



Fast, Switched, Scalable Ethernet Connectivity to Remote LANs

Innovx FastSwitch Highlights

- Secure, robust ethernet switching for applications where high-quality, high-reliability, security and low-cost are needed.
- Scalable 10/100Mbps connectivity in 9- or 18-port increments, using the existing infrastructure.
- Ideal for remote LAN access applications when used with its companion product, the FastRoute static router, or any other bridge/router device.
- Flexible and secure management options.

Introduction

The Innovx FastSwitch devices provide fast ethernet connectivity for enterprise networks, allowing efficient and secure management of LAN-attached equipment. As part of GDC's Innovx family of products, the FastSwitch offer the high reliability and safety required in mission-critical enterprise environments. FastSwitch can be deployed as a replacement to legacy hubs or in new installations where fast ethernet switching is desired.

Innovx FastSwitch devices are also a cost-effective means of dramatically increasing network performance. FastSwitch reduces collisions and eases congestion problems on existing shared-hub networks. Unnecessary network traffic is eliminated as FastSwitch delivers dedicated bandwidth for each of the ports.

Secure and Managed

FastSwitch devices can be monitored and managed using standard protocols, including Telnet, SNMP, and HTTP (web). Local management via a craft interface is also provided. Management access to the unit is multi-level, password-protected with the additional support of inactivity timers. FastSwitch also features IronGate Security, which provides port-by-port MAC address filtering. For additional security during periods of heightened alert, SNMP and web access may be disabled.

9-Port and 18-Port Models

The FastSwitch 9-Port is a single-width, 7-inch by 9.5-inch Innovx card with nine RJ45 ports. The FastSwitch 18-Port is a double-width, 7-inch by 9.5-inch Innovx card with 18 ports. FastSwitch can operate as a standalone switch or, for greater port density, can employ one or two ports as a logical uplink to another switch/hub device.

Scalable and Integrated

The FastSwitch 9-Port installs in any Innovx shelf or enclosure (*Figure 1*). For higher density applications, the FastSwitch 18-Port installs in the 10-slot Innovx MultiPak enclosure or the 16-slot Innovx High Density shelf. Any Innovx family product card can be co-located with FastSwitch devices, for an integrated and flexible managed shelf environment that is scalable to network requirements.

Figure 1: INNOVX FastSwitch Card:

StandAlone and Rack-mount Options



INNOVX 1000
(1-slot Enclosure)

INNOVX TwinPak
(2-slot Shelf)



INNOVX High Density
(16-Slot Shelf)



Not Shown:
INNOVX MultiPak Enclosure (10 Slots)

Power Supplies FastSwitch Cards FastRoute Cards Compatible INNOVX Product Cards

NETWORK APPLICATIONS

The Innovx FastSwitch provides low-cost, fast ethernet switch connectivity to LANs. The secure and robust FastSwitch can be deployed anywhere within the enterprise network at the central site or data center, or in remote (branch) offices.

FastSwitch allows the segmenting of attached LAN devices to improve network performance and provides a 100Mbps full- or half-duplex channel for servers. It allows a network to be mixed (10 and 100Mbps) for optimal price/performance ratio, and is ideal for relieving bandwidth bottlenecks and providing faster response times. Using ethernet switch technology, FastSwitch supports cabling distances of up to 100 meters by eliminating the propagation delays normally found with hubs/repeaters.

Extending Small and Large Networks

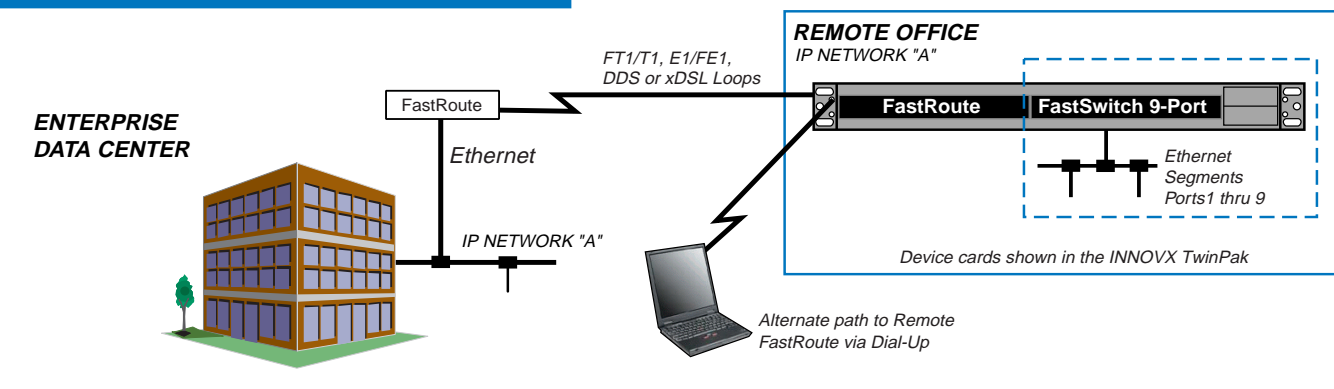
Network operators typically use FastSwitch to extend small or large networks. In a small network application, the FastSwitch is installed at the remote site with one of the Ethernet ports connected to any router or bridge at that site. The remaining FastSwitch ports may be used to connect additional LAN devices at that site.

In large enterprise networks with multiple sites, FastSwitch can provide connectivity from a central site all the way out to multiple remote sites. Router/bridge functions can be provided by customer equipment or by Innovx FastRoute, a companion product to the Innovx FastSwitch.

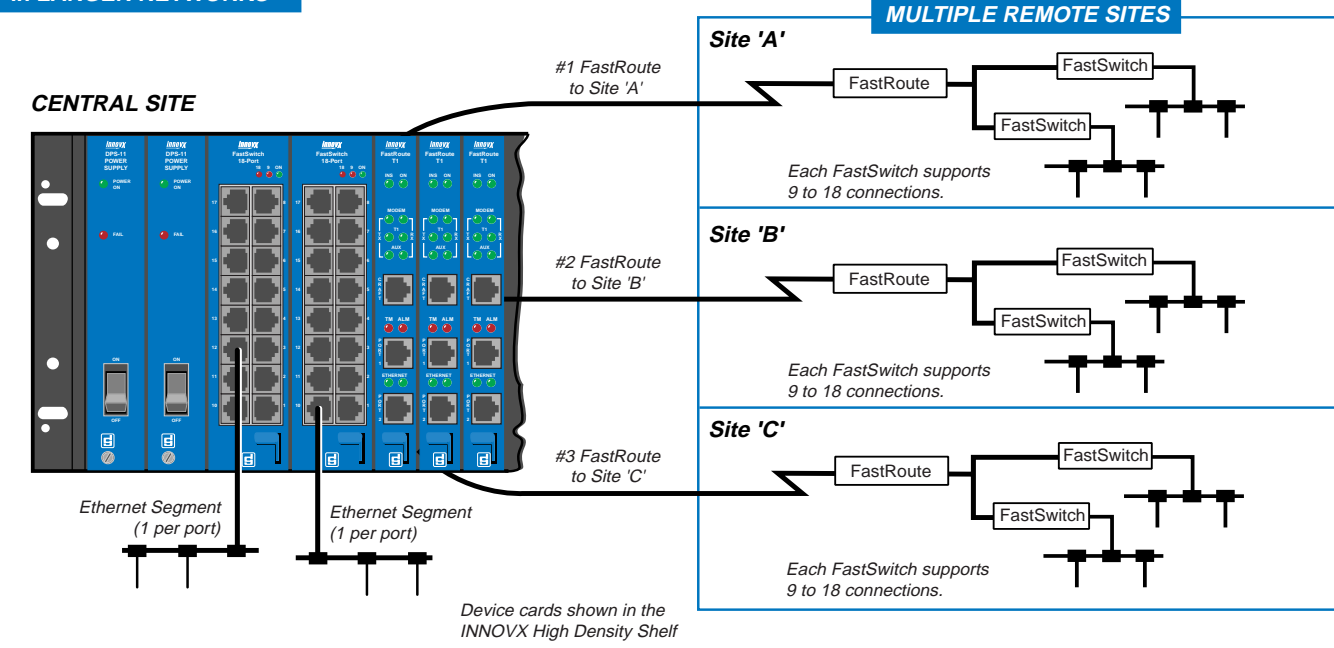
Figure 2 demonstrates FastSwitch and FastRoute devices extending small and large enterprise networks.

Figure 2: SCALABLE ETHERNET CONNECTIVITY

FastRoute and FastSwitch in SMALL NETWORKS



in LARGER NETWORKS



ADDITIONAL FEATURES

- Employs GDC's 'Smart CLI', an interactive command line interface, and the web-based CLI interface.
- Allows direct switch-to-switch connection via the Auto-Sense feature which detects and corrects for crossover cables.
- Auto-negotiates for 10 or 100 Mbps port speed, full- or half-duplex modes and enabled/disabled flow control.
- Employs GDC's IronGate Security for port-by-port MAC filtering via a user-defined list of authorized MAC addresses.
- Auto-learns network addresses for up to two thousand unicast MAC addresses and builds connections between network elements.
- Full redundancy and loop elimination with standards-based Spanning Tree Protocol (STP)
- Efficient configuration of multiple FastSwitch devices via ASCII batch file upload/download.
- Responds to HPOV polling and Auto Discovery
- High performance 'run from ram' architecture includes Running, Primary and Standby versions of software.
- Software can be upgraded via standard TFTP.
- In a future release, the Innovx FastSwitch will support:
 - QoS Configuration for prioritization of traffic.
 - Port-based VLANs for port partitioning.

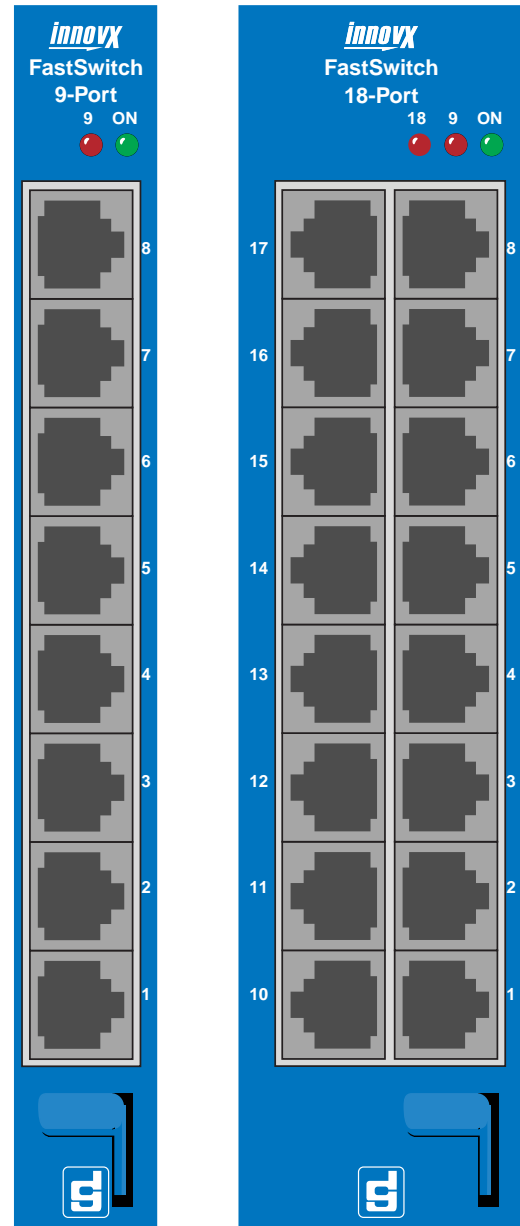
Reliable, Robust GDC Engineering

General DataComm's rigorous engineering standards for network access products serves the stringent performance and cost requirements of mission-critical enterprise networks. The GDC Innovx family of products conform to the robust and proven Innovx packaging scheme for product cards, shelves and enclosures. Each Innovx component is designed and tested for reliable connectivity that exceeds MTBFs of 150,000 hours.

Flexible and Scalable

Any compatible Innovx device can be co-located in the shelf with Innovx FastSwitch cards, providing a unified, flexible, managed shelf environment that is scalable to your enterprise network requirements. Typical shelf configurations can combine the Innovx FastSwitch with the Innovx FastRoute cards, the Innovx View manager, and the Innovx SurePath family of access cards: SurePath T1 DSU, SurePath T3 DSU, SurePath DDS, and SurePath V.34 modems.

Innovx FastSwitch Devices (9-Port and 18-Port)



MANAGEMENT INTERFACES

FastSwitch configuration is managed through SMART CLI, an interactive command line interface. Using CLI an authorized user can monitor or configure any FastSwitch in the network from a terminal or Telnet connection or through any popular web browser. Using an embedded SNMP agent, authorized users have access to the unit via any standard SNMP controller.

Secure Access and Protection

Management access is protected by several robust security features:

- User- and Supervisor-level password protection authorizes every access attempt.
- Inactivity logoff prevents hacks through 'left on' equipment
- Enable/disable of SNMP, HTTP, and TFTP services deters hacking through these protocols.
- Enable/disable management traffic by interface.
- Enable/disable TACACS+ protocol.
- Enable/disable MAC Security.

Centralized and Versatile Options

The illustration (right) demonstrates centralized management of an Innovx system in an enterprise network. From the central site, units are accessed via the desired interface: Terminal or Telnet CLI, Web-based CLI, or SNMP.

SMART CLI Features

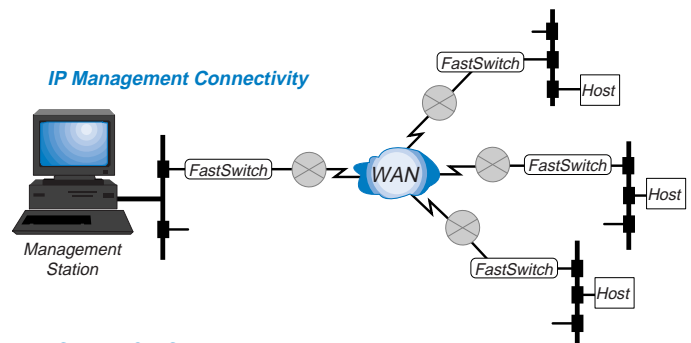
General DataComm's SMART CLI has a look and feel that will be familiar to most field personnel, with the benefit of several enhancements over most standard CLIs, such as:

- Recognition and auto-expansion of abbreviated commands and sub-commands.
- Auto-prompts for required command arguments.
- General help at the command prompt.
- Context-sensitive help at the command string.
- Command line recall of previous commands.
- Generates downloadable ASCII configuration files.
- FastSwitch upgrades via TFTP downloads of software versions and configuration data.
- Command line entry from a Telnet or terminal connection, or a standard web browser.

Statistics

The Innovx FastSwitch accumulates statistics for each port. Displayed at the command line interface, these statistics help in troubleshooting network problems and measuring network performance.

Centralized and Versatile Access



Sample CLI Screen

```
FASTSWITCH% configure
Type "configure ?" for a list of subcommands
FASTSWITCH% configure ?
Help for "configure"
accounts  Configure usernames and passwords; clear login statistics
banner    Configure login banner
inactivity Configure inactivity timer; requires 1 parameter(s)
mgt        Configure management parameters
mirroring  Configure port mirroring parameters
ports      Configure port parameters
prompt     Configure custom prompt; requires 1 parameter(s)
security   Configure port security parameters
snmp       Configure SNMP server parameters
switch     Configure ethernet switch parameters
tacacs+    Configure TACACS+ query parameters
time       Configure time service parameters
FASTSWITCH% configure _
```

Sample Web Screens

INNOVX FastSwitch	
YOUR SYSTEM NAME (172.16.5.127)	
clear	Reset functions
configure	Configure system parameters
help	Description of the command line interface and help system
show	Show system parameters
reboot	Halt and perform a reboot
services	Show/Enable/Disable HTTP, SNMP, & TFTP Services

INNOVX FastSwitch			
Statistics for Port 1			
RX Octets:	3936583	TX Octets:	147368
RX Undersize Packets:	0	TX Dropped Packets:	0
RX Pause Packets:	0	TX Broadcast Packets:	44
RX 64 Octet Packets:	49518	TX Multicast Packets:	0
RX 65-127 Octet Packets:	5997	TX Unicast Packets:	1844
RX 128-255 Octet Packets:	647	TX Collisions:	0
RX 256-511 Octet Packets:	459	TX Single Collisions:	0
RX 512-1023 Octet Packets:	0	TX Multiple Collisions:	0
RX 1024-1522 Octet Packets:	1	TX Deferred Transmit:	0
RX Oversize Packets:	0	TX Late Collisions:	0
RX Jabbers:	0	TX Excessive Collisions:	0
RX Alignment Errors:	0	TX Frame In Disc:	0
RX FCS Errors:	0	TX Pause Packets:	0
RX Good Octets:	3936583	Admin State:	On
RX Dropped Packets:	0	Link Status:	Up
RX Unicast Packets:	2387	Auto Negotiate:	Enabled
RX Multicast Packets:	5521	Flow Control:	Disabled
RX Broadcast Packets:	48714	Port Speed:	100
RX SA Changes:	51438	Duplex Status:	Full
RX Fragments:	0	MDIX Status:	MDIX
RX Excess Size Disc:	0	Channel Polarity:	Normal
RX Symbol Error:	0		

Physical & Electrical Specifications

FastSwitch 9-Port Dimensions

Width: 178 mm (7.0 in.)
Height: 21 mm (0.81 in.)
Depth: 241 mm (9.5 in.)

Weight: 0.28 kg (10 oz.)
Shipping weight: 0.74 kg (1 lb 10 oz)

FastSwitch 18-Port Dimensions

Width: 178 mm (7.0 in.)
Height: 42 mm (1.62 in.)
Depth: 241 mm (9.5 in.)

Weight: 0.33 kg (12 oz.)
Shipping weight: 0.78 kg (1 lb 12 oz)

Environmental Specifications

Non-Operating
Temperature: -40 to 70 degrees C (-40 to 158 degrees F)
Relative Humidity: 5% to 95%
Altitude: up to 12,191 m (40,000 ft)

Operating
Temperature: 0 to 40 degrees C (32 to 104 degrees F)
Relative Humidity: 5% - 90% non-condensing
Altitude: -60 to 4,000 m (-197 to 13,123 ft)

Electrical Specifications

Electrical Characteristics:

Power Requirements: AC power, according to your Innovx shelf/enclosure configuration.
Voltage/Frequency: 100 to 240 VAC, determined by your Innovx shelf/enclosure.
Fusing: Determined by your Innovx shelf/enclosure.
9-Port Power Dissipation: 6 Watts maximum
18-Port Power Dissipation: 9 Watts maximum

Compliance & Compatibility

Safety: UL Listed, CUL Listed
EMI: FCC Part 15 Class A Approved
Immunity:
IEC-61000-4-2 ESD, IEC-6100-4-5 Surge
Quality Assurance:
The MTBF reliability shall be greater than 150,000 hours per BELLCORE TR-232.

Operational Specifications

Modes of Operation

As a Standalone Switch providing 9- or 18-port connectivity.

For greater port density requirements, one or two ports can be used as logical uplinks to another switch/hub device.

Physical Interfaces

Rear Panel Craft Port:
TIA/EIA-232

Front Panel Ethernet Ports (8 or 16 ports):
RFC1213 MIB-2; RFC1643 Ethernet-like MIB; RFC 1493 Bridge MIB
IEEE 802.3, 802.3U, 802.3x providing compatibility with all industry standard Ethernet and fast Ethernet devices.

Rear Shelf Slot Ethernet Ports (1 or 2 ports):
Can be used as logical uplinks;
Same specifications as for Front Panel ports.

Statistics

RX and TX Octets
RX and TX Pause Packets
RX and TX Dropped Packets
RX and TX Unicast Packets
RX and TX Multicast Packets
RX and TX Broadcast Packets
RX Undersize/Oversize Packets
RX Jabbers
RX Alignment Errors
RX FCS Errors
RX SA Changes
RX Fragments
RX Excess Size Disc
RX Symbol Error
TX Collisions
TX Deferred Transmit
TX Frame In Disc

Management Options

Command line interface via VT-100 compatible terminal

Command line interface via Telnet and web-interface

HTTP interface via embedded web-server agent using PC browser (HTML and JAVA 1.1 supported)

SNMP support for standard statistics.

Security

Username and Password access

Multi-level Permissions: User (Read-only), Supervisor (Read-Write) or Administrator (Read-Write and special functions)

Individual disabling of HTTP, SNMP and/or TFTP access

HTTP, Telnet and TFTP timeouts

Port-by-port security via MAC filtering.



General DataComm

The Best Connections in the Business

GDC Professional Services

General DataComm has field-proven experience in the successful deployment and maintenance of voice and data networking equipment. Flexible and responsive to your specific needs, General DataComm provides nation-wide installation, maintenance and product repair services for the complete line of Innovx network access cards, shelves, enclosures and compatible products.

Installation Services

GDC offers fast and effective installations of its products nation-wide, along with services such as project management, coordination, staging, field installation and network testing.

Maintenance Plans

To maximize uptime, GDC offers a range of guaranteed maintenance response plans: two- four- or eight-hour and next day on-site service. On-site maintenance may also be purchased on a T&M basis.

Extended Warranty

GDC provides extended warranties on new and used equipment for customers who prefer to perform their own product maintenance. A wide choice of extended warranty plans cover hardware and software repair beyond the standard warranty period.

Factory Direct Training

General DataComm provides customer operator training on GDC products and applications. Unlike most industry-offered training which delivers off-the-shelf, packaged training programs, GDC creates a custom training solution to fit your specific needs in terms of course content and duration.

Factory Direct Repair

General DataComm provides regular and warranty repair at its factory Direct Repair center in Naugatuck, Connecticut. Standard factory service includes repair within 10 business days of receipt at the repair center. Expedited services are available on request.

Contact GDC

GDC Professional Services

Phone: 1-800-523-1737

Fax: 1-203-723-2883

Email: clientservices@gdc.com

GDC Factory Direct Repair

Email: factorydirect@gdc.com



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