

DEVMAN FOR SERIES 80

(FOR NOKIA SERIES 80 V1 & SERIES 80 V2 9210, 9210i, 9210c, 9290, 9300, 9500)

FORMALLY KNOWN AS MEMORY MONITOR

BY MICHAEL ULLRICH

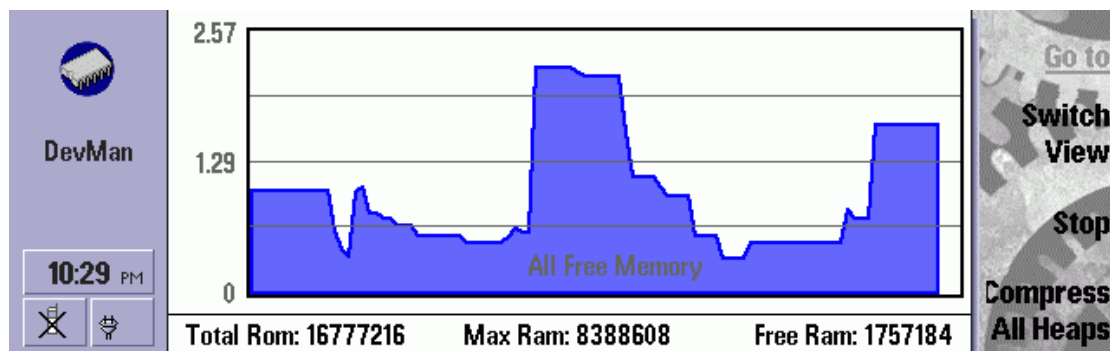
1 Introduction

The purpose of this utility is to switch and manage running tasks and to monitor memory. DevMan (short for Device Manager) uses minimal memory and has many customisable features to help you utilise your device in an efficient manner.

It is also a useful tool for programmers, enabling them to spy on any thread running on the device and monitoring memory usage by time.

It is designed to be run constantly in the background, can be switched to at any time by pressing the combination of Ctrl-Tab (this is modifiable), and can be enabled to be the first application visible on the opening of the devices case.

This version of DevMan is for the Series 80 platform which encompasses the following devices: Nokia 9210, 9210i, 9210c, 9290.



DevMan Graph View

The DevMan Task View displays a table of memory usage for various applications. The table has two columns: 'All Free Memory' and 'Heap'. The applications listed are Calendar, Contacts, Desk, DevMan, and Extras. The memory usage for each application is shown in kB. Below the table, the following statistics are shown: Total Rom: 16777216, Max Ram: 8388608, Free Ram: 1474560. The interface includes a DevMan icon, a clock showing 10:25 PM, and a sidebar with buttons: Go to, Switch View, Set Spy, and Compress All Heaps.

All Free Memory	Heap
Calendar	100 kB
Contacts	148 kB
Desk	48 kB
DevMan	160 kB
Extras	72 kB

Total Rom: 16777216 Max Ram: 8388608 Free Ram: 1474560

DevMan Task View

2 Instructions

2.1 Quick Reference Instructions, DevMan Shortcuts

(* denotes that this feature can be changed, enabled or disabled in Preferences)

When any application selected on the device:

***Ctrl-Tab** switch to DevMan

When the device case is closed:

***open case** switch to DevMan

When the device case is open:

***close case** pause the DevMan sampling of the selected heap

When DevMan application is selected:

enter, g	go to selected task
i	show selected task information
s	spy on selected task's memory usage
k	kill selected task
v	switch between task view and graph view
a	app view - show only tasks that can be switched to
t	thread view - show all threads
r	refresh task list
Ctrl-d	show disk information dialog
Ctrl-p	open preferences dialog
Ctrl-e	close DevMan

2.2 General usage

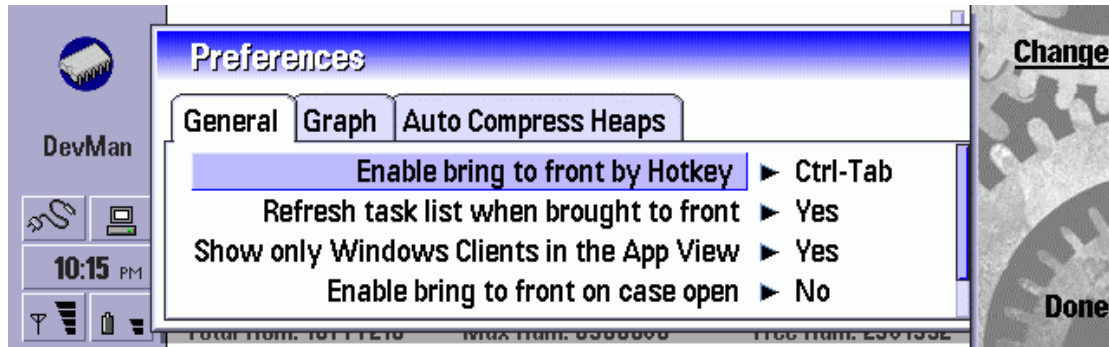
The task switcher functionality is designed to be used as follows:

- when using one application and wanting to change to another, first press **Ctrl-Tab** (or other global hotkey) to switch to DevMan
- then highlight the application in the task list of DevMan you want to switch to and press **enter** or **s**.

To view memory usage over time select **v** or the "**Switch view**" CBA button.

2.3 DevMan Preferences

Menu: File/Preferences
Shortcut: Ctrl-p
CBA: None



The preferences are saved automatically on exit from the dialog (unless Esc is pressed).

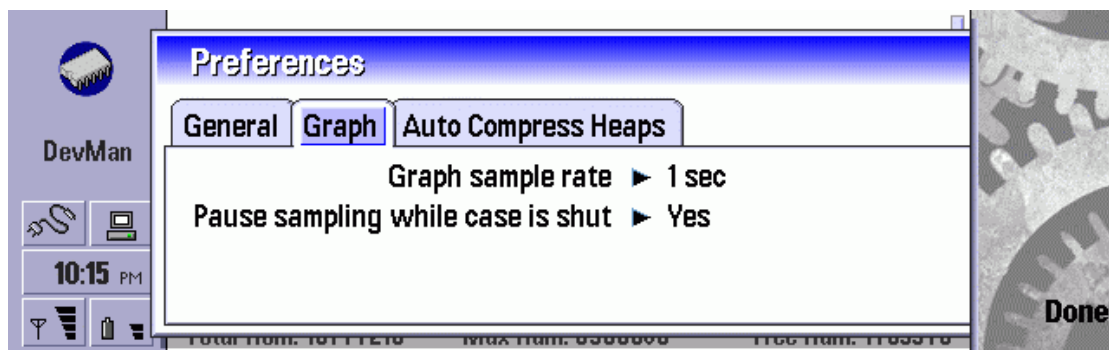
Enable bring to front by Hotkey enables or disables the global hotkey. Possible predefined Hotkeys include: Ctrl-Tab, Shift-Tab, Ctrl-Esc, Ctrl-Menu, and Off. Ctrl-Menu is especially useful if you do a lot of two thumb typing.

Refresh task list when brought to front enables task refreshing after Ctrl-Tab (or other global hotkey) is used. This ensures that the task list contains all the apps that are currently running on the device.

Show only Windows Clients in the App View disables displaying of threads that own windows but do not have visible windows or switchable to windows.

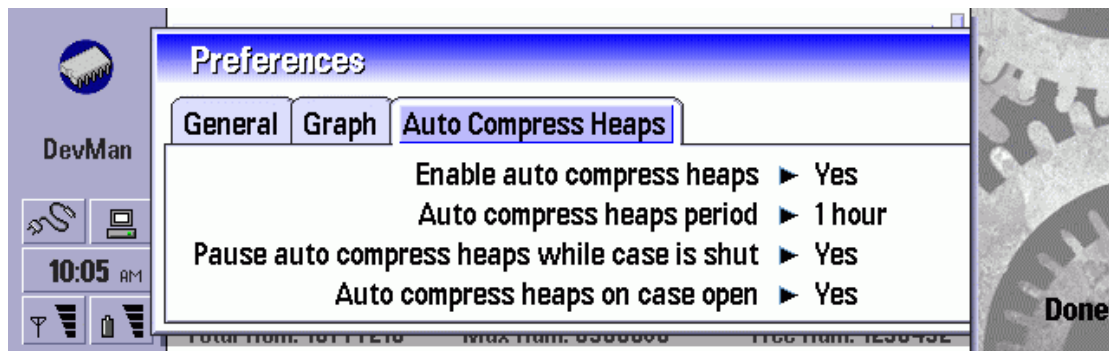
Enable bring to front by case open enables DevMan to be the first application to be displayed when the user opens their device.

Set as System application will make DevMan a Symbian OS system application. This will ensure that it does not get closed down by the Symbian OS low memory framework or by the backup framework. Note: If you attempt to backup your device using PC Suite, it will find the application is locked. To backup DevMan, exit before starting a backup.



Graph sample rate allows the user to select how often they want DevMan to sample either all available free memory or the heap that they are currently spying on.

Pause sampling while case is shut disables sampling while the case is shut. This offers a slight power saving advantage, however sometimes it is useful to view memory usage while the case is closed.



Enable auto compress heaps allows DevMan to compress heaps at a set period of time. See Compress All Heaps section for further information. The following two options are available if this option is enabled.

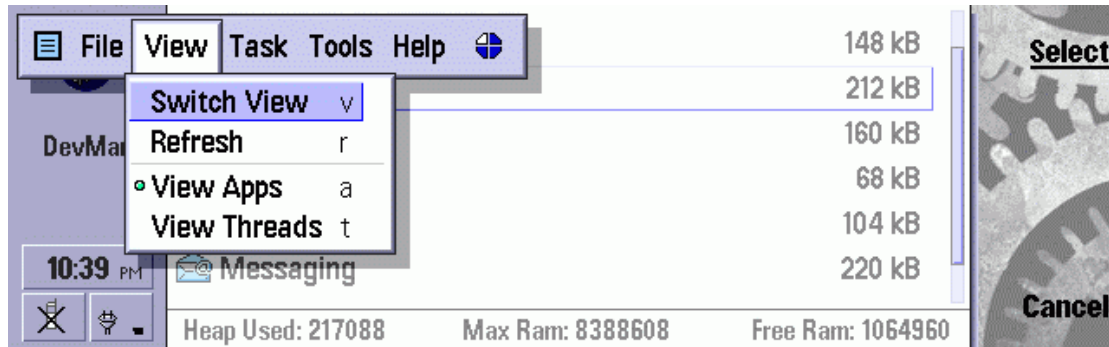
Auto compress heaps period sets the amount of time between each compress heap.

Pause auto compress heaps while case is shut disables auto compress heap while the case is shut. This offers a slight power saving advantage and the majority of the time very little happens on the Symbian OS side while the case is closed so this option is best left enabled.

Auto compress heaps on case open compresses the heaps every time the case is opened.

2.4 View Options

There are two view options in DevMan - Task View and Graph View. Task View can either show applications or all threads.



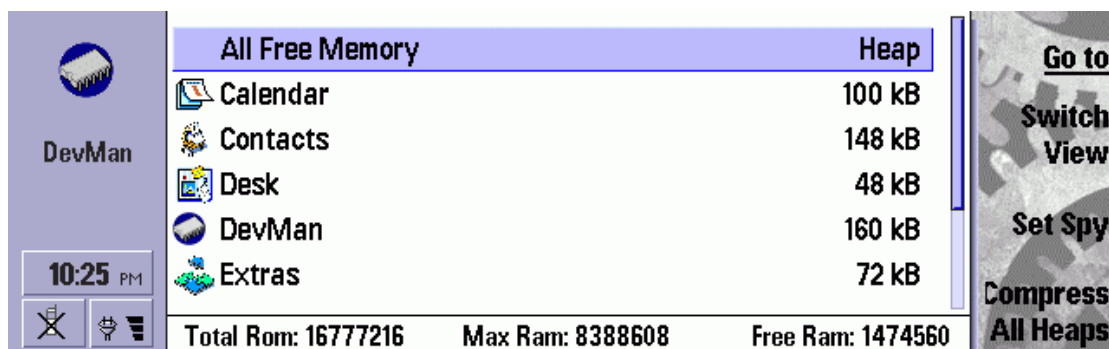
2.4.1 Switch View

Menu: View/Switch View
Shortcut: v
CBA: Second button
View: Task View and Graph View

This option toggles between Task View and Graph View.

2.4.2 Application View

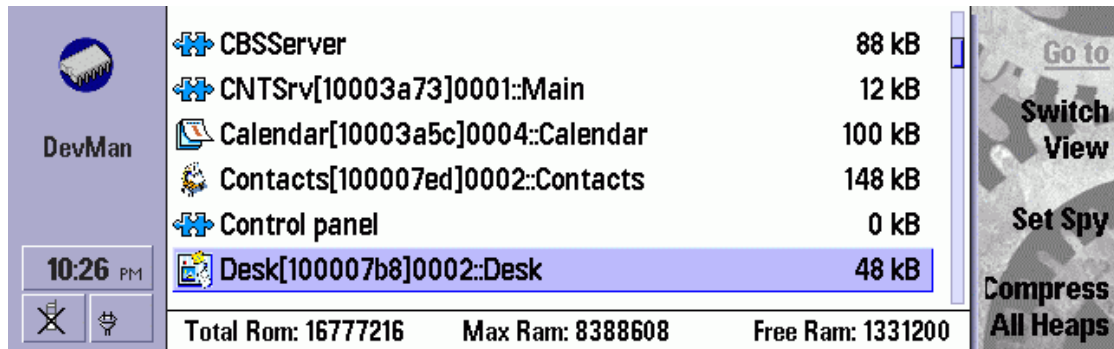
Menu: View/View Apps
Shortcut: a
CBA: None
View: Task View









This option shows all tasks that have a window (unless the preference *Show only Windows Clients in the App View* is selected), and their heaps use.

2.4.3 Thread View

Menu: View/View Threads
Shortcut: t
CBA: None
View: Task View



	CBSServer	88 kB
	CNTSrv[10003a73]0001::Main	12 kB
	Calendar[10003a5c]0004::Calendar	100 kB
	Contacts[100007ed]0002::Contacts	148 kB
	Control panel	0 kB
	Desk[100007b8]0002::Desk	48 kB

Total Rom: 16777216 Max Ram: 8388608 Free Ram: 1331200

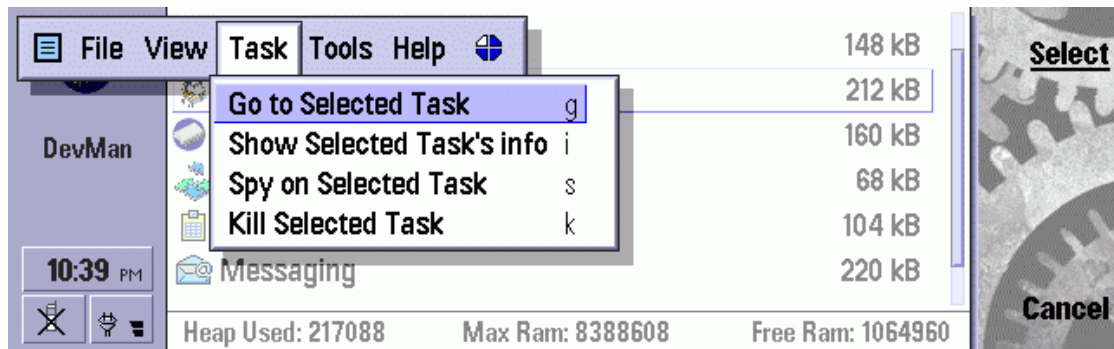
This option shows all threads that are running on the device, and their heaps use.

2.4.4 Refresh View

Menu: View/Refresh
Shortcut: r
CBA: None
View: Task View

This option refreshes the Task List.

2.5 Task Tools



2.5.1 Go to Selected Task

Menu: Task/Go to Selected Task
Shortcut: g
CBA: First Button, Default action
View: Task View and Graph View

Selecting this option switches to the highlighted application in the Task View or to the Spied on application in the Graph View.

2.5.2 Show Selected Task's Information

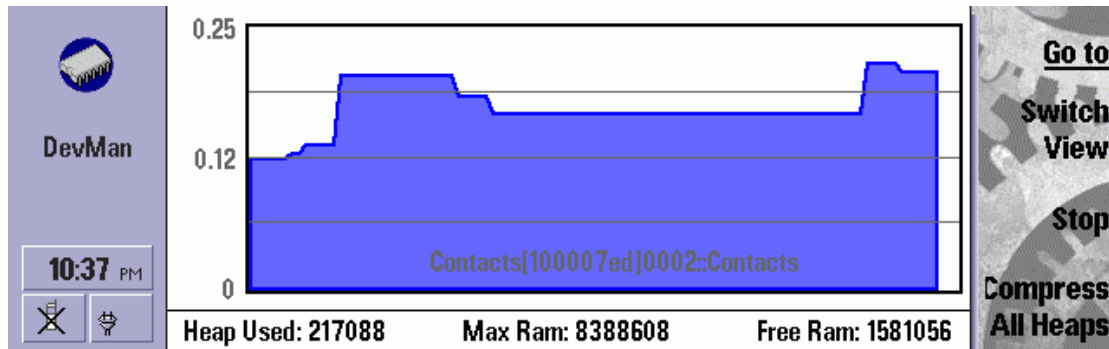
Menu: Task/Show Selected Task's info
Shortcut: i
CBA: None
View: Task View and Graph View



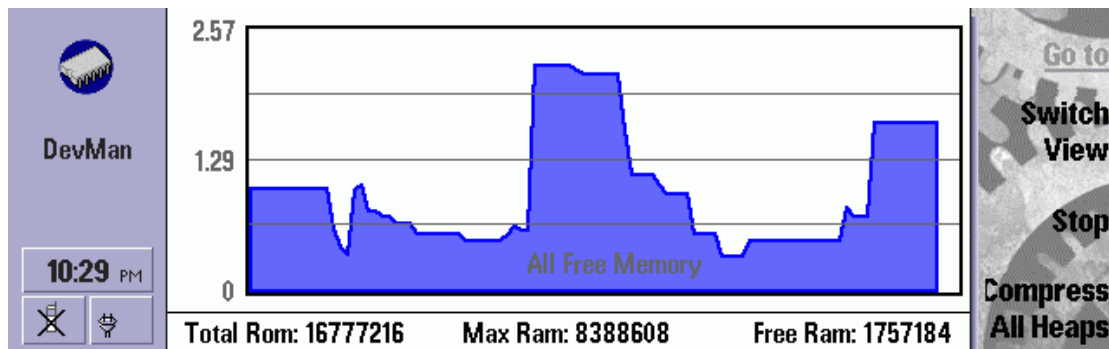
Selecting this option shows information about the highlighted application in the Task View or about the Spied on application in the Graph View.

2.5.3 Spy on Selected Task

Menu: Task/Spy on Selected Task
Shortcut: s
CBA: Third button only in Task View
View: Task View



Spying on a specified thread



Spying on All Free Memory

This option allows you to set the context of what the graph is plotting.

All Free Memory

To view All Free Memory highlight the All Free Memory item in the Task List (this is always at the top of the Task List) and select Spy. This plots all memory available to all application heaps running on the device. The sample rate is selectable in Preferences.

Spy on specified Thread

To spy on a specific thread or application, highlight the desired thread and select Spy. This plots the size of the selected application's heap. The sample rate is selectable in Preferences.

Status Bar in Graph View

The "All Free Memory" View shows:

Total Rom: (a) Max Ram: (b) Free Ram: (c)

The "Spy on Thread" View shows:

Heap Used: (d) Max Ram: (b) Free Ram: (c)

- (a) is the total amount of ROM contained in this device in KB (KiloBytes)
- (b) is the total amount of RAM contained in this device in KB (KiloBytes)
- (c) is the total amount of free RAM available to the Symbian OS from the global heap in KB (KiloBytes)
- (d) is the total amount of memory allocated to the spied on thread's heap in KB (KiloBytes)

Menu:	Task/Kill Selected Task
Shortcut:	k
CBA:	None
View:	Task View

2.6 General Tools



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Menu:      Tools/Show Disk Info
Shortcut:  Ctrl-d
CBA:       None
View:      Task View and Graph View
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"Show Disk Info" displays information about each drive the device currently has mounted. To change drive, use the left and right arrow keys.
To check the integrity of a drive, select "Check Disk" from the CBA.

2.6.2 Compress All Heaps

Menu: Tools/Compress All Heaps
Shortcut: None
CBA: Fourth Button
View: Task View and Graph View

"Compress Heaps" releases excess allocated memory from the top of all heaps. To elaborate, memory is allocated from the global heap and mapped to a process in chunks. eg: a user may request 580KB of RAM, but the system may allocate 600KB of RAM due to chunk, segment or granularity size. This is normal, however more memory has been allocated than is required. To free the excess memory that is available at the top address range of the process's heap, use the Compress Heaps functionality. Several hundred KB are often freed using this function. Note: fragmented free memory that is contained in the middle of the heap is not freed with the function.

A vertical marker is displayed on the Graph View each time Compress All Heaps is called.

2.6.3 Close All Programs

Menu: Tools/Close All Programs
Shortcut: None
CBA: None
View: Task View and Graph View

"Close All Programs" shuts down all non-system programs (including applications, non-essential servers, and application engines), which frees up available memory. The user can also re-select this item, which will re-open all programs which were closed by this action. This is useful for copying off data files that are locked in general use of the device, for de-fragmenting memory, or for running memory intensive applications or games.

Memory gets fragmented over time by programs allocating and freeing memory over and over again. eg: When you boot your device you may have 3.5MB of free RAM with all programs closed. Two weeks later you may have 2.5MB of free RAM when the device is in a similar state (same programs open).

For efficient heap use it is ideal to allocate memory in contiguous chunks and free it in reverse order. In reality this rarely happens, and as memory gets allocated and freed (in many different size chunks) over time there are areas of the heap which are free but due to their size often cannot be readily re-allocated within the process. This is an example of memory fragmentation. The memory is free, and can be utilised by the process if it requires small enough allocations, but is usually unavailable to the global heap due to constraints of the chunk size/MMU. One way to remedy this is to

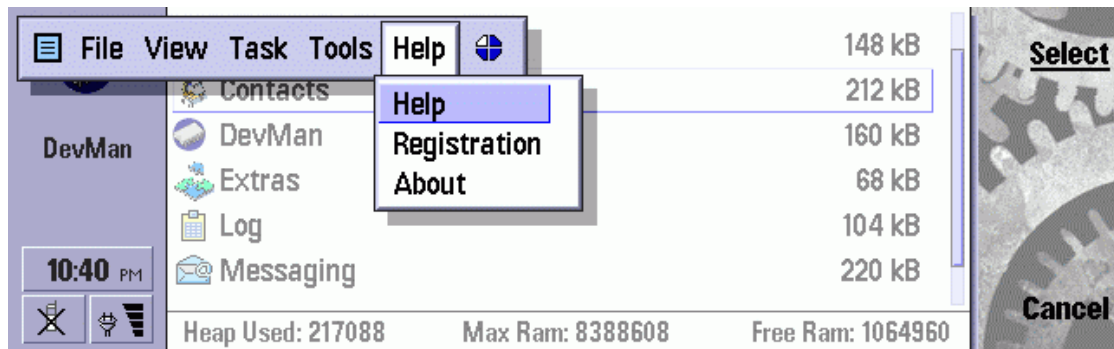
unload all the applications, engines and servers and reload them, then all the heaps would be able to be re-allocated in a more efficient manner. "Close All Programs" will shut down all non-essential threads and reload them (once it is reselected) thus de-fragmenting some of the memory.

2.6.4 Reset Device

Menu:	Tools/Reset Device
Shortcut:	None
CBA:	None
View:	Task View and Graph View

The Reset Device options performs a warm boot of the device.

2.7 Help, About, and Registration



2.7.1 Help

Menu: Help/Help
Shortcut: Help button
CBA: None
View: Task View and Graph View

Shows Help.

2.7.2 Registration

Menu: Help/Registration
Shortcut: None
CBA: None
View: Task View and Graph View

Shows Registration information. See Section 3.

2.7.2 About and System up time

Menu: Help/About
Shortcut: None
CBA: None
View: Task View and Graph View

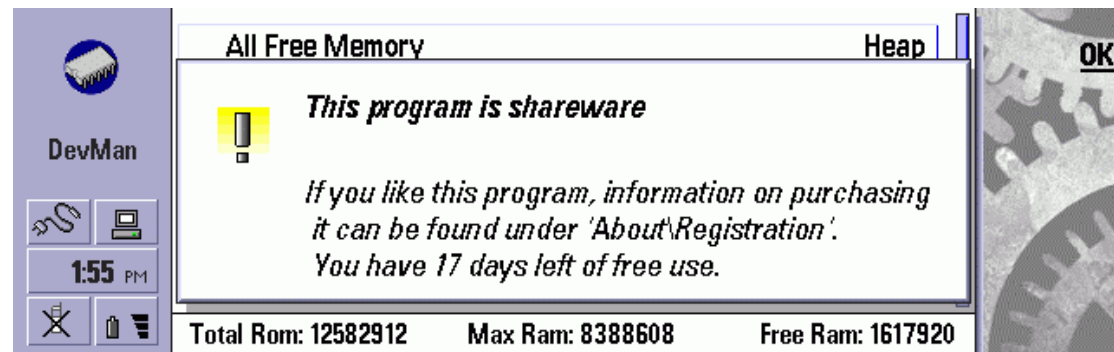


This shows standard About information and the time since the device was booted.

3 Product Registration

This product is free to use for the first 25 days from the date of DevMan's installation.

After registration, the registration information screen which is shown at the DevMan start up will no longer be displayed.



If you do not choose to register, then after 25 days when App Manger is run, you will be presented with the Registration screen. If you do not input a valid Registration Code then App Manger will exit.

3.1 How to get a Registration code



To register DevMan, you have to purchase it. The price of DevMan is US\$9.00.

DevMan can be purchased at <http://www.handango.com> or any of its Symbian affiliates (such as <http://shop.my-symbian.com>).

During purchase you will be asked for a Customer ID. The Customer ID that DevMan for Series 80 uses is the IMEI number. This can be displayed by selecting **Show Device Serial No.** in the Registration Screen of DevMan, or by selecting the **Tools\Serial Number** menu in the Telephone application. Another way to find out the IMEI number is by entering ***#06#** into the phone keypad.

Once this serial number is entered, a Registration Code will be generated. This can be entered into the Registration Screen by selecting **Set Reg Code**, entering the code, and selecting **Done**.

Note: The IMEI number is usually 15 digits and does not contain dashes ("-"), even though the Handango instructions may say so.

If there is any problems entering the registration code, please send an email with your devices IMEI code, and the reference number of your product purchase to devman@mikeullrich.com.

4 Support, Help, Suggestions

If you require any support or help, have discovered any defects, or have any suggestions for further enhancements please contact devman@mikeullrich.com

5 FAQ

Q: What are the purple/magenta vertical lines that appear on the graph?

A: These lines denote when a Compress All Heaps function has been executed, whether by manual or automatically.

Q: Why during a backup of the device does it say that DevMan is locked?

A: This is because DevMan can be set as a System Application, which prevents it from being shut down in low memory situations or by the backup framework. To back up DevMan, exit before commencing backup.

Q: When would I use auto compress heaps functionality?

A: 9210 devices come in three main revisions, 3.xx and 4.xx ROMs for 9210 and 5.xx ROMs for 9210i. You can check this by entering *#0000# on the phone keypad. 4.xx and 5.xx ROMs have an improved memory handler which will shut down less used applications and perform a compress all heaps in a low memory situation. 3.xx ROMs do not have this, so you can periodically set DevMan to compress all heaps. Normally you would have the auto compress all heaps functionality disabled on case closed.

6 History

V2.21

- Updated with correct Product Identification codes for Series 80 V2.
- Allowed the user to select whether they want the application to be automatically started.
- Reports CPU type, ABI Mode, and CPU Speed in the about menu.

V2.20

- Released for Series 80 V2. Supporting Nokia 9300 and 9500.

V2.05

- Updated registration code to deal with the new way Handango formats IMEI codes.

V2.04

- Added debug output
- Fixed defect where controls weren't being removed from the stack

V2.02

- Added support for Series 80 V2 as a separate target executable
- Still need to finish new IMEI code.

V2.01

- Improved internal architecture.
- Added preference to enable/disable system application status.
- Added framework to allow auto heap compression on case open or after a set period.
- Compress Heaps marker added to graph view.
- Added FAQ to documentation.

V2.00

- Major re-write of Memory Monitor, changed name to DevMan.
- More efficient memory use.
- Changed to Shareware, added registration features.
- Added Preferences, Task List views, task info display, device reset, global hotkeys support, case open/close checking, and many other features.

V1.04

- Now reports the amount of time since the device was last booted in the About box.

V1.03

- Changed to a more modular architecture so that Series 80 and Series 60 variants can be compiled from same source.
- The user can select a specific thread to terminate using the Kill function.
- Close All Programs functionality has been added which allows you to shut down all non-essential programs (similar to doing a backup), after this function has been unselected all closed programs are restored.
- S60: Removed Close button from the right app button.

V1.02

- The user can select a specific thread to monitor heap usage using the Spy function.
- Memory Monitor is now made a system app which means that it won't be automatically be closed down by the OS during memory management or during a backup.