

# Masser RC2

## User manual for form factor calculation

V.1.4.2



## Table of contents

1. General.....	3
2. RC2 .....	3
3. External connections .....	4
4. Measuring Program .....	4
4.1 Program flow chart .....	6
4.2 Settings.....	7
4.2.1 Form Factor .....	7
4.2.2 Language selection.....	7
4.2.3 Used basal area factor(R-FAC) .....	7
4.2.4 Clearing the memory .....	7
4.2.5 Software version .....	7
4.3 Output.....	8
5. Loading a new program version .....	8
6. Warranty .....	9
7. Contact information .....	10

## 1. General

This manual describes the use of **Masser RC2** basal area Counter Calculator . RC2 is designed for substituting paper, pencil and a calculator in point-sampling measurement system. Measured data can be printed out to printer or downloaded to a spread sheet program. Volumes or basal areas of stands can also be seen on the units display.

RC2 calculates volumes of trees based on mean heights and form factors which the user can feed individually for each species. If the heights are not measured, the RC2 calculates the basal areas only. Calculation is done as an average of every plot from selected stand.

## 2. RC2

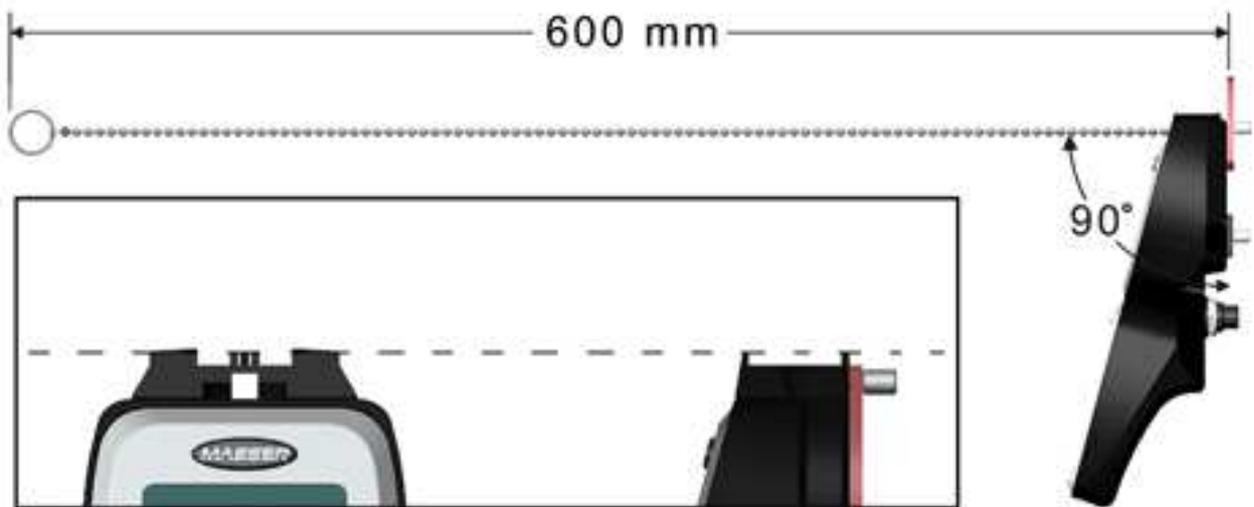


#### RC2 user interface

RC2 is powered with one AA-sized battery, which is placed under the cover in the handle. The screws holding the cover can be opened with a small coin. The battery lasts for weeks in normal use. If the device is left on, it shuts off automatically in 15 minutes.

RC2 is switched ON by pushing ENTER / ON – key from the keyboard. The device is switched OFF by pushing ENTER / ON – key when the text ON / OFF is visible on a display.

RC2 is waterproof and does not need any specialized servicing.



The calculator must be held in 90 degrees angle to the chain to get the right readings. Notice the measuring distance 60 cm from your eye (cheek).

### 3. External connections

Connecting the RC2 to a PC or a serial printer is made via the RS-232 serial port situated on the back of the device by the serial cable supplied with the calculator. Settings for the connection are: 9600 baud, 8 bit, 1 stop, no parity.

### 4. Measuring Program

The device is switched on by pushing ENTER / ON-key and the display shows ON/OFF.



Arrow up and arrow down keys are used for scrolling up and down the menus. Selection is made by ADD-button. MENU-key is used for jumping out from a program. Number entry is done via the arrow keys and entering is done with the ADD-button. Counting the trees is done by clicking the ADD-button and the selection of species with the arrow keys.

Measuring program first asks the number of the stand (1-20) and the size in hectares (accuracy 0.1 ha). Next the program asks the number of the plot (1-30).

The user counts every tree which fills the aiming plate opening by pushing the ADD-button. Counting is done by species. Only every second one of the borderline trees is counted. Selection of species is done by arrow keys.

The user can delete the last entry by pushing ENTER / ON-key and ADD-button to accept the erasing and the display shows the new counter value.

When all the trees has been counted on the plot the user pushes the MENU- key and the calculator asks for the median height for every species counted (accuracy 0.1 m). If the user feeds zero length for any of the species then the calculation is done by basal area (m<sup>2</sup>) only.

The device stores the measured data automatically to non-volatile flash-memory. WAIT is displayed (it takes some seconds). Whenever starting the measurement program, the calculator reloads the earlier measured data when selecting previously measured stands and plots. This makes it possible to measure heights as a separate operation.

First the calculator shows the total volume m<sup>3</sup> (accuracy 0.1 m<sup>3</sup>) for the stand (calculated as an average of all the plots of that stand). Volumes for the different species can be viewed by scrolling with the arrow keys. Users can see, during the sampling work in the forest, when the average volume stabilizes and figure out the required accuracy from the deviation.

By pushing MENU- button the program returns to main menu.

## 4.1 Program flow chart

### ON / OFF

#### SAMPLE

<i>ADD</i>	=>	<b>STAND XX</b>		
		<b>HA XX.X</b>		
		<b>PLOT XX</b>		
		<b>SP01 XXX</b>		
		<i>On</i>	=>	<b>CANCEL</b>
		<i>Menu</i>	=>	<b>H 01 XX.X</b>
				<i>Arrow</i>
			=>	<i>feed the height</i>
				<b>WAIT</b>
				<b>M3 XXX.X</b>
				<b>SP01XXX.X</b>
			=>	<b>NEW PLOT</b>
				<b>RETURN</b>

### SETTINGS

<i>ADD</i>	=>	<b>FORM FAC</b>		
		<i>ADD</i>	=>	<b>SP01 500</b>
				<i>ADD</i>
			=>	<b>FAC XXX</b>
				<i>ADD</i>
				<i>Menu</i>
		<b>LANGUAGE</b>	=>	<b>ENGLISH</b>
		<i>ADD</i>		<b>SUOMI</b>
				<b>ESPAÑOL</b>
				<b>DEUTSCH</b>
				<b>FRANÇAIS</b>
				<b>SVENSKA</b>
				<b>RUSSIAN</b>
				<b>PORTUGUE</b>
				<b>LATVIAN</b>
		<b>R-FAC</b>	=>	<b>0.5</b>
		<i>ADD</i>		<b>2.0</b>
				<b>1.0</b>
				<b>3.0</b>
				<b>1.22</b>
				<b>4.0</b>

#### CLEARMEM

<i>ADD</i>	=>	<b>NO</b>	
		<b>YES</b>	
		<i>ADD</i>	=> ERASING

VER 1.40

### OUTPUT

<i>ADD</i>	=>	<b>NO</b>	
		<b>YES</b>	
		<i>ADD</i>	=> <b>SENDING</b>

## 4.2 Settings

### 4.2.1 Form Factor

Users can specify individual form factors for 30 species. Default form factor is 0.500. Form factor is used for calculation of the volume (V) of the trees.

$V = FAC * BA * H$  (BA = Basal Area, H= average height of the species)

First the program shows the pre-set form factor for species number 01:

**SP01 500**. By pushing the ADD-button the program gives an entry display: **FAC XXX**. Selection is made by arrow keys and accepted with ADD-button and the display returns to show species and selected form factor. These values are not changed with **CLEAR MEM** function. By pushing MENU key the program returns to **SETTINGS** menu.

### 4.2.2 Language selection

In the language menu users can change the display and output texts to another language. Selection is made by arrow keys and accepted with ADD-button.

### 4.2.3 Used basal area factor(R-FAC)

User can select by arrow keys which BA-factor he is using. Selections are 0.5, 1.0, 2.0, 3.0, 4.0.

### 4.2.4 Clearing the memory

When entering the memory clear-function the display shows: **CLEARMEM**

By pushing the ADD-button the display shows: **NO**

If ADD-button is pushed the program returns to **SETTINGS** menu

User can select an option **YES** with arrow keys and accept it with ADD-button and the display shows **CLEARING**

### 4.2.5 Software version

On a display is shown the loaded software version number. This manual is valid for SW-versions 1.4.x. **VER 1.4**

## 4.3 Output

A PC-program for downloading the measured data to the PC (LOADER RC2) can be installed from CD.

Connect the cables or check that the Bluetooth option is in ON-state.

The receiving device (PC, printer) must be set in a waiting state. LOADER RC2 is set to receive the data by selecting RECEIVE / START from the PC menu window.

Select from RC2 **OUTPUT** and push the ADD-button, the display shows: **NO**  
(If ADD-button is now pushed the program returns to main menu.)

Select an option **YES** with arrow keys and accept it with ADD-button and the display shows **SENDING**. When the down load is ready the RC2 shuts off.

Example of the output file:

STAND	AREA	PLOT	RF	SPECIES	PCS	LENGTH	BA
1	1.0	1	1	1	5	20.0	5.0
1	1.0	1	1	2	4	21.0	4.0
1	1.0	1	1	3	3	22.0	3.0
STAND	AREA	SPECIES	m3	m3/ha	BAm2/ha		
1	1.0	1	50.0	50.0	5.0		
1	1.0	2	42.0	42.0	4.0		
1	1.0	3	33.0	33.0	3.0		
TOTAL	*	*	125.0	125.0	12.0		

\*\*\* RC2 Int. V1.40 \*\*\*

## 5. Loading a new program version

1. Connect the PC-cable to RC2 and PC.
2. Start the RC2 loader from the PC and OPEN the loaded program.
3. Push the MENU-key down while starting the RC2 from ON-key.
4. Release both buttons and a load-menu appears:

**RUN** (starts the previous loaded program)

**INSTALL** (starts the loading of a new program)

**SHUTDOWN** (shuts the device off)

1. Select first **INSTALL** from the RC2 menu and press ADD-button.
2. Select **START Y** with ARROW UP/DOWN keys and press ADD-button.
3. Then select LOAD from the PC program.



4. Program loading starts and wait until RC2 shuts off.
5. Loading is complete.

## 6. Warranty

- Hardware Limited Warranty

MASSEER products and accessories are warranted for a period of (1) one year starting from the date of delivery. Masser Oy warrants that this hardware product will perform substantially in accordance with published specifications and be substantially free of defects in material and workmanship.

- Software License, Limited warranty

This Masser software is licensed and not sold. Masser Oy warrants that this Masser product will substantially conform to Masser's applicable published specifications for the software for a period for ninety (90) days, starting from the date of delivery.

- Limitation of Liability

Warranty applies to manufacture defects and general malfunction. Masser Oy is not liable for the misuse of this product or for the damages caused due to misuse or unauthorized service.

Masser is not liable, in any case, for the lost of data collected.

Warranty does not cover transportation costs.

## 7. Contact information

### MASSER OY

Jämytie 1  
FIN-96910 ROVANIEMI  
FINLAND

Tel + 358 400 904 500  
Fax + 358 16 282 554

e-mail: [masser@masser.fi](mailto:masser@masser.fi)

[www.masser.fi](http://www.masser.fi)

