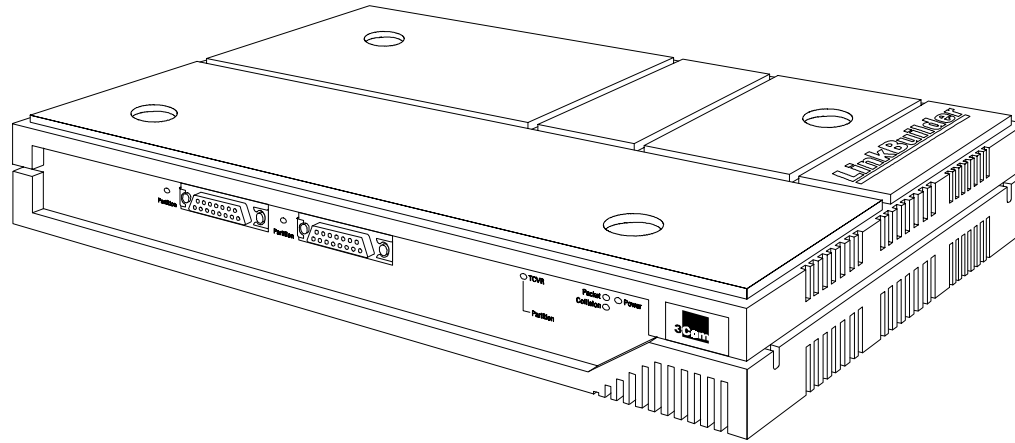


# LinkBuilder

## LinkBuilder Repeater User 's Handbook

3C1620-0, 3C1621-0, 3C1650-0 and 3C1650-5




## Safety Information



Please read the following safety information before installing the LinkBuilder Repeater.

- Installation and Removal of the Repeater must be carried out by **qualified personnel only**.
- This equipment must be earthed.
- Connect the Repeater to an earthed mains supply to ensure compliance with European safety standards.
- The power cord set must be approved for the country where it will be used.
- The appliance coupler, ie: the connector to the device itself and not the wall plug, must have a configuration for mating with an EN60320/IEC320 appliance inlet.
- For USA and Canada:
  - the cord set must be UL-approved and CSA certified.
  - the minimum specifications for the flexible cord are:
    - No. 18 AWG
    - Type SV or SJ
    - 3-conductor.
  - the cord set must have a rated current capacity of at least 10A.
  - the attachment plug must be an earth-grounding type with a NEMA 5-15P (15A, 125V) or NEMA 6-15P (15A, 250V) configuration.

- It is essential that the mains plug of the final installation remains accessible. You can only disconnect the Repeater by removal of the mains plug from the supply outlet.
- If the mains supply plug is unsuitable and you have to replace it, you may find other codings for the respective connections. Connect the power supply wires from the Repeater according to the following scheme.
  - Brown wire to the Live (Line) plug terminal which may be marked with the letter L or coloured red.
  - Blue wire to the Neutral plug terminal which may be marked with the letter N or coloured black.
  - Yellow/Green wire to the Earth (Ground) plug terminal which may be marked with the letter E or the earth symbol  or coloured green/yellow.

This unit operates under SELV conditions (Safe Extra Low Voltage according to IEC 950), the conditions of which are maintained only if the equipment to which it is connected is also operational under SELV.

### France and Peru Only

This unit cannot be powered from IT<sup>t</sup> supplies. If your supplies are of IT type, then this unit should be powered by 230V (2P+T) via an isolation transformer ratio 1:1, with the secondary connection point labelled neutral, connected directly to earth (ground).

<sup>t</sup>Impédance à terre

## About This Manual

This manual contains all the information you need to install and use the LinkBuilder Repeaters, 3C1620-0, 3C1621-0, 3C1650-0 and 3C1650-5. The manual has been written for the person who will install and normally be responsible for the Repeater. Keep the manual with or near the Repeater or give it to the person responsible for looking after it.

The manual explains:

- How to install and use the Repeater
- How to identify Repeater problems and possible solutions to these problems.

The manual does *not* explain:

- How to design your network.



**Note:**

*In this manual the different LinkBuilder Repeaters will be called simply the Repeater.*

Throughout this manual, we will assume that you are familiar with the concepts and operation of your Ethernet Local Area Network.

If you are unfamiliar with Ethernet networks, a full range of training courses is available. Please contact your nearest 3Com office for more details (telephone and fax numbers are on the back page of this manual).

This manual is supplied in a transparent wallet with four double-sided sticky pads. You may choose the manual storage method which suits you best. Two suggestions are given below.

- Store the manual in the wallet in a ring-binder.
- Using the sticky pads, fix the wallet containing the manual to the underside of the repeater or a surface close by. The manual will be available whenever you need to consult it.

## About The LinkBuilder Repeaters

There are three types of LinkBuilder Repeater. All the repeaters have two ports on the front panel and a slot for a Transceiver Interface (port 3) on the rear panel. The sections below describe the different combinations of ports on the front panel.

### 3C1620-0

The 3C1620-0 AUI/AUI Repeater has two AUI ports on the front panel. Using suitable transceivers each AUI port can be connected to any Ethernet cable type.

### 3C1621-0

The 3C1621-0 AUI/Thin Ethernet Repeater has one AUI port and a Thin Ethernet BNC connector on the front panel. The AUI port can be connected to any Ethernet cable type using a suitable transceiver. The BNC connector can connect to a Thin Ethernet segment using a standard T-piece or in-line connector.

(details of the 3C1650-X Fiber Optic Repeaters are given overleaf)

### 3C1650-0 and 3C1650-5

The 3C1650-0 and 3C1650-5 Fiber Optic Repeaters are identical apart from the types of fiber optic connector used. Both types of repeater have one AUI port and a pair of fiber optic connectors on the front panel. The AUI port can be connected to any Ethernet cable type using a suitable transceiver. The 3C1650-0 Repeater has a pair of SMA screw type connectors for direct connection to optical fiber cable. The 3C1650-5 Repeater has a pair of ST bayonet type connectors.



#### Note:

*The Fiber Optic repeater is designed to the 10BaseFL standard. As such, it is backwards compatible with equipment made to the FOIRL standard.*

### Repeater Functions

The Repeater has been designed to conform to the IEEE 802.3 standard for Local Area Networks. The Repeater provides all the standard functions of an 802.3 repeater, including the following:

- Signal Retiming
- Preamble Regeneration
- Fragment Extension
- Automatic Partition/Reconnection.

### Siting The Repeater

Site the Repeater where you can provide:

- Adequate ventilation around the unit. We recommend that a minimum of 25mm (1 inch) clearance is provided.
- Adequate clearance at the front and rear of the unit to provide cable access.
- Access to an adjacent mains power supply.



#### Warning

*The case of the Repeater is not water-proof or drip-proof. You must take care to position the repeater where water or moisture cannot enter the case of the unit. The Repeater is force cooled by a fan located on the right-hand side of the unit when viewed from the front. Air flow around the unit and through the vents in the side of the case must not be restricted.*

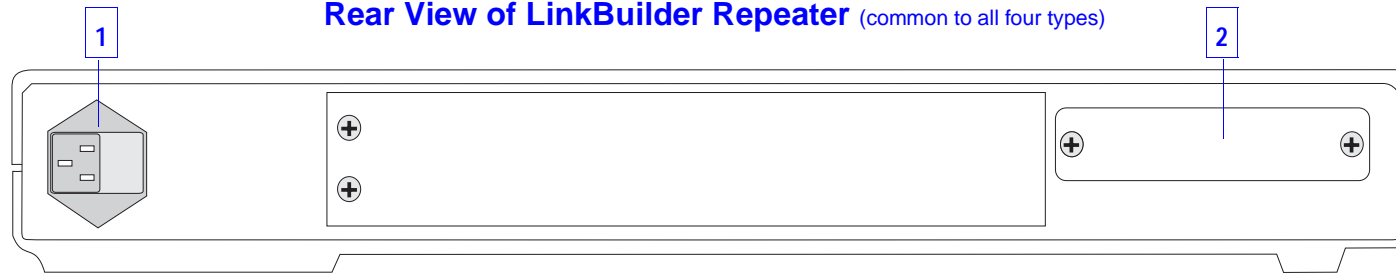
To prolong the operational life of your units, please:-

- Never stack the units more than four high.
- Do NOT place heavy objects on top of any unit or stack.

### Rack

The Repeater can also be mounted in a 19 inch equipment rack using one of the optional Rack Mounting Kits available from your supplier. Please read the additional instructions supplied with the kit before installing the repeater.

## Rear View of LinkBuilder Repeater (common to all four types)



The numbered arrows on this and following diagrams refer to the numbered text where the item indicated is described.

### Rear Panel Connections And LEDs

#### 1 Power Supply & Fuse Information



#### **Important Safety Information**

*Ensure that the power supply is disconnected before opening the fuse holder cover.*

The power socket and fuse holder are located on the rear panel. The Repeater automatically adjusts to the supply voltage. The fuse is suitable for both 110V AC and 220-240V AC operation.

To change the fuse, release the fuse holder by gently levering a small screwdriver under the fuse holder catch. Only 2A anti-surge type fuses of the same type and manufacture as the original should be used with the Repeater. Close the fuse holder.

A spare fuse must NOT be fitted in the spare holder of the IEC socket for safety reasons.

#### 2 Transceiver Interface

The Transceiver Interface allows you to connect to any type of cabling without the need for a separate transceiver. Install the Transceiver Interface as described in the manual that accompanies that device **with the exception that the component side of the interface must face downward**. That document also describes the connection of the cables and the function of LEDs which may be present .

## Front Panel Connections And LEDs

### 3 AUI Port (all models)

You can connect to any Ethernet transceiver using AUI cable (also known as transceiver cable or drop cable). Connect one end of the cable to the AUI port on the front panel of the Repeater and the other to the AUI port on the transceiver. Engage the slide locks at both ends of the AUI cable.

### 4 BNC Connector (3C1621-0)

A Thin Ethernet segment of up to a maximum length of 185 metres (600 feet) may be connected to the Repeater's BNC connector using a T-piece or a BNC connector.

If the Repeater is at the end of a segment, one of the following conditions must apply.

- a BNC connector with an inline terminator must be used and the termination selector switch (alongside the Repeater's BNC connector) set to 'External'.
- the T-piece must be fitted with a terminator and the termination selector switch set to 'External'.
- the BNC connector must be of the standard type and the termination selector switch set to 'Internal'(factory setting).

Otherwise, the termination selector switch is set to 'External'.

An earth post is provided on the left hand side (from the front) of the repeater. This provides an external connection to the casing of the BNC connector for your convenience. An earth strap may be attached using a tag and a 4BA screw and washer.

### 5 Fiber Optic Port (3C1650-x)



#### **Warning**

*Take care to keep the ends of the fiber connectors clean. Wipe with a tissue moistened with ethanol if necessary.*

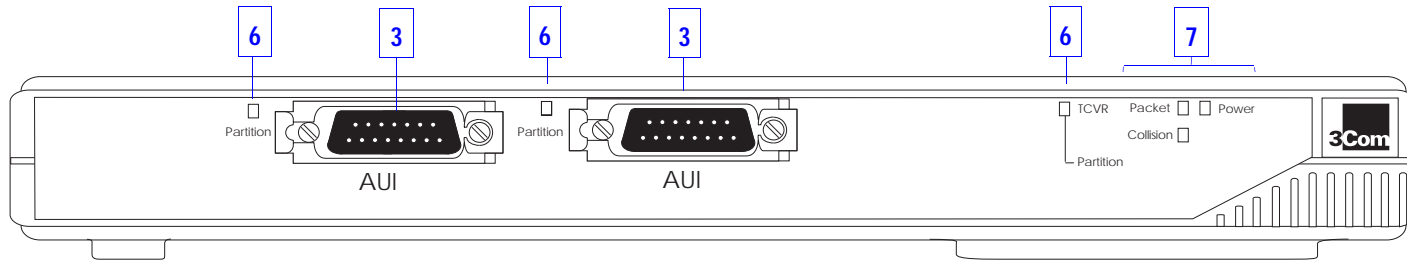
Check that the fiber optic cables have the right connectors for your LinkBuilder Repeater. The SMA version (3C1650-0) has threaded barrel connectors which should be only finger-tight. The ST version (3C1650-5) has bayonet type connectors which will latch when pushed gently after alignment of the key with the slot.

The **Link** LED is lit whenever there is sufficient light, either as idle signal or data, present on the Rx fiber.

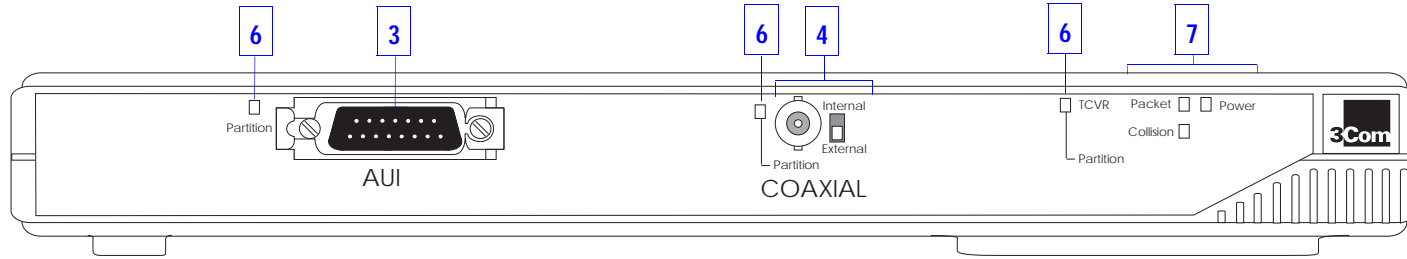
Cable-pairs are connected to the opposite ports (i.e. **Rx to Tx** and **Tx to Rx**) of the LinkBuilder Repeater. Power up the devices (see Power Up section below) at each end of the fiber link and connect one cable to each fiber port. No traffic is needed. The **Link** LED (green) will light if you have the correct cable orientation. If otherwise, reverse the cables.

If the LED still does not light, there is insufficient optical input from the cable. Check the following:

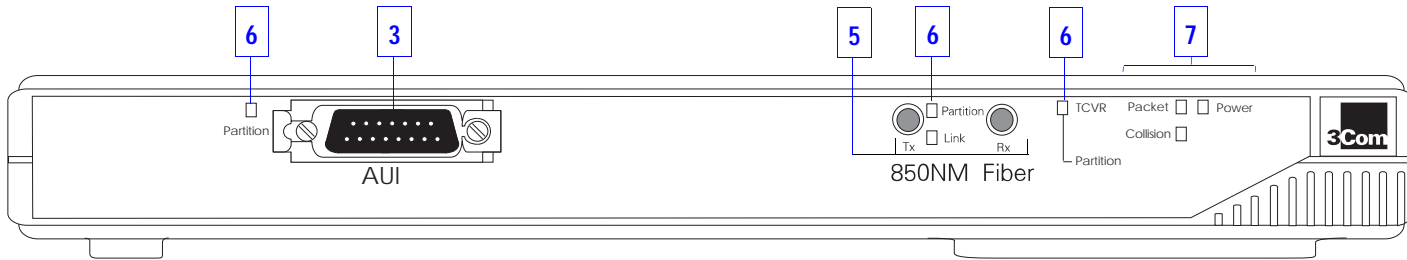
- The remote unit is powered on.
- Cleanliness of the connectors.
- Continuity of the fiber cable.



**LinkBuilder Repeater 3C1620-0**



**LinkBuilder Repeater 3C1621-0**



**LinkBuilder Repeaters 3C1650-0 and 3C1650-5**

## 6 Partition LEDs (all models) Red

The **Partition** LEDs show the partition state for each port.

### Off

The port is functioning normally.

### Red

The segment attached to this port has been partitioned from the rest of the network. If the workstation is powered on and the **Partition** LED lights, check that the **Packet** LED is showing traffic. If no traffic is indicated, turn off the power to the Repeater briefly and then turn it back on. If the fault is still indicated (**Partition** LED lit) or traffic is present, carry out the following actions:

- Check the connections and the cable for any breaks in the segment.
- Check that the Transceivers attached to the LinkBuilder Repeater are correctly connected and powered up.
- Make sure that the SQE Test on the attached Transceivers is switched off.

If this still fails to clear the partitioning, it may be that the Repeater or the device connected to it is faulty. Call your supplier for further advice.

Once the problem is found and corrected, the partitioned segment will be reconnected automatically after the first valid packet is received.

## 7 Repeater LEDs

### Packet LED

### Yellow

This LED lights whenever a packet is received from one of the segments attached to the ports and flashes on for a minimum of 30ms.

If this LED does not light, there is no activity on the ports of the Repeater.

### Collision LED

### Yellow

This LED lights when a packet collision has been detected on one of the segments attached to the ports, provided that the segment is not partitioned. The LED flashes on for a minimum of 30ms.

Under normal operation collisions occur and cause the **Collision** LED to flash. This would be increased during heavy traffic activity on the network. The Auto Partition/Reconnection function partitions a segment from the network if multiple consecutive collisions are detected on that segment.

## Power LED

Green

This LED lights to indicate the power supply to the Repeater is correct.



### **Warning**

*If the **Power LED** is not lit, it does **not** necessarily mean that power is not supplied to the unit. The LED may have failed or there may be an internal fault.*

If the **Power LED** does not illuminate after the unit is switched on, check the fuse in the IEC socket (as described in the section Power Supply And Fuse Information) and also the fuse within the power cable's plug (if fitted). If this fails to restore the unit to normal operation, or if the fuse fails repeatedly, then contact your supplier .

## Power Up



### **Note:**

*If you are checking the orientation of fiber cables on the 3C1650-0 and 3C1650-5, you will only need apply power to the two devices connected by the fiber link.*

Before you power up, check that all the network connections are secure.

The Repeater start-up sequence is as follows:

- Connect the mains power cable to the power socket on the rear panel of the Repeater.
- Connect the plug to the mains outlet socket and switch on the power supply at the socket.
- All LEDs on the front panel will light briefly. If one does not, it is faulty and you should contact your supplier.
- When the Repeater is powered up, the **Power LED** should remain illuminated. If it does not, refer to the section 'Front Panel LEDs' in this manual.

If the network is active, the **Packet LED** should flash at a rate dependent upon traffic density. If the **Partition LEDs** are illuminated red, then refer to section 'Front Panel LEDs' in this manual.

## Spot Checks

At frequent intervals we recommend that you check the Repeater visually. Regular checks can give you an early warning of a possible failure. Any problems can then be attended to when there will be least effect on users. Check the following:

- Cabling  
Check that all external cabling connections are secure and that no cables are pulled taut.
- Transceiver Interfaces  
Check that the Transceiver is connected securely. Refer to the appropriate *How To Install And Use .....* manual provided with the Transceiver Interface.

### What To Do Next?

If the Repeater fails to operate successfully, then contact your supplier with the following information before returning the unit.

- Serial Number
- Revision Number
- A brief description of the fault.

When returning any equipment to your supplier make sure the equipment is packed suitably for transit.



#### **Technical Support**

*The supplier of your LinkBuilder products provides a Technical Support service. If there are any problems with the Repeater which you cannot solve yourself using this manual, please contact your supplier's Support Representative.*

## Technical Information

Dimensions	
Width	361mm (13.8 ins)
Depth	222mm ( 8.5 ins)
Height	64mm ( 2.5 ins)
Weight	1.6Kg (3.5 lbs)

### Related Standards

The LinkBuilder Repeater has been designed to conform to the following standards:

Functional	ISO 8802/3 IEEE 802.3
Safety	UL 1950 EN 60950 CSA 22.2 #950
EMC	EN 55022 VFG 243 IEC 801
Environmental	IEC 68

### Environmental

Operating Temperature	0 - 40°C (32 - 105°F)
Humidity	0 - 90%(non-condensing)

### Electrical (typical)

Type	<u>3C1620-0</u>	<u>3C1621-0</u>	<u>3C1650-x</u>
Power Inlet	IEC 320	IEC 320	IEC 320
Fuse Protection	2Amps	2Amps	2Amps
240Vac Supply :-			
Power Consumption	19W	17W	18W
Power Dissipation	65 BThU/hr	59 BThU/hr	61 BTU/hr
120Vac Supply :-			
Power Consumption	14W	12W	13W
Power Dissipation	48 BThU/hr	41 BThU/hr	44 BThU/hr

### Electrical (maximum)

(with AUI Transceiver Interface fitted: each AUI drawing maximum permitted current)

Maximum Power Consumption	<35W	<30W	<30W
Maximum Power Dissipation	<102 BThU/hr (all types)		

## Radio Frequency Interference Statement

This equipment has been tested with a class A computing device and has been found to comply with part 15 of FCC Rules. Operation in a residential area may cause unacceptable interference to radio and TV reception requiring the operator to take whatever steps are necessary to correct the interference.

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage édicté par le ministère des Communications de Canada.

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### Other Information

3Com would appreciate your comments concerning this document. These should be sent to your nearest 3Com office.

In the unlikely event that this product is found to be damaged on arrival, or fails to function once installed, you should contact your distributor or supplier for advice.

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