AN/FCC-100 Multiplexer

The Workhorse of Tactical Communications

- SNMP Support
- Maximize Bandwidth
- Voice, Video and Data Traffic
- Legacy Support
- Crypto Support
- Unique Tactical Interfaces
- Variety of Accessories and Spares Available
- Newly Redesigned Cards Eliminate Obsolescence Issues

Overview

DNE Technologies has a tradition of building rugged, reliable voice/data multiplexers for military and secure applications. The AN/FCC-100(V)9/9X is the newest version of the DNE tactical multiplexer family and delivers compressed voice communications, flexible data interfacing, and support for centralized system management, including new SNMP management capability.

The AN/FCC-100(V)9/9X is a 7" high multiplexer which supports up to sixteen user interfaces and mounts in a 19" EIA rack or optional tactical case.

A wide variety of user interfaces and data rates are supported, allowing most types of communication to be transported economically over a single satellite or microwave radio link. The AN/FCC-100(V)9/9X supports both digital and analog (VF) user interfaces which may be mixed as required to meet specific system requirements. The (V)9 operates on 110/220 VAC, 50-60 Hz, and the (V)9X operates on 110/220 VAC, 50-400 Hz or 28 VDC or 48 VDC. The (V)9X also supports automatic fallback to DC power when AC line power is removed.

A new feature of the AN/FCC-100(V)9/9X is SNMP management. The AN/FCC-100(V)9/9X SNMP agent is compatible with popular SNMP management packages, such as HP OpenView™. DNE's SNMP management agent supports central supervision of configurations and alarms over the communications network.

With the AN/FCC-100(V)9/9X, the SNMP manager can edit configurations off-line and then download the configuration to a remote multiplexer before activating the configuration across a link. Errors within the communication network are reported to a central location.

Users of earlier versions of the AN/FCC-100 will note that most data rates and traffic types continue to be supported, making the AN/FCC-100(V)9/9X backward compatible with a majority of older units. Upgrades may be available to bring earlier versions up to the current (V)9/9X revision. Contact DNE for more details regarding available upgrades for your particular version.

Ultra ELECTRONICS

Overview

The release of the AN/FCC-100(V)9/9X also incorporated a number of design changes, aimed at increasing the reliability of the unit by replacing key components whose obsolescence was imminent. The redesign allowed support of the AN/FCC-100 to keep pace with the continuing demand for its use in large communication applications. The new AN/FCC-100(V)9/9X incorporates a more powerful microprocessor, a more robust cooling fan, and an LCD display front panel, as well as a number of component changes.

In 2002, DNE also began a program to update a number of interface cards for the AN/FCC-100. The cards have undergone significant redesign to prevent obsolescence and to increase reliability through the use of fewer components. Frequent users of the AN/FCC-100 will note significant cosmetic differences between older interface cards and newer cards shipped in 2002 and later. These newly redesigned cards are completely interoperational with older, installed cards yet are form, fit and function replacements with no discernable difference to the operator.

Since the configuration of the AN/FCC-100(V)9/9X is dependent on user-specific system requirements, DNE suggests contacting the factory or your local sales representative to discuss the unique configuration needed for your application.

SNMP Management

The AN/FCC-100(V)9/9x has new network management capabilities, using a third party Simple Network Management Protocol (SNMP) software, such as those available from Hewlett-Packard, Novell, or Sun Microsystems. These types of SNMP management packages allow the AN/FCC-100(V)9/9X multiplexer to report on alarms and allow multiplexers to be configured remotely, facilitiating network management from one centralized location.

A Management Information Base (MIB) has been created for the AN/FCC-100(V)9/9X which defines relevant status information and reports it to common management software. The MIB provides slot configuration information for all DNE AN/FCC-100(V)9/9Xs connected to the network, and supports traps and ping testing.

Interoperability

DNE has made efforts to preserve backward compatibility with previously fielded units despite a number of redesigns throughout its lifespan. All DNE AN/FCC-100(V)9/9X multiplexers will communicate with older versions at the rates supported by the older units.

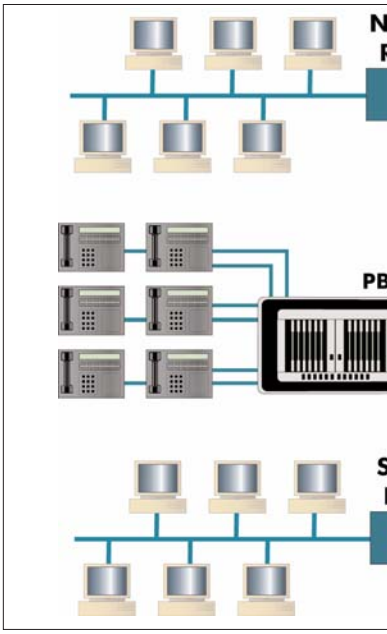
Frequent AN/FCC-100 operators will notice a number of cosmetic changes to the internal interface cards. There is no change in the functionality or compatibility of the individual cards and all are interoperable with older versions.

Additional Options:

The AN/FCC-100(V)9 & (V)9X are supported by a number of options designed to enhance its use in tactical environments. These options include:

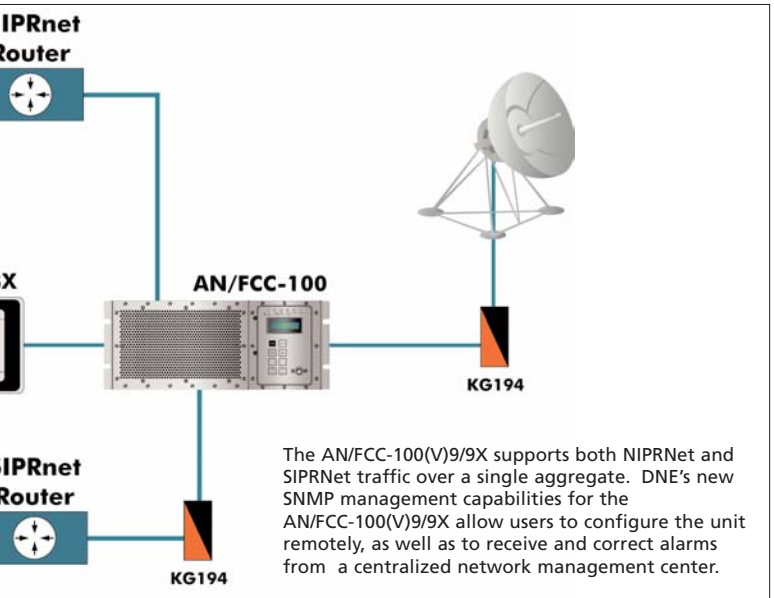
- Transit case with shock mounting
- Transit case for mux and spares drawer
- Connectorized rear panel with UG-1837 connectors for use with CX-11230 cables. Includes lightning protection on TRI-TAC interfaces
- Quick-connect push connectors for field wire
- BNC adapter cables
- AC/DC power supply with wide range input selection.

Upgrades to older units may also be available. Contact DNE for details.



Product	Ports (Types/Max. Rate)	Aggregate	
AN/FCC-100(V)1 & (V)1X	Sync, Anisoc, CDI Up to 64 kbps	NRZ, CDI Up to 256 kbps	Origin AC/DC
AN/FCC-100(V)2 & (V)2X	Sync, Anisoc, CDI, CVSD, PCM Up to 64 kbps	NRZ, CDI Up to 256 kbps	Added AC/DC
AN/FCC-100(V)4 & (V)4X	Sync, Anisoc, CDI, CVSD, PCM, Telemetry Sub-multiplexer Up to 64 kbps	NRZ, CDI Up to 256 kbps	Added AC/DC
AN/FCC-100(V)3X	Sync, Anisoc, Async, CDI, CVSD, PCM Up to 512 kbps	NRZ Up to 2,048 kbps	TEMP AC Pr
AN/FCC-100(V)5 & AN/FCC-100(V)6	Sync, Anisoc, Async, CDI, CVSD, TRI-TAC, PCM Up to 576 kbps	NRZ, TRI-TAC Up to 2,048 kbps	9597((V)5 5 (V)6 5
AN/FCC-100(V)7 & AN/FCC-100(V)8	Sync, Anisoc, Async, CDI, CVSD, TRI-TAC, PCM 2/4 wire compressed voice Up to 1152 kbps	NRZ, TRI-TAC Up to 2,048 kbps	(V)7 A (V)8 A Added
AN/FCC-100(V)9 & (V)9X	Sync, Anisoc, Async, CDI, CVSD, TRI-TAC, PCM 2/4 wire compressed voice Up to 1152 kbps	NRZ, TRI-TAC Up to 2,048 kbps	Added Capab

The table above offers a quick comparison of the AN/FCC-100 versions. Early vers aggregate rate of only 256 kbps and are not upgradable to today's aggregate of 2048 kb AN/FCC-100 can communicate with today's versions at a maximum rate of 256 kbps.



The AN/FCC-100(V)9/9X supports both NIPRNet and SIPRNet traffic over a single aggregate. DNE's new SNMP management capabilities for the AN/FCC-100(V)9/9X allow users to configure the unit remotely, as well as to receive and correct alarms from a centralized network management center.

Comments	Upgrade
al LSTDM C Primary Power	(V)2 or (V)4
d voice capability C Primary Power	(V)4
d Telemetry Sub-Mux C Primary Power	None
EST Certified imary Power	(V)9 or (V)9X
0000 CDI Muxes 0-60 Hz 0-400 Hz	(V)9 or (V)9X
C Primary Power C/DC Primary Power d 2 wire voice and VF compression	(V)9 or (V)9X
d SNMP Management ility	Current version

sions of the AN/FCC-100 had a maximum
ps. However, earlier versions of the

Aggregate Interfaces

The multiplexed signal (aggregate) is user-specified as either synchronous MIL-STD-118-114A, RS422/423 or TRI-TAC conditioned diphase (CDI). The synchronous interfaces support a crypto resynchronization capability for circuits that require bulk encryption of the user data.

System timing capabilities are very flexible, supporting virtually all conceivable configurations. The aggregate on the AN/FCC-100(V)9/9X also provides full duplex with asymmetric transmit and receive rates. For satellite applications, the AN/FCC-100(V)9/9X incorporates a user-defined aggregate satellite buffer to offset the timing variations associated with diurnal variations in the satellite's signal. The unit also supports simplex rates on the aggregate.

When the multiplexers are configured for TRI-TAC interfaces, timing from Port 16 can be selected to time the multiplexer aggregate interface. The TRI-TAC interfaces have also been proven to work with MSE equipment, providing interfaces to MSE that could not normally be supported.

Timing:

Timing to the AN/FCC-100(V)9/9X can be derived through either NRZ or CDI connections. NRZ timng is supported in both the asymmetric mode or the equirate mode. CDI timing is equirate.

NRZ asymmetric Transmit timing supports four sources, including Internal, Tx Clock In, Rx Clock In and Aux Clock In. Asymmetric Receive timing supports Internal, Rx Clock In and Aux Clock In. NRZ Equirate transmit timing also supports Port 16 Tx Clock In.

CDI Equirate timing supports Internal, Rx Clock, Aux Clock and Port 16 Tx Clocking.

Data Rates:

The AN/FCC-100(V)9/9X can be configured with up to eight interface option cards. Each port carrier interface offers a Balanced 124 ohm, MIL-STD-188-114A connector and an Unbalanced MIL-STD-188-114A connector.

Data rates can be configured with synchronous, CDI, asynchronous, isochronous, and T-CDI at both low-speed and high-speed rates. Data rates supported will depend on the configuration option chosen for each interface slot, but each configuration option offers a wide range of data rates from which the user can choose to maximize the efficiency of the communications link.

User Interfaces

The AN/FCC-100 supplies a CDI interface which provides phantom power and transformer coupled interfaces to phones up to 2km away from the multiplexer, eliminating the need for a separate power supply.

Two and four wire analog voice port devices provide support to a wide range of telephone equipment, including standard telephones, facimile machines, modems, and the STU-III. An optional voice compression module compresses the digitized analog signal from 64kbps to user-selectable rates of 2.4, 4.8, 9.6, 12.8, 14.4, or 16kbps, providing significant bandwidth conservation. STU-III telephone calls can be compressed while in clear mode, while allowing the VF module's modem relay capability permits enrypted voice to use the compressed clear channel with no increase in bandwidth requirements.

Compatibility

Other DNE products are available for use with the AN/FCC-100(V)9/9X, including:

CV Series of NRZ/CDI/Fiber Optic converters that extend cable lengths and better position encryption equipment, video cameras and routers; and

DNE TAC Multi-Service Access Concentrators that provide multiservice ATM access at rates of up to 155Mbps OC-3/STM-1 or 20 Mb Serial.

	AN/FCC-100(V)9	AN/FCC-100(V)9X
Aggregate	The AN/FCC-100 aggregate supports up to 16 user interfaces. The aggregate provides full duplex with asymmetric Tx and Rx rates, as well as simplex.	
Aggregate Drivers Low Speed: T-CDI Low Speed: T-CDI High Speed:	The AN/FCC-100(V)9/9X can be configured with the following Aggregate Drivers: MIL-STD-188-114A, 1.2 to 384kbps, RS-422-A/RS-423-A; EIA Standard, Rates to 2,048kbps Conditioned Diphase Unbalanced, 16, 32, 56, and 64kbps Conditioned Diphase Balanced, 72, 128, 144, 256, 288, 512, 576, 1024, and 2048kbps	
Aggregate Rates Synchronous NRZ: CDI Low Speed: CDI High Speed:	Aggregate Data Rates are dependent on Driver Selection (all rates are kbps): 1.2, 2.4, 4.8, 7.2, 9.6, 14.4, 16, 16.8, 19.2, 24, 28.8, 32, 38.4, 48, 50, 56, 57.6, 64, 72, 76.8, 96, 112, 115.2, 128, 144, 153.6, 192, 224, 230.4, 256, 288, 307.2, 384, 448, 512, 768, 1024, 1344, 1536, 1544, 1920, 2048 16, 32, 56, 64 72, 128, 144, 256, 288, 512, 576, 1024, 2048kbps.	
Asynchronous Control Terminal Rate	75, 150, 300, 600, 1200, 2400, 4800bps.	
Synchronous Port Timing	Fully independent transmit/receive: internal, external, local and remote using asymmetric NRZ aggregate.	
Satellite Buffer	Variable Length on Rx and Tx Aggregate, set to: 0, +/- 4, +/-8, +/-16, +/- 32, +/- 63	
Interfaces **Port Carrier:** Synchronous: CDI: Asynchronous: Isochronous: T-CDI Low Speed: T-CDI High Speed:	The AN/FCC-100(V)9/9x can be configured with up to eight interface option cards: Balanced 124 ohms, MIL-STD-188-114A, Unbalanced MIL-STD-188-114A. Port Carrier Data Rates depend on Options Selected (specify): 50, 75, 150, 300, 600 bps. 1.0, 1.2, 1.8, 2.0, 2.4, 3.0, 3.6, 4.0, 4.8, 7.2, 8.0, 9.6, 12, 14.4, 16, 19.2, 24, 28.8, 32, 38.4, 48, 50, 56, 57.6, 64, 72, 76.8, 96, 112, 115.2, 128, 144, 153.6, 192, 224, 230.4, 256, 288, 307.2, 384, 512, 768kbps. 75, 150, 300, 600 bps 1.2, 2.4, 4.8, 7.2, 8.0, 9.6, 16, 19.2, 24, 32, 64, 96kbps 50, 75, 110, 134.5, 150, 300, 600bps, 1.2, 1.8, 2.0, 2.4, 3.6, 4.8, 7.2, 9.6, 19.2kbps <18.75, <75, <150, <300, <600, <1.2, <2.4, <4.8kbps 16, 19.2, 32, 56, 64kbps 72, 96, 128, 144, 153.6, 192, 230.4, 256, 288, 307.2, 384, 512, 576, 1024, 1152kbps	
Voice Compression: CELP: STU-III: LD-CELP Secure: Low-Speed T-CDI: High Speed T-CDI:	Three optional voice compression interfaces are available: FXS, FXO and 4-wire E&M. Each of these interface cards provide 600 or 900 ohms balanced connections, and 2 PCM Channels at 64 kbps compression (each) Each interface can be ordered with up to two of the following three option cards: 4.8, 7.2, 9.6kbps with Group III Fax (or STE in STU-III mode) clear voice, 2.4kbps LPC, 4.8, 9.6kbps (CELP) 12.8, 14.4, 16 kbps 125 ohms, balanced only, Port Mark Sense: user programmable, positive or negative Port Clock Source: user programmable, internal or external for transmit and receive 125 ohms, balanced only, Port Mark Sense: user programmable, positive or negative Port Clock Source: user programmable, internal or external for transmit and receive	
NRZ Timing: Asymmetric: Equirate: **CDI Timing:** Equirate:	 Transmit: Internal, Rx Clock In, Tx Clock In, Aux Clock In Receive: Internal, Rx Clock In, Aux Clock In Transmit: Internal, Rx Clock In, Tx Clock In, Aux Clock In, Port 16 Tx Clock In Internal, Rx Clock, Aux Clock, Port 16 Tx Clock	
Dimensions	6.97"H x 18.31"W x 23.19"D, 70 pounds	6.97"H x 18.31"W x 25.31"D, 70 pounds
Temperature:	Operating: 0 - 49 deg C Storage: 0 - 65 deg C for all AN/FCC-100(V) 9/9X models	
Power	115 VAC or 230 VAC, single phase 47-63 Hz	115 VAC or 230 VAC, single phase, 47-400 Hz, 48 VDC or +24 VDC

Ultra Electronics
DNE TECHNOLOGIES
50 Barnes Park North
Wallingford CT USA 06492
Tel: (203) 265-7151 Toll Free: (800) 370-4485
Fax: (203) 265-9101 info@ultra-dne.com
www.ultra-dne.com

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