



## CV-MCU Protocol Converter

Interchangeable Modules Provide Low Cost Upgrade Path

- Universal Durable Chassis
- Supports Fiber and Copper
- Rates to 16.384Mb
- NRZ to CDI Protocol Conversion
- Hot-Swappable
- Wide Range of Module Capabilities
- Two Individual Circuits per Chassis can be Mixed and Matched by Application

### Overview

DNE's new Protocol Converter Multi-Channel Unit (CV-MCU) product line brings a new, versatile concept for upgrading and maintaining communication vans and shelters: flexibility. DNE's CV-MCU protocol conversion product line allows functionality to be upgraded without unranking and recabling the chassis. Individual circuit modules - two per chassis - are hot-swappable and independently configurable for greatest system continuity. The modular design of the CV-MCU allows the user to mix and match circuit types within the same chassis, providing the lowest total cost of ownership on the market.

Today's communications systems are changing almost daily, needing higher speeds, smaller footprints, and more robust features. Legacy systems may require a copper CDI modem, today's systems may utilize 16Mbps fiber links, and tomorrow's system will require new technology insertions. The CV-MCU chassis is installed only once, allowing van cabling and rack-mounted modules to remain permanent, while the functionality of each circuit is designated by the user.

A wide variety of options for CDIM and FOM protocol conversion are offered to enable the user to custom-configure circuit fiber types, speeds, and protocols as needed.

CV-MCU modules can be configured quickly to address a range of applications including converting encryption interfaces to CDI and circuit extensions over CDI or fiber spans up to 30 km. Each module also supports most circuit timing and data mark sense configurations. In addition, the CV-FOM option modules allow interoperability with JTC3A 9109C compliant units such as ITT's GSC-54 and Northrop Grumman's MD-1272.

## Overview

The DNE CV-MCU chassis can mix and match application circuits - for example, owners of a deployed CV-8448-D unit can also host a CV-FOM converter circuit - as a replacement to or in conjunction with the existing equipment. This capability allows the user to upgrade or replace functionality on an as-needed, per-circuit basis, without recabling or powering down the system.

Each chassis offers two Balanced DB-9 connectors, four Sub-Triax Unbalanced connectors, and four optical ST-style connections - two per installed module. All circuits accept five timing sources and offer two loopback states, allowing for testing of both the local circuit and the far end terminal.

All CV-MCU units can be accessed through the rear configuration port of the CV-MCU rack-mount chassis.

## CV-MCU Chassis:

DNE's versatile CV-MCU chassis houses interchangeable option modules, allowing the user to configure each individual circuit as needed. Upgrades can be made with a simple module exchange, while the chassis remains rack-mounted and cabled.

Each CV-MCU chassis provides for two independently configurable circuit modules, which can be programmed through a DB-9 terminal connection on the rear of the chassis. Two chassis can be daisy-chained together to allow up to four individual circuits to be programmed from one terminal.

Existing CV-8448 modules can share a chassis with a CV-FOM module. Each individual circuit can be upgraded as needed without un-racking and rewiring a new unit.

## Loopbacks

Loopbacks are provided on the CDI, NRZ, and Fiber interfaces on both the near-end and far-end terminal. This loopback function allows the local unit to be tested along with the far end terminal through cabling via a single unit. Using this function at each terminal independently allows unit checks to be done.

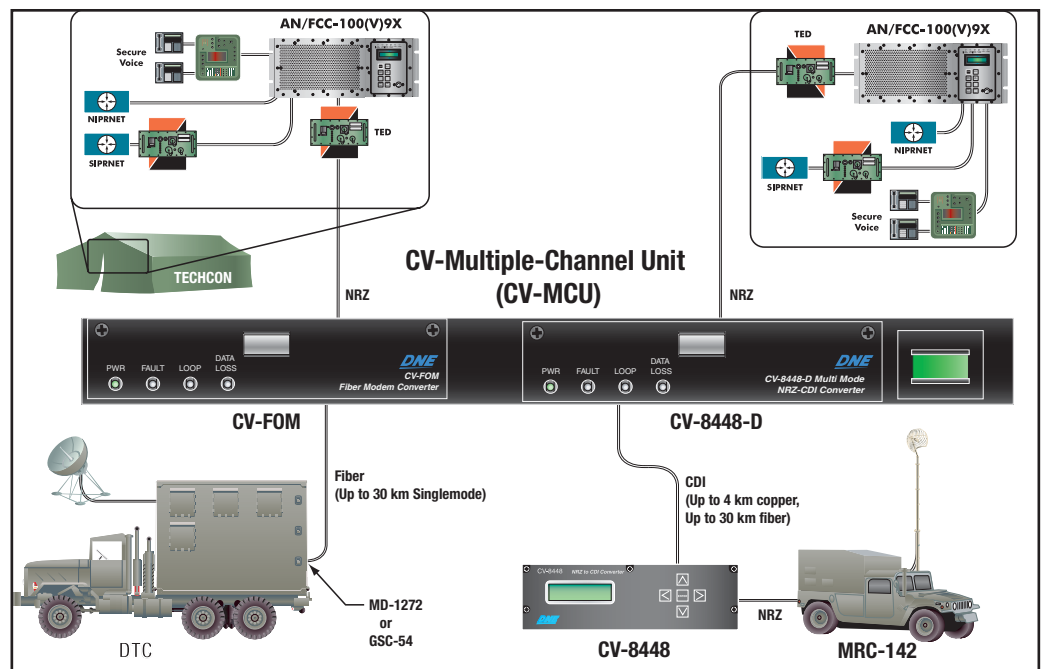
The CV-MCU modules can also be configured to be a CDI repeater. The unit can take a CDI copper interface and output it on the CDI fiber interface, thereby increasing the drive distance.

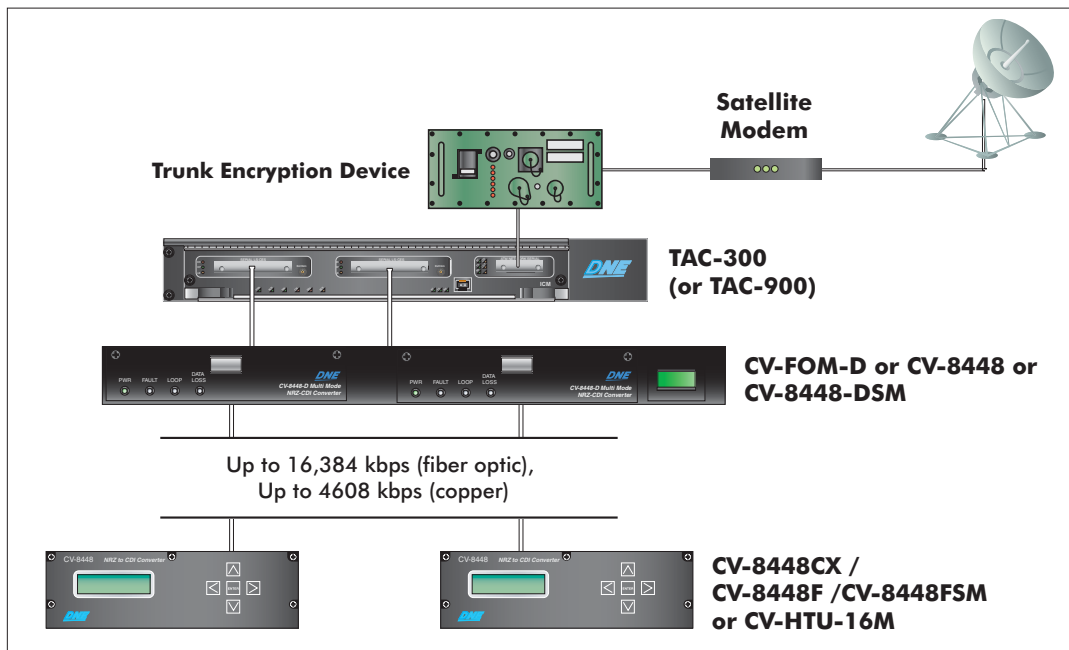
## Additional Features

The CV Products offer a variety of additional features that focus on operational flexibility and reliability such as user-selectable data mark sense (normal or inverted), auto baud, alarms, and parameter diagnostics.

Features new to the CV-FOM modules include an Auto-Baud Detect, a Built-In Bit Error Rate Test (BERT), and a user-selectable DTE/DCE option to minimize recabling requirements. The CV-FOM modules also offers a tracking option designed to recover timing from the CDI reference of EPLRS radios.

► **The CV-MCU Product Line can be used for both NIPRNet traffic and SIPRNet traffic.** The CV units allow the operator to use CDI protocols between two NRZ devices (such as cryptos, routers, and multiplexers) to increase the distance between the transmission point and the communications center.





▲ **The CV Converter units are interchangeable**, and compatible with DNE's TAC and PacketAssure product lines. This allows multiple services to be encrypted, and transmitted several kilometers from the satellite link.

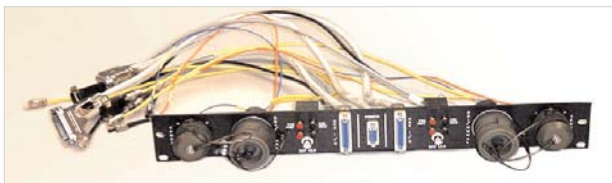
## Universal Fiber Connectivity

The CV-FOM module fiber connections are supported through a universal 9/50/62.5 ST connector for maximum flexibility with minimum recabling.

## CV-FOM Modules:

Each module in the CV option family are independent NRZ to CDI converters mounted side by side in a 1-U high rack mount chassis. Each individual converter module offers Balanced, Unbalanced and Fiber CDI connectors, and can be configured independently through a single data terminal at the rear of the chassis. Each module is field-replaceable and hot-swappable.

## Tactical Interface Panel



Ultra-DNE offers a tactical interface connector panel for use with the CV-MCU chassis. This connector panel features TFOCA™ or TFOCA-II™, UG-1837, and push pin connectors. The copper signal CDI Interfaces also features lightning surge protection. All cables are connected from the factory for use as a front- or rear-mount panel. Features include:

- ▶ Optical Fiber conversion from ST to TFOCA or TFOCA-II (*Version must be specified at time of order*)
- ▶ Unbalanced CDI conversion from Sub-Triax to UG-1837
- ▶ Balanced CDI conversion from DB-9 to Quick-Connect Pins
- ▶ Extends NRZ, Configuration Port and External clock connections from MCU chassis to connector panel.

## Cable Options

The CV-MCU supports lightweight, low density cables that are commercially available, easily formed and simple to install. Cables available include a CV-2048M adapter kit, Red/Black cables, and a rear connector panel assembly for tactical installations.

## Timing:

The CV-MCU is a versatile unit with modules that accept timing from five sources: NRZ, CDI (Copper), CDI (fiber), External Clock In, and Internal Clock. The external timing input port is a BNC connector on all units.

In addition, the FOM module supports Receive Fiber, and offers an optional high-margin tracking selection for EPLRS support.

DNE's CV-FOM option modules are fully compatible and interoperable with JTC3A 9109C Fiber Optic Modems, such as the GSC-54 and the MD-1272, while preserving inter-operability with DNE's complete protocol converter line.

With the CV-FOM modules, the CV-MCU can support currently deployed programs such as the US Marine Corps' Digital Tech Control (DTC) and the US Army's Brigade Subscriber Node (BSN).

Operation of the CV-FOM modules is divided into CV mode and FOM mode. In CV mode, the unit performs all functions of DNE's CV-8448 units. The CV-FOM-D Module can interoperate with legacy FOM equipment at rates up to 16,384kbps.

## CV-FOM-D Module

<b>CDI Interfaces</b> Balanced Unbalanced Optical	<i>(All specifications refer to the individual option module unless otherwise specified. Two modules maximum per chassis)</i> One Female DB-9 for all module types Two Sub-Triax for all module types Two 9/50/62.5µm 125µm multimode@1310nm metal, ST for FOM Modules
<b>NRZ Interface</b>	One Female DB-25 connector for all module types. The Balanced RS-422 NRZ interface supports Tx Data In, Tx Clock In, Tx Clock Out (Demand), Rx Data Out and Rx Clock Out using standard EIA-530 pin-out definitions. Data Carrier Detect is also supported, indicating a loss of Rx CDI.
<b>System Timing</b>  Additional Timing Support	One Female BNC connector per module provides External Station Clock In. 1 MHz, 5 MHz, or Bit Rate Supported.  NRZ, CDI, Fiber Recovered Timing and Internal Clock supported for all option modules. Standard clock tracking option maintains internal timing at the selected rate with $\pm 50$ ppm and phase is referenced from the selected input clock. High-margin tracking ( $\pm 2000$ ppm) for EPLRS support is offered. Receive Fiber System Timing is supported.
<b>Data Mark Sense</b>	Data Mark Sense is user-selectable to be either positive or negative upon configuration.
<b>Data Rates (kbps)</b> Unbalanced  Balanced  Balanced EPLRS Optical	72, 96, 112, 128, 144, 192, 224, 256, 288, 320, 384, 448, 512, 576, 640, 768, 960, 1024, 1152, 1344, 1536, 1544, 1920, 1952, 2048, 2304, 2560, 2816, 3072, 3088, 3200, 3584, 3968, 4096, 4608. 16, 32, 56, 64, 72, 96, 112, 128, 144, 192, 224, 256, 288, 320, 384, 448, 512, 576, 640, 768, 960, 1024, 1152, 1344, 1536, 1544, 1920, 1952, 2048. 32, 56, 64, 128, 256, 512. 164 data rates from 72kbps to 16.384Mbps
<b>Drive Distances</b> Balanced Unbalanced Optical	Up to 3.2 km at 64kbps; up to 1.6 km at 384 kbps; up to .4 km at 1544 kbps; up to 0.4 km at 2048 kbps Up to 3.2 km at 448 kbps; up to 2.4 km at 768 kbps; up to 1.2 km at 1544 kbps; up to .8 km at 4096 kbps Up to 30 km depending on data rates and fiber type used.
<b>Compatibility</b>	Compatible with earlier DNE CV-2048, CV-CX, CV-8448 models or option cards at rates offered by both units. Compatible with AN/TSQ-158 EPLRS and JTC3A 9109C Devices
<b>Environmental</b>	0° C to 50° C Operating, -30° C to 80° C storage, Up to 95% Humidity (non-condensing), Operating altitudes of up to 15,000 ft (4600m), storage altitudes up to 40,000 ft (12,200m)
<b>Power</b>	100-240 VAC, 47-63 Hz 30 Watts Typical, 15 Watts per module
<b>Menu Selection</b>	All configuration selections are made via ASCII terminal using a DB-9M connector on the rear of the unit
<b>Dimensions</b>	19.0" W x 1.75" (1RU) H x 13.5"D (CV-MCU Chassis) Full chassis weight with two installed modules: approximately 9 pounds



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*This document has been cleared for public release by the United States Department of Defense, July 2005.*

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