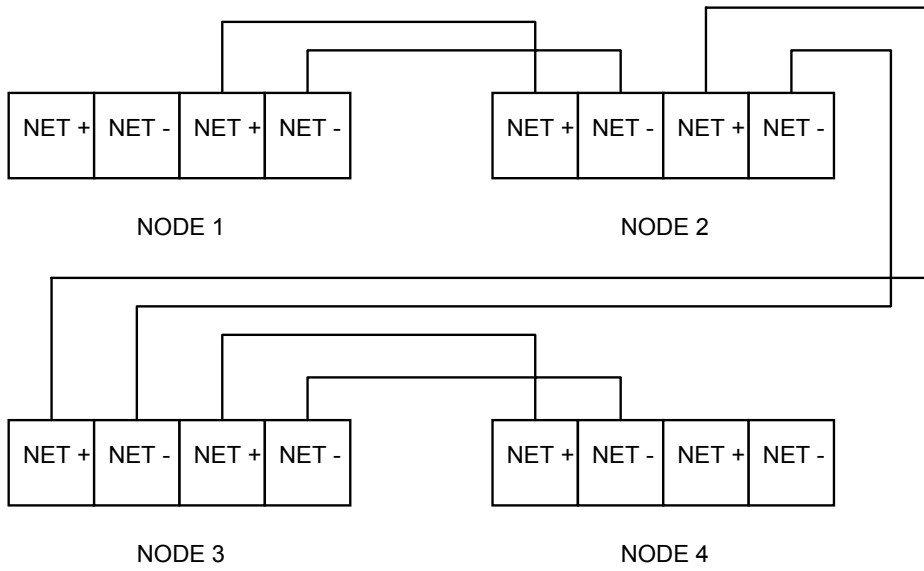
or an equivalent cable.

These cables are designed for the interconnection of computers, peripherals, data processing equipment etc., they are twisted pair cables with an aluminised sheath and a drain wire.

Maximum recommended cable distance is 5 Km.

CONNECTION

Connect cables between each node as shown below:



Note: The drain wire should be connected to the MAINS EARTH.

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