



M A I N S T R E E T P R O D U C T F A M I L Y



NEWBRIDGE

## Newbridge Means Leadership in Networking Technology and Service

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Newbridge® Networks Corporation designs and manufactures a comprehensive family of networking products and systems, delivering the power of multimedia communications to organizations in more than 100 countries. We are a world leader in TDM (time division multiplexing) and frame relay, and a pioneer in bringing ATM (asynchronous transfer mode) technology to market. For more than ten years, customers have trusted Newbridge to provide reliable, scalable solutions. Our customers know that in buying Newbridge products, they are protecting their existing network investment and getting fully end-to-end managed solutions, open for integration with other systems and modular for migration into the future as new technologies emerge. They also know that reliability is the hallmark of all Newbridge products, which are backed by a strong commitment to service and customer satisfaction.



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## The Newbridge Family of Products

Newbridge offers three families of products: MainStreet®, MainStreetXpress™ and VIVID™. Each family is designed to meet specific network requirements: MainStreet for narrow-band networks, MainStreetXpress for broadband multiservices networks and VIVID for switched routing solutions. All three product lines work in harmony to ensure customers get the most complete, managed solution available.

### THE NARROWBAND SOLUTION

The MainStreet family is a line of cost-effective, narrowband backbone equipment, access products and extension units that extend the reach of the WAN (wide area network) right to the desktop. MainStreet products support multiple technologies and are fully managed by the industry-leading MainStreetXpress management suite. They offer the ability to scale as the network grows, and to migrate as technologies change.

The MainStreet family offers a range of products for specialized applications, making it easy to customize solutions to various needs. MainStreet products are adaptable to either service provider or enterprise applications. Service providers find the manageability, range and multitechnology support ideal for creating tailored services for their customers. Enterprise network administrators find the scalability and center-weighted, end-to-end management of MainStreet products cost-effective in building private networks.

### THE BROADBAND CONNECTION

The MainStreetXpress architecture delivers a managed multiservices broadband network solution. It provides the optimal building blocks for each layer of the broadband network — core, edge and access.

The MainStreetXpress family is the result of co-operation between two telecommunications industry leaders — Siemens AG and Newbridge Networks. Building on our vision that most voice, data, video and multimedia traffic will be carried on ATM-based, broadband, multiservices networks in the future, the MainStreetXpress architecture provides a fast and reliable means for deploying new services and provides a clear migration from narrowband to broadband networking.

### THE SWITCHED ROUTING ALTERNATIVE

VIVID switched routing solutions provide scalable, cost-effective and high performance Layer 3 services. These services improve the efficiency of large IP (Internet Protocol) networks like the Internet by enabling single-hop routing, which eliminates the need to make routing decisions at every node. Seamless integration between the VIVID and MainStreet product lines makes possible such services as geographically dispersed virtual LANs¶ (local area networks) intranets and the delivery of bandwidth-intensive applications to the desktop.

## International Standards Compliance

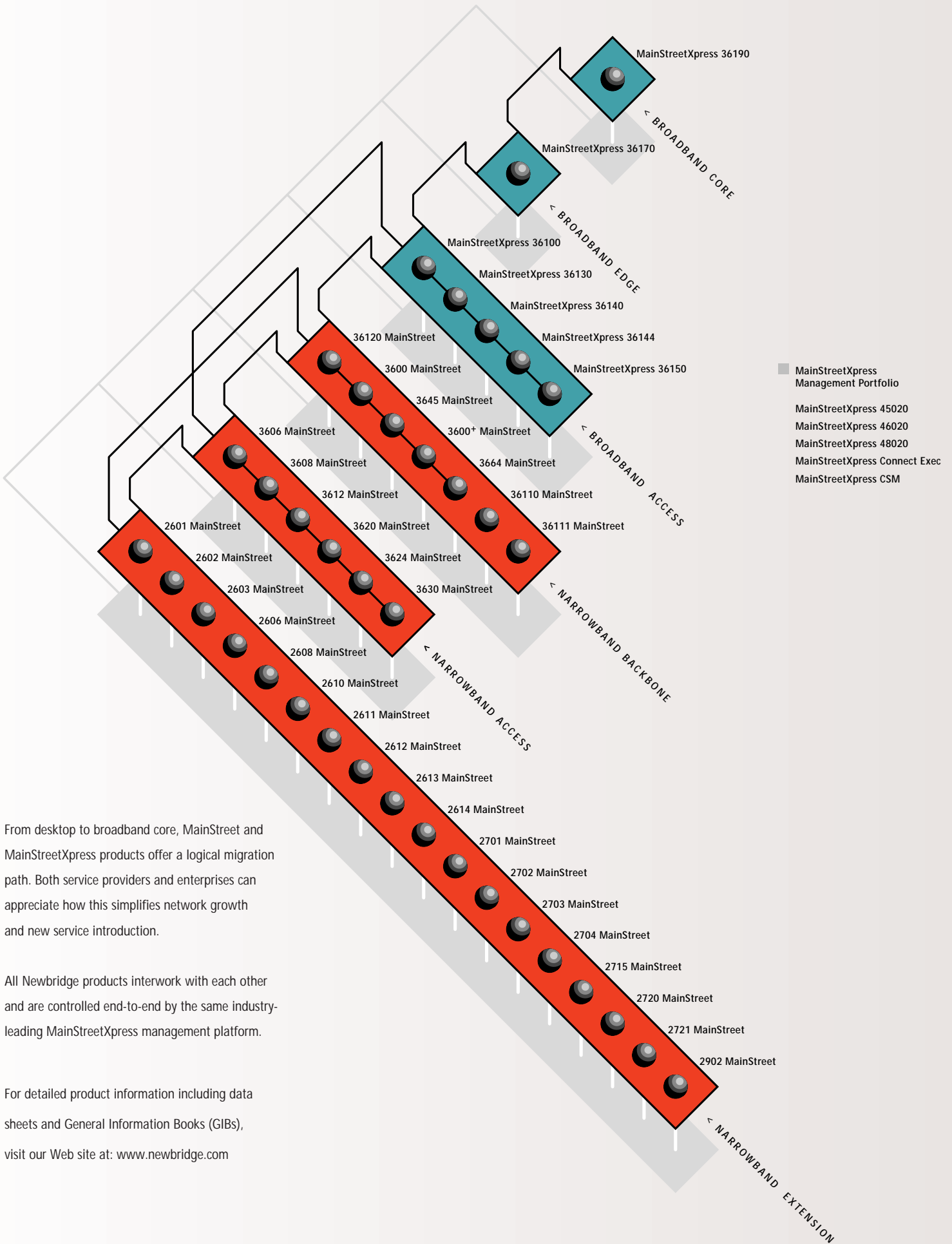
All Newbridge products are designed to comply with international standards in order to deliver maximum interoperability and performance in multiprotocol, multivendor networks. Newbridge Networks is an active member of leading industry associations and organizations that help define specifications and standards for ATM, frame relay, network management and other state-of-the-art technologies.

## Global Professional Services

Newbridge provides a complete set of support services to minimize or even eliminate the disruption typically associated with increasing the reach or capacity of a network. Service packages are bundled, making it easy to select the appropriate services based on available resources, budget and network plans. The professional services portfolios cost less than buying the same services individually and provide the added peace of mind that comes only with comprehensive support solutions.

## Commitment to Quality

Newbridge is dedicated to quality in every aspect of its business and is committed to ISO 9000 standards. We have already achieved certification in both design and manufacturing. Our customer service professionals are dedicated to meeting customer needs and maintaining the highest standards of performance. They are specialists in their fields with a solid understanding of the latest technologies, an intimate knowledge of Newbridge products and extensive experience in a vast array of network applications.



From desktop to broadband core, MainStreet and MainStreetXpress products offer a logical migration path. Both service providers and enterprises can appreciate how this simplifies network growth and new service introduction.

All Newbridge products interwork with each other and are controlled end-to-end by the same industry-leading MainStreetXpress management platform.

For detailed product information including data sheets and General Information Books (GIBs), visit our Web site at: [www.newbridge.com](http://www.newbridge.com)

## The MainStreet Advantage

The Newbridge MainStreet product line is a family of narrowband backbone equipment, access devices and extension units. MainStreet products deliver fully managed, very reliable TDM-based voice and data solutions as well as support for packet-based technologies including ATM, frame relay and X.25.

The MainStreet family is managed end-to-end by the industry-leading MainStreetXpress management suite.

MainStreet products use a common architecture that allows multiple technologies to co-exist within the same network, and provide a clear migration path to higher capacities in the edge of the WAN and in the backbone. These software-driven products are scalable and can be easily upgraded as advances in technology are achieved.

### FOR THE ENTERPRISE

Enterprises of all kinds use narrowband networks to efficiently deliver voice and data services to dispersed sites, both locally and globally. For enterprise network administrators, simply maintaining basic communications can be challenging enough. But with escalating demands for new services and emerging technologies, and the growing emphasis on the network as a business differentiator, the task of maintaining a network is even more daunting.

Communication speed and quality have always been important. Recently, network capacity has become crucial with the increasing use of specialized services — notably multimedia, video-on-demand and the Internet.

Businesses, governments and other institutions around the world value MainStreet products for their support of legacy technologies and the migration path they provide to higher capacity emerging technologies, including broadband network solutions.

### FOR THE SERVICE PROVIDER

Today's service providers must be able to meet the needs of both large and small customers for efficiently managed and competitively priced bandwidth. Their customers want easy, affordable access to public services and, at the same time, they want to build secure, cost-effective virtual private networks and intranets using a combination of their own and their service provider's resources. And, they want all of this with minimal impact to their workload so they can concentrate on their main business.

MainStreet products, along with the MainStreetXpress management suite and MainStreetXpress broadband solutions, give service providers the tools they need to meet customer demands and build tailored solutions to suit each customer's unique and exacting requirements.

## Advanced Voice Solutions

Enterprise networks need to transport voice services between dispersed locations and branch offices. Increasingly, there is a requirement to integrate the transport of voice traffic with data on a single, flexible, high performance network. In doing this, a balance must be achieved between delivering maximum performance for data applications while maintaining the quality of speech transmission. Newbridge offers the flexibility of either circuit switched CBR (constant bit rate) or packetized VBR (variable bit rate) voice service.

### VOICE COMPRESSION

Using advanced compression algorithms and other bandwidth management techniques, MainStreet solutions deliver premium voice quality at very low bit rates. This enables service providers, or enterprises building private networks, to reduce the costs of very expensive international bandwidth. In addition, voice compression transparently supports fax and modem traffic, without the need for a separate network or additional bandwidth.

Newbridge MainStreet products support a number of voice compression algorithms including the Newbridge proprietary stHCV (super-tandem high capacity voice), which ensures voice quality, and industry standard ADPCM (adaptive differential pulse code modulation), as well as a new generation of voice compression algorithms, including G.729 A-CELP and LD-CELP.

## Integrated Data Solutions

Newbridge leads the way in data communication products and services, offering a full range of solutions to suit both service provider and enterprise needs. With MainStreet products, services such as X.25, frame relay, and ATM are easily integrated with other technologies and services — all on one network.

### FRAME RELAY SUPPORT

When users require cost-effective delivery of bursty data traffic, frame relay is the logical choice. MainStreet frame relay products offer affordable and efficient connectivity between many sites. Users are provided with a variety of services through frame relay, including e-mail, client server database access, groupware and LAN internetworking.

### X.25 SUPPORT

X.25 is a packet-based protocol that provides guaranteed end-to-end delivery of data. MainStreet X.25 solutions are used when cost is a constraint and guaranteed data integrity is required. Finance, banking, airlines and point-of-sale terminals rely on MainStreet X.25 services to guarantee the delivery of data traffic.

### ATM SUPPORT

The MainStreet solution includes ATM service adaptation capabilities to support the cost-effective integration and transmission of voice and data over multiservices broadband networks.

### DATA COMPRESSION

To achieve significant cost savings and the efficient use of wide area bandwidth, the MainStreet product line includes support data compression and frame truncation techniques. Data compression reduces the size of messages and the time required to transmit them. Frame truncation reduces the time it takes for a packet to cross a wide area network link.

## Guaranteed Network Reliability

For guaranteed network reliability on a private line network, MainStreet solutions use the telephone network, Switched 56 network or ISDN to protect vital voice and data circuits. Failed paths on aggregate links can be rerouted to external switched network devices using path routing features, such as AAR (automatic alternate rerouting) and RAPID (reserved alternate path with immediate diversion). These path routing algorithms ensure the use of another leased line if the original fails. With MainStreetXpress management, ISDN or PSTN backup can be scheduled on a daily, monthly or one-time basis.

## MainStreet Backbone Products: A Strong Foundation for Business

The modular architecture of the MainStreet backbone products allows for easy migration and customization of network services — the possibilities are endless.

A full range of high performance bandwidth managers provides flexible and scalable service delivery for both service providers and enterprises.



### Backbone Product Applications

- Forming the basis of enterprise WANs
- Providing reliable and protected service in multitechnology environments
- Integrating an end-to-end solution with access and extension devices
- Creating managed virtual private networks

### 3600 MainStreet

#### Bandwidth Manager

The 3600 MainStreet is a flexible, intelligent networking node that combines the functions of an intelligent channel bank, a digital cross-connect switch, an integrated voice and data multiplexer, and a frame relay and X.25 switch.

- Up to 32 T1/E1 interfaces
- 64 Mbit/s non-blocking switching matrix
- Control/power/aggregate redundancy
- RAPID and AAR
- Mu-law to A-law companding conversion
- Multiple synchronization options
- DDS, X.50, I.460, HCM sub-rate multiplexing
- Voice compression (ADPCM, A-CELP, LD-CELP, A-CELP Annex A, super-tandem HCV for improved compressed voice quality)
- Call processing for Euro-ISDN, Q.Sig, CorNET-NQ, INS-64/1600, National ISDN
- Integral HDSL
- Statistics for billing, traffic analysis and trouble isolation
- Leased line backup over ISDN
- Fully software configurable, remote management, remote software download
- ATM access via inverse multiplexing over ATM

### 3645 MainStreet

#### High Capacity Bandwidth Manager

The 3645 MainStreet offers superior granularity in a high capacity bandwidth manager (3/0 DACS) and supports a wide range of services.

- Up to 256 T1/E1 interfaces
- 512 Mbit/s non-blocking switching matrix
- All of the features supported by the 3600 MainStreet Bandwidth Manager

### 3600+ MainStreet

#### Bandwidth Manager

The 3600+ MainStreet builds on the capabilities of the 3600 platform architecture to provide a scalable option to meet the increasing demand for multiple services, including SONET/SDH, and higher bandwidths on a single platform. The switch supports a wide range of circuit- and packet-based voice and data services and is fully compatible with the 3600 and 3645 MainStreet bandwidth managers.

- Up to 32 T1/E1 interfaces
- SONET/SDH interfaces for SONET interworking
- All of the features supported by the 3600 MainStreet Bandwidth Manager

### 3664 MainStreet

#### Fractional Access Multiplexer

The 3664 MainStreet is an integrated voice and data multiplexer that can operate in a T1, E1, X.21 or V.35 primary rate environment. The 3664 is a more economical version of the 3600 MainStreet family. It can be used as a medium capacity private or hybrid networking multiplexer, an n\* 56/64 kbit/s node or an integrated feeder node.

- Up to 32 T1/E1 interfaces
- Fractional T1, E1 and ISDN interfaces
- Signaling, companding, super-rate conversion, and line and circuit grooming
- All of the features supported by the 3600 MainStreet Bandwidth Manager

### 36120 MainStreet

#### Packet Transfer Exchange™

The 36120 MainStreet provides high speed circuit and packet switching on a single platform. It has the extensive circuit switching capabilities of the 3600 and 3645 MainStreet bandwidth managers, a frame relay switching capacity of more than 100,000 frames per second and X.25 switching capacity of more than 100,000 packets per second.

The 36120 provides a complete frame relay solution, fully manageable through the MainStreetXpress management system. Traffic parameters are configurable in either symmetrical or asymmetrical modes to optimize bandwidth usage based on specific requirements. The 36120 MainStreet also provides frame relay-ATM interworking using its integral FRATM Interworking Unit.

- 512 Mbit/s switching capacity
- Sub-rate (1,200 bit/s) and super-rate (up to 2 Mbit/s) connections
- Up to 3,968 frame streams and 126,976 PVCs
- Supports frame relay SVCs at the UNI and NNI
- Standards-based congestion management
- Sustained bursting beyond the committed information rate
- ATM Forum standards compliant FRATM Interworking Unit
- Remote software downloading
- All of the features supported by the 3600 MainStreet Bandwidth Manager

### 36110 and 36111 MainStreet

#### Multiprotocol Concentrators

The 36110 and 36111 MainStreet Multiprotocol Concentrators extend the range of access of the Newbridge network by supporting synchronous and asynchronous terminals, SNA architectures and LANs in conjunction with MainStreet X.25.

The 36110 and 36111 support a wide range of protocols operating both on the user side (PAD, X.25, SNA, IP, IPX) and in wide area networks (X.25, frame relay, ISDN). The 36111 MainStreet High Capacity Multiprotocol Concentrator is a higher capacity version of the 36110 MainStreet.



- Up to 20 T1/E1 interfaces (36110)
- Up to 80 T1/E1 interfaces (36111)
- Remote loopback (V.54)
- Modem support
- Basic rate internode link (64 or 128 kbit/s)
- Integrated traffic generator and datascopes
- Multipoint SNA 802.2/LLC.2 bridge compatible with source route bridging
- SDLC/Token Ring converter
- Token Ring/QLLC converter
- NetBIOS name caching
- Multipoint NetBEUI bridge compatible with source route bridging
- Filtering of broadcasts
- Local polling and acknowledgment

## Product Enhancements

### Frame Relay Support

As an alternative to the full frame relay service provided by the 36120 MainStreet, the 3600-series MainStreet bandwidth managers can be provisioned for frame relay simply by adding frame relay resource cards. This is a highly cost-effective migration path from TDM to frame relay networking.

The Frame Relay Switch (FRS), Frame Relay Engine (FRE) and Packet Engine (PE) cards are multiport resource cards that provide flexible allocation of transmission bandwidth among multiple users. The FRS card provides economical, high fan out, high speed packet data communications — at 2,000 fps (frames per second) — from a single card. With the FRS card, multiple line facilities can be consolidated into a single shared facility, lowering service costs and improving the quality of service. The FRE card provides all the consolidated frame relay support of the FRS card, with 8,000 fps switching. With a simple software upgrade, the FRE card can support X.25. The PE is a high performance packet switching platform supporting all the frame relay and X.25 features of the FRE card.

### FRATM (Frame Relay Over ATM) Interworking Unit

The FRATM Interworking Unit attaches to the 36120 MainStreet system through a FASTbus™ Interconnect Panel (FIP), allowing FRE cards on the 36120 MainStreet to connect to a MainStreetXpress 36150 Access Switch or MainStreetXpress 36170 Multiservices Switch or to a third party ATM network. The FRATM can also provide high speed backbone trunk service between 36120 MainStreet nodes.

- Resource congestion control
- Wide range of statistics and maintenance features
- Hot standby redundancy
- Hot insertion/removal of the FRATM from 36120 MainStreet FASTbus
- Downloadable software
- Network and service interworking
- VCC (virtual circuit connection) and VPC (virtual path connection) traffic shaping
- Up to DS3 interface

### ATM Services Card

The ATM Services Card allows the 3600 MainStreet Bandwidth Manager to integrate legacy voice and data systems with ATM services. The ATM Services Card provides ATM service adaptation and IMA (inverse multiplexing over ATM) for 3600 MainStreet bandwidth managers. Installed in any UCS, the ATM Services Card adapts low speed, legacy services to ATM cells for transmission through a multiservices broadband network.

- Single logical ATM interface, user programmable for one to four T1 or E1 interfaces
- AAL1 or AAL1/AAL5 ATM service adaptation
- ATM Forum UNI 3.1 interface

### MainStreet X.25

With a simple software upgrade, either the PE or FRE cards on the 36120 MainStreet system can route X.25 traffic. Together the software and hardware components deliver a small footprint, high performance X.25 switching platform.

- X.25 service compliant with 1984, 1988, 1992 and 1996 ITU-T X.25 Recommendations
- ITU-T Recommendation X.75 conforming to 1984, 1988, 1992 and 1996 X.75 versions for interworking between public data networks
- Access speeds from 1200 bit/s to 2 Mbit/s
- Comprehensive support of all widely used X.25 network features
- Accounting and billing
- Dynamic routing
- High performance, over 3,000 data packets per second
- Load balancing
- X.25 / frame relay service interworking

### 3901 and 3902 MainStreet

#### Digital Echo Cancellation

The MainStreet solution includes complete echo cancellation features. The 3901 and 3902 MainStreet Digital Echo Cancellers eliminate a host of potential echo problems. They provide superior subjective voice quality and dependable facsimile transmission. Enhancement options allow for upgrades as network compatibility requirements change.

The 3901 MainStreet provides the most advanced level of echo control available for each channel of up to two T1 or E1 primary rate links. The 3902 MainStreet provides echo control for each channel of up to 12 T1 or E1 primary rate facilities.



# MainStreet Backbone and Access Interfaces

	3600 MainStreet	3600+ MainStreet	3645 MainStreet	3664 MainStreet	36110 MainStreet	36111 MainStreet	36120 MainStreet	3606 MainStreet	3608 MainStreet	3612 MainStreet	3620 MainStreet	3624 MainStreet	3630 MainStreet
<b>Aggregate Interfaces</b>													
T1	•	•	•	•	•	•	•				•	•	•
DS3(T3/E3)			•										
E1	•	•	•	•	•	•	•			•			
X.21 PRI	•	•	•	•	•	•	•	•	•	•			
V.35 PRI	•	•	•	•	•	•	•	•	•	•			
MPA (Multiport Aggregate)	•	•	•	•	•	•	•						
TTC-2M	•	•	•	•	•	•	•						
T1/E1 HDSL	•	•	•	•	•	•	•				•	•	•
S/T BRI	•	•	•	•	•	•	•		•				
U BRI	•	•	•	•	•	•	•						
<b>Voice Interfaces</b>													
T1 D4 and ESF formats	•	•	•	•	•	•	•				•	•	•
E1 CAS and CCS, R2D (E&M)	•	•	•	•	•	•	•						•
E&M	•	•	•	•	•	•	•	•	•	•	•	•	•
4WTO	•	•	•	•	•	•	•				•	•	•
2WTO	•	•	•	•	•	•	•				•	•	•
LGS	•	•	•	•	•	•	•	•	•	•	•	•	•
LGE	•	•	•	•	•	•	•	•	•	•	•	•	•
MRD	•	•	•	•	•	•	•	•	•	•	•	•	•
G3 Fax	•	•	•	•	•	•	•	•	•	•	•	•	•
U BRI	•	•	•	•	•	•	•						
<b>Voice Features</b>													
8/16 kbit/s HCV	•	•	•	•	•	•	•	•	•				
ADPCM	•	•	•	•	•	•	•		•				
A-CELP	•	•	•	•	•	•	•						
LD-CELP	•	•	•	•	•	•	•						
Voice over Frame Relay									•				
<b>Data Interfaces</b>													
RS422	•	•	•	•	•	•	•	•	•	•	•	•	•
RS232	•	•	•	•	•	•	•	•	•	•	•	•	•
E1 G.703	•	•	•	•	•	•	•			•			
Ethernet router											•		
2WTO, 4WTO											•	•	
DNIC/2B1Q (for NTU connection)	•	•	•	•	•	•	•			•	•	•	•
OCU-DP	•	•	•	•	•	•	•				•	•	
DS0-DP	•	•	•	•	•	•	•				•	•	
X.21	•	•	•	•	•	•	•	•	•	•	•	•	•
V.35	•	•	•	•	•	•	•	•	•	•	•	•	•
Frame relay	•	•	•	•	•	•	•		•	•			
DDS	•	•	•	•	•	•	•	•	•	•	•		
<b>ATM</b>													
ATM Services Card	•	•											
T3 ATM UNI (with FRATM)							•						
E3 ATM UNI (with FRATM)							•						
<b>SONET / SDH</b>													
SONET OC-3		•											
SDH STM-1		•											

## MainStreet Access Products: Flexible, Cost-Effective Remote Access

Newbridge offers small or branch office users a range of solutions for a variety of bandwidth requirements. MainStreet access products provide access to the enterprise WAN or public network, allowing smaller sites to take advantage of multiple services including voice, data, IP, frame relay or ISDN — as if they were directly connected to a larger multiservice WAN.



### Access Product Applications

- Integrating voice and data circuits
- Acting as a customer premises gateway to primary rate facilities
- Providing specialized voice and data services between corporate sites

## 3606 MainStreet

### Little Mux™

The 3606 MainStreet is a compact, high performance voice, fax and data multiplexer. A data only variant of the 3606 MainStreet, the iDSU (integrated data service unit) allows direct connection to the DDS network. (iDSU is available only in North America.)

- One V.35/X.21 interface with speeds up to 256 kbit/s
- Multiple data interfaces
- Multidrop data bridging
- Connections for remote data devices
- 8/16 kbit/s HCV voice compression

## 3608 MainStreet

### Packet Access Mux

Flexible and modular, this expandable frame relay-compatible platform provides access to frame relay services for toll quality voice, fax and data. The 3608 MainStreet Packet Access Mux uses packetized voice to take advantage of the cost-effectiveness of multiple services over frame relay.

- One V.35/X.21 interface with speeds up to 256 kbit/s
- Consolidation of voice, fax and data over frame relay
- Toll quality voice
- ITU-T G.165 echo cancellation
- Adaptive network delay jitter equalization
- Advanced traffic management
- Intelligent response to frame relay network congestion
- Local and remote configuration and software upgrade
- SNMP management
- Standards compliant
- Desktop or rack mountable
- Adaptive silence suppression

## 3612 MainStreet

### Narrowband Multiplexer

The 3612 MainStreet is a highly flexible voice and data multiplexer providing connection to leased lines, Euro-ISDN, S<sub>0</sub>FV and INSNet services.

- Up to 12 voice or data customer premises module interfaces
- Up to two S/T-BRI ISDN or four V.35 or X.21 fractional aggregates with E1 speeds up to 512 kbit/s each
- Frame relay support
- DNIC and 2B1Q for connection with MainStreet NTUs
- 8/16/32 kbit/s voice compression
- E&M, LGS, LGE, MRD and GEN-GEN voice interfaces

## 3620 MainStreet

### Branch Access Controller

The 3620 MainStreet addresses branch office networking requirements by combining the voice and data multiplexing features of the MainStreet product line with advanced Ethernet routing capabilities.

- Ethernet router module
- Six slots
- One T1 aggregate
- E&M, LGS, LGE and MRD voice interfaces
- Tributary T1 (DSX-1) interface to a co-located PBX
- DNIC and 2B1Q for connection with MainStreet NTUs
- RS232, X.21 and V.35 direct connect data interfaces
- OCU, 2WTO and 4WTO modules

## 3624 MainStreet

### Intelligent T1 Channel Bank

The 3624 MainStreet is a versatile T1 multiplexer offering a wide range of voice and data interfaces. The 3624 MainStreet is ideally suited as a customer premises T1 multiplexer in either a point-to-point configuration or for access to public networks.

- Up to 24 voice or 96 data interfaces
- 12 slots
- One T1 aggregate
- E&M, LGS, LGE, MRD voice interfaces
- Tributary T1 (DSX-1) interface to a co-located PBX
- DNIC and 2B1Q for connection with MainStreet NTUs
- RS232, X.21 and V.35 direct connect data interfaces
- OCU, 2WTO and 4WTO modules

## 3630 MainStreet

### Primary Rate Multiplexer

The 3630 MainStreet is a versatile drop-and-insert primary rate multiplexer. The 3630 serves as a gateway on the customer premises to primary rate facilities for a wide range of equipment or is used as a managed network termination unit on the customer premises.

- Up to 32 voice or 128 data interfaces
- Two T1 or E1 aggregates
- LGS, LGE, E&M, MRD and GEN-GEN voice interfaces
- DNIC and 2B1Q for connection with MainStreet NTUs
- RS232/V.24, X.21 and V.35 direct connect data interfaces
- OCU-DP module

## SPRITE

### T1 or E1 Network Access Card

Newbridge, in conjunction with Sun Microsystems, developed this SBus T1/E1 WAN access card for channelized T1 (1.544 Mbit/s) or E1 (2.048 Mbit/s) connectivity directly to Sun SPARCstations, SPARCservers, UltraServers and NetraInternet Servers. The SPRITE card can be used in the MainStreetXpress 46020 Network Manager providing Control Packet Switching System (CPSS) routing in networks with multiple domains.

The SPRITE T1 is an intelligent T1 network access card with an integral channel service unit (CSU). It can terminate up to 24 data circuits over one T1 link, allowing remote site data concentration. The SPRITE E1 card can connect up to 31 remote LANs or workstations over one E1 link.

## MainStreet Extensions: Management and Control to the Edge

When you can't bring the user to the network, bring the network to the user. For small sites located within a few miles of a MainStreet WAN switch, Newbridge provides a fully manageable family of NTUs (network termination units) including a range of DTUs (data termination units). They provide data termination, as well as frame relay, Internet access and video monitoring, to the customer premises. MainStreet NTUs offer the best solution for extending WAN connectivity and management control to the desktop.



	2601 MainStreet	2602 MainStreet	2603 MainStreet	2606 MainStreet	2608 MainStreet	2610 MainStreet	2611 MainStreet	2612 MainStreet	2613 MainStreet	2614 MainStreet	2701 MainStreet	2702 MainStreet	2703 MainStreet	2704 MainStreet	2715 MainStreet	2720 MainStreet	2721 MainStreet	2902 MainStreet
Maximum Loop	km   mi	3   2	3   2	3   2	3   2	3   2	3   2	3   2	3   2	3   2	7   5	7   5	7   5	7   5	7   5	7   5	7   5	5   3
Maximum Speed	kbit/s	64	128	128	128	128	128	128	64	128	128	64	128	128	64	128	128	2.08 Mbit/s
Aggregate Interfaces																		
G.704 E1																		1
V.35			2					2				2		1	1	1	2	
V.24	2			8	8	2		2	4	2			2	1	1	1	4	DNIC
X.21		2										2					2	
2B1Q																		1
NTSC / PAC								4										
RS449		2										2						

## The MainStreet NTU Family

Engineered for both internal and external applications over conventional twisted pair wiring, MainStreet NTUs or DTUs can carry services up to 7 km (5 mi). They are reliable and rugged, and provide full management and self-testing features. All MainStreet NTUs are software configurable, both locally and remotely, and can be managed remotely.

- Local, remote and channel loopbacks
- Performance statistics
- Automatic self-diagnostics
- Sync/async operation
- Setting and monitoring the state of the control leads
- Selection of rate adaption parameters and control lead functions
- Collection of performance statistics (2700 MainStreet DTUs only)
- Full set of loopbacks
- No DIP switch settings
- Loss of power alarms (2715 MainStreet only)
- Integral BERT (bit error rate tester) (2612, 2613 and 2715 MainStreet only)

### 2600 and 2700 MainStreet Series

#### Data Termination Units

The 2600-series MainStreet DTUs connect to a DNIC port available on most 3600-series nodes and operate at distances up to 3 km (2 mi). The 2612 and 2613 deliver data services for on-premises applications and are ideally suited for campus and building environments.

The 2700-series MainStreet DTUs connect to a 2B1Q or DNIC port available on several 3600-series MainStreet nodes and operate at a distance of up to 7 km (5 mi). The 2700 MainStreet DTUs are used to deliver data services to customer premises, over internal and external twisted pair cable. These devices are very reliable and rugged.

The 2612, 2613 and 2715 enhanced DTUs provide additional operation and maintenance capabilities (link quality, alarms, power fail detect, statistics and integral BERT) making them ideally suited for premium data services.

All of these units are designed to address the growing demand for affordable alternatives in the expanding corporate intranet and Internet access markets. These units offer ISDN-like access of up to 128 kbit/s without the cost and limitations associated with ISDN — switched network congestion, long hold times caused by limited dedicated and semi-dedicated lines, and high capital costs associated with implementing and upgrading ISDN access.

## Special Function NTUs

### 2606 MainStreet

#### Sync/Async RS232 Data Termination Unit

The 2606 MainStreet is an eight-port RS232 sub-rate multiplexer used to connect data devices to MainStreet multiplexers up to 3 km (2 mi) away. Data is time division multiplexed or multidrop bridged onto one or two B channels. Each B channel has an aggregate bandwidth of up to 64 kbit/s. Rate adaption and bit alignment of the aggregate stream allow further time division multiplexing or multidrop bridging at the multiplexer.

### 2608 MainStreet

#### Data Termination Unit

The 2608 MainStreet provides basic rate 2B+D connections. Each B channel aggregate has an aggregate bandwidth of 2.4 kbit/s to 64 kbit/s. Data from up to eight asynchronous devices is statistically multiplexed onto the B channels. Rate adaption and bit alignment of the aggregate stream allow further time division multiplexing. By combining automatic self-diagnostics, performance statistics, loopbacks and exceptional bandwidth utilization, the 2608 MainStreet makes low speed, long distance data transmission an affordable reality.

### 2610 MainStreet

#### CPSS PAD

The 2610 MainStreet is a converter for connecting devices to a MainStreetXpress network manager via the network control channel. It has two V.24/RS232 ports and supports VT100 access.

### 2611 MainStreet

#### Video Termination Unit/Video Management System

The 2611 MainStreet Video Termination Unit (VTU) and Video Management System together provide a scalable video-over-network system. The 2611 MainStreet VTU compresses a standard camera output (PAL or NTSC) down to a low speed data stream which can be carried locally over standard twisted pairs or transmitted efficiently over the WAN.

### 2614 MainStreet

#### Frame Relay Data Termination Unit

The 2614 MainStreet adapts a wide variety of data traffic types to Newbridge-based frame relay networks. It offers high efficiency for asynchronous transport and provides an easy migration to frame relay service. The 2614 can be used for frame relay access from a customer site.

### 2720 and 2721 MainStreet

#### Network Termination Units

The 2720 MainStreet Internet Termination Unit provides fixed link Internet access up to 128 kbit/s. The 2721 MainStreet Router Termination Unit provides frame relay access to Ethernet-connected LANs.

### 2902 MainStreet

#### Multiservice Network Termination Unit

The 2902 MainStreet delivers managed bandwidth access of up to 2 Mbit/s over existing copper pairs (HDSL) or E1 facilities. The 2902 delivers integrated data and digital voice access with flexibility and reliability, while making use of existing network infrastructure.

## MainStreetXpress Management: Seamless Control of the MainStreet Portfolio

The MainStreetXpress management family allows service providers or enterprises to push the limits of efficient networking and service provisioning with open, integrated tools that provide center-weighted control of the network.

The MainStreetXpress 46020 Network Manager is the cornerstone of the MainStreetXpress family. The 46020 is a flexible network level management system with a rich GUI (graphical user interface). The 46020 is fully integrated with other products in the MainStreetXpress management family, and is open for integration with peer network management systems.

Other products in the family range from the interoperable MainStreetXpress 45020 Element Manager, which can manage SNMP elements in a multivendor environment, to the MainStreetXpress 48020 MultiNetwork Service Controller (MNSC), which can manage multiple networks in a global, multitechnology environment.

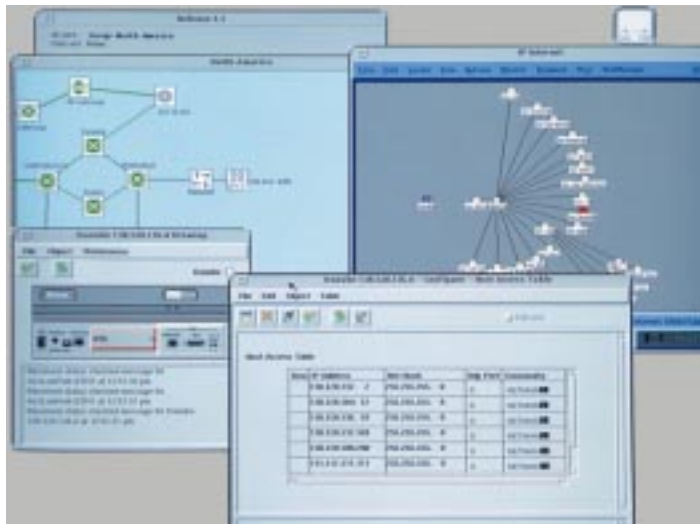


## The TMN Model

MainStreetXpress management products are based on the industry standard TMN model from the ITU (International Telecommunications Union). The TMN model provides a co-operative framework for integrated management both within and across multiple networks. The model separates management tasks into logical layers, ranging from element and network management functions through to service and business management. Each layer performs its function using a more abstract subset of management data than that used at the level below. Each system member, specialized in its tasks, works independently yet in harmony with other members to provide effective management solutions.

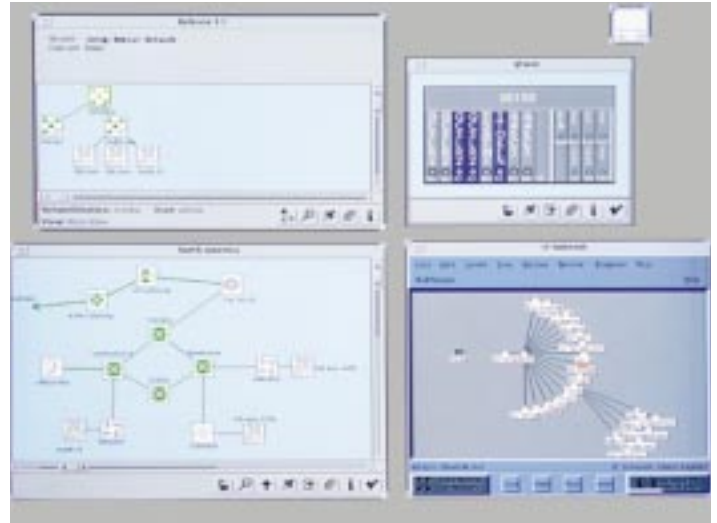
### MainStreetXpress 45020 Element Manager

The MainStreetXpress 45020 Element Manager is an element level management tool used for managing SNMP devices. It operates on HP OpenView as a standalone tool or through the MainStreetXpress 46020 Network Manager platform for a complete element and connection management solution. Modules called descriptor files create 45020-managed nodes on the GUI and can be easily modified when new functionality is added to a node. In this manner, the 45020 extends the power of the 46020 to manage non-Newbridge SNMP devices. Newbridge provides the 45020 technology to external developers and provides support, including developer's training courses.



### MainStreetXpress 46020 Network Manager

The MainStreetXpress 46020 Network Manager is a reliable, scalable network management solution. It provides network operators or administrators with a full range of configuration capabilities on multiprotocol, multitechnology networks. Traffic and service parameters on frame relay, ATM, X.25,



SONET/SDH and ISDN links and paths can be configured through its point-and-click GUI. It allows multiple operators (up to 128) to simultaneously access the same system and manage the network from different sites. Management activities can be tailored by customizing views of the network for different operators.

Network partitioning is a powerful tool for customizing access either by geographical region or by technology. Through the partitioning function of the 46020, portions of the network can be controlled or monitored by other management tools, such as the 48020 MNSC or the CSM (Customer Service Management™) family of products.

Detailed statistical data can be collected and used for performance analysis or billing purposes. A number of value-added products are available for processing 46020 data, including KeyInfo and Resolve SLA (service level agreement) manager by CrossKeys and Network Health by Concord.

### MainStreetXpress Customer Service Management (CSM)

The MainStreetXpress CSM solution set provides three products, each with its own distinctive advantages for different types of customers. The CSM family allows service providers to maintain control of the entire network, while delegating control or visibility of the network to their customers. For the enterprise network administrator, the CSM advantage lies in choice. There is a range of options available for varying degrees of enterprise network control.

#### ***The CSM Service Director™***

The CSM Service Director allows service providers to tailor and package their offerings to suit the unique requirements of their customers. It allows customers to monitor a portion of their WAN as designated by the service provider. The system operates on either Netscape Navigator or Microsoft Internet Explorer to provide users with graphical representation of their network performance details.

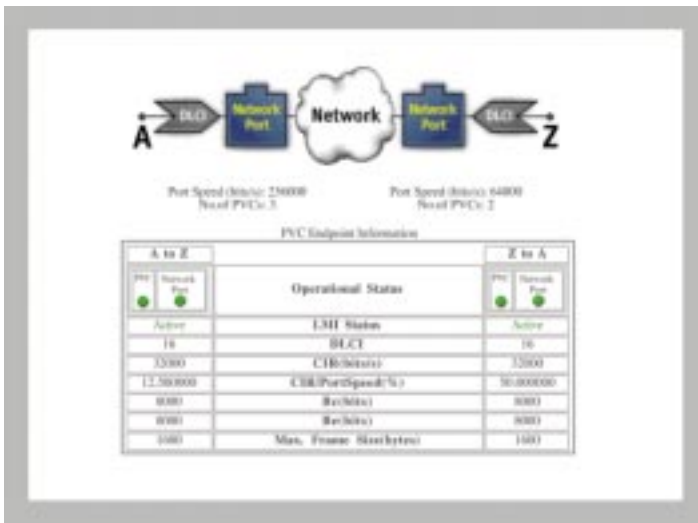
## MainStreetXpress 48020

### MultiNetwork Service Controller

In today's global economy, networks are becoming larger and service providers are becoming aligned or creating partnerships. The MainStreetXpress 48020 MultiNetwork Service Controller (MNSC) can help make consortia and large networks easier to manage.

The 48020 provides consistent and cost-effective delivery of service provisioning across multiple networking domains. Operating at the service management level of the TMN model, the 48020 MNSC provides an end-to-end service or executive perspective of the network, rather than a device or technology-oriented view.

The 48020 consolidates the management of network resources exported to it from one or more 46020-managed networks. Prior to export, the resources are configured using the MainStreetXpress 46020 Network Manager. The 48020 MNSC interoperates with 46020 to provide a scalable service management solution for large networks. The MainStreetXpress 48020 system grows as the multinet environment grows, ensuring investments in infrastructure and system training are not lost.



### The Customer X-Station

The Customer X-Station is designed to provide technically-oriented customers a network management layer view of their outsourced WAN resources. This view is customized using the 46020 partitioning function.

### The CSM Agent

Through the CSM Agent, CSM services can be accessed from SNMP network management systems, such as HP OpenView. This allows customers to smoothly integrate their LAN and WAN management capabilities, and access CSM services from a common platform.

## MainStreetXpress

Connect Exec™

MainStreetXpress Connect Exec is a CMIS (common management information services) / TMN-compliant OSI (open systems interconnection) agent interface. Connect Exec allows a peer OSS (operations support system) to perform MainStreetXpress 46020 management functions including:

- alarm and event management
- end-to-end path management
- topology management
- inventory and status monitoring (equipment, links and paths)
- diagnostics
- access network-wide views

Through Connect Exec, service providers can fully integrate the management of multivendor networks, automating processes such as flow-through provisioning, problem handling, fault isolation and service level monitoring.

The 46020 Active or Standalone workstation maintains a database representation of the network. The Connect Exec MIB mirrors this database using an object oriented database to represent the components of the network.

## Physical Specifications

	MainStreet Product	wide	high	deep	
		cm in.	cm in.	cm in.	
MainStreet Backbone	3600, 3645, 3664, 36120				
	Class A 19"	48.3 19.0	48.51 19.1	24.64   25.9 9.7   10.2	
	Class B 19"	48.3 19.0	48.51 19.1	24.64 9.7	
	PU 23"	58.4 23.0	44.5 17.5	30.35 11.95	
	3645 HSPS1	48.3 19.0	48.51 19.1	24.64 9.7	
	3645 HSPS2 [includes integral heat deflector]	48.3 19.0	57.79 22.75	30.48 12.0	
	3600+	48.3 19.0	80.01 31.5	12.97 12.0	
	36120 FRATM Module	43.2 17.0	8.84 3.48	25.65 10.1	
	36110 -8	21.95 8.64	13.97 5.5	35.58 13.3	
	36110 -20	43.94 17.3	13.87 5.46	33.78 13.3	
	36111 -24	48.4 19.0	14.38 5.66	48.62 19.14	
	36111 -80	48.4 19.0	27.61 10.87	49.02 19.3	
	3901	48.3 19.0	8.9 3.5	43.8 17.25	
	3902	48.3 19.0	17.8 7.0	46.7 18.5	
	MainStreet Access	3606	19.0 7.6	5.94 2.34	27.18 10.7
		3608	19.0 7.6	5.94 2.34	27.18 10.7
		3612	30.23 11.9	60.58 23.85	11.3 4.45
		3620 wall mount	30.5 12.0	44.45 17.5	11.3 4.45
		3620 rack mount	43.2 17.0	13.51 5.32	36.37 14.32
		3624	30.5 12.0	44.45 17.5	11.3 4.45
3630		30.23 11.9	60.58 23.85	11.3 4.45	
MainStreet Extension		2601, 2602, 2603, 2606, 2608, 2610, 2611, 2612, 2613, 2614, 2701, 2702, 2703, 2704, 2715	19.41 7.64	3.76 1.48	26.67 10.5
		2720, 2721	21.6 8.5	43.71 1.46	15.32 6.03
		2902	43.2 17.0	9.3 3.66	28.14 11.08
	2902 with mountings	48.2 19.0	9.3 3.66	28.14 11.08	

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