



**C** **CABLE MODEM SYSTEMS** **M** **21**  
*ComUNITY Access Products*

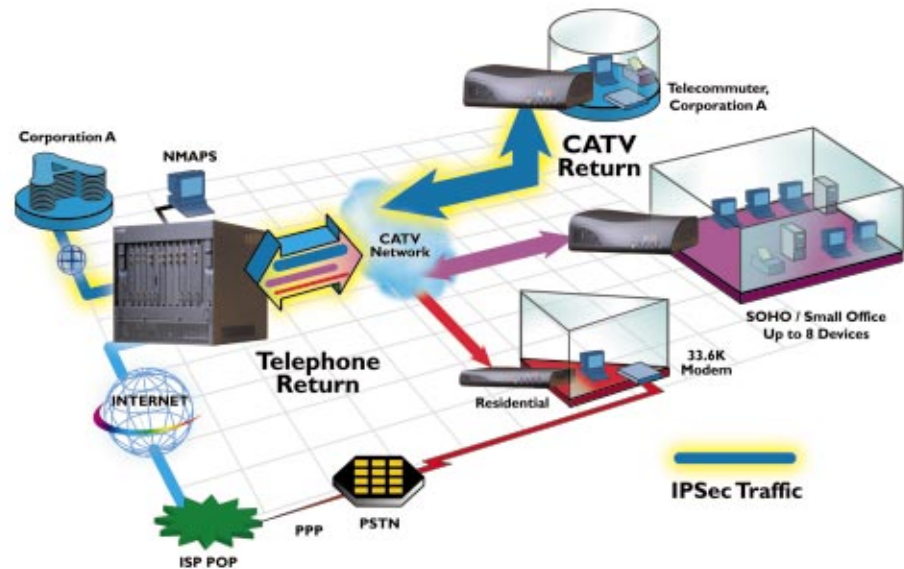
## THE COMUNITY ACCESS™ SOLUTION

Com21's ComUNITY Access is a cable modem communications system designed to make high-speed data services more profitable for systems of all sizes and architectures—suburban or metropolitan, HFC or coax, one-way or two-way. ComUNITY Access provides unique features that reduce operating overhead and total cost of ownership while increasing new MSO revenue opportunities in

multiple market segments—home consumer, telecommuter, corporate networking, and small business.

The ComUNITY Access system is comprised of the ComPORT™ cable modem, the ComCONTROLLER headend switch, NMAPS™ management/provisioning software, and optional RF noise containment devices.

### ComUNITY Access System Overview



## TRANSLATE OPPORTUNITY TO PROFIT

Com21 is dedicated to providing best-in-class solutions for cable operators. The Com21 system generates revenue for cable operators that does not require plant upgrades, and guarantees capacity for power users. Com21 delivers a secure, scalable system that's easy to operate and maintain, resulting in lower overall cost of ownership. A system with advanced

management capabilities that can actually detect and report performance degradation for corrective maintenance action before an outage occurs.

## COMUNITY ACCESS DELIVERS MORE REVENUES

Don't leave money on the table with only flat-rate pricing for Internet access. Power users and business customers are willing to pay a premium for higher data rates. ComUNITY Access gives you entry into these high-margin opportunities.

### Speed programmable cable modem

Any ComPORT cable modem can be remotely configured to work at any data rate, from 32Kbps to 10Mbps. So e-mail and residential users can be accommodated at lower data rates, while business users who require higher data rates are provisioned accordingly.

### Up to 16 different levels of service

There's no need to limit your earning potential to one flat rate of service. Define up to 16 classes of service and associated pricing, and still maintain spectral efficiency and performance guarantees for high-demand users.

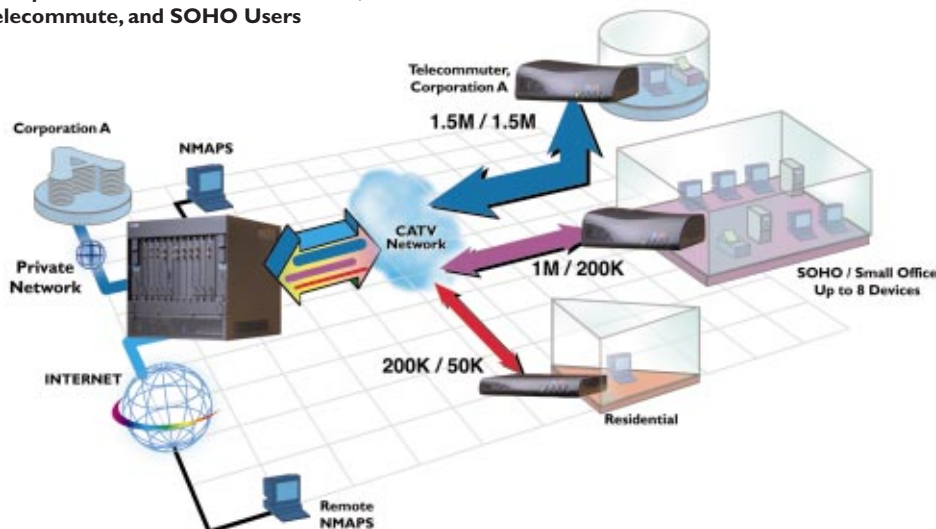
### Flexibility to support multiple network types

Com21 technology enables operators to look at new data network market opportunities—from remote corporate networking to academic research to telemedicine applications. ComUNITY Access is designed to support the needs of any existing network, public or private.

### Build Virtual Private Networks, for greater revenue and new market opportunities

Only ComUNITY Access lets you compete with telco-based ISPs, offering secure Virtual Private Networks (VPNs) as competitive alternatives to ISDN or T-1 services. VPNs can be designed as integrated remote networks that offer secure, high-speed, "always on" connections between the employee's home and corporate network.

Multiple Service Levels for Residential, Telecommute, and SOHO Users



### Secure communication

Because business users are concerned with the privacy of their networks on your cable plant, ComUNITY Access offers high security capabilities.

### DES Encryption

DES Encryption and key management ensure secure data communications in both upstream and downstream channels.

### Virtual Local Area Networks (VLANs)

ComPORTs grouped into their own private VLAN allow sensitive data to be confined for secure peer-to-peer communications. Although users share the same downstream channel, VLANs prevent co-mingling of traffic, a critical requirement for corporations.

### Secure IP communications

For additional security to a corporate network, the optional IP-Sec Module may be installed in the ComPORT to create end-to-end encrypted VPN connections managed by the corporate MIS department.

### ATM and QoS provide unequal flexibility

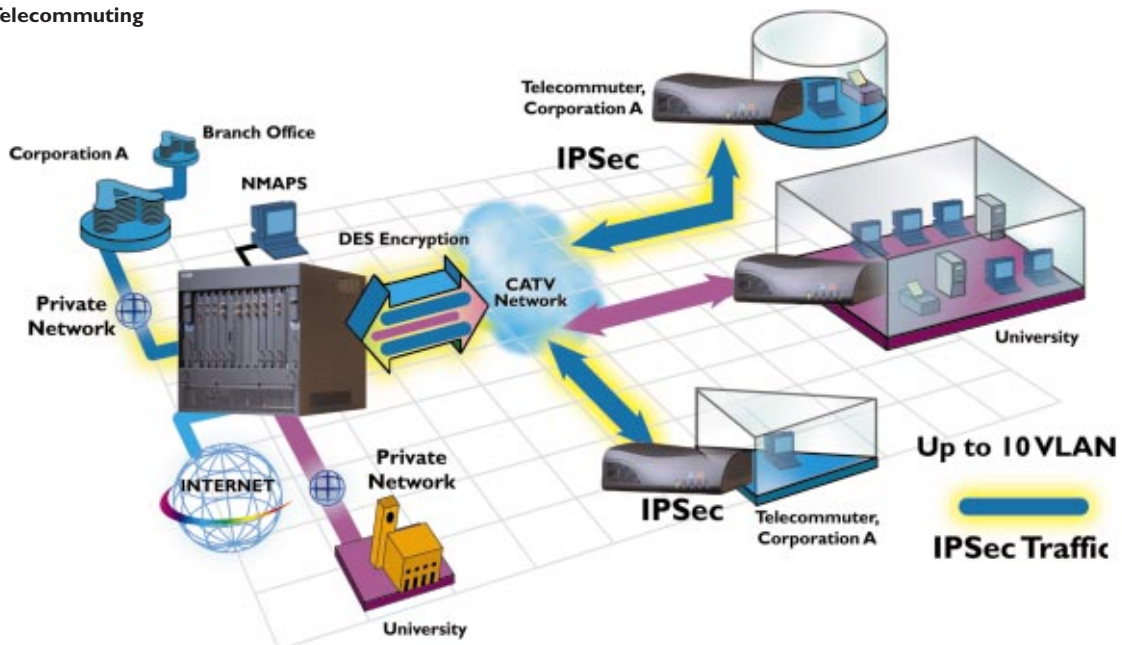
Utilizing the benefits of Asynchronous Transfer Mode (ATM) technology and Quality of Service (QoS) provisioning, the ComUNITY Access system provides unequal flexibility and security to support both commercial VPN applications and multiple service levels for the consumer market.

Com21's QoS feature lets you set up multiple classes of service with minimum/maximum data rates and traffic prioritization, so you can build services and a pricing structure that reflects user demands. Each QoS class can be programmed from 32Kbps to 10Mbps and each ComPORT can be assigned to any of the 16 service levels. Additionally, NMAPS offers a usage-based accounting feature to allow billing based on actual usage.

The underlying ATM technology also facilitates a wide range of differentiated services, from low network demands on latency and throughput (such as e-mail or electronic commerce applications) to very high network demands (such as multiplayer gaming, videoconferencing or voice applications). This enables operators to provide guaranteed constant-bit-rate (CBR) service levels to high demand market segments (such as business users) as well as best-effort service levels to low demand segments (Internet surfers, consumers).

Com21 looks at today's networks with an eye on the future—where multimedia broadband applications must be seamlessly delivered over public or private networks. ATM technology facilitates both the low latency/high throughput demands of emerging services and the flexibility to establish a hierarchy of differentially priced service offerings.

### Virtual Private Networking for Secure Corporate Telecommuting



## A SINGLE SYSTEM FOR ONE-WAY OR TWO-WAY CABLE PLANTS

The ComUNITY Access dual-mode capability provides the ideal evolutionary strategy for one-way cable networks to migrate from coaxial distribution to fully interactive two-way HFC (hybrid fiber/coax) architectures, and to grow the data business incrementally as revenue streams build.

### RF or Telephone return

Each ComPORT cable modem is dual-mode ready and can be operated with either a telephone or RF return path, allowing for deployment throughout cable systems where the RF return path is not universally activated. With a mouse-click in NMAPS, the ComPORT can be simply reconfigured for RF return. No truck rolls for hardware changeouts, no node restrictions on market launches. Install the same product on both one-way and two-way drops, and upgrade service levels as return path activation progresses.

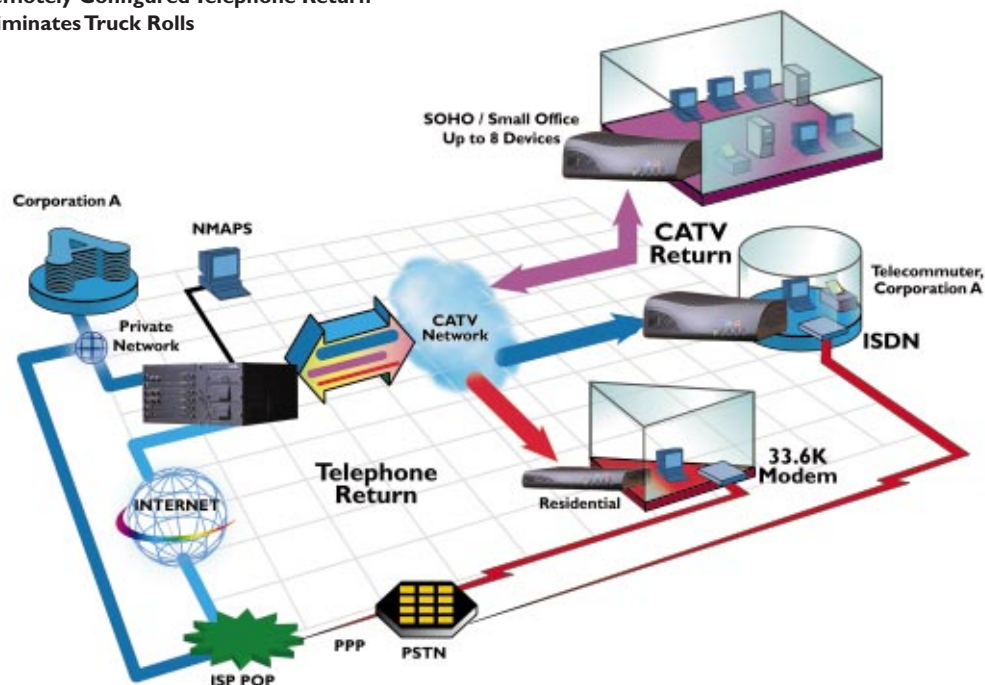
Both return path modes are simultaneously supported by the ComCONTROLLER and NMAPS.

This capability allows MSOs who are upgrading a one-way cable system, to offer high-speed data service with a single cable modem system, regardless of the subscriber's cable trunk capability. There is no more cost-effective or operationally efficient way to provide high speed data services in today's cable plant than with the ComUNITY Access system.

### Plug-and-Play

The ComPORT cable modem is easy to install and completely self-configuring from power-up. Front-mounted LEDs indicate status during installation process and aid in remote trouble-shooting.

### Remotely Configured Telephone Return Eliminates Truck Rolls



## REDUCE CAPITAL EQUIPMENT AND OPERATING COSTS

Even under the best of circumstances, spurious noise and signal degradation can be anticipated. ComPORT cable modems perform error-free and deliver the top-quality service your customers expect—even in all-coaxial systems.

### Robust performance

- Error-free upstream performance at 16dB CNR.
- Dynamic frequency agility—the ComUNITY system detects signal degradation in the upstream channel and frequency hops to alternative channels in high-noise situations.
- FEC—Reed-Solomon Forward Error Correction (FEC) in both upstream and downstream paths minimizes lost data and optimizes overall throughput.

### User-friendly network management

The NMAPS system features easy-to-use screens for managing and provisioning bandwidth and multiple service level allocations. The NMAPS Remote feature also allows operators to manage the system from anywhere in the world with a standard web browser.

Each ComPORT periodically reports performance statistics back to the ComCONTROLLER, allowing NMAPS to detect and isolate network problems. System operators may configure specific performance thresholds to turn on alarms. Fully utilized, this powerful diagnostic system is a proactive network management tool that can reduce maintenance expenses and prevent outages.

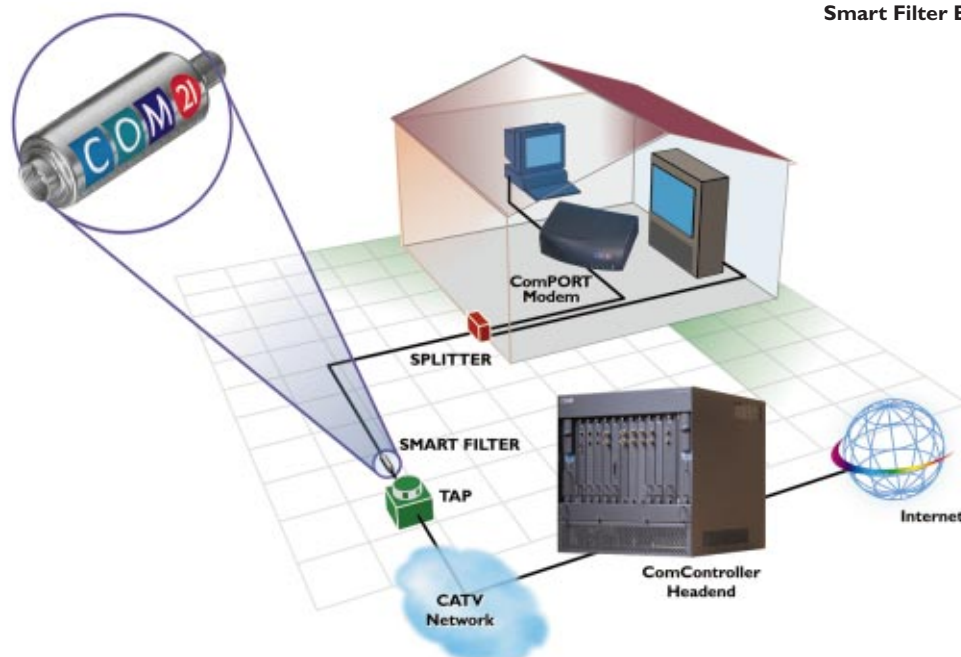
### Ingress Noise Blocker

Com21's Ingress Noise Blocker (INB) is an electronically controlled device that blocks all upstream signals except during

transmission of data by a cable modem or INB-compatible set-top device. The INB is installed at the tap, isolating ingress noise at the home and drop from the return path of the cable plant. It acts as a high pass filter allowing only downstream signals (54-860MHz) to pass when upstream traffic is idle.

### Return Path Multiplexer

The Return Path Multiplexer (RPM) is a high-speed multi-port RF switch used to concentrate eight RF return paths into a single ComCONTROLLER receiver channel. Concentration is accomplished without aggregating system noise from the separate returns and reduces the overall investment in headend cable data equipment required in large HFC deployments.



Smart Filter Blocks Ingress Noise

## THE CoMUNITY ACCeSS PRoDUCT FAmILY

### ComCONTROLLER products

The ComCONTROLLER headend switch is configured as a multi-slot rack mounted chassis that supports up to 2,000 ComPORT cable modems. It performs all transmit (Tx), receive (Rx), I/O and control functions using hot-pluggable modules. The system supports 30Mbps downstream in a 6MHz channel (64 QAM) and multiple 2.56Mbps upstream in 1.8MHz (QPSK) channels.

### ComCONTROLLER 2000

The low-cost ComCONTROLLER 2000 is a six-slot chassis which supports two 2.56Mbps (1.8MHz) upstream Rx modules and is ideal for smaller networks or telephone return deployments.

### ComCONTROLLER 2100

The ComCONTROLLER 2100 is designed for larger deployments. It supports six 2.56Mbps (1.8MHz) upstream Rx modules.

### ComCONTROLLER 2102

The ComCONTROLLER 2102 when combined with the ComCONTROLLER 2100 expansion chassis is used to increase receive channels to twelve for an aggregate upstream capacity of 30Mbps. When fully configured, the combined ComCONTROLLER 2100 and 2102 also support I/O modules.

### ComUNITY Access Product Family



## ComPORT products

The speed programmable ComPORT cable modem delivers 10 Mbps to the user's PC, and transmits RF upstream at either 2.56 Mbps, or by telephone return through the user's dial-up modem. The return path mode is selectable within NMAPS and the ComPORT connects to one computer via 10BaseT Ethernet port or up to eight

via a hub. Its frequency agile transmitter dynamically shifts frequencies in response to network noise and loading, providing continuous availability.

### ComPORT 1000

The ComPORT 1000 cable modem features an expansion-ready slot for application interface modules (AIM), such as:

- IPsec
- IP Voice
- Parallel Port

### ComPORT 2000

The ComPORT 2000 cable modem is a non-expandable, low profile ComPORT without an AIM slot.

## NMAPS products

### NMAPS

The NMAPS Network Management software is a powerful element management system that configures and controls the ComPORT and ComCONTROLLER. NMAPS provides all subscriber provisioning and bandwidth allocation functions, QoS and VPN group provisioning, network performance and fault management, diagnostics and DES encryption. A key feature of the NMAPS system is its ability to perform event correlation diagnostics to proactively detect and isolate network degradation and pre-outage conditions.

NMAPS uses HP Openview and supports up to 50 ComCONTROLLERS. NMAPS is also Web accessible via HTML using the NMAPS Remote feature.

### NMAPS lite

A restricted-license version of NMAPS software to manage a single ComCONTROLLER chassis. All NMAPS features (except for the optional NMAPS Remote and Tools) are supported and each additional license provides support for another ComCONTROLLER. NMAPS lite is ideal for small or growing networks.

## ComCONTROLLER Products



## ComPORT Products



## TECHNICAL SUPPORT AROUND THE CLOCK

At Com21, we know that responsive technical support is key to minimizing any system downtime. We've designed each system element to be user friendly and trouble-free. But when there are problems, we have several levels of support available.

**Level 1 Help Desk**—Available for both 5 x 12 and 7 x 24 service options.

**Level 2 Technical Support**—Provided by Com21 in North America, and by our System Integrator partners internationally.

**Pre-configured headend systems**—Com21 can pre-configure the ComCONTROLLER and NMAPS system to your specifications for ease of installation. Our expert field engineers are also available for on-site assistance.

## WHEN YOU SUCCEED, WE SUCCEED

At Com21, we have focused our technology on the needs of today's cable industry. The resulting product solution is the ComUNITY Access system, designed to perform flawlessly under the rigors of today's cable networks—before, during, and after upgrade to fully interactive HFC networks.

ComUNITY Access will help you:

- Generate the most data-service revenue in both one-way and two-way plants.
- Reduce your overall cost of maintenance with easy-to-use products, robust RF performance, and noise containment technology.

- Serve residential and business markets with a single system.
- Proactively manage plant performance to prevent outages before they occur.
- Prepare for introduction of emerging services with a flexible data network.

Every aspect of the ComUNITY Access system is oriented toward your profitability and operational savings. At Com21, your success is our success.



**Communications for  
the 21st Century**

Com21, Inc.  
750 Tasman Drive, Milpitas, CA 95035  
Phone: 408.953.9701 Fax: 408.953.9299  
<http://www.com21.com>

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