

MEMSPEED PRO II™

Clock Oscillator Programmer



**ABRACON
CORPORATION**

Programmer Users Guide

This is a quick and simple operation manual for the Abracon MEMSpeed Pro II product. Once installed, the MEMSpeed Pro II software will automatically download software updates as they become available.

The MEMSpeed Pro II kit consists of the MEMSpeed Pro II programmer, USB cable, antistatic tweezers, Quick Start guide & installation USB Flash drive

The MEMSpeed Pro II programmer presently provides two functions:

1. programs the frequency of Abracon MOSflex blank parts (DSC8002 and DSC8001).
2. reads and indicates the frequency of a programmed part.

Included in the MEMSpeed Pro II kit is a USB flash drive with the installation software used to load the latest version of the MEMSpeed Pro II control software on the PC of your choice via an internet connection and a soft copy installation manual for the MEMSpeed Pro II software. If you choose to accept the default software installation location folder on your PC, then depending on the computer architecture (32bit or 64 bit) the location of the installation software and the manual will be;

**C:\Program Files\Abracon\MEMSpeed Pro II\ or
C:\Program Files (x86)\Abracon\MEMSpeed Pro II**

There is a hard copy of the manual located in the MEMSpeed Pro II delivery box inside the left panel (when the package is opened)

Socket Adapter Cards are required for programming of the DSC8XXX oscillators with the MEMSpeed Pro II programmer. The Socket Adapter Cards

1. Physically translate the DSC8XXX component pins appropriately to the 26 pin MEMSpeed Pro II programming module
2. Configure the programming unit to correctly communicate with the Abracon DSC8XXX that is plugged into its socket.

A specific model of card exists for each separate Abracon programmable product. The socket adapter boards may be identified by a silk screened Abracon engineering board number. Table 2 (at end of this document) can be used to match the user sample kit order number to the socket card board number, programming blank and the corresponding fixed frequency part. For added convenience, the socket size is designated at the top of each card.

Using MEMSpeed Pro II to program blank (unprogrammed) DSC8XXX devices

After installation of the MEMSpeed Pro II control software, execute the following steps to launch the application.

1. Navigate to the installation location of the program “MEMSpeed Pro II.exe” and then double click on the icon. For convenience, a “shortcut” of this icon on your desktop or tool bar will ease continued use of the software. Initially the MEMSpeed Pro II application will display a logo with a transparent background as a windows screen while the application is launching. When the software is loaded, the following screen will appear.

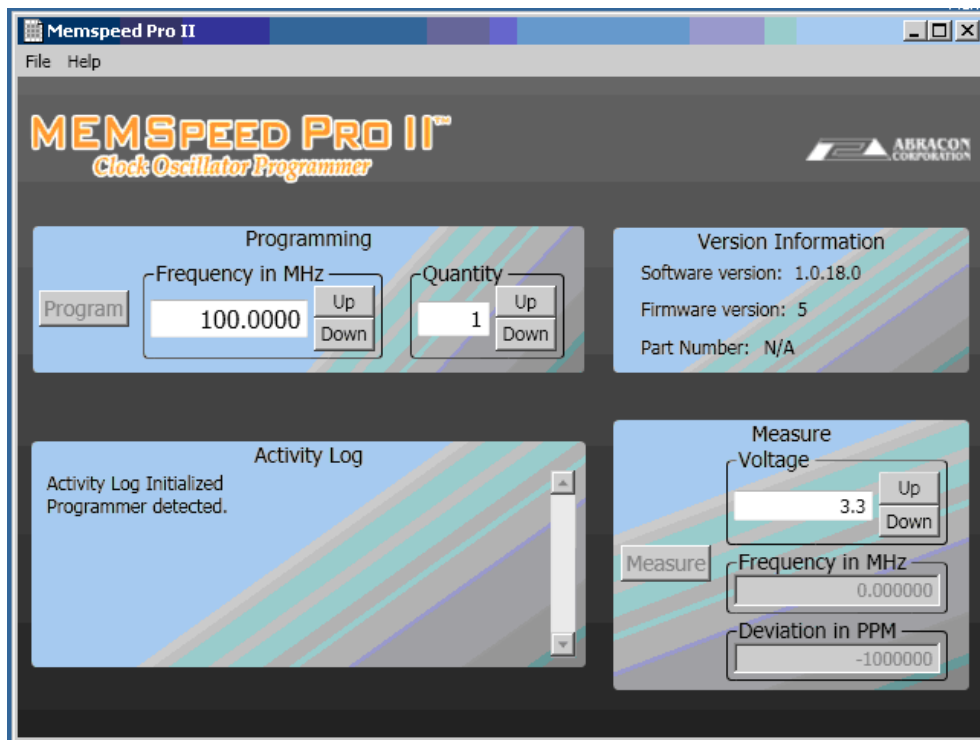


Figure 1. The MEMSpeed Pro II “working” screen

The version information pane displays the following information (see Figure 2 below):

A. The software version. [G] This is the version of MEMSpeed Pro II software that is running in your PC.

B. The Firmware Version. [F] This is the version of the control software that is currently running in the MEMSpeed Pro II programming module. If the module is not attached then it will be blank.

C. The part number. [E] This field indicates the part number and package size of the blank component you currently have inserted in the socket adapter card.

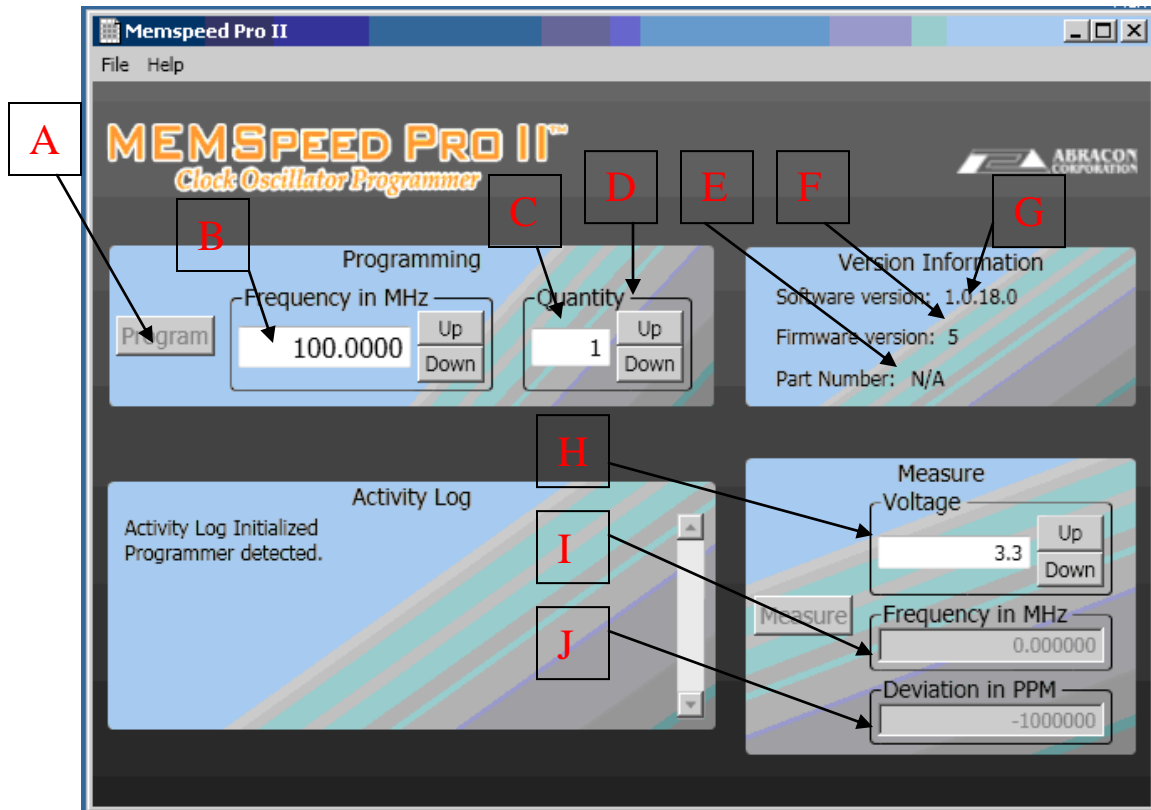


Figure 2

NOTE: The items indicated in this figure will be referred to in the format of [*] later in this manual to reference their location on this screen. Thus [E] refers to the Part Number item in the Version Information pane of this screen

To program a DSC8XXX component:

- A. Plug the USB cord into any available USB port on your computer
- B. Plug the MEMSpeed Pro II programming module into the micro USB end of the USB cable
- C. Plug the desired Socket Adapter Card into the MEMSpeed Pro II programming module. The correct orientation results in the socket of the socket adapter card and LED's of the programming module being on the same side of the assembled unit. If the socket adapter card is inadvertently connected to the programming module either 180 degrees rotated or offset from the correct alignment, no harm

will be done to the units. Under this condition, **[E]** on the screen will not display a part number.

NOTE: You may connect the MEMSpeed Pro II module to the PC before or after the software on the PC is started and you may connect the MEMSpeed Pro II programmer to the socket adapter cards before or after the software is started. You may also unplug and plug in new socket adapter cards while power is connected (the USB cable) at any time. The only restriction is that you may not unplug components, socket adapter cards or the USB cable while actual programming is being done. This condition is indicated by the programmer's blue busy LED being illuminated on the MEMSpeed Pro II module.

- D. Launch the MEMSpeed Pro II software on your PC and note the software version, programmer's firmware and part number are displayed and that the part number is correct for the part you are about to program.
- E. Using the supplied antistatic tweezers, place the DSC8XXX component into the socket on the socket adapter card

Note: There is a pin 1 designator printed in the corner of the socket card to assist in correctly aligning the component in the socket. If the component is inserted backwards, this condition will be detected and abort programming. The blank oscillator will not be damaged. Successive attempts to program a component that is inserted backwards will can lead to degraded performance of the component so it is advised to use care when inserting the components into the unit's socket.

- F. Using normal Microsoft Widows screen navigation techniques, select the "Frequency in MHz" numeric block in the "PROGRAMMING" window **[B]** of the software
- G. Type in or click on the spin buttons until the desired frequency is displayed.
- H. Check the "Quantity" **[C]** numeric block to insure that it displays "1". Operation for quantities greater than one will be discussed below in Sequential Programming of Multiple Devices.
- I. Click the programming button in this window **[A]**
- J. Wait for either the Busy (blue) LED on the programmer to extinguish or the finished message to appear in the "ACTIVITY LOG" screen window

The device has know been programmed!

The MEMSpeed Pro II programmer can be used to measure the frequency of the programmed part.

- A. Either type in the desired operating voltage for the programmed part or use the up and down buttons to increment the voltage value **[H]**. If you use the buttons you will be selecting the standard voltages (1.8, 2.5, 2.8, 3.0 and 3.3 Volts. If you type in an absolute value, you can select any voltage (in 10 millivolt increments) from 1.8V to 3.3V. Using this method, measurement of the frequency can be measured across the desired operating voltage range (Margining).
- B. Read the actual measured frequency **[I]** and PPM offset **[J]** from the desired frequency in the "MEASURE" pane.

NOTE. The PPM offset value in the MEASURE pane uses the frequency value displayed in the PROGRAMMING pane as its 0PPM reference point.

Sequential Programming of Multiple Devices

- A. To program multiple DSC8XXX devices to the same frequency, the “Quantity” **[C]** numeric block can be set to a number greater than 1 by use of the up and down buttons **[D]**. The user may select a quantity count from 1 to 999. When the program button is pressed, the system MEMSpeed Pro II will program the part that is in its adapter card socket. If the part is either previously programmed. When the part is successfully programmed, the counter will be decremented and the system will measure and display the frequency in the FREQUENCY area of the MEASURE pane **[I]**.
- B. Using the supplied antistatic tweezers, place the next DSC8XXX component into the socket on the socket adapter card
- C. Click the programming button in this window **[A]** and observe that the counter decremented
- D. Continue repeating steps B & C until all devices are programmed.

If the device does not program, an error message appears in the “Activity Log” and the counter will NOT decremented.

Measuring frequency of oscillators in the MEMSpeed Pro II system

A second function of the MEMSpeed Pro II system is to measure the frequency of programmed components. To do this:

- A. Assemble a programming module and socket card adapter per instructions above and connect it to a PC.
- B. Start the PC software
- C. Insert the component into the socket adapter socket
- D. Set the desired testing voltage in the MEASURE panes VOLTAGE values location **[H]**.
- E. Type the expected frequency into the PROGRAM panes FREQUENCY value location **[B]**. If you do not know what value to expect the component to be outputting then skip this step.
- F. Click on the MEASURE button in the MEASURE window
- F. Read the actual measured frequency in the MEASURE panes FREQUENCY value location **[I]**. If you set the PROGRAM pane frequency **[B]**, then you may also read the PPM offset value in the MEASURE panes DEVIATION PPM value location **[J]**.

Error messages

This table displays the MEMSpeed Pro II Application error messages based on 3 classifications on severity: Information Only, Warning and Error.

Table 1 Application Messages

Message Text	Message Type	Location	Pre-Condition
Downloading installer...	Information Only	Activity Log	Update link pressed by user
Installer was successfully downloaded.	Information Only	Activity Log	Downloading installer pointed by version.xml successful
Burn started.	Information Only	Activity Log	User pressed “Burn”
Burn complete.	Information Only	Activity Log	Programming was successful.
Measurement started.	Information Only	Activity Log	User pressed “Measure”
Measurement successful.	Information Only	Activity Log	Measurement successful
Programmer detected	Information Only	Activity Log	MEMSpeed Pro II was connected and initialized successfully
Daughter Card detected	Information Only	Activity Log	A supported daughter card was connected
Daughter Card removed	Information Only	Activity Log	A daughter card was removed
Programmer removed	Information Only	Activity Log	MEMSpeed Pro II was removed
Please replace the part with a blank one and press OK.	Information Only	Pop-up Dialog	When the quantity field is > 1 and programming an oscillator was successful, this dialog gives the user a chance to insert a new part.
Testing programmed part failed. Try doing a measurement.	Warning	Activity Log	Communication failure with the programmer while trying to measure the frequency of the oscillator after programming and power-cycle

Not supported Daughter Card detected, check for application updates.	Warning	Activity Log	A not supported daughter card was connected
Could not download the installer.	Error	Activity Log	Downloading installer pointed by version.xml failed
Could not locate the installer. Update failed.	Error	Activity Log	The installer pointed by version.xml was not found or cannot be accessed
Part inserted backwards.	Error	Activity Log	An over-current was detected, probably because the oscillator was inserted backwards
No programmable part present.	Error	Activity Log	Communication failure with the oscillator while trying to calibrate the frequency
Burn failed, still programmable, re-burn same part.	Error	Activity Log	Communication failure with the oscillator while trying to measure the calibrated frequency
Burn failed, still programmable, re-burn same part.	Error	Activity Log	The deviation between the target and measured frequency is > 1000ppm
Burn failed, discard part.	Error	Activity Log	OTP programming failed. Part most likely not re-usable
Could not cycle power. Unplug the programmer and reconnect.	Error	Activity Log	Turning power off/on failed.
Measurement failed.	Error	Activity Log	Communication failure with the programmer while trying to measure the frequency.

Table 2

<u>MEMSpeed Kit Number</u>	<u>Socket adapter part Number</u>	<u>“Blank” device</u>	<u>Corresponding Fixed Frequency Device Number</u>
DCS-PROG-8001-7050	1101_P47050C_005	ASVMB-BLANK	ASVMB-FREQ
DCS-PROG-8001-7050	1101_P47050C_005	ASFLMFB-BLANK	ASFLMB-FREQ
DCS-PROG-8001-7050	1101_P47050C_005	ASEMB-BLANK	ASEMB-FREQ
DCS-PROG-8001-7050	1101_P47050C_005	ASDMV-BLANK	ASDMB-FREQ
DCS-PROG-8001-7050	1101_P47050C_004	ASVM-BLANK	ASVM-FREQ
DCS-PROG-8001-7050	1101_P47050C_004	ASFLM-BLANK	AASFLM-FREQ
DCS-PROG-8001-7050	1101_P47050C_004	ASEM-BLANK	ASEM-FREQ
DCS-PROG-8001-7050	1101_P47050C_004	ASDM-BLANK	ASDM-FREQ

NOTE: “FREQ” = the frequency of the specific component

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