



VERSATILE MULTIPLEXER
MODEL No. ICS VM - 30

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INTRODUCTION :

ICS.VM30 drop insert multiplexer is a state of the art solution multiplexer technology to meet modern network communication requirements. The equipment operates at a primary rate of 2048 kbps and can provide service to 30 voice / data channels

FEATURES:

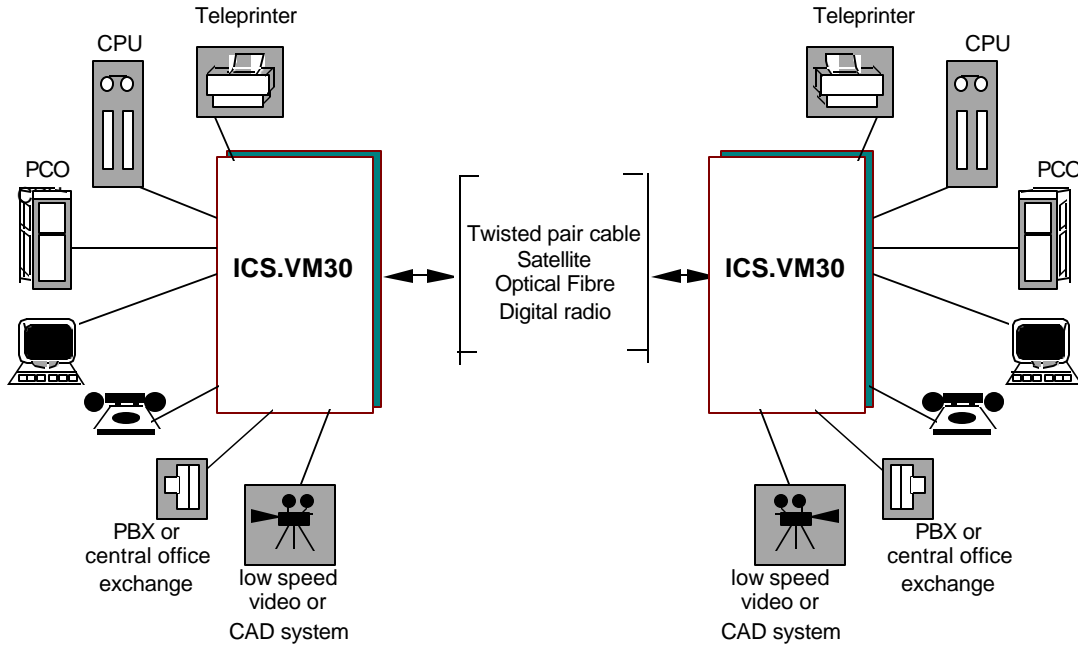
- Drop and insert / end terminal applications
- Voice / data service
- Modularity of interfaces at 2 channel level
- Drop/insert of any time slot at the same station
- Multidrop for data channels
- Channel assignment independent of slot position in the subrack
- PC interface
- Monitoring and network control
- Extensive set of alarms
- User programmable alarm responses
- Synchronism to different user selectable clock sources
- Software programmable level setting
- Diagnostic feature for termination cards
- Automatic bypass during node failure
- Microprocessor and software based design
- Compliance with all relevant CCITT recommendations
- Compact and composite construction
- Fully solid state
- No forced cooling required

FACILITIES:

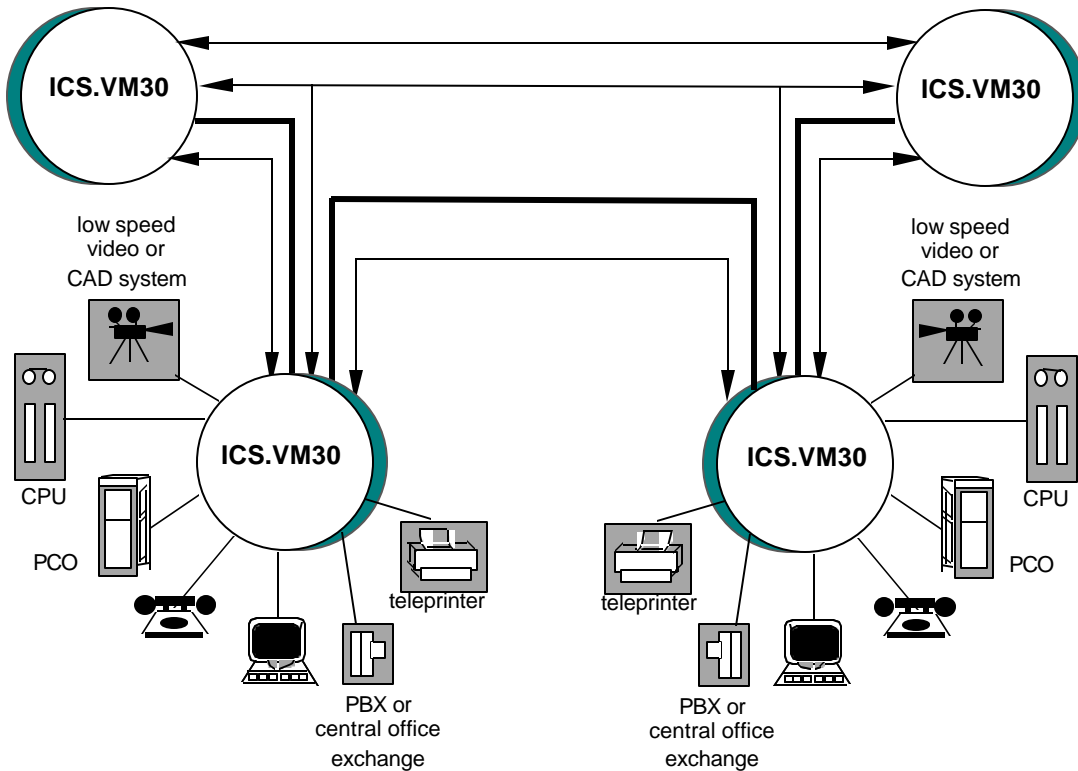
- Synchronous high speed (64kbps) data communication with V.35 (N*64) data interface
- Point to point synchronous / asynchronous low speed (upto 19.2 kbps) data communication with V.24 data interface
- Point to Multipoint synchronous / asynchronous low speed (upto 19.2kbps) data communication with V.24 data interface (Multidropped polled data mode)
- Codirectional data (64kbps) communication with G.703 data interface
- Point to point voice mode exchange interfaces providing the following:
 - 2 wire / 4 wire E&M signalling
 - Loop disconnect signalling
 - 16kHz metering detection
- Point to point voice mode subscriber interface providing the following:
 - Loop disconnect signalling
 - Ring down with decadic pulsing
 - 16kHz metering injection
- Conference voice mode with a maximum of twelve 3 party conferences
- Teleprinter operation (50 / 100 baud) with teleprinter interface
 - 75Ω / 120Ω impedance selection at primary rate ports

- **Basic Configuration**

- **Terminal Multiplexer**



- **Drop/insert multiplexer**



System Composition

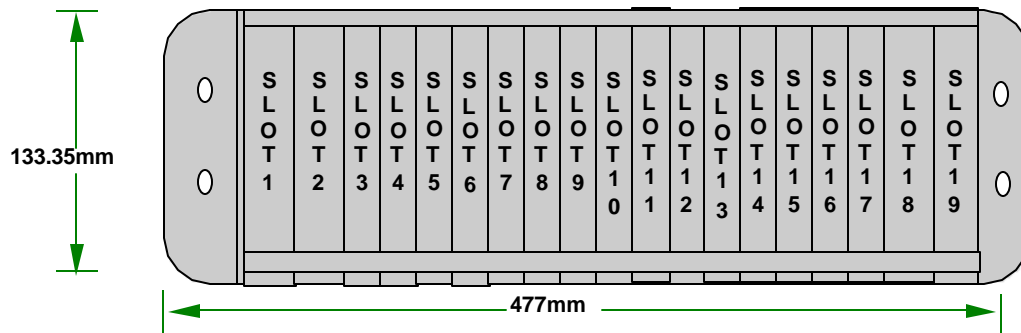
Core Units

Control Card 1
 Control Card 2
 Power Supply Card
 Back Panel Mother board

Interface Cards

V.24 data interface card
 V.35 (NX 64) data interface card
 G.703 data interface card
 2 wire outgoing trunk interface card
 2 wire incoming trunk interface card
 2 wire exchange loop interface card
 2 wire subscriber loop interface card
 2 wire E&M trunk interface card
 4 wire E&M trunk interface card
 Teleprinter interface card

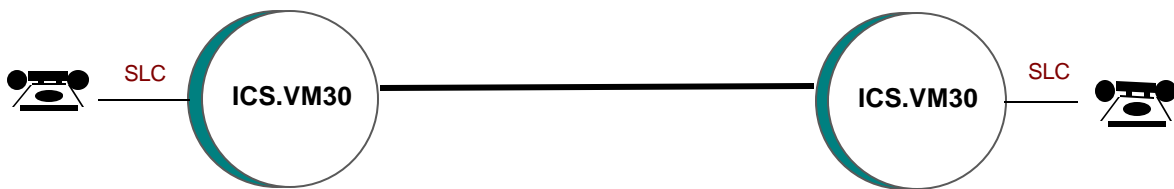
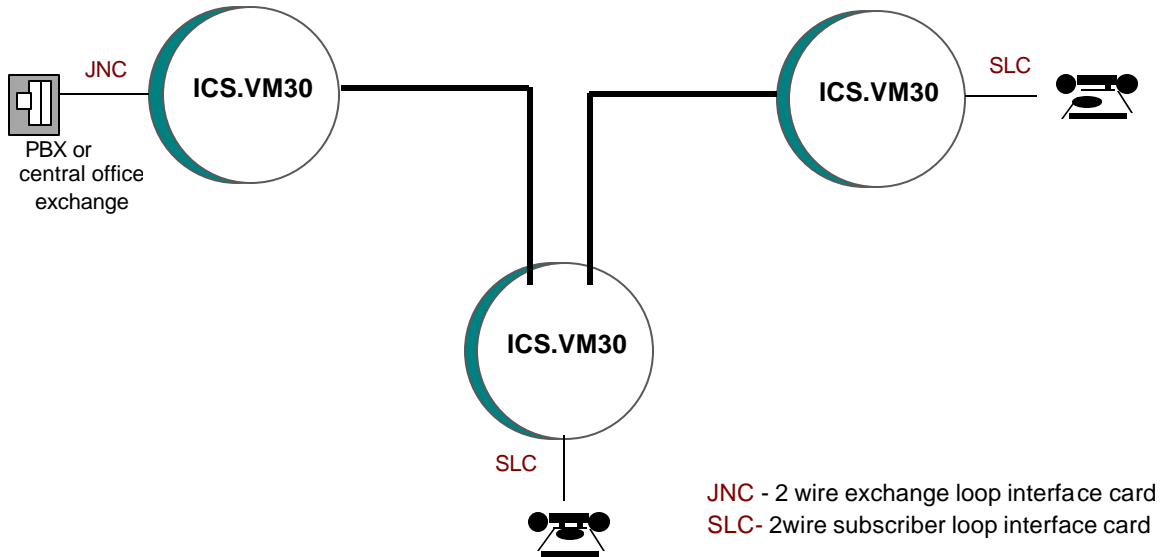
Shelf Configuration



- SLOT 1 (30.48mm) - **Power Supply Card**
- SLOT 2 (30.48mm) - **Vacant**
- SLOT 3 to 17 (20.32mm) - **Voice / Data Interface Cards**
- SLOT 18 (30.48mm) - **Control Card 1**
- SLOT 19 (25.4mm) - **Control Card 2**

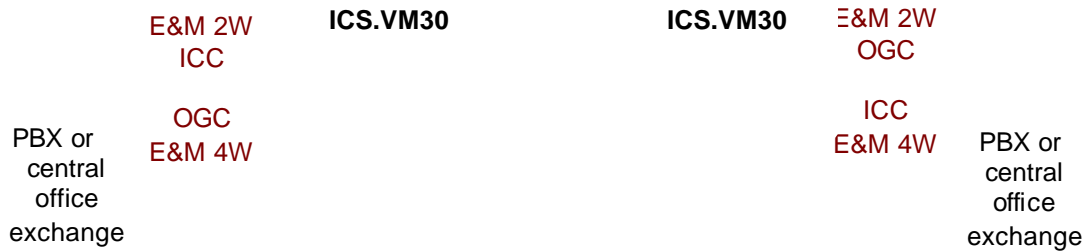
Data channel applications
Voice channel applications

• **Extension of Subscriber to Exchange**



SLC - 2 wire subscriber loop interface card

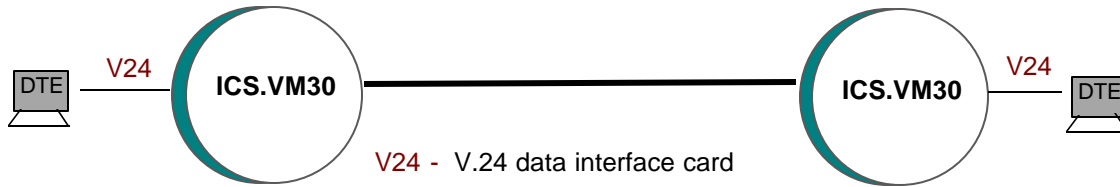
• **Exchange to exchange link**



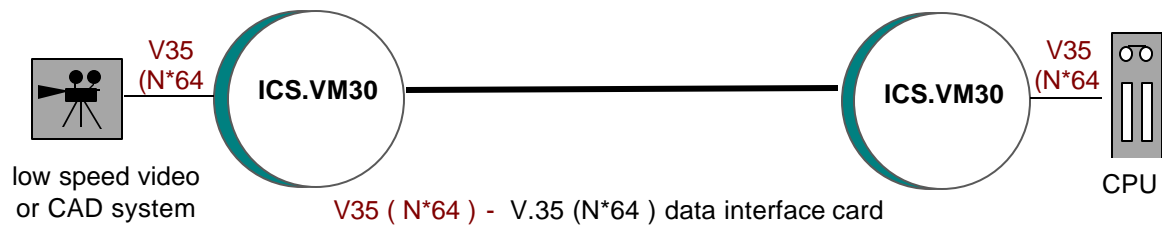
ICC - 2 wire subscriber loop interface card
 OGC - 2 wire outgoing trunk interface card
 E&M2W - 2 wire E&M trunk interface card
 E&M4W - 4 wire E&M trunk interface card

Data channel applications

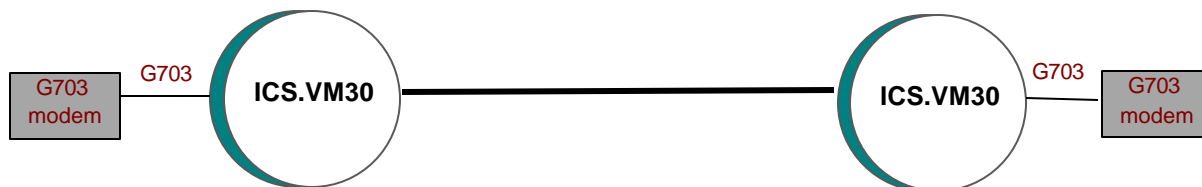
Low speed (upto 19.2 kbps) synchronous / asynchronous data interface



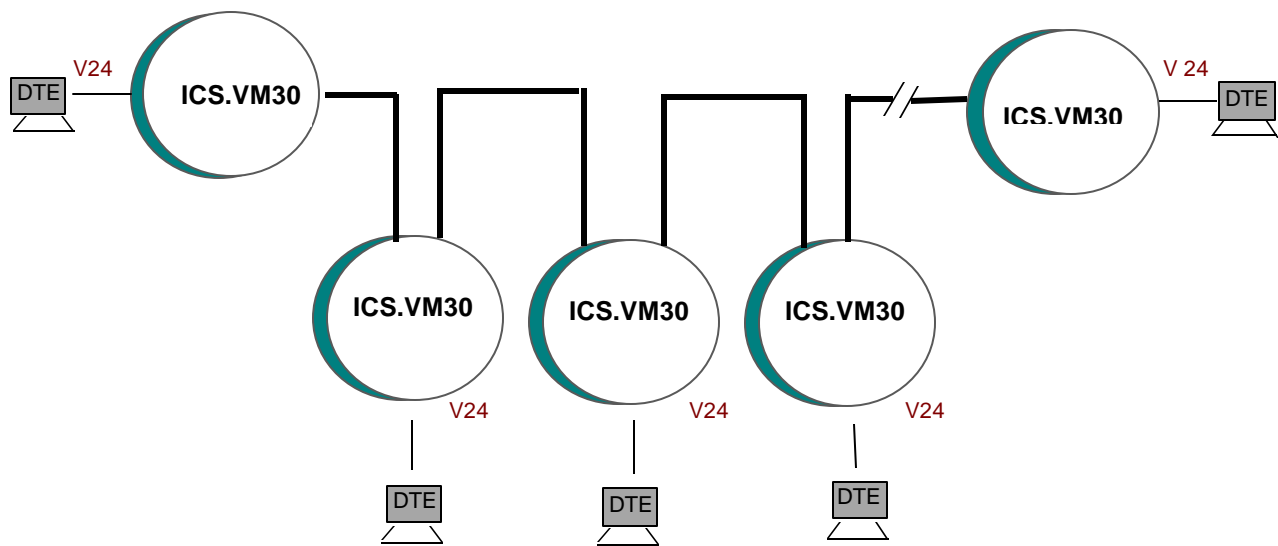
High speed (upto 64kbps) synchronous data interface



64kbps codirectional interface



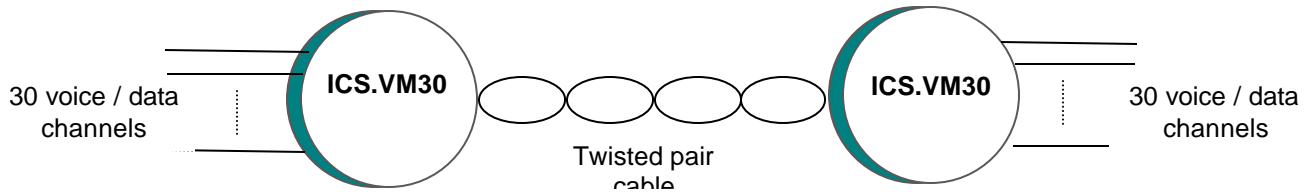
Polled Data Communication



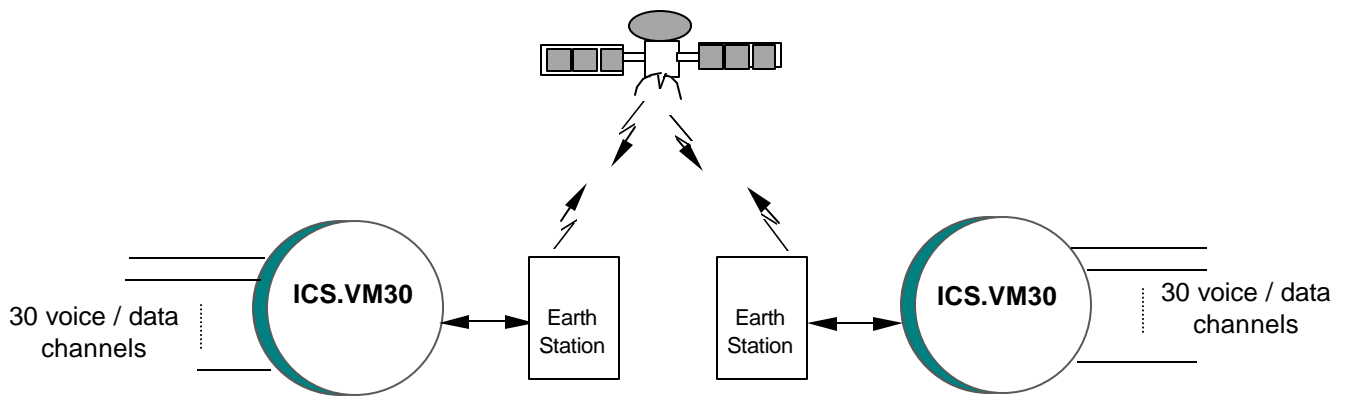
V24 - V.24 data interface card

Transmission Media

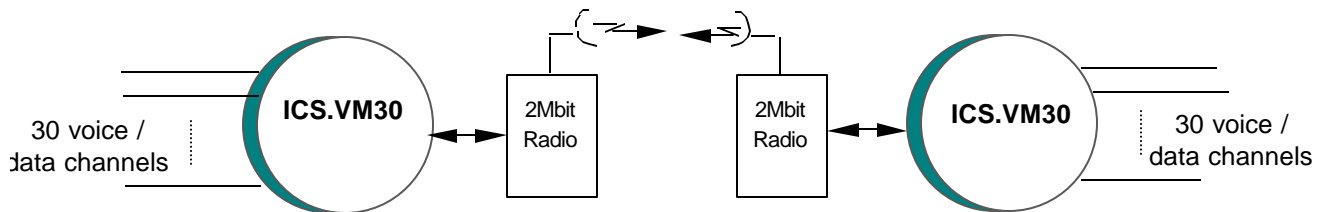
Twisted pair cable



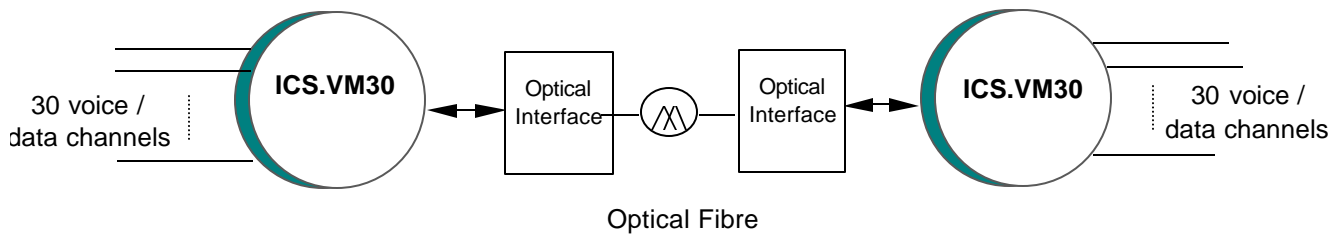
Digital Satellite Circuit



Digital Radio



Optical Fibre



Technical Specifications

Digital Interface at 2048kbps

Number	2
Conformity	G. 703
PCM sampling rate	8000 samples/ sec
Encoding law	A law as per CCITT G.823
Bit rate	2048 kbps \pm 50 ppm
Code	HDB3
Nominal Impedance	120 Ω balanced/75 Ω unbalanced
Peak Voltage of a mark	
for 120 Ω balanced interface	3.0 V \pm 0.3 V
for 75 Ω unbalanced interface	2.37 V \pm 0.237 V
Peak Voltage of a space	
for 120 Ω balanced interface	0 V \pm 0.3 V
for 75 Ω unbalanced interface	0V \pm 0.237 V
Nominal Pulse Width	244 ns
Pulse Mask	as per CCITT rec. G.703
Output Jitter	< 0.05 UI (in the frequency range 20Hz to 100kHz)
Permissible attenuation	6 dB at 1 MHz
Return Loss at:	
51.2 KHz to 102.4 KHz	> 12dB
102.4 KHz to 2048KHz	> 18dB
2048KHz to 3072 KHz	> 14dB
Jitter tolerance	as per CCITT G.823
Frame Structure	as per CCITT G.704
Signaling	Channel Associated Signaling
Loss and recovery of frame alignment	as per clause 3 of CCITT G.732
Loss and recovery of multiframe alignment	as per clause 5.2 of CCITT G.732

4 wire voice frequency interface

Number per card	2
Maximum number	30

Performance Characteristics:

between voice frequency ports	as per CCITT G.712
for separate send and receive side	as per CCITT G.714
Receive level	
Nominal	- 3.5 dBr
Minimum	-14.0 dBr

Transmit level

Nominal	- 3.5 dBr
Maximum	+ 4.0 dBr
Range of level adjustment	15 dB
Level adjustment	in steps of 0.5 dB

2 wire voice frequency interface

Number per card	2
Maximum number	30
Performance Characteristics between voice frequency ports	as per CCITT G.713
Receive level	
Nominal	0.0 dBr
Minimum	-11.0 dBr
Transmit level	
Nominal	-2.0 dBr
Maximum	0.0 dBr
Range of level adjustment	15 dB
Level adjustment	in steps of 0.5 dB

2 wire loop outgoing with trunk offering

Number per card	2
Maximum number	30
Performance characteristics	as per CCITT G.713
Receive level	
Nominal	0.0 dBr
Minimum	- 7.0 dBr
Transmit level	
Nominal	-2.0 dBr
Maximum	0.0 dBr
Range of level adjustment	7 dB
Level adjustment	in steps of 0.5 dB
Operating voltage	-48 V dc (Nominal)
Loop resistance	600 ohm
Dial pulse speed	8-12 pps

2 wire loop incoming with trunk offering facility

Number per card	2
Maximum number	30
Performance characteristics	as per CCITT G.713
Receive levels	same as 2W loop outgoing
Transmit levels	same as 2W loop outgoing
Range of level adjustment	7 dB
Level adjustment	in steps of 0.5 dB
Operating voltage	-48 V dc (Nominal)
Open loop resistance	> 30K ohm
Closed loop resistance	Constant current sink of 20mA
Dial pulse speed	8-12 pps

2 wire subscriber loop interface

Number per card	2
Maximum number	30
Performance characteristics	as per CCITT G.713
Receive & Transmit levels	same as 2W loop outgoing
Range of level adjustment	7dB
Level adjustment	in steps of 0.5 dB
Operating voltage	-48V dc (Nominal)
Loop resistance	600 ohm
Ring voltage	75 Vrms
Ring frequency	25 Hz
Dial pulse speed	8-12 pps
Metering signal frequency	16 kHz
Metering signal voltage	2Vrms

2 wire exchange loop interface

Number per card	2
Maximum number	30
Performance characteristics	as per CCITT G.713
Receive and transmit levels	same as 2W loop outgoing
Range of level adjustment	7dB
Level adjustment	in steps of 0.5 dB
Operating voltage	-48 V dc (Nominal)
Open loop resistance	> 22 K ohm
Closed loop resistance	Constant current sink of 20mA
Ring voltage detection (min)	15Vrms
Dial pulse speed	8-12 pps

2 wire hot line interface

Number per card	2
Maximum number	30
Performance characteristics	as per CCITT G.713
Receive and transmit levels	same as 2W loop outgoing
Range of level adjustment	7 dB
Level adjustment	in steps of 0.5 dB
Operating voltage	-48 V dc (Nominal)
Loop resistance	600 ohm
Ring voltage	75 Vrms
Ring frequency	25 Hz

High speed Synchronous Data Interface

Number per card	2
Maximum number	30
Conformity	to CCITT rec. V.35
Mode	synchronous
Bit rate	NX64 kbps

Low speed Data Interface

Number per card	2
Maximum Number	30
Conformity	to CCITT rec. V.24
Mode	synchronous / asynchronous
Bit rate	2.4 / 4.8 / 7.2 / 9.6 / 19.2 kbps

Codirectional Data Interface at 64 kbps

Number per card	2
Maximum number	30
Conformity	to CCITT rec. G.703
Functional requirements	as per CCITT rec. G.703
Electrical Characteristics	as per CCITT rec. G.703
Nominal Impedance	120 ohm

Teleprinter Interface

Output telegraph voltage	+/- 60V
Output current requirement	100 +/- 20mA
Range of receive voltage detection	+/- 30 V to +/- 80 V
Baud rate	50 / 100 baud
Mode	Double current full duplex mode / single current half duplex mode

Synchronisation

Synchronisation sources	Internal clock, external clock, timing derived from incoming HDB3 links
External clock input	as per CCITT rec. G.703
Impedance of external clock input port	120 Ω balanced /75 Ω unbalanced
Default option	internal clock

Power Supply

Input DC voltage	-48V DC (nominal)
Range of input	-20V to -60V DC
Output voltages	+5V, -5V, 75 Vrms (ringer voltage), filtered -48V (for term. cards)
Output voltage variation	within \pm 5% of output nominal voltage
Full load output current	4A at +5V 0.5A at -5V
Input voltage reversal protection	provided in the card
Over current protection	6A for +5V, 0.5A for -5V

Short circuit protection

current limit - 6A. Recovers on
removal of short

Under voltage

< 4.5V

Over voltage

5.4V to 5.6V

Efficiency at full load

>70%

Ripple at full load

<5mVrms

Spike at full load

<50mV

Power consumption

42W

Mechanical Specifications**Rack mounting**

Standard 19 inch rack

Height

133.35mm

Depth

260mm

Width

477mm

For further information, please contact :

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