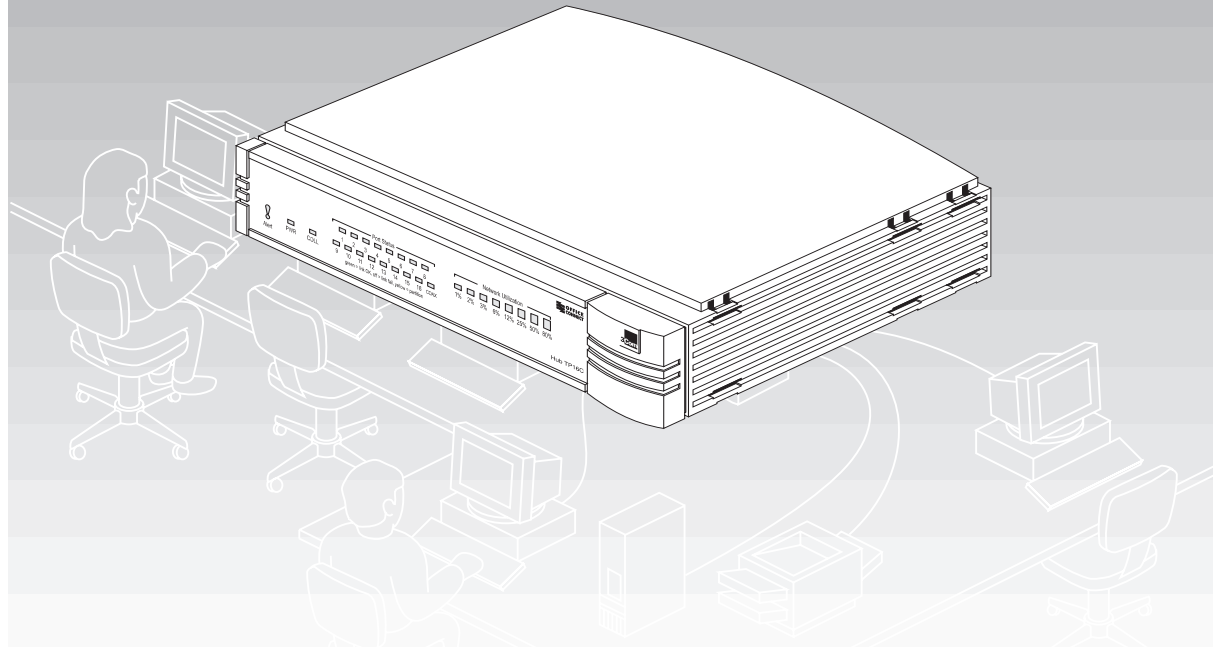




OFFICECONNECT™ HUB TP16C

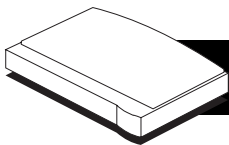
3C16702

USER GUIDE



Part No.
DUA1670-2AAA01

Published
December 1996



INTRODUCTION

Welcome to the world of networking with 3Com®.

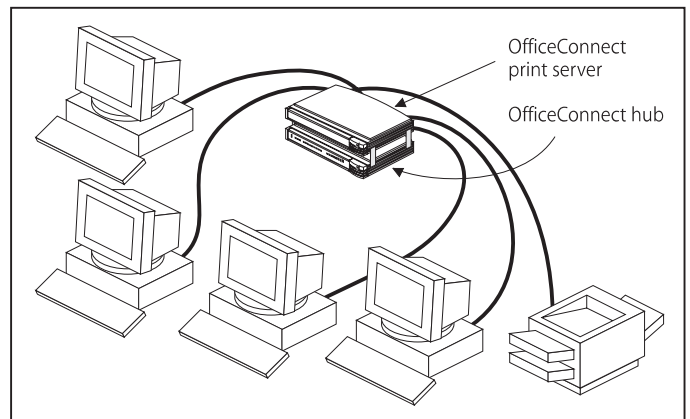
In the modern business environment, communication and sharing information is crucial. Computer networks have proved to be one of the fastest modes of communication but until now only large businesses could afford the networking advantage.

The OfficeConnect™ product range from 3Com has changed this, bringing networks to the small office.

The OfficeConnect Hub TP16C is ideal for creating small networks. It is compact and attractively designed for desktop use. This product forms part of the OfficeConnect range which neatly stack together with clips, providing a host of facilities, for example print sharing and a network fax. For information on these products, see the "OfficeConnect Product Range" sheet that accompanies this product.

When referring to the OfficeConnect Hub TP16C, this guide uses the term 'OfficeConnect hub'.

A single OfficeConnect hub allows you to create a medium-size network with up to sixteen workstations.

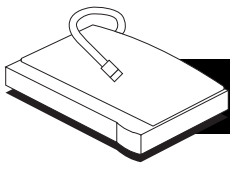


Medium-size Network With OfficeConnect Hub And Optional Print Server

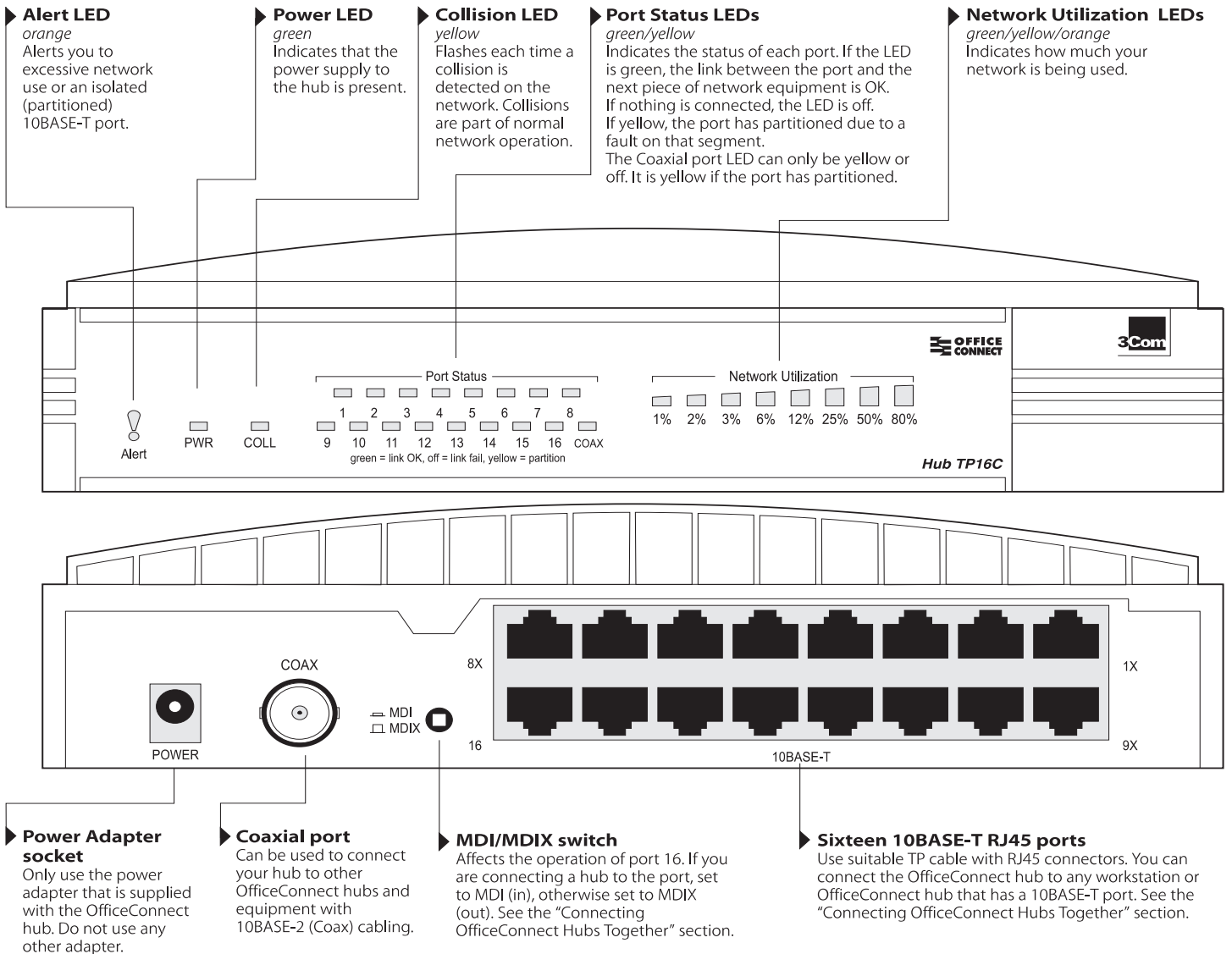
If you need to connect more workstations, simply connect and clip another OfficeConnect hub to form a stack (each hub is a single repeater).

The OfficeConnect Hub TP16C has sixteen 10BASE-T ports and one 10BASE-2 (Coax) connector.

This guide helps you get the most out of your hub.



CREATING YOUR NETWORK



Networking Terminology

A **Network** is a collection of workstations (for example, IBM-compatible PCs) and other equipment (for example, printers), connected for the purpose of exchanging information or sharing resources. Networks vary in size, some are within a single room, others span continents.

A **Local Area Network (LAN)** is a network, usually in an office, that spans no more than a single site.

Ethernet is a type of LAN, referring to the technology used to pass information around the network. It operates at 10Mbps (megabits per second).

10BASE-T is the name given to the Ethernet protocol that runs over **Twisted Pair (TP)** cable.

10BASE-2 is the name given to the Ethernet protocol that runs over **Coaxial** cable.

A **Network Loop** occurs when two pieces of network equipment are connected by more than one path. Your hub detects this and **Partitions** (isolates) one of its ports to break the loop.

A **Segment** is the length of cable connected to a port, whether this cable is 10BASE-T, 10BASE-2 (Coax), or another type. When you daisy-chain equipment together with 10BASE-2 (Coax) cable, **all** of the cable forms a single segment.

Packets are the units of information your workstations and other equipment send to each other over the network.

Collisions are a part of normal Ethernet operation and occur if two or more devices (pieces of network equipment) attempt to transmit at the same time. A sudden sustained increase in the number of collisions can indicate a problem with a device, particularly if it is not accompanied by a general increase in traffic. On coaxial segments an increase in collisions can also indicate faulty cabling.

Before You Start

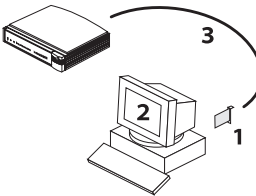
Your OfficeConnect hub comes with:

- One power adapter for use with the OfficeConnect hub
- A Warranty Registration card for you to fill out and return
- Four rubber feet
- Four stacking clips
- An OfficeConnect Product Range sheet
- This guide

i The extra parts mentioned below are **not** supplied with the hub.

Workstation Connections

To connect workstations or other equipment to your hub, you need:

- 1 10BASE-T connections for all your equipment. 3Com produce a range of easy to install network adapters, which provide your workstations with 10BASE-T connections.
- 2 An operating system with network support configured, running on your workstations.
- 3 One 'Straight-through' 10BASE-T cable for every workstation or piece of equipment. A 'Straight-through' cable is one where the pins of one connector are connected to the same pins of the other connector. 10BASE-T cables can be shielded or unshielded. We recommend you use shielded. The maximum length you can use is 100 meters (328 feet).

i In order to comply with the 10BASE-T standard, ports designed for workstation connections have been marked with the graphical symbol 'X'. This denotes a crossover in the port's internal wiring, for example 1x, 2x, 3x...

Hub Connections

If you have additional hubs you want to connect using 10BASE-2 (Coax), you need:

- One 10BASE-2 50 Ohm cable for each additional hub. The minimum cable length you can use is 0.5 meters (1.6 feet). The maximum segment length you can have is 185 meters (607 feet).
- One 10BASE-2 'Y' piece for each hub. You can use 'T' pieces but 'Y' pieces provide optimum clearance of the other ports.
- Two 10BASE-2 50 Ohm terminators (end pieces).

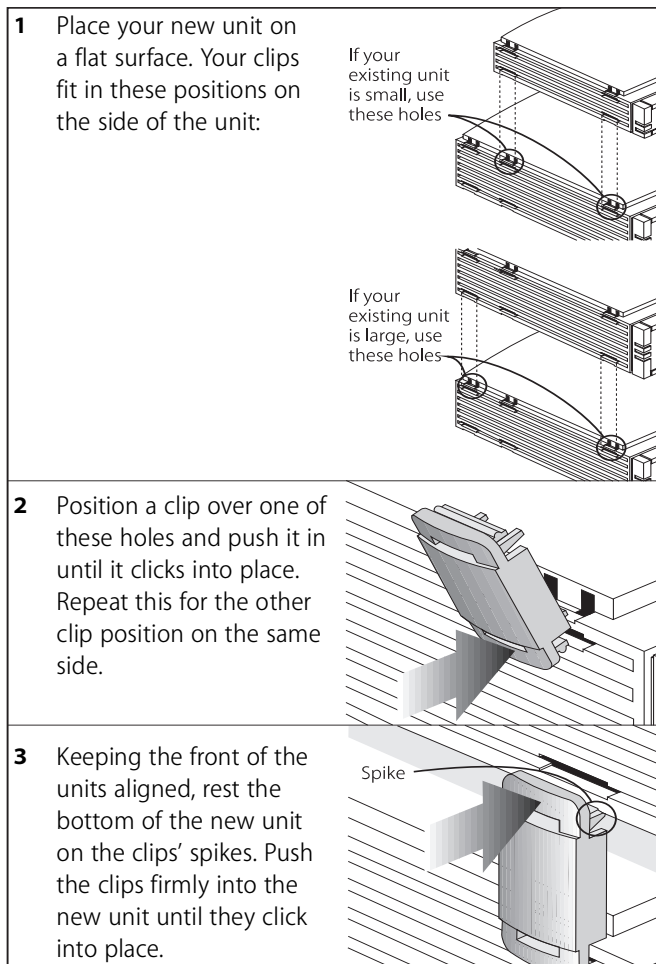
If you have additional hubs you want to connect using 10BASE-T, you need:

- One 'Straight-through' 10BASE-T cable for each additional hub.

Using the Rubber Feet and Stacking Clips

The four self-adhesive rubber feet prevent your hub from sliding around on your desk. Stick the feet to the marked areas at each corner of the underside of your hub.

The four stacking clips are used for neatly and securely stacking your OfficeConnect units together. **You can stack up to a maximum of four units. Small units must be stacked above large units.** To stack your units, secure the clips on one side and then on the other. Use the following method to secure one side:



Repeat these steps to secure the other side.

To remove a clip, hold the units firmly with one hand and hook the first finger of your other hand around the back of the clip. Use reasonable force to pull it off.

Positioning Your OfficeConnect Hub

When installing your OfficeConnect hub, ensure:

- It is out of direct sunlight and away from sources of heat.
- Cabling is away from power lines, fluorescent lighting fixtures, and sources of electrical noise such as radios, transmitters and broadband amplifiers.
- Water or moisture cannot enter the case of the unit.
- Air flow around the unit and through the vents in the side of the case is not restricted. We recommend you provide a minimum of 25.4 mm (1 in) clearance.



Wall mounting screw hole guide
142 mm (5.6 in)



Wall mounting the OfficeConnect Hub

There are two slots on the underside of the OfficeConnect hub which are used for wall mounting. You can mount the unit with the LEDs facing upwards or downwards, to suit your needs.



When wall mounting the unit, ensure that it is within reach of the power outlet.

You need two suitable screws. Ensure that the wall you are going to use is smooth, flat, dry and sturdy. Make two screw holes which are 142 mm (5.6 in) apart. Use the guide at the top of this page to mark the position of the holes. Fix the screws into the wall, leaving their heads 3 mm (0.12 in) clear of the wall surface.

Remove any connections to the unit and locate it over the screw heads. When in line, gently push the unit on to the wall and move it downwards to secure. When making connections, be careful not to push the unit up and off the wall.



CAUTION: Only wall mount single units, do not wall mount stacked units.

Connecting Workstations and Other Equipment to Your Hub



WARNING: Ensure you have read the Important Safety Information section carefully before you start.

ACHTUNG: Versichern Sie sich, daß Sie den Abschnitt mit den wichtigen Sicherheitshinweisen gelesen haben, bevor Sie das Gerät benutzen.

AVERTISSEMENT: Assurer que vous avez lu soigneusement la section de L'information de Sécurité Importante avant que vous commenciez.



CAUTION: Do not power the hub off and on quickly. Wait about 5 seconds between power cycles.

Connecting workstations and other equipment to your hub is easy. Connect them using 10BASE-T cables to any of the hub's sixteen 10BASE-T RJ45 ports.

10BASE-T cables are very easy to use. To connect a 10BASE-T cable, simply slot the connector into the relevant RJ45 port. When the connector is fully in, its latch locks it in place. To disconnect the cable, push the connector's latch in and remove it.

The hub detects all port connections, so you can start using your network immediately. When you need more ports, simply add more OfficeConnect hubs.



If you are using port 16 to connect to a workstation, ensure the MDI/MDIX switch is set to MDIX(out).

Connecting OfficeConnect Hubs Together

You can increase the number of workstations that can connect to your network by adding more OfficeConnect hubs. You can use either 10BASE-T or 10BASE-2 (Coax) to do this:

- With 10BASE-2 (Coax) you can connect up to 30 hubs on a single segment, leaving all of the RJ45 ports free.
- With 10BASE-T you can connect up to four hubs in series.



CAUTION: Do not connect the same two hubs together using both 10BASE-T and 10BASE-2 (Coax). This causes a network loop.

Connecting Hubs Using 10BASE-2 (Coax)

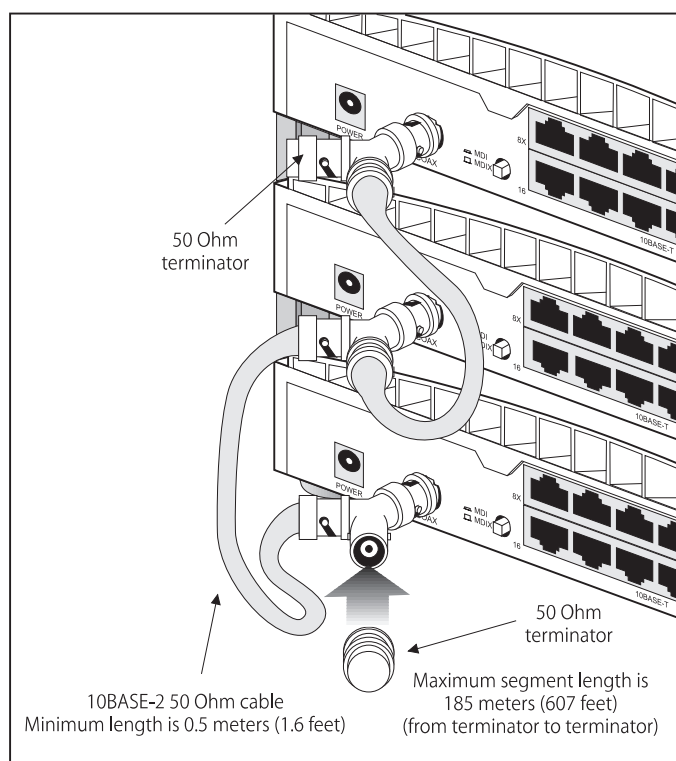


When using 10BASE-2 (Coax) cable, it is important that both ends of the segment are properly terminated with 50 Ohm terminators (end pieces).

Only use 50 Ohm 10BASE-2 (Coax) cables and use a 'Y' piece for each hub. You can use 'T' pieces but 'Y' pieces provide optimum clearance of the other ports.

Connect a 10BASE-2 'Y' piece to each of your hubs. Daisy-chain each 'Y' piece with 10BASE-2 (Coax) cable to form a single segment (as shown in the diagram). Remember to terminate the two free ends of the segment by fitting terminators (end pieces).

To disconnect a 10BASE-2 (Coax) cable, twist each connector counter-clockwise to unlock it, and remove it.



Correct Hub Connections Using 10BASE-2 (Coax)

Connecting Hubs Using 10BASE-T

You can connect hubs together with 10BASE-T in a number of ways, but for simplicity we recommend the following method:

- 1 Starting from the bottom, connect port 16 of the lower hub to port 15 of the hub immediately above. Repeat for each hub (as shown in the diagram).
- 2 Set all MDI/MDIX switches to MDI (in) except for the top hub (the one with port 16 not connected to another hub). This unused port can be connected to a workstation provided that the MDI/MDIX switch is set to MDIX (out).

Checking Hub Connections

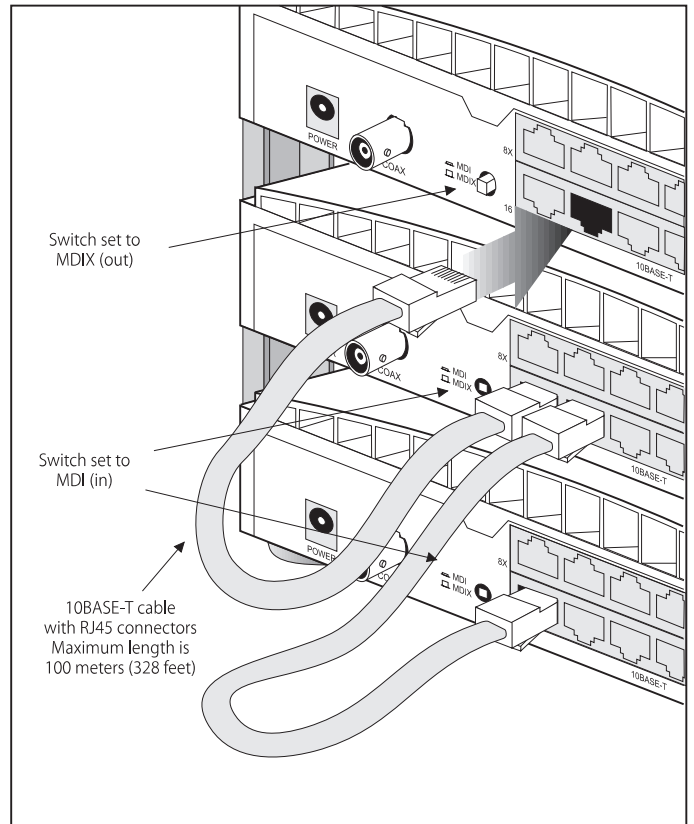
When you have connected your hubs, power them on. The Port Status LEDs for the ports you have used on the hubs should be green. If they are not, check your connections and the settings of the MDI/MDIX switches.

Spot Checks

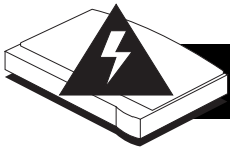
At frequent intervals, visually check that:

- The Alert LED is off — this is the best way to find out if there are problems with your network
- Case vents are not obstructed
- Cabling is secure and not pulled taut

If you suspect a problem, refer to [“Problem Solving”](#) on page 7.



Correct Hub Connections Using 10BASE-T



IMPORTANT SAFETY INFORMATION



WARNING: Warnings contain directions that you must follow for your personal safety. Follow all instructions carefully.

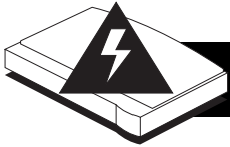
Please read the following information carefully before installing the OfficeConnect unit:

- Exceptional care must be taken during installation and removal of the unit.
- Only stack the OfficeConnect unit with other OfficeConnect units.
- Only use the power adapter that is supplied with the unit to ensure compliance with international safety standards.
- It is essential that the power outlet is located near the unit and is accessible. You can only remove power to the OfficeConnect unit by disconnecting the power adapter from the unit or from the socket outlet.

- This unit operates under SELV conditions (Safety 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.
- There are no user-replaceable fuses or user-serviceable parts inside the unit. If you have a physical problem with the unit that cannot be solved with problem solving actions in this guide, contact your supplier.
- Disconnect the power adapter before moving the unit.



WARNING: Twisted Pair RJ45 ports. These are RJ45 data sockets. They cannot be used as telephone sockets. Only connect RJ45 data connectors to these sockets.



WICHTIGE SICHERHEITSHINWEISE



ACHTUNG: Die Warnungen enthalten Anweisungen, die Sie zur eigenen Sicherheit zu befolgen haben.

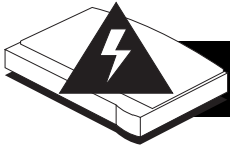
Lesen Sie bitte die folgenden Informationen sorgfältig durch, bevor Sie das Gerät einbauen:

- Auf besondere Vorsicht muß während des Ein- und Ausbaus des Gerätes geachtet werden.
- Stapeln Sie das Gerät nur mit anderen OfficeConnect Gerätes zusammen.
- Verwenden Sie nur das mit dem Gerät mitgelieferte Netzteil um die internationalen Sicherheitsstandards zu erfüllen.
- Die Netzsteckdose muß sich in unmittelbarer Nähe des Gerätes befinden und frei zugänglich sein. Sie können das Gerät nur spannungsfrei schalten, indem Sie das Steckernetzteil aus der Netzsteckdose ziehen oder die Verbindung zum Gerät unterbrechen.

- Dieses Gerät arbeitet mit SELV-Spannung (Safety Extra Low Voltage, Sicherheitskleinspannung) gemäß IEC950. Diese Bedingungen werden nur eingehalten, wenn die Geräte mit denen des Gerätes verbunden ist ebenfalls mit SELV-Spannung arbeiten.
- Es sind keine von dem Benutzer zu ersetzende oder zu wartende Teile in dem Gerät vorhanden. Wenn Sie ein Problem mit dem Gerät haben, das nicht mittels der Fehleranalyse in dieser Anleitung behoben werden kann, setzen Sie sich mit Ihrem Lieferanten in Verbindung.
- Bevor das Gerät ausgebaut wird ist das Netzteil zu ziehen.



ACHTUNG: gedrehte paarfache RJ45 Anschlüsse. Es sind RJ45 Datenanschlußbuchsen. Sie dürfen nicht als Telefonanschluß verwendet werden. Verbinden Sie nur RJ45 Datenstecker mit diesen Anschlüssen.



L'INFORMATION DE SÉCURITÉ IMPORTANTE



AVERTISSEMENT: Les avertissements contiennent les instructions que vous devez suivre pour votre sécurité personnelle. Suivre toutes les instructions avec soin.

Veillez lire à fond l'information suivante avant d'installer l'appareil:

- Le soin exceptionnel doit être pris pendant l'installation et l'enlèvement de l'appareil.
- Seulement entasser l'appareil avec les autres appareils OfficeConnect.
- Seulement utiliser la pièce de raccordement d'alimentation qui est fournie avec l'appareil pour assurer la conformité avec les normes de sécurité internationales.
- C'est essentiel que le socle de prise de courant du réseau soit localisé proche de l'appareil et soit accessible. Vous pouvez seulement enlever l'alimentation de l'appareil en débranchant la pièce de raccordement d'alimentation de l'unité ou du socle de prise de courant.

- Cet appareil fonctionne sous les conditions SELV (Sécurité du Voltage le plus Bas) d'après IEC950, les conditions desquelles sont maintenues seulement si le matériel à qui il est branché est aussi en exploitation sous SELV.
- Il n'y a pas de parties remplaçables par les utilisateurs ou entretenues par les utilisateurs à l'intérieur de l'appareil. Si vous avez un problème physique avec l'appareil qui ne peut pas être résolu avec les actions de la résolution des problèmes dans ce guide, contacter votre fournisseur.
- Débrancher la pièce de raccordement d'alimentation avant de remuer l'appareil.



AVERTISSEMENT: Les ports RJ45 de paire tordue. Ceux-ci sont les socles de données RJ45. Ils ne peuvent pas être utilisés comme socles de téléphone. Seulement brancher les connecteurs de données RJ45 à ces socles.

3Com Corporation, 5400 Bayfront Plaza, Santa Clara, California, 95052-8145

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PROBLEM SOLVING

The OfficeConnect hub has been designed to aid you when detecting and solving possible problems with your network. These problems are rarely serious; the cause is usually a disconnected or damaged cable, or incorrect configuration. If this section does not solve your problem, contact your supplier for information on what to do next.

Perform these actions first:

- Ensure all equipment is powered on.
- Power each unit off, wait about 5 seconds and then power them on.

Check the following symptoms and solutions:

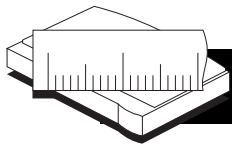
Power LED not lit. Check your power adapter connection. If there is still no power, you may have a faulty power adapter which needs replacing with another OfficeConnect power adapter. **Do not use any other power adapter with the hub.**

Alert LED continuously lit. There is either continual excessive use of your network (over 80%) or, more likely, a 10BASE-T port has partitioned due to a loop in your network (in which case the corresponding Port Status LED will be yellow). Examine your connections and remove the loop. Each piece of equipment needs only one connection to your OfficeConnect hub.

Port Status LED yellow for a 10BASE-T port. It is likely that there is a loop in your network which has caused this port to partition. Examine your connections and remove the loop. Each piece of equipment needs only one connection to your OfficeConnect hub. The LED will change from yellow to green, on receiving a valid packet on the port.

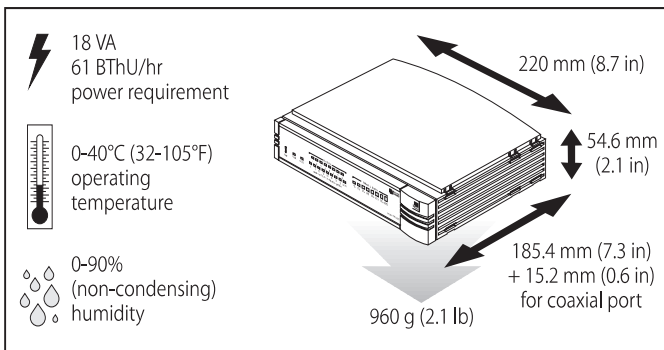
Port Status LED not lit for a port that has a connection. There is a problem with this connection. Check that you are using a 'Straight-through' cable which is properly connected at both ends, and is not damaged. If the cable is connected to port 16, ensure that the MDI/MDIX switch is set to MDIX (out). Also check that the equipment being connected to the hub is powered on, operating correctly and contains the correct type of connection.

Link between two OfficeConnect hubs not working. Check your hub connections; follow the information given in the ["Connecting OfficeConnect Hubs Together"](#) section. With 10BASE-T it is likely that an MDI/MDIX switch is incorrectly set. With 10BASE-2 (Coax) it is likely a terminator (end piece) is not properly fitted; this would cause the Coax Port Status LED to light yellow (partition).



DIMENSIONS AND STANDARDS

Dimensions and Operating Conditions



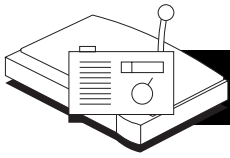
OfficeConnect Hub TP16C

Standards

Functional:	ISO 8802/3 IEEE 802.3
Safety:	UL 1950, EN 60950 CSA 22.2 #950
EMC:	EN 55022 Class B [†] EN 50082-1 FCC Part 15 Class B* [†] CSA C108.8 Class B [†] VCCI Class 2 [†]
Environmental:	EN 60068 (IEC 68)

[†]Shielded Category 5 cables must be used to ensure compliance with the Class B limits. The use of unshielded cable complies with the Class A limits.

*Refer to the ["EMC Statements"](#) section for conditions of operation.



EMC STATEMENTS

FCC STATEMENT: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and the receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

CSA STATEMENT: This Class B digital apparatus meets all requirements of the Canadian Interference-Causing Equipment Regulations.

Cet appareil numérique de la classe B respecte toutes les exigences du Règlement sur le matériel brouilleur du Canada.

この装置は、第二種情報処理装置（住宅地域又はその隣接した地域において使用されるべき情報処理装置）で住宅地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会（VCC）基準に適合しております。

しかし、本装置をラジオ、テレビジョン受信機に近接してご使用になると、受信障害の原因となることがあります。

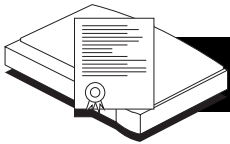
取扱説明書に従って正しい取り扱いをして下さい。

The user may find the following booklet prepared by the Federal Communications Commission helpful:

'How to Identify and Resolve Radio-TV Interference Problems'

This booklet is available from the U.S. Government Printing Office, Washington, DC 20402, Stock No. 004-000-00345-4.

In order to meet FCC emissions limits, this equipment must be used only with cables which comply with IEEE 802.3.



LIFETIME LIMITED WARRANTY

The duration of the warranty for the OfficeConnect Hub TP16C (3C16702) is lifetime, including the power adapter.

Advance hardware exchange is available during the first year from your date of purchase in accordance with 3Com's standard terms and conditions for such service. After the first year, the warranty reverts to 3Com's standard lifetime limited warranty.

To qualify for the lifetime limited warranty and the advance hardware exchange, you must submit the appropriate product warranty registration card to 3Com, otherwise this product will be warranted for a period of one (1) year without advance hardware exchange.

HARDWARE: 3Com warrants its hardware products to be free from defects in workmanship and materials, under normal use and service, for the following lengths of time from the date of purchase from 3Com or its Authorized Reseller:

Network adapters	Lifetime
Other hardware products	One year (unless otherwise specified above)
Spare parts and spare kits	90 days

If a product does not operate as warranted above during the applicable warranty period, 3Com shall, at its option and expense, repair the defective product or part, deliver to Customer an equivalent product or part to replace the defective item, or refund to Customer the purchase price paid for the defective product. All products that are replaced will become the property of 3Com. Replacement products may be new or reconditioned. Any replaced or repaired product or part has a ninety (90) day warranty or the remainder of the initial warranty period, whichever is longer.

3Com shall not be responsible for any software, firmware, information, or memory data of Customer contained in, stored on, or integrated with any products returned to 3Com for repair, whether under warranty or not.

SOFTWARE: 3Com warrants that the software programs licensed from it will perform in substantial conformance to the program specifications therefor for a period of ninety (90) days from the date of purchase from 3Com or its Authorized Reseller. 3Com warrants the media containing software against failure during the warranty period. No updates are provided. 3Com's sole obligation with respect to this express warranty shall be (at 3Com's discretion) to refund the purchase price paid by Customer for any defective software products, or to replace any defective media with software which substantially conforms to 3Com's applicable published specifications. Customer assumes responsibility for the selection of the appropriate applications program and associated reference materials. 3Com makes no warranty or representation that its software products will work in combination with any hardware or applications software products provided by third parties, that the operation of the software products will be uninterrupted or error free, or that all defects in the software products will be corrected. For any third party products listed in the 3Com software product documentation or specifications as being compatible, 3Com will make reasonable efforts to provide compatibility, except where the non-compatibility is caused by a "bug" or defect in the third party's product.

STANDARD WARRANTY SERVICE: Standard warranty service for hardware products may be obtained by delivering the defective product, accompanied by a copy of the dated proof of purchase, to 3Com's Corporate Service Center or to an Authorized 3Com Service Center during the applicable warranty period. Standard warranty service for

software products may be obtained by telephoning 3Com's Corporate Service Center or an Authorized 3Com Service Center, within the warranty period. Products returned to 3Com's Corporate Service Center must be pre-authorized by 3Com with a Return Material Authorization (RMA) number marked on the outside of the package, and sent prepaid, insured, and packaged appropriately for safe shipment. The repaired or replaced item will be shipped to Customer, at 3Com's expense, not later than thirty (30) days after receipt of the defective product by 3Com.

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