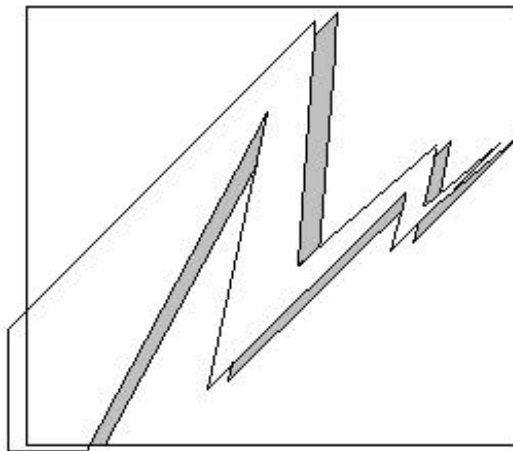


# **P2295 PHYSICAL REPEATER**



## **USER MANUAL**

**FOR P2295 Network Physical Layer Repeater**

**June 1999**

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# 1 Introduction

## P2295 INTRODUCTION

The P2295 Network Physical Repeater has been designed to increase the allowable maximum length of the Free Topology Alarm Network System. In effect, it allows the maximum length of the Free Topology Network to be extended from 450 metres to 900 meters.

Each repeater can be connected to two networks of up to 450 metres so that larger networks can be installed without data loss.

The repeater unit includes two data indicator LED's which can be used to test the integrity of each network segment, thus the repeater can also be used as a network integrity tester.

## 2 Unit Description

### UNIT HOUSING

The electronics is housed within a moulded plastic enclosure measuring 147mm x 92mm x 29mm (L x W x H). There are cutouts for power and network connector access.

### FRONT PANEL

The front panel consists of three LED's which can be used for checking data transfer and unit power.

**Power** Red LED which when lit indicates that the repeater has power.

**Segment A** Green LED which indicates when there is data being transmitted on the network connected to the Segment A connectors.

**Segment B** Green LED which indicates when there is data being transmitted on the network connected to the Segment B connectors.

### POWER SOCKET

Power to the repeater is connected via a 2.5mm power socket at the top of the unit case. Power can be either AC or DC with a minimum of 9 volts at 50mA.

### SEGMENT A CONNECTORS

The right-hand side of the unit contains the Segment A electronics and connectors. The connectors consist of two 8-way RJ-45 (telephone style) sockets and two links blocks. The two connectors allow the unit to be placed anywhere within the network, and not just at the end of the network.

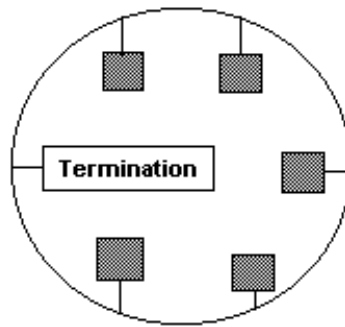
### SEGMENT B CONNECTORS

The left-hand side of the unit contains the Segment B electronics and connectors. The connectors consist of two 8-way RJ-45 (telephone style) sockets and two links blocks. The two connectors allow the unit to be placed anywhere within the network, and not just at the end of the network.

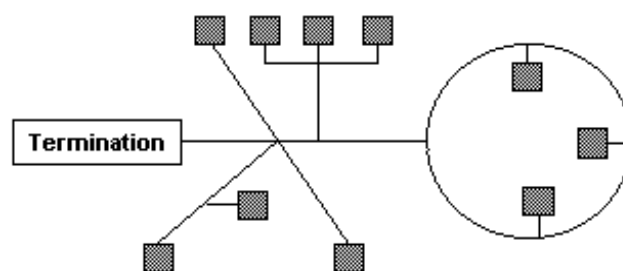
## NETWORK SEGMENT WIRING

Each network segment connection is made via either one of the two 8-way sockets. The two sockets are provided, should a “daisy chain” wiring configuration be required. The system wiring can be of any configuration as shown if Fig 1 to 4 below, however there are limits on the cable length. The maximum total wire length in each segment installation is 450 metres and the maximum distance between any device to any device, or a termination is 250 metres. The purpose of the repeater is to allow an extension to the maximum network length but the distance between devices must still be adhered to.

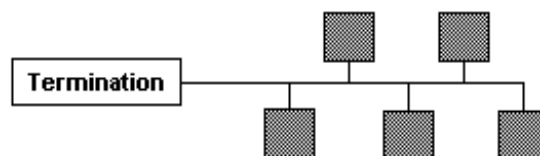
The cable length figures above apply to a category 5 utp solid twisted pair cable. Only two of the eight ways of the network socket are used at this stage, (see specifications for pinouts) eight way is provided for future expansion.



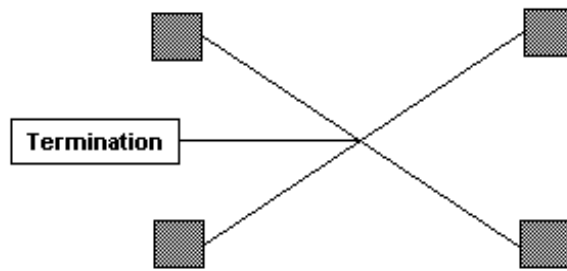
**Figure 1** Loop Topology



**Figure 2** Mixed Topology



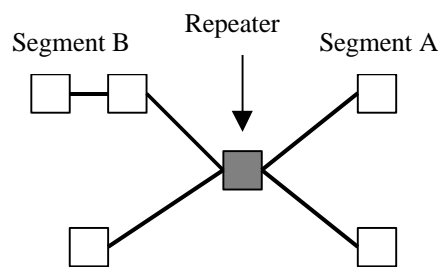
**Figure 3** Single Terminated Bus Topology



**Figure 4** Star Topology

## NETWORK REPEATER WIRING

The wiring between successive segments should be as one of the following:



**Figure 5** 2 Segment Network

## NETWORK TERMINATION LINKS

While the network system used by the P2295 is of a “Free Topology” nature, it still requires one termination on each segment. It is not critical where the termination should be, so long as it is there. Each device has the ability to provide the termination, or it is possible to use the terminations on the repeater for each segment.

There are 2 link blocks beside the 8 way network sockets. The link closest to the 8-way sockets is the “TERM.” Link, whilst the other link is the “TERM TYPE”. To provide termination both links should be installed, both should be left out if termination is not required.

Each segment needs its own termination so if the repeater is being used as the terminator device, then all links should be installed, otherwise one device on each segment must have the termination links inserted. (See device user manual for more information).

### 3 Unit Operation

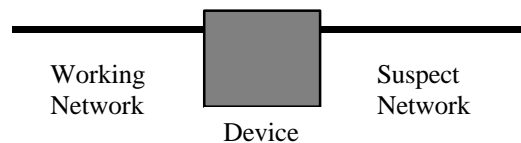
#### UNIT REPEATER INSTALLATION

To install the repeater, select the desired closest to each network segment and mount the unit. The unit should be in a location that is both easy to access and reasonably free from dust. As the enclosure itself has cutouts, it is suggested that the unit be placed away from any pipes carrying liquid.

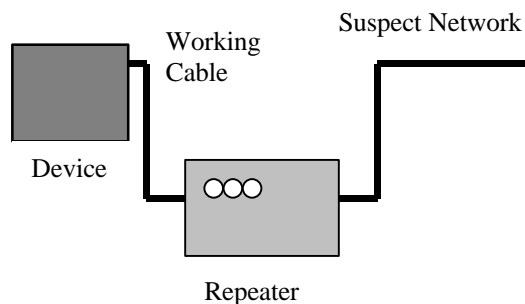
Connect the two networks via the 8-way sockets and change the termination links if appropriate. Apply power to the unit and the Power LED will light up. Any data on either segment will be transferred across to the other segment and the appropriate segment LED will light.

#### UNIT NETWORK TESTER

To use the repeater as a network integrity tester, insert the unit between a network device and the remaining network cable. Power the repeater and wait for up to 30 seconds. As each device sends out a network heartbeat every 20 seconds or so, it will be possible to see if both sides of the repeater have data communications (by using the segment LED's as data indicators)



**Figure 6a** Device with suspect network



**Figure 6b** Testing suspect network



## 4 Specifications

### SPECIFICATIONS

#### Power Consumption

Operating Voltage: 9 - 12 Volts AC or DC +/- 10%

Current Consumption: 0.05 Amps

Power Consumption: 0.5 Watts

#### Environmental Conditions

Operating Temperature Range: 0 - 45 Deg C

Operating Humidity Range: 95% R.H. non-condensing

#### Network Information

Cable Type: Category 5 utp solid

Cable Length:

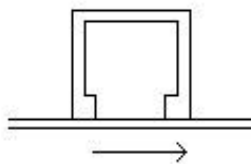
Maximum total length in segment = 450 metres

Maximum length any node to any node or termination = 250 metres

Network Frequency: 78 kbps

Maximum No. Of Nodes: 30

#### Socket Connections



Pin numbering runs left to right

**Figure 8**

#### Network 8 Way

<u>Pin No.</u>	<u>Function</u>
1	N/C
2	N/C
3	N/C
4	N/C
5	N/C
6	N/C
7	Network
8	Network