BLACK BOX Catalogue Ltd
The Source for Connectivity

IC9015
IC9016C
IC9017C
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IC9020C

IC9015
ATM MEDIA CONVERTER AND REPEATER

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CHAPTER 1
INTRODUCTION

1.1 GENERAL

The ATM Media Converter provides retimed or transparent conversion of optical and electrical signals for ATM, FDDI, Fast Ethernet and other protocols at data rates up to 155 Mbps. The modularity of the ATM media converter interfaces enables field-changeable conversion between any two media.

Both transparent and retimed modules are available. Transparent modules provide cost-effective media conversion without reclocking. Retimed modules provide media conversion with reclocking, which enables using the ATM media converter as a repeater. These modules can also be set for transparent operation.

The ATM media converter is supplied as a stand-alone unit. Special hardware for mounting either a single unit or two units side-by-side in a 19" rack can be ordered separately.

Retimed Modules

The ATM media converter provides retimed media conversion for the following ATM interfaces:

TAXI (100 Mbps),

STM-1,

STS-3c and

STS-1 over optical and electrical interfaces

Retimed conversion is also available for FDDI and Fast Ethernet between single mode and multimode fiber, and for extending FDDI and Fast Ethernet UTP connections over fiber. The retimed modules provide rate selection for 51, 100 or 155 Mbps. When set to one of these rates, the retimed module regenerates and reclocks the incoming signal and acts as an ATM, FDDI or Fast Ethernet repeater. When the switch is set to "OTHER", the modules regenerate the signal without reclocking as transparent modules do.

Transparent Modules

The ATM media converter provides transparent conversion for any two-level optical protocol. Transparent modules are recommended for short distances and for all fiber and copper applications performed at less than 100 Mbps.

A special "WRAP" button activates loopbacks at the two interfaces. This can be used for test purposes or for special applications as explained later.

1.2 FEATURES

Modular Media Converter and Repeater

Media types supported:

- Single Mode Fiber
- Multimode Fiber
- STP
- UTP
- Coax

Retimed media conversion for 51 Mbps, 100 Mbps and 155 Mbps

Transparent media conversion up to 155 Mbps

In retimed mode can be used as a Fiber Optic or copper repeater

Protocols supported in retimed mode:

- 51 Mbps OC-1
- 100 Mbps TAXI
- 155 Mbps OC-3
- 155 Mbps STS-3c over UTP/STP
- 155 Mbps STS-3c/STM-1 over Coax
- FDDI
- 100BaseT (Fast Ethernet)

Transparent mode supports any two-level optical protocol including:

- Ethernet
- Token Ring
- Protocols supported in retimed mode (fiber and copper) performed at less than 100 Mbps

Complies with ATM forum specifications.

Multiple connector types are available for both electrical and optical interfaces.

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1.3 APPLICATIONS

A single ATM media converter is used to connect two devices operating with dissimilar fiber or electrical interfaces (see *Figure 1-1*).

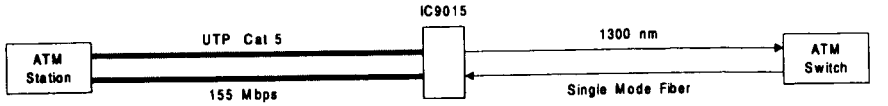

Figure 1-1. Dissimilar Device Connectivity

A pair of ATM media converters connect two similar devices over different media types (see *Figure 1-2*).

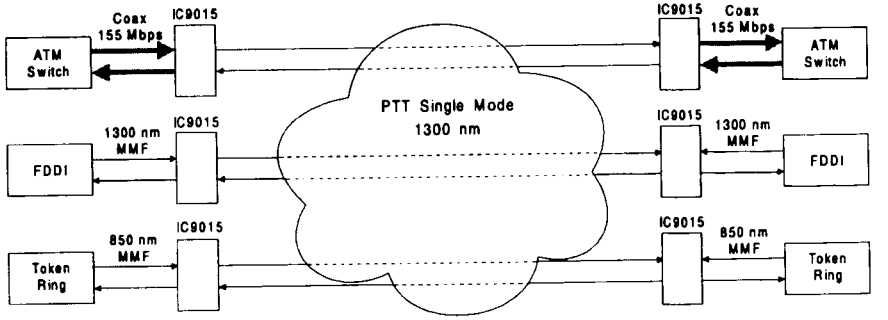

Figure 1-2. Dual Similar Device Connectivity

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A single ATM media converter in WRAP mode can be used for double conversion between single mode and multimode fiber for a dual attached FDDI station or concentrator (see *Figure 1-3*).

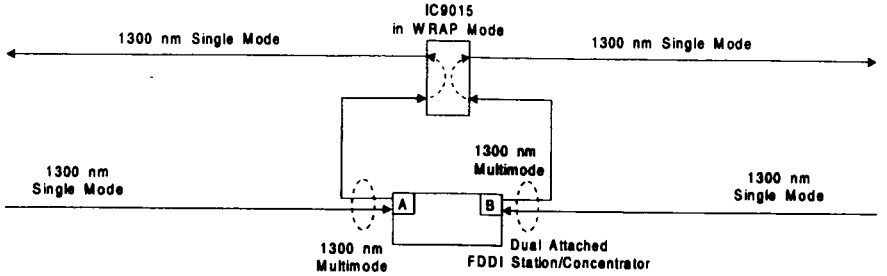

Figure 1-3. WRAP: Dual SM to MM Conversion

A single ATM media converter equipped with a single interface in WRAP mode can be used for conversion between single mode and multimode fiber (see *Figure 1-4*).

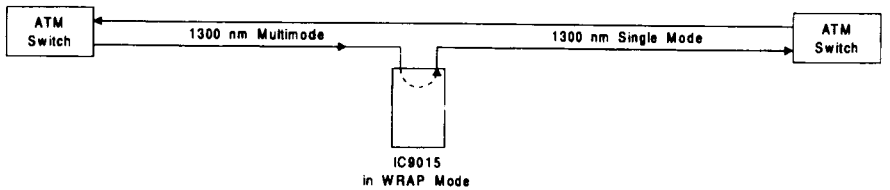

Figure 1-4. Single Interface SM to MM (WRAP)

The FDDI and Fast Ethernet standard (100BaseT) apply scrambling to data when operating over UTP, but do not apply the scrambling when operating over fiber. Because of this, the ATM media converter can only work in pairs for extending FDDI and Fast Ethernet connections over fiber (See *Figure 1-5*).

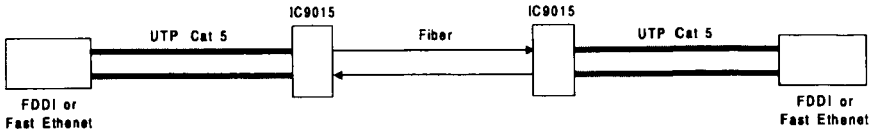

Figure 1-5. FDDI and Fast Ethernet Operations

1.4 SPECIFICATIONS

Data Rate:		Up to 155 Mbps
Indicators:	POWER (PWR):	ON when unit is powered
	FAULT (FLT):	BLINKS when card configuration is wrong
	WRAP:	ON when the two interfaces are wrapped
	SIG:	ON when received signal from Rx is valid BLINKS when the PLL is out of lock
Controls:	WRAP:	For double conversion or test purposes.
	RATE:	For data rate selection 51, 100, 155 Mbps
	OTHER:	For transparent mode
Power:		100-240 VAC, 0.80.4 Watts, 47-63 Hz or -48 VDC
Physical:	Height:	4.4 cm / 1.8 in (1U)
	Width:	21.6 cm / 8.5 in
	Depth:	24.2 cm / 9.5 in
	Weight:	1.1 kg / 2.8 lb
Environment:	Temperature:	0-40°C/32-104°F
	Humidity:	Up to 90%, non-condensing
	Radiation Suppression:	Complies with FCC part 15, subpart J, class A Complies with EN-55022, Class A

Table 1-1. Optical Module Characteristics

Module Name	Protocols Supported	Fiber Type (Wavelength)	Connector Type	Dynamic Range	Coding Method	Optical Power	Sensitivity
MM/SC/13*	TAXI, FDDI, Fast Ethernet, STS-3c/STM-1, STS-1	62.5/125 (1300 nm)	Duplex SC	19 dB	4B/5B NRZ	-18 dBm	-32 dBm
MM/ST/13*	TAXI, FDDI, Fast Ethernet STS-3c/STM-1, STS-1	62.5/125 (1300 nm)	ST	19 dB	4B/5B NRZ	-18 dBm	-32 dBm
MM/ST/85**	Token Ring, Ethernet only	62.5/125 (850 nm)	ST	18 dB	4B/5B NRZ Manchester	-18 dBm	-30 dBm
SM/ST/13*	TAXI, FDDI, Fast Ethernet, STS-3c/STM-1, STS-1	9/125 (1300 nm)	ST	18 dB	4B/5B NRZ	-18 dBm	-32 dBm
SM/ST/13L*	TAXI, FDDI, Fast Ethernet, STS-3c/STM-1, STS-1	9/125 (1300 nm)	ST	18 dB	4B/5B NRZ	-12 dBm	-32 dBm
SM/ST/15L*	TAXI, FDDI, Fast Ethernet, STS-3c/STM-1, STS-1	9/125 (1550 nm)	ST	20 dB	4B/5B NRZ	-12 dBm	-32 dBm
SF1/ST	TAXI, FDDI, Fast Ethernet, STS-3c/STM-1, STS-1	Transmit 9/125 (1300 nm) Receive 9/125 (1550 nm)	ST	18 dB		-12 dBm	-32 dBm
SF2/ST	TAXI, FDDI, Fast Ethernet, STS-3c/STM-1, STS-1	Transmit 9/125 (1300 nm) Receive 9/125 (1550 nm)	ST	18 dB		-12 dBm	-32 dBm
SF1/FC	TAXI, FDDI, Fast Ethernet, STS-3c/STM-1, STS-1	Transmit 9/125 (1300 nm) Receive 9/125 (1550 nm)	FC-PC	18 dB		-12 dBm	-32 dBm
SF2/FC	TAXI, FDDI, Fast Ethernet, STS-3c/STM-1, STS-1	Transmit 9/125 (1300 nm) Receive 9/125 (1550 nm)	FC-PC	18 dB		-12 dBm	-32 dBm

* Data Rates are switch-selectable from the front panel

** Transparent only

Table 1-2. Electrical Module Characteristics

Module Name	Protocols Supported	Cable Type	Connector Type	Range/Budget	Coding Method	Impedance (Ohms)
UTP/155	STS-3c	UTP Cat 5	Shielded RJ-45	100 m*	NRZ	100
STP/155	STS-3c	STP Type 1	DB-9	100 m*	NRZ	150
UTP/100	FDDI, Fast Ethernet	UTP Cat 5	Shielded RJ-45	100 m*	NRZ	100
CX/BNC/155***	STS-3c STM-1	Coax	BNC	12.7 dB**	CMI	75
CX/DIN/155***	STS-3c STM-1	Coax	DIN 47295 1.6/5.6 Coaxial connector	12.7 dB**	CMI	75

* 50 m in transparent module

** Retimed only

*** At 78 MHz, according to square root of frequency law; 150 m is attainable when using RG-59 B/U cable

CHAPTER 2
INSTALLATION

2.1 UNPACKING

Before Unpacking

Inspect the equipment container before unpacking. Note and report evidence of damage immediately

Unpacking Procedure

- Place the container on a clean flat surface. Cut all straps and open or remove top.
- Remove the unit carefully and place it securely on a clean surface.
- Remove all packing material.
- Inspect the unit for damage. Report any damage immediately.

2.2 SITE REQUIREMENTS

Power

The ATM media converter is powered by 100 to 240 VAC or from -48 VDC.

The unit should be installed within 1.5 meters (5 ft) of an easily accessible grounded AC outlet capable of supplying 230 V (115 V).

Front and Rear Panel Clearance

Allow at least 90 cm (36 inches) of clearance at the front of the unit for operator access. Allow at least 10 cm (4 inches) clearance at the rear of the unit for power cord connection.

Ambient Requirements

The ambient operating temperature of the ATM media converter should be 0-40°C (32-122°F) at a relative humidity of up to 90% non-condensing.

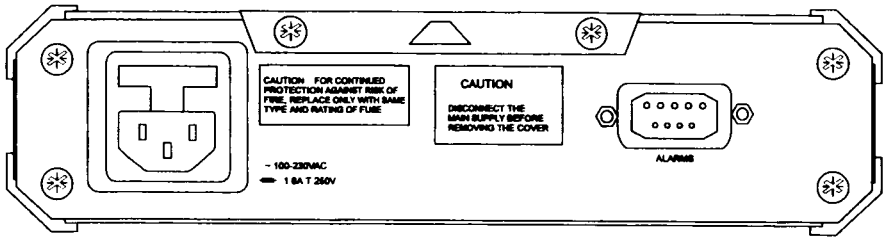

Figure 2-1. IC9015 Rear Panel: AC Version

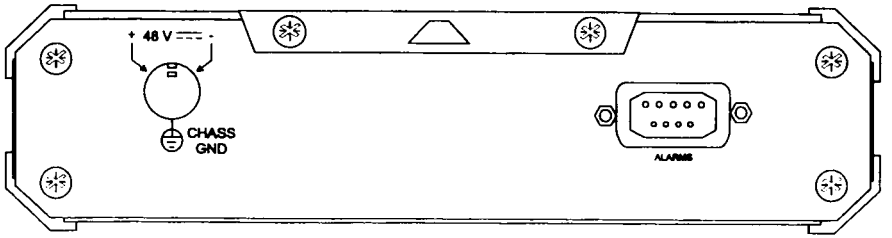

Figure 2-2. IC9015 Rear Panel: DC Version

Installation of a Single Unit

Rack adapter components for installing a single unit include one short bracket and one long bracket. Each bracket is fastened to the side walls of the unit by two screws (with flat washers) which are inserted into the two front holes on the side wall (The unit is supplied with nuts already in place on the inner side wall). Note that the short bracket fastens to the left side of the unit, and the long bracket to the right side of the unit (See *Figure 2-3*).

Once the brackets are fastened to the side walls, the unit is ready for installation in the 19" rack. Place the unit in the rack and fasten the brackets to the side rails of the rack by means of the two screws situated on each side (not included in the kit).

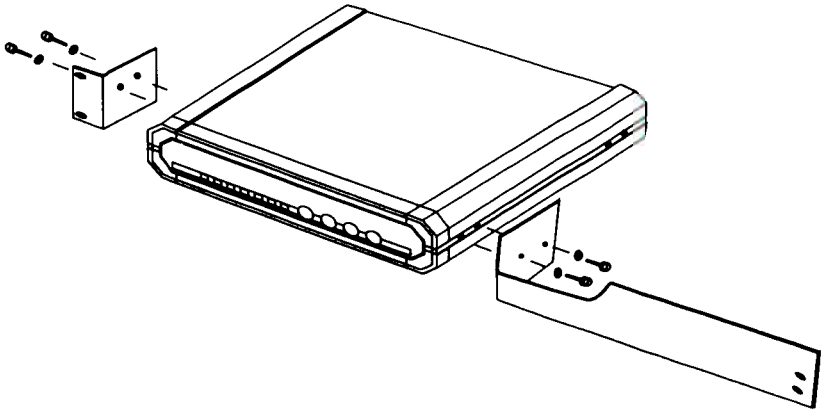

Figure 2-3. Installation of a Single Unit

Installation of Two Units

Rack adapter components for installing two units include two long side rails (one for each unit) which slide one into the other fastening the two units together, and two short side brackets which hold the two units in the 19" rack (see *Figure 2-4*).

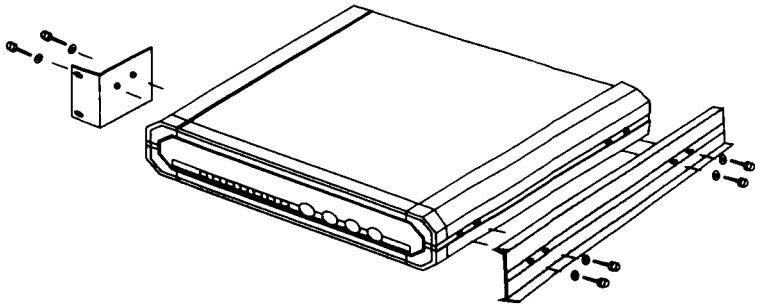

Figure 2-4. Installation of Two Units (a)

To install two units follow these instructions:

1. Fasten one long side rail to each unit (right side to one unit, left side to the other unit) using the four screws and flat washers supplied. The side rails must be attached in opposing fashion, the narrow flange of the first rail opposite the wide flange of the second rail.
2. Attach one short bracket opposite the side rail on each unit using the four screws and flat washers supplied.
3. Slide the side rail of one unit into the side rail of the other unit, fastening the two units together (see *Figure 2-5*).
4. Secure the supplied plastic caps to the ends of the rails, to prevent the units moving and to protect the rail ends.
5. Place the assembled units in the rack and fasten the brackets to the side rails of the rack, by means of the four screws situated on each side (not included in the kit).

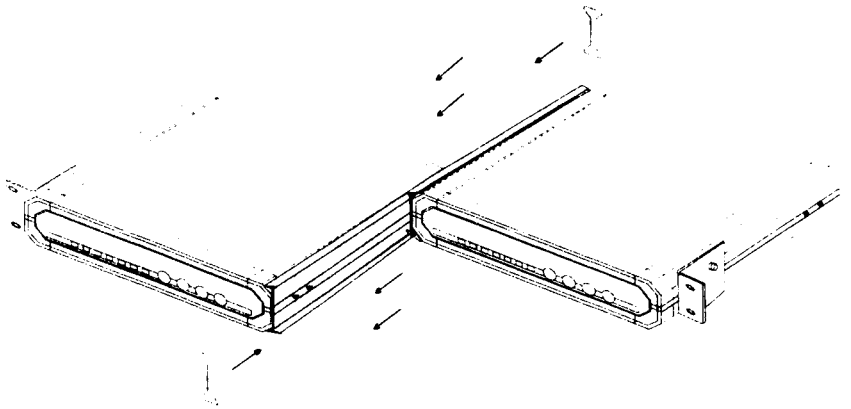

Figure 2-5. Installation of Two Units (b)

2.3 CABLE CONNECTIONS

AC Power Connection

AC power should be supplied to the ATM media converter through a 1.5 m (5 ft) standard power cord terminated by a grounded 3-wire plug.

⚠ ***WARNING***

When applying AC power, first connect the plug of the AC cable to the power connector on the rear panel of the ATM media converter and then to the mains outlet.

Grounding

⚠ ***WARNING***

Interrupting of the protective (grounding) conductor (inside or outside the instrument) or disconnecting the protective earth terminal can make this instrument dangerous. Intentional interruption of the grounding conductor is prohibited.

2.4 ATM MEDIA CONVERTER MODULES

The upper part of the module panel contains the AMC-R in case of a retimed conversion module, or the AMC-T for a transparent conversion module. The lower part of the panel contains the module name.

*MM/SC/13/R Module

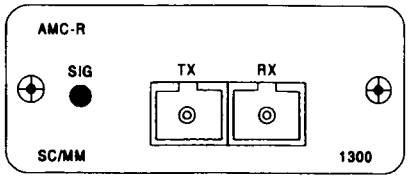

Figure 2-6. MM/SC/13/R Module Front Panel

Wavelength:	1300 nm
Connector:	SC
Used with:	Multimode fiber
Protocols supported:	STS-3c, STM-1, STS-1, FDDI, TAXI and Fast Ethernet
Timing mode:	Retimed
Coding method:	4B/5B, NRZ
Optical output into 62.5 fiber:	-18 dBm
Receiver sensitivity:	-32 dBm
Maximum input power	-14 dBm

*MM/SC/13/T Module

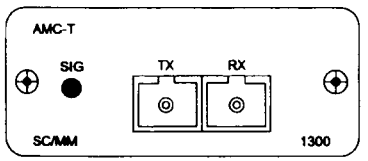

Figure 2-7. MM/SC/13/T Module Front Panel

Wavelength:	1300 nm
Connector:	SC
Used with:	Multimode fiber
Protocols supported:	Any two level optical protocols up to 155 Mbps
Timing mode:	Transparent
Coding method:	4B/5B, NRZ
Optical output into 62.5 fiber:	-18 dBm
Receiver sensitivity:	-32 dBm
Maximum input power	-14 dBm

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*MM/ST/13/R Module

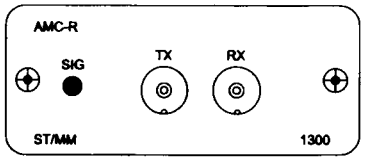

Figure 2-8. MM/ST/13/R Module Front Panel

Wavelength:	1300 nm
Connector:	ST
Used with:	Multimode fiber
Protocols supported:	STS-3c, STM-1, STS-1, FDDI, TAXI and Fast Ethernet
Timing mode:	Retimed
Coding method:	4B/5B, NRZ
Optical output into 62.5 fiber:	-18 dBm
Receiver sensitivity:	-32 dBm
Maximum input power	-14 dBm

MM/ST/13/T Module

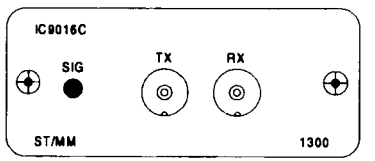

Figure 2-9. MM/ST/13/T Module Front Panel

Wavelength:	1300 nm
Connector:	ST
Used with:	Multimode fiber
Protocols supported:	Any two level optical protocols up to 155 Mbps
Timing mode:	Transparent
Coding Method	4B/5B, NRZ
Optical output into 62.5 fiber:	-18 dBm
Receiver sensitivity:	-32 dBm
Maximum input power	-14 dBm

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*SM/ST/13/R Module

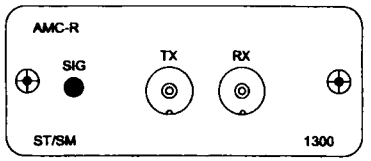

Figure 2-10. SM/ST/13/R Module Front Panel

Wavelength:	1300 nm
Connector:	ST
Used with:	Single mode fiber
Protocols supported:	STS-3c, STM-1, STS-1, FDDI, TAXI and Fast Ethernet
Timing mode:	Retimed
Coding method:	4B/5B, NRZ
Optical output into 62.5 fiber:	-18 dBm
Receiver sensitivity:	-32 dBm
Maximum input power:	-15 dBm

SM/ST/13/T Module

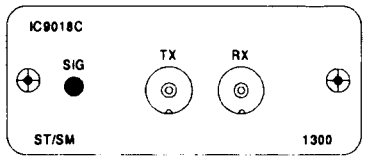

Figure 2-11. SM/ST/13/T Module Front Panel

Wavelength:	1300 nm
Connector:	ST
Used with:	Single mode fiber
Protocols supported:	Any two level optical protocols up to 155 Mbps
Timing mode:	Retimed
Coding method:	4B/5B, NRZ
Optical output into 62.5 fiber:	-18 dBm
Receiver sensitivity:	-32 dBm
Maximum input power:	-15 dBm

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*SM/ST/13L/R Module

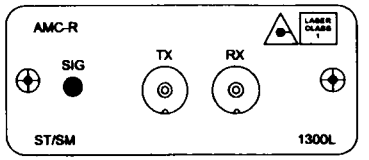

Figure 2-12. SM/ST/13L/R Module Front Panel

Wavelength:	1300 nm
Connector:	ST
Used with:	Single mode fiber
Protocols supported:	STS-3c, STM-1, STS-1, FDDI, TAXI and Fast Ethernet
Timing mode:	Retimed
Coding method:	4B/5B, NRZ
Optical output into 62.5 fiber:	-12 dBm
Receiver sensitivity:	-32 dBm
Maximum input power:	-15 dBm

SM/ST/13L/T Module

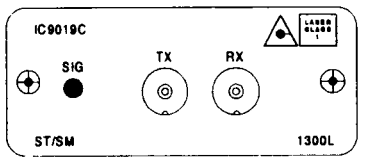

Figure 2-13. SM/ST/13L/T Module Front Panel

Wavelength:	1300 nm
Connector:	ST
Used with:	Single mode fiber
Protocols supported:	Any two level optical protocols up to 155 Mbps
Timing mode:	Retimed
Coding method:	4B/5B, NRZ
Optical output into 62.5 fiber:	-12 dBm
Receiver sensitivity:	-32 dBm
Maximum input power:	-15 dBm

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*SM/ST/15L/R Module

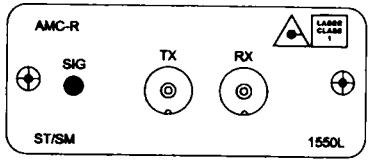

Figure 2-14. SM/ST/15L/R Module Front Panel

Wavelength:	1550 nm
Connector:	ST
Used with:	Single mode fiber
Protocols supported:	STS-3c, STM-1, STS-1, FDDI, TAXI and Fast Ethernet
Timing mode:	Retimed
Coding method:	4B/5B, NRZ
Optical output into 62.5 fiber:	-12 dBm
Receiver sensitivity:	-32 dBm
Maximum input power:	-15 dBm

MM/ST/85/T Module

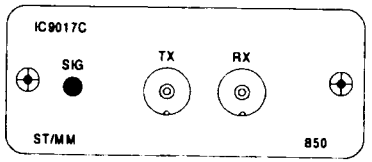

Figure 2-15. MM/ST/85/T Module Front Panel

Wavelength:	850 nm
Connector:	ST
Used with:	Multimode fiber
Protocols supported:	Any two level optical protocols up to 155 Mbps
Timing mode:	Transparent
Coding method:	4B/5B, NRZ, Manchester
Optical output into 62.5 fiber:	-18 dBm
Receiver sensitivity:	-30 dBm

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*SF1/ST/R Module

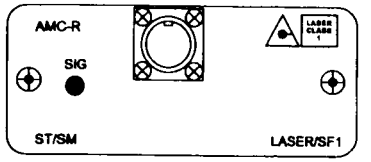

Figure 2-16. SF1/ST/R Module Front Panel

Wavelength:	Transmit: 1300 nm; receive: 1550 nm
Connector:	ST
Used with:	Single mode fiber
Protocols supported:	STS-3c, STM-1, STS-1, FDDI, TAXI and Fast Ethernet
Timing mode:	Retimed
Optical output into 9/125 fiber:	-12 dBm
Receiver sensitivity:	-32 dBm

* - Available on Special Order
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*SF2/ST/R Module

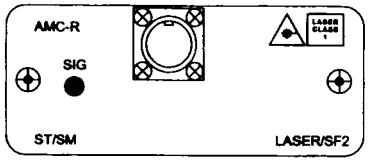

Figure 2-17. SF2/ST/R Module Front Panel

Wavelength:	Transmit: 1550 nm; receive: 1300 nm
Connector:	ST
Used with:	Single mode fiber
Protocols supported:	STS-3c, STM-1, STS-1, FDDI, TAXI and Fast Ethernet
Timing mode:	Retimed
Optical output into 9/125 fiber:	-12 dBm
Receiver sensitivity:	-32 dBm

*SF1/FC/R Module

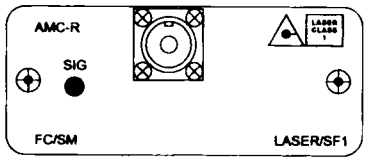

Figure 2-18. SF1/FC/R Module Front Panel

Wavelength:	Transmit: 1300 nm; receive: 1550 nm
Connector:	FC
Used with:	Single mode fiber
Protocols supported:	STS-3c, STM-1, STS-1, FDDI, TAXI and Fast Ethernet
Timing mode:	Retimed
Optical output into 9/125 fiber:	-12 dBm
Receiver sensitivity:	-32 dBm

* - Available on Special Order
Call BLACKBOX Technical
Support on: 01189312233

*SF2/FC/R Module

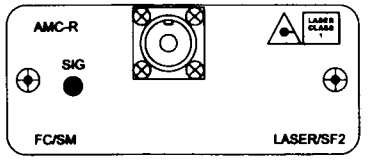

Figure 2-19. SF2/FC/R Module Front Panel

Wavelength:	Transmit: 1550 nm; receive: 1300 nm
Connector:	FC
Used with:	Single mode fiber
Protocols supported:	STS-3c, STM-1, STS-1, FDDI, TAXI and Fast Ethernet
Timing mode:	Retimed
Optical output into 9/125 fiber:	-12 dBm
Receiver sensitivity:	-32 dBm

*CX/BNC/155/R Module

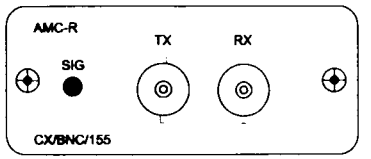

Figure 2-20. CX/BNC/155/R Module Front Panel

Connector:	BNC
Used with:	Coax cable
Protocols supported:	STS-3c, STM-1
Timing mode:	Retimed
Range calculation:	12.7 dB at 78 MHz according to square root of frequency law; 150 m is attainable when using RG-59 B/U cables (Cable length varies in accordance with cable type)
Impedance:	75 Ω

* - Available on Special Order
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*CX/DIN/155/R Module

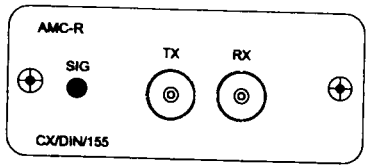

Figure 2-21. CX/DIN/155/R Module Front Panel

Connector:	1.6/5.6 Coax
Used with:	Coax cable
Protocols supported:	STS-3c, STM-1
Timing mode:	Retimed
Range:	12.7 dB at 78 MHz according to square root of frequency law; 150 m is attainable when using RG-59 B/U cables (Cable length varies in accordance with cable type)
Impedance:	75 Ω

* - Available on Special Order
Call BLACKBOX Technical
Support on: **01189312233**

*STP/155/R Module

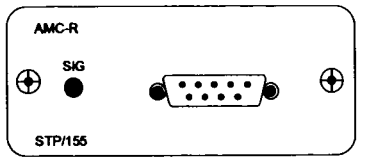

Figure 2-22. STP/155/R Module Front Panel

Connector:	DB-9
Used with:	STP type 1 cable
Protocols supported:	STS-3c
Coding method:	NRZ
Range:	100 m
Impedance:	150 Ω

Pinout	
Pin 1	RX+
Pin 2	
Pin 3	
Pin 4	
Pin 5	TX+
Pin 6	RX-
Pin 7	
Pin 8	
Pin 9	TX-

* - Available on Special Order
Call BLACKBOX Technical
Support on: **01189312233**

*STP/155/T Module

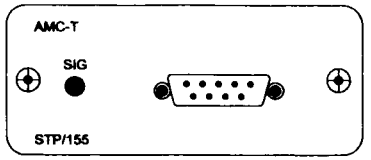

Figure 2-23. STP/155/T Module Front Panel

Connector:	DB-9
Used with:	STP type 1 cable
Protocols supported:	STS-3c
Timing method:	Transparent
Coding method	NRZ
Range:	50 m
Impedance:	150 Ω

Pinout	
Pin 1	RX+
Pin 2	
Pin 3	
Pin 4	
Pin 5	TX+
Pin 6	RX-
Pin 7	
Pin 8	
Pin 9	TX-

* - Available on Special Order
Call BLACKBOX Technical
Support on: **01189312233**

*UTP/155/R Module

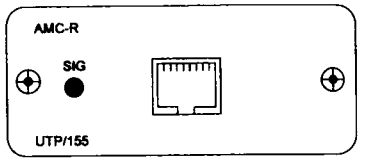

Figure 2-24. UTP/155/R Module Front Panel

Connector:	Shielded RJ-45
Used with:	UTP Cat 5
Protocols supported:	STS-3c
Timing method:	Retimed
Coding method:	NRZ
Range:	100 m
Impedance:	100 Ω

Pinout	
Pin 1	TX+
Pin 2	TX-
Pin 3	
Pin 4	
Pin 5	
Pin 6	
Pin 7	RX+
Pin 8	RX-

* - Available on Special Order
Call BLACKBOX Technical
Support on: **01189312233**

*UTP/155/T Module

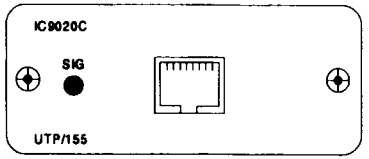

Figure 2-25. UTP/155/T Module Front Panel

Connector:	Shielded RJ-45
Used with:	UTP Cat 5
Protocols supported:	STS-3c
Timing method:	Transparent
Coding method	NRZ
Range:	50 m
Impedance:	100 Ω

Pinout	
Pin 1	TX+
Pin 2	TX-
Pin 3	
Pin 4	
Pin 5	
Pin 6	
Pin 7	RX+
Pin 8	RX-

* - Available on Special Order
Call BLACKBOX Technical
Support On: 01189312233

*UTP/100/R Module

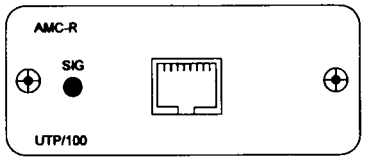

Figure 2-26. UTP/100/R Module Front Panel

Connector:	Shielded RJ-45
Used with:	UTP Cat 5
Protocols supported:	FDDI, 100BaseT
Timing method:	Retimed
Coding method	NRZ
Range:	100 m
Impedance:	100 Ω

Pinout	
Pin 1	TX+
Pin 2	TX-
Pin 3	
Pin 4	
Pin 5	
Pin 6	
Pin 7	RX+
Pin 8	RX-

* - Available on Special Order
Call BLACKBOX Technical
Support on: 01189312233

*UTP/100/T Module

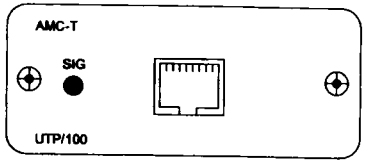

Figure 2-27. UTP/100/T Module Front Panel

Connector:	Shielded RJ-45
Used with:	UTP Cat 5
Protocols supported:	FDDI, 100 BaseT
Timing method:	Transparent
Coding method	NRZ
Range:	50 m
Impedance:	100 W

Pinout	
Pin 1	TX+
Pin 2	TX-
Pin 3	
Pin 4	
Pin 5	
Pin 6	
Pin 7	RX+
Pin 8	RX-

* - Available on Special Order
Call BLACKBOX Technical
Support on: 01189312233

CHAPTER 3
OPERATION

3.1 CONTROLS AND INDICATORS

All controls and indicators are located on the front panel of the ATM media converter.

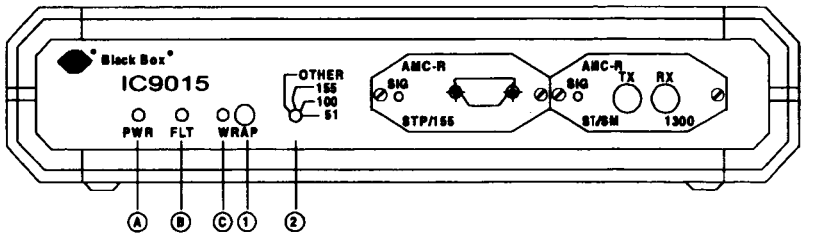

Figure 3-1. ATM Media Converter Front Panel

Indicators

A. POWER: ON when unit is powered (GREEN)

B. FAULT: BLINKS when card configuration is wrong (RED)

C. WRAP: ON when the two interfaces are wrapped (GREEN)

Controls

1. WRAP: Activates loopback at the two interfaces

2. RATE: For data rate selection (51, 100, 155 Mbps) or transparent mode (other)

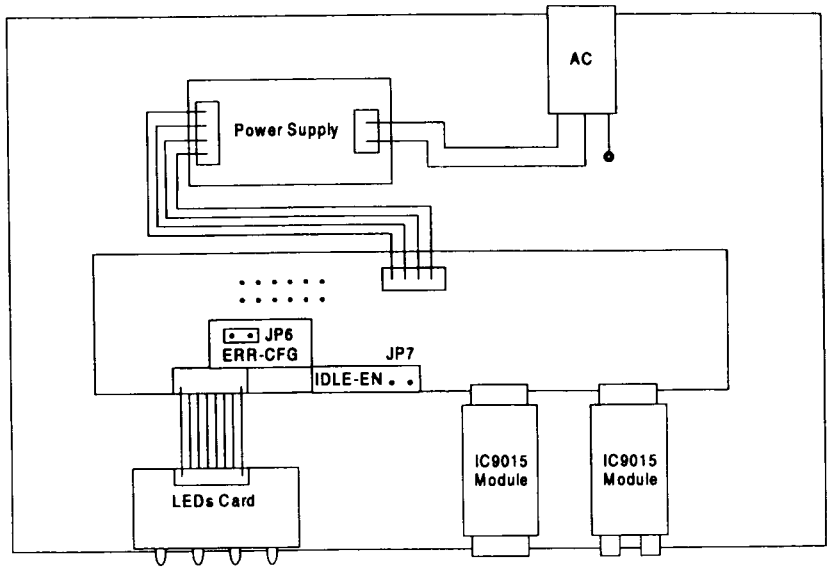

Figure 3-2. Jumper location and Functions

Table 3-1. Functions and Settings

Jumper ID	Function	Conditional Setting
JP6	ERR-CFG	Mounted (Factory Default)
JP7	Idle-Enable	If mounted, idle will be transmitted when no signal is received from the other side. Not mounted (Factory Default)

3.2 TURNING ON THE ATM MEDIA CONVERTER

Connect the AC cable of the ATM media converter to the mains outlet. The POWER indicator on the front panel should light.

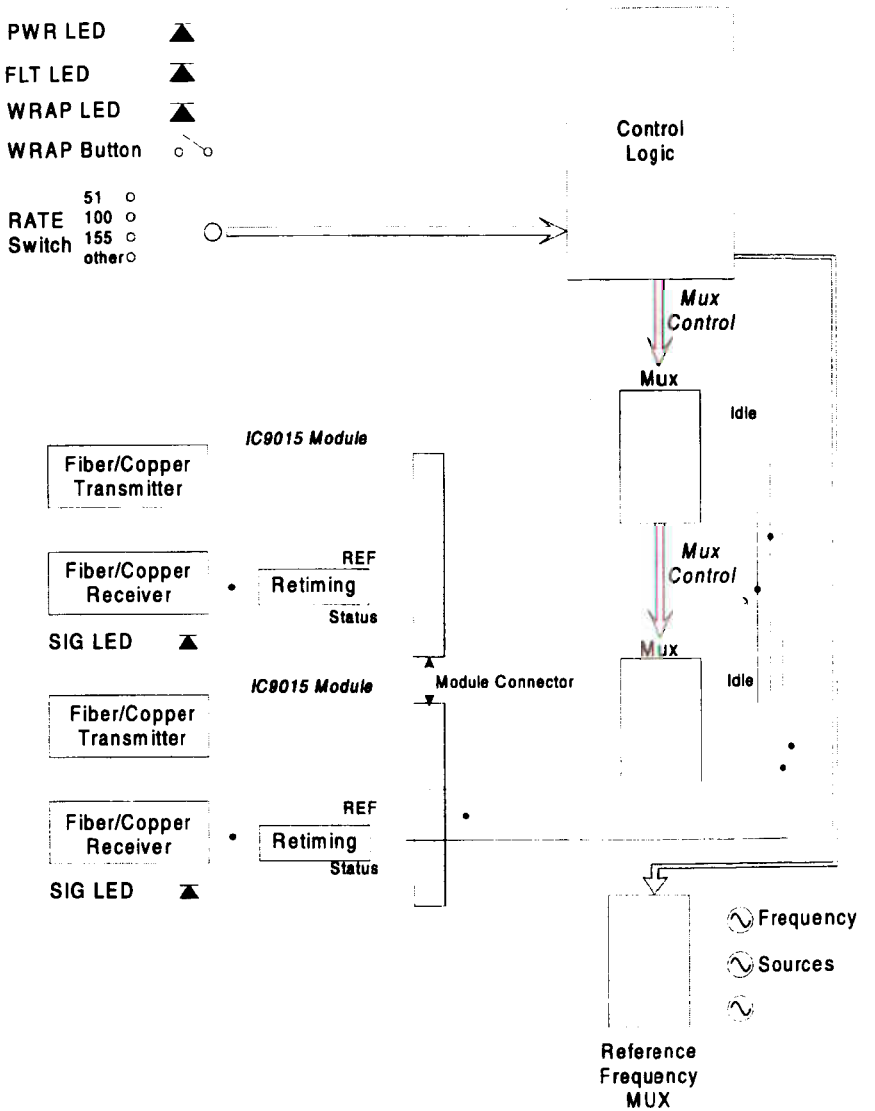

Figure 3-3. ATM Media Converter Block Diagram

3.3 NORMAL OPERATION

Once powered on, the POWER indicator should light and the FLT should be turned off. If the FLT indicator blinks, a configuration error exists: the combination of the card types and the selected data rate is illegal.

Each ATM media converter module contains a SIG indicator. If the SIG indicator is turned off; no signal is received by the module. If the SIG is turned on; a signal is received by the module, and if the re-timing option is in use, the PLL is synchronized to the receive signal. If the SIG blinks, a signal is received by the module but the PLL is out of sync.

A special circuitry can be configured to transmit idle signal in case of not receiving any signal from the other side. This option is enabled by the idle jumper (JP-6) and can be used for power measurements in case of absence of "real" data.

The WRAP function can be locally activated at any time and causes the signal received by the module to be transmitted by the same module. If the module features retiming, the looped back signal is retimed and re-clocked.

3.4 TURNING OFF THE ATM MEDIA CONVERTER

Disconnect the ATM media converter AC cable from the mains outlet.

3.5 PROCEDURE IN CASE OF MALFUNCTIONING

The POWER LED does not light

- Check the power cord connection on the back of the unit and at the mains outlet.
- Verify power availability at the mains outlet.

Data transmission difficulties

- Ensure that the plugged-in modules are compatible with the protocol used (media, data rate).
- Ensure that the FLT LED is off. (If the LED blinks, a configuration error exists: the combination of the module types and the selected data rate is illegal).
- Verify that the SIG LED is on and fixed. If the LED is off, no signal is being received by the module. If the LED is blinking, the module PLL is out of sync.
- Use the WRAP option to localize the problematic segment.