



MainStreet ARIC (ATM Radio Interface Card)

Highly scalable and fully managed as part of a multiservices solution, Newbridge broadband wireless products together provide a powerful, cost-effective broadband wireless access solution for last-mile delivery of a wide range of data, Internet, voice and video services.

Quick and easy to deploy, the Newbridge® broadband wireless access solution enables operators to capture new markets and revenue immediately. Its multiservices platform supports the simultaneous delivery of data, Internet, voice and video, and its integrated network and service management permits one-platform management of both wireline and wireless resources. Value-added applications also provide a host of differentiated business and residential services.

A key component of the Newbridge broadband wireless solution is the MainStreet® ARIC (ATM Radio Interface Card). The ARIC fits into a universal card slot on the MainStreetXpress™ 36170 Multiservices Switch and provides an interface between the wireline and wireless worlds. Its main functions are ATM cell grooming and distribution, radio modulation/demodulation, forward error correction (FEC) and digital coding.

The broadband wireless product portfolio is a family of products that are designed to work together. NIUs (network interface units) are connected to multiservices base stations via wireless links, and the base stations are, in turn, connected to the backbone network through wired or point-to-point wireless links. The system provides a communications infrastructure with both narrowband WAN and broadband ATM points of attachment. The entire network is managed, end-to-end by the industry-leading MainStreetXpress network and service management suite.

ATM RADIO INTERFACE CARD (ARIC)

Base Station Architecture

In the wireless base station, common control and switching functions are performed by the MainStreetXpress 36170 Multiservices Switch equipped with the associated interface cards such as common control, switching fabric, service, OC-3/OC-12, frame relay, TDM (time division multiplexing) and ARIC.

The base station may be configured as either single or multi-shelf to meet the bandwidth requirements of the cell site. A single MainStreetXpress 36170 shelf supports up to 160 Mbit/s of radio capacity in a fully redundant configuration.

The individual ARIC cards support either 20 or 40 Mbit/s of downstream ATM payload and 20 Mbit/s of upstream ATM payload. Their IF (intermediate frequency) outputs can be combined through external combiners, to increase the overall cell/sector capacity.

To support additional services within the base station, other interfaces may be included on the MainStreetXpress 36170:

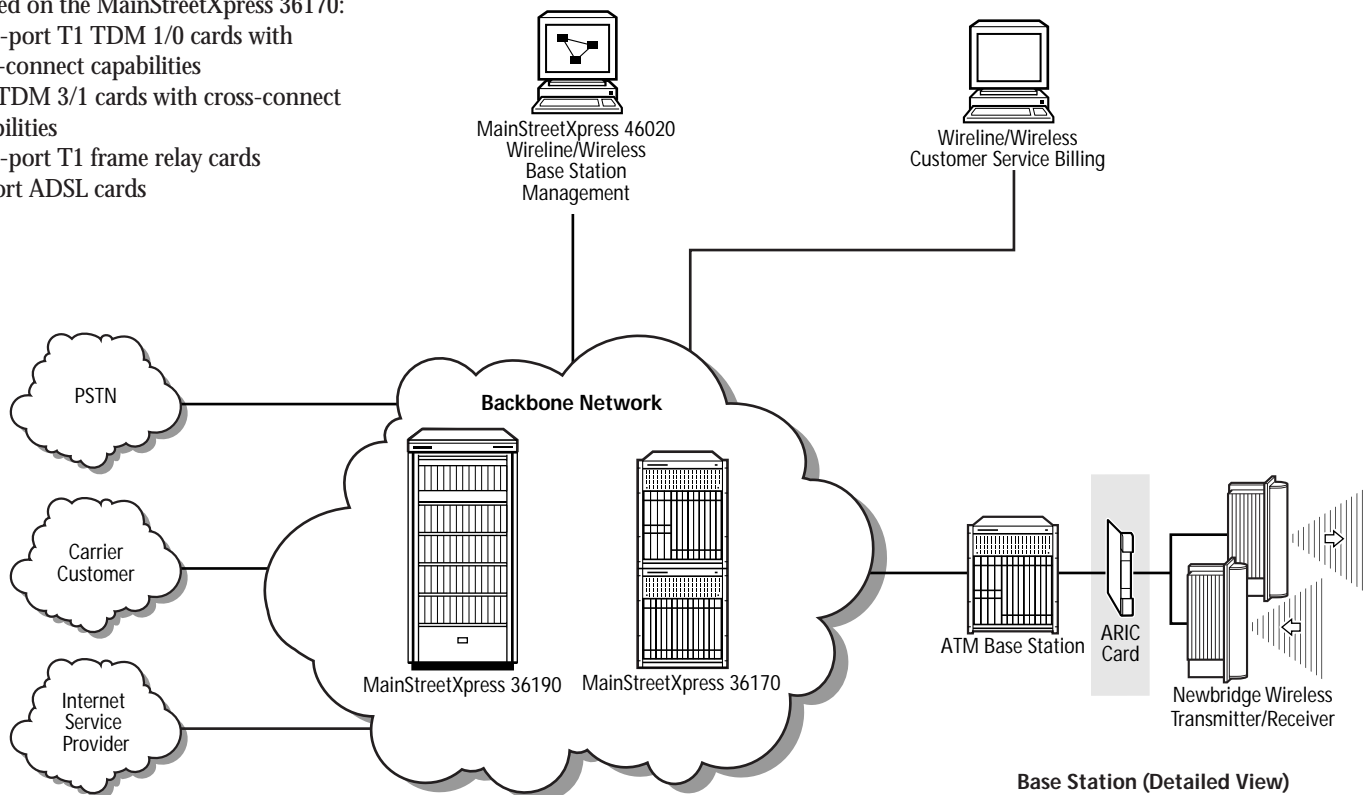
- Eight-port T1 TDM 1/0 cards with cross-connect capabilities
- DS3 TDM 3/1 cards with cross-connect capabilities
- Eight-port T1 frame relay cards
- 16-port ADSL cards

ARIC, QPSK/TDMA Variant (ARIC-TDMA)

The ARIC, QPSK-TDMA (quarternary phase shifting key/time division multiple access) variant (ARIC-TDMA) is an interface card that carries out a number of functions within the MainStreetXpress 36170 Multiservices Switch. This card essentially interfaces the ATM portion of the network with the RF (radio frequency) upmost receivers and transmitters portion of the access network.

The ARIC can be plugged into a standard MainStreetXpress 36170 universal card slot. Initially, PVC (permanent virtual circuit) connections are supported over the air. SVC (switched virtual circuit) connections will also be supported. The ARIC collects various performance metrics and passes them to the network management system — the MainStreetXpress 46020 Network Manager.

The ARIC-TDMA employs a TDMA modem. TDMA is implemented on the uplink, so that a shared bandwidth environment is created at the air interface level for subscriber access. This ARIC card can be programmed to offer symmetric or asymmetric (up to 4:1 up/down) services down to a granularity of a single DS0 (see Table 1). Bandwidth can be permanently dedicated for leased line services, call duration dedicated for voice services, or dynamically allocated for LAN services delivery. A frequency division multiple access (FDMA) ARIC will also be available to support high capacity customers, MDUs (multiple dwelling units) and integrated wireless cell-site backhaul capability.



Technical Summary

System Features

- ATM cell queuing and traffic shaping
- One QPSK downstream modulator supporting FEC (forward error correction), interleaving and two software provisionable symbol rates
- Two upstream differentially-coded QPSK burst demodulators with FEC
- Integral L-band tuner supporting software provisionable channelization from the network manager
- Serial port for configuration and monitoring of upmast base station ratios
- MAC layer supporting dynamic bandwidth allocation
- Support of UBR (unspecified bit rate) and CBR (constant bit rate) ATM classes of service

Network and Element Management

- MainStreetXpress 46020 Network Manager
- MainStreetXpress 45020 Element Manager

Related Products

- MainStreetXpress 36170 Multiservices Switch
- 28110/28120 MainStreet NIUs
- ISC card for MainStreetXpress 36170 Multiservices Switch
- Customer premises RF transceivers and antennas

Parameter	Downlink Low/High	Uplink
Access Method	TDM	TDMA
Frame Format	ATM encapsulated in MPEG-2	Single ATM cell per time slot
Frame Length	5.625 ms	5.625 ms
ATM Cells Per Frame	273/553	133 (including one polling and one guard)
Channel Bandwidth	18/36 MHz	9 MHz (x2)
Modulation	QPSK	Differentially-coded QPSK
ATM Payload Rate	20.58/41.68 Mbit/s	10.02 Mbit/s (x2)
IF Tuning Range (BTS)	1050 – 1750 MHz	550 – 850 MHz
IF Tuning Range (CPE)	950 – 2050 MHz	400 – 700 MHz

Table 1: Release 1.1 TDMA Link Rates and Formats

Minimum Component Requirements for Broadband Wireless Solution

- One 36170 peripheral shelf
- One control card interconnect panel
- One system synchronization unit
- One switching hub card (two for redundancy)
- One control card (two for redundancy)
- One ATM Radio Interface Card (ARIC)
- One OC-3/STM-1 card (assuming the base station is connected to an ATM backbone)
- One transmitter
- One receiver
- External power supply for the transmitter and receiver
- Two 90° sectorized antennas (one for transmit, one for receive)

Operating Environment

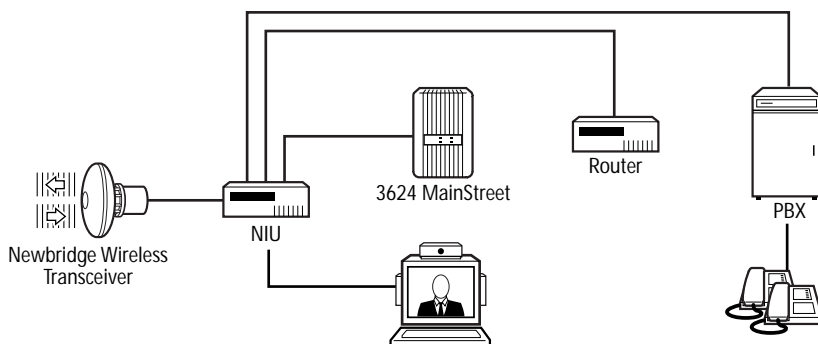
MainStreetXpress 36170 Multiservices Switch

- Operating temperature 0° to 40° C (32° to 104° F)
- 5% to 95% relative humidity, non-condensing

Dimensions

MainStreetXpress 36170 Peripheral Shelf

high	55 cm (21.75 in.)
wide	48 or 61 cm (19 or 24 in.)
deep	30 cm (12 in.)



Customer Premises Equipment

**Corporate Headquarters**

Newbridge Networks Corporation
600 March Road, P.O. Box 13600
Kanata, Ontario Canada K2K 2E6
Telephone: +1 613 591 3600
Facsimile: +1 613 591 3680
Internet: www.newbridge.com

North and South America

Newbridge Networks Inc.
593 Herndon Parkway
Herndon, Virginia U.S.A. 20170-5241
Telephone: 1 800 343 3600
 +1 703 834 3600
Facsimile: +1 703 471 7080

Europe, Middle East and Africa

Newbridge Networks Limited
Coldra Woods, Chepstow Road
Newport, South Wales NP6 1JB U.K.
Telephone: +44 (0) 1633 413600
Facsimile: +44 (0) 1633 413680

Asia Pacific

Newbridge Networks Sdn. Bhd.
Unit 1201 Level 12, Uptown Two
2, Jalan SS 21/37
Damansara Uptown
47400 Petaling Jaya
Selangor Darul Ehsan, Malaysia
Telephone: +60 3 715 8400
Facsimile: +60 3 715 8415

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