

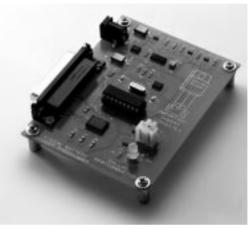


DS1633K DS1633K–220 Battery Charger Programming Kit

FEATURES

- · Eases development of load lines for Battery Chargers
- Programs EPROM DS1633 devices
- Operates with a PC compatible host system
- Communicates via standard 9600 baud RS232 serial port

DS1633K PROGRAMMING MODULE



INTRODUCTION

The DS1633K Battery Charger Kit provides everything you need to program the Battery Charger chip with your battery's specifications. Unlike other battery chargers, the DS1633 requires no external components, and you don't need to write sophisticated microcode. The Load Line Software included with the kit lets you draw a load line and specify other charger parameters to meet your requirements, and then program a DS1633 in a matter of minutes. You can generate as many prototypes as you need with as many different curves as you need.

KIT CONTENTS

The DS1633K kit contains the following:

- 1. Four unprogrammed DS1633 Battery Chargers*
- 2. Programming Module
- 3. DS1633K data sheet (this data sheet)
- 4. DS1633 data sheet
- 5. DS1633 Load Line Software floppy diskette
- 12V AC–DC Adaptor (DS1633K 110 VAC, DS1633K–220 – 220 VAC European version)

If you do not receive one of these items in your kit, please contact Dallas Semiconductor Customer Service at (972) 371–4969.

*We also offer DS1633s pre-programmed to work with several popular battery packs.

EQUIPMENT NEEDED

To use the DS1633K, you will need in addition to what comes with the kit:

- 1. An IBM–compatible computer with a 3.5" floppy drive, a mouse, and an available serial port
- A suitable RS232 cable which can connect from the DB25 connector on the DS1633K to the serial port on your PC.
- 3. If using a DS1633K–220, a mechanical adapter may be necessary to connect the transformer to your local mains supply.

NOTE: You can program 1633s via mouse, by clicking boxes, or via the keyboard, by pressing function keys. For simplicity's sake, these instructions discuss the mouse method. However, each screen indicates the corresponding function key that performs the same action.

SETUP AND INSTALLATION

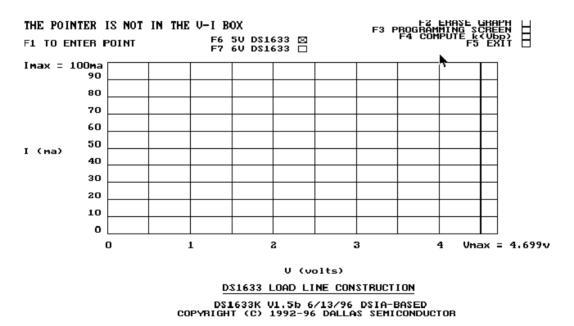
First, make the following connections:

- 1. Connect the programming module to your serial port using a standard 25–pin RS232 cable (not provided in the kit).
- 2. Plug the mini-jack of the AC-DC adaptor into the Programming Module.
- 3. Plug the AC-DC adaptor into a power source.

The DS1633K hardware must be connected to the computer and powered up for the software to run.

To use the Load Line Software, do the following:

- 1. Insert the floppy diskette in an IBM–compatible computer.
- 2. From the DOS prompt, you can either copy the DS1633K.EXE program to your hard drive or run it from the floppy diskette.
- Type DS1633K.EXE 1 (for serial port 1) or DS1633K.EXE 2 (for serial port 2). The main programming screen, shown in Figure 1, will appear.



MAIN PROGRAMMING SCREEN Figure 1

021798 2/5

DRAWING THE LOAD LINE

The Load Line defines for the DS1633 the current that should be sourced into the battery when the battery is at a given voltage. Many batteries, such as NiCd or NiMH batteries, only require a constant current – meaning that their load line would be a straight, horizontal line at the desired current level, up to the point of maximum battery voltage for the battery pack the DS1633 is desired to charge. Other chemistries require that the current level change when the battery voltage changes. Either type of load line can be accommodated by the DS1633.

You can draw your load line either with a mouse or from the keyboard. If you are using a mouse, position it at each point that defines the curve and click the left mouse button at each of those points. If you do not have a mouse, use the up and down arrow keys to move the cursor to the desired position. Press F1 to enter a point.

The software will automatically draw a line from the previous point to the most recently placed point. The first point you enter is automatically extrapolated to the vertical axis and the last point is extrapolated to the horizontal axis (i.e., constant current load lines can be defined by clicking a single point). You can use from one to 32 points to define your curves. You can erase your line by clicking on the Erase Graph box in the upper right hand corner of the screen. Exit the program at any time by clicking the Exit box.

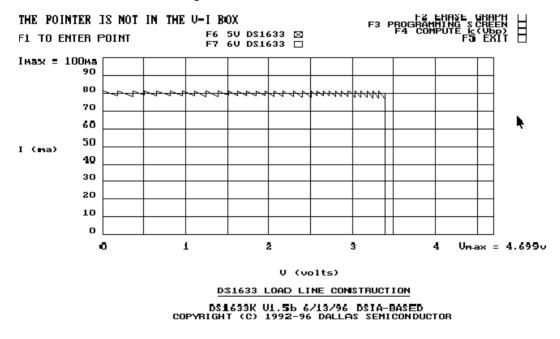
CONVERT LOAD LINE TO SOFTWARE

Now that your curve is completed, the Load Line Software will generate the required program to emulate your curve.

Move the mouse pointer to the upper middle of the screen and click either 5V DS1633 or 6V DS1633, whichever is appropriate for your needs. (Note: If you select a point with a voltage greater than 3.699 volts, it cannot be programmed for 5V).

Click the Compute k(Vbp) box in the upper right corner. Your PC will now calculate the required array to approximate the load line curve you drew. Depending on the configuration of your PC, array generation may take several minutes. Do not turn off or reset your PC, as you will have to redraw the curve.

Once the Load Line Software has finished its calculations, it will draw the approximation of your requested curve, which can then be programmed into the DS1633 (see Figure 2).



APPROXIMATED LOAD LINE Figure 2

DEFINE OTHER CHARGING CHARACTERISTICS

Click the Programming Screen box in the upper right hand corner. It will show a variety of data (see Figure 3).

The table summarizes the information needed to configure your load line. You needn't do anything with it - or even understand it. The first two columns show the register value and the voltage value calculated for the open circuit voltage at that breakpoint (Vocx); the second two columns show the register value and the voltage value calculated for the breakpoint voltages (Vbpx); and the last two columns show the register value and Thevenin resistance calculated for each breakpoint (Rthx). The current into the battery at that breakpoint is thus (Vocx-Vbpx)/Rthx.

There are four pieces of information in the bottom lefthand comer. The first tells you whether this is a 5V or 6V

PROGRAMMING SCREEN Figure 3

device. The remaining three are options that can be reset by clicking the appropriate box or hitting the corresponding function key. You can:

- 1. Turn the toggle timer mode on or off.
- 2. Increase or decrease the duty cycle. This determines whether current is to be applied to the battery all of the time or part of the time after the timer has expired.
- 3. Increase or decrease the number of hours for which the timer is set. This controls the maximum time the DS1633 can charge at a high current. The timer can be incremented or decremented in units of two hours, from two hours to 32 hours maximum.

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021798 4/5

You may save your load line and attributes to a file. This allows you to program multiple DS1633s without having to redraw the load line in subsequent sessions.

Click the Save Registers box in the upper right comer, or press the function key indicated. The screen will prompt you to enter a file name.

Click the Read Registers box (or press the function key) if you want to retrieve the specifications you saved from a previous session and program more DS1633s.

PROGRAMMING A DS1633

NOTE: Before you start, verify that the Programming Module is set up correctly. If it is not, the software will hang and you'll have to reboot your PC.

Insert a DS1633 into the socket (see Figure 4). Click the Program Registers box or press the function key indicated. Within 15 seconds, you will hear a beep and a message should appear on the programming screen saying "PROGRAMMING OPERATION SUC-CESSFUL". And that's it. The DS1633 is completely programmed.

INSERTING A DS1633 INTO THE SOCKET Figure 4

+--DALLAS DS1633X At this point, you can program more devices, modify the programming from this screen, or return to the previous load line screen to make a new graph.

NOTE: If the programming was not successful or the setup is incorrect, you will get the message "REGISTER PROGRAMMING FAILED, OK". Check your setup. If it is correct, it is possible that the DS1633 has been previously programmed. If you can't find the problem, contact the factory.

Once a DS1633 has been programmed, it cannot be reprogrammed. You can read the contents of a previously programmed DS1633 by clicking in the 'Read Contents of DS1633' box. This may help you determine if a part which fails to program has already been programmed, or may allow you to use a master part to make copies from in case you didn't save the register values in a file on disk.

RETURNING TO THE LOAD LINE SCREEN

To return to the previous screen, click Exit. if you did not save the previous load line before returning to the load line screen, you can still return to the programming screen and save the load line in a file. You can also draw and erase a graph on the load line screen without erasing the previous numbers in the programming screen.

However, once you click the Compute k(Vbp) box, all previous values in the programming screen will be replaced with the new values from the current graph.

To exit the program, click Exit from the load line screen.