



Bryan's Motorsport Electronics  
[www.raceBME.com](http://www.raceBME.com)

# MoTeC M8, M4, M48, M2R, MLS Communications on Windows 10/11 using DOSBox

## Reference Guide

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Version 1.1

12/18/2023



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# 1. Introduction

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*This manual will cover connecting a modern Windows 10 PC to a M8, M48, M4, M2R, and MLS using the DOSBox Emulator. These models used a DOS based software called MoTeC ECU Manager that is no longer supported on modern Windows PCs. Thanks to the DOSBox DOS Emulator we can reestablish communication and functionality to these retro pieces of Motorsport hardware.*

## 1.1 Overview

*This document will cover all required software and setup to establish communication using a DOS emulator, throughout this manual we will install DOSBox, RealTerm Serial Monitor, and the required MoTeC ECU Manager software, along with any required drivers for our serial devices. While having physical serial port on your PC is recommend, it is not required. Many USB-to-Serial adapters work just as well when they have the correct chipset and drivers.*

- *Overview of Serial Cables & choosing the correct one...*
- *Installation of MoTeC ECU Manager...*
- *Installation of our DOS emulator to run the MoTeC software...*
- *Installation of a serial port monitor software for diagnostics...*
- *Setup of our DOS emulator and identifying which COM port to use...*
- *Wiring our MoTeC device to our PC...*
- *Establishing Connection...*

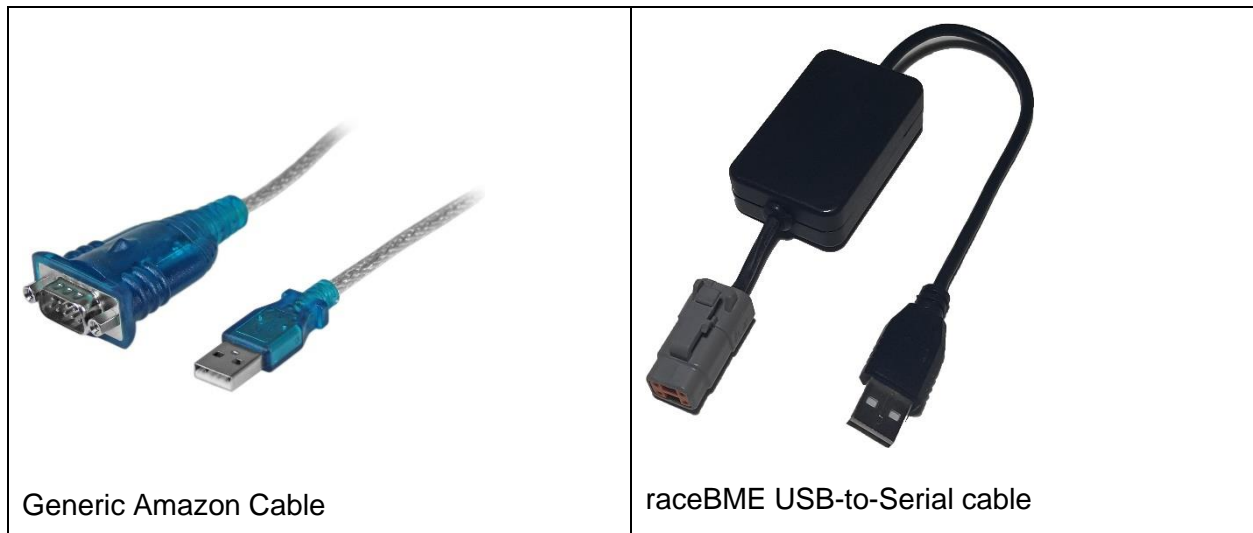
## 2. Prerequisites and Configuration

### 2.1 Serial Cables & USB Adapters

*For M4 ECU's before serial number 3000, along with all M8 and M48 ECU's will require a TTL serial adapter. These units did not use the standardized RS232 protocol. Thus, a different voltage logic level of 3.3v is used instead of 5v.*

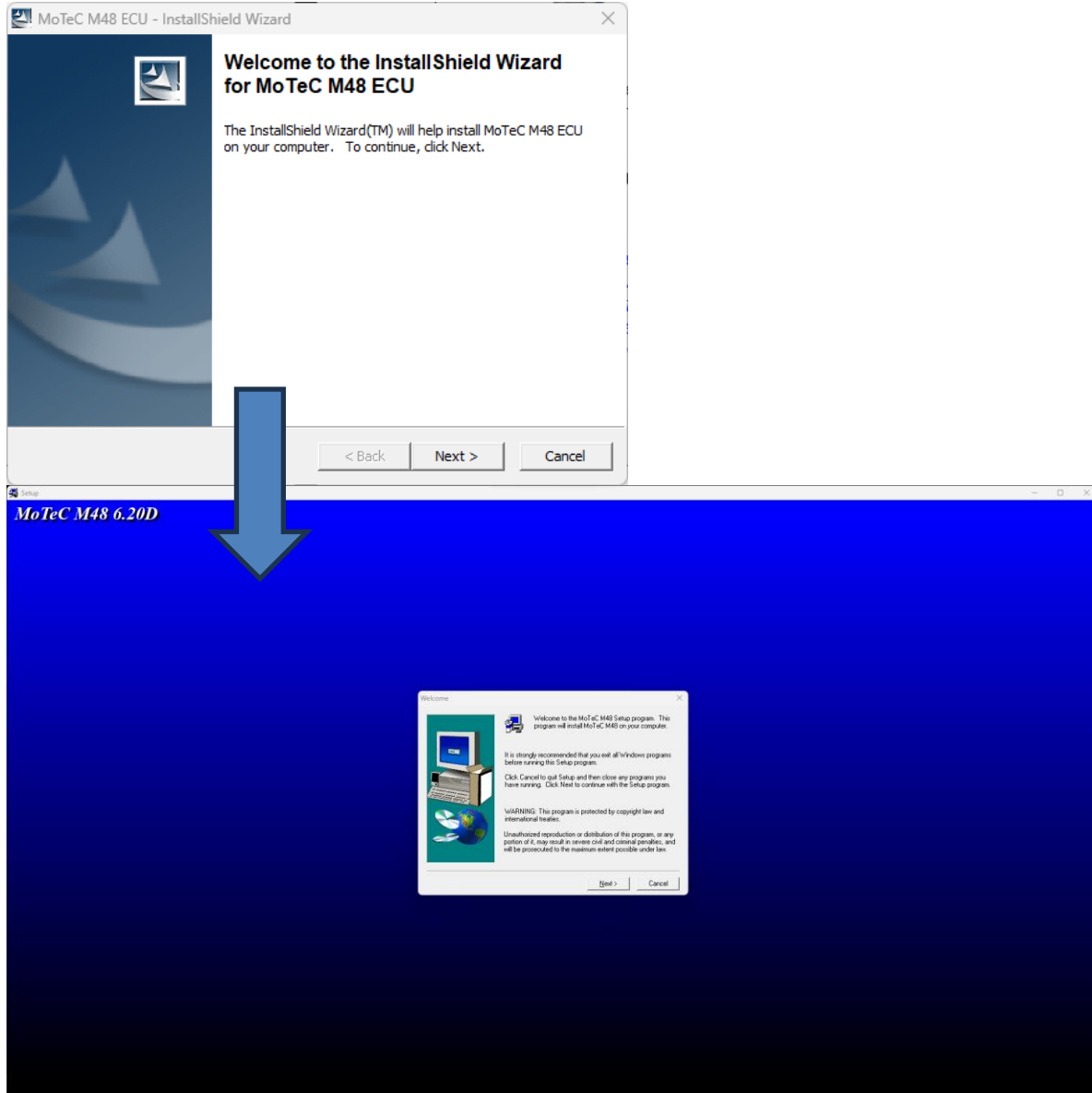
- If you have an original MoTeC communication cable, this guide will still apply to you.*
- If you do not have an original MoTeC cable, and require the TTL logic levels, you can build your own, or contact us to make one for you.*
- If you have an M4 ECU with serial over 3000, M2R or MLS you can use an USB-to-RS232 adapter, or a native built in serial port.*

*For USB-to-RS232 adapters, the Prolific PL2302 chipset is recommended. These generic PL2302 cables are available on Amazon, or a more robust and configurable cable is available from our website: [www.racebme.com/usb-to-serial-adpater/](http://www.racebme.com/usb-to-serial-adpater/)*



## 2.2 Installation of MoTeC ECU Manager

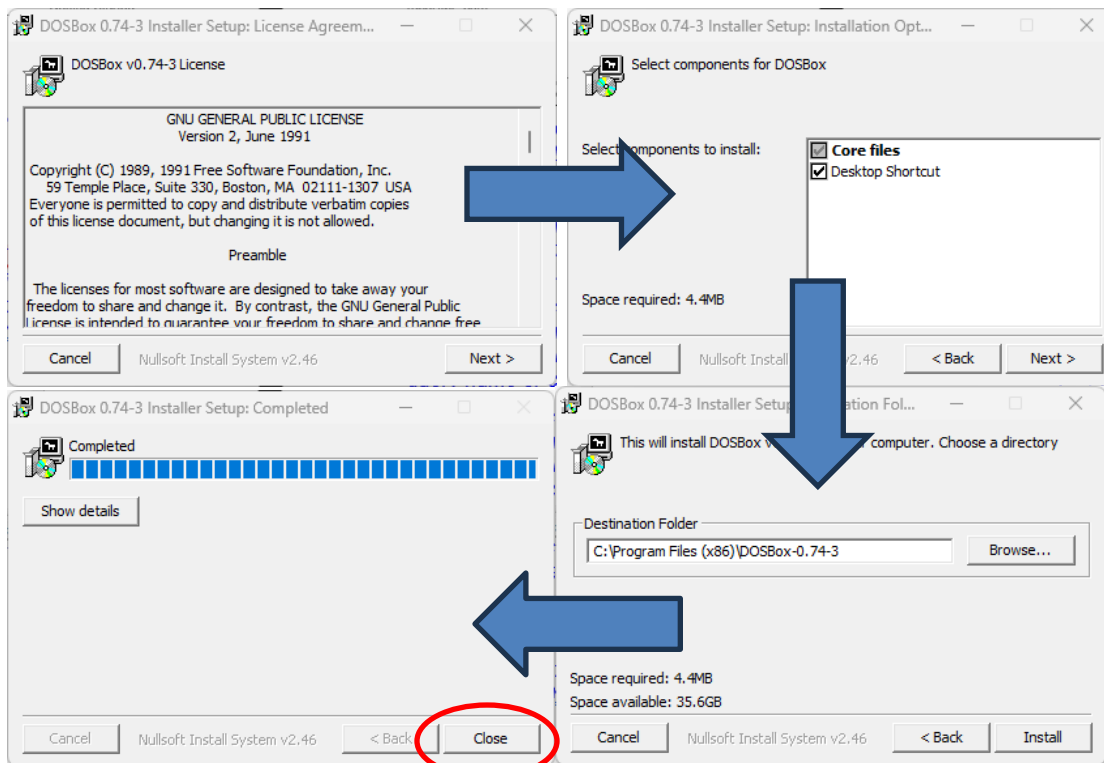
*Simply visit MoTeC's website at [www.motec.com.au/downloads](http://www.motec.com.au/downloads) and find your corresponding ECU's software. Each version indicates a different firmware, although knowing your firmware is not crucial until communication is made. Once your PC is connected to the ECU, it will warn you of the firmware incompatibility, displaying the ECU firmware version and either ask to upgrade or disconnect. For this reason, download the latest version to start. If you do not wish to upgrade, you can then go back to MoTeC's website and download the correct version.*



*Once the installation is complete, proceed to the next step to install DOSBox.*

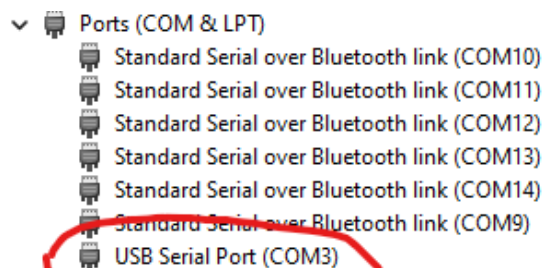
## 2.3 Installation of DOSbox: The MS-DOS Emulator

*Visit [www.dosbox.com](http://www.dosbox.com) and download the latest release of DOSBox. The installation is straightforward, just click next until finished. There will be more setup later on, as we need to configured to COM port and load the MoTeC Software.*



*After the installation is complete, we need to connect our USB-to-Serial Adapter and confirm our COM Port number. Right click on the Windows Start button, and select “Device Manager”.*

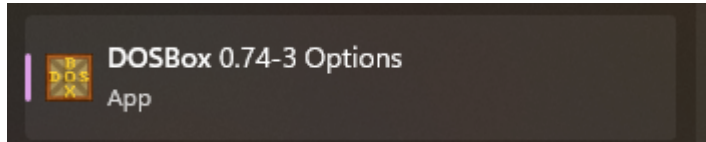
*With our adapter connected, we should see it under “Ports (COM & LPT)”:*



*This indicates that our adapter is on COM3. Yours may not be! You can plug and unplug the adapter to see which COM port disappears and reappears if the options on the list are not obvious. If you are using a native/built-in COM port, you will need to find a method to determining which one you plan to use. These are commonly listed as “Communications Port (COM1)”, “Communications Port (COM2)”, and so-on.*

*Once you know which COM port you plan to use, continue to configure DOSBox...*

Once DOSBox is installed, a change to the configuration file must be made to enable to the serial port functions. Click the Windows Start button, and begin to type "DOSBox". A few options will appear. Click DOSBox Options as shown below.



This will open a Notepad file containing all the configuration info, and this is where the serial ports will need to be enabled and configured. Scroll until you find **[serial]**.

The first line should read "serial1=dummy".

Change the entire line to "serial1=directserial realport:com3 rxdelay:0".

Note the highlight yellow text, this 'com3' variable might be subject to change. If your serial adapter is on COM1, COM2, etc. In this example, it is set to COM3 because that's what our adapter is in the screenshot above.

```
dosbox-0.74-3.conf.txt
File Edit View
autorun=raise
swap34=false
buttonwrap=false

[serial]
# serial1: set type of device connected to com port.
# Can be disabled, dummy, modem, nullmodem, directserial.
# Additional parameters must be in the same line in the form of
# parameter=value. Parameter for all types is irq (optional).
# for directserial: realport (required), rxdelay (optional).
# (realport:COM1 realport:ttyS0).
# for modem: listenport (optional).
# for nullmodem: server, rxdelay, txdelay, telnet, usedtr,
# transparent, port, insocket (all optional).
# Example: serial1=modem listenport:5000
# Possible values: dummy, disabled, modem, nullmodem, directserial.
# serial2: see serial1
# Possible values: dummy, disabled, modem, nullmodem, directserial.
# serial3: see serial1
# Possible values: dummy, disabled, modem, nullmodem, directserial.
# serial4: see serial1
# Possible values: dummy, disabled, modem, nullmodem, directserial.
serial1=directserial realport:com1 rxdelay:0
serial2=dummy
serial3=disabled
serial4=disabled

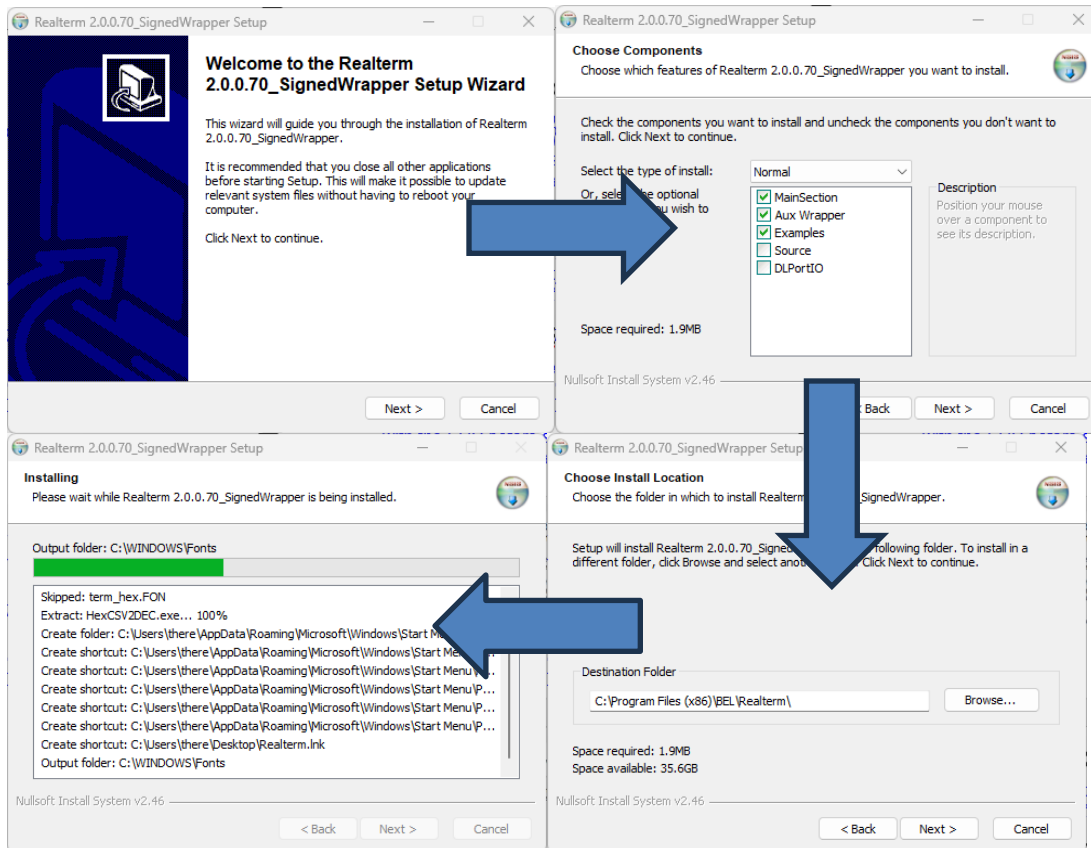
[dos]
# xms: Enable XMS support.
# ems: Enable EMS support.
# umb: Enable UMB support.
# keyboardlayout: Language code of the keyboard layout (or none).
xms=true
ems=true
umb=true
keyboardlayout=auto

[ipx]
# ipx: Enable ipx over UDP/IP emulation.
ipx=false
```

Save the file and exit.

## 2.4 Installation of RealTerm Serial Port Monitor

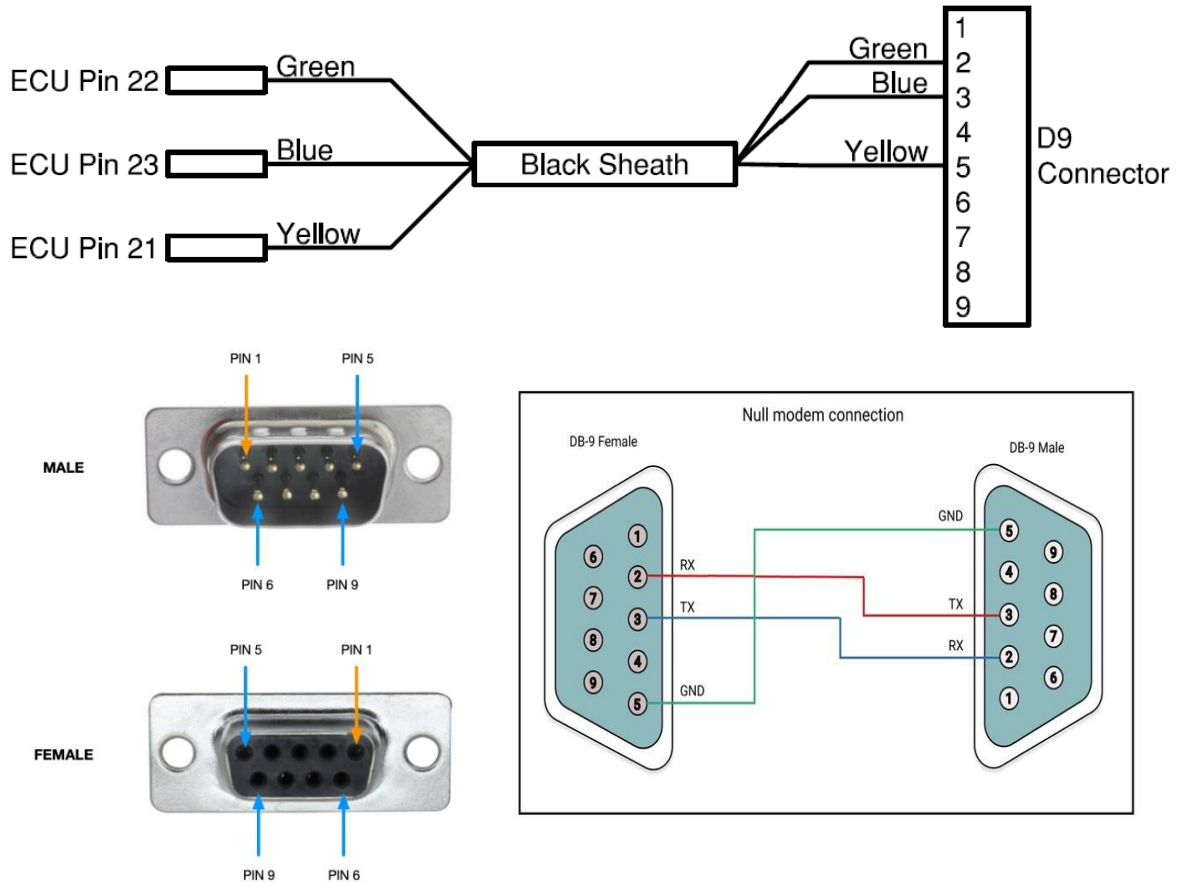
Visit [www.realterm.sourceforge.io](http://www.realterm.sourceforge.io) and download the latest release of RealTerm. This will be the serial port monitoring software used to validate communication is being made with the ECU before starting DOSBox. This is a useful way to check and confirm our wiring, ECU, and serial cable or adapter is functioning properly without worry if either DOSBox and MoTeC software is causing an issue.



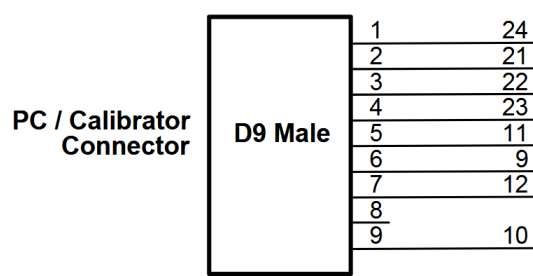
Once the installation is complete, we will be finished with RealTerm for now. We will start RealTerm for the first time right before we connect and power up the ECU.

## 2.5 Wiring and Connections

*Once our software is setup and installed, ensure your device is wired properly before attempting to communicate with the PC using the diagrams below.*



**NOTE:** Although the MoTeC user manual indicates more pins are needed on some ECUs such as the M4 shown below. Only 3 wires are needed for serial.



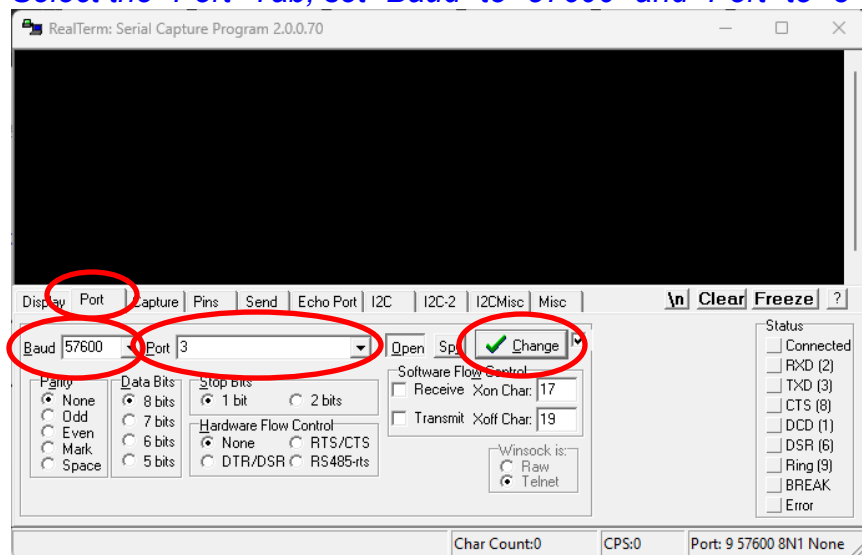
**REMEMBER:**

1. TX from the ECU goes to RX of the PC
2. TX of the PC goes to RX of the ECU.
3. The pin numbers of the D9 connector are mirrored from Male to Female.
4. ECU Pin 22 is Tx, ECU Pin 23 is Rx, ECU pin 21 is Ground.

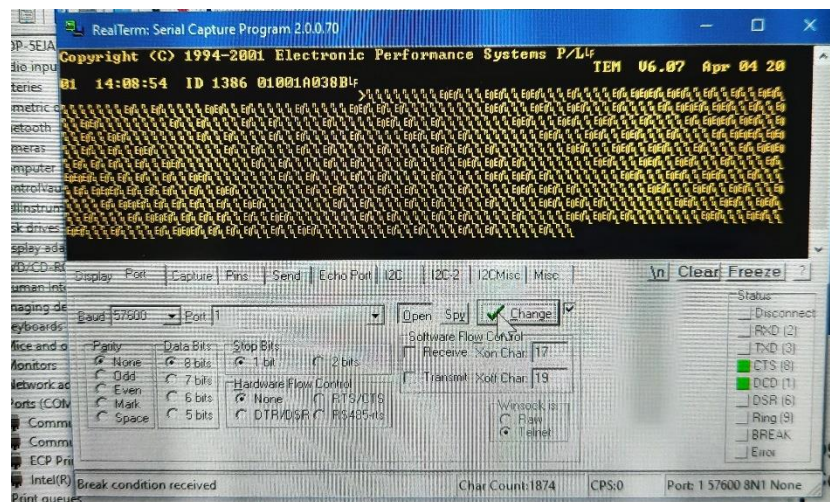
## 2.6 Starting RealTerm and Checking for Communication

*Now that the wiring and connections are made, start RealTerm to initialize our COM port and start monitoring.*

*Select the “Port” Tab, set “Baud” to “57600” and “Port” to “3”. Lastly, click “Change”.*



*Now power on your ECU, and you should start to receive serial data!*



*At this point, our ECU is communicating, and the top row of words are legible.*

*We are ready to start the MoTeC software in DOSBox.*

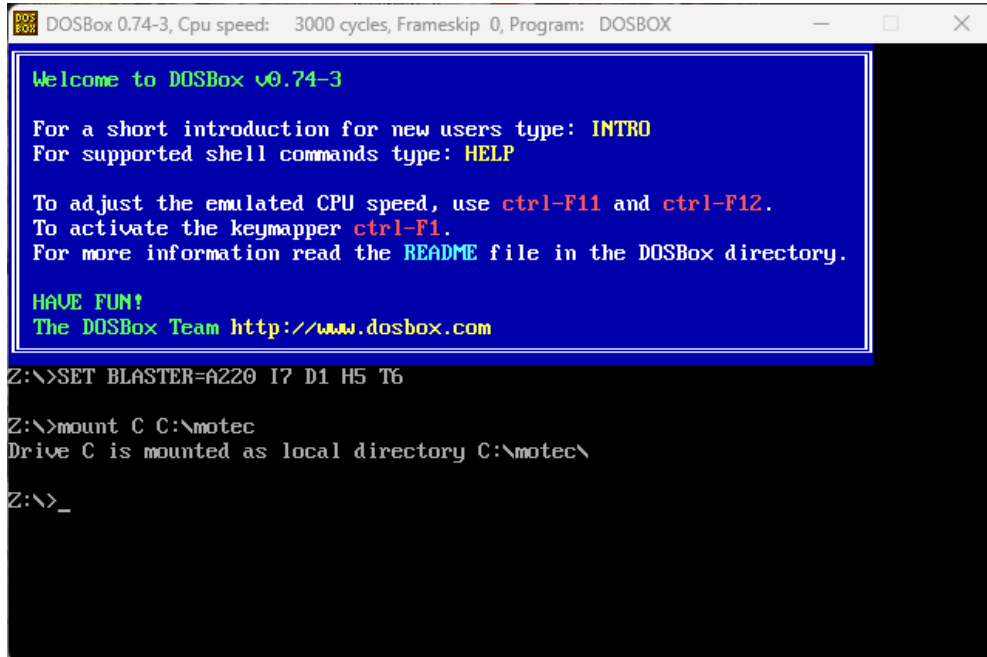
**HINT:** *If you are not receiving data, recheck your COM port or try another.*

*If you are receiving jumbled non-legible text, adjust the baud rate until you do.*

### 3. Starting DOSBox and MoTeC ECU Manager

*To start DOSBox, use the Desktop icon or shortcut in the start menu.*

*Once open type "mount C C:\motec" then press ENTER.*



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX

Welcome to DOSBox v0.74-3

For a short introduction for new users type: INTRO
For supported shell commands type: HELP

To adjust the emulated CPU speed, use ctrl-F11 and ctrl-F12.
To activate the keymapper ctrl-F1.
For more information read the README file in the DOSBox directory.

HAVE FUN!
The DOSBox Team http://www.dosbox.com

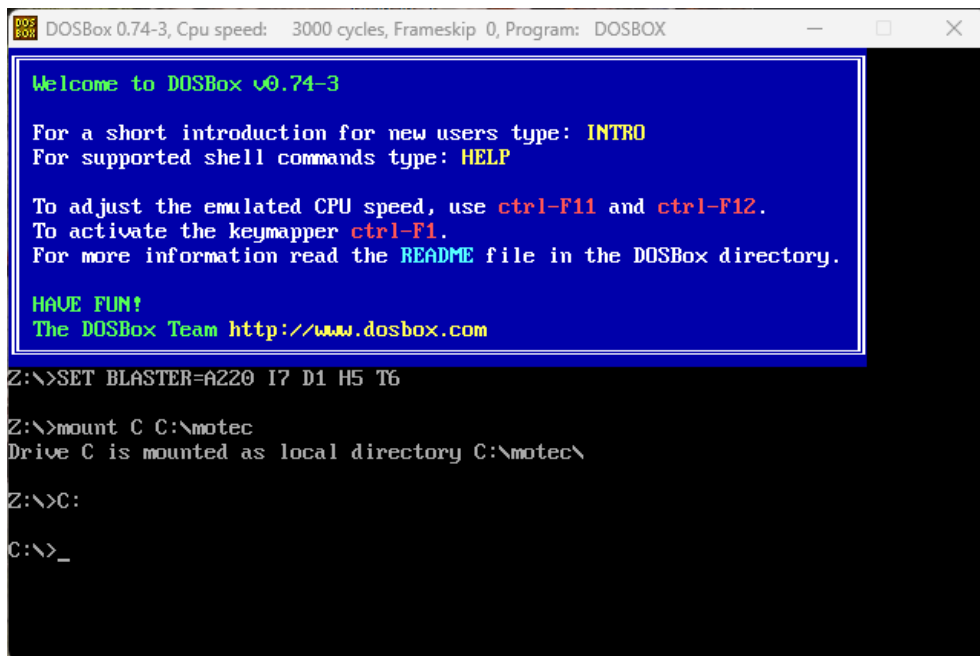
Z:\>SET BLASTER=A220 I7 D1 H5 T6

Z:\>mount C C:\motec
Drive C is mounted as local directory C:\motec\

Z:\>_
```

*This add the MoTeC folder on our Win10/11 machine with DOS MoTeC Software to DOSBox local directory under a virtual drive named C:*

*Next, we need to mount DOSBox to that directory by typing "C:".*



```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX

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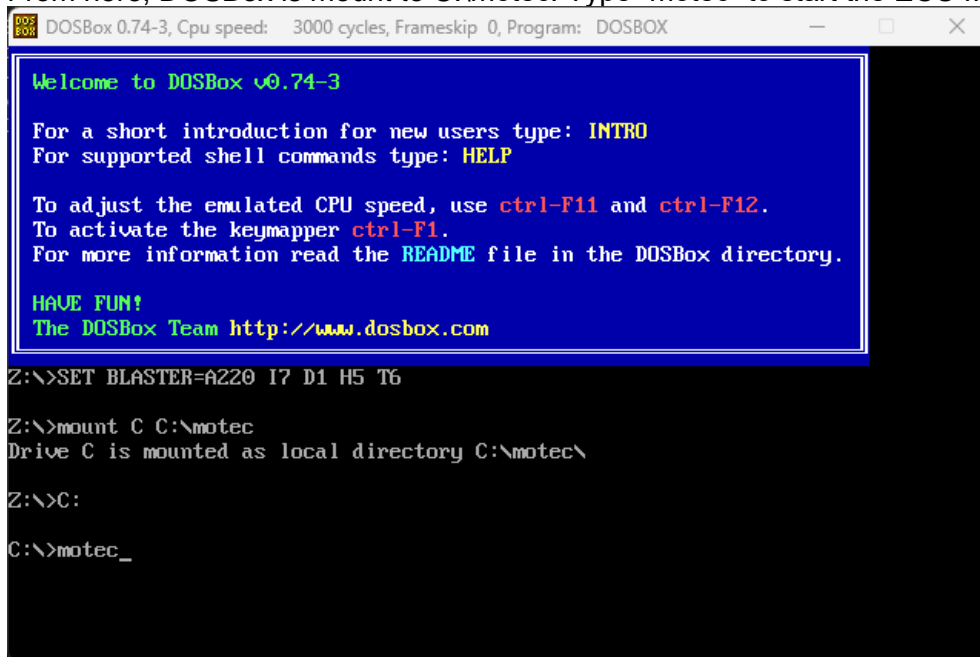
HAVE FUN!
The DOSBox Team http://www.dosbox.com

Z:\>SET BLASTER=A220 I7 D1 H5 T6

Z:\>mount C C:\motec
Drive C is mounted as local directory C:\motec\

Z:\>C:
C:\>_
```

From here, DOSBox is mount to C:\motec. Type “motec” to start the ECU Manager Software.



DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX

```
Welcome to DOSBox v0.74-3

For a short introduction for new users type: INTRO
For supported shell commands type: HELP

To adjust the emulated CPU speed, use ctrl-F11 and ctrl-F12.
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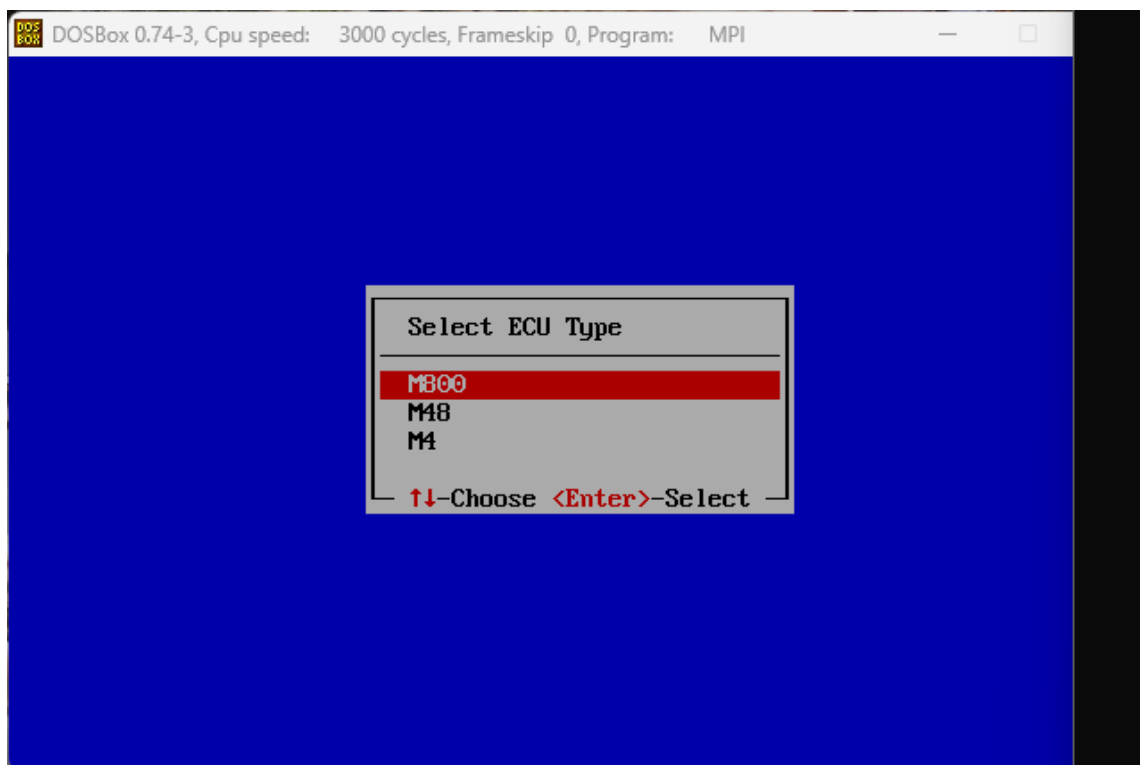
Z:\>SET BLASTER=A220 I7 D1 H5 T6

Z:\>mount C C:\motec
Drive C is mounted as local directory C:\motec\

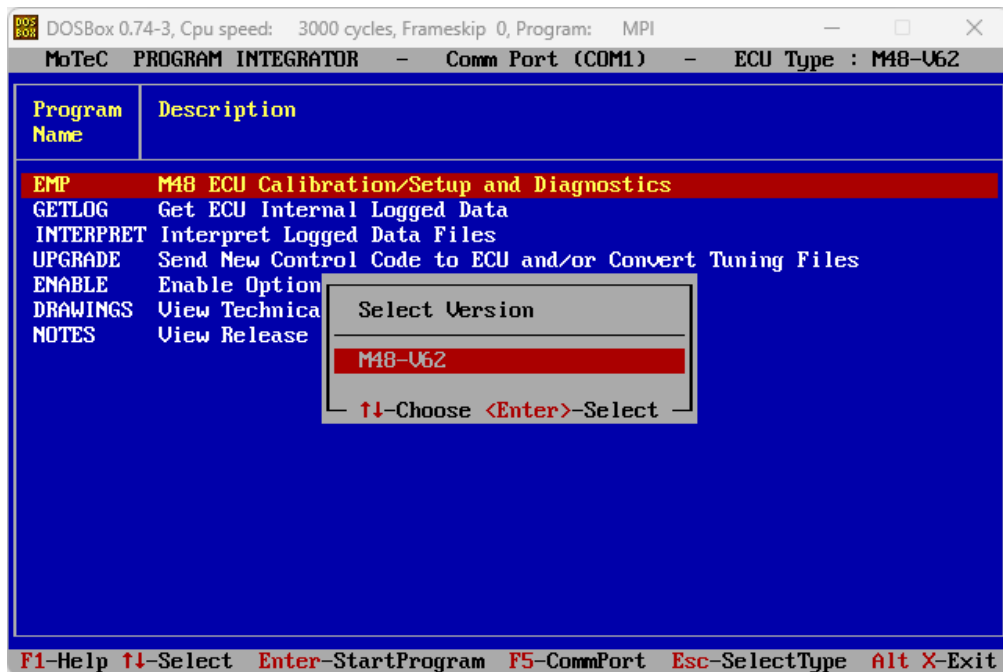
Z:\>C:

C:\>motec_
```

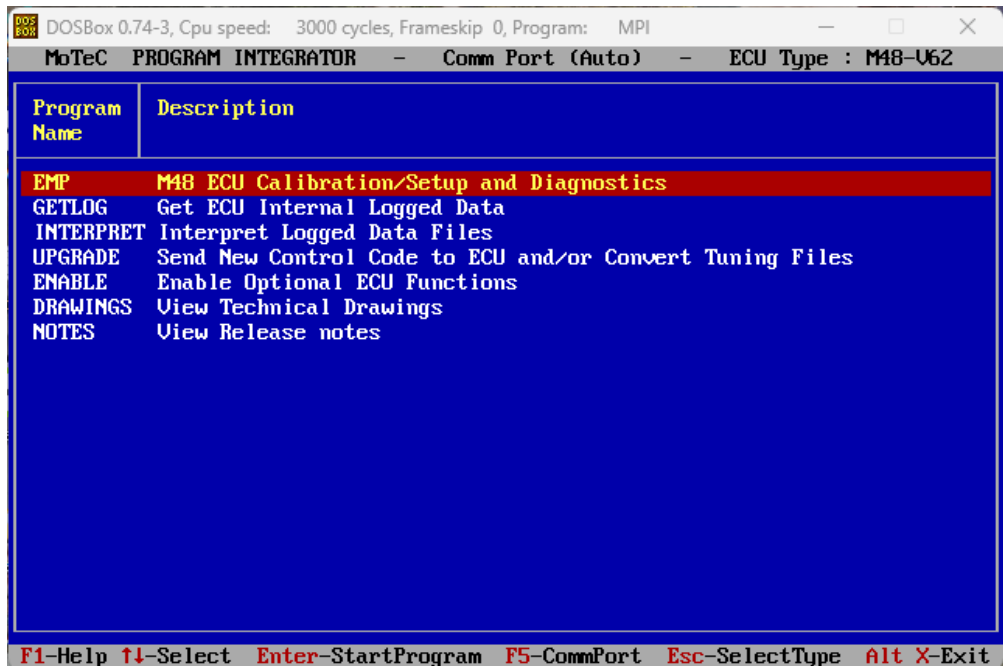
*At this point you should be greeted with a message to select your type of ECU. These menu options will depend on the various types of Goldbox ECU managers you have installed. If your ECU is missing from the list, ensure the software is installed, or attempt to reinstall it.*



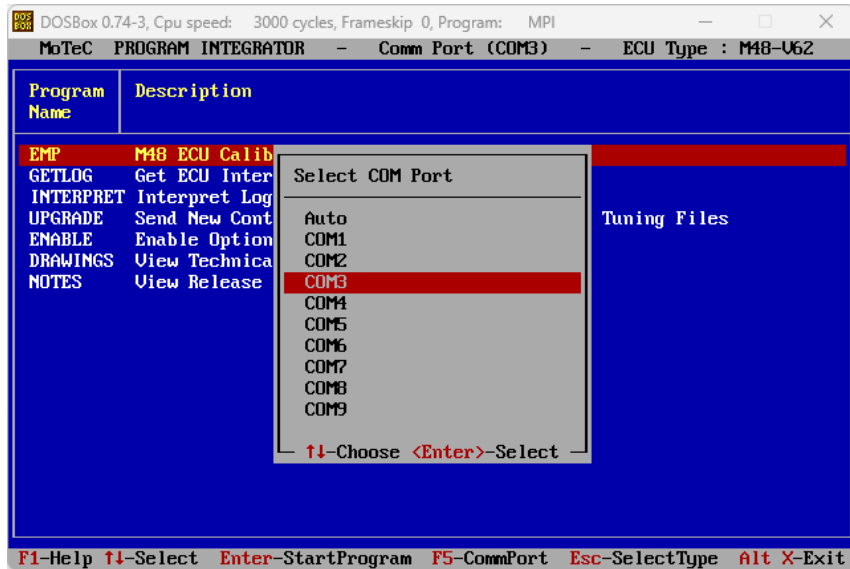
*You will next be asked to select the version of firmware, this also depends on the current installations on your PC. Go ahead and click one and proceed.*



*After selecting your version, you will now need to set the COM port. Press F5 to open the “Select COM Port” dialog box.*

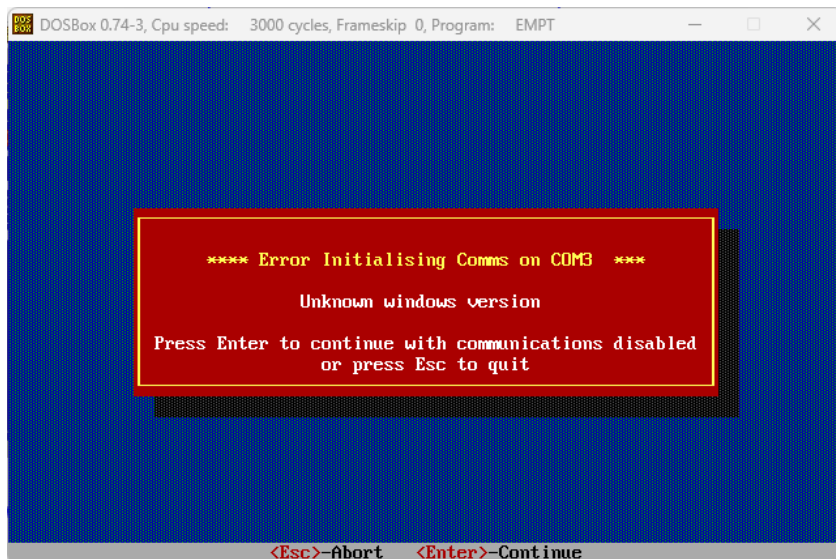


Select the corresponding COM port from before, and press ENTER.



Power your ECU on, and select “EMP” from the menu. You should see a message in the top right indicating you are connected and the firmware version on the ECU. You may receive an error stating the software version does not match the ECU. If that is the case, note the ECU firmware version and download the corresponding version from MoTeC’s website. Close DOSBox, install the correct software, then restart DOSBox and try again.

You may also receive this error. Its very common to experience this, typically it will be because you’ve selected the wrong COM Port, or your COM Port’s baud rate is incorrect.



*If all went well, you should be able to open the calibration software and view your ECU's Parameters as shown!*

SBox Status Window

DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: EMPT

112100 / mcneil / tuneyellowfinal ECU Connect V6.07

Diag Errs 4	RPM	0	Sensors		Fuel
	Effcy	200.0	TP	5.0 %	Pulse W 5.6 mSec
	Load	200.0	MAP	200.0 kPa	Duty Cycle 0 %
	Lambda	0.00	Bat U	12.1 U	INJ Time 115 deg
	La Table	0.84	Eng Temp	80 °C	Ignition
	La Table Dif	0.84	Air Temp	55 °C	
	La Ctrl	OFF	Aux U	108.5	
			Aux	1023	Advance 3.0 BTDC
					Dwell 12.0 mSec

Fuel Main ( % of IJPU )

Eff \ RPM	0	250	500	750	1000	1350	1500	1800	2250
100	18.0	23.5	22.0	13.0	13.0	13.0	22.0	22.0	22.0
90	18.5	22.5	22.0	13.0	13.0	13.0	22.0	24.0	22.0
75	20.0	20.0	17.5	13.0	13.0	13.0	14.0	22.0	22.0
60	13.5	13.5	13.5	13.5	13.5	11.5	12.5	18.0	17.0
50	21.0	16.5	12.5	12.5	11.0	10.5	11.5	15.0	15.0
35	19.5	16.5	12.5	12.5	11.0	10.5	11.0	11.0	11.0
15	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

F1-Help F3-Diag F5-Ign F6-EOI F9-Func PgUp/Dn-Adj Enter-Set Esc-Screen/End

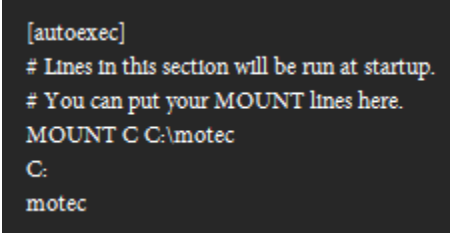
**NOTE:** Older versions of software do not like being installed under any 64-Bit machine, following the troubleshooting guide below on using DOSBox to install them.

### 3.1 Bypassing The DOS Command Line

If you want to skip all the command line in DOSbox paste this at the very end of the DOSBox configuration file under [autoexec]:

```
MOUNT C C:\motec  
C:  
motec
```

This will automatically boot DOSbox into the MoTeC ECU Manager.



```
[autoexec]  
# Lines in this section will be run at startup.  
# You can put your MOUNT lines here.  
MOUNT C C:\motec  
C:  
motec
```

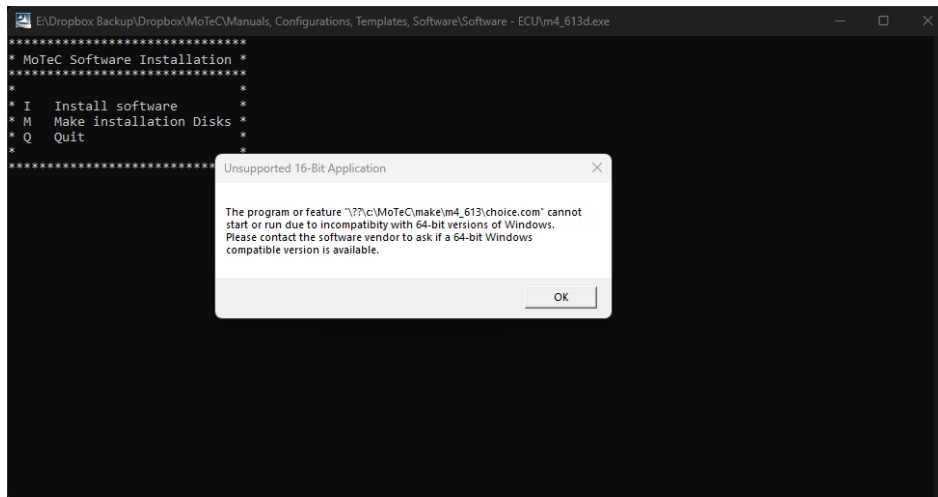
## 4. Troubleshooting & Support

*This section will cover known issues with this technique and be updated to reflect fixes and workarounds.*

If you have any questions or need assistance, please contact us at [www.racebme.com](http://www.racebme.com)

### 4.1 Installing Older Versions of MoTeC ECU Manager

*The most recent version of the M4 software will install. Anything older will give you this error message. Here is the workaround:*



*Even though you receive this error, some files are still placed in the C:\motec folder we can use.*

- 1. Start DOSBox and mount the C:\motec folder.*
- 2. Type C: to change to our MoTeC directory.*
- 3. Type "cd make" to move into the folder the failed installer made.*
- 4. Type "dir" to list all the folders.*

*You should see a directory named after the version of software you want to install.*

```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX

Z:\>mount C C:\motec
Drive C is mounted as local directory C:\motec\

Z:\>C:

C:\>cd make

C:\MAKE>dir
Directory of C:\MAKE\
.                <DIR>                19-12-2023  1:33
..               <DIR>                19-12-2023  1:50
CDD_100         <DIR>                14-08-2022  19:49
M48_620         <DIR>                18-12-2023  19:18
M4_607          <DIR>                19-12-2023  1:33
M4_613          <DIR>                19-12-2023  1:33
M4_620          <DIR>                14-08-2022  19:58
M001354E        <DIR>                14-08-2022  19:48
 0 File(s)      0 Bytes.
 8 Dir(s)       262,111,744 Bytes free.

C:\MAKE>
```

5. Type “cd” then whichever version you want to install.
6. Finally, type “install” and follow the on-screen instructions.

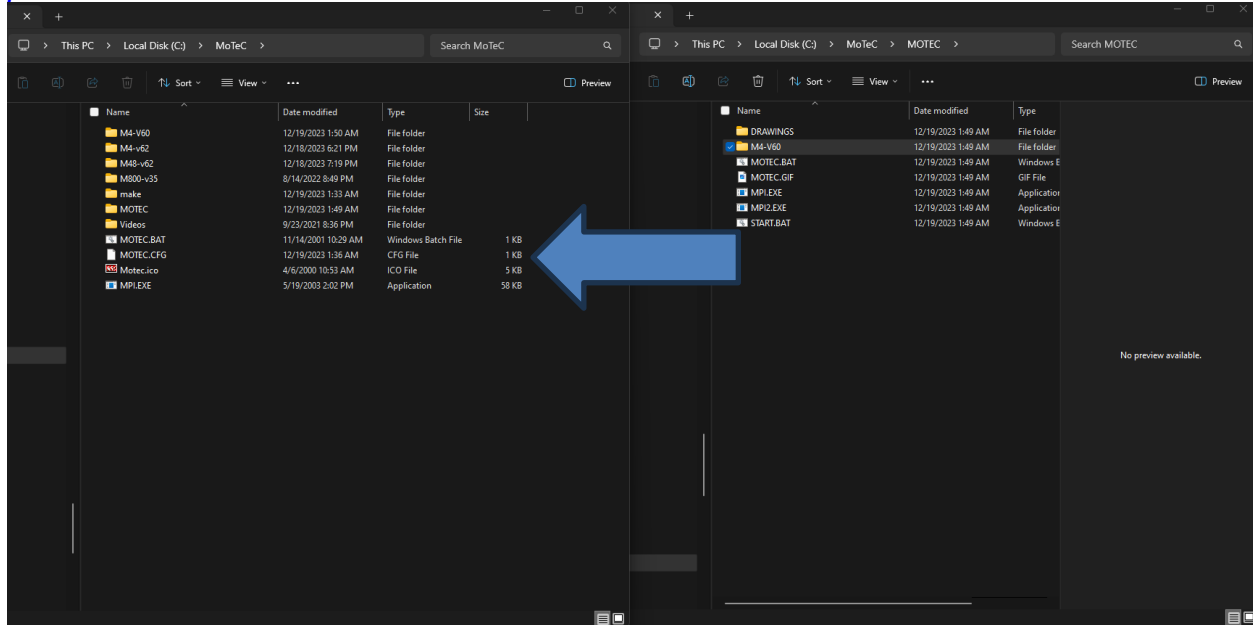
```
DOSBox 0.74-3, Cpu speed: 3000 cycles, Frameskip 0, Program: DOSBOX

*****
* MoTeC Software Installation *
*****
*
* I  Install software          *
* M  Make installation Disks  *
* Q  Quit                     *
*                               *
*****

Choose an option [I,M,Q]?
```

Once this is finished, you will need to move the newly installed files to the correct folder. Since DOSBox believes its operating the C: drive, it makes another folder called MOTEC in our C:\motec directory. (C:\motec\MOTEC).

*We need to move the folder for our newly install version from C:\motec\MOTEC and place it in C:\motec.*



*Now you can restart DOSBox and ECU Manager, the new firmware has been added.*