



INDeX

Installation & Maintenance

(Level 8.0)



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Introduction

General

This manual covers the installation and maintenance of an INDeX system. It is intended for use by installers and maintainers who have successfully completed the appropriate INDeX training courses.

The manual covers the installation of EMC compliant, CE Mark approved INDeX equipment (*For EMC compliance requirements, see page 10*).



Ensure that you have read and understood this manual before beginning installation.

Areas Not Covered by this Manual

This manual does not cover the following areas:

- **INDeX Technical Data:**
Detailed technical data on the functionality, features and performance of the INDeX are covered by the INDeX Product Description.
- **Rack Installation:**
You can install the INDeX cabinets into a suitable rack system. The Rack Installation Notes Manual covers the additional requirements for rack installation.
- **System Programming:**
System programming is necessary for installation and maintenance of the INDeX. This manual only covers very basic programming, for full details refer to the INDeX System Programming Manual.
- **Terminal Usage:**
This manual does not detail the usage and functionality of INDeX terminals. The details are found in the appropriate User Guides.
- **Other Equipment:**
Other peripheral equipment (eg. Windows Operator Consoles, Voice Manager, ACD Manager) have their own installation manuals.

Existing Lucent Technologies & INDeX Systems

INDeX Level 8.0 software does not support the attachment of SDX 420N GCU's.

The INDeX System

The major elements of the INDeX system are:

– **Cabinets:**

– **INDeX Control Cabinet:**

Provides 8 cassette slots. The eighth slot takes a CPU Cassette. A cable from this to the cabinet provides the system's serial ports (x4), parallel port (x1 - *not used and not present on some newer cabinets*) and music port (x1). You can insert a Link Cassette (LC) into the 7th slot for links to Expansion Cabinets.

– **INDeX-100s Control Cabinet:**

Provides 4 cassette slots. The fourth slot takes a CPU cassette. A cable from this to the cabinet provides the system's serial (x2) and music (x1) ports. The INDeX-100s Cabinet cannot use Link Cassettes (LC) or Expansion Link Cassettes (ELC).

– **Expansion Cabinet:**

Provides 8 cassette slots. The eighth slot takes an Expansion Link Cassette (ELC) which connects to the Link Cassette (LC) in the Control Cabinet.

– **Power Supply Units: (PSU)**

– **PSU-4:** Supports only the 4 cassette slots. Those are slots 1, 2 & 3 plus the CPU Cassette or Expansion Link Cassette slot.

– **PSU-8:** Supports all 8 cassette slots.

– **CPU Cassettes:**

Each system requires a CPU cassette installed in the Control Cabinet.

– **CPU-100:** Supports only slots 1, 2, 3 & 8 in a single cabinet system.

– **CPU-200:** Supports the use of all slots in a single cabinet system.

– **CPU-400:** Supports all slots in the Control Cabinet and a single Expansion Cabinet.

– **CPU-800:** Supports all slots in the Control Cabinet and up to three Expansion Cabinets. This cassette is being phased out in favour of the CPU-1000.

– **CPU-1000:** Support all slots in the Control Cabinet and up to four Expansion Cabinets.

– **Link Cassettes: (LC)**

Installing a Link Cassette in slot 7 of the Control Cabinet provides for attachment of Expansion Cabinets. Different models of Link Cassette support different numbers of Expansion Cabinets.

– **Expansion Link Cassette: (ELC)**

Each Expansion Cabinet requires an Expansion Link Cassette installed in its eighth slot. This connects to the Link Cassette in the system's Control Cabinet.

– **Device Cassettes:**

The remaining Control Cabinet and Expansion Cabinet slots (if supported by the PSU, CPU and Link cassette) can be filled by any of the range of INDeX cassettes.

Preparing for Installation

Introduction

This section reviews the requirements for installing an INDeX system. You must meet these requirements for the system to operate safely and in the intended manner.

This section covers:

- "Tools & Parts Required" on page 5.
- "Space Requirements" on page 6.
- "Environmental requirements" on page 7.
- "Power Supply Requirements" on page 7.
- "Cabling & Trunking" on page 8.
- "EMC & Earthing Requirements" on page 10.

Tools & Parts Required

General:

- 6.5mm Slothead screwdriver (removal of cabinet covers).
- No.1 Crosspoint (cassette screws and cabinet grille plate).
- Cutter/knife for cable ties.
- Cable ties - 3mm x 50mm.

Cabinet Mounting:

- Tape measure (up to 500mm).
- Drill + 8mm drill bit.
- Spirit level.
- 5mm diameter woodscrews + wallplugs (3 per cabinet).

PSU Installation:

- Digital voltmeter (DVM).
- Spare Fuses: Note that these are **BABT safety critical items** and **must not** be replaced by any other type.
 - PSU-4 (5A) - 38CPR10001SAB.
 - PSU-8 (6.3A) - 38CPR10001SAA.

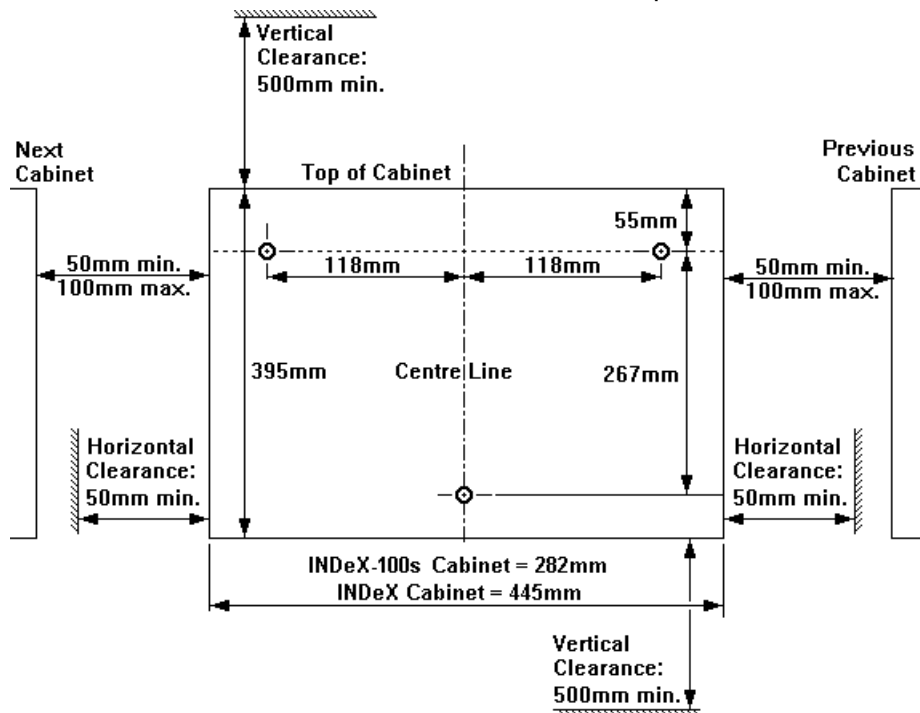
Programming:

- PC with serial port supporting 9.6K baud minimum.
- PC comms package emulating VT-100 dumb terminal.
- INDeX programming cable.
- For software uploads and downloads Kermit V2.29b **must** be used. A baud rate of 19.2K or 38.4K baud is also strongly recommended.
- INDeX System Programming Manual.

Space Requirements

Check that the planned location meets the following requirements.

- **Height:** 1400mm Minimum, allowing 500mm above and below each cabinet.
- **Width:** The width required depends upon the number of cabinets.
 - **1 x INDeX-100s Cabinet:** 382 mm minimum width required.
 - **1 x INDeX Cabinet:** 545 mm minimum width required.
 - **2 x INDeX Cabinets:** 1040 mm minimum width required.
 - **3 x INDeX Cabinets:** 1535 mm minimum width required.
 - **4 x INDeX Cabinets:** 2030 mm minimum width required.
 - **5 x INDeX Cabinets:** 2525 mm minimum width required.



WARNING: Cabinets must not be mounted vertically above each other except in a proper fan cooled rack installation (see *Rack Installation Notes Manual*).

- Allow a minimum clearance of 50mm to the left and right of the cabinet.
- Between cabinets, allow a separation of 50 to 100mm.
- Allow for trunking to the lower-right corner of each cabinet.
- Check there is suitable lighting for installation, system programming and future maintenance. Similarly check that there is sufficient working space for installation and future maintenance.
- Check that there is sufficient space for any anticipated future expansion or addition of peripheral equipment, eg. Voice and ACD Manager systems and other Server PC products.
- Ensure that likely activities near the system will not cause any problems, eg. access to and maintenance of any other equipment in the area.

Environmental requirements

The planned location must meet the following requirements:

- Check that the area is a well ventilated area, having a temperature range of 0°C to +40°C and a humidity range of 10% to 90% non-condensing.
- Check there are no flammable materials in the area.
- Check there is no possibility of flooding.
- Check that no other machinery or equipment needs to be moved first.
- Check that it is not an excessively dusty atmosphere.
- Check that the area is unlikely to suffer rapid changes in temperature and humidity.
- Check for the proximity of strong magnetic fields, sources of radio frequency and other electrical interference.
- Check there are no corrosive chemicals or gasses.
- Check there is no excessive vibration or potential of excessive vibration, especially of the cabinet mounting surface.

Power Supply Requirements

Check the following:

- **INDeX Cabinets:**

Each cabinet requires a separate switched mains supply. This should be a 230V ($\pm 10\%$), 50Hz single-phase mains supply rated at 10A maximum. The supplied mains-in cable length is 3 metres. Each mains supply must provide an earth connection (see "EMC & Earthing Requirements" on page 10).

- **UPS Equipment:**

The use of UPS's to support the INDeX system during mains power failure is highly recommended. Such equipment also provides mains conditioning. Contact Lucent Technologies for details of preferred and tested suppliers and models. The general requirements are:

- **For PSU-4 Cabinet:** 250 VA rated UPS.
- **For PSU-8 Cabinet:** 600 VA rated UPS.
- **Duration:** A UPS operating time of 4 hours is recommended.

- **Peripheral Equipment:**

Check that sufficient mains supply sockets exist for any peripheral equipment that may be connected to the INDeX system (eg. Voice Manager, ACD Manager, line drivers, etc).

Heat Dissipation

The following figures are for worst case heat dissipation from INDeX systems. They assume that the systems have been correctly installed.

- **Fully equipped single cabinet system:** 353W (1204BTU).
- **Fully equipped four cabinet system:** 1412W (4816BTU).
- **Single cabinet with PSU 4 and 4 cassettes:** 147W (502BTU).

Cabling & Trunking Requirements

The table below shows the maximum cable distances allowed from INDeX cassettes to the MDF, PSTN NTP's or device sockets. If the cabling is already in place, check that it does not exceed those distances.

Check also that the correct types of cables and sockets have been used and that the site wiring is clearly labelled. All cables and wires should run through protective trunking or ducts wherever possible.

Table of Cable Distances

See also "6. Connecting to the MDF" on page 18.

<u>Cabinet to:</u>	<u>Cable Type</u>	<u>Standard Cable Length</u>	<u>Maximum Length</u>
MDF	32 twisted-pair cable	3m	15m
DASS NTP	Coaxial cable (Type 43 to BNC).	3m	300m
DPNSS NTP	Coaxial cable (Type 43 to BNC)	3m	300m
Euro PRI NTP	UTP Cables (RJ45 to RJ45)	3m	200m
BRI NTP	32 twisted-pair cable	3m	See page 31.
Mains	–	3m	3m

<u>MDF to:</u>	<u>Cable Type</u>	<u>Standard Cable Length</u>	<u>Maximum Length</u>
DT/TT Socket	Type CW1308 (1 twisted pair)	–	1000m
Two-Wire Socket	Type CW1308 (1 twisted pair)	–	2400m
Alog PSTN	Type CW1308 (1 twisted pair)	–	1000m
AC15	Type CW1308 (2 twisted pairs)	–	400m

MDF (Krone) Cable Connection Requirements

Many cassettes used in the INDeX connect to the MDF using an INDeX 32-pair cable. We strongly recommended that you provide connection points for every cable pair even if the cassette does not require all 32 pairs. This allows for system expansion and maintenance with the minimum cable rewiring.

The INDeX 32-pair cable uses wires with a conductor diameter of 0.4mm (26 AWG) which is acceptable for use with Krone LS+ Quick Connection IDC Connectors.

- In excess of 100 re-terminations of the same wire diameter is possible provided that an approved Krone IDC tool is always used.
- When new Krone connectors are used it is possible to terminate two wires of the same diameter in one contact, ie 2 x 0.4mm diameter wires.
- It is not acceptable to terminate two wires of different diameters in one contact. Once an INDeX 32-pair cable wire has been terminated (wires of 0.4mm diameter), a wire of greater diameter (eg. 0.5mm) must not be terminated on top of it, even if only for test purposes. Such an action could result in poor contact of the smaller wire.
- Once a Krone connector has been terminated with a wire of diameter greater than 0.4mm it cannot be used for an INDeX 32-pair cable wire connection as this will result in poor contact.
- It is bad practice to use old Krone connectors unless you are certain that only 0.4mm diameter wires have previously been used in them.

Sockets & NTP's

DT & TT Terminal Sockets:

Each INDeX DT or TT terminal requires a slave jack (LJU 2/3A) socket connected to the MDF by a single twisted-pair cable. The wires connect to socket terminals 3 & 4.

Two-Wire Extension Sockets:

All two-wire terminal devices connected to the INDeX require a master jack (LJU 2/1A) socket fitted with gas discharge tubes for additional protection. The socket connects to the INDeX MDF by a single twisted-pair cable. The wires connect to socket terminals 2 and 5.

Network Termination Points: (NTP)

This equipment is provided and installed by the PSTN provider. It remains their equipment and no actions should be carried out on the line connection side. INDeX PRI cassettes usually connect directly to their NTP points. Other cassettes (eg. AC15) usually connect to their NTP via the MDF first.

Cable Requirements

Unless otherwise stated, all devices connect to the MDF using standard telephone cable (type CW1308). This can be a single or multiple pair cable. All cables should run through cable ducting or protective trunking.

General Cable Specification:

- **Type:** CW1308 (0.5mm diameter copper wire).
- **Wire Insulation:** PVC Type 2 insulation to BS6746.
- **Cable Sheathing:** PVC Type TM1 sheathed to BS6746.
- **Resistance:** 84Ω/Km maximum at 20°C.
- **Capacitance Unbalance:** Between any conductor and all other conductors connected to earth this is limited to 500pf maximum.

EMC & Earthing Requirements

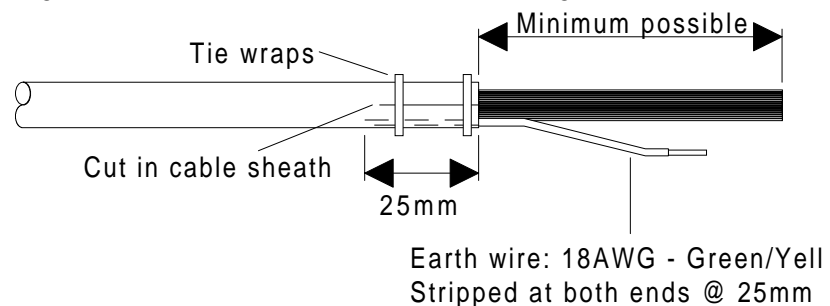
The INDeX system is EMC approved and carries CE mark approval. For an installation to be EMC compliant, it must meet the following requirements at all times:

- Only EMC approved INDeX equipment must be used. You must not include pre-EMC INDeX cabinets (including covers), power supply units and cassette cables. You can include pre-EMC cassettes.
- You must install all cabinets with their base grilles and front covers in place.
- You must only use EMC Cassette cables (ie. cables in which the sheath includes a braid and foil barrier).
- Where provided all cables exiting a cabinet must use their P-clip for earthing.
- The mains supply must provide an earth connection.

Cable Earthing at the MDF

All cassette cables must be earthed at the MDF using one of the following methods. In all cases, you must keep the amount of sheathing removed from the cable to a minimum.

- A P-clip earth connection if provided.
- Adding an earth lead to the cable end (see the diagram below).



- You may use other methods if indicated for a particular cassette type.

Additional Earthing

If correctly installed, the INDeX is earthed via its power supply connections. However, in some locations local regulations may require connection of an additional safety earth.

Connection of an additional safety earth can be done as detailed below. Note that Lucent Technologies do not supply any parts for this connection.

- **Connecting an Additional Safety Earth**
Prepare a suitable earth lead with termination for an M6 bolt or screw. Using the bolt or screw, attach the cable to the threaded insert provided adjacent to the INDeX cabinets mains input socket.

Installing a New System

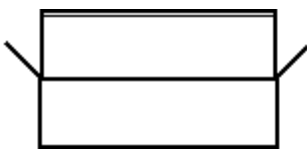
0. Introduction

Before proceeding with installation, ensure that you have read the notes covered in Pre-Installation.

This chapter covers:

- "1. Unpacking" on page 11.
- "2. Installing Wall Mounted Cabinets" on page 12.
- "3. Installing the PSU's" on page 13.
- "4. Installing the CPU Cassette" on page 16.
- "5. Basic System Programming" on page 17.
- "6. Connecting to the MDF" on page 18.
- "7. Installing a Link Cassette" on page 19.
- "8. Installing an Expansion Link Cassette" on page 20.
- "9. Installing DSLC Cassettes" on page 21.
- "10. Installing ALOG Cassettes" on page 22.
- "11. Installing ACA Cassettes" on page 25.
- "12. Installing DASS & DPNSS PRI Cassettes" on page 26.
- "13. Installing EURO ISDN PRI Cassettes" on page 27.
- "14. Allocating PRI Cassette Channels" on page 28.
- "15. Installing Basic Rate Interface (BRI) Cassettes" on page 29.
- "16. Installing Combo Cassettes" on page 33.
- "17. Installing VCC Cassettes" on page 36.
- "18. Closing Off the Cabinets" on page 37

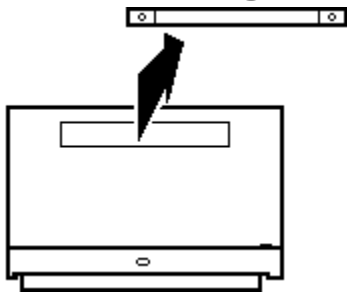
1. Unpacking



Unpacking and checking:

1. Do not start unpacking until the equipment is at the site of installation.
2. Before unpacking check for any signs of damage that has occurred during transit. If any damage exists bring it to the attention of the carrier.
3. Check all cartons against the packing slip. Report any errors or omissions to the equipment supplier.
4. Whilst unpacking the equipment, retain all the packaging material. Fault returns are only accepted if repackaged in the original packaging.
5. Visually inspect each item and check that all the necessary documentation and accessory items have been included. Report any errors or omissions to the dealer who supplied the equipment.
6. Ensure you read and understand any documentation included with any item.

2. Installing Wall Mounted Cabinets

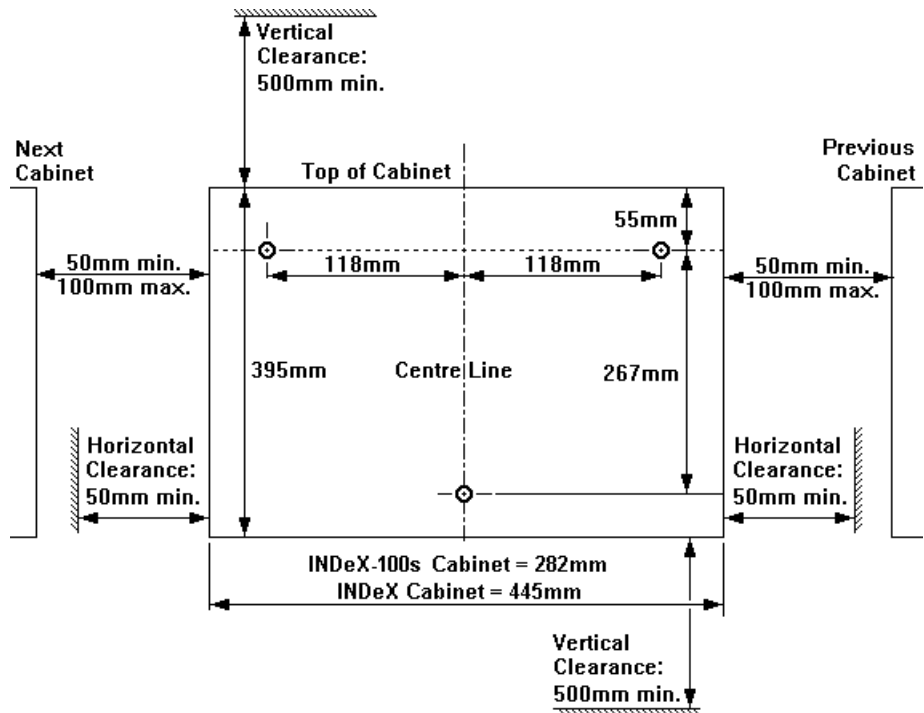


This section covers the installation of wall-mounted cabinets. Ensure the section of wall chosen is solid, vibration free and flat. For rack installation refer to the Rack Installation Notes Manual.

WARNING: Cabinets must not be mounted vertically above each other except in a proper fan cooled rack installation (see *Rack Installation Notes Manual*).

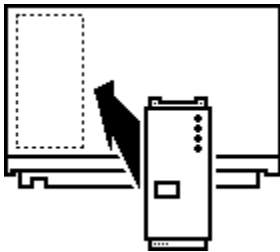
To wall mount a cabinet:

1. Check that you have the correct cabinet type. Control Cabinets include a CPU connection cable not present in Expansion Cabinets).
2. Check the positioning for the cabinet relative to any other cabinets, MDF equipment, power supplies, etc. The Control Cabinet normally goes on the right of any other cabinets.
3. Mark 2 mounting bracket holes and 1 cabinet fixing hole using the details below:
 - On a horizontal line 55mm below the top of the cabinet, mark 2 holes at 118mm either side of the cabinet's vertical centre-line.
 - Mark another hole on the cabinet's vertical centre-line and 267mm below the other holes.



4. Drill and insert wallplugs suitable for 5mm woodscrews (25mm length minimum) supporting a 20Kg load in each hole.
5. Screw the cabinet mounting bracket to the wall and hang the empty cabinet from it.
6. Put a fixing screw through the slot at the back of the cabinet rear to secure the cabinet.
7. Repeat the above steps for the next cabinet if required.

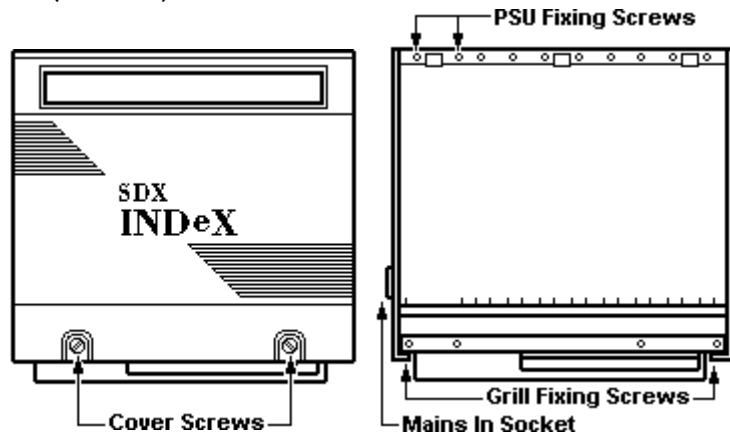
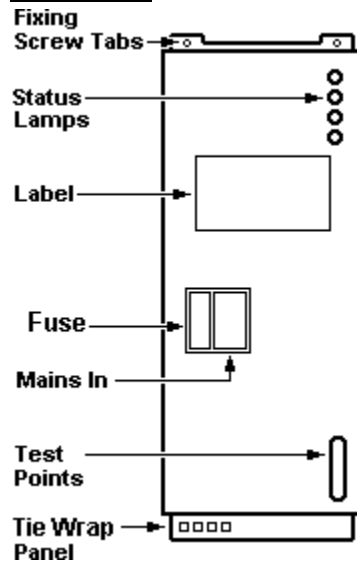
3. Installing the PSU's



This section covers installing the power supply units. Each cabinet includes an integral mains lead. This connects from the cabinet's mains-in socket to the PSU's mains-in socket.

1. Check that you have the correct type of PSU for the cabinet:
 - The cabinet requires a PSU-8 if more than 4 cassettes (including a CPU or Expansion Link Cassette) are being fitted or a Link Cassette being fitted.
2. If necessary, remove the cabinet cover (2 retained screws). Remove the base grille plate (2 screws).

PSU Features:



3. Remove the two screws at the top of the space adjacent to Slot-1 of the cabinet (at the left-hand side).
4. Insert the PSU into the space.
5. Connect the short integral mains cable from the cabinet's mains-in socket to the front mains-in socket of the PSU.
6. Plug the mains-in cable from the mains supply into the cabinets mains-in socket (on the left-hand edge).
7. Test the PSU (*see page 14*).
8. If the PSU is okay, secure the PSU (*using the two screws previously removed*) at the top of its front panel.
9. Tie wrap the mains cable to the bottom of the PSU front panel.
10. Repeat this process for any other cabinets in the system.

Testing the PSU's

Use the following procedures to test and check PSU units.

To test the PSU:

1. Switch on power to the cabinet.
2. Wait a few seconds and then check which lamps on the PSU are still on.
 - Even if a PSU is okay, the under-voltage lamp may come on for a few seconds when power is applied.
3. Depending which lamps are on (or otherwise), refer to the sections below.
4. Repeat the tests for all PSU's in the system.

No PSU Lamps On

1. Switch power to the cabinet off.
2. Check the mains cable connections and that there is power to the mains socket.
3. Check the mains cable fuse and replace if necessary.
4. Check the PSU fuse and replace if necessary. Note that the fuses are BABT Safety Critical items and **must** only be replaced with a suitable Lucent Technologies approved type:
 - **PSU-4:** 5A (38CPR10001SAB).
 - **PSU-8:** 6.3A (38CPR10001SAA).
5. Restart the PSU test. If no lamps come on, replace the PSU.

Converter Operating Lamp On Only

If the PSU displays only the green **CONVERTER OPERATING** lamp, then check the PSU voltages. This is done using 5 test points, accessible at the bottom right of the PSU front panel.

To check the PSU test point voltages:

1. Using a Digital Voltmeter (DVM), check that the test point voltages are within the following ranges:
 - **Pin 1:** 70V ac. RMS $\pm 10\%$
 - **Pin 2:** -38V dc. $\pm 10\%$
 - **Pin 3:** -5V dc. $\pm 2\%$
 - **Pin 4:** 0 Volts (test meter reference)
 - **Pin 5:** +5V dc. $\pm 2\%$
2. If any of the voltages are outside the stated range, replace the PSU and restart the PSU test.
3. If the problem persists, suspect a fault in the cabinet backplane.

Over Voltage Shutdown Lamp On

This red lamp is lit if any of the four PSU outputs exceeds its voltage limits. If this occurs then all PSU outputs will drop to 0 Volts and the PSU will latch in that state.

Note: The **Over Temperature Shutdown** lamp also comes on in the event of an **Over Voltage Shutdown**.

To recover from an Over Voltage Shutdown:

1. Switch off power to the cabinet and wait approximately 15 seconds.
2. Switch power to the cabinet on again. If the fault reoccurs, replace the PSU and restart the PSU test.
3. If the problem persists, suspect a fault in the cabinet backplane.

Over Temperature Shutdown Lamp On

This red lamp comes on if the cabinet is not sufficiently ventilated or a PSU circuit fault causes an overheating failure. If this occurs then all PSU outputs will drop to 0 Volts and the PSU will latch in that state.

To recover from an Over Temperature Shutdown:

1. Switch off power to the cabinet.
2. Check that none of the ventilation slots and grills above and below the cabinet are blocked.
 - In a rack mounted system check that the rack fan cooling units are correctly installed and operating (*see Rack Installation Notes Manual*).
3. Check that the 500mm clearance above and below the cabinet. Make sure that no heat generating equipment has been placed near the cabinet.
4. Check that the ambient room temperature has not exceeded the limit of +40°C near the cabinet.
5. Switch power to the cabinet on again. If the fault reoccurs, replace the PSU and restart the PSU test.
6. If the fault persists, test to see if providing the cabinet with additional forced ventilation improves the situation.

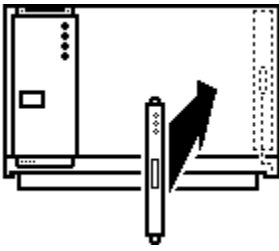
Under Voltage Lamp On

This red lamp comes on when any of the four PSU outputs falls below its normal limits. Note that it is normal for this lamp to briefly come on when power to the cabinet is switched on or off. The PSU does not latch in the off state when this fault occurs and may recover automatically.

To recover from an Under Voltage Warning:

1. Remove any other cassettes in the cabinet one at a time. This determines whether an individual cassette is causing the under voltage condition.
2. If the problem persists even with all cassettes removed then the cabinet backplane or the PSU itself may be faulty.
3. If the problem persists even with the PSU not connected to the backplane, then the PSU is probably faulty.

4. Installing the CPU Cassette

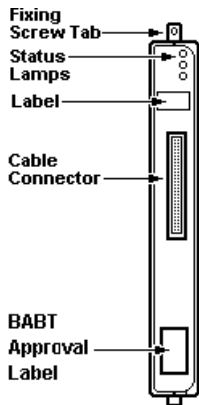


This section covers installation of the INDeX system's CPU Cassette.

To install a CPU cassette:

1. Check that you have the correct type of CPU cassette:
 - **CPU 100:** Supports slots 1, 2, 3 and 8 in a single cabinet system.
 - **CPU 200:** Supports all slots in a single cabinet system.
 - **CPU 400:** Supports all slots in a 2 cabinet system.
 - **CPU 800:** Supports all slots in a 4 cabinet system.
 - **CPU 1000:** Supports all slots in a 5 cabinet system.
2. Check which cabinet and slot the CPU Cassette goes in:
 - The CPU cassette should go in the right-hand cabinet.
 - The CPU cassette uses Slot 8, the slot labelled **ELC OR CPU ONLY**.
 - The cabinet must have a CPU cable present (this links the cassette to the sockets under the right-hand edge of the cabinet).
3. Remove the screw above the slot and insert the CPU Cassette into the slot.
4. Secure the cassette (using the screw previous removed) using the tab at the top of the cassette.
5. Plug the CPU cable into the CPU cassette. Take care not to stretch or pull this cable.

CPU Cassette Features:



Checking the CPU

The CPU cassette performs an automatic self-test when power to the Control Cabinet is switched on. The status lamps on the front of the cassette indicate the result of the self-test.

To check the CPU Cassette:

1. Check the status displayed by the CPU cassette lamps:

<u>Green</u>	<u>Red</u>	<u>Amber</u>	<u>Status</u>
On	Off	On	CPU okay, automatic self-test passed.
Flashing	Off	On	CPU S/W upload in progress or system shutdown.
Off	Off	On	CPU fault or no CPU software present.
Off	Off	Off	Power failure or CPU fault.

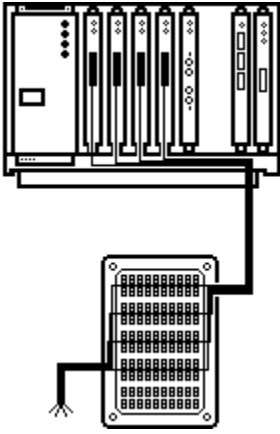
- Any other condition in addition to those above indicates a CPU fault.
2. If the status lamps indicate a fault, switch off the system and replace the CPU cassette.
 3. If the fault persists, more detailed investigation is required.
 4. If the CPU appears okay (Amber and Green lamps on only), proceed with the installation.

5. Basic System Programming

This sections covers only the most basic aspect of system programming required before installation of any device cassettes. Full system programming will be highly dependent of the customer requirements.

1. Log on to the system. If the CPU is at default, you should be asked to enter a password that then becomes the new Engineers password for that system.
2. During log on check the software version and CPU type shown are correct and note the CPU Cassette's serial number.
3. The following steps ensure that the system database is at full default.
 - From the **Main Menu** select **Database Management** and the select **Erase Database**.
 - Escape back to the **Main Menu** and select **Maintenance**. Select **Reset System** and enter **SYSTEM RESET**.
4. Set the system date, time and name.
 - **Date:** Main Menu > System > Clock > Date.
 - **Time:** Main Menu > System > Clock > Time.
 - **Name** Main Menu > System > Installation > Installation Name.
5. Set the required base numbers to use during the insertion of device cassettes.
 - From the **Main Menu** select **Directory**, then **Set up** and then **Reserved numbers**. Set the **Next terminal number**, **Next trunk number** and **Next group number** as required.
 - Escape back to the **Main Menu** and select **Maintenance**. Select **Reset System** and enter **DEVICE DATABASE**.
6. Backup the existing database changes. Remember to repeat this action frequently during the insertion of new device cassettes into the system.
 - From the **Main Menu** select **Database Management** and then **Database Backup**.

6. Connecting to the MDF

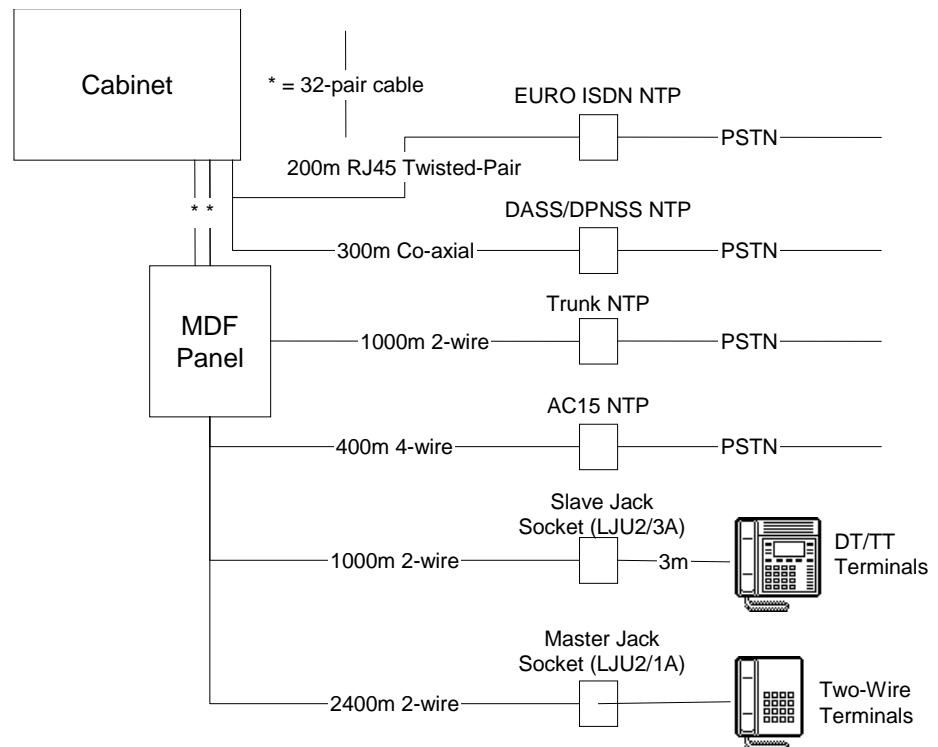


Whilst Lucent Technologies do not supply the MDF panel as part of the INDeX, we **strongly recommend** that you provide 32 connection pairs for each cassette that requires a connection strip. This greatly simplifies maintenance and upgrading of cassettes.

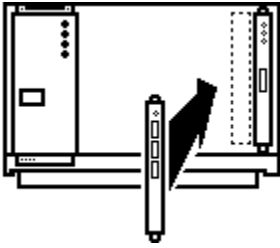
The cable supplied with DSLC, BRI and ALOG cassettes is a 3m 32 twisted-pair cable (CW1308 wire) (other lengths can be ordered if required). The twisted-pairs are separated into 3 groups of 10 pairs by coloured wrappers plus two loose pairs.

General Connection Requirements:

1. Connect each cable to the MDF panel (*see the appropriate cassette installation sections for individual wiring details*).
2. Ensure that PSTN connections are wired onto separate connection strips from any other equipment (eg. terminals). This is a BABT requirement.
3. Ensure that the cable and each wire connection is labelled with its type and address (cabinet, cassette and channel number).
4. You must earth all cables at the cabinet using the P-clips where provided.
5. The diagram below is only indicative of the maximum cable distances (*for BRI connections, see "Basic Rate ISDN Cabling" on page 31*).



7. Installing a Link Cassette



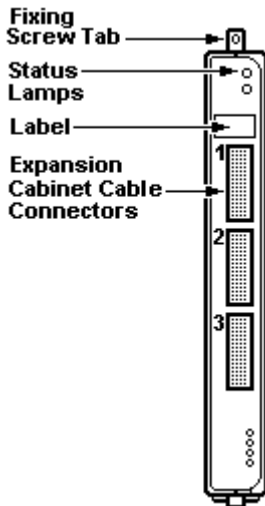
This section covers the installation of a Link Cassette to provide connections from the Control Cabinet to Expansion Cabinets. The use of a Link Cassette requires the cabinet to include a PSU-8 and either a CPU400 (one expansion cabinet), CPU800 (up to three expansion cabinets) or CPU1000 (up to four expansion cabinets).

Note: INDeX Level 8+ does not support connections to SDX 420N GCU's even if supported by the type of Link Cassette being fitted.

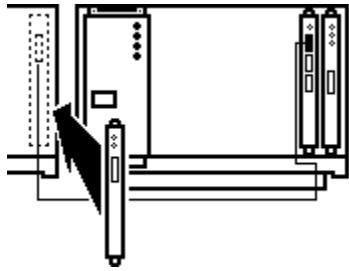
To install a Link cassette:

1. Check that you have the correct type of Link cassette for the number of Expansion Cabinets. This is indicated on the cassette label as "**LCxE-V**" where **xE** is the number of Expansion cabinets supported by the cassette.
2. Remove the screw from above the slot next to the CPU cassette (the slot labelled "**LC**").
3. Insert the Link cassette into that slot.
4. Check which lamps come on.
 - **Green On/Red Off:** Power supply to cassette okay.
 - **Green Off:** Swap the cassette. If the problem persists, check the PSU/CPU.
 - **Red On:** Swap the cassette. If the problem persists, check the PSU/CPU.
5. Secure the cassette (*using the screw previously removed*) through its top tab.
6. Add links for the expansion cabinets:
 - Plug a suitable length Link Cassette cable into the first (top) 96-way socket.
 - Repeat downwards for any other expansion cabinets.
 - Attach each cable's P-clip to the appropriate point at the rear base of the cabinet (labelled "**ELC/LC**").
7. Cable tie the cable to the front of the cassette.

Link Cassette Features:



8. Installing an Expansion Link Cassette

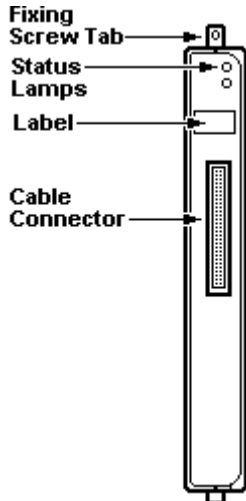


This section covers the installation of Expansion Link cassettes into any Expansion Cabinets in the system.

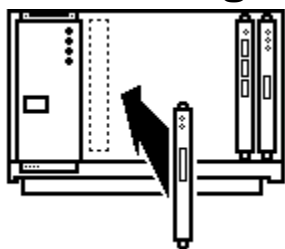
To install an Expansion Link cassette:

1. Remove the screw at the top of the right-most slot of the expansion cabinet (the slot labelled "ELC or CPU Only").
2. Insert the Expansion Link cassette into that slot.
3. Secure the cassette (*using the screw previously removed*) through its top tab.
4. Plug in the LC cable from the Link cassette in the Control cabinet. Use the cable from the top port for the first Expansion cabinet and so on.
5. Check which cassette lamps come on.
 - **Green On/Red Off:** Power supply to cassette okay.
 - **Green Off:** Swap the cassette. If the problem persists, check the PSU/CPU.
 - **Red On:** It is normal for ELC Cassettes to display a red lamp until another cassette is installed in the Expansion Cabinet. If after this the lamp stays on, swap the cassette. If the problem persists, check the PSU/CPU.
6. Attach the cable P-clip to the appropriate point at the rear base of the cabinet (labelled "ELC/LC").
7. Cable tie the cable to the front of the cassette.
8. Repeat for any other expansion cabinets in the system.

Expansion Link Cassette:



9. Installing DSLC Cassettes



This section covers the installation of DSLC cassettes for DT & TT terminals.

To install a DSLC cassette:

1. Ensure that you have the correct cassette and a plan of which cassette goes in each slot. The cassette's label shows its capacity as "DSL C_x " where x is the number of DT/TT terminals supported.
2. Remove the screw at the top of the slot to be used. Insert the new cassette.
3. Check which lamps come on.
 - **Green On/Red Off:** Power supply to cassette okay.
 - **Green Off:** Swap the cassette. If the problem persists, check the PSU/CPU.
 - **Red On:** Swap the cassette. If the problem persists, check the PSU/CPU.
4. Secure the cassette using its top tab (*using the screw previously removed*).
5. Connect a 32-pair INDeX cable to the cassette. Attach the cable's P-clip to the appropriate point at the base of the cabinet for the cassette slot.
6. Cable tie the cable to the front of the cassette.

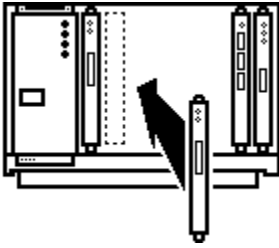
DSL C Cassette Cable Connections

The table below shows the connections from the DSLC cassette to the MDF using an INDeX 32 pair cable. You must earth the cable screen at the MDF (*see page 10*). For the connection from the MDF, each channel requires a Slave Jack Socket (Type LJU 2/3A). The wire pairs connect to pins 3 & 4.

Ensure that the cable and wires are clearly labelled at both ends.

Channel	DSL C -8	DSL C -16	DSL C -32	DSL C -32	Wrap	Speech & Data	Speech & Data
Channel 1	DSL C	DSL C	DSL C	DSL C	Orange	White/Blue	Blue/White
Channel 2	DSL C	DSL C	DSL C	DSL C	Orange	White/Orange	Orange/White
Channel 3	DSL C	DSL C	DSL C	DSL C	Orange	White/Green	Green/White
Channel 4	DSL C	DSL C	DSL C	DSL C	Orange	White/Brown	Brown/White
Channel 5	DSL C	DSL C	DSL C	DSL C	Orange	White/Slate	Slate/White
Channel 6	DSL C	DSL C	DSL C	DSL C	Orange	Red/Blue	Blue/Red
Channel 7	DSL C	DSL C	DSL C	DSL C	Orange	Red/Orange	Orange/Red
Channel 8	DSL C	DSL C	DSL C	DSL C	Orange	Red/Green	Green/Red
Channel 9	–	DSL C	DSL C	DSL C	Orange	Red/Brown	Brown/Red
Channel 10	–	DSL C	DSL C	DSL C	Orange	Red/Slate	Slate/Red
Channel 11	–	DSL C	DSL C	DSL C	Green	Black/Blue	Blue/Black
Channel 12	–	DSL C	DSL C	DSL C	Green	Black/Orange	Orange/Black
Channel 13	–	DSL C	DSL C	DSL C	Green	Black/Green	Green/Black
Channel 14	–	DSL C	DSL C	DSL C	Green	Black/Brown	Brown/Black
Channel 15	–	DSL C	DSL C	DSL C	Green	Black/Slate	Slate/Black
Channel 16	–	DSL C	DSL C	DSL C	Green	Yellow/Blue	Blue/Yellow
Channel 17	–	–	DSL C	DSL C	Green	Yellow/Orange	Orange/Yellow
Channel 18	–	–	DSL C	DSL C	Green	Yellow/Green	Green/Yellow
Channel 19	–	–	DSL C	DSL C	Green	Yellow/Brown	Brown/Yellow
Channel 20	–	–	DSL C	DSL C	Green	Yellow/Slate	Slate/Yellow
Channel 21	–	–	DSL C	DSL C	Brown	White/Blue	Blue/White
Channel 22	–	–	DSL C	DSL C	Brown	White/Orange	Orange/White
Channel 23	–	–	DSL C	DSL C	Brown	White/Green	Green/White
Channel 24	–	–	DSL C	DSL C	Brown	White/Brown	Brown/White
Channel 25	–	–	–	DSL C	Brown	White/Slate	Slate/White
Channel 26	–	–	–	DSL C	Brown	Red/Blue	Blue/Red
Channel 27	–	–	–	DSL C	Brown	Red/Orange	Orange/Red
Channel 28	–	–	–	DSL C	Brown	Red/Green	Green/Red
Channel 29	–	–	–	DSL C	Brown	Red/Brown	Brown/Red
Channel 30	–	–	–	DSL C	Brown	Red/Slate	Slate/Red
Channel 31	–	–	–	DSL C	None	Black/Blue	Blue/Black
Channel 32	–	–	–	DSL C	None	Black/Orange	Orange/Black

10. Installing ALOG Cassettes



This section covers installation of ALOG cassettes including AC15 cassettes.

INDeX Alog Terminal Ports

- 2.4K Maximum cable distance.
- REN of 2 per port.
- Message light function using Mitel Solutions Technique (Option 3).

ALOG Cassette Restrictions

- The ALOG 0/24 only supports MF dialling.
- Only 1 ALOG cassette should be used in a cabinet with a PSU4.
- ALOG and COMBO/BRIC cassettes should not be used together in a cabinet with a PSU4.
- A maximum of 80 simultaneous ringing ALOG extensions is supported per cabinet (112 extensions if using ALOG 0/24).
- Cabinets fully equipped with ALOG cassettes are not recommended for high traffic environments such as call centres.

To install an ALOG cassette:

1. Ensure that you have the correct cassette. The cassette label shows its type as "ALOG x/y/z" where *x* is the number of analogue terminals, *y* the number of analogue trunks and *z* the number of AC15 trunks.
2. Remove the screw at the top of the slot to be used. Insert the new cassette.
3. Check which lamps come on.
 - **Green On/Red Off:** Power supply to cassette okay.
 - **Green Off:** Swap the cassette. If the problem persists, check the PSU/CPU.
 - **Red On:** Swap the cassette. If the problem persists, check the PSU/CPU.
4. Secure the cassette using its top tab (*using the screw previously removed*).
5. Connect the INDeX 32-pair cable to the cassette. Attach the cable's P-clip to the appropriate point at the base of the cabinet for the cassette slot.
6. Cable tie the cable to the base of the cassette.

Configuring the Two-Wire Terminal Circuits

By default, two-wire terminal circuits use MF signalling with time break recall. The process below details how to switch a two-wire circuit between LD and MF signalling.

Note: Alog 0/24 and BRIC cassettes only support MF dialling. Note also that in some countries the INDeX software itself will not support LD dialling.

To configure a two-wire terminal for LD or MF:

1. From the **Main Menu**, select **Terminal** and enter the directory number or address.
2. Select **Analogue Control Data**.
3. Select **Recall Detect Minimum**. The value is set in 10ms units.
 - For a terminal using MF dialling, set this to **5** (default).
 - For a terminal using LD dialling, set this to **9**.
4. Repeat the process for other two-wire terminal circuits.

Configuring the AC15 Circuits

By default, AC15 circuits use DTMF signalling. The process below details how to switch an AC15 circuit between DTMF and 10PPS signalling.

To configure an AC15 circuit for MF or 10pps:

1. From the **Main Menu**, select **Trunk** and enter the directory number or address.
2. Select **Analogue Control Data**.
3. Select **Signalling Type**.
 - For a trunk using MF dialling (eg. for DISA), set this to **DTMF** (default).
 - For a trunk using 10pps dialling, set this to **pulse**.
4. Repeat the process for other AC15 circuits.

Configuring ALOG Trunk Circuits

By default, ALOG trunk circuits use unguarded clearing. This must be altered to meet the requirements of the PSTN line provider.

To configure ALOG trunk circuits:

1. From the **Main Menu**, select **Trunk** and enter the directory number or address.
2. Select **Analogue Control Data**.
3. Select **Clearing mode** and set this to the mode required by the PSTN provider (**Unguarded**, **Disconnect** or **Guarded**).
4. Select **Disconnect/guarded clear**. The value is set in 10ms units.
 - For unguarded clearing and disconnect clearing, set this to **45** (default).
 - For guarded clearing, set this to **2**.
5. Repeat the process for other ALOG trunk circuits.

ALOG Cassette Connections

The sections below list the connections for ALOG cassettes using an INDeX 32-pair cable. In all cases, you must earth the cable screen at the MDF (see page 10).

Connecting ALOG Trunks & Two-Wire Cable Connections

The table below shows the circuit connection for ALOG cassettes providing two-wire and analogue trunk circuits.

Ensure that the cable and wires are clearly labelled at both ends. The power fail circuits (shown as PF in the table below) must be clearly labelled on the MDF connection strips and at the wall sockets.

Two-Wire Terminal Connections:

For the connection from the MDF, each two-wire channel requires a Master Jack Socket (Type LJU2/1A). The wire pairs connect to pins 2 & 5.

Trunk Connections:

The connection from the MDF to the NTP depends on the PSTN provider.

Channel	8/2/0	8/8/0	2/8/0	4/2/0	0/16/0	0/24/0	Wrap	Speech	Speech
Channel 1	Trunk	Trunk	–	–	TW	TW	Orange	White/Blue	Blue/White
Channel 2	Trunk	Trunk	–	–	TW	TW	Orange	White/Green	Green/White
Channel 3	Trunk	Trunk	–	–	TW	TW	Orange	White/Slate	Slate/White
Channel 4	Trunk	Trunk	–	–	TW	TW	Orange	Red/Orange	Orange/Red
Channel 5	Trunk	Trunk	–	Trunk	TW	TW	Orange	Red/Brown	Brown/Red
Channel 6	Trunk	Trunk	–	Trunk	TW	TW	Green	Black/Blue	Blue/Black
Channel 7	Trunk ^{PF2}	Trunk ^{PF2}	Trunk	Trunk	TW	TW	Green	Black/Green	Green/Black
Channel 8	Trunk ^{PF1}	Trunk ^{PF1}	Trunk ^{PF1}	Trunk ^{PF1}	TW	TW	Green	Black/Slate	Slate/Black
Channel 9	TW ^{PF1}	TW ^{PF1}	TW ^{PF1}	TW ^{PF1}	TW	TW	Green	Yellow/Orange	Orange/Yellow
Channel 10	TW ^{PF2}	TW ^{PF2}	TW	TW	TW	TW	Green	Yellow/Brown	Brown/Yellow
Channel 11	–	TW	TW	–	TW	TW	Brown	White/Blue	Blue/White
Channel 12	–	TW	TW	–	TW	TW	Brown	White/Green	Green/White
Channel 13	–	TW	TW	–	TW	TW	Brown	White/Slate	Slate/White
Channel 14	–	TW	TW	–	TW	TW	Brown	Red/Orange	Orange/Red
Channel 15	–	TW	TW	–	TW	TW	Brown	Red/Brown	Brown/Red
Channel 16	–	TW	TW	–	TW	TW	None	Black/Blue	Blue/Black
Channel 17	–	–	–	–	–	TW	Orange	White/Orange	Orange/White
Channel 18	–	–	–	–	–	TW	Orange	White/Brown	Brown/White
Channel 19	–	–	–	–	–	TW	Orange	Red/Blue	Blue/Red
Channel 20	–	–	–	–	–	TW	Orange	Red/Green	Green/Red
Channel 21	–	–	–	–	–	TW	Orange	Red/Slate	Slate/Red
Channel 22	–	–	–	–	–	TW	Green	Black/Orange	Orange/Black
Channel 23	–	–	–	–	–	TW	Green	Black/Brown	Brown/Black
Channel 24	–	–	–	–	–	TW	Green	Yellow/Blue	Blue/Yellow

Note: Alog cassettes up to PCS 5 supported two power fail circuits. From PCS 6+, the Alog 2/8/0 and Alog 4/2/0 cassettes only have one power fail circuit

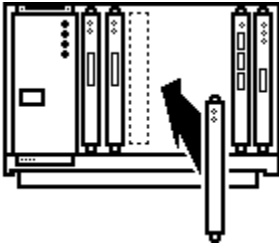
AC15 Cable Connections

The table below shows the connections for ALOG cassettes providing AC15 circuits. Connection from the MDF to the NTP depends on the PSTN provider.

Ensure that the cable and wires are clearly labelled at both ends.

Channel	0/0/4	Wrap	Tip Transmit	Ring Transmit	Tip Receive	Ring Receive
Channel 13	AC15	Brown	White/Slate	Slate/White	Red/Blue	Blue/Red
Channel 14	AC15	Brown	Red/Orange	Orange/Red	Red/Green	Green/Red
Channel 15	AC15	Brown	Red/Brown	Brown/Red	Red/Slate	Slate/Red
Channel 16	AC15	None	Black/Blue	Blue/Black	Black/Orange	Orange/Black

11. Installing ACA Cassettes



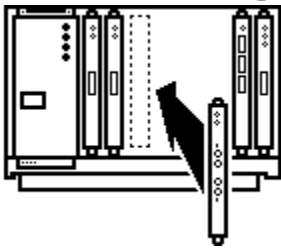
This section covers the installation of ACA cassettes. Each ACA cassette contains a combination of one 60 second module and three 16 second modules. You can use these modules ACA or DMOH devices.

No cable connection is required for this type of cassette.

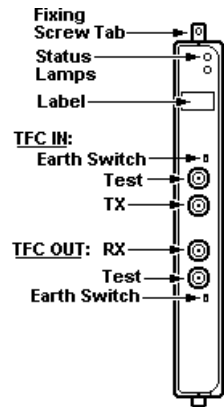
To install an ACA/DMOH cassette:

1. Ensure that you have the correct cassette.
2. Remove the screw at the top of the slot to be used. Insert the new cassette.
3. Check which lamps come on.
 - **Green On/Red Off:** Power supply to cassette okay.
 - **Green off:** Swap the cassette. If the problem persists, check the PSU/CPU.
 - **Red On:** Swap the cassette. If the problem persists, check the PSU/CPU.
4. Secure the cassette using its top tab (*using the screw previously removed*).

12. Installing DASS & DPNSS PRI Cassettes



PRI Cassettes:



This section covers the installation of both DASS and DPNSS PRI (Primary Rate Interface) Cassettes. Note that earthing is provided by proper use of the 'Bulkhead' cables attached to the cable clamp plate. The co-axial cables **must not** be earthed at the PSTN NTP.

To install a DASS or DPNSS PRI cassette:

1. Ensure that you have the correct cassette. The cassette label will indicate its type and the number of channels supported.
2. Ensure that you have information from the PSTN provider about the **Frame Format** and **Signalling Channel** (*DPNSS only*) settings required.
3. Ensure that you have a co-axial cable pair of sufficient length to reach the NTP junction box and with the correct plugs. The cassette is supplied with two short 'bulkhead' (link) cables and two 3m co-axial cables.
4. Remove the screw at the top of the slot to be used. Insert the cassette.
5. Remove the cable clamp plate from the cabinet's base grille.
6. Connect the short Bulkhead cable pair from the TX/RX sockets on the cassette to the matching fixing holes on the cable clamp plate.
7. Repeat the above step for all the other PRI cassettes using co-axial cables.
8. Attach the external co-axial cables to the NTP as follows:
 - From the cassette's **TX** bulkhead lead to NTP **Traffic In** socket
 - From the cassette's **RX** bulkhead lead to NTP **Traffic Out** socket.
9. Check the cassettes lamps:
 - **Green On/Red Off:** Power supply to cassette okay.
 - **Green Off:** Swap the cassette. If the problem persists, check the PSU/CPU.
 - **Red On:** This is normal until the line is connected. If the lamp then stays on check that the cable connections are the correct way round and that the **Frame Format** setting is correct. If these are correct swap the cassette. If the problem persists, check the PSU/CPU and monitor the line using suitable test equipment.
10. Secure the cassette (*using the screw previously removed*) through its top tab.

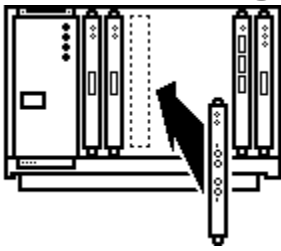
PRI Cassette Linecard Setup

The settings for PRI cassettes **must** match those required by the PSTN service provider. PRI cassettes achieve these by software settings.

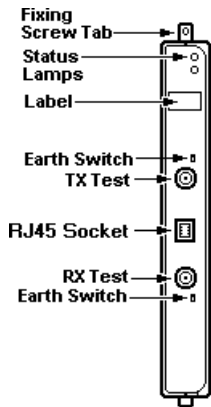
To setup PRI cassettes:

1. From the **Main Menu**, select **Linecard information** and **Linecard details**.
2. Use the **tab** key or **Select card** to display the PRI cassette.
3. Select **Linecard setup**.
 - **DPNSS cassettes:** Select **Signalling Channel** and select **A** or **B** as required by the PSTN provider.
 - **DPNSS & DASS Cassettes:** Select **Frame Format** and select **CRC** (*cyclic redundancy check*) or **DF** (*double frame*) as required by the PSTN provider.

13. Installing EURO ISDN PRI Cassettes



EURO ISDN Cassettes:



This section covers the installation of EURO ISDN PRI (Primary Rate Interface) Cassettes. Note that the cassette earth switches are not used.

To install a EURO ISDN cassette:

1. Ensure that you have the correct cassette. The cassette label shows the cassette type and capacity.
2. Ensure that you have information from the PSTN provider about the **Frame Format** settings required.
3. Remove the screw at the top of the slot to be used. Insert the cassette.
4. Plug the RJ45-to-RJ45 cable into the cassette. Attach the cable's P-clip to the appropriate point at the base of the cabinet for the cassette slot.
 - The Lucent Technologies supplied cable is for a **T-interface (Network)** connection between the switch and PSTN. Plug the other end of the cable into the NTP. If the NTP is not earthed the remote end P-clip must be used to earth the cable.
 - For an **S-interface (User)** connection between an ISDN device and the switch a suitable adapter to swap the cable pairs should be used.
5. If the RJ45-to-RJ45 cable is not appropriate, the wire connections to an RJ45 8-way socket are:
 - **T-Interface Connection:** Rx = Pins 1 & 2, Tx = Pins 4 & 5.
 - **S-Interface Connection:** Rx = Pins 4 & 5, Tx = Pins 1 & 2.
6. Check which lamps come on.
 - **Green On/Red Off:** Power supply to cassette okay.
 - **Green Off:** Swap the cassette. If the problem persists, check the PSU/CPU.
 - **Red On:** This is normal until the line is connected. If the lamp then stays on check the **Frame Format** setting is correct. If this is correct then swap the cassette. If the problem persists, check the PSU, CPU and monitor the line using suitable test equipment.
7. Secure the cassette (*using the screw previously removed*) through its top tab.
8. Cable tie the cable to the base of the cassette.

PRI Cassette Linecard Setup

The settings for PRI cassettes **must** match those required by the PSTN service provider.

Note: The physical wiring of the cable pairs must be changed according to the selection of either **S** or **T**-interface operation.

To setup PRI cassettes:

1. From the **Main Menu**, select **Linecard information** and **Linecard details**.
2. Use the **tab** key or **Select card** to display the PRI cassette.
3. Select **Linecard setup**.
5. Select **Frame Format** and set this to **CRC** (cyclic redundancy check) or **DF** (double frame) as required by the PSTN provider.
6. Select **Interface Type** and set this to **T** (switch connection to **Network**) or **S** (**User** connection to the switch) as appropriate (cassette PCS 3+). The Lucent Technologies supplied RJ45 cable is for a T-interface.

14. Allocating PRI Cassette Channels

PRI Cassettes connections carry up to 30 channels (digital trunks) on a single link (also known as a pipe). To use the channels on the cassette, you must allocate each channel a valid switch address.

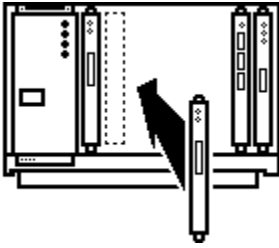
To allocate PRI channels:

1. From the **Main Menu**, select **Linecard information**, then select **Linecard details** and then **Channel details**.
2. Repress tab until details of the PRI cassette channels appear.
3. To allocate all channels in one go, enter *. The system then assigns the channels free directory numbers in sequence starting with the channel 1.
4. To allocate a single channel at a time, enter the channel number.

To deallocate a PRI channel:

1. Follow the same process as for allocating a channel. After selecting the channel, press ↵ to reset the address to **not assigned** (you can use * to deallocate all the cassette channels at the same time).

15. Installing Basic Rate Interface (BRI) Cassettes



Each BRI circuit provides a 2B+D connection. The B channel pair can be set as either **S** or **T**-interfaces. Additionally, BRI circuits can be used as point-to-point or point-to-multipoint connections.

- **T-Interface:** INDeX to ISDN2 exchange line connection.
- **S-Interface:** ISDN Terminal Device to INDeX connection.
- **Point-to-Point:** Connection of a single ISDN device to an ISDN interface.
- **Point-to-Multipoint:** Connection of several ISDN devices to an ISDN interface.

To install a BRI cassette:

1. Ensure that you have the correct cassette. The cassette label shows the cassette type and the number of circuits (2B+D connections).
2. Remove the screw at the top of the slot to be used and insert the cassette.
3. Check which lamps come on.
 - **Green On/Red Off:** Power supply to cassette okay.
 - **Green Off:** Swap the cassette. If the problem persists, check the PSU/CPU.
 - **Red On:** If the lamp stays on, swap the cassette. If the problem persists, check the PSU, CPU and monitor the line using suitable test equipment.
4. Secure the cassette using its top tab (*using the screw previously removed*).
5. Connect the INDeX 32-pair cable to the cassette. Attach the cable's P-clip to the appropriate point at the base of the cabinet for the cassette slot.
6. Cable tie the cable to the base of the cassette.

Configuring BRI Cassettes

When inserted, the system defaults the cassette's first circuit to a T-interface (network) and any remaining circuits to S-interfaces (user). Each B-channel (two per circuit) is allocated an appropriate device address at the same time. The system automatically adds T-Interface circuits to group 90 when allocating trunk numbers. You must manually remove the numbers from group 90 if necessary.

If a circuit is changed from S to T or T to S, the system automatically de-allocates the existing pair of trunk or terminal directory numbers and allocates two new terminal or trunk directory numbers.

To configure BRI cassette circuits:

1. From the **Main Menu**, select **Linecard information**.
2. The screen displays details of the cassette in each cabinet slot.
3. Select **Linecard details** to display details of the first cassette.
4. Press **Tab** until the BRI cassette details appear.
5. Select **Enter description** and enter a name of up to 30 characters.
6. Select **Linecard setup**. The cassette circuits appear at the base of the screen.
7. To change a circuit's settings, enter the circuit number, the circuit type and circuit type suffix (*if required*). The options are:
 - **Circuit Types:**
 - T** = T-Interface with connect detect (ie. power from the line). Use this setting for INDeX to ISDN2 exchange line connections in the UK.
 - X** = T-Interface with no connect detect (ie. no power from the line).
 - S** = S-Interface. Use this setting for INDeX to ISDN terminal device connections.
 - **Circuit Type Suffix:**
 - P** = Point to point connections (p-p). Use this setting for S-interface connections if the cassette firmware is before PCS1.8. For firmware PCS1.8 or higher cassettes, set S-interfaces to **M**.
 - M** = Point to multipoint connection (p-m). Use this setting for T-interfaces in the UK even though they must only be physically connected as point-to-point connections.

Basic Rate ISDN Cabling

Basic Rate ISDN interfaces can support single (*point-to-point*) or multiple (*point-to-multipoint*) ISDN terminal devices. The number of devices supported depends on the cable distances and type of wiring used.

Wiring Notes:

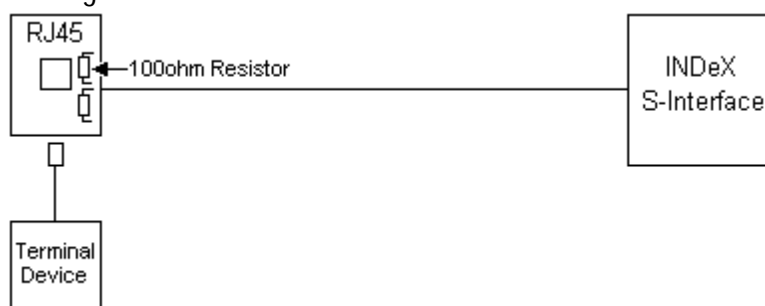
- The table below gives the maximum cable distances for 0.5mm diameter CW1308 wiring. Figures in brackets refer to 0.5mm diameter CW1700 wiring.

	<u>Point-to-Point</u>	<u>Short Bus</u>	<u>Extended Bus</u>
Maximum Bus Length	400m (800m)	100m (150m)	250m (400m)
1st Socket to Last Socket	N/A	–	45m (70m)
Maximum N° of Sockets	1	8	4

- In all configurations, the last socket must include $100\Omega \pm 5\%$ resistors across the transmit pair and across the receive pair.
- If a socket is added as a spur rather than a bus junction, the spur length must not exceed 1m.
- All wiring must be twisted pair or quad type.

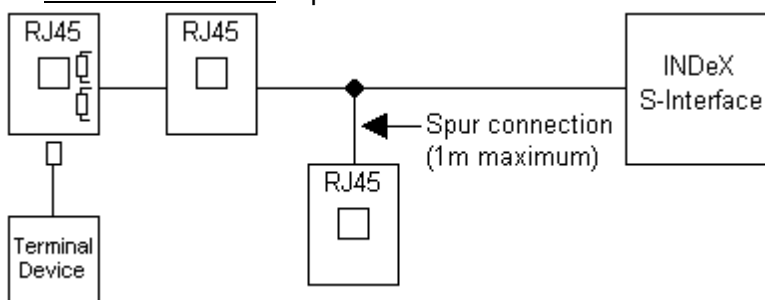
Point-to-Point Connection:

- Single ISDN Terminal Device Socket.



Point-to-Multipoint Connection:

- Supported on S-interfaces only with PCS 3+ BRI cassettes.
- It is vital that wiring polarity is maintained throughout the wiring bus.
- **Extended Passive Bus:** Up to 4 ISDN Terminal Device Sockets.
- **Short Passive Bus:** Up to 8 ISDN Terminal Device Sockets.



Basic Rate Cable Connection

The following table shows the wiring connections for a Basic Rate Interface Cassette. The pin numbers shown in the right-hand columns relate to RJ45 connections (*For S-Interface connections to ISDN terminal device sockets see page 31 also*).

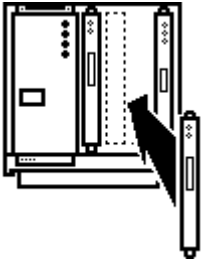
Note the polarity of the wire where indicated. When used in a point-to-multipoint configuration it is vital that the wiring polarity is maintained throughout the wiring bus configuration.

Ensure that both the cable and wires are clearly labelled with the connection type and cassette. Note that each circuit displays in INDeX programming as two channels.

BRI Circuits

<u>Circuit</u>	<u>BRI-2</u>	<u>BRI-4</u>	<u>BRI-8</u>	<u>Wrap</u>	<u>Wire</u>	<u>Polarity</u>	<u>T-Interface</u>	<u>S-Interface</u>
Circuit 1	BRI	BRI	BRI	Orange	White/Blue	+ve	Rx - Pin 5	Tx - Pin 6
				Orange	Blue/White	-ve	Rx - Pin 4	Tx - Pin 3
				Orange	White/Orange	+ve	Tx - Pin 6	Rx - Pin 5
				Orange	Orange/White	-ve	Tx - Pin 3	Rx - Pin 4
Circuit 2	BRI	BRI	BRI	Orange	White/Slate	+ve	Rx - Pin 5	Tx - Pin 6
				Orange	Slate/White	-ve	Rx - Pin 4	Tx - Pin 3
				Orange	Red/Blue	+ve	Tx - Pin 6	Rx - Pin 5
				Orange	Blue/Red	-ve	Tx - Pin 3	Rx - Pin 4
Circuit 3	-	BRI	BRI	Orange	Red/Brown	+ve	Rx - Pin 5	Tx - Pin 6
				Orange	Brown/Red	-ve	Rx - Pin 4	Tx - Pin 3
				Orange	Red/Slate	+ve	Tx - Pin 6	Rx - Pin 5
				Orange	Slate/Red	-ve	Tx - Pin 3	Rx - Pin 4
Circuit 4	-	BRI	BRI	Green	Black/Green	+ve	Rx - Pin 5	Tx - Pin 6
				Green	Green/Black	-ve	Rx - Pin 4	Tx - Pin 3
				Green	Black/Brown	+ve	Tx - Pin 6	Rx - Pin 5
				Green	Brown/Black	-ve	Tx - Pin 3	Rx - Pin 4
Circuit 5	-	-	BRI	Green	Yellow/Orange	+ve	Rx - Pin 5	Tx - Pin 6
				Green	Orange/Yellow	-ve	Rx - Pin 4	Tx - Pin 3
				Green	Yellow/Green	+ve	Tx - Pin 6	Rx - Pin 5
				Green	Green/Yellow	-ve	Tx - Pin 3	Rx - Pin 4
Circuit 6	-	-	BRI	Brown	White/Blue	+ve	Rx - Pin 5	Tx - Pin 6
				Brown	Blue/White	-ve	Rx - Pin 4	Tx - Pin 3
				Brown	White/Orange	+ve	Tx - Pin 6	Rx - Pin 5
				Brown	Orange/White	-ve	Tx - Pin 3	Rx - Pin 4
Circuit 7	-	-	BRI	Brown	White/Slate	+ve	Rx - Pin 5	Tx - Pin 6
				Brown	Slate/White	-ve	Rx - Pin 4	Tx - Pin 3
				Brown	Red/Blue	+ve	Tx - Pin 6	Rx - Pin 5
				Brown	Blue/Red	-ve	Tx - Pin 3	Rx - Pin 4
Circuit 8	-	-	BRI	Brown	Red/Brown	+ve	Rx - Pin 5	Tx - Pin 6
				Brown	Brown/Red	-ve	Rx - Pin 4	Tx - Pin 3
				Brown	Red/Slate	+ve	Tx - Pin 6	Rx - Pin 5
				Brown	Slate/Red	-ve	Tx - Pin 3	Rx - Pin 4

16. Installing Combo Cassettes (COMBO & BRIC)



This section covers installation of Combo cassettes. These cassettes provide a combination of DSLC, analogue trunks, two-wire extensions and BRI interface circuits.

Cassette Restrictions

- For non-CPU100 systems a **Combo Cards** licence key must be entered. The licence allows a maximum of up to 3 Combo cassettes. The licence is not required for CPU 100 systems.
- Only two COMBO/BRIC cassettes are supported in a cabinet with a PSU4.
- ALOG and COMBO/BRIC cassettes should not be used together in a cabinet with a PSU4.

To install a Combo cassette:

1. Ensure that you have the correct cassette. The cassettes label shows either:-
 - **COMBO w/x/y** where **w** is the number of analogue trunks, **x** the number of analogue terminals and **y** the number of DSLC (DT or TT) terminals.
 - **BRIC w/x/y/z** is the same as the COMBO except for **z** which is the number of BRI circuits.
2. Remove the screw at the top of the slot to be used.
3. Insert the new cassette.
4. Check which lamps come on.
 - **Green On/Red Off:** Power supply to cassette okay.
 - **Green Off:** Swap the cassette. If the problem persists, check the PSU/CPU.
 - **Red On:** Swap the cassette. If the problem persists, check the PSU/CPU.
5. Secure the cassette using its top tab (*using the screw previously removed*).
6. Connect the INDeX 32-pair cable to the cassette. Attach the cable's P-clip to the appropriate point at the base of the cabinet for the cassette slot.
7. Cable tie the cable to the base of the cassette.

Combo Cassette Circuit Connection

Configuration of individual circuits is as per non-combo cassettes:

- **Analogue Trunk & Two-Wire Circuits:** See page 22.
- **DSLC Circuits:** See page 21.

The table below shows the connections for combo cassettes. **Note:** For cassettes providing trunk circuits, the power fail circuits (shown as ^{PF} in the table below) **must** be clearly labelled on the MDF connection strips and at the wall sockets.

<u>Channel</u>	<u>0/8/16</u>	<u>6/2/16</u>	<u>Wrap</u>	<u>Speech</u>	<u>Speech</u>
Channel 1	TW	Trunk ^{PF1}	Orange	White/Blue	Blue/White
Channel 2	TW	Trunk ^{PF2}	Orange	White/Green	Green/White
Channel 3	TW	Trunk	Orange	White/Slate	Slate/White
Channel 4	TW	Trunk	Orange	Red/Orange	Orange/Red
Channel 5	TW	Trunk	Orange	Red/Brown	Brown/Red
Channel 6	TW	Trunk	Green	Black/Blue	Blue/Black
Channel 7	TW	TW ^{PF2}	Green	Black/Green	Green/Black
Channel 8	TW	TW ^{PF1}	Green	Black/Slate	Slate/Black
Channel 17	DSLC	DSLC	Green	Yellow/Orange	Orange/Yellow
Channel 18	DSLC	DSLC	Green	Yellow/Green	Green/Yellow
Channel 19	DSLC	DSLC	Green	Yellow/Brown	Brown/Yellow
Channel 20	DSLC	DSLC	Green	Yellow/Slate	Slate/Yellow
Channel 21	DSLC	DSLC	Brown	White/Blue	Blue/White
Channel 22	DSLC	DSLC	Brown	White/Orange	Orange/White
Channel 23	DSLC	DSLC	Brown	White/Green	Green/White
Channel 24	DSLC	DSLC	Brown	White/Brown	Brown/White
Channel 25	DSLC	DSLC	Brown	White/Slate	Slate/White
Channel 26	DSLC	DSLC	Brown	Red/Blue	Blue/Red
Channel 27	DSLC	DSLC	Brown	Red/Orange	Orange/Red
Channel 28	DSLC	DSLC	Brown	Red/Green	Green/Red
Channel 29	DSLC	DSLC	Brown	Red/Brown	Brown/Red
Channel 30	DSLC	DSLC	Brown	Red/Slate	Slate/Red
Channel 31	DSLC	DSLC	None	Black/Blue	Blue/Black
Channel 32	DSLC	DSLC	None	Black/Orange	Orange/Black

BRIC Combo Cassette Cable Connection

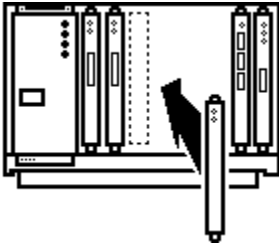
Configuration of individual circuits is as per non-combo cassettes:

- **Two-Wire Circuits:** See page 22. Note that the BRIC TW circuits support MF dialling only.
- **DSLC Circuits:** See page 21.
- **BRI Circuits:** See page 29. The pin numbers shown below refer to an RJ45 socket connection.

WARNING: Connection of this cable to a DSLC or ALOG cassette may result in damage to BRI termination resistors.

<u>Channel</u>	<u>BRIC 0/8/16/4</u>	<u>Wrap</u>	<u>Wire</u>	<u>Wire</u>	
Channel 1	TW	Orange	White/Blue	Blue/White	–
Channel 2	TW	Orange	White/Orange	Orange/White	–
Channel 3	TW	Orange	White/Green	Green/White	–
Channel 4	TW	Orange	White/Brown	Brown/White	–
Channel 5	TW	Orange	White/Slate	Slate/White	–
Channel 6	TW	Orange	Red/Blue	Blue/Red	–
Channel 7	TW	Orange	Red/Orange	Orange/Red	–
Channel 8	TW	Orange	Red/Green	Green/Red	–
		<u>Wrap</u>	<u>Wire</u>	<u>T-Interface</u>	<u>S-Interface</u>
Channel 9	BRI	Orange	Red/Brown	+Rx - Pin 5	+Tx - Pin 6
			Brown/Red	–Rx - Pin 4	–Tx - Pin 3
			Red/Slate	+Tx - Pin 6	+Rx - Pin 5
			Slate/Red	–Tx - Pin 3	–Rx - Pin 4
Channel 10	BRI	Green	Black/Blue	+Rx - Pin 5	+Tx - Pin 6
			Blue/Black	–Rx - Pin 4	–Tx - Pin 3
			Black/Orange	+Tx - Pin 6	+Rx - Pin 5
			Orange/Black	–Tx - Pin 3	–Rx - Pin 4
Channel 11	BRI	Green	Black/Green	+Rx - Pin 5	+Tx - Pin 6
			Green/Black	–Rx - Pin 4	–Tx - Pin 3
			Black/Brown	+Tx - Pin 6	+Rx - Pin 5
			Brown/Black	–Tx - Pin 3	–Rx - Pin 4
Channel 12	BRI	Green	Black/Slate	+Rx - Pin 5	+Tx - Pin 6
			Slate/Black	–Rx - Pin 4	–Tx - Pin 3
			Yellow/Blue	+Tx - Pin 6	+Rx - Pin 5
			Blue/Yellow	–Tx - Pin 3	–Rx - Pin 4
		<u>Wrap</u>	<u>Wire</u>	<u>Wire</u>	
Channel 13	DSLC	Green	Yellow/Orange	Orange/Yellow	–
Channel 14	DSLC	Green	Yellow/Green	Green/Yellow	–
Channel 15	DSLC	Green	Yellow/Brown	Brown/Yellow	–
Channel 16	DSLC	Green	Yellow/Slate	Slate/Yellow	–
Channel 17	DSLC	Brown	White/Blue	Blue/White	–
Channel 18	DSLC	Brown	White/Orange	Orange/White	–
Channel 19	DSLC	Brown	White/Green	Green/White	–
Channel 20	DSLC	Brown	White/Brown	Brown/White	–
Channel 21	DSLC	Brown	White/Slate	Slate/White	–
Channel 22	DSLC	Brown	Red/Blue	Blue/Red	–
Channel 23	DSLC	Brown	Red/Orange	Orange/Red	–
Channel 24	DSLC	Brown	Red/Green	Green/Red	–
Channel 25	DSLC	Brown	Red/Brown	Brown/Red	–
Channel 26	DSLC	Brown	Red/Slate	Slate/Red	–
Channel 27	DSLC	None	Black/Blue	Blue/Black	–
Channel 28	DSLC	None	Black/Orange	Orange/Black	–

17. Installing VCC Cassettes



This section covers the installation of a VCC cassette. This cassette is used in conjunction with ISDN 2, ISDN 30, DASS II or DPNSS cassettes. It provides voice compression and DPNSS functions over those links those other INDeX systems with VCC cassettes.

Note: The system only supports one VCC cassette at any time.

To install an VCC cassette:

1. Ensure that you have the correct cassette. The cassette label shows "VCC *x*" where *x* is the maximum number of calls supported.
2. Remove the screw at the top of the slot to be used.
3. Insert the new cassette.
4. Check which lamps come on.
 - **Green On/Red Off:** Power supply to cassette okay.
 - **Green Off:** Swap the cassette. If the problem persists, check the PSU/CPU.
 - **Red On:** Swap the cassette. If the problem persists, check the PSU/CPU.
5. Secure the cassette using its top tab (*using the screw previously removed*).

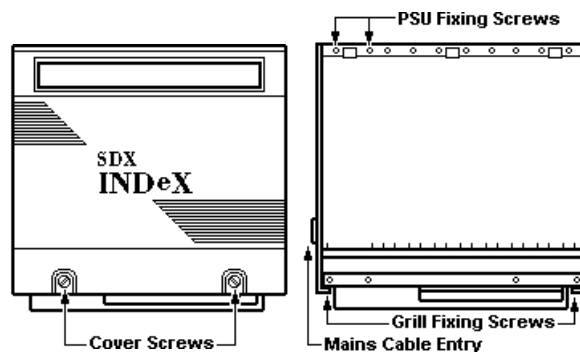
VCC 28 Output Channels

For the VCC 28, the number of outputs channels (ie. B-channels carrying calls) must be set.

1. From the **Main Menu**, select **Linecard information** and then **Linecard details**.
2. Use either the **Tab** key or **Select Card** to display the VCC cassettes details.
3. Select **Linecard setup** and then **Number of output channels**.

18. Closing Off the Cabinets

You must follow the steps below in order to maintain the EMC compliance of the INDeX system.



To close off a cabinet:

1. Ensure that each cassette displays just the single green lamp.
2. Check that each cable to the cassettes is clearly labelled and identified.
3. Slide the cabinet grille plate back into the base of the cabinet. Ensure that the cables all exit the cabinet through the proper cable exit points.
4. Secure the grille plate using the 2 screws previously removed at the start of installation.
5. Adjust the cable clamp provided at the cable exit point.
6. Hook the front cover back onto the cabinet and secure the two captive cover screws.
7. Check that none of the cabinet ventilation grills have been blocked.

Terminal Installation

Assigning User Numbers

When new terminal devices are added to the switch, they are automatically assigned new user numbers based sequentially on the **Next terminal number** field (**Directory > Set up > Reserved numbers**). This automates the process of allocating user numbers and assigning users to a device. The Set up menu can then be used to move/swap numbers if necessary.

The **Next terminal number** field can also be left blank. This disables the automatic creation and assigning of new user numbers to new terminal devices. When this option is used the switch provides two routes for assigning a user to a terminal.

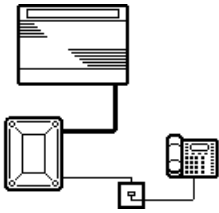
For all terminal device types:

1. Create a range of new user numbers using **Allocate user numbers** (**Directory > Set up**).
2. Program the required settings for the user numbers through **Users** and **Directory > Users**.
3. Assign the user numbers to devices using **Assign user to device** (**Directory > Set up**).

For display terminals:

1. Create a range of new user numbers using **Allocate user numbers** (**Directory > Set up**).
2. Program the required directory name (**Directory > Users**) for each user number.
3. At the display terminal, use one of the following methods:
 - Press **•LOG ON** and enter the unallocated user number that should be assigned to the terminal.
 - Press **•INDeX** and select by name the unallocated user number to assign to the terminal.

Checking Terminals



It is preferable to leave connection of terminals until after installation of other Lucent Technologies INDeX equipment and full system programming has been completed (including the setup of directory numbers and names).

Whilst installing and checking each terminal, it may also be required to do some basic terminal programming such as setting diverts and pickup group numbers.

INDeX DSS/BLF Units: *Refer to the DSS/BLF User Guide.*

Connecting & Testing DT-1 Terminals

Use the following process to connect and check a DT-1 terminal.

To check a DT-1 terminal:

1. Unpack the terminal and check that all parts are present including labels and user guides.
2. Insert the handset cord into the base. Route the cord thorough the cable channels to come out at the side of the DT-1.
3. Insert the line cord into the wall socket.
4. While holding down the **1** key, insert the line cord into the terminal's base and then release the **1** key.
5. Press each key and check that you hear a tone.
6. Lift the handset and check that you hear dial tone. Press **SPEAKER**, you should hear dial tone through the speaker. Replace the handset and press **ANSWER RELEASE**.
7. Remove the line cord. Wait a few seconds and then reinsert the line cord without holding down any keys.
8. Make a test call to another extension.

Connecting & Checking Two-Wire Terminals

All two-wire devices should be tested according to the manufacturer's instructions before connection to the INDeX system. After checking that the device's LD/MF settings match the socket's (**Terminal/Analogue control data**), connect the two-wire device and make a test call.

Power Fail Telephones/Sockets

All two-wire power fail sockets must be tested.

To test a power fail socket:

1. Locate the socket and check that it is clearly labelled as a power fail socket.
2. Connect a standard two-wire telephone to the socket.
3. With power to the INDeX system switched on, make a test call.
4. Switch the power to the INDeX system off and again make a test call.
5. Switch the power to the INDeX system back on again.
6. Repeat the test for any other power fail sockets.

Connecting & Checking DT/TT Display Terminals

Use the following process to connect and check a DT or TT display terminal.

To check a DT or TT display terminal:

1. Unpack the terminal and check that all parts are present including labels and user guides.
2. For DT terminals, insert the handset cord into the base. Route the cord through the cable channels to come out at the side of the terminal.
3. Insert the line cord into the wall socket.
4. While holding down the **1** key, insert the line cord into the terminal's base and then release the **1** key.
5. All the elements of the terminal display should be on, plus the terminal lamp and any BLF lamps.
6. Press any key. The terminal should display its type and the terminal software release.
7. Pressing any other key has the effect shown below. Check that all the display elements appear correctly.

<u>Key</u>	<u>Effect</u>
MUTE	Cycles through left-hand display legends, eg. DATE.
PROGRAM	Cycles through right-hand display legends, eg. TIME.
REDIAL	Cycles through left-hand digit display.
SPEED DIAL	Cycles through right-hand digit display.
HOLD	Cycles through display digit separators.
ANSWER RELEASE	Cycles through character display line characters.
0...9, *, #	Display dialling digits.
DSS Keys	Display DSS keys and cycles through BLF lamps if present.
Other keys	Display key icons (●).

8. Remove the line cord, wait a few seconds and then reinsert it. The terminal display should now show the time and date plus other functions.
9. Press **PROGRAM** and then **SPEAKER** (or **VIEW**). The display should show the correct directory number, directory name and terminal type.
10. **DT Only:** Lift the handset and check that you hear dial tone. Press **SPEAKER**, you should hear dial tone through the speaker. Replace the handset and press **ANSWER RELEASE**.
11. **TT Only:** Attach a headset. Press **ANSWER RELEASE** and check that you hear dial tone. Press **ANSWER RELEASE** again to end dial tone.
12. Make a test call to another extension.

Wall Mounting Terminals

Mounting Bracket Kits:

Each kit contains two brackets for one terminal plus self-adhesive rubber pads (for wall mounting use).
Charcoal - 38RBT00001SAA
Light Grey - 38RBT00001SAB

Additional Items:

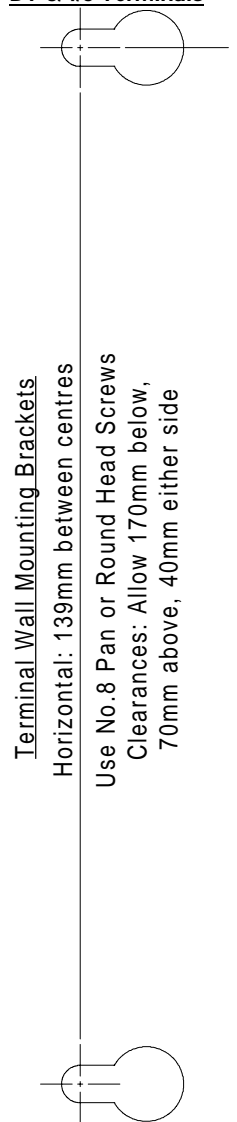
- Two No. 8 Pan or Round head screws.
- Two wallplugs.
- Drill and drill bit.
- Screwdriver.

Mounting brackets exist which clip onto the base on all DT and TT terminals. These brackets (two required per phone) can be used to either raise the desk position of the terminal or for wall mounting. Before wall mounting a terminal, check that the surface is flat, vertical and not subject to movement or vibration.

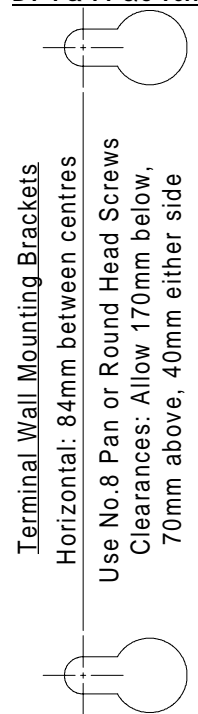
To wall mount a DT or TT terminal:

1. Using the templates below, mark the position for the screw holes. Ensure that adequate clearance above and below the terminal is allowed.
2. Drill the necessary holes and insert the wall plugs.
3. Insert the screws, leaving the heads approximately 3mm proud of the surface (check by clipping a bracket over the screw head).
4. Attach the brackets to the terminal. Then slide the bracket key-slots over the screw-heads.
5. Place one of the self-adhesive rubber pads (supplied with the mounting brackets) onto the horizontal surface above the hook-switch (this helps stop the handset falling off due to vibration or accidental knocking of the terminal).

DT-3/4/5 Terminals



DT-1 & TT-3/5 Terminals



System Handover

Checklist

Equipment:

- Have all extensions been tested?
- Have all exchange lines been tested?
- Have all private wires been tested?
- If fitted has the modem/Reporter been tested?
- Is system programming in line with the customer specification?
- Have system backup disks been made and left on site?
- Has the customer been made aware of the drop back (power fail) locations? Are those clearly marked and have they been tested?
- Has the mains supply (and any UPS if fitted) been tested?
- Have any peripheral systems been tested (eg. ACD, WOC, NOC, Voice Mail, DECT)?

Wiring:

- Is the distribution wiring satisfactory to the required national standards?
- Is the site clean and tidy with all rubbish removed?

Documentation:

- Have the system documents, TJF records and floor plans been completed?

Information:

- Have the handset user guides been issued to the user.
- Has the customer been made aware of the telephone number for maintenance/fault reports.

Maintenance

Repair and Replacement of Parts

This chapter covers maintenance actions that may be required (eg. the replacement of parts and assemblies) but are not covered by repeating stages in the installation process.

- The INDeX is designed for quick maintenance by the replacement of parts. All replacement parts must be of the same part number as the original and have the same or a higher PCS level unless otherwise indicated by Lucent Technologies in a Technical Bulletin.
- **There are no site repairable parts in the INDeX system and repair must never be attempted. Failure to comply invalidates any equipment warranties.**
- All faulty parts should be returned to Lucent Technologies for repair, using the packaging from the replacement part for protection. Do this following the "Product Returns Procedure".

Cassette Shutdown

DT/TT Display Terminals:

These terminals support a **ClearCheck™** feature. When a cassette is shutdown, any DT display terminal on a call using that cassette displays a message to finish the call.

Link Cassette Shutdown:

Shutting down a Link Cassette ends any calls by expansion cabinet devices instantly, ie. Link Cassettes do not provide polite shutdown.

Though the system supports hot-maintenance, you should not simply remove a cassette as this ends any calls using that cassette. The system provides a method to shutdown a cassette prior to removal (this off-lines all the channels on the cassette when not busy). Shutting down and removing a cassette does not affect the database details associated with the cassette.

To shutdown a cassette:

1. From the **Main Menu**, select **Linecard information**.
2. Select **Linecard details**.
3. The screen displays the first cassette. To select another cassette, either press **Tab** for the next slot or select **Select card** and enter the cassette address.
4. Select **Card shutdown** and respond to the yes/no prompt.
5. If any devices using that cassette are still involved in a call, the cassette's green LED flashes slowly. When all calls have finished, the LED goes off. All devices on the cassette are now off-line and you can remove the cassette.

To restart a shutdown cassette: Either

1. Repeat the first 4 steps of the cassette shutdown process above.
2. Remove and reinsert the cassette (or a replacement).

System Shutdown

DT/TT Display Terminals:

These terminals support a **ClearCheck** feature. When a cassette is shutdown, any DT display terminal in a call using that cassette displays a message to finish the call.

System shutdown is similar to cassette shutdown, it off-lines all cassettes when not busy.

To shutdown the system:

1. If you have recently performed any system programming, do a database backup before shutting down the system (*see page 45*).
2. From the **Main Menu**, select **Linecard information**.
3. Select **System shutdown**.
4. If any devices are still involved in calls, the cassette's green LED flashes slowly. When all calls have finished, the LED goes off. All devices on the cassette are now off-line and you can remove power.

Swapping or Replacing a Cassette

Once a cassette is inserted into an unused slot, the INDeX system locks the slots usage to that type and capacity of cassette. If the cassette is removed and another type or capacity of cassette is inserted, the cassettes red lamp flashes (*Link Cassettes display this if a cassette slot which they do not support is in use*).

- Like for like replacement of a cassette requires no programming.
- Upgrading the capacity of a slot requires the slot to be unlocked first so that the new circuits will be recognised and allocated directory numbers.
- Changing the cassette type requires unlocking of the slot and de-allocation of the existing cassette settings.

To swap a cassette with the same type and capacity:

1. Remove the cabinet front cover.
2. From the **Main Menu**, select **Linecard information** and then **Linecard details**.
3. Either press **Tab** or use **Select Card** to display the cassette required.
4. Select **Card shutdown** and respond to the yes/no prompt.
 - If any of the cassette's devices are in use, the cassette's green LED flashes slowly. When the LED goes off all devices on the cassette are off-line.
 - If intending to replace the cassette with one of a different type or higher capacity, select **Toggle lock status** to set the slot to **Unlocked**.
 - If intending to replace the cassette with one of a different type, select **Deallocate linecard**.
5. Detach the cassette cable(s) and cut any cable tie at the base of the cassette.
6. Remove the cassette and insert the replacement. The system should automatically bring the cassette back on-line.
7. Reattach the cassette cable(s).
8. Perform the same checks as for a new cassette of the same type.
9. If okay, replace the cable tie.

Database Backups

The process of database backup (manual or automatic) does not interfere with calls on the system. You should perform a database backup after any programming on the system.

To change the automatic backup time:

1. From the **Main Menu**, select **Database Management**.
2. Select **Set backup time** and enter a new value for the time of day at which backup should occur.
 - Pressing **Enter** without setting a time cancels automatic database backup. This option is only intended for test purposes only. It must never be used on an end customer system.

To manually backup the main database:

1. From the **Main Menu**, select **Database Management**.
2. Select **Database Backup**.
3. The **Flash Database status** changes to **Busy** for approximately a minute.

To erase the backup database:

This action should only be performed if you require a 'clean' system as all previous system programming will need to be re-entered.

1. From the **Main Menu**, select **Database Management**.
2. Select **Erase database**.
3. Escape back to the **Main Menu** and select **Maintenance**. Select **Reset System** and enter **SYSTEM RESET**.

Setting the Upload/Download Speed

Whilst 9600 is adequate for system programming, when performing any kind of upload or download, you should select the highest matching speed that both the system and the PC support.

To set the maximum port speeds:

1. Connect the PC to the system serial port 1 and log on from Kermit as normal.
2. From the **Main Menu**, select **System** and then **Ports**.
3. Use the **Tab** key to select the port and then select the highest baud rate that your PC supports. Remember that only Port 1 can be used for uploads and downloads.
4. Press **Ctrl** and **]** simultaneously, then press **C**.
5. Type **set baud 38400** or the speed just selected on the system.
6. Type **C** and press **↵** to return to the system connection.

Database Download



Download Times:

A database download does not affect normal switch operation. The times given below are only approximate:

38400 baud = 4 minutes.

19200 baud = 8 minutes.

9600 baud = 16 minutes.

You can download the database from the system onto the programming PC. You can then upload the database file onto another system for study or keep it as a long term archive copy.

For a database download you must connect to serial port 1 of the system. To minimise the download time set both the system serial port and the PC to the highest matching speed possible .

To start a database download:

1. Connect the PC serial link to serial port 1 of the system and log on from Kermit as normal.
2. Set the system and PC to the fastest matching port speed they support (See page 45).
3. From the **Main Menu**, select **Database Management**.
4. Select **Database download**. After the "sure y/n" prompt wait for the # N3 response to appear.
5. Press **Ctrl** and **]** at the same time, then press **C**.
6. At the Kermit prompt, type **GET** and press **↵**.
 - a. The system requests the **"Remote Source File"**. Enter **DB** and press **↵**.
 - b. The system requests the **"Local Destination File"**. Enter the name of the DOS file name for the downloaded database and press **↵**.
7. The screen shows the progress of the database file transfer. The PC beeps on completion of the transfer.
8. Enter **FIN** and wait a few seconds until the **Kermit-MS>** prompt appears.
 - If the prompt does not appear, press **↵** several times until "Unable to tell host that session has finished" appears.
9. Press **C** and then **↵** to reconnect to the system.
10. Press **Esc** to restart normal system programming.
11. The downloaded database file is located in the Kermit directory under the name specified above.

Database Upload



Upload Times:

A database upload does not affect normal switch operation. The times given below are only approximate:

38400 baud = 4 minutes.

19200 baud = 8 minutes.

9600 baud = 16 minutes.

You can upload suitable databases from the programming PC to the system. You **must** ensure the database being uploaded comes from a system with the same (or lower) level of software and CPU cassette capacity. In all cases check with Lucent Technologies for database compatibility.

The system stores the uploaded database in RAM until you instruct that it should replace the main database. If the system loses power, it also loses the uploaded database. The presence of an uploaded database does not affect the backup databases.

To start the database upload:

1. If the database file is on floppy disk or in a storage directory on your hard disk, copy it to your Kermit directory first.
2. Connect the PC serial link to serial port 1 of the system and log on from Kermit as normal.
3. Set the system and PC to the fastest matching port speed they support (see *page 45*).
4. From the **Main Menu**, select **Database Management**.
5. Select **Database upload**. After the "sure y/n" prompt wait for the # **N3** response to appear.
6. Press **Ctrl** and **J** simultaneously, then press **C**.
7. At the Kermit prompt, type **SEND** and press ↵.
 - a. The system requests the **"Local Source File"**. Enter the name of the DOS file to be uploaded and press ↵.
 - b. The system request the **"Remote Destination File"**. Enter **DB** and press ↵.
8. The screen shows the progress of the database file transfer. The PC beeps on transfer completion.
9. Enter **FIN** and wait a few seconds until the **MS-Kermit>** prompt appears.
 - If the prompt does not appear, press ↵ several times until "Unable to tell host that session has finished" appears.
10. Press **C** and then ↵ to reconnect to the system.
11. Press **Esc** to restart normal system programming.
12. See "Using an Uploaded Database" on page 49 for note on using an uploaded database.

CSV Directory Upload

The switch can accept the upload of Comma Separated Variable (CSV) files to create or amend user and system speed dial numbers. CSV files can be created using any basic text editor. They can also be created using many database and spreadsheet programs.

User Numbers CSV File

Below is an example CSV file for user directory numbers:

```
EXTENSION, USER NAME, DEPARTMENT
300, Alan Jones, MIS
301, Mary Smith, MIS
302, Ray Wilkins, Accounts
```

When uploaded to the switch, the file will act as follows:

- If a user number does not exist then it is created with the user name shown.
- If the number already exists, its user name is replaced.
- If a DEPARTMENT column is included, it is used to create groups using the department name and containing those EXTENSION numbers in the same department. The group number is taken from the **Next group number** (Directory > Set up > Reserved numbers > Next group number).

System Speed Dial CSV File

Below is an example CSV file for system speed dials.

```
STORE, EXTERNAL, ACCOUNT, COMPANY NAME
9000, 01707392200, , Acme Parts
9001, 01603333234, 12345, Warehouse
```

When uploaded to the switch, the file will act as follow:

- Create or amend matching speed dial stores. The switch automatically inserts the appropriate external dialling number as the **Dial Prefix**.

To start the directory upload:

1. Copy the CSV file to the same directory as Kermit.
2. Connect the PC serial link to serial port 1 and log on from Kermit as normal.
3. Set the switch and PC to the fastest matching speed supported (*see page 45*).
4. From the **Main Menu**, select **Directory, Set up, Upload directory**.
5. Select **Upload file**. After the "sure y/n" prompt wait for the # N3 prompt.
6. Press **Ctrl** and **]** simultaneously, then press **C**.
7. At the Kermit prompt, type **SEND** and press ↵.
 - a. The system requests **"Local Source File"**. Enter the name of the CSV file to be uploaded and press ↵.
 - b. The system request **"Remote Destination File"**. Enter **DY** and press ↵.
8. The screen shows the progress of the database file transfer. The PC beeps on transfer completion.
9. Enter **FIN** and wait a few seconds until the **MS-Kermit>** prompt appears.
 - If the prompt does not appear, press ↵ several times until "Unable to tell host that session has finished" appears.
10. Press **C** and then ↵ to reconnect to the system.
11. Press **Esc** to restart normal system programming.
12. The line **Upload file** should now also show **File loaded**.
13. Use **Preview** to view the uploaded file. Press ↵ to extend the preview.
14. To add the uploaded directory settings select **Install/Update**.

Using an Uploaded Database

After uploading a database, if you leave and then re-enter the **Database management** menu you should see the message ***** Uploaded DB present *****. The uploaded database is in buffer memory and does not affect operation of the system.

Before restarting the system using the uploaded database, you can select which parts (options) of the uploaded database you want to use. If you select no options then the whole uploaded database is used.

To select part of the uploaded database:

1. Select **Database management**. The message ***** Uploaded DB present ***** should be shown.
2. Select **Select options from uploaded db**. A screen listing the available optional parts appears.
3. Key the number next to an option to select/deselect it. Currently selected options are shown by a * symbol.

To replace the main database with the uploaded database:

This process interrupts any calls in progress. Perform a system shutdown first (see *"System Shutdown" on page 43*).

1. Select **Database management**. The message ***** Uploaded DB present ***** should be shown.
2. Select **Restart system with uploaded db** to overwrite the main database with the upload (the system will prompt you "sure y/n").
3. After the restart, the port speeds will have reset to the settings in the uploaded database. Change your PC port speed to a matching value and log on again.
4. Select **Database management**. The message ***** Uploaded DB active **** should be shown.
 - If operation of the system is okay, select **Database Backup** to update the backup database (see page 45).
 - If operation of the system seems faulty, restart the system by powering down or perform a system reset.

To delete an uploaded database:

1. Select **Database management** and then **Delete uploaded db**.

CPU Software Upload



Upload Time:

A software upload halts normal switch operation. The times given below for uploading a compressed format file are only approximate:

38400 baud = 8 minutes.

19200 baud = 16 minutes.

9600 baud = 32 minutes.

You can upload CPU software to the system. However, you must check that the software supplied is suitable for the CPU cassette. It must also be compatible with all other equipment in the system and with the existing database. The software is supplied in a compressed format.

To start the software upload:

1. Copy the CPU software file to the Kermit directory on your PC.
2. Connect your PC to the INDeX system's port 1 (front of cabinet) and log on as normal. **Set the speed INDeX system port and then the PC port to 9600.**
3. Perform a **System Shutdown** before proceeding (*see page 43*).
4. Switch the INDeX system power off and wait approximately 5 seconds.
5. Switch the INDeX system power on and immediately type **CJW** (in upper case and within 3 seconds). The screen displays the "Monitor Loader" header and the : monitor prompt.
6. Type **Z**. The system asks if you want to erase the existing software, answer **Y**.
7. When the erase has completed, the : symbol reappears.
8. Set the INDeX port to match the highest baud rate your PC supports. Press **8** for 38400 baud, **7** for 19200 baud or **6** for 9600 baud.
9. Press **Ctrl** and **J** at the same time, then press **C**.
10. Type **set baud 38400** (or the baud rate set above for the INDeX) and press ↵.
11. Press **C** and then ↵ to return to the system connection.
12. Press **L**. The display shows **Kermit upload**. Wait for # **N3** to appear.
13. Press **Ctrl** and **J** at the same time, then press **C**.
14. Type **SEND** and press ↵.
15. The system requests the **"Local Source File"**. Enter the name of the software file to be uploaded and press ↵.
16. The system requests the **"Remote Destination File"**. Type **P0** and press ↵.
17. The PC beeps on completion of the upload and displays the Kermit prompt.
18. Type **FIN** and press ↵.
 - If the prompt does not appear, press ↵ several times until "Unable to tell host that session has finished" appears.
19. Type **C** and press ↵ twice. The : prompt should reappear.
20. Type **U** to uncompress the software. This takes approximately a minute after which the : prompt reappears.
21. Type **X**. The system should restart after 30 seconds with the CPU light coming back on.
22. You will have to reset your PC's port speed back to 9600 to log on again.
23. You can now program the new CPU software features.

Cassette Software Upload

The system supports the uploading of the software used within some cassettes. This may occur for upgrades or special site software releases. The process has two stages, firstly uploading the new cassette software into the systems RAM memory and then downloading it from there to the individual cassette(s).

To upload the cassette software:

1. If the cassette software file is on floppy disk or in a storage directory on your hard disk, copy it to your Kermit directory.
 - Ensure that you have a copy of any additional instructions for the software. The correct order of some uploads may be important.
2. Connect the PC serial link to serial port 1 of the system and log on from Kermit as normal.
3. Set the system and PC to the fastest matching port speed they support (See page 45).
4. From the **Main Menu**, select **Maintenance**.
5. Select **Software upload** and wait for the response # **N3** to appear.
6. Press **Ctrl** and **]** simultaneously, then press **C**.
7. At the Kermit prompt, type **SEND** and then press ↵.
 - a. The system requests the **"Local Source File"**. Enter the name of the software file to upload and press ↵.
 - b. The system requests the **"Remote Destination File"**. Enter one of the following and then press ↵.

File	Software	File	Software	File	Software
DP	DPNSS software	PR	DASS software	IS	Euro ISDN software
BR	BRI software	CO	Combo cassette	DS	Combo & Alog DSP
BC	BRIC software	E1	E1/R2 software	D1	DSP1
D2	DSP2	D1	ALOG-R	DD	ALOG-R DSP
VD	VCC DSP	VC	VCC software		

8. The screen shows the progress of the file transfer. The PC beeps on transfer completion.
9. Enter **FIN** and wait a few seconds until the **MS-Kermit>** prompt appears.
10. Press **C** and then ↵ to reconnect to the system.
11. Press **Esc** to restart programming.
12. An **UPLOAD COMPLETE** screen appears.
13. Except for BRI software, enter the number of channels the cassette should support and press ↵. **Note:** You cannot increase the number of channels a cassette already supports.

To download the software to individual cassettes:

1. Select **Maintenance**. A message should appear stating the type of software uploaded.
2. Select **Card Software Download**. The screen displays all the cassettes in the system.
3. Select **Select card** and enter the address of the cassette to upgrade. The selected cassette is shown by a * symbol. If the card has not been shutdown you will be prompted to do a cassette shutdown.
4. Select **Start download**. The cassette is automatically brought back on-line.
5. Select another cassette or press **Esc**.
6. Select **Release upload buffer** to remove the uploaded software from the systems buffer memory.

Maintenance Reports

Notes

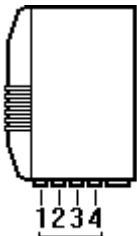
This section covers the reports provided for checking the systems operation. These relate mainly to communications between the systems internal links and digital trunk services. Other report and Monitor options (eg. Event Trace, Software diagnostics report, Task monitor) are intended for use by Lucent Technologies only and not for general on-site work. The system programming manual details connecting a printer and running real-time logs.

This section covers:

- "Connecting a Printer" on page 52.
- "Real-Time Network Monitor" on page 53.
- "Equipment Fault Report" on page 54.

Connecting a Printer

Serial Ports:



Serial Ports

Note: The INDeX-100s cabinet has only two serial ports.

To use a printer for reports or log printing from the INDeX, you must configure it as follows (*refer to the printer manufacturer's information*).

- 80 columns x 24 lines minimum.
- RS232C serial interface.
- Transmission at 300, 600, 1200, 2400, 4800, 9600, 19200 or 38400 baud.
- Transmission format: 8-bit, no parity, two-stop bits.

To connect the printer:

- Connect the printer to a free system serial port using a suitable serial cable. *Avoid using port 1, leave that port free for database/software downloads and uploads.*
- Ensure that the printer is loaded with sufficient paper, switched on and on-line.
- From the **Main Menu**, select **System**.
- Select **Ports** and use **Tab** to select the port to which the printer is connected.
- Select a baud rate for the port that matches the printer (*refer to the printer manufacturer's instructions*).

Real-Time Network Monitor

The Real-Time Network Monitor provides a status indication of all digital cassettes in the system. It is updated approximately once per second and provides information regarding the physical link, not the signalling.

To run the real-time network monitor:

1. Log on and select **Maintenance** and then **System monitors**.
2. Select **Real-time Network Monitor**.
3. The monitor reports on all the digital cards and cassettes in the system. It reports the **Type**, the **Synch** source and the **State**. The interpretation of these is given below. Always observe the Real Time Network Monitor for several minutes to ensure that the link is fully operational or that problems are not transitory.
4. The **Switch** field at the base of the report indicates which switching matrix is being used by the INDeX. **CPU** indicates the CPU cassette's switching matrix, **BIF** indicates the Link Cassette's switching matrix.

Synch: Status of frame timing

OK	Signal from link is satisfactory.
OK SOURCE	The circuit is recovering frame timing from the Network.
LOST SYNC	The circuit has failed to recover frame sync. See STATE for reasons.

State: Condition of link

OK	Signal from link is satisfactory.
CARD FAULT	Card not communicating with system, assumed to be faulty. Renew card.
NO SIGNAL	Signals not being received from far end. Cable/far end fault, check FAULTS 1, 2 and 3 below.
ALARM IND or REM ALARM	Alarm indication signal (all 1s or Bit 3 in TSO set) being received from end, normally loss of signal from this end. Cable/this end fault, check FAULTS 4, 2 and 5 below.
NO SYNCH	Frame timing lost on signal from far end, normally loss of signal from far end. Cable/far end fault, check FAULTS 6, 2 and 3 below.
FRAME ERRS	Bit error rate greater than 10 on signal from far end. Cable/far end fault, check FAULTS 1, 2 and 3 below.

Fault: Check:

- | | | |
|----|---|---|
| 1: | Check for faulty: | <ul style="list-style-type: none"> – TFC OUT coaxial cable connection. – NTE (TFC OUT). |
| 2: | Check with Network Operator for faulty: | <ul style="list-style-type: none"> – 2 Mbit/s bearer (e.g. BT Megastream). – Local exchange for DASS II Link. |
| 3: | Check with far end for faulty: | <ul style="list-style-type: none"> – NTE equipment – PBX – TFC in cable faults. |
| 4: | Check for faulty: | <ul style="list-style-type: none"> – TFC IN coaxial cable connection. – NTE (TFC IN). – TFC IN earthing at DTLC |
| 5: | Check with far end for faulty: | <ul style="list-style-type: none"> – NTE (TFC OUT) or coaxial cable. – DPNSS PBX receiver. – TFC OUT earthing at DTLC. |
| 6: | Check for faulty: | <ul style="list-style-type: none"> – TFC OUT coaxial cable connection. – NTE (TFC OUT). – TFC OUT earthing at DTLC. |

Equipment Fault Report

The system collects details of equipment faults during normal operation. It can output these faults either later as a fault report or when they occur as a real-time fault log.

The system loses all fault details following a system reset. Some false faults are generated during a normal power-up. It is sensible to clear these using the **clear faults** command after starting the system.

To print a fault report:

1. From the **Main Menu**, select **Report** and then **Report fault details**.
2. Use **Tab** to select the port on which to output the report.
3. Select **print faults** and enter either a device directory number or **All** for all device faults.

To clear all stored faults:

1. From the **Main Menu**, select **Report** and then **Report fault details**.
2. Select **clear faults** and enter either the directory number of the device or **All** for all device faults.

Each line on the fault report or log has the following parts:

- **Site Code:** The sites network node number.
- **Prefix:** Fixed as "ALM"
- **Fault Priority:** 1 = Major alarm, 2 = minor alarm, 3 = warning, 4 = information (eg. alarm cleared).
- **Fault Code:**

<u>Code</u>	<u>Priority</u>	<u>Description</u>
10	3	No line card detected on power up (card previously detected in slot).
11	2	Analogue line card failure.
12	1	Digital line card failure.
13	1	Digital line remote alarm detected.
14	1	Digital line frame synchronisation lost.
20	3	Extension disconnected/failed.
21	3	Analogue line circuit fault (circuit kept in service).
22	3	Unexpected event from trunk circuit (possible lost call).
23	2	Analogue trunk seizure failed (circuit removed from service).
24	2	Response lost from call sequencer card (possible malfunction).
91	4	Line card fault cleared.
92	4	Device fault cleared.
100	1	Card probe failure.
101	4	Card fault cleared.

- **Fault Codes:**
The faults codes are used in blocks; 10 to 19 = line cards (91 = fault cleared), 20 to 29 = device cards (92 = fault cleared).
- **Equipment Number:**
Shown in the standard address format (cabinet/slot/channel).
- **Date:**
The date the fault occurred.
- **Time:**
The time the fault occurred.

Addendum

Attaching Loudspeaker Systems

A page call to any DT telephone where the handset is physically off-hook and the telephone is idle (not receiving dial tone) is directed to the handset speaker rather than the DT loudspeaker. This option allows external loudspeaker systems to be connected to the DT's handset cord socket.

Though connecting an external loudspeaker via this route requires a DT, it is more flexible than connection via an analogue trunk circuit. The DT linked external loudspeaker can be paged directly or as part of a group with other telephones.

The external loudspeaker system must be CE marked to indicate compliance with EMC (EN41003) and Low Voltage (EN60950) directives. This is mandatory with the EU countries for all electrical products.

- **Loudspeaker Impedance:**
The matching impedance of the external loudspeaker should be 150 ohms.
- **Voltage Levels:**
The typical voltage levels on the DT handset Rx output are:
 - DT Set to minimum volume: 55mV p-p.
 - DT Set to maximum volume: 55mV p-p.
- **Wiring of plug:** RJ 11 Pins 2 & 3 (inner pair).

Glossary of Terms

Slave Socket

A terminal socket including just wiring connection points.

Master Socket

A terminal socket including components such as ringing capacitors.

Basic Rate Interface

A digital signalling interface providing 2B channels plus a D channel for call control signalling. The switch treats each B channel as a separate device.

Primary Rate Interface

A digital signalling interface providing up to 30B channels plus a D channel for call control signalling. The switch treats each B channel as a separate device.

T-Interface

A digital interface connection between the switch and the PSTN. Also referred to as a Network interface.

S-Interface

A digital interface connection between terminal devices and the switch. Note that the terminal device may be another switch. Also referred to as a User interface.

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