eC-reflow-mate V4 User Manual



Contents

Introduction	4
Redesigned furnace of eC-reflow-mate V4	5
Application of this device	5
Before starting	6
Technical Specifications	7
Declaration of compliance	8
Safety precautions	9
Parts of the device	11
Main parts	11
Rear connector panel	12
Placing the PCB	14
Data plate	15
Using the device	16
Elements of the main screen	16
Device settings	17
Process selection	18
Process editing	19
Set "Zone" settings	21
Set BOTTOM temperatures	22

eC-015V04 reflow-mate V4

user manual

Temperature offset	24
Predefined profiles	25
Predefined preferences	26
Details to predefined profiles	26
PCB settings	27
The soldering process	28
Soldering with PCB sensor	29
Soldering without PCB sensor	38
Information window	43
Testing	44
Use of PC software (eC-reflow-pilot)	46
Welcome screen	47
Comparison window	49
Colour profile settings	50
Language settings	51
Example profiles	52
Profile Editing	53
Reflow process	54
Firmware update	56
Contents of the package	57
Waste management	58

eC-015V04 reflow-mate V4

user manual

<u>Maintenance</u>	58
Warranty conditions	59
<u>Contact</u>	59

Introduction

Thank you for purchasing the **eC-reflow-mate V4** designed and manufactured by EUROCIRCUITS

Please, read these instructions carefully before operating your **eC-reflow-mate V4**.

The eC-Reflow-mate V4 is the latest member of our reflow-mate family. The new and improved V4 replaces the highly popular V3 version. We have designed the new eC-reflow-mate oven based on feedback from our customers to add additional features and continue our program of continuous improvements. This allows us to meet the latest expectations of the electronics industry when reflow soldering a PCB.

Below we would like to highlight the main changes:

- Improved isolation to give more static processes and homogenous thermal dispersion
- 32 bit ARM processor for more precise calculations
- 3,5" colour display with touch sensor
- High precision sensors interface with linearizing algorithm
- Extraction connector to control discontinous operation of extraction system
- Inclusion of the extraction hood (eC-reflow-mate hood) compatible with eC-fumeCube (please see website or contact one of our sales team for details)

Redesigned furnace of eC-reflow-mate V4



This graph demonstrates the improved heat up and cool down efficiencies of the **eC-reflow-mate V4** compared to the previous **V3** version.

Thanks to the better isolation and redesigned inner parts, the PCB reaches the desired temperature more quickly and efficiently, meaning that the reflow process requires less time, resulting in energy and time savings for our customers.

Application of this device

The **eC-reflow-mate V4** device is exclusively designed for PCB reflow soldering with SMD parts.

Please follow the instructions within this Instruction Manual carefully and store for future reference. The manufacturer shall not be held legally responsible for any equipment damage or personal injury caused by incorrect installation or operation other than that covered in this manual.

Before starting

Unpacking

The oven is heavy, so you will need 2 people to safely remove it from its box.

Placement

• The **eC-reflow-mate V4** is designed for indoor use where suitable power sources are available. Please store in a cool dry place when not in use.

• Do not expose the device to rain or other humidity.

• Place the **eC-reflow-mate V4** on a solid, hard, dry, stable surface; ensure good ventilation and pay attention during operation in order to avoid any accidents or burn injuries.

- Leave proper clearance around the device (min. 20 cm).
- Do not place the device on damaged or sensitive surfaces.

As with all electronic equipment, when installing the oven in a new location the oven should be left for a sufficient time to allow any accumulated moisture in the machine to evaporate before use.

Technical Specifications

Heating method: Infrared heating Maximum operating height: 2000m Power: 3000W Net weight: 35kg Dimensions of the oven: 62,5cm x 48,5cm x 23,5cm Dimensions of the oven with hood: 62.5cm x 66,0cm x 26,0cm Control options: via display or via computer (Windows) connected with USB Maximum PCB size: 350 x 250mm (L x W) Operational voltage: 230V

Type: **eC-015V04** nominal voltage: 230 V, 50-60 Hz Tested operating range: 230 V-10% - 240 V+10%, 50-60 Hz

The device belongs to the OVERVOLTAGE II category.

The equipment shall be connected to a supply network where the impedance is equal to or lower than (Zsys = Zmax= 0.305 Ohm); as it is described in the 61000-3-3 standard.

Above this value, the screen may flicker using the same phase

Operating temperature: 260°C (500°F) (measured on the top side of the PCB) Ambient temperature: 5°C - 40°C (41°F -104°F)

Fuse: ESKA : 6,3x32mm 16A 230V, delayed

Netto size: 61,8cm x 66,0cm x 26,0cm, 35 kg Brutto size: 79,5cm x 59,5cm x 47cm, 42,6 kg

CE Declaration of compliance

Producer: Eurocircuits Kft. Berva-völgy HRSZ.: 2401/9. 3324 Felsőtárkány Hungary

Product description: Reflow device for soldering PCBs. Shock protection class: I. Type: -eC-015V04 This device complies with the following directives and standards:

Directives: 2014/35/EU 2004/108/EC 2011/65/EU Standards: IEC/EN 61010-1:2001 IEC/EN 61010-2-10:2003 IEC/EN 61326-1:2013

61010-1: 2001 61010-2-010: 2003

Regulations: 3/2002. (II.8) SzCsM-EüM 25/2000.(IX.30) SzCsM-EüM

CE - mark placing - 2017

Based on the above documents we declare the above product complies with these standards and has the right to be marked CE.

Safety precautions

ONLY use the **eC-reflow-mate V4** for reflow soldering the SMT components onto Printed Circuit Boards.

The use of the **eC-reflow-mate V4** for any other purpose can lead to serious damage to the machine or its environment. Misuse of the **eC-reflow-mate V4** may cause electric shock, fire, and other hazards. Any unauthorized dismantling, repair attempts or misuse of the **eC-reflow-mate V4** will automatically invalidate the warranty. We accept no liability for any damage of any sort caused by the incorrect use of the **eC-reflow mate V4** or by failure to follow these safety instructions.

The **eC-reflow-mate V4** is constructed according to the European CE regulations.

• DO NOT place your hands inside the oven. A hot oven does not cool instantaneously.

• DO use heat proof gloves when handling a board that has just been soldered. It remains hot for some time.

• DO make sure that the PCB materials you are using are suitable for lead-free reflow soldering.

• DO NOT leave a PCB in the heated oven for an extended period. The board could be damaged by the high temperatures inside the oven.

• DO NOT put inflammable or explosive materials into or near the oven as they could constitute a fire or explosion hazard.

• DO NOT place anything on top of the oven.

• DO NOT allow children access to, or near the oven.

• DO stand the oven on a strong, heat resistant bench or table

• DO use the oven, like any soldering equipment, in a well-ventilated area or under a fume extractor

• Use the furnace only with extraction hood. Recommended extraction: **eC-FumeCube**

Eurocircuits has tested the harmful effect on human health and the environment of **eC-reflow-mate V4** / code XCIII 1993 / for the purpose of risk analysis.

report: BM009265

The test has been made for 8 hours continuously, waiting for the device cooling down to 80°C between the soldering.

used paste : eC-solderpaste

extraction head : eC-FumeCube

During the test in the 50m³ room, there was no additional ventilation.

Notwithstanding that the measured harmful emissions have been significantly under the limits for the entire 8 hours.

The test has been made with **eC-FumeCube** extraction head. Eurocircuits accepts no liability of using other extraction heads.

eC-reflow-mate V4 has complied with the requirements set out in codes 3/2002 II. 8 SZCSM EuM and 25/2000 (IX.30) EüM-SzCsM.

• ONLY use the oven with the power cord supplied. If it becomes damaged in any way contact us for a replacement.

• ONLY plug the power cord to grounded main socket!

Cleaning the eC-reflow-mate V4

• DO make sure that the oven is not switched on and that it is completely cooled before cleaning.

• DO wait for the oven to cool for 30 minutes before any manual intervention.

• DO NOT make any internal adjustments or repairs by yourself. Contact our Support Services at euro@eurocircuits.com

• DO use only soft clothes and a non-aggressive detergent to clean the outside of the oven.

• DO NOT use cleaning solvent or sprays.

• DO NOT try to clean the inside of the oven. Contact our Support Services at euro@eurocircuits.com.

• DO check the oven thoroughly after any cleaning or other intervention to make sure that it is safe to be operated. Any cleaning product residue may smell as it is burned off when the oven is first switched on following cleaning.

Parts of the device

Main parts



1. Main power switch

This switch serves to power on or off the device. The 'on' state of the device is indicated by the built in lamp of the switch. This switch additionally serves as the emergency stop button.

2. Touch Display

The user can monitor the process and modifying settings through the touch display. All functions are available from the menu without having to use the pc software.

3. Drawer

PCB's's are placed here for reflow soldering to take place. Its lock is electrically operated.

Caution, hot surface!



This sign means hot surface. The opening drawer may reach



up to 280 °C.

The front window may reach up to 280 °C.

4. Internal sensor connector

This connects the internal thermocouple that measures the PCB's temperature.

5. Extraction hood

To remove hot air and smoke from the furnace after the reflow process.

Rear connector panel



eC-015V04 reflow-mate V4 user manual



1. Power Connector

Type of cords

Region	Туре	Producer	Device
EU	SN25-3/15/2BK	BQ Cable	eC-015V04

2 Fuse socket

eC-015V04-230 type 6,3x32mm 16A use slow fuse

3. Exthaust control connector

This is used to connect **eC-FumeCube** which can be controlled by the **eC-reflow-mate V4**

Maximum load: 32 VAC 1 A



eC-015V04 reflow-mate V4 user manual

4. USB PC connector (USB B type)

The reflow oven communicates with your PC by USB A to USB cable (included)

5. DFU button

This button is used in the firmware update process. (see below)

6. Exthaust adapter

The hot air is directed through here from the oven which can be connected to an extraction system.

7. Drawer spring tension adjuster

This is used for adjusting the tension of the drawer spring.

Placing the PCB

You need to place the PCB centrally in the oven between the top and bottom sensors. It is very important that the PCB is placed under the sensor so that the sensor does not receive any radiated heat from the preheater (bottom) IR-lamps. This ensures that the temperature control will function properly.

When precise temperature readings on the PCB are required, place the external sensor thermocouple directly to the PCB in order to measure the temperature on its surface. Secure it with Kapton tape or solder it using solder wire with high melting temperature to the top or the bottom of the PCB. Type : **eC-solder-wire-high-temp**



Data plate



Using the device

Elements of the main screen



1. PCB sensor temperature:

Temperature at the touching point of the PCB sensor and the PCB.

2. Top sensor temperature:

Air temperature measured by the Top sensor above the PCB.

3. Bottom sensor temperature:

Air temperature measured by the Bottom sensor under the PCB.

4. Door opening button:

Either open the door by pushing this button or use the door handle to open it. Either action causes the running process to stop.

5. Set up screen

Setup your eC-reflow-mate V4 device.

eC-015V04 reflow-mate V4

user manual

6. Process editing menu

Displays the currently stored program

7-8. Program selection buttons

With the left arrow button you can select a lower numbered stored program.

With the right arrow button you can select a higher numbered stored program.

9. Start

Starts the selected program

Device settings



eC-015V04 reflow-mate V4

user manual

1. Set PID values

Set the heating control parameters

2. Touch sounds

Mute/short/long

3. About device

Serial number, Software version, EEPROM version

4. Welcome screen

Switch on or off the welcome screen

5. Set temperature unit

Celsius/Fahrenheit

6. View of predefined profiles and import as users profile

7. Back

Process selection

-				
Program1 FR4	Program2 FR4-stdrd	Program3 FR4-cmp1x		•
Program4 ALU-W-M	Program5 ALU-B-M	Programó ALU-W-L	\checkmark	←_3
Program7 ALU-B-L	Program8 RO-G-M	Program9 RO-G-L	Dry	← _2
L			J	

1. Program selection

Select the required program and accept it with the tick to edit the preferences

2. Select the drying process

Set a specific process with lower temperature and longer time period typically for PCB/parts drying tasks.

This is important because parts may have be stored for long periods, absorbing the moisture.

3. Control screen for the selected program

Accept the selected program and move to the control screen

4. Back

These predefined profiles may not be suitable for every PCB configuration!

Process editing



1-2-3-4. Set up the preferences of different process zones(temperature required and dwell time)

After starting the process, the device warms up the PCB to the "Preheat1" temperature, and holds it for the specified "Preheat1" time.

Once "Preheat1" is completed, the device proceeds device proceeds to the "Preheat2" phase.

This process is repeated for "Preheat2", "Preheat3" and "Reflow Zone". Maximum temperature and time settings for each zone is 260°C and up to 30 seconds.

5-6. Extraction hood/Door opening

The time of Door Opening depends upon whether the extraction hood is installed. If the extraction hood is installed, the door opens immediately after the Reflow zone has completed.

If the hood is not installed, then the door opens after the set "Reflow Time" and only when the PCB temperature is lower than the set Door Opening temperature.

eC-015V04 reflow-mate V4 user manual

7. Bottom side temperature offset

A different temperature can be set for the bottom side heating elements to the top side heating elements temperature.

8. Set temperature offset

Sets the offset temperature.

9. T ramp-up delimiter

This is when all of the Preheat Zones are inactive and in a state of "Slow heat up", the temperature reaches the 190°C level in 2 minutes. In the same scenario but in the state of "Normal heat up" consider only the "Reflow" zone

10. Back

11. Save process settings



Saving profile this message appears only on the device, not in the software.

Accept it with "YES" the saved profile will be synchronised to the **eC-reflow-pilot**.

Refuse with "NO" there will not be synchronisation, the profile will not be in **eC-reflow-pilot**.

Set "Zone" settings



1. Set PreheatX zone temperature with numeric pad

The range of temperatures for all zones are between 80°C-260°C. The temperature is measured on the PCB's surface. On this screen numeric values can be set. Use the tick to accept the selected values.

2. Set PreheatX zone time with numeric pad

The maximum time period is between 1 - 30 sec's for all zones. On this screen numeric values can be set. Use the tick to accept the selected values.

3. Set PreheatX zone temperature

Use the + button for increasing, or the - button for decreasing the values. Tap and hold the button for faster change. Use the tick to accept the selected values. Values must be between 80°C-260°C.

4. Set PreheatX zone time

Use the + button for increasing, or the - button for decreasing the values. Tap and hold the button for faster change. Use the tick to accept the selected values. Values must be between 1-30 seconds.

eC-015V04 reflow-mate V4 user manual

5. Active/NonActive zones

If we have an active zone, the process will run according to the given time and temperature settings. If the status is NonActive ,this zone will be skipped. It is possible to de-activate Preheat1, Preheat2, Preheat3, but the Reflow zone is always active.

6. Back to the previous screen without save

Return to the previous screen without save, keeping the original settings.

7. Back to the previous screen with save

Return to the previous screen saving the new zone settings.

Set BOTTOM temperature



Selection modes for the lower heating element:

- Bottom element heating mode 0°C: in this mode there is no difference between the bottom heating temperature and the PCB temperature so the offset is 0°C
- Negative offset: For this mode the bottom heating temperature follows the PCB's temperature with the offset value.
 Offset values can be between 0°C-180°C.
- Independent mode: in this mode a specific value for offset is set e.g.150°C.

Please note!! The bottom temperature will not be able to maintain a higher offset temperature than the top temperature.

The Top heating elements have more effect on the entire inner temperature than the Bottom heating elements.

1-2. Increase or decrease the specified values

If the selected value is 0, then Bottom element heating mode is selected. If the selected value is negative, then negative offset mode is selected If a specific value is set then independent mode is selected.

3. Bottom Heating mode

On this screen the type of heating along with the set values can be seen.

4. Back

Return to the previous screen without saving, maintaining the original settings.

5. Save

Save the selected values for Bottom heating.

user manual



1. Enable temperature correction

If the selected value is 0, the device uses Bottom heating element heating mode.

2. Temperature correction difference

The temperature correction difference between main and external sensors.

3. Activation temperature

If the temperature reaches this value, then the external sensor readings are ignored and the internal temperature sensors will be used this would normally occur if the external sensor is defective or has poor contact to the PCB.

4. Back

Return to the previous screen without saving, keeping the original settings.

5. Save

Save the selected temperature offset value.

Predefined Profiles /see in Settings menu/

		Predefine	d profile:	1		
	$\left(\right)$	Program1 FR4	Program2 FR4-stdrd	Program3 FR4-cmp1x		←(4)
1		Program4 ALU-W-M	Program5 ALU-B-M	Program6 ALU-W-L	\checkmark	←3
		Program7 ALU-B-L	Program8 RO-G-M	Program9 RO-G-L	Set all default	←2

1. Predefined profiles

Predefined profiles for the most frequently used PCB's.

2. Set default profiles

All the user profiles can be set as default profiles and be edited in profile editing menu

3. View PCB preferences and profile With this button the preferences of selected predefined profiles can be monitoring

4. Back

Predefined preferences to the selected predefined process

	Predefined	profile:	1		
\int	PCB color Green	Type FR-4	Total Size Medium 70cm2		-2
	Thickness 1.5	Layers 2	Copper Count 35um	V	-3

- 1. PCB preferences Type of PCB
- 2. Back
- 3. PCB profile settings

Details to predefined profiles and import

		Predefined	profile:	1		
	1	Preheat1 NotActive	Preheat2 NotActive	Preheat3 Active		-0
		100'C 5sec	160'C 10sec	160'C 1sec		
1		Reflow 255'C 1sec	Hood ON	DoorOpen 185°C	V	- 3
		Bottom Follow bottom temp Ø'C				

eC-015V04 reflow-mate V4 user manual

- 1. Values to predefined profiles
- 2. Back
- 3. Import to users selected profile Values can be edited

PCB settings

	Predefined	profile:	1		
\int	PCB color Green	Type FR-4	Total Size Medium 70cm2		-2
	Thickness 1.5	Layers 2	Copper Count 35um	\checkmark	-3

1. PCB colour:

Green Black White Red Blue

Yellow

Transparent

No Soldermask

2. PCB type:

- FR-4
- ALU

Rogers

3.The largest PCB size:

Mini Small Medium Large Extra

4. PCB thickness: /mm/

- 0.5
- 1.0
- 1.5
- 2.0
- 2.4
- 3.2
- 3.2

5. PCB layout numbers:

1-16

6. PCB copper thickness:

- 12µm
- 18µm
- 35µm
- 70µm
- 105µm

The soldering process



After configuring the program in your required process, return back to the main screen. Program selection can be made with buttons 7 & 8. The selected program is indicated in area 6. Ensure the oven drawer is closed.

If all conditions are met, then the soldering process can be started by pressing the 9th button.

Soldering with PCB sensor

It is possible to choose this method in two cases: If we would like to control the PCB's temperature during the process, or would like to create a reference process for soldering without sensor.





After choosing soldering with PCB sensor option (PCB sensor is connected), the above option will be displayed.

Select YES, the process will start at 50°C TOP sensor temperature.



1. Parameters of selected program

2. Stop button

Stops the running process without opening the door.

3. Temperature preferences

Current temperature set for TOP and BOT heating

4. Actual temperature values

This shows the actual TOP, BOT temperatures, and the elapsed time for the running process

5. Graph

Displays the real time values of the measured temperatures PCB sensor : yellow TOP sensor : red BOT sensor : blue

6. Possible statuses of running process

1. DATA ERROR!:

Process failed to start because of incorrect data.

- 2. DOOR ERROR!:
 - If the door should open but not operational.
- OVERHEAT!: If the TOP sensor spends more than 5 minutes above 200°C, the process stops.
- 4. TEMP.DIFF.HIGH!:

If the temperature difference is more than 50°C between the TOP and PCB sensor, the process stops.

5. Preprocess Running:

In case of soldering with PCB sensor and reference process the starting temperature is 50°C measured at TOP and PCB sensors. In case of soldering with PCB sensor but not reference process, the process can be started if the TOP and BOT temperature difference is lower than 80°C.

In case of soldering without PCB sensor, the starting temperature of TOP sensor should be lower than 80°C.

6. Process Running:

In case of running process

7. Reflow:

Reaching the highest temperature zone / Reflow /

8. Cooldown:

Using the device without extraction head, after the Reflow zone, the door of the furnace will open, when the temperature of PCB sensor is lower than the temperature value set for door opening. In this case *Cooldown* status can be seen until the door can be opened.

 Ref.Process saving You can see this text if you click Yes button when the program asks "Will it be a reference process?"

14. Ref. Processing running

You can see this text if you run reference process without PCB sensor.

7. Zone Status

- 1. Idle State: No running process
- 2. Heat ZONE1 : Heating up to the Preheat1 zone temperature
- 3. Hold ZONE1 : Holding the Preheat1 zone temperature
- 4. Heat ZONE2 : Heating up to the Preheat2 zone temperature
- 5. Hold ZONE2 : Holding the Preheat2 zone temperature
- 6. Heat ZONE3 : Heating up to the Preheat3 zone temperature
- 7. Hold ZONE3 : Holding the Preheat3 zone temperature
- 8. Heat REFLOW : Heating up to the Reflow time zone temperature
- 9. Hold REFLOW : Holding the Reflow time zone temperature

In the case of soldering without a PCB sensor, there will only be the "HEAT" and "HOLD" statuses indicated.

Click on the 'curves' or the 'process data' the graphs will be zoomed, as picture below.



Messages during the process





At opened door the process can not be started. Close the door and restart.





This question can be seen, if the PCB sensor's temperature do not reach the next zone's temperature.

Choose "NO" this question will be appeared if the PCB sensor's temperature do not reach in 6 minutes the next zone's temperature. Choose "YES" the process stops and the door opens.

High temp.diff between TOP and PCB sensor! PCB cannot reach the zone temperature for more than 6 minutes. Please check the PCB sensor fixation and the position of the PCB! Would you like to stop the process? 59 s



The situation is the same, but the difference between the PCB sensor's temperature and TOP sensor's temperature is to large.

eC-015V04 reflow-mate V4 user manual





In case when the difference between the TOP sensor's temperature and BOT sensor's temperature is to large (more than 50° C).



This warning message can be seen at the end of the soldering processes when the door opens till the festener.

During this warning message can be seen, it is forbidden to open the door, touch the PCB. It can be hot and cause serious burns!

This warning message is universally valid, not only after soldering, but after restart if the PCB sensor's temperature or the TOP sensor's temperature is warmer than 80°C.

Soldering without PCB sensor

Select this method, if a reference process has been saved in the PCB sensor program.

Without a reference program, the furnace can not execute a PCB soldering process.

Examples of cases where no reference programs for a specified profile or PCB are available

- 1. There has not been a reference process made for the profile
- 2. There were modifications made on the profile in the menu
- 3. Upload the modifications, made by eC-reflow-pilot software
- 4. Reset EEPROM



The results of the two soldering options are the same.

These options are available to enable the user to solder multiple batches of the same PCB, the PCB sensor is not required to be connected, which is more convenient and can save time.





This question can be seen if we using reference process and the temperature is higher than 50° C.

Choose "YES" the process stops and we can cool the furnace down faster with opened doors. Under 50°C we have to restart the process of course. Choose "NO" the doors keep closed and the furnace will without interruption cool down. This process is much slower.



At the end of the process the device asks, whether to save the actual process as a reference process.

Accepting the process choose "YES", at any failure (e.g. lost PCB sensor) choose "NO"



After saving the reference process we have opportunity to sync it to the **eC-reflow-pilot**, where R mark shows, this is a reference process. Until the PCB or the TOP sensor temperature is warmer than 80°C, it is forbidden to open the furnace door, because it can be hot and cause serious burns!



While the TOP sensor temperature is warmer than 80°C never open the furnace door or touch the PCB because it can be hot and cause serious burns!

At the end of the soldering program, the door will open and be stopped by the door latch.

Whilst the display shows as pictured above, it is forbidden to open the door or touch the PCB, because it can be hot and cause serious burns!

This caution is valid at all times, not just before soldering, but after restart as well, if the PCB or the TOP sensor temperature is warmer than 80°C.

Information window

(1 → (2→	eC-reflow-mate v4 EEPROM version:5 May 22 2017 10:03:25 UniqueID 00350048 33345117	.1.5		€-(5)
	30363338	TEST	EEPROM reset	
		3		

- 1. Version
- 2. Finished and the uniqe device ID every ARM processor has a unique ID.
- 3. Start test
- 4. EEPROM reset restore the default EEPROM settings
- 5. Back

Testing

eC-reflow-pilot	Dourd option	Drofilo odi	ine	Cold	lauine.	c	
		Profile edi	ing	5010	iering	5	settings
	9. PCB	196°C ТОР	1/9°C	BOT 206	03:48		
FK4-G-M						T T	1
300							
250							
200	1	E -					t 0638 T ℃
150							Δt 00:12 ΔT 0 °C
							0 °C/sec
100	J.						
							BOT BOT
50							Temperature 0 🔶 °C OK
							Measure OK
0 1 2	3	4					
Connected Process running						,	

Test process:

- 1. Top heating 100% power Bot heating 0% power Duration: 2 minutes
- 2. Top heating 0% power Bot heating 100% power Duration: 2 minutes

If during the test the operational conditions were correct - Top and Bot lights, Top and Bot sensors, PCB sensor, the same results can be seen.

If one of the sensors cools instead of heating so it was connected with replaced polarity in a failure mode.

If the Top and/or Bot sensors' graphs are inconsistent, it may be sensor fault. This can not be judged at PCB sensor, because may the sensor lost the connection to the PCB.

Duration of tests are 2-2 minutes.



Use of PC software (eC-reflow-pilot)

System requirements:

Supported operating systems: Windows7 or newer.

Supported architectures:

x86, x64

Hardware requirements:

- min. 1GHz Pentium processor
- min. 512 MB RAM
- min. 2GB free space on hard disc

Program installation:

- 1. Unzip the files
- 2. If your system does not have .NET environment, choose the .NET4 installing file and run it
- 3. Start the eC-reflow-pilot V4.msi or setup.exe program
- 4. Install the eC-reflow-pilot V4 program
- 5. Run the file

You will find the **eC-reflow-pilot V4** shortcut on your desk

Program uninstall:

Reinstall the program or

In this menu choose uninstall: Menu/Control Panel/Uninstall a Program/eC-reflow-pilot V4

Warnings;

Do not delete the eC-reflow-pilot V4 folder! Do not delete/move files from the eC-reflow-pilot V4 folder!

Welcome screen



1. Settings

Colour profile settings, language settings

2. Example profiles

Select and edit the tested profiles

3. Profile editing

Edit/open/save the soldering processes

4. Soldering

Start/monitor, analyse soldering

5. Version

Comparison window

Infile 1					and the second	Perfied						Profile 7																					
oner			0			Profile4			0			Profile /																					
	PI	ot	0	en	Reep	D 1 11	n	ot	UV V	en	Keep Pilot	1	n	ot	0	en	Ke																
renear i						Prenear I						Prenear 1																					
eneat2					Кеер	Prenear2			A .		Кеер	Preneat2			400.00		K																
reheat 3					Oven	Preheat3	160 °C		160 °C		Oven	Preheat3	160 °C		160 °C																		
enow	240 0		240 0			Reflow	200 0		200 0			Herrow	200 0		200 0																		
bood	0		0	N		Hood	0	N	0	N		Hood	0	N	0	N																	
oorUpen						DoorOpen			185			DoorOpen	185			PC .																	
ottom heat	Follow		Follow			Bottom heat	Follow		Follow			Bottom heat	Follow	/0°C	Follow	10°C																	
emp.Corr.	N		N			Temp.Corr.	N		N			Temp.Corr.	N		N																		
ramp-up	Ye	18	Y	38		I ramp-up	. N	>	N	0]		I ramp-up	N	•	. N	0																	
file?						Profile 5						ProfileS																					
those the second s	D	-	0			Tionioo	Di	-	0.			Tronico	Di	-	0																		
	100.10	20	100.00	en	Keep Bilot	D 1 11		ot	U	en V	Keep Pilot	P. 1. 11	n	ot	0	en	Ki p																
renear	100 C	30 8	100 C	30 \$		Prenear I						Prenear																					
reheat2	160 °C	20.8	160 °C	20.8	Кеер	Preheat2					Кеер	Preheat2					K																
reheat3	210 °C		210 °C	58	Oven	Preheat3	160 °C		160 °C		Oven	Preheat3	160 °C	20 s	160 °C	20 s																	
ctlow	240°C		240°C			Reflow	255°C		255°C			Reflow	255°C		255°C																		
ood	0	N	0	N		Hood	0	N.	.0	N		Hood	0	N	0	N																	
borOpen			185			DoorOpen						DoorOpen	185																				
ottom heat	Follow	0.0	Follow	10°C		Bottom heat	Follow	0.0	Follow	0°C		Bottom heat	Follow	/0°C	Follow	/0°C																	
Corr.			No			Temp.Corr.	No No		No		orr. No		No		No		No		No No		No No		No No		No No			Temp.Corr.					
ramp-up			N			T ramp-up	N		N			T ramp-up			N																		
ofile3						Profile6						Profile 9																					
	Pi	ot	Ov	en	Keep		Pi	ot	Ov	en	Keep		Pil	ot	Ov	en	К																
Preheat 1	140 °C	30 s	140 °C	30 s	Pilot	Preheat 1					Pilot	Preheat 1					P																
Preheat2	150 °C	20 s	150 °C	20 s		Preheat2						Preheat2																					
Preheat3	185 °C	15 s	185 °C	15 s	Oven	Preheat3	160 °C		160 °C		Oven	Preheat3	160 °C	20 s	160 °C	20 s	II õ																
Reflow	240°C	25 s	240°C			Reflow	255°C		255°C			Reflow	255°C	30 s	255°C	30 s																	
lood						Hood						Hood																					
loorOpen						DoorOpen						DoorOpen				1°C																	
ottom heat	Follow	0.0	Follow	/0°C		Bottom heat	Follow	0 °C	Follow	0 °C		Bottom heat	Follow	0°C	Follow	0°C																	
emp.Corr.			N	6		Temp.Corr.	N		N			Temp Corr.	N		N	0																	
																	4																

This window can be seen at starting a program or USB connecting, if there is a difference between the profiles. It compares the **eC-reflow-pilot** profiles to the device profiles.

If there is a difference between the preferences of the profiles it is indicated in red.

With closing the window we can save the differences.

Keeping the reflow profile settings and sync to the **eC-reflow-pilot** use the "Keep oven" button.

Keeping the saved profile settings in **eC-reflow-pilot** and sync to the furnace use the "Keep pilot" button.

Colour profile settings



1. Colour profile name

Set the profile name for using or editing

2. Colour profile components

- background colour
- background colour 1
- background colour 2
- measure lines
- PCB curve
- Top curve
- Botton curve
- Marker line 1
- Marker line 2
- properties background
- properties text

eC-015V04 reflow-mate V4 user manual

3. Mix colours

The operator can mix the colours for the components

4. Save

Save the mixed colour components to the profile

5. Delete

I

Delete the selected colour profile

- 6. Create a colour profile name
- 7. Create a new colour profile name

Language settings

eC-reflow-pilot V4					
Settings	English				
Color Profile	ОК				
Languages					
Languages					

Choose your language from the above list, then click the OK button. After that the text will be shown in your selected language.

Making a language file: Everybody can create their own language file. The language files can be found in the User\Language\ directory. Make a copy of any of the files in this directory, open it, modify as required for your language and save it.

Example profiles



In this section we can see the predefined processes and the most common used PCB types.

In this picture we can check the profile and PCB's preferences.

In this chart we can see the graphs and the corresponding reflow profiles.

If we choose a colour button we can edit the selected profile in the "Profile editing" window and save as an own profile.

user manual

Profile Editing



- 1. Table of profiles
- 2. Drying
- 3. Settings
- 4. Open
- 5. Save
- 6. Save as
- 7. Synchronising PC->Reflow
- 8. Synchronising Reflow->PC
- 9. Profile Name
- 10. Profile settings
- 11. Zone temperature, time, activity
- 12. Extraction hood
- 13. Advanced settings
- 14-15. Set or offset used BOT heating
- 16-17. Temperature correction

18. T ramp-up delimiter without Preheat Zone (normal/slow) If no usb connection and the user wants to synchronize a profile, a warning message can be seen. When does sync happen?

 Sync from profile editing window: Check USB connection
Profile 5. sync PC->Reflow Message
Start PC: Check the actual profile match between the reflow and PC, if match: start process if not match: ask, would you like to sync
yes: sync and start
no: no action

3. Start oven:

Check the actual profile match between the reflow and PC,

if match: process start fine

if not: show the process properties, but not save in pilot, no selected

Reflow Process



user manual

1. Start the process

The set process synchronises and starts

After starting the process, all buttons will be disabled, except for STOP and door opening buttons

2. Stop the process

The running program will abort, the door opens, and collection of data will be aborted

3. Door open

Opens the door. If there was a running process it will be aborted.

4. Program Selection

Program selection

5. Drying function

Start the drying process.

6. PCB sensor temperature

7. TOP sensor temperature

8. BOT sensor temperature

9. Process Time

10. Program parameters

11. Marker values

Temperatures and time values for markers. Setting a specified time value, the marker will show the requested time and temperature values.

12. Marker status

Shown the differences between two markers

13. Display and measurement

By switching On and OFF, selects the graph that is followed

14. Pick analysis

View how much time the PCB has spent above a specified level

15. X-Axis size

Set a period to be viewed during the process

16. Exports

Open an earlier process for analysing

Saving a graph for analysing

Save a graph as picture

Save a graph as xls format

Save graph as pdf report

17. Zone status

18. Markers

By moving the markers on the selected curve the temperature values belong to the marker's time can be viewed.

These appear in the measure box to the right side of the analyzing box.

The curve on the analysing box must be specified.

eC-015V04 reflow-mate V4 user manual

19. Measuring box and measurement point

In this box the temperature and time values can be seen belonging to active markers.

Only exisiting graphs with valid markers will give valid data.

- 20. Zone Marker
- 21. Furnace connection status
- 22. Furnace status

Firmware update



The **eC-reflow-mate V4** The latest firmware can be downloaded from our website.

- 1. Switch on the device
- 2. Connect the device to the computer via USB cable
- 3. Start the eC_reflow_V4_FU.exe
- 4. After the program started read the instructions carefully, then push the "Update" button
- 5. Wait for "Loading OK!" message
- 6. Switch off then swich on the device
- 7. Sometimes the device needs EEPROM update.

It indicates the "EEPROM update" message. This process may take several minutes. During this process do not switch off the device.

www.eurocircuits.com Contents of the package

Туре	ltem	pcs	Identifier
EU/UK	eC-reflow-mate V4	1	eC-015V04
EU/UK	eC-reflow-mate-hood	1	eC-002V01_R04
EU	Power cord	1	SN25-3/15/2BK
EU/UK	Purex control cable	1	eC-015-042_R00
EU/UK	Thermocouple	1	XF-324-FAR
EU/UK	PCB mounting pin	2	eC-015-117
EU/UK	PCB support pin	6	eC-015-118
EU/UK	User manual	1	eC-015-999

eC-015V04 reflow-mate V4 user manual

Waste management

This device may contain harmful parts for the environment. Do not put it into communal waste because it may harm the environment. Used electric devices are collected separately; use the recycling system in your area.

Since 13/08/2005 you can return used devices to the place of purchase; it will be disassembled and recycled properly.

Environmental protection is very important to our company and our childrens' future. Please help us to protect our environment for future generations.



Do not throw away your used device; send it back to the manufacturer or return to a recycling center.

Maintenance

Any unauthorized dismantling, repair attempts of the **eC-reflow-mate V4** will automatically invalidate the warranty.

After the warranty has expired, it is recommended to have repair carried out by the manufacturer.

Check the drawer in the case of regular use monthly, clean it if it is necessary and finish it with teflon spray.

Clean the door monthly with home detergent product.

DO check the power cord before every use.

DO NOT make any internal adjustments or repairs by yourself. Contact our Support Services at euro@eurocircuits.com

DO make sure that the oven is not switched on before maintenance.

Warranty conditions

We support the eC-reflow-mate V4 soldering device with 12 months warranty.

Please send the defective device to Eurocircuits in the original package.

Only the original packaging can warrant the safe return postage of the device.

The transport cost must be paid by the sender.

Contact

EUROCIRCUITS Ltd.

Berva-völgy 2401/9. 3324 Felsőtárkány, Hungary Tel: +36 531 560 e-mail : euro@eurocircuits.hu