



# FUTURECOM MOBEXCOM P25 DVRS Digital Suitcase User Guide

[Home](#) » [FUTURECOM](#) » FUTURECOM MOBEXCOM P25 DVRS Digital Suitcase User Guide

## Contents [ [hide](#) ]

- [1 FUTURECOM MOBEXCOM P25 DVRS Digital Suitcase](#)
- [2 Related Publications](#)
- [3 Foreword](#)
- [4 Computer Software Copyrights](#)
- [5 Commercial Warranty](#)
- [6 Temporary-Fixed Site](#)
- [7 Vehicular Use](#)
- [8 Introduction](#)
- [9 Suitcase Mount DVRS Installation](#)
- [10 Suitcase Mount DVRS Antenna Requirements](#)
- [11 Suitcase Mount DVR Specifications](#)
- [12 Approved Antennas and Maximum output power \(W\) for combination DVR and APX mobiles for Temporary-Fixed Site](#)
- [13 Documents / Resources](#)
- [14 Related Posts](#)



**FUTURECOM MOBEXCOM P25 DVRS Digital Suitcase**



## Related Publications

Publication Number	Description
8A083X30	DVRS User's Manual, APX Series P25 Interface
8A083X21	Tactical DVR User's Manual
8M083X02	Tactical DVR Installation and Programming Guide
8F083X03	DVRS – Product & RF Safety Booklet
8F083X14	Indoor Fixed Mount DVRS – Installation Guide, APX Interface
8F083X15	Outdoor Fixed Mount DVRS – Installation Guide, APX Interface
8F083X04	Flash Loader and Tweaker Programmer Installation Guide

## Foreword

This manual provides Installation guidelines for the Futurecom Mobexcom P25 DVR that is interfaced to a remote mount APX6500 or APX7500 Mobile radio with O2, O3, O5 or O7 control head and installed in a Suitcase Mount suitcase. O9 Control head is not compatible with the Suitcase Mount Suitcase DVRS models.

## Terminology Used

Abbreviation	Description
<b>Suitcase Mount DVRS</b>	Complete DVR and Mobile Radio System, packaged in a Suitcase Mount Suitcase
<b>DVR</b>	Digital Vehicular Repeater
<b>MSU</b>	Mobile Subscriber Unit
<b>CH</b>	Mobile Radio Control Head – O2,O3, O5 or O7
<b>TG</b>	Mobile Radio Talk Group

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#### **RF Energy Exposure Compliance, Awareness and Control Information and Operational Instructions**

This radio equipment is intended for use in occupational / controlled conditions, where users have full knowledge of their exposure and can exercise control over their exposure to meet FCC limits. This radio device is NOT authorized for general population, consumer or any other use.

#### **ATTENTION!**

Changes or modifications not expressly approved by Futurecom Systems Group, ULC. could void the User's authority to operate the equipment.

#### **Temporary-Fixed Site**

Futurecom requires the P25 Suitcase Mount DVRS operator to ensure FCC/IC Requirements for Radio Frequency Exposure are met. It is the responsibility of the Licensee to ensure that the appropriate separation distances between the antennas and bystanders are established and followed to meet the FCC and IC Maximum Permissible Exposure (MPE) Requirements in any particular Temporary-Fixed location. In situations where a site assessment is not practical, it is recommended that the antennas be located at least 9 feet from bystanders. This should ensure MPE compliance in any Temporary-Fixed application and is likely to be a much greater separation distance than is necessary in most cases. Failure to observe the MPE distance exclusion area around the antenna may expose persons within this area to RF energy above the FCC/IC exposure limits for bystanders (general population).

#### **Vehicular Use**

If the Suitcase Mount DVRS is set up in an vehicle, Users should refer to the separation distances specified in the "RF Safety" Book 8F083X03 (shipped with the DVRS) to determine the separation distances to be used and the antennas approved for such vehicular use. Failure to observe the MPE distance exclusion area around the antenna may expose persons within this area to RF energy above the FCC/IC exposure limits for bystanders

(general population). It is the responsibility of the repeater operator to ensure MPE limits are observed at all times during transmissions.

### **ATTENTION!**

Approved antennas and associated output powers for use with Suitcase Mount (suitcase) DVRS and APX Mobile radios are listed in Appendix 2 of this document. Refer to Product Safety and RF Energy Exposure Booklet 8F083X03 (shipped with DVRS) for basic fixed site installation guidance, and for use in a vehicular application.\

## **Introduction**

The Digital Vehicular Repeater System (DVRS) is typically mounted inside the trunk of a car and powered from the car's battery. Some applications other than vehicular use require added flexibility, which can be achieved with the use of a Suitcase Mount DVRS.

**Note:** – Product Safety and RF Energy Exposure Booklet 8F083X03 includes approved antennas and associated output powers for DVRS vehicular installation. The Suitcase Mount DVRS is a complete DVRS and power supply packaged in a compact suitcase as shown on Figure 1 below. The Suitcase Mount DVRS can be powered up either by connecting it directly to 117V AC or by using a battery pack (ordered separately). As an option, the unit can be configured for 220V AC Operation. The battery is packaged in a similar suitcase and provides up to 3 hrs of backup (50/50% duty cycle). The operation of the battery pack and charger are described in document 8M077X02.



**Dimensions:** 23" x 16" x 10"

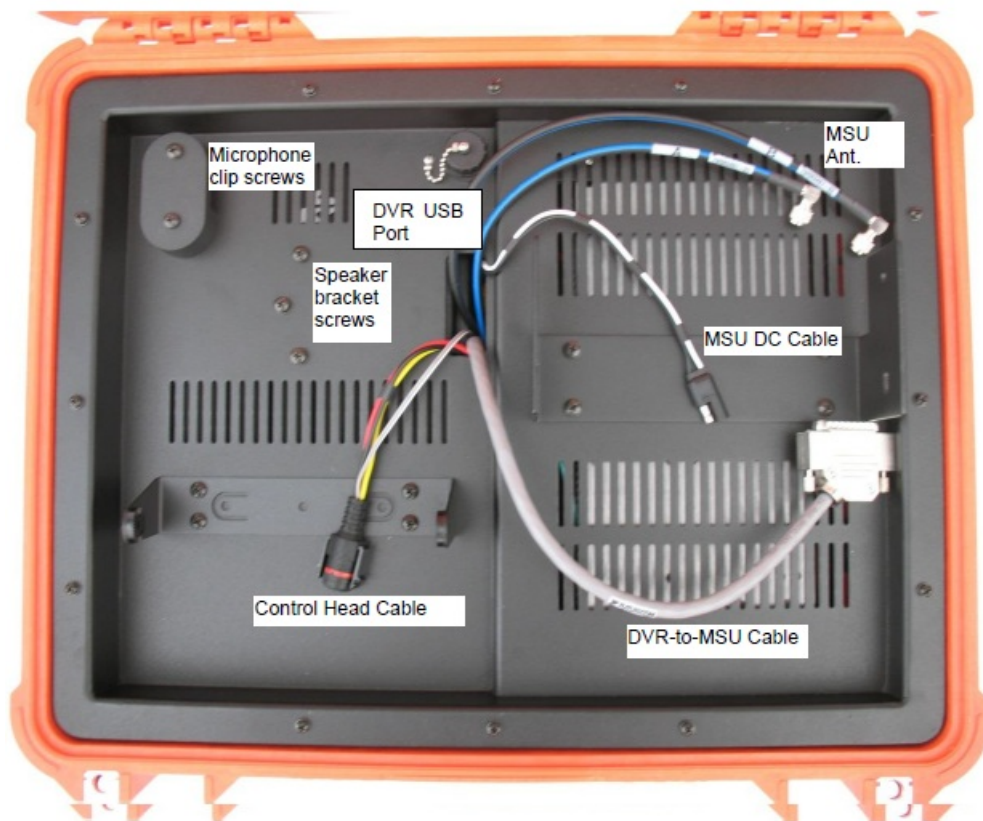
## **Suitcase Mount DVRS Installation**

### **Installation Tools Required**

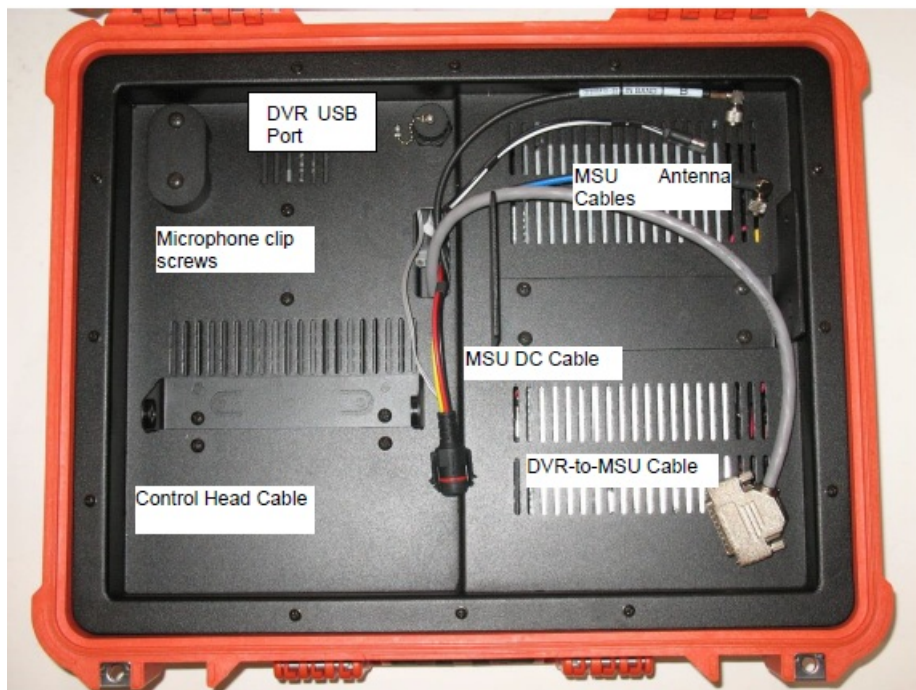
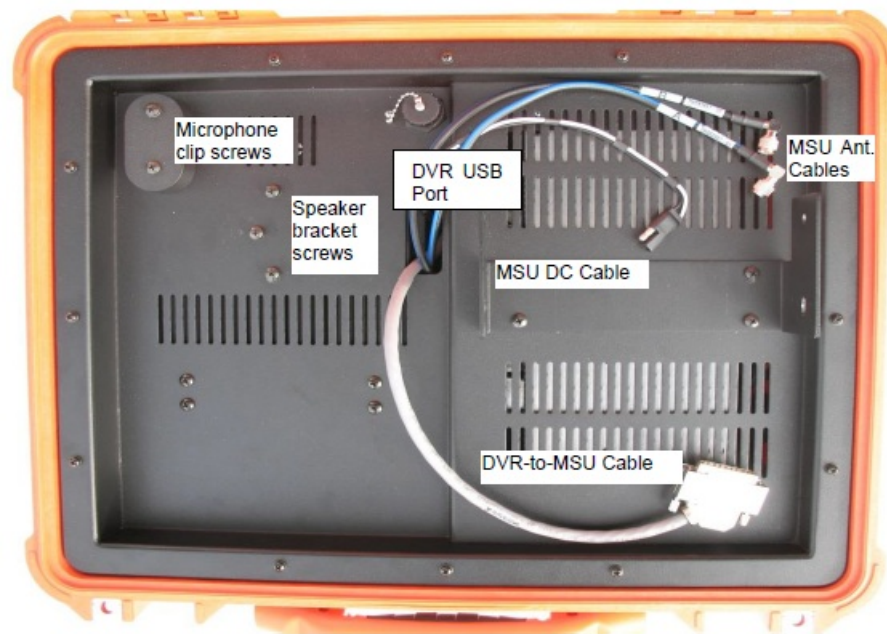
Description	Needed for:
#2 Philips	Tightening of screws.
3/16" Flat Screwdriver	Tightening of connector screws.

### Installation Guidelines

1. STEP 1 Open the Suitcase Mount DVRS cover and note the location of the mounting screws for the MSU speaker bracket and microphone clip as shown on Figure 2 and Figure 3. For the O2 model there is no speaker but note the microphone clip location in Figure 4.







2. STEP 2 Install the microphone clip and speaker bracket as shown on Figure 5, Figure 6 and Figure 7 below. Connect the speaker connector to the CH harness.



3. STEP 3 Install the MSU using the supplied MSU thumb screws (see Figure 8 below).





4. STEP 4 Connect the MSU DC power cable, antenna cables, control head cable and DVR to Mobile cable. The RF cable marked as "In-Band B" must be connected to the in-band antenna port of the Mobile Radio.
5. STEP 5 Install the speaker, microphone and Control Head. Connect the CH DC cable, the other end of the MSU-to-CH cable and microphone cable as shown on Figure 9, Figure 10 and Figure 11 below.





6. STEP 6 Program the MSU, DVR and Portables for DVRS operation. Ensure the templates are fully matched by following the Guidelines provided in the DVRS Programming Guide. To program the DVRS, connect a PC with compatible Tweaker Programming Software to the DVR USB port located under the cap behind the MSU Speaker at the back end of the suitcase.

**IMPORTANT!** When programming the DVRS Frequencies, please ensure they match the DVRS Filtering frequencies. To check the tuning of the DVRS Duplexer, please refer to the DVRS labels located on the inside lid cover as shown on Figure 12.



## Suitcase Mount DVRS Antenna Requirements

Any DVRS Model requires the use of two or three antennas – one or two connected to the Mobile Radio and one connected to the DVR. The antennas are not part of the Suitcase Mount package and need to be provided separately. Refer to Appendix 2 for a list of approved antennas for Temporary-Fixed Site.

### **IMPORTANT!**

All DVRS models require 30dB minimum Antenna Isolation between the DVR and Mobile Radio Antennas for interference-free operation. A separation of several feet between the antennas may be needed to achieve this. In addition to 30dB isolation, ensure RF exposure separation distance is maintained. Refer to the RF Energy Exposure Compliance, Awareness and Control Information and Operational Instructions section of this document.

## Suitcase Mount DVR Specifications

<b>General Specifications</b>		
<b>Dimensions: Height / Width / Depth</b>	<b>20.6" x 17" x 8.6"</b>	
<b>Approximate Weight</b>	<b>50 lbs</b>	
<b>Channel Spacing</b>	<b>12.5 or 25 kHz programmable</b>	
<b>Number of Channels</b>	<b>Up to 192</b>	
<b>CTCSS/DCS</b>	<b>Programmable per Channel</b>	
<b>Power Supply</b>	<b>13.8V DC +/- 20%</b> <b>115 V AC (Optional 220V AC)</b>	
<b>Current Drain</b> <b>Standby/Receive</b> <b>Transmit</b>	<b>115 VAC</b> <b>0.5A</b> <b>2.8A</b>	<b>13.8 VDC 1.6A 14.5A</b>
<b>Operating Temperature</b>	<b>-30°C to +60°C</b>	
<b>Antenna Impedance</b>	<b>50 Ohms</b>	
<b>Duty Cycle</b>	<b>Continuous (DVR)</b>	

<b>External Connectors</b>  <b>Antenna (DVR and Mobile) Computer Interface</b>  <b>Power</b>	<b>N female USB</b>  <b>AC – MS3102E14-7P; DC – MS3102E16-11P</b>			
<b>Equipment Type Acceptance</b>	<b>VHF</b>	<b>UHF</b>	<b>700</b>	<b>800</b>
<b>FCC</b>  <b>Industry Canada</b>	<b>LO6-DVRSV HF 2098B-D VRSVHF</b>	<b>LO6-DVRSU HF 2098B-D VRSUHF</b>	<b>LO6-DVRS7 00 2098B-D VRS700</b>	<b>LO6-DVRS80 0 2098B-DVR S800</b>
<b>Transmitter Specification</b>	<b>VHF</b>	<b>UHF</b>	<b>700</b>	<b>800</b>
<b>Frequency Band [MHz]</b>	136-174	380-430 450-470 470-512	764-776	851-869
<b>Power Output @ Antenna Port</b>	<b>10W (programmable per channel from 1W to 10W)</b>			
<b>CCT Option</b>	<b>15 sec to 15 min or Disabled</b>			
<b>Max Spurious Output</b>	<b>-20dBm</b>			
<b>Frequency Stability</b>	<b>+/- 1.5ppm</b>			
<b>FM Hum and Noise    12.5 / 25 kHz</b>	<b>37 dB / 43 dB</b>			
<b>Audio Response</b>	<b>+1, -3 dB of 6 dB / octave pre-emphasis characteristic over 300 Hz – 3 kHz</b>			

<b>Audio Distortion</b>	<2%			
<b>Receiver Specification</b>	<b>VHF</b>	<b>UHF</b>	<b>700</b>	<b>800</b>
<b>Frequency Band [MHz]</b>	136-174	380-430 450-470 470-512	794-806	806-824
<b>Receiver Sensitivity</b>	<b>-115 dBm</b>			
<b>Frequency Stability</b>	<b>+/- 1.5ppm</b>			
<b>Selectivity 12.5 / 25 kHz</b>	<b>60 dB / 75 dB</b>			
<b>Intermodulation</b>	<b>70 dB</b>			
<b>Deviation 12.5 / 25 kHz</b>	<b>+/-2.5 kHz / +/-5 kHz</b>			
<b>FM Hum and Noise 12.5 / 25 kHz</b>	<b>37 dB / 43 dB</b>			
<b>Audio Output (Repeater Detect Audio)</b>	<b>600 mV RMS nominal, flat response</b>			
<b>Audio Response</b>	<b>+1, -3 dB of 6 dB / octave de-emphasis characteristic over 300 Hz – 3 kHz</b>			
<b>Audio Distortion</b>	<2%			



## Approved Antennas and Maximum output power (W) for combination DVR and APX mobiles for Temporary-Fixed Site

### NOTE:

APX mobile RF conducted antenna power in the tables below denotes up to 50% Tx duty cycle. DVR RF conducted antenna power in the tables below denotes up to 100% Tx duty cycle.

### DVR

Band	Antenna	Power (W)
VHF (136-174MHz)	DDN9014	6
UHF1 (406-430MHz)	DDN9015	10
UHF2 (450-470MHz)	DDN9015	10
UHF3 (470-512MHz)	DDN9015	10
700 (768-806MHz)	DDN9016	5
800 (806-869MHz)	DDN9016	10

### APX MSU


Band	Antenna	Power (W)
VHF (136-174MHz)	DDN9014	60
UHF1 (406-470MHz)	DDN9015	48
UHF2 (450-520MHz)	DDN9015	54
700/800 (764-870MHz)	DDN9016	42

### Max Power (W) for combination DVR and APX

		APX MSU			
	DVR/APX	VHF	UHFR1	UHFR2	700/800MHz
DVR	VHF	6/60	6/48	6/54	6/42
	UHFR1	10/60	10/48	10/54	10/42
	UHFR2	10/60	10/48	10/54	10/42
	UHFR3	10/60	10/48	10/54	10/42
	700MHz	5/60	5/48	5/54	5/42
	800MHz	10/60	10/48	10/54	10/42

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## Documents / Resources

	<p><b><a href="#">FUTURECOM MOBEXCOM P25 DVRS Digital Suitcase</a></b> [pdf] User Guide  MOBEXCOM P25 DVRS Digital Suitcase, MOBEXCOM P25, DVRS Digital Suitcase, Digital Suitcase, Suitcase</p>
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