

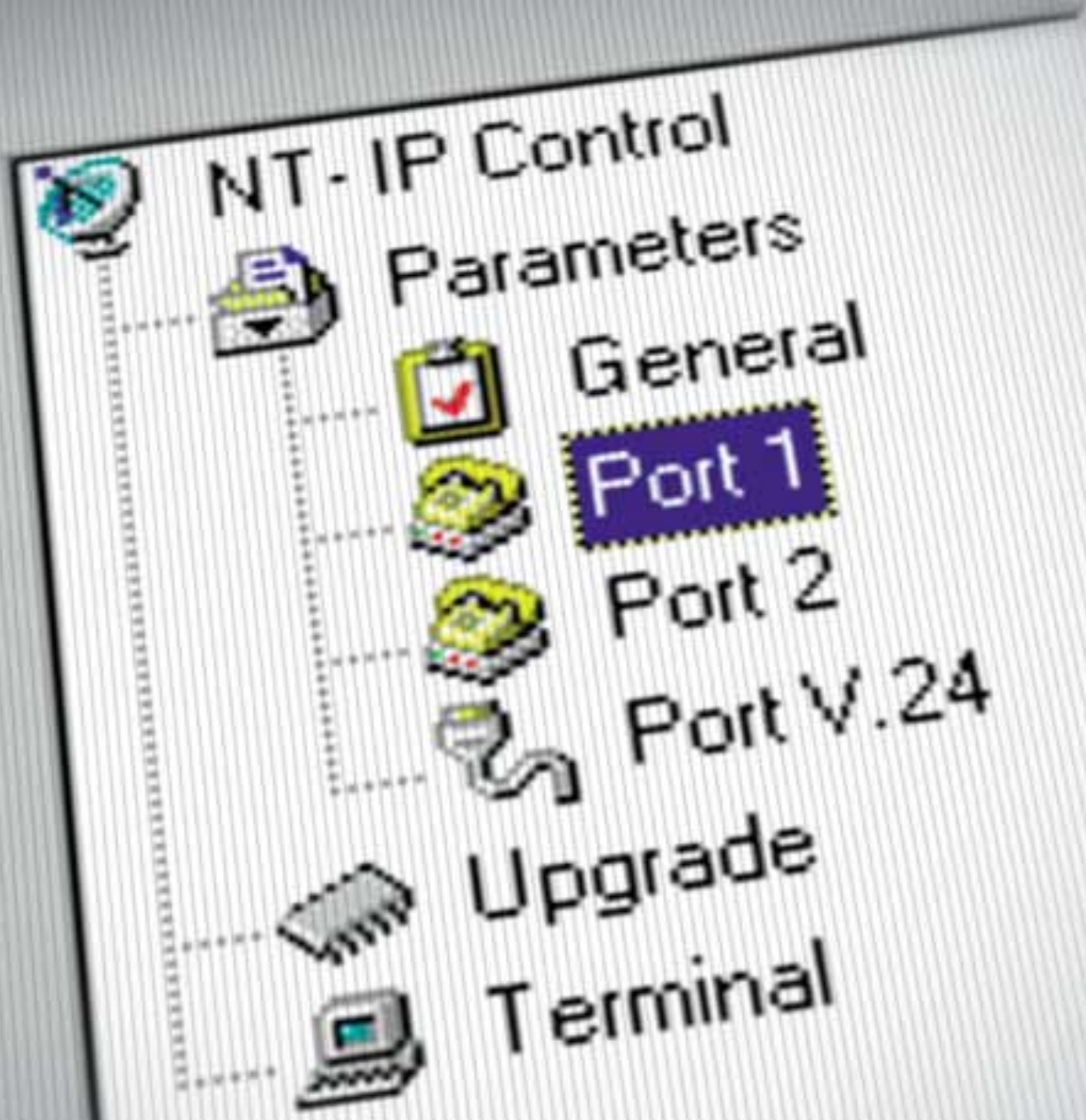
Aethra

NT-IP

Local

Remote

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# Enhanced ISDN network termination for Internet access and analogue phones

The **NT-IP** is a network termination for the ISDN basic rate access, which adds to the features commonly found in a standard ISDN network termination (NT1), two standard telephone ports and an RS232 interface to provide a fully digital, fast and reliable connection to a PPP terminal server, such as Internet Service Provider (ISP), remote access, e-mail access server, etc.

## BENEFITS

### AO/DI

AO/DI, unlike standard ISDN, actually makes three communications channels available to the user. If, for example, both B-Channels are bonded for a data session, and an incoming call is received, one of the B-Channels is automatically freed up for the telephone call. If a fax call also comes in, the remaining B-Channel may be allocated to the fax call. The data session continues on the D-Channel until a B-Channel is available, if needed.

### TELEPHONY SERVICES

When connecting to the ISDN over a NT-IP, subscribers deploy ISDN basic telephony services without any need to purchase additional equipment (digital phones and/or terminal adapters), and can keep using standard devices, such as standard phone sets, cordless phones, analogue modems, group 3 fax machines, automatic answering machines, analogue micro PBX's etc.

The NT-IP also supports a range of supplementary telephony services (call hold, call waiting, 3-party conferencing, call forwarding, etc.).

### DIAL-UP DATA SERVICES

A fully digital data service is provided by the NT-IP straight to the COM port of a PC with unrivalled performance compared to analogue modems, including sub-second call setup times and a virtually error free data channel to the service provider at a guaranteed bit rate. No additional hardware or software need to be installed to operate the service.

### NATIVE ISDN SERVICES

Additionally, subscribers connect native ISDN terminals, such as videophony terminals, group 4 fax machines, etc., directly on the S-bus.

### OPERATOR ADVANTAGES

Being an integrated access device, the NT-IP offers the telecom operators simplified provisioning and installation.

The NT-IP fully supports remote monitoring, configuration, maintenance, and firmware upgrade: operators can therefore offer their customers a faster maintenance service at a lower cost by limiting the number of on-site interventions.



## FEATURE SUMMARY

### STANDARD NT1

- 2-wire interface on the U reference point.
- 4-wire user bus on the S/T reference point.

### POTS INTERFACES

Electrical:

- PCM speech coder/decoder, according to G.711, A-law.
- Pulse and/or tone dialling, metering pulse generation.
- One port available in emergency conditions (mains off).
- Local tone generation (dial tone, congestion and call waiting) is provided when required.
- Register recall or hook-flash keys are also supported to invoke supplementary services.
- To allow operation with a wide range of terminal, the NT-IP features high on-hook battery voltage and high voltage ringing even on heavy ringer loads (~3 REN's).

Additional functions can be provided according to customer specifications.

### STANDARD SUPPLEMENTARY SERVICES FOR THE POTS INTERFACES

- The POTS ports of the NT-IP support the Multiple Subscriber Numbers (MSN), the Calling Line Identification Presentation (CLIP), Connected Line Identification Presentation (COLP) supplementary services.

### ADDITIONAL SUPPLEMENTARY SERVICES

- The NT-IP supports supplementary services based on stimulus procedures.
- Particularly, the following ETSI functional protocol services are supported: Call Hold (CH), Call Waiting (CW), Advice of Charge (AOC), 3-Pty Conference (3-PTY), Calling Line Identification Restriction (CLIR), Explicit Call Transfer (ECT) and

Malicious Call Identification (MCID).

### AO/DI

AO/DI allows the user to maintain a continuous connection without continuously tying up a circuit. In its Dynamic ISDN aspect, AO/DI allows the B-Channels, and thus the circuit-switched network and connected hardware, to be dynamically allocated to end users only as actually needed.

### RS232 PORT

- PPP asynchronous to synchronous conversion
- Enhanced AT command set.
- Handling of control signals (DTR, DSR, CTS, etc.).
- Implicit rate adaption via the HDLC framing.

Other major features of the RS-232 port include:

- Selectable hardware (CTS) or software (X-on, X-off) flow control.
- One directory number (DN) can be allocated for the RS232 port.
- Internet Access on a single B-channel or on both B-channels using the multilink PPP (MP) protocol
- Always on /Dynamic ISDN (AO/DI)
- Bandwidth on Demand (BOD)
- Bandwidth Allocation Protocol and Bandwidth Allocation Control Protocol (BAP/BACP)
- Peer to peer communication according to ITU-T V.120 or V.110 recommendations
- Enhanced AT command
- Automatic bit rate recognition up to 230,4 kb/s

### PPP OPERATION

- Single link PPP
- Multilink PPP
- Call Bumping
- Bandwidth On Demand
- The Bandwidth Allocation Protocol
- Always On/Dynamic ISDN

# NT-IP

## So INTERFACE

On the So interface the NT-IP provides the same quality of service as a standard NT1, including:

- Full compliance to regulatory standards.
- Up to 8 terminals allowed on the S bus.
- Complete transparency to the test procedures from the exchange.

## So POWER SUPPLY

Standard PS1 phantom supply to the So bus is provided when the local a.c. power is available.

## U INTERFACE

The NT-IP fully complies to ETS Technical Report TS 102 080, except for higher power consumption when emergency power is provided to the POTS port.

## SYSTEM OPERATION

### LEDS

The following status monitoring LEDs are located near the front panel:

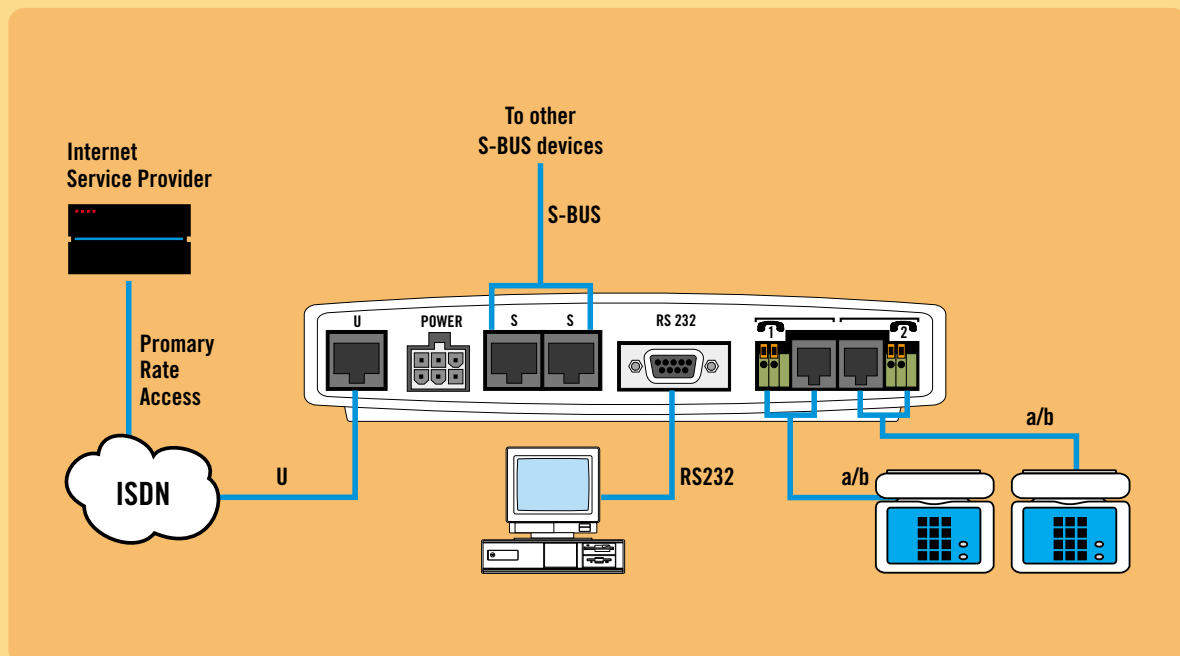
PWR	A.C. power supplied
U	Line interface connected
DTR	Data Terminal Ready (C108)
DCD	Line status or Carrier detect (C109)
CTS	Clear to Send (C106)
TD	Transmit Data (C103)
RD	Receive Data (C104)
B1	Channel B1 status
B2	Channel B1 status

### SWITCHES

On the bottom side of the device two dip switches are available to:

- select the So bus configuration (short passive/extended)
- include terminating resistors for the So bus (100  $\Omega$ / off)

All other settings are made via configuration procedures.



## INSTALLATION AND CONFIGURATION

Local and Remote installation and configuration procedures are available through a DTMF phone either connected to one of the POTS interfaces or from a "secured" ISDN access, through a normal telephone or a PC connected to a NT-IP or an Aethra TA-INET or TA-IP or Front End. Some parameters related to the RS-232 port can only be configured using AT-commands.

## LOCAL AND REMOTE MAINTENANCE

The NT-IP provides a list of diagnostic features:

- Download of firmware upgrades.
- Remote diagnostics for POTS interfaces.
  - ringing voltage
  - microphone current
  - capacity measurement on the POTS interfaces
  - short circuit control.

## TECHNICAL SPECIFICATIONS

### Line interface

Line codes	2B1Q or 4B3T
Standard compliance	TS 102 080
Power consumption	max 1.4 W
Range	up to 1k $\Omega$ (V remote supply > 90Vdc)

### RS232 port

Control circuits	TXD,RXD,RTS,CTS,DSR,DTR,DCD
Data rate	up to 230.4 kbit/s
Access protocol	PPP, internal async to sync converter, V120, V110
Dialling mode	Hayes <sup>®</sup> AT command set

### POTS interfaces

Dialling mode	DTMF, pulse
Impedance	600 $\Omega$ or complex (optional)
Speech quality	Q.552
No load voltage	< 60 V
d.c. load	from 0 to 800 $\Omega$

### Ringing Generator

Ringing Voltage	> 40 V / 2k $\Omega$
Ringing load	approx. 3 REN
Frequency	25 Hz, asymmetrical
Max distortion	10%

### Reference Standard for Environmental Quality

Safety	EN60950 (oct. 96)
EMC and protections	ETS 300 047, ETS 300 386-2-2
Transport	ETS 300 019-1-1 class 1.2
Storage	ETS 300 019-1-2 class 2.2
Operation	ETS 300 019-1-3 class 3.2
Overvoltages protection	exceeds ITU-T K21

### Mechanical

Dimensions	180x140x45 mm.
Weight	455 gr.

### Power Supply

Current	<100 mA
Voltage	90 $\div$ 250 Vac, 50 $\div$ 60 Hz

### Operating System Requirements

Windows 95, 98, 98 SE, ME, 2000, NT4, Linux, Macintosh

## CONNECTIONS

So bus	Two modular RJ-45 ISO8877 connectors (8p/4c)
POTS	Two modular RJ-11 connectors (6p/2c) 2-pole spring terminal
RS232 port	DB-9 connector
Line pair (U)	2-pole screw terminal or RJ-45
Power supply	Plug (external feeder)



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