



**G-Converter 2048 Channel Card:
MTU200CF-2048**

Rev 1.0

G-Converter 2048 Channel Card

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**G-Converter 2048
G.703 to X.21/V.35 Converter Card
User Manual**

WARNING - BEFORE INSTALLATION, PLEASE REFER TO SAFETY INSTRUCTIONS IN APPENDIX A, AND EMC INSTRUCTIONS IN APPENDIX C

The following declaration is made assuming the G-Converter 2048 Channel Cards have been installed correctly in an G-Converter Chassis.

Certified Compliant in the EC, when fitted in accordance with the installation instructions, against the following directives/standards:

Low Voltage Directive (73/23/EEC and amendment 93/68/EEC)

EN60950 : 1992 (Safety)

Electromagnetic Compatibility directive (89/336/EEC and subsequent amendments to date):

EN55022 : 1994 (Emissions)

EN55024 : 1998 (Immunity)

Telecommunications Terminal Equipment directive (91/263/EEC and amendment 93/68/EEC) where indicated in approvals requirements section.



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Introduction

This manual provides information covering installation and set-up procedures of the G-Converter 2048 Channel Card.

This card is designed to be used in conjunction with an G-Converter Chassis, for which there is a separate manual.

G-Converter 2048 Channel Cards are interface adapters that will convert between a G.703 link and an X.21/V.11 interface or optionally V.35.

The intended use of this unit is to terminate G.703 links

G-Converter 2048

The G-Converter 2048 is a low cost simple converter. The card has no management and can only be configured using link settings. A G-Converter manager card will not recognise a G-Converter 2048 Channel Card.

The G-Converter 2048 Channel Card has a Bi-coloured LED mounted on the front panel, this indicates the card status.

Functional Overview

The G-Converter 2048 Channel Cards provide interfaces and rate conversion between G.703 data stream and X.21/V.11 or optionally V.35 interface.

The E1 connection is via either an RJ45 connector offering a 120 Ohm balanced impedance or two BNC connectors offering unbalanced 75-Ohm impedance. The X.21/V.11 connection is via a 15-way D type connector. V.35 connection is also available on a 15-way D type connector, a conversion cable providing MRAC connection is available as an option.



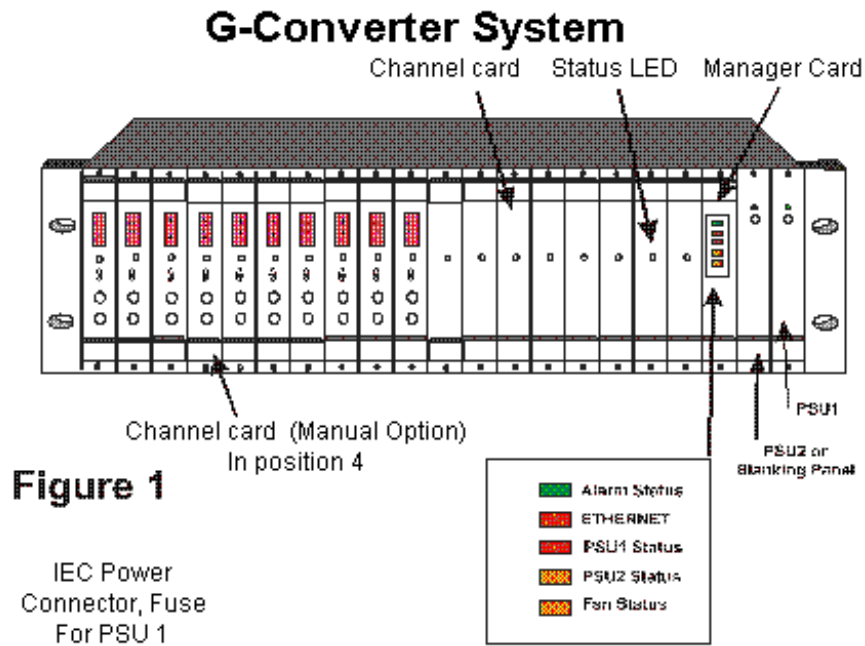


Figure 1

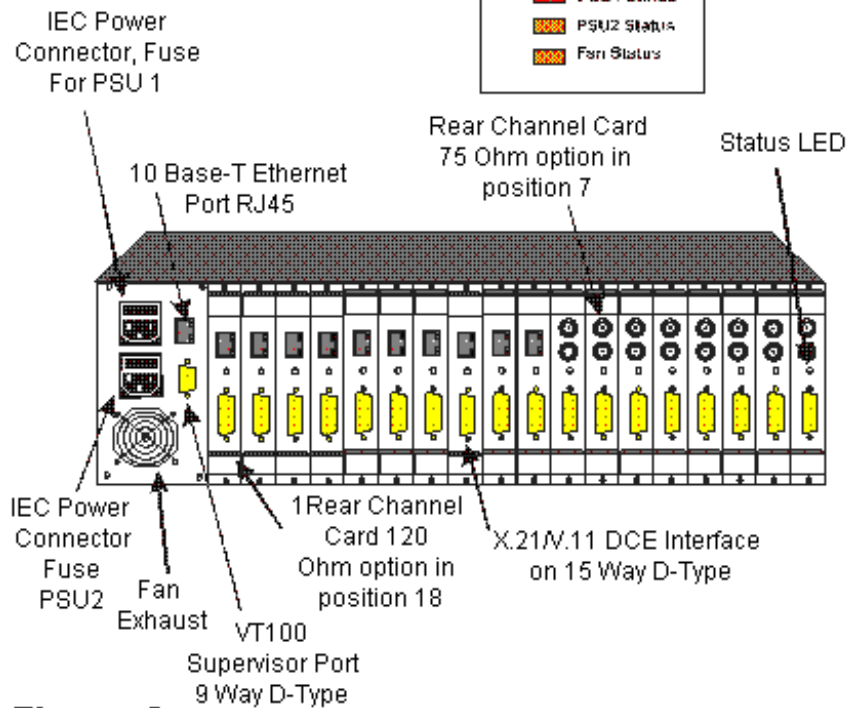


Figure 2

Typical applications

Typically the G-Converters are used to connect a router with an X.21/V.11 or V.35 interface to an E1 circuit with G.703 interface



Installation

BEFORE INSTALLATION, PLEASE REFER TO THE SAFETY WARNINGS, APPROVAL REQUIREMENTS AND EMC REQUIREMENTS IN THE APPENDICES.

Environmental Considerations

The equipment may only be operated under the following atmospheric conditions:

Temperature: 0 to 40 degrees centigrade.
Humidity: 0% to 90% non-condensing.

Installation in to the G-Converter Chassis

The G-Converter Channel Cards are plugged into slots numbered 1 to 18 of the chassis. The card is divided into 2 pieces the longer card is plugged into the backplane from the front of the G-Converter Chassis; the shorter card with connectors is plugged into the backplane from the rear of the chassis. **It is essential that the front and rear cards are plugged into sockets in the backplane with the same number.**

There are 4 variants of rear card:

1. 120 Ohm, RJ45 E1 connection, 15 way D type X.21/V.11 data connection
2. 120 Ohm, RJ45 E1 connection, 15 way D type V.35 data connection.*
3. 75 Ohm, Dual BNC E1 connection, 15 way D type X.21/V.11 data connection
4. 75 Ohm, Dual BNC E1 connection, 15 way D type V.35 data connection.*

* Converter cable to MRAC connector available as an option.

After plugging the cards into the chassis, they should be retained by the screws provided in the front and rear panels.

G.703 Interface Presentation 120Ohm.

A shielded RJ45 connector is provided on the rear of the G-Converter 2048 Channel Card. The port is compliant with TBR12. A pin out of this connector is given in Appendix D.

G.703 Interface Presentation 75Ohm

Dual 75 Ohm BNC connectors are provided with this option. This port is compliant with PD7024. See Appendix E.

X.21/V.11 DCE interface.

This interface is presented on a 15-way D-type female connector. A pin out of this connector is given in Appendix F.



V.35 DCE Interface

This interface is presented on a 15-way D-type female connector. A pin out of this connector is given in Appendix G.



Configuration and Use – G-Converter 2048 Channel Card

There are configuration links on the G-Converter 2048 Channel Card.

Selection of the interface is made by choosing the appropriate rear card.

X.21/V.11 Interface

When an X.21 type rear card is plugged in then the DTE interface is presented as X.21. The connector pin out for the X.21 interface is given in the Appendix G.

CONTROL OF “I” LEAD

The “I” lead status is synthesized by the converter since no information about the “I” lead status is passed across the link. Status of the “I” lead is fixed. Three choices are available to the user.

Selection is made via jumper settings. Refer to the location diagram in Appendix J.

LK4		FUNCTION OF I LEAD
Position C		I follows Carrier
Position B		I = active
Position A		I follows C
No jumper fitted		I= inactive

Termination of X.21 Transmit data.

When operating an X.21 interface it is sometimes desirable to terminate with 120 Ohms the transmit data pair. This can be achieved by selection of LK3.

LK3	FUNCTION OF I LEAD
Position 1 &2	X.21 TxD terminated
Position 2 & 3	X.21 TxD not terminated

V.35 Interface

When a V.35 type rear card is plugged in then the DTE interface is presented as V.35. The connector pin out for the V.35 interface is given in the Appendix G. The V.35 interface is presented on the 15-way D-type connector. Two “control flags” are available as outputs and one “control flag” is available as an input. The V.35 specification calls for the following signals;

V.35 CONTROL FLAG SIGNALS			
Name	Description	Type at Connector	Signal number
RTS	Request To Send	Input	105
RFS	Ready For Sending (CTS)	Output	106
DSR	Data Set ready	Output	107
DCD	Data Channel Detector	Output	109

Control signals

The G-Converter 2048 supports one input flag and two output flags. RTS would normally be the definition for Flag 1 I/P as this is the only I/P called up by the V.35 spec.

The two output flags, Flag 2 O/P and Flag 3 O/P can be assigned to RFS, DSR or DCD, the choice is at the discretion of the user.

The connector pin out for the V.35 interface is given in appendix H and a suggested stub cable converter to 34 pin MRAC is given in appendix I.

Configuration Of V.35 Control Flags

When the V.35 interface is selected the FLAG 1 O/P and FLAG 2 O/P can be individually controlled. Four choices are available to the user.

Selection is made via Link settings, LK2 configures FLAG 1 O/P and LK1 configures FLAG 2 O/P. Refer to the location diagram in Appendix J

The position of LK1 and LK2 is shown below;

LK1 AND LK2 SETTINGS	
Jumper position	O/P Flag function
C	Flag n O/P follows carrier
B	Flag n O/P on
A	Flag n O/P follows Flag 3 I/P
Not fitted	Flag n O/P off

G-Converter 2048 Channel Card

Front panel LED indicator

The G-Converter 2048 Channel Card has one LED indicator

LED COLOUR	STATUS	NOTES
RED	Link faulty	No RX Carrier established.
GREEN	Link good	Normal operation
OFF	No power	LED faulty, Unit faulty

Appendix A - Warnings0

WARNING: *This equipment relies on the EARTH/GROUND connection to ensure EMC compliance. It must not under any circumstances be operated without an earth connection, which could nullify its approval.*

WARNING: **INSTALLATION OF EQUIPMENT**

Installation of this equipment must only be performed by suitably trained service personnel.

This equipment allows connection only of suitably approved equipment to its ports, the safety status of which are defined below.

SELV Ports:

i) ***“To DTE”***

The above named ports are classified as SELV (Safety Extra Low Voltage) in accordance with in Clause 2.3 of EN60950 (BS7002, IEC950 as applicable), and **must only** be connected to equipment which similarly complies with the SELV safety classification.

TNV Ports:

i) ***Euro 120 ohm RJ45***

The above named ports are classified as TNV (Telecom Network Voltage) in accordance with Clause 6 of EN60950 (BS7002, IEC950 as applicable), and **must only** be connected to equipment, which similarly complies with the TNV safety classification.

Appendix B – Approval Requirements

The G-Converter 2048 Channel Card Converter carrying the BABT/CE168 assessment symbols and approval number, is approved for connection to the networks identified in this Appendix as follows:

G.703

Throughout Europe (Pan European) to CTR12 and CTR13 via RJ45 Connector (120 Ohms Balanced) The 75 Ohms unbalanced variant is approved to PD7024.

Appendix C – EMC Requirements

To ensure compliance with the EMC directive, some care must be taken to ensure that the units are installed properly, using suitable cables and connections. The following must be observed:

Limitation of Emissions:

'D-Type' Connections

This product relies on the use of screened cables for connection to the 15 way 'D-Type' ports. The cables must have the foil or braid screen connected effectively to the metal headshell to ensure continued compliance.

The diagram below illustrates an example of a suitable screen connection. Note how the foil or braid screen is bent back over the 'C' clip to achieve a pressure contact of the screen against the shell:

It is important
to keep the
screen to shell
connection as
short as
possible.

Appendix D - G.703 120 Ohms Interface Pinout

COMPOSITE INTERFACE CONNECTIONS (EUROPE) USING 120 OHM BALANCED RJ45			
Name	Description	Type at Connector	DTE – RJ45 Female
RxA	RX Pair	Input	1
RxB	RX Pair	Input	2
TxA	TX Pair	Output	4
TxB	TX Pair	Output	5
S1	Shield Reference	-	3
S2	Shield Reference	-	6

Appendix E - G.703 75 Ohms Interface Pinout

COMPOSITE INTERFACE CONNECTIONS (UK) USING 75 OHM UN-BALANCED BNC			
Name	Description	Type at Connector	DTE – BNC Female
RxA	RX Pair	Input	Centre RX
RxB		Ground Reference	Outer RX
TxA	TX Pair	Output	Centre TX
TxB		Ground Reference	Outer TX

Appendix F – RJ45 E1 Crossover Cable

RJ45 CROSSOVER CABLE (EUROPE) USING 120 OHM BALANCED RJ45			
Name	Description	DTE2 – RJ45 Male	DTE1 – RJ45 Male
TxRxA	TXRX Pair	4	1
TxRxB		5	2
RxTxA	RXTX Pair	1	4
RxTxB		2	5
S1	Shield Reference	6	3
S2	Shield Reference	3	6

Appendix G – X.21/V.11 Data Channel Pinout

**X.21/V.11 Data Channel connectors
(15 Way DB25 Type Configured DCE)**

DATA CHANNEL CONNECTIONS			
Name	Description	Type at Connector	DCE – DB15 Female
Protective Ground		-	1
G	Signal Ground	-	8
T(A)	TxDa	Input	2
T(B)	TxDb	Input	9
R(A)	RxDa	Output	4
R(B)	RxDb	Output	11
S(A)	Clock a	Output	6
S(B)	Clock b	Output	13
I(A)	Indicate a	Output	5
I(B)	Indicate b	Output	12
C(A)	Control a	Input	3
C(B)	Control b	Input	10
X(A)	Ext Clock a	Input	7
X(B)	Ext Clock b	Input	14

Notes:

Connector shell and termination must be as specified in the EMC section contained in Appendix C.



Appendix H – V.35 DCE Pinout**15 Way female D type configured as DCE**

DATA CHANNEL CONNECTIONS			
Number	Name	Type at Connector	DCE – DB15 Female
-	Protective Ground	-	1
102	Signal Ground	Bidirectional	8
See note 1	Flag 3 I/P	V.28 Input	15
113	ExtClk(A)	V.11 Input	7
113	ExtClk(B)	V.11 Input	14
115	RXClk(A)	V.11 Output	6
115	RXClk(B)	V.11 Output	13
114	TXClk(A)	V.11 Output	5
114	TXClk(B)	V.11 Output	12
104	RX(A)	V.11 Output	4
104	RX(B)	V.11 Output	11
See note 2	Flag 1 O/P	V.28 Output	3
See note 2	Flag 2 O/P	V.28 Output	10
103	TXD(A)	V.11 Input	2
103	TXD(B)	V.11 Input	9

Note 1. Input flag can be configured to be any V.28 input (to DCE) i.e. Request To Send RTS (105),

Note 2 Output Flags can be configured to any V.28 outputs (from DCE) i.e. Clear To Send CTS (106), Data Set Ready DSR (107) Data Carrier Detect DCD (109)

Connector shell and termination must be as specified in the EMC section contained in Appendix C.

Appendix I - V.35 Stub Cable

V.35 Stub cable			
15 way D type connector Male	Name	Type	MRAC 34 pin Female
1	Protective Ground	-	Shield
8	Signal Ground	Bidirectional	B
15	RTS(Flag 3 I/P)	V.28 Input	C
7	ExtClk(A)	V.11 Input	U
14	ExtClk(B)	V.11 Input	W
6	RXClk(A)	V.11 Output	V
13	RXClk(B)	V.11 Output	X
5	TXClk(A)	V.11 Output	Y
12	TXClk(B)	V.11 Output	AA
4	RX(A)	V.11 Output	R
11	RX(B)	V.11 Output	T
3	RFS (Flag 1 O/P)	V.28 Output	D
10	DSR(Flag 2 O/P)	V.28 Output	E
2	TXD(A)	V.11 Input	P
9	TXD(B)	V.11 Input	S

Connector shell and termination must be as specified in the EMC section contained in Appendix C.

Appendix J – Position of Links on the G-Converter 2048 Channel Card

