

AMC-101



Universal Media Converter and Repeater



FEATURES

- Modular media converter and repeater
- Supports single mode fiber, multimode fiber, single mode in single fiber, STP, UTP and coax
- Fiber Optic or copper repeater (in retimed conversion mode)
- Complies with ATM Forum specifications
- Protocols supported in retimed mode:
 - 51 Mbps OC-1
 - 100 Mbps TAXI
 - 155 Mbps OC-3
 - 155 Mbps STM-1/STS-3c over UTP/STP
 - FDDI
 - 100Base-Tx or 100Base-Fx (Fast Ethernet)
- Transparent media conversion of up to 155 Mbps
- Transparent mode supports any two-level optical protocols including:
 - Ethernet
 - Token Ring
 - Any protocols supported in retimed mode
- Bridging of Ethernet and Fast Ethernet
- Multiple connector types are available for both electrical and optical interfaces

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DESCRIPTION

- The AMC-101, Universal 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 AMC-101 interfaces enables field changeable conversion between any two media.
- Both transparent modules and retimed modules are supported. Transparent modules provide cost-effective media conversion without reclocking. Retimed modules provide media conversion with reclocking, which enables using AMC-101 as a repeater.

APPLICATIONS

RETIMED MODULES

- AMC-101 provides retimed media conversion for the following ATM interfaces: STS-1 (51 Mbps), TAXI (100 Mbps) and STM-1/STS-3C (155 Mbps) over optical and electrical interfaces. Retimed conversion is also available for FDDI and Fast Ethernet (100 Mbps).
- 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.

TRANSPARENT MODULES

- AMC-101 provides transparent conversion for any two-level optical protocol.

- Transparent modules are recommended for short distances and for all applications performed at less than 100 Mbps.
- AMC-101 can be used to convert between different media (see *Figure 1*). A single AMC-101 converter with different media modules is used to connect two devices operating with dissimilar fiber or electrical interfaces. Either transparent or retimed modules can be used.
- AMC-101 can be used as a repeater for extended distances (see *Figure 2*). A single AMC-101 can be used as a fiber optic or copper repeater for ATM or FDDI and Fast Ethernet, when installed with two similar retimed modules (B1 and B2).

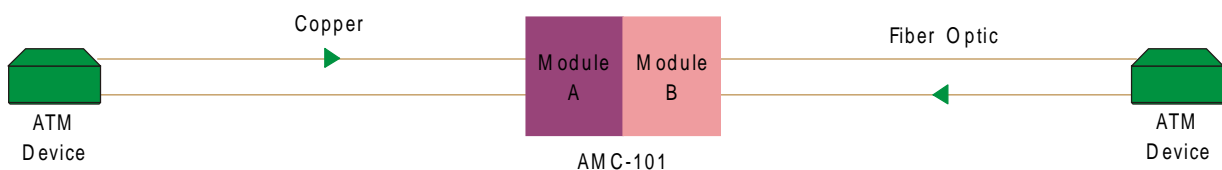


Figure 1. Conversion between Different Media

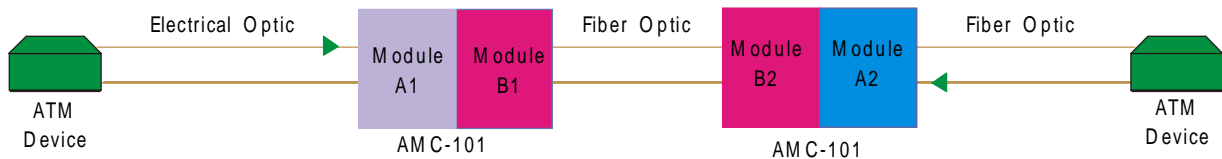


Figure 2. Repeater Application (Using only retimed modules for protocols running at 155, 100 or 51 Mbps)

- A pair of AMC-101 converters can be used to connect two similar ATM devices over a different media type using retimed modules B1 and B2 (see *Figure 3*).
- The FDDI and Fast Ethernet (100Base-T) standards apply scrambling to data when operating over UTP, but do not apply it when operating over fiber. As a consequence, AMC-101 cannot convert between UTP and fiber for the two protocols. In this situation, it is recommended that a pair of AMC-101s be used to convert from UTP to fiber optic and then back to UTP. This extends the FDDI-UTP (CDDI) and 100Base-T over fiber using retimed modules. Alternatively, 100BT/B and 100BT/R modules can be used for 100Base-Tx to 100Base-Fx conversion.

- AMC-101 can be used in applications of Ethernet or Fast Ethernet remote bridging over long distances (see *Figure 4*). Modules A1 and A2 can be AMC-100BT/B or AMC-10BT/B. Modules B1 and B2 can be any transparent (for Ethernet) or retimed (for Fast Ethernet) optical modules.
- AMC-101 can be used to connect two ATM devices over a single fiber (see *Figure 5*). A pair of AMC-101s is used to connect two ATM devices where the physical link is a single fiber. In this application, modules B1 and B2 are using the WDM technology, where the transmit signal is at a different wavelength than the receive signal. Modules A1 and A2 can be any modules.

- Modules B1 and B2 can be a pair of AMC-M/SM/**/SF1 and AMC-M/SM/**/SF2.
- AMC-101 is supplied as a standalone unit. Special hardware for mounting either a single unit or two units side-by-side in a 19" rack can be ordered separately (see *Ordering*).

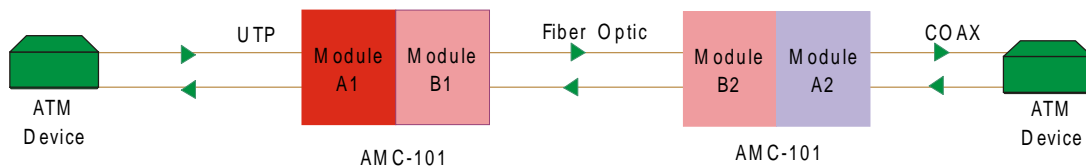


Figure 3. Connecting two ATM Devices over Different Media

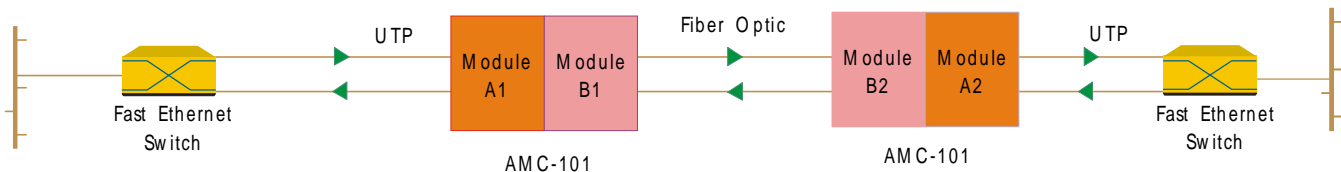


Figure 4. Ethernet or Fast Ethernet Remote Bridging over Extended Lines

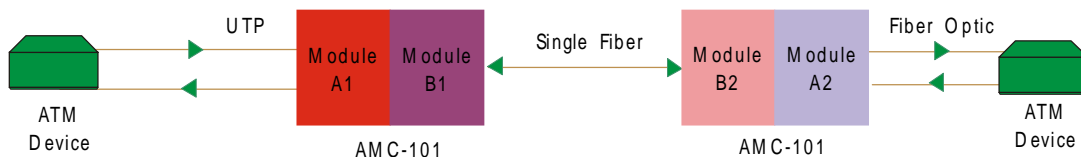


Figure 5. Connecting Two ATM Devices over a Single Fiber

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ALARMS CONNECTOR

- A dry circuit with a 9-pin D-type connector on the rear panel, has been added to the unit to signal minor and major alarms. The dry contact circuit is used to signal the following alarms:
 - RED ALARM - Power Failure (DC voltage on board)
 - YELLOW ALARM - Signal Detect Failure (to any of the unit modules)
 - CONFIG ALARM - Improper Configuration (incompatible modules and/or data rates selected)
- Three pins are dedicated for each alarm: Common (COM), OK and FAIL. The COM pin is the input for each alarm. The user can drive the COM pin with any signal (0 to 5V). If the signal is received OK, the COM pin is connected to its corresponding OK pin; if there is a failure, the COM pin is connected to its corresponding FAIL pin (See *Figure 7* and *Table 1* for the connector pin assignments).

Table 1. Connector Pin Assignment Table

ALARM TYPE	PIN TYPE		
	COM	OK	FAIL
RED	9	4	5
YELLOW	3	8	7
CONFIG	6	2	1

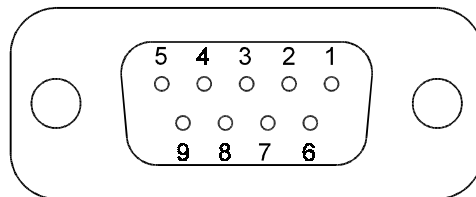


Figure 7. Connector Pin Assignment

Table 2. Bridging Modules

Module Name	Protocols Supported	Cable Type	Connector Type	Range	Impedance
10BT/B*	Ethernet	UTP Cat 5	Shielded RJ-45	100m	100Ω
100BT/B**	Fast Ethernet	UTP Cat 5	Shielded RJ-45	80m	100Ω
100BT/R***	Fast Ethernet	UTP Cat 5	Shielded RJ-45	80m	100Ω

* Remote Ethernet bridge module

** Remote Fast Ethernet bridge module

*** Media converter for Fast Ethernet (Tx to Fx)

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Table 3. Optical Module Characteristics

Module Name	Protocols Supported	Fiber Type (Wavelength)	Connector Type	Typical Distance	Dynamic Range	Optical Power (typical)	Sensitivity
MM/ST/85*	Token Ring, Ethernet only, FDDI, Fast Ethernet	62.5/125 (850 nm)	ST	2 km / 1.2 mile	18 dB	-18 dBm	-30 dBm
MM/SC/13**	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	62.5/125 (1300 nm)	SC	2 km / 1.2 mile	17 dB	-18 dBm	-31 dBm
MM/ST/13**	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	62.5/125 (1300 nm)	ST	2 km / 1.2 mile	17 dB	-18 dBm	-31 dBm
SF1/FC***	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 Transmit 1300 nm Receive 1550 nm	FC-PC (Single Strand)	40 km / 25 mile	28 dB	-12 dBm	-29 dBm
SF2/FC***	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 Transmit 1550 nm Receive 1300 nm	FC-PC (Single Strand)	40 km / 25 mile	28 dB	-12 dBm	-29 dBm
SF1/ST***	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 Transmit 1300 nm Receive 1550 nm	ST (Single Strand)	40 km / 25 mile	28 dB	-12 dBm	-29 dBm
SF2/ST***	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 Transmit 1550 nm Receive 1300 nm	ST (Single Strand)	40 km / 25 mile	28 dB	-12 dBm	-29 dBm
SM/FC/13**	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 (1300 nm)	FC-PC	25 km / 16 mile	30 dB	-18 dBm	-31 dBm
SM/FC/13L**	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 (1300 nm)	FC-PC	40 km / 25 mile	30 dB	-10 dBm	-31 dBm
SM/FC/13LH** (LASER)	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 (1300 nm)	FC-PC	60 km / 37 mile	33 dB	-2 dBm	-34 dBm
SM/FC/15LH** (LASER)	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 (1550 nm)	FC-PC	110 km / 68 mile	33 dB	-1 dBm	-34 dBm
SM/SC/13L** (LASER)	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 (1300 nm)	SC	40 km / 25 mile	30 dB	-10 dBm	-31 dBm
SM/ST/13**	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 (1300 nm)	ST	25 km / 16 mile	30 dB	-18 dBm	-31 dBm
SM/ST/13L** (LASER)	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 (1300 nm)	ST	40 km / 25 mile	30 dB	-10 dBm	-31 dBm
SM/ST/13LH** (LASER)	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 (1300 nm)	ST	60 km / 37 mile	33 dB	-2 dBm	-34 dBm
SM/ST/15L** (LASER)	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 (1550 nm)	ST	50 km / 31 mile	30 dB	-10 dBm	-31 dBm
SM/ST/15LH** (LASER)	TAXI, FDDI, Fast Ethernet, STS-1, STS-3c/STM-1	9/125 (1550 nm)	ST	110 km / 68 mile	33 dB	-1 dBm	-34 dBm

* Transparent only

** Data rates are switch selectable from the front panel

*** Retimed only

Note: Typical distances based on attenuation of 0.4 dB/km for 1300 nm modules and 0.25 dB/km for 1550 nm modules

Table 4. Electrical (Copper) Module Characteristics

Module Name	Protocols Supported	Cable Type	Connector Type	Range	Impedance
UTP/155*	STS-3c	UTP Cat 5	Shielded RJ-45	100m	100Ω
STP/155*	STS-3c	STP Type 1	DB-9	100m	150Ω
UTP/100*	FDDI	UTP Cat 5	Shielded RJ-45	100m	100Ω
CX/BNC/155**	STS-3C, STM-1	Coax	BNC	12.7 dB*	75Ω
CX/DIN/155**	STS-3C, STM-1	Coax	DIN 47295 1.6/5.6 Coaxial connector	12.7 dB*	75Ω

* 50m in transparent module

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

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SPECIFICATIONS

- **Data Rate**

Up to 155 Mbps

- **Indicators**

PWR ON when unit is powered
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 for test purposes
RATE for data rate selection
51, 100, 155 Mbps or
OTHER for transparent mode

- **Power**

From 90-260 VAC, 8W
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

ORDERING

AMC-101/#

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Specify power supply:
AC for 90-260 VAC
48 for -48 VDC

AMC-M/+/&

Interface module for AMC-101

+ Specify module name:
See *Table 2*, *Table 3* and *Table 4*)

& Specify retiming mode:
R for retimed module
T for transparent module

RM-1/NEW

Hardware for mounting one or two units in a 19" rack

data communications

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