

MARK-IVD 800MHZ NARROWBAND SIGNAL BOOSTER M4DBDA8

USER'S MANUAL

**REVISION 1
SUBMITTED BY:**

CANAM TECHNOLOGY, INC.

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CANAM TECHNOLOGY, INC. (CTI)

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Part 90 Signal Boosters THIS IS A 90.219 CLASS A DEVICE

WARNING. This is NOT a CONSUMER device. It is designed for installation by FCC LICENSEES and QUALIFIED INSTALLERS. You MUST have an FCC LICENSE or express consent of an FCC Licensee to operate this device. You MUST register Class A signal boosters (as defined in 47 CFR 90.219) online at www.fcc.gov/signal-boosters/registration. Unauthorized use may result in significant forfeiture penalties, including penalties in excess of \$100,000 for each continuing violation."



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Section A. INTRODUCTION

The MARK-IVD 800MHz Narrowband Signal Booster (M4DBDA8) is a Class “A” Industrial Signal Booster for FCC Part 90 PLMRS Public Safety Agencies used to operate within range 806-817 MHz (UL path), 851-862 MHz (DL path) for Land Mobile Radio.

This document is the M4DBDA8 User's Maintenance Manual, intended for the Radio Technical Personnel.

This manual is intended to be used with the M4DBDA8 Equipment only. It is not to be used with any other equipment unless it is authorized by Canam Technology, Inc.



Canam Technology, Inc provide this document “as is” without any warranty of any kind. Canam Technology may make changes to the equipment, software or specifications in this document at any time without notice to the user. These changes will be notified to the party responsible for FCC compliance and they will be incorporated in future releases of this document.

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment”



This document may contain typographical errors and technical inaccuracies. Canam Technology will not accept any liability from the use and misuse of this manual, the information contained within, or the consequences of any actions resulting from the use of this information.



Signal boosters such as the M4DBDA8 generate radio signals and, therefore, electromagnetic fields. The technical personnel should have a complete understanding of FCC CFR Title 47 sections 1.1307 and 1.1310. Recommendations are included in this Manual, but they do not substitute the FCC guidelines.

M4DBDA8 Key Features:

- Narrowband Class A Signal Booster, per FCC Part 90.
- Maximum Output Power at the antenna port +37 dBm per carrier.
- AGC circuit provides a constant output power, regardless of the input power.



This device may require the use of antennas for proper functioning, depending on the application. The installation of the antennas should be performed by qualified technical personnel. All antennas should be fixed mounted and physically secured to one location **The people must be away from the antennas at least 1.0 meters to comply with the RF Human Maximum Permissible Exposure limits, as long as the antenna system gain is lower than 11.3 dBi.** If greater gain is used the separation should be increased, please refer to the FCC Rules.



If service should be performed on the antenna, please shut down the transmitter or lower its power in order to comply with the maximum permissible exposure.



Section B. SYSTEM DESCRIPTION

The MARK-IVD 800MHz Narrowband Signal Booster (M4DBDA8) is a Class “A” Industrial Signal Booster for FCC Part90 PLMRS Public Safety Agencies used to operate within range 806-817 MHz (UL path), 851-862 MHz (DL path) for Land Mobile Radio.

The system features eight or more programmable frequency narrowband filters. The desired operation frequencies must be configured using built-in Web Server.

Programmable Individual Rx Threshold level (Squelch) per filter allows transmission if the probe signal is greater than configured Squelch.

Individual Automatic Gain Control (AGC) per filter delivers constant output power level per channel (+/- 1 dB) regardless of their input level variations. The maximum output level per filter can be changed with option “Maximum Desired Output Level per filter” in Main Settings page from Web Server

The built-in Web Server provides a Graphical User Interface (GUI) to ease in remote monitoring & control. Access is obtained via a PC's Web Browser and a TCP/IP connection to the Unit. The system can be connected directly to a PC computer or can be plugged into the local area network.

Some pages shown by the Web Server are the following:

- “Main Status”: depicts status alarm indicators and meters.
- “Main Settings”: is used to configure system-level macro settings.
- “Filter Settings” contains the settings that can be configured for each filter window.

Never operate the system without adequate Load/Termination on the Donor/Base and Service/Side T/R port. The 800 MHz Signal Booster will amplify until 120dB gain any input stimulus greater than Rx Threshold level (Squelch).

The Web Server allows to Mute/Un-mute Power Amplifiers in “Main Settings” page. Make sure the power amplifiers are un-muted before start with the test.

Section C. PHYSICAL OVERVIEW

Figure 1 shows the visual status that the D.U.T. front panel. Table 1 contains a brief explanation.

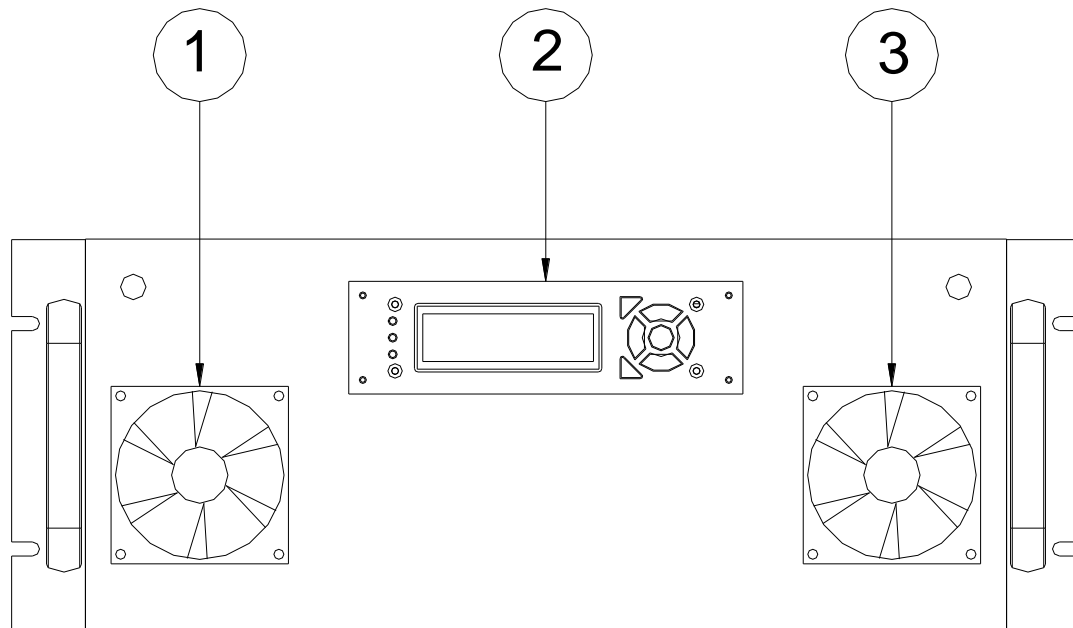


Figure 1 - Front Panel details

Table 1 – Front Panel details

Item	Description
1	Intake fan 1
2	LCD Display/Keypad
3	Intake fan 2

Figure 2 shows the connectors and visual status that the D.U.T rear panel has. Table 2 contains a brief explanation.

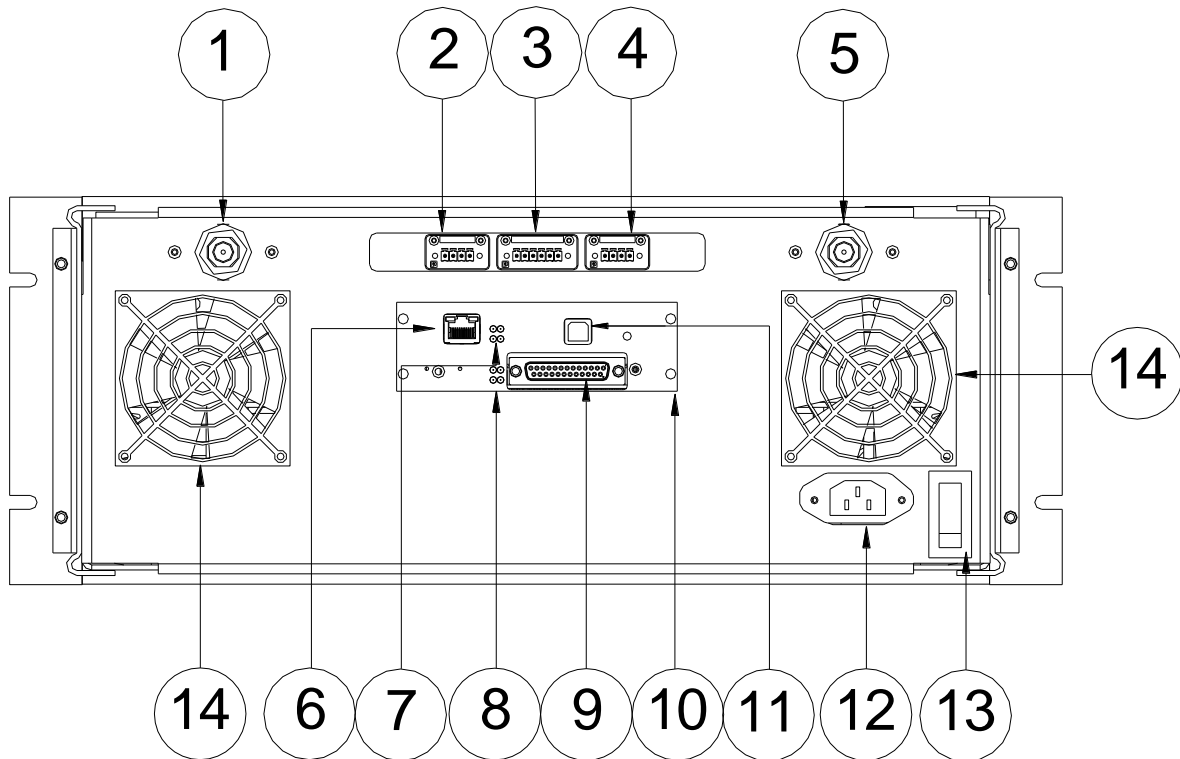


Figure 2 - Rear Panel details.

Table 2 – Rear Panel details.

Item	Description
1	DONOR/BASE T/R PORT
2	FAN 1 DE-01
3	AUX I/O DE-02
4	FAN 1 DE-03
5	SERVICE/SIDE T/R PORT
6	(ECM) ETHERNET 10/100 NETWORK PORT
7	(ECM) GREEN LEDS STATUS INDICATORS
8	(ECM) RED LEDS (RELAY CONTACTS)
9	(ECM) DB-25 I/O CONNECTOR
10	PLUGGABLE EMBEDDED CONTROL MODULE (ECM)
11	(ECM) FACTORY USB DEBUG PORT
12	AC POWER "IEC" INLET
13	AC MAINS ON/OFF POWER SWITCH
14	AIR EXHAUST REAR FANS

Section D. START - UP

D.1 ACCESSING D.U.T. WEB SERVER

The system can be connected to a PC computer using an Ethernet crossover cable or to LAN using an Ethernet straight cable.

D.1.1 Connect D.U.T to P.C computer using a crossover cable

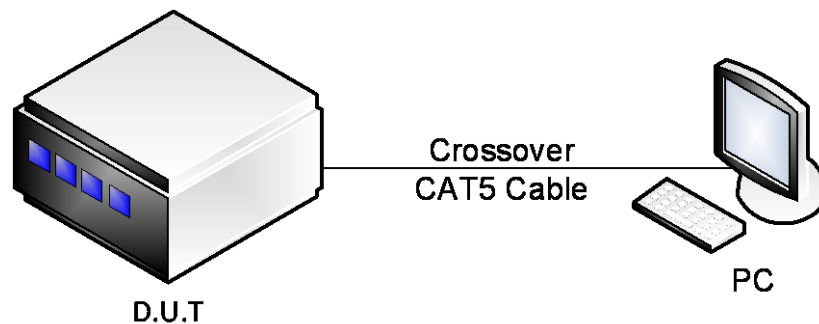


Figure 3 – D.U.T. connected directly to PC computer.

1. Use an Ethernet crossover cable for connect equipment directly to a PC computer LAN port (refer to Item #8 in Figure 2).
2. The IP address of the equipment is shown in the LCD display. By default it is 192.168.100.75 with Network Mask = 255.255.255.0.
 - To verify IP address press the Down key in LCD Display and Keypad assembly until get IP ADDRESS value.
3. Configure the local computer IP address to allow access to the controller, within the same sub-net.
 - Go to "Star >> Control Panel >> Network Settings".
 - Right-Click on the "Local Area Connection" and choose "Properties".
 - Look for "Internet Protocol" and click "Properties".
 - Select "Use the following IP Address".
 - Configure PC computer IP address as 192.168.100.X (X is a value between 0-255) with Network Mask = 255.255.255.0.

- Default gateway can be same value as IP address.
 - Select "Obtain DNS server address automatically".
- 4. Open a web browser and access the equipment by typing, in the address bar, the IP address of the equipment (<http://192.168.100.75>).
 - Login with username = technician, password = technician.

D.1.2 Connect D.U.T to local area network

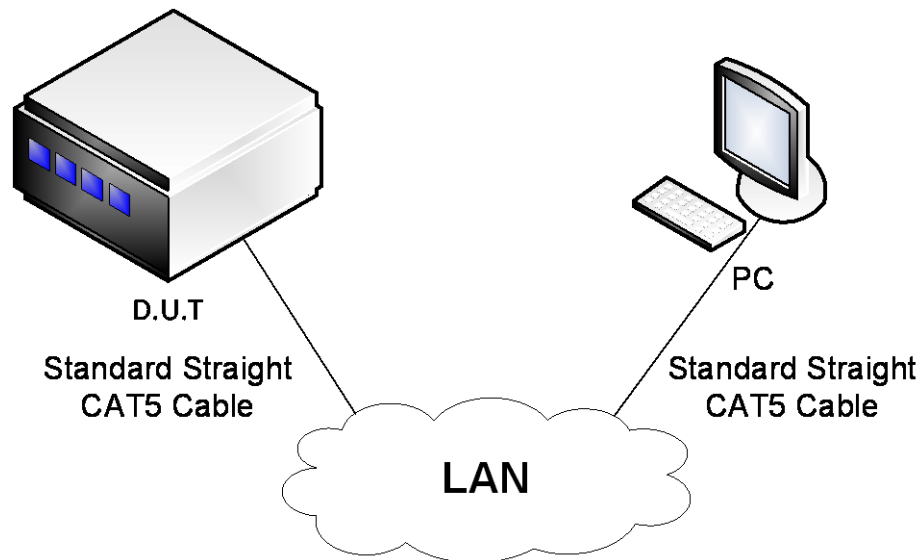


Figure 4 - D.U.T. connected into local area network.

D.2 USING AND SETTING UP D.U.T

1. Open a web browser and access the equipment by typing, in the address bar, the IP address (<http://192.168.100.75>) assigned to the equipment.
 - Login with username = technician, password = technician.
 - The [Main Status](#) page will be displayed if connection available.
2. Go to [Calibration](#) page for:
 - Changing meters calibration, settings such as "Local Oscillator", minimum readable for some meters.
3. Go to [Filter Settings](#) page for:
 - Configuring the center desired frequencies.
 - Enable/disable filter windows.
 - Setting other filters attributes as Fine-Tune, Rx Threshold, Enable/disable AGC.
4. Go to [Main Settings](#) page for:
 - Changing "Maximum Desired Output Level per Filter".
 - Enabling/disabling MCPA output per path.
 - Enabling/disabling Pilot Test Carrier.
 - Configuring input attenuator.



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Section E. RF CONNECTIONS

1. Use a coaxial cable to connect the test instrument input to D.U.T. Donor/Base or Service/Mobile when corresponds (refer to Items #2 and #8 in Figure 2).
2. Use a coaxial cable to connect the RF generator output to D.U.T. Donor/Base or Service/Mobile when corresponds (refer to Items #2 and #8 in Figure 2).



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