

MARK-IVD 700MHZ NARROWBAND SIGNAL BOOSTER M4DBDA7

USER'S MANUAL

**REVISION 0
SUBMITTED BY:**

CANAM TECHNOLOGY, INC.

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CANAM TECHNOLOGY, INC. (CTI)

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Section A. INTRODUCTION

The MARK-IVD 700MHZ Narrowband Signal Booster (M4DBDA7) is a Class B Narrowband Signal Booster to operate within range 763-775 MHz (DL path), 793-805 MHz (UL path) for Land Mobile radio FCC Part 90.

This document is the M4DBDA7 User's Maintenance Manual, intended for the Radio Technical Personnel.

This manual is intended to be used with the M4DBDA7 Equipment only. It is not to be used with any other equipment unless it is authorized by Canam Technology, Inc.



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



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Signal boosters such as the M4DBDA7 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.

M4DBDA7 Key Features:

- Narrowband Class B 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

This system (D.U.T.) is an 700MHz Signal Booster to operate within range 763-775 MHz (DL path), 793-805 MHz (UL path) for Land Mobile radio FCC Part 90.

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 700 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.

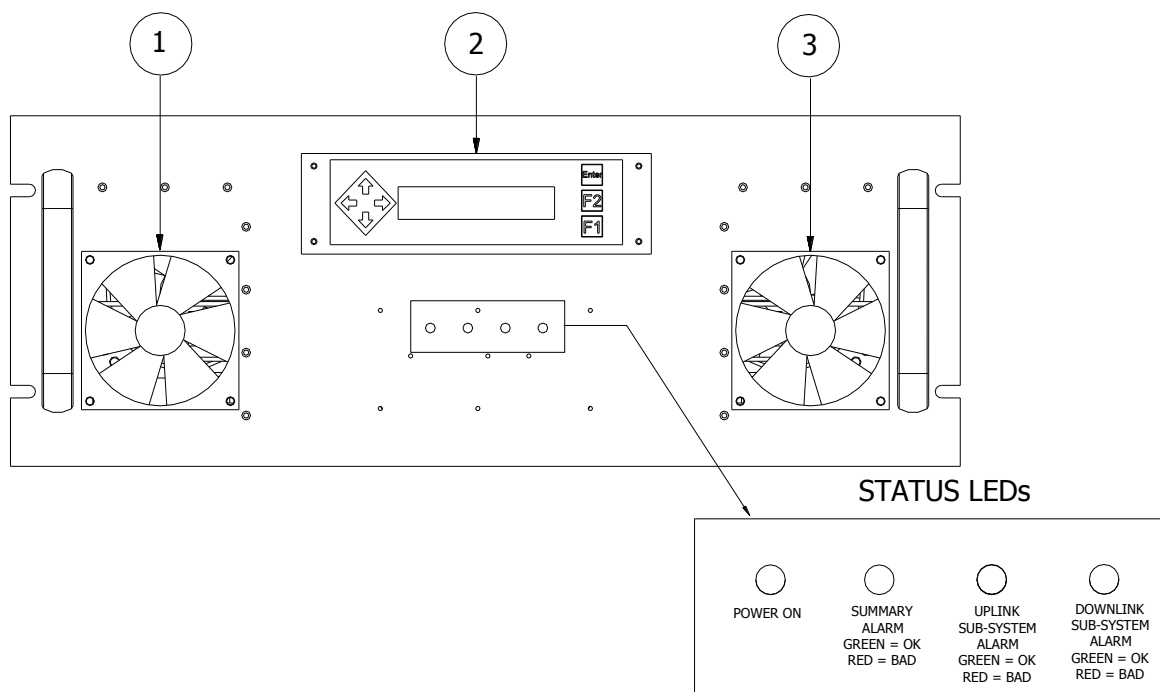


Figure 1 - Front Panel details

Table 1 – Front Panel details

Item	Description
1	Intake fan 1
2	LCD Display/Keypad
3	Intake fan 2
4	Power ON LED (Green = ok, Red = bad)
5	Summary Alarm LED (Green = ok, Red = bad)
6	Reflected Power Alarm LED (Green = ok, Red = bad)
7	Cooling Alarm LED (Green = ok, Red = bad)

Figure 2 shows the connectors and visual status that the D.U.T rear panel has. Table 2Table 1 contains a brief explanation.

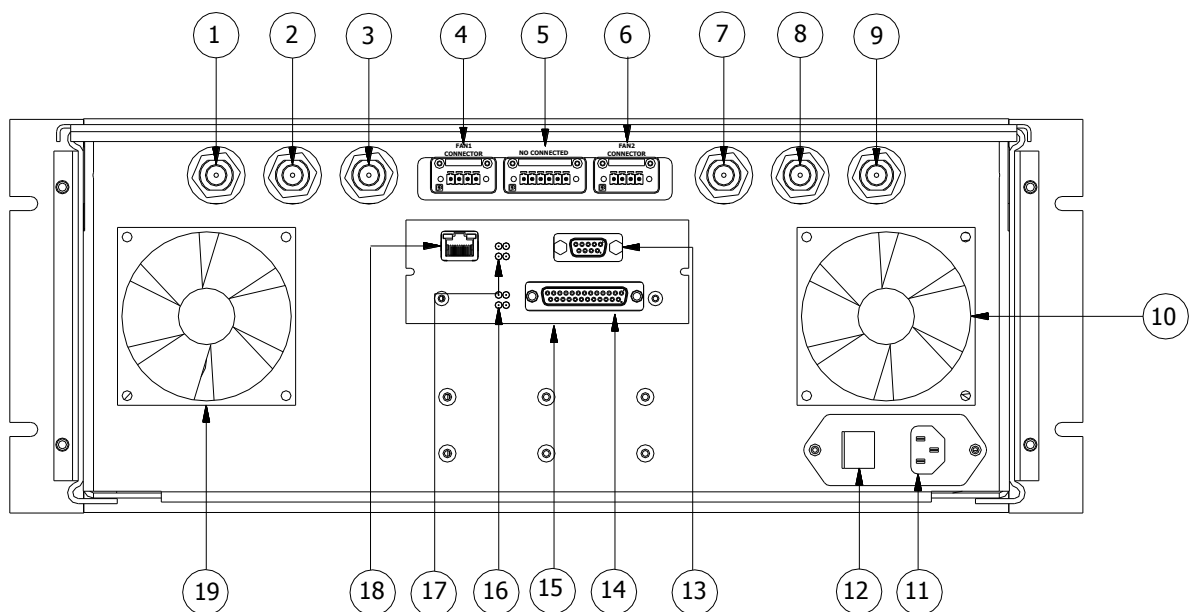


Figure 2 - Rear Panel details.

Table 2 – Rear Panel details.

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

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

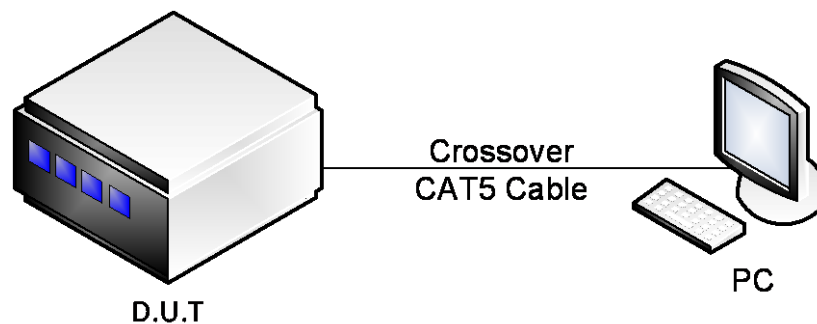


Figure 3 – D.U.T. connected directly to PC computer.

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 192.168.100.87 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://192.168.100.87>).
- Login with username = factory, password = factory.

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

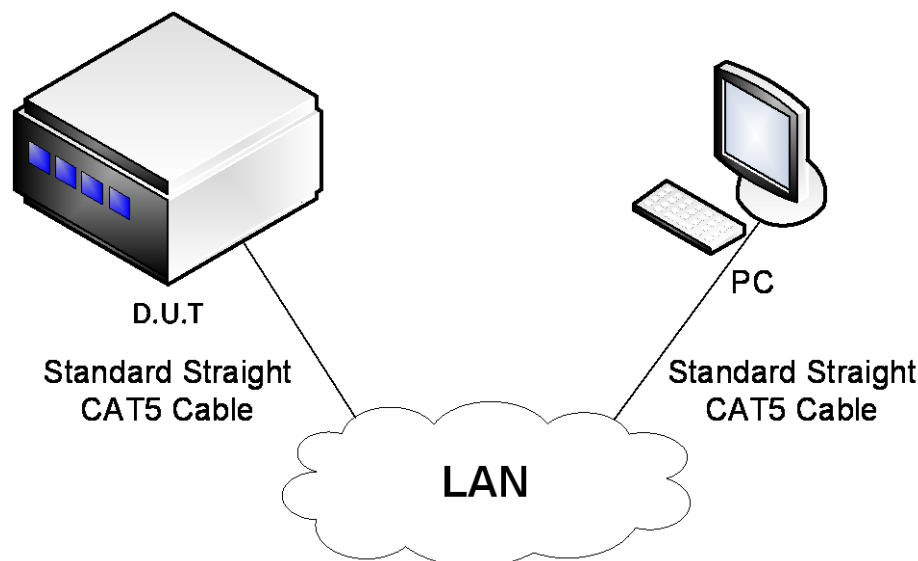


Figure 4 - D.U.T. connected into local area network.

The following steps are necessary to connect D.U.T to LAN:

1. Find out the subnet the PC computer is currently plugged into.
2. Configure D.U.T IP address avoiding conflict with other devices IP addresses. Use procedure in previous section D.1.1.

Please refer to UHF Narrow band Signal Booster O&M Manual for more details.

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://192.168.100.87>) assigned to the equipment.
 - Login with username = factory, password = factory.
 - 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.



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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).