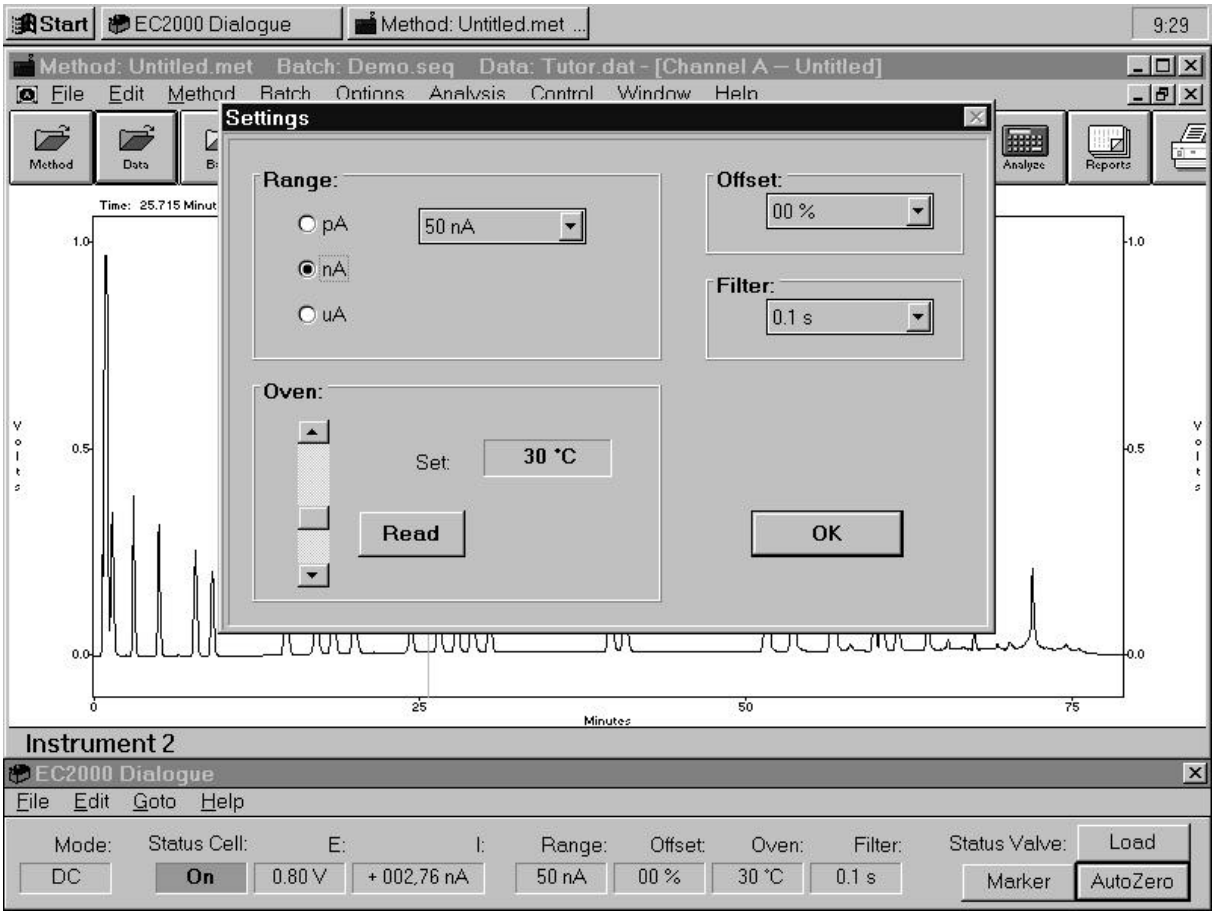
THERMO SEPARATION PRODUCTS

EC2000 Dialogue 3



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1. Introduction

EC2000 Dialogue for Windows is a multi-functional status and control bar for the EC2000 electrochemical detector. The program runs simultaneously with OS/2 and Windows-compatible integration software or any other Windows program. The Time-File editor provides a well-organised spreadsheet for convenient writing of TimeFiles. Each TimeFile provides a stepwise, time based, full parametric control with a time resolution of 1 second. Programmable parameters comprise cell potential, range, autozero, offset, rise time, electrical injector and control of EC2000 output contacts for control of external equipment.
In this manual all features of EC2000 Dialogue are discussed. For quick starters 'Chapter 2. Installation and quick start' provides the minimum of information needed to run the program.

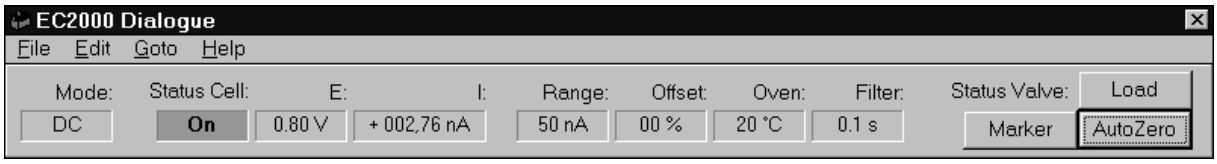


Fig. 1. EC2000 Dialogue status and control bar

2. Installation and quick start

The EC2000 Dialogue for Windows is a multi-functional control bar which handles all important settings of the EC2000 via the RS232C port.

Installation

1. Connect the EC2000 with the PC using the supplied RS232C cable.
2. Start Windows and run SETUP.EXE from floppy disk for installation on the hard disk.
3. Switch on the EC2000, the main screen will appear.
4. Choose 'RS232' (F5) from the EC2000 main screen.

Running EC2000 Dialogue

1. Start the Windows compatible integration program.
2. Return to Program Manager and run EC2000.EXE.
3. The first time you run EC2000.EXE a dialogue appears.
4. Select the communication port and the Device ID numbers.
5. Select DC, Pulse or Scan mode.
6. EC2000 Dialogue appears and the actual settings of the EC2000 are displayed.

Click buttons

Every text box, except I-cell, can be activated by a mouse double-click. A dialogue appears that allows you to change a particular setting. Double-clicking 'Off' in the cell status text box will immediately turn On the cell potential (and visa versa). **Most changes in the dialogues will be effective immediately!**

Short keys

Several settings can be changed using short keys. The range can be ALTered by typing ALT-r (the left 'ALT' key). The text box is now highlighted and the range can be varied by pressing '+' or '=' (increase) or '-' (decrease). The Offset can be changed in a similar way by pressing ALT-o. Autozero or Marker is given by ALT-a or ALT-m respectively.

EC2000 Auto mode and TimeFile editor

The TimeFile editor provides a well-organised spreadsheet for convenient writing of TimeFiles. These TimeFiles are executed in the EC2000 Auto mode. Programmable parameters comprise cell potential, range, autozero, offset, rise time, electrical injector and control of output contacts.

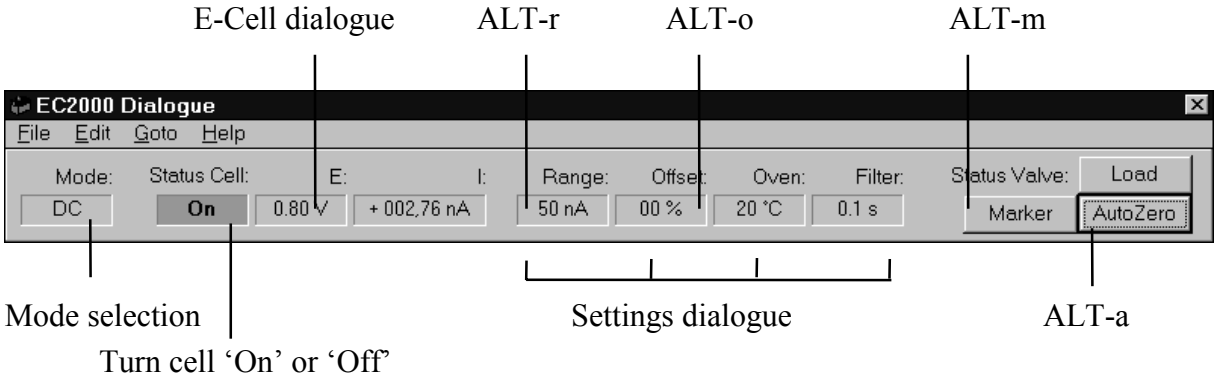
3. Parameters in EC2000 Dialogue

The EC2000 settings can be altered by mouse double-clicking on the Dialogue status and control bar, by choosing a menu item or by using certain short keys. Characteristic for the dialogues is that the settings are effectuated immediately. Unlike most Windows applications EC2000 Dialogue does not use 'Cancel' buttons. The reason is simple: it is more convenient. A minimum of mouse clicks results in a maximum effect. The settings of the EC2000 can be changed real-time without 'OK' confirmation and closing the dialogues.

For example, when a user wants to change the offset until the baseline is in-scale, the Settings dialogue is opened by a mouse double-click on the Offset text box. The user than changes the offset, if necessary multiple times, without multiple dialogue opening and closing steps. Even more convenience is offered by short keys. Pressing ALT-o followed by '+' or '-' increases or decreases the % Offset.

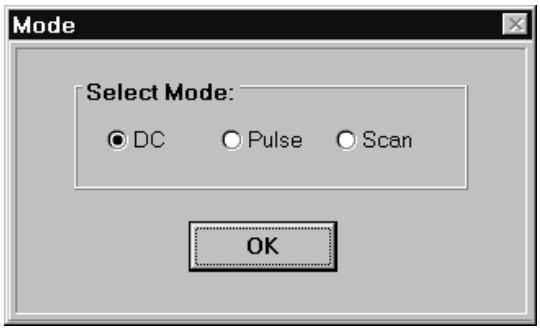
Another example, the EC2000 is operated in the pulse mode and the user wants to see the effect of changing potential E1, E2 and E3 on the noise. The user than simply opens the E-Cell dialogue and has a real-time access to all important parameters such as the pulse potential, the pulse time and the sampling time. At the same time the baseline can be monitored on an integrator or flatbed recorder.

Fig. 2. Mouse double clicks and short keys in EC2000 Dialogue



The dialogues are in fact a temporary extension of the Dialogue. Using these dialogues is the only way to keep the window size of EC2000 Dialogue as small as it is. More than 80% of your monitor screen will be available for display of a chromatogram. The text boxes that respond on mouse double-clicking are outlined in Fig. 2.

Mode

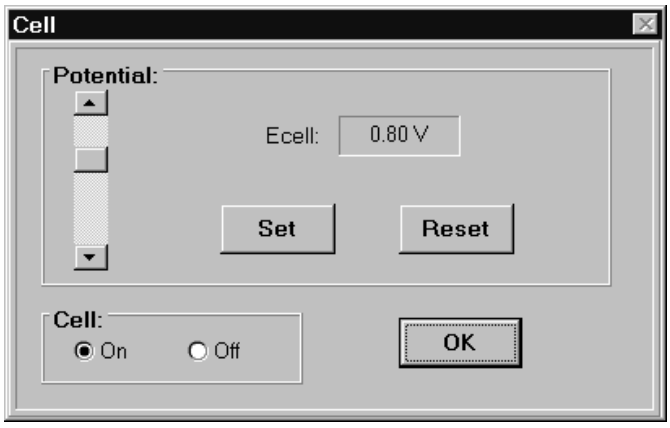


The mode (DC, Pulse or Scan) can be selected by double-clicking on the mode text box or by selecting ‘Mode’ under the menu option ‘Edit’. A dialogue window appears which enables mode selection. The mode is set after confirmation with the ‘OK’ button. The ‘Mode’ window also appears after a reset of the EC2000.

Status Cell

The cell can be turned on or off by double-clicking on the ‘Status Cell’ text box.

E (DC mode)



A dialogue appears after double-clicking on the ‘E’ text box which enables setting of the cell potential. Changing the cell potential is effectuated only after pressing ‘Set’. If ‘OK’ is pressed without ‘Set’ the potential will not be changed. The cell potential in the DC mode is the only parameter that requires a confirmation from the user before changing.

The ‘Reset’ button resets the E-cell text box to the actual cell potential. The cell status can be changed in the ‘Cell’ dialogue, switching the cell On or Off is effectuated immediately. The Cell dialogue can also be accessed by choosing ‘E-Cell’ under menu item ‘Edit’.

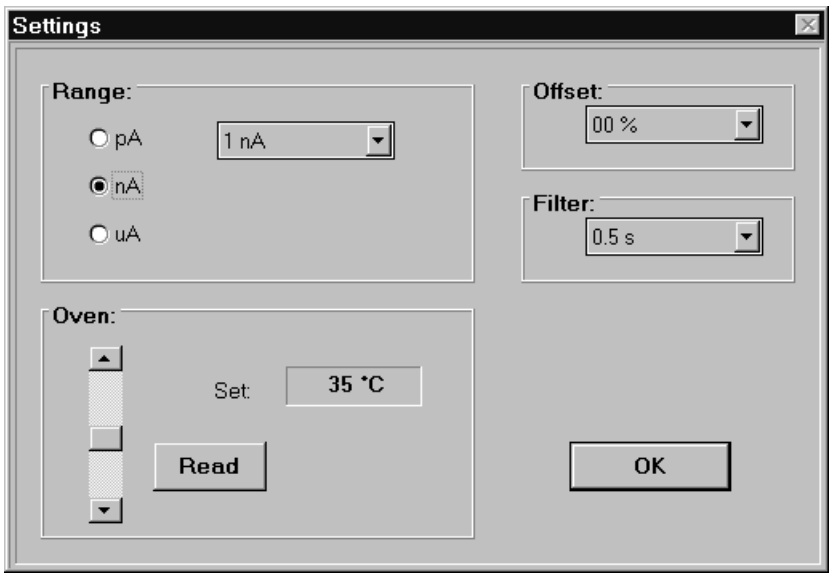
I

The display of the cell current is refreshed every second. The cell current is not affected by the offset and gives important information on the status of the analytical system. When the current exceeds a certain value an ‘Overload’ message appears.

Range, Offset, Oven and Filter

The ‘Settings’ dialogue appears after double-clicking on one of the text boxes Range, Offset, Oven or Filter. Pressing ‘Read’ under dialogue item ‘Oven’ displays the actual

oven temperature. The ‘Settings’ dialogue can also be accessed by choosing ‘Settings’ under menu item ‘Edit’.



Range and Offset short keys

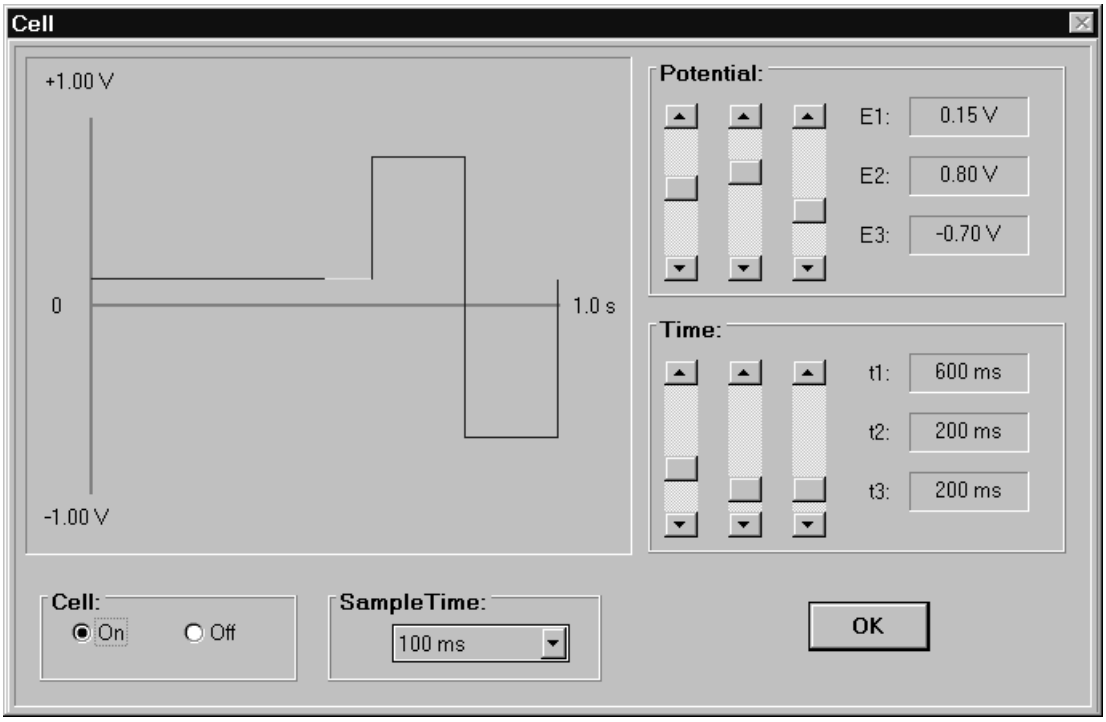
The Range and the Offset can be ALTered by typing ALT-r or ALT-o respectively. The corresponding text box is now highlighted and the Range or Offset can be varied by typing ‘+’ (increase) or ‘-’ (decrease). The Dialogue only responds on these short keys when it is the top window. Switching between Windows applications is done by ALT-TAB or by a mouse-click on the window of interest.

Marker and Autozero short keys

A Marker or Autozero can be given by pushing the corresponding button or by pressing ALT-m or ALT-a respectively.

Exit EC2000 Dialogue

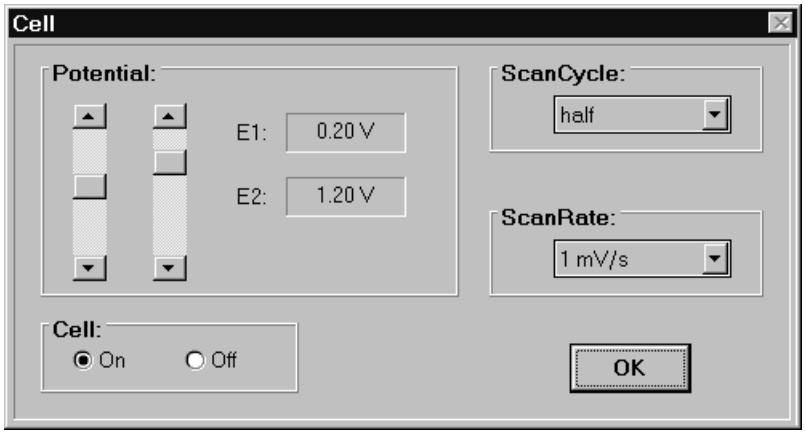
EC2000 Dialogue is programmed in a way that the detector is not affected by possible computer problems. Resetting the PC, switching off the PC or terminating EC2000 Dialogue, does not affect the status or functioning of the EC2000. Each time the program is restarted all settings of the EC2000 are loaded in Dialogue.
On the other hand, if the EC2000 is switched off or if the RS232 mode is left, the EC2000 Dialogue is immediately ended. A message (Dialogue message 6) ‘Not in the RS232 mode, no connection’ appears. Activating the key lock (under menu item ‘Edit’) prevents accidental termination of the EC2000 Dialogue this way.



DC, Pulse and Scan mode

The Pulse mode differs from the DC mode in that the cell potential consists of more parameters and that the noise filter is not needed. The shape of the pulse is graphically displayed and the parameters can be set using convenient scroll bars. Similar differences are seen in the Scan mode.

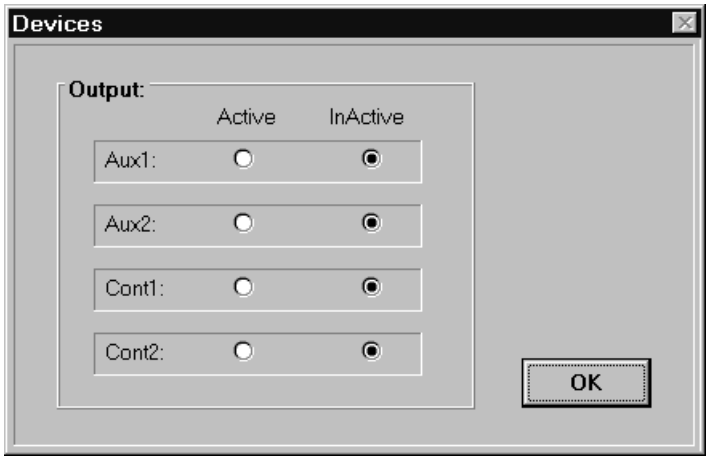
Key lock



When the EC2000 is operated in the RS232 mode the keyboard of the EC2000 can be locked by choosing ‘Key lock’ under menu item ‘Edit’. The key lock is turned off by choosing ‘Key lock’ again. When the key lock is active and the program is terminated or the PC is turned off, the keyboard of the EC2000 remains locked. Running EC2000 Dialogue again enables unlocking of the keyboard by choosing ‘Key lock’. Switching off and on the EC2000 also unlocks the keyboard.

Devices

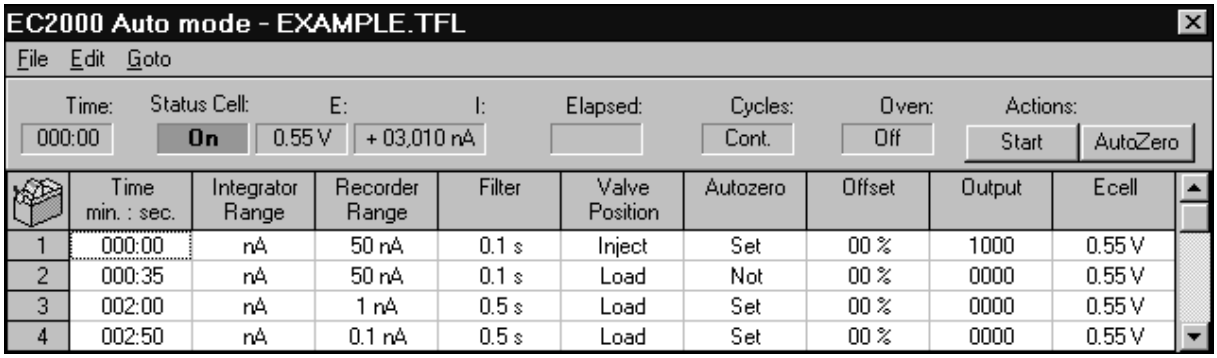
The status of the I/O ports can be changed by selecting ‘Devices’ under menu item ‘Edit’. The I/O ports Aux 1 and 2 and Cont 1 and 2 are found at the back panel of the EC2000. Each time the program is started the status of the I/O ports is loaded into the Dialogue. Terminating the program does not change the status of the I/O ports.



4. EC2000 Auto mode

EC2000 Auto mode

In the Auto mode a TimeFile can be executed. If the EC2000 is master, it can be executed several times. The number of cycles can be set in the TimeFile editor and the number of executed cycles is given in 'Elapsed'. In the slave mode, a TimeFile is executed each time an external trigger is given.

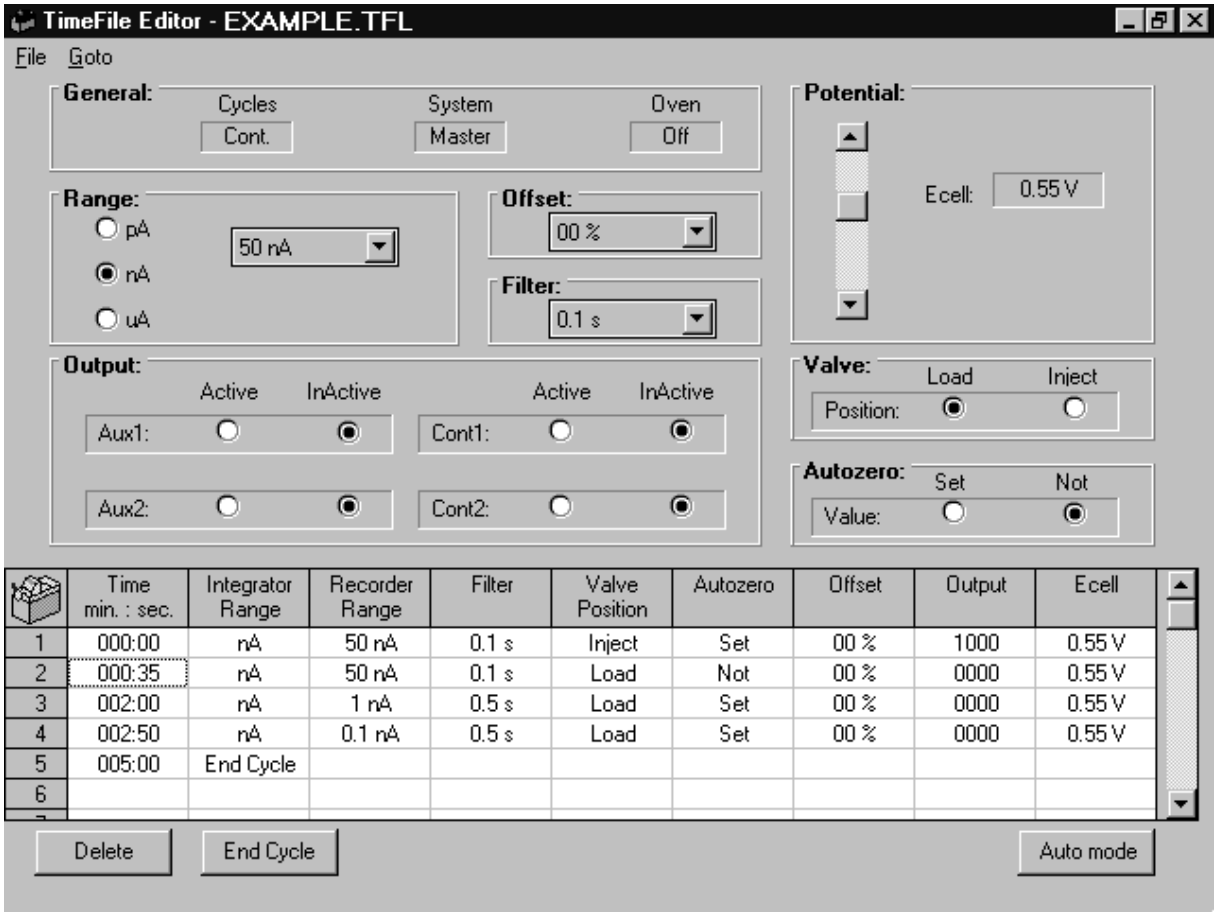


	Time min. : sec.	Integrator Range	Recorder Range	Filter	Valve Position	Autozero	Offset	Output	Ecell
1	000:00	nA	50 nA	0.1 s	Inject	Set	00 %	1000	0.55 V
2	000:35	nA	50 nA	0.1 s	Load	Not	00 %	0000	0.55 V
3	002:00	nA	1 nA	0.5 s	Load	Set	00 %	0000	0.55 V
4	002:50	nA	0.1 nA	0.5 s	Load	Set	00 %	0000	0.55 V

Before running, a TimeFile is created (or loaded) in the TimeFile editor. If the cell potential in the TimeFile differs from the actual cell setting a message appears: 'Parameter conflict' (see page 18). It is necessary to stabilise the cell at the working potential before starting a TimeFile. It is not allowed to start a TimeFile (or to enter the Auto mode when EC2000 = slave) with the cell off.
The TimeFile editor can be used during execution of a TimeFile, however, to avoid conflicts not all parameters are accessible.

5. The TimeFile editor

The TimeFile editor is started by choosing ‘TimeFile’ under menu item ‘Goto’. To make a TimeFile ‘New’ is selected under menu item ‘File’. The time is set at 00:00 and the actual EC2000 settings appear in the first line. These values can be changed by clicking on the corresponding settings in the upper part of the TimeFile editor.



Entering a new line

A new line is entered by clicking on an empty time field and typing the new time. The settings of the previous line are copied in the new line. These values can be changed by clicking on the corresponding settings in the upper part of the TimeFile editor.

Inserting a new line

New data lines are automatically sorted by time. Inserting a data line between two existing data lines is done by entering the new time on an empty time field. The new time is

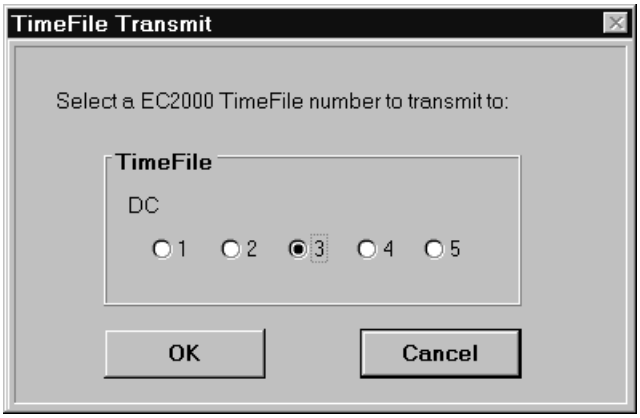
automatically placed in the TimeFile. The settings of the previous line are copied in the new line.

The last time: End Cycle

A TimeFile is ended by entering the 'End Cycle' command in a TimeFile. This is done by clicking on the time field and entering the time that a run should end. The EC2000 settings appear in the data line. The 'End Cycle' command is entered by pushing the 'End Cycle' button at the bottom of the TimeFile editor. The 'End Cycle' command appears in the data line.

Transmit

A TimeFile can be uploaded to the EC2000 RAM by choosing 'Transmit' under menu option 'File'. A total of 5 TimeFiles can be stored when the EC2000 is in the DC. These TimeFiles can be executed in the Auto mode of the EC2000 independently from the PC. This option is particularly useful for users of integration software running under DOS.



6. Dialogue messages

Table 1. Dialogue messages.

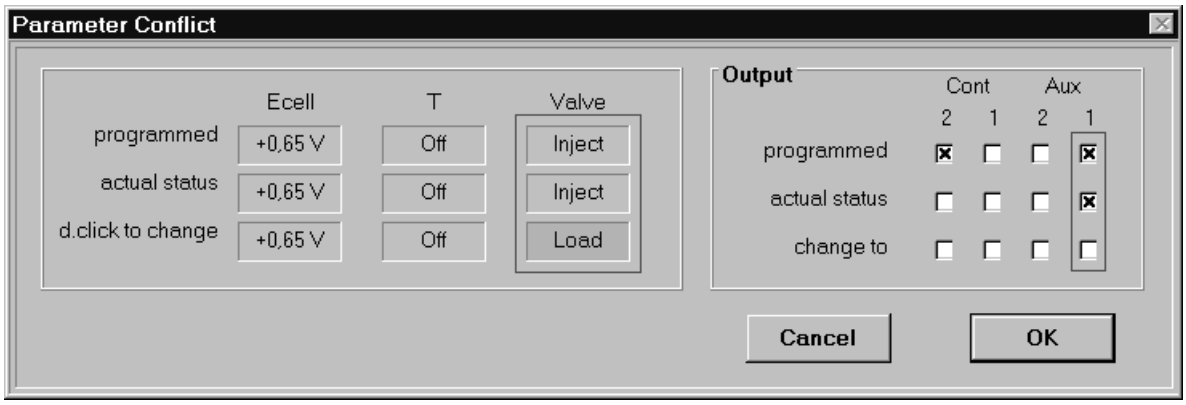
Nr.	Message	Description
1	COM1 not available. Use COM2 ?	COM1 is in use (e.g. by a mouse). Setup automatically looks for COM2.
2	COM1 and COM2 not available. Execution aborted	Both comports are in use. The program needs COM1 or COM2. Try COM3 or COM4 for other hardware.
3	The cell is off!	Scan mode: trying to start a scan with the cell off. Auto mode: trying to start a run with the cell off. In both cases the cell must be on before starting.
6	Not in RS232 mode, no connection	There is no handshake between the EC2000 and the PC. This may be due to i.e. the EC2000 is not in the RS232 mode (EC2000 main screen), or an user interruption of the RS232 mode in the EC2000 occurred, or the RS232 cable is of poor quality, or because the EC2000 is not equipped with R-version software.
7	Incorrect entry. Time window is between 00:01 and 999:59.	TimeFile editor message.
8	No response, wrong Device ID.	Device ID not correct, execution aborted. Delete EC2000.INI (in Windows directory) and try again. Often used device settings: ID1=31, ID2=30. Alternatively, the ID's in the EC2000 can be changed in the service mode.
9	Invalid file!	Not the correct file format.
10	Impossible to delete this time!	Time 0:00 can't be deleted.
11	End Cycle time already exists!	Only one End Cycle time is allowed.
12	End Cycle time not valid!	End Cycle time 0:00 is not allowed.
13	Not the last data line in TimeFile!	A time larger than End Cycle time exists.
14	Data line entered without time!	A time is always required.
15	TimeFile has no End Cycle time!	An End Cycle time is always required.
16	TimeFile has been changed, save current changes?	
17	Too many lines!	A TimeFile may contain a maximum of 50 data lines. If a file is transmitted to the EC2000 a maximum of 20 data lines is allowed.
18	A new time must be entered as digits, i.e. 6 minutes and 12 seconds is entered as: 0612 or 6:12 or 6.2	
19	Time already exists!	
20	New time exceeds End Cycle time!	
21	Illegal filename, file xx is in use.	During execution of TimeFile xx it is not possible to overwrite this file.

Table 2. Windows messages.

Message	Description
Device unavailable	COM port is in use. Occurs when EC2000 Dialogue is started while another version of this program is already running.

Parameter conflict

A parameter conflict occurs when the first data line of the TimeFile contains settings that are in conflict with the actual detector settings. For example, such a conflict occurs if in the first line an 'inject' command is programmed, while the valve is already in the inject position (actual status = inject). In that case no injection will take place.



A similar conflict occurs if in the first line AUX1 is activated, while the status of this output is already active. In that case this command will have no effect.
The parameter conflict dialogue can be used to change the actual status of the EC2000. When 'OK' is given, the parameters in the lower line are accepted: i.e. the valve is switched to 'Load' and the output AUX1 is deactivated. By double clicking on 'Load', the valve status will be unchanged ('Inject'). Cancel returns to the TimeFile editor.

Appendix. Installation of the RS232 option

The supplier assumes no responsibility for damage due to installation of the RS232 option by unauthorised personnel.

Computer requirements

Minimal 386SX, 25 MHz, 4 Mb, MS DOS 5.0, Windows 3.1, one free RS232 port.
For EC2000 Dialogue a EC2000 software R-version 3.xx or higher is required (EPROM).

RS232 upgrade

The upgrade kit for the RS232 option comprises:

- EC2000 Dialogue for Windows software (1 HD diskette)
- User's manual
- EPROM with EC2000 software R-version (exchange)
- Standard RS232 cable
- If necessary: RAM chip + jumper.

Depending on the serial number of the controller, either the EPROM only or both the EPROM and the EC2000 RAM have to be changed.

To install **only the EPROM** follow the next steps:

1. Disassemble the EC2000 (see below).
2. Locate the CPU board (the second board from the left) and notice the position of the EPROM.
3. Remove the EPROM and place the new one in the same position on the CPU board.
4. Reassemble the EC2000 (see below).
5. After switching on the MAIN screen will display your EPROM version with R-extension.
6. The system is now ready for use.

To install **the EPROM and RAM chip** follow the next steps:

1. Disassemble the EC2000 (see below).
2. Partly loosen the screws (2x M4x16) and lower the metal strip that holds the boards.
3. Disconnect the 2 flat cables on top of the CPU board (second board from the left) use a long screwdriver.
4. Remove the CPU-board by gently pulling it out of the slot.
5. Locate the RAM-chip (IC 2) and notice its positioning!

6. Remove the RAM chip.
7. Set the RAM jumper (JP1) to the most-right position.
8. Place the new RAM with the dot mark to the upper-left side (same position as the previous, see 5).
9. Locate the EPROM and notice its position.
10. Remove the EPROM and place the new one in the same position on the CPU board.
11. Check that JP2 and JP3 are both placed, if not place JP3 (use the jumper supplied).
12. Gently install the CPU-board into its slot (third slot from the left).
13. Reconnect the flat cables (each on its unique header) .
14. Reposition the metal strip that holds the boards.
15. Assemble the EC2000 (see below).
16. Switch on the EC2000, an ERROR 7 may occur.
17. Continue with the setting of the zero value in RAM.

The following steps are required to set the proper zero value in the new RAM:

1. Enter the service mode by resetting:

Press simultaneously the right arrow & F3, followed by holding the 'Enter' key until the service mode main screen appears. **All TimeFiles will be erased after this reset, default settings will appear!**

2. Choose 'F4' (ADJ)
3. In 'adjustments' choose 'F3' (ZER.IE)
4. Choose 'F2' (READ) and read the value. The '0000' will be stored in RAM.
5. Leave the controller on for minimal 30 min (warming up) and repeat the previous step.
6. Leave the service mode by switching off your controller.
7. After switching on the MAIN screen will display your EPROM version with R-extension.
8. The system is now ready for use.

Disassembling the EC2000

Before disassembling read this carefully:

1. Disconnect the EC2000 from mains power.
2. Put the EC2000 in front of you on a table with the back panel to the right i.e. the injector to the left. Make sure there is enough room on the table between you and the EC2000 i.e. this room should be the width of a EC2000.
3. On the back panel (at your right-hand side) of the EC2000 unscrew the four outer screws i.e. the screws at the edge of the cabinet (4x M3x8).
4. Open the oven compartment, and unscrew the ten screws in the plastic bottom cover i.e. the one's in the holes, remove these screws and put them aside (10x M3x12)
5. With the opened oven compartment lift out the complete upper part. To do so put your left hand under the left out coming part (where the injector is mounted), and your right hand under the backside of the cover.
6. The power cable will be restrained by the corner of the board rack and needs attention while lifting the upper part.
7. **Take care not to lift it too high or too fast because of possible damage to the backside of the motherboard and the cable connections!!**
8. Now put the upper part in front of the cabinet; this is sometimes difficult because the power cable coming from the left of the cabinet going to the right of the upper part can be obstructed at a corner.
9. From left to right there are six board positions:

electrode board, spare, CPU board, oven control + scrubber control board (option), I/O board, spare.

10. Most boards include cable connections. Gently remove these before board removal. The connections are all unique, so mixing them up is impossible.
11. Continue with the upgrade as described above.

Reassembling the EC2000

Before re-assembling read this carefully:

1. Re-assembling is done in fact in reversed order, but some details should be taken into account.
2. Be sure that the EC2000 is disconnected from mains power.
3. When the upper part is lifted above the cabinet **take care of the power cable and the back of the motherboard.**
4. Slowly lower the upper part with the back panel (right) between the sides of the cabinet.
5. Keep the power cable between the shielding cover of the power supply and the side of the cabinet, at the side facing towards you. The cable set at the right must be pushed inside and up while lowering.
6. When everything is in place, it must be possible to lower the upper part **smoothly** into the cabinet. If it does not fit, lift the top up again and reposition cables (a long screwdriver might help).
7. When both parts fit correctly, the four screw holes at the back panel (right) correspond, such that the screws can be fitted.
8. Refit all screws and do not over-tighten those in the plastic parts.
9. Continue with the upgrade as described above.

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