

Service Manual

for

TECO COATRON M2



This Service Manual is valid for Software Revision 1.10 and higher.

Id.No. 38 462 01 - Rev. 1

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WARNING

This Service Manual is valid for Software Revision 1.10 and higher.

Please read the Service Manual in its entirety prior to service the *TECO COATRON M2*. In order to ensure a high level of performance, all warnings and references to technical safety in this Service Manual must be followed. Repairs to the instrument may only be carried out by trained personnel, and replacement parts must comply with instrument specifications.

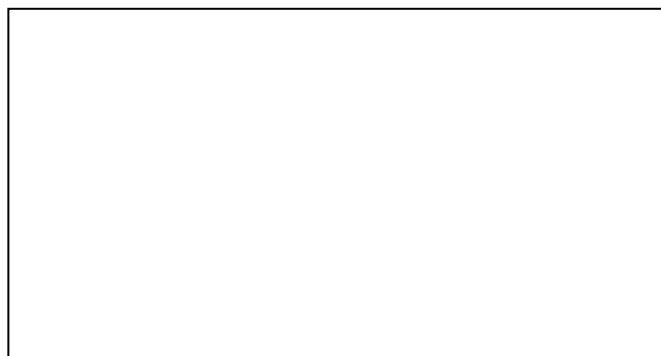
The *TECO COATRON M2* is intended for use with human plasma. As there is no known test that can offer complete assurance that product derived from human blood will not transmit Hepatitis, AIDS, or other infectious diseases, appropriate precautions should be taken by the instrument operator. In case of plasma spill on the instrument, clean with a paper towel soaked in 10% bleach.

The *Coatron M2* is manufactured by TECO GmbH .

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 Dieselstr. 1
 D-84088 Neufahrn N.B.
 Germany

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 Fax: +49 (0)8773 910011
 E-Mail: info@teco-medical.de
 Internet: www.teco-medical.de

Authorized Distributor:



Distributor's stamp / address / label

1.0 GENERAL DESCRIPTION

The **TECO COATRON M2** is a manual two channel photo-optical instrument that offers clotting testing capabilities. The **TECO COATRON M2** can be used for a wide variety of coagulation and fibrinolysis tests such as: Prothrombin Time (PT), Activated Partial Thromboplastin Time (APTT), Thrombin Time (TT), Fibrinogen (Clauss and derived), Factor Assays, Protein C (PC), Activated Protein C Resistance (APC_R), Protein S (PS), Heparin (HEP), and ATIII (clotting based).

FEATURES:

- No specific reagent manufacturer necessary (open system)
- Optimized for sensitive Thromboplastins
- Quarter volume testing possible
- Calculation in Activity, INR, Ratio, g/L or mg/dL
- Every test is programmable up to 5 calibration points
- Correlation analysis of calibration curve
- Two stop-watch functions which can be used independently
- Multi-language software (german, english, spanish, french, italian, portugese)
- Patient identification
- Test-Duplicate Modus
- Routines for self test (trouble-shooting)
- Routines for print outs (result, calibration, service, system)
- Internal thermal printer
- Optional Autopipette with electronic triggered start
- Optional research software
- Optional external barcode scanner for patient id.
- Easy software update
- Laboratory Information System Support (LIS)

2.0 INSTALLATION

No special precautions are necessary when starting up the **TECO COATRON M2**. However, the following is recommended:

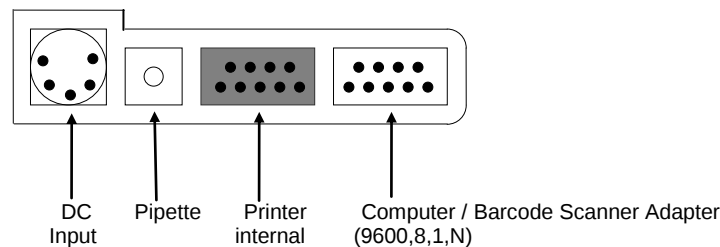
- Place on a level surface in an area free from excessive temperature fluctuations
- Avoid vibration during measurement
- Protect the instrument from direct sunlight, moisture and dust
- Check that the voltage and frequency data on the identification plate on the instrument agree with the local power rating before starting the instrument for the first time

The instrument is connected to the power supply by the main cable supplied. If obvious damage has occurred during shipping, **do not use**. Contact your local distributor for replacement or repair.

Remark: Please fill-out the attached Installation report and Warranty sheet after final installation

2.1 Rear of equipment

Two serial interfaces are available, but one port is occupied by the internal printer device. The second port can be used for software upgrades, for light absorption monitoring, for laboratory information system (LIS) or for a barcode scanner. The port is fixed at 9600 Baud, 8 Data, 1 Stop, No parity.



2.1.1 DC input

DIN 5-pol socket for connection of the external Power Supply UP40431, Cat.No. 17 004 00

Remark: Please use only the original supplied external Power Supply UP40431 for safety reason. Do not connect any other Power Supply. The warranty and all approvals will be then invalid.

2.1.2 Autopipette

Socket for connection of the Autopipette, Cat.No. 19 029 00, which is an optional accessory tool for automatic test start. The pipette supports four different volumes: 25, 50, 100 and 200 μ L

2.1.3 RS232C for Thermal-Printer

SUB-D9 Socket for connection of the internal thermal printer for automatic print-out:

- Result Print-Out
- Test Parameter Print-Out
- Service-Report Print-Out
- System-Identification Print-Out

2.1.4 RS232C for Personal Computer

Serial Interface is used to connect a Personal Computer for software updates and research functions

2.1.5 Barcode Scanner (optional)

Optional accessory tool for easy handling of patient identification. Upto 20 characters can be read. Barcodes with more information will cut off at the maximum length. The barcode-scanner must support a serial interface, set to 9600 Baud, 8 Data, 1 Stop, No parity.

2.2 Technical data

Instrument:

Boards	SMD (Small Mounted Devices) based
Microprocessor	NEC V25
Flash-EPROM	128x8 KBit
RAM	128x8 KBit
EEPROM	2 KBit
AD-Converter	18 Bit (16 bit used)
Optics	2 Laser LED's 470 nm

Power Supply:

external,	
Input voltages	96 Vac to 243 Vac / 50 to 60 Hz
Output voltages	+5Vdc/3A; +15Vdc/2A; -15Vdc/0,5A
approvals	TÜV, CSA, UL, CE, IEC950, IEC380

Keyboard:

3x8 matrix, foil keyboard, with Test, Function and numerical keys

Display:

4 lines x 20 characters Liquid Crystal Display

Incubation block:

6x2 double-cuvette pre-warming positions, 2 measuring and 3 reagent positions

Autopipette (optional):

25 / 50 / 100 / 200 µL volume with electronic triggered start

2.3 Safety Standard Approvals

The **TECO COATRON M2** is in full compliance with following approvals:

CE-Mark	EN 55011:1991 Group 1, Class B Limits and methods of measurement of radio disturbance characteristics of industrial, scientific and medical (ISM) radio frequency equipment. EN 60601-1-1:1993 Medical electrical equipment, Part 1 - General requirements for safety 2. Collateral standard: Electromagnetic compability - Requirements and tests IEC 801-2:1984/1991: Electrostatic discharge IEC 801-3:1984: Radiated electromagnetic field requirements IEC 801-4:1988: Electrical fast transients requirements
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The Power supply is in full compliance of following approvals:

CSA, UL, TÜV-GS, CE, IEC950, IEC380

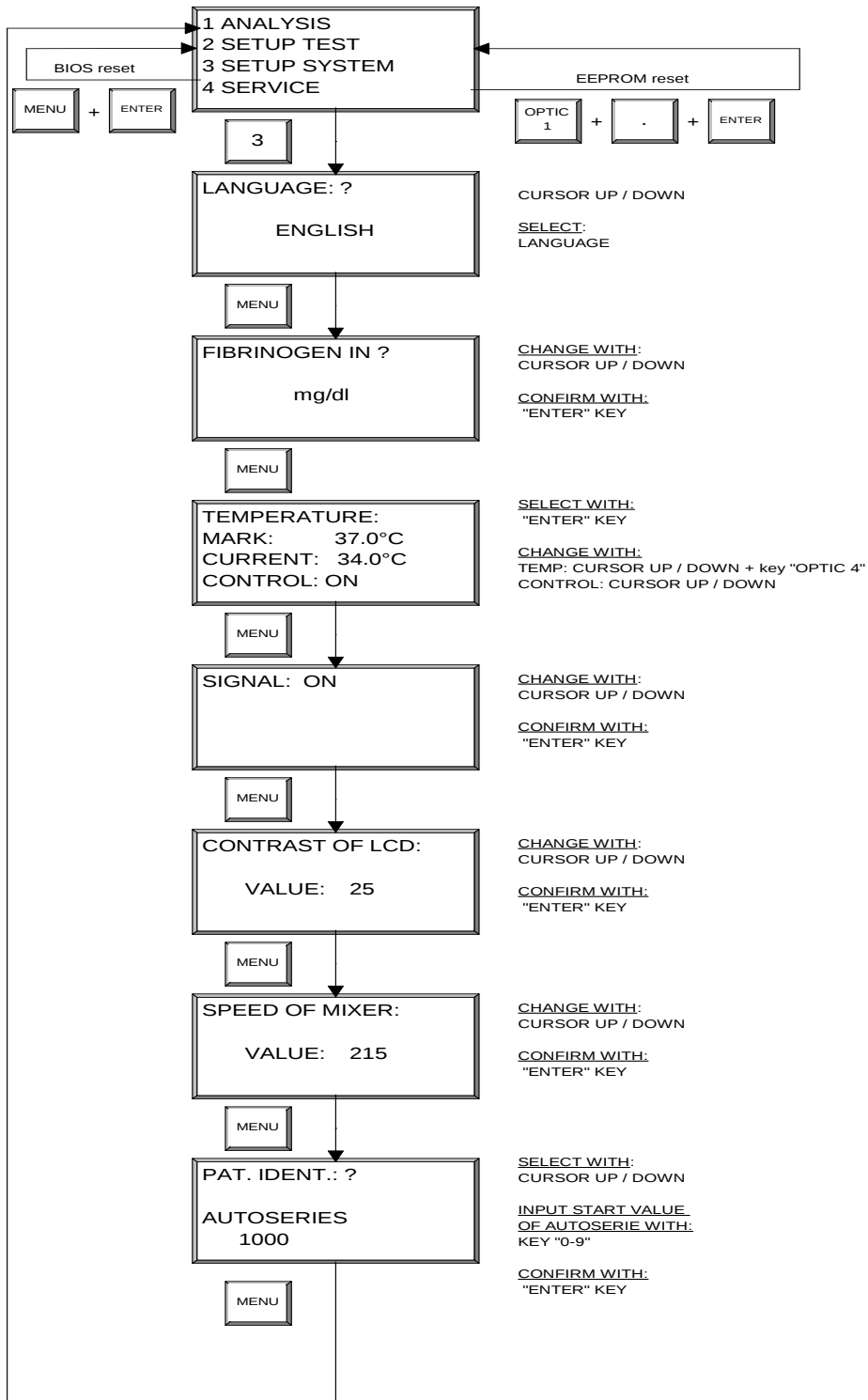
3.0 OVERVIEW OF THE USER DIALOG

On the following pages the overview of the user dialog can be seen. Directly after switching on the **TECO COATRON M2** a Self test is running, during this time the **Software revision is displayed**.

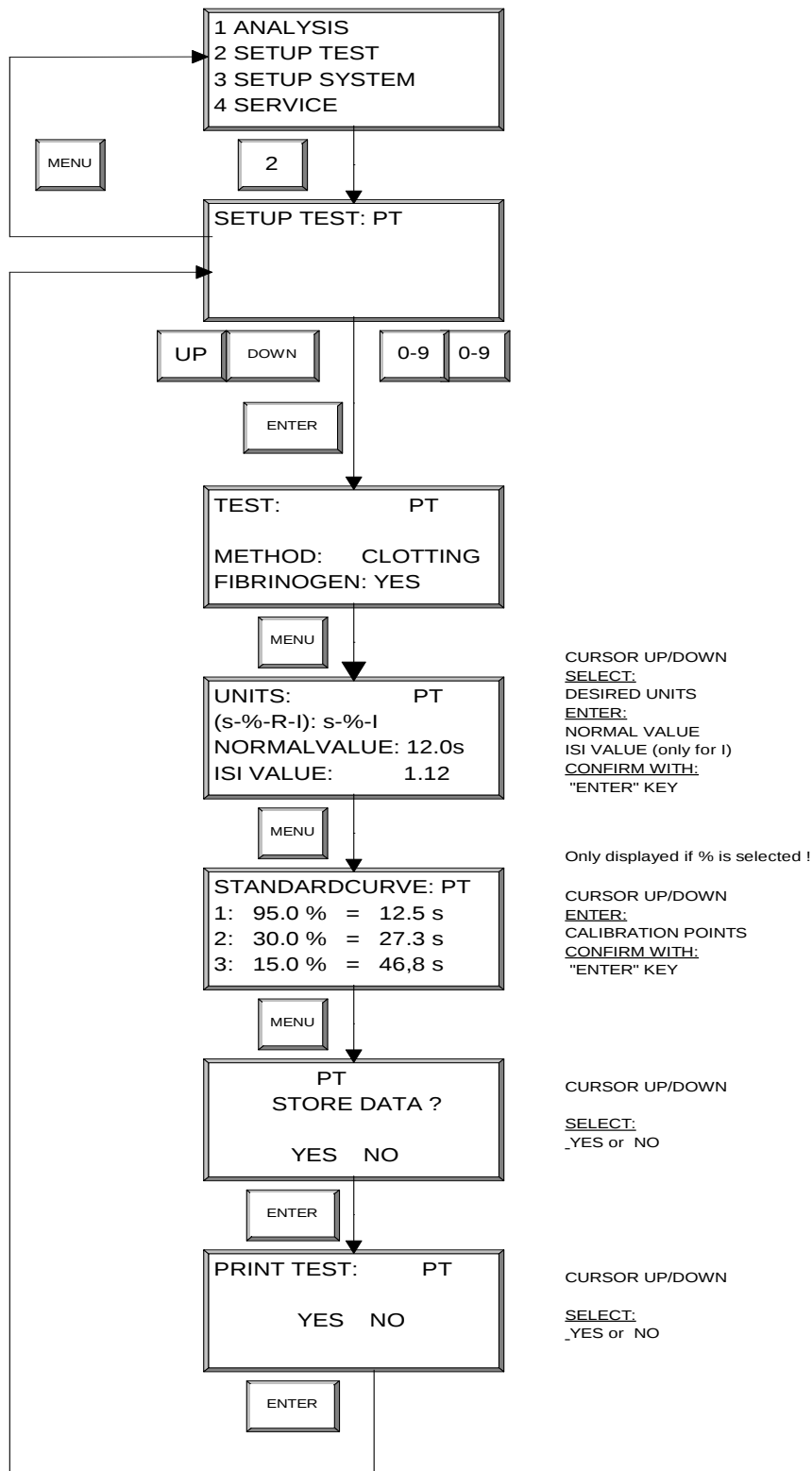
SOFTWARE: VER. 7.07
PLEASE WAIT
LOADING DATA

3.1 Setup System

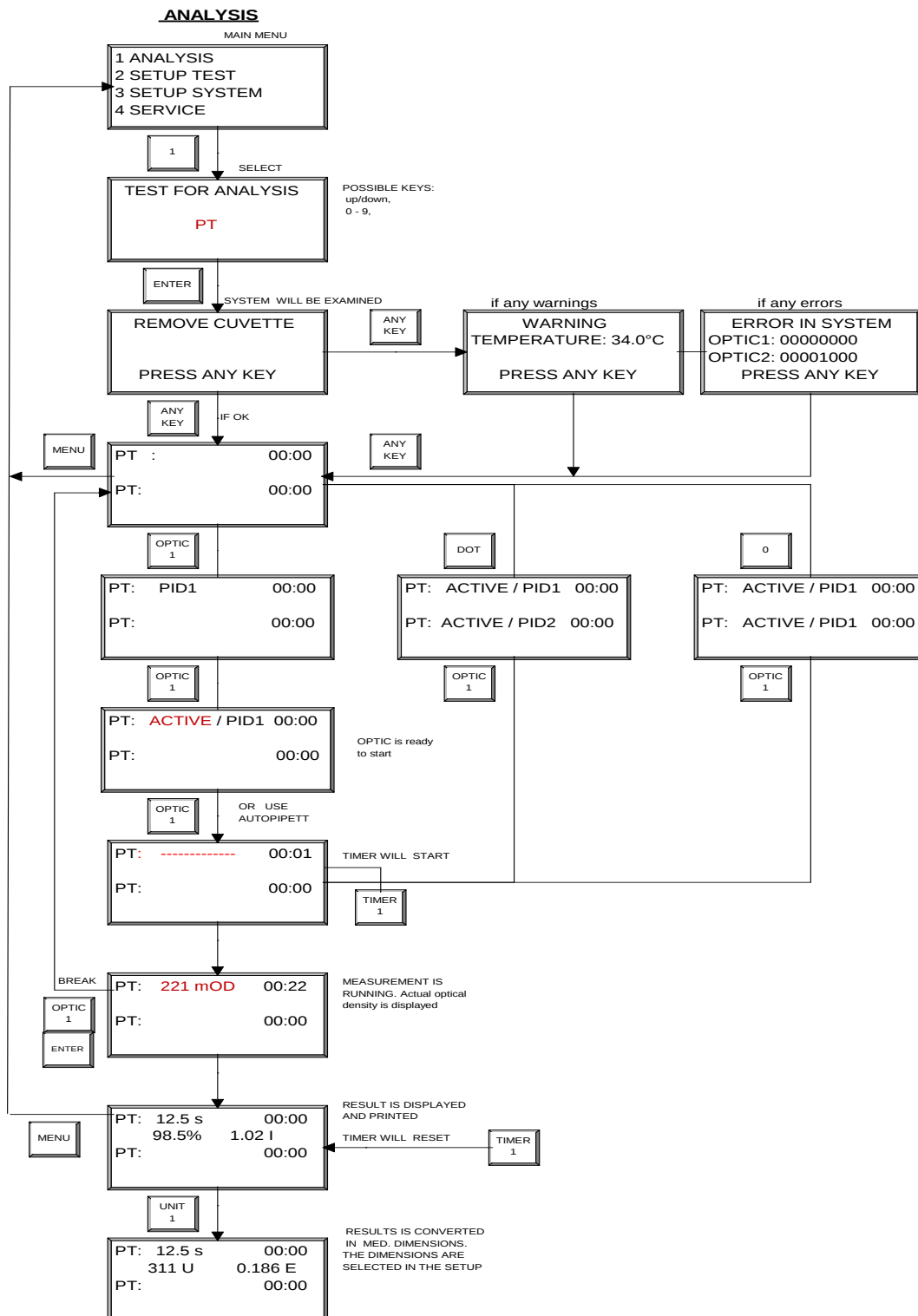
SETUP SYSTEM



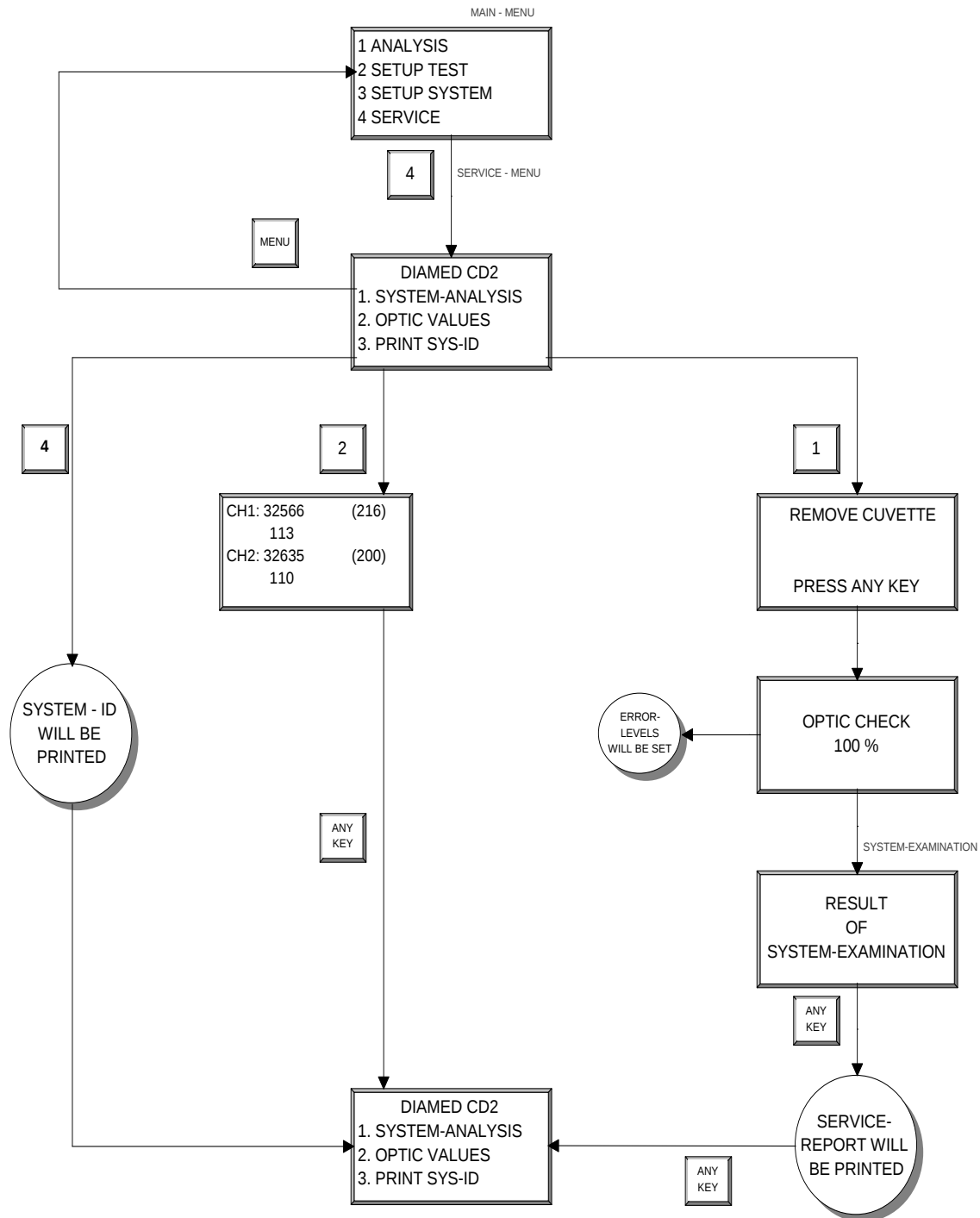
3.2 Setup Test



3.3 Analysis



3.4 Service



4.0 SERVICE MENU

TECO COATRON M2

1. SYSTEM ANALYSIS
2. OPTIC VALUES
3. PRINT SYS-ID

4.1 System Analysis

Press key “1” from the Service submenu to perform a “**System Analysis**” .

Press key “Unit 2” from the Service submenu to perform a “**Quality System Analysis**” .

Press #1 from the Service submenu to enter. Perform a “**SYSTEM ANALYSIS**” to check instrument operational status. In “**SYSTEM ANALYSIS**”, the **TECO COATRON M2** check the optic, temperature, Memory values and Analog to Digital Conversion. The Error Level for each channel is determined and displayed if a system error or warning is identified.

ERROR IN SYSTEM
OPTIC1: 00001000
OPTIC2: 00000000
PRESS ANY KEY!

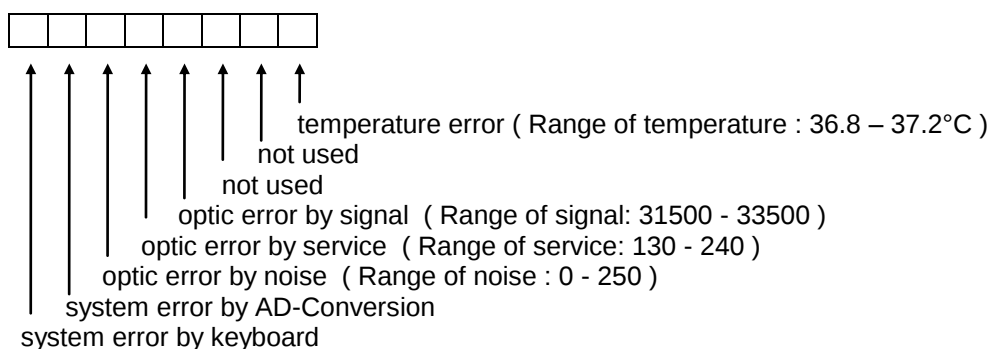
An example of a “**SYSTEM ANALYSIS**” screen is:

The number after CH1-2 is the error code: Referring to section 4.2. the LED light of channel is not working correctly, while channel 2 is without troubles.

After the self-check is complete, a service report is automatically printed.

4.2 Error Level

When the self-check is followed by an error message, a 8 BIT long number in binary code can be seen. Each BIT is indicative of a specific error or warning:



Example: The Error Level “00000001” indicates that the temperature is out of range.

Refer to the troubleshooting guide for information on corrective actions.

4.3 Optic-Values

From the “**SERVICE**” submenu, press #2 to enter “**OPTIC VALUES**”. The values of signal, noise and service is displayed for each channel.

Recommended values: *

SIGNAL :	31500 – 33500
SERVICE:	130 – 240
NOISE:	0 - 250

* optic channels must be empty .

4.4 Keyboard Check

This check is performed only during “QUALITY CONTROL SELFTEST” . Press all keys onetime . The key “ENTER” must be the last. Every key has his own numeric code . This code is displayed . Additional every code is added to a checksum and must be equal to 383 before or 408 after pressing key “ENTER”.

4.5 Print Sys-ID

To print out the identification number of the Optic Unit, Processor Board and the software version/revision number of the **TECO COATRON M2**, press # 3 from the Service menu.
Following information are printed out:

SYSTEM - IDENTIFICATION TECO COATRON M2		

MAINBOARD REVISION	955	Internal Assay No.
MAINBOARD INDEX	0	Index code to see actual level
MAINBOARD SER.NO.:	327	Serial No. of the Mainboard
BIOS REVISION:	1	Operating system revision
BIOS INDEX:	0	Index code to see actual level
FLASH REVISION:	2	FLASH EPROM revision
FLASH INDEX:	0	Index code to see actual level
SOFTWARE REVISION:	7	actual loaded Software revision
SOFTWARE INDEX:	7	Index code to see actual level

to recognize this actual numbers, please read in the following way:

This Main board with the Assay No. 955 have the Revision level 0 and the Serial No. 327 and additionally the BIOS Rev. 1.0, Flash Rev. 2.0 and the Software Rev. 7.07 loaded.

4.6 Print Quality Report (Hidden Printout)

To print out a Service Report of the **COATRON M2**, press "**1**" in the Service menu.

To print out a Quality Report of the **COATRON M2**, press "**Unit 2**" in the Service menu.

QUALITY - REPORT		
SYSTEM: TECO COATRON M2		
SN: 1000		
SOFTWARE: 7.10		
TEMP.FACTOR: 15501		
CONTRAST: 25		
MIXER: 200		
TEMPERATURE: 37.1 °C		
OPTIC	1	2
SIGNAL	32567 (31500 – 33500)	32720
NOISE	118 (0 – 250)	101
SERVICE	180 (130 - 240)	182
SYSTEM ANALYSIS		
OPTIC1 = 00000000 OK		
OPTIC2 = 00000000 OK		

SERVICE - REPORT		
SYSTEM: TECO COATRON M2		
SN: 1000		
SOFTWARE: 7.10		
TEMP.FACTOR: 15501		
CONTRAST: 25		
MIXER: 200		
TEMPERATURE: 37.1 °C		
OPTIC	1	2
SIGNAL	32567 (20000 – 35000)	32720
NOISE	118 (0 – 500)	101
SERVICE	180 (110 - 300)	182
SYSTEM ANALYSIS		
OPTIC1 = 00000000 OK		
OPTIC2 = 00000000 OK		

If status of the Channel 1 and Channel 2 are not okay, please check Error level and LED and/or electronic

5.0. HIDDEN FUNCTIONS

To protect the instrument from improper use, critical routines can be called by pressing special key combinations.

5.1 Set BIOS to default

Within the “main menu” press key “**ENTER**” and “**MENU**” simultaneously.

Following parameters will be changed:

- Integration-time of the receiver to 100 µs
- Temperature-Basis-Offset
- LCD-Contrast to 25
- Speed of Mixer to 215

This routine is only recommend when the System pcb (Main board) will be exchanged. The procedure must be followed by a temperature adjustment (see section 6.2) !

5.2 Set Memory to default

Within the “main menu” press key “**OPTIC 1**” and “.” and “**ENTER**” simultaneously.

Following parameters will be changed:

- all tests will be correct initiate into the memory. This means in detail that all calibration points will be reset to zero, the method to clotting, the dimensions to seconds.
- The language is set to English
- The format of fibrinogen concentration is mg/dL
- The sensitivity will be reset to “normal”
- The serial interface will be configure to 9600 Baud, Stop 1, Data 8, Parity Off

This routine is only recommend when a new software will be updated on the instrument.

5.3 Set all test calibration points to zero

When entering the position “STANDARD CURVE” in the submenu “SETUP TEST” all calibration points can be set to zero by pressing the keys “0” and “ENTER” simultaneously.

5.4 Entering of the serial number

- Enter the submenu “SETUP SYSTEM / PATIENT IDENTIFICATION”
- Set mode to “AUTOSERIES”
- Press key “TIMER1” and “TIMER2” simultaneously → “SERIEN-NUMMER” will be displayed
- Enter the serial number of the instrument and confirm with enter

6.0 Troubleshooting

<u>TEMPERATURE ERROR</u>	
DESCRIPTION	Temperature is not between 36.0 – 38°C
PROBABLY CAUSE	1. temperature draft enviroment (window) 2. electronic error 3. temperature is not adjusted correctly
CORRECTIVE ACTION	1. place instrument in a draft free enviroment without direct sun lighting 2. allow instrument to heat up at least 15 min after temp. adjustment or bootup 3. adjust temperature (sections 7.1 & 7.2) Contact technical services at local distributor if error persists.

<u>OPTIC ERROR : NOISE</u>	
DESCRIPTION	Noise is produced by IC chips and external light sources (sun , lab-lighting) The digital value of the noise must be below 500 .
PROBABLY CAUSE	1. The instrument is lighted by intensive external light sources, such as sun or halogen beamer 2. electronic errors
CORRECTIVE ACTION	1. Protect instrument against sun or UV – light 2. Contact technical services at local distributor if error persists

<u>OPTIC ERROR : SIGNAL</u>	
DESCRIPTION	This error occurs if not enough light is flashing onto the receiver . The optical signal must be between 20000 - 35000
PROBABLY CAUSE	1. temp. out of range 2. dirt in optics 3. LED's on optic block defective 4. chip errors on boards
CORRECTIVE ACTION	1. wait until instrument is temperatured to 37°C 2. clean optics (see chapter 7.3) 3. replace optic block 4. Contact technical services at local distributor if error persists

<u>OPTIC ERROR : SERVICE</u>	
DESCRIPTION	This error occurs if the required signal amplification is not between 110 - 300
PROBABLY CAUSE	1. temp. out of range 2. dirt in optics 3. LED's on optic block defective 4. chip errors on boards
CORRECTIVE ACTION	1. wait until instrument is temperatured to 37°C 2. clean optics (see chapter 7.3) 3. replace optic block 4. Contact technical services at local distributor if error persists

<u>SYSTEM ERROR : AD-Conversion</u>	
DESCRIPTION	The photoreceiver convert light intensity to analog direct current . This current is converted to a digital signal. Every digital value has his own signature . If there is lost a value, the system error occurs .
PROBABLY CAUSE	1. CPU defect 2. ADC defect
CORRECTIVE ACTION	Contact technical services at local distributor

<u>ANALYSIS ERROR : ++++</u>	
DESCRIPTION	No clotting reaction is detected within 300s
PROBABLY CAUSE	1. There is really no clot 2. The fibrinogen concentration in the sample is below 50 mg/dL 3. started channel and pipeted channel are not equal
CORRECTIVE ACTION	1. confirm correct handling 2. Determine clotting time with research software "TECMONI" or observe the optical values on the display during screen. The time until a change in signal can be observed is the clotting time 3. change to recommended reagent provider

<u>ANALYSIS ERROR : ----</u>	
DESCRIPTION	Clotting reaction start and end before deadtime
PROBABLY CAUSE	1. PT based test clot before 7 sec 2. PTT based tests clot before 15 sec
CORRECTIVE ACTION	change to recommended reagent provider

ANALYSIS ERROR :????

DESCRIPTION	The instrument detected a reaction , but was not able to verify as a clot reaction .
PROBABLY CAUSE	1. air bubbles 2. touching of cuvette 3. clot reaction starts before deadtime
CORRECTIVE ACTION	1. avoid air bubbles – pipet against cuvette wall 2. avoid touching the cuvette during measurement start 3. change to recommended reagent provider

ANALYSIS ERROR : SIGNAL

DESCRIPTION	The received signal is below 200 digits
PROBABLY CAUSE	1. very turbid samples or reagents 2. dirt in optics 3. optic is defective
CORRECTIVE ACTION	1. clean optics 2. check optic value (see chapter 5.3) 3. change to recommended reagent provider

ANALYSIS ERROR : > , <

DESCRIPTION	Assay range limitation
PROBABLY CAUSE	1. calculated units are not within 0-999 2. calculated activity is not within 3 – 180% 3. calculated ratio is not within 0-9 4. calculated inr is ot within 0-12
CORRECTIVE ACTION	Check test setup and recalibrate test if necessary

ANALYSIS ERROR : *

DESCRIPTION	Calculated result is extrapolated . Extrapolated results can vary to intrapolated results.
PROBABLY CAUSE	The obtained result is outside of calibration
CORRECTIVE ACTION	Extend the calibration curve. High and low standards are helpful.

7.0 MAINTENANCE

7.1 Recommended Maintenance

- Daily: Check that the optic unit and the filters are free from dirt. Clean with lint-free tissue paper if necessary.
- Monthly: Check the temperature of the incubator block. When the green LED is on, place water in a reagent bottle and place in one of the reagent positions. Insert a thermometer and record temperature after 10 minutes. The temperature should be in the range of 36.5°C and 37.5°C. Proceed to section 7.2 if the temperature is incorrect.
- Yearly: Service check by authorized technical person.
(total cleaning of instrument, function tests , quality-control routines)

7.2 Temperature Adjustment

1. When the green LED is on, fill a reagent container (bottle) with water and place in a reagent position on the incubator block. Place a thermometer in the water.
2. Allow to warm for 10 minutes.
3. Enter the submenu "Setup System" and advance to the temperature screen. The current temperature of the **TECO COATRON M2** is displayed.
4. Compare the temperature displayed by the system and the thermometer. If the temperature is different, adjust the temperature on the **TECO COATRON M2** by simultaneously pressing the Up/Down cursor keys *and* the "OPTIC 1" key. (To increase or decrease using larger increments, press additionally the numeric "1" key.)
7. Wait until a stable temperature of 37.0°C is displayed on the **TECO COATRON M2**. Check and correct the system temperature if not equivalent to the external thermometer.
8. If both the thermometer and instrument display the same temperature, press the "Enter" key and exit back to the main menu.

7.3 Cleaning procedures

The casing should be cleaned with a light alcoholic solution or with a light soap solution, using a soft foam only. The optical filter should be cleaned with just light alcoholic solution. Dry well with clean, fat-free wipes

Warning:

- **Do not use aggressive cleaning solutions !**
- **Do not use hard foam material or metallic foams.**

8. Replacement of the mainboard

- Unplug any printer device
- Open the instrument
- Unplug keyboard , display and printer power supply and remove complete optic unit
- Exchange the mainboard and insert it to the instrument
- Switch on the instrument and update the software (see section 9.)
- Set the memory to default (see section 10)
- Adjust the temperature (see section 7)
- Enter a the serial number
- Print out a “QC REPORT” (see section 4.6)

Entering of the serial number

- Enter the submenu “SETUP SYSTEM / PATIENT IDENTIFICATION”
- Set mode to “AUTOSERIES”
- Press key “TIMER1” and “TIMER2” simultaneously → “SERIEN-NUMMER” will be displayed
- Enter the serial number of the instrument and confirm with enter

9. Software update

Requirements :

1. Windows PC ,
 2. download cable ,
 3. update files - flash.bat , download.exe , flashdl.exe , flashv25.exe and the analyser firmware xxxxx.img (i.e. cm2710.img → TECO COATRON M2 V7.10)
- connect DiaMed-CD4 service port to PC serial port com1 or 2
 - change to MS-DOS prompt and insert disk.
 - Change directory to update files (i.e. command “a:” if files are on floppy or “cd c:\flash” if files are in the folder flash on harddisk c)
 - enter command : “FLASH 2 CM2710” for PC com port2 (Syntax: flash [com] [program])
 - First a small bar should be observed followed by a circling bar.
 - After 30 – 120 seconds the instrument will reboot and perform automatically a memory reset.

10. Set Memory to default

Within the “main menu” press key “**OPTIC 1**” and “.” and “**ENTER**” simultaneously.

Following parameters will be changed:

- all tests will be correct initiate into the memory. This means in detail that all calibration points will be reset to zero, the method to clotting, the dimensions to seconds.
- The language is set to English
- The format of fibrinogen concentration is mg/dL
- Patient ID mode to “NO PID”
- Contrast of LCD to 33
- Speed of mixer to 200
- Signal to ON , Value 324
- Format of date to USA

This routine is only recommend when a new software will be updated on the instrument.

11.0 ORDER INFORMATION

11.1 Consumables and Accessory

TECO COATRON M2 (with Standard Package)

Cat. Number: 80 700 07

including:

- 1 pc Power supply (93-240Vac/50-60Hz)
- 1 pc Main cable
- 25 pcs Double cuvettes (4 wells/each)
- 5 pcs Reagent container
- 1 pc Stirring magnets
- 1 pc Reagent adaptor (Ø22.5mm)
- 1 pc Thermal paper 58mm
- 1 pc Pipette fastener with 2 screws
- 1 pc Operation manual

Consumables and Accessories

Cat.No.	Description	Content	Qty
19 000 02	Double-cuvette (2 pos/ea)	250	1 Pac
19 029 00	4-stage-Autopipette 25/50/100/200 µl	1	1 Pc
19 030 01	Reagent adaptor Øi=22,5mm	1	1 Pc
19 030 02	Reagent adaptor Øi=22,8mm	1	1 Pc
19 030 03	Reagent adaptor Øi=24,2mm	1	1 Pc
19 030 04	Reagent adaptor Øi=27,8mm	1	1 Pc
19 030 05	Reagent adaptor Øi=25,2mm	1	1 Pc
19 054 00	Thermal paper 58mm	5	1 Pac
80 050 06	Stirring magnets	4	1 Pac
80 050 09E	Power cord Europe	1	1 Pc
80 050 09U	Power cord US	1	1 Pc
80 525 00	Reagent container Ø 22,4mm	100	1 Pac
80 530 00	Reagent tubes Ø 16mm	100	1 Pac
80 920 07	Pipette tips 25/50/100/200 µl	1.000	1 Pac
18 040 00	Interface cable for Update / Research / LIS	1	1 Pc
18 044 00	Interface cable for Barcode Scanner Type A	1	1 Pc
18 045 00	Interface cable for Barcode Scanner Type B	1	1 Pc

11.2 Spare parts

Cat.No.	Description	Content
17 009 00	Display with cable	1 Pc
17 023 00	Rubber feet	4 Pc
17 028 00	Stirring motor	1 Pc
19 004 00	Power Supply UP30431	1 Pc
19 006 01	PCB, System CD2/LX2	1 Pc
19 007 01	PCB, Transmitter CD2	1 Pc
19 008 01	PCB, Receiver CD2/LX2	1 Pc
19 015 01	Optic block (w/o boards)	1 Pc
19 016 00	Heating foil	1 Pc
19 020 01	Heating block	1 Pc
19 021 00	Label CD2, Front	1 Pc
19 023 00	Label CD2/LX2, Rear	1 Pc
19 025 00	Ground plate CD2/LX2	1 Pc
19 026 00	Distance M3x13,5	1 Pc
19 027 00	Distance M4x27	1 Pc
19 028 00	Distance M3x42	1 Pc
19 031 03	Label CD2, Bottom	1 Pc
19 050 00	Thermal printer + Interface	1 Set
19 051 00	Cable serial, for int. Printer	1 Pc
19 052 00	Cable Power, for int. Printer	1 Pc
19 053 00	Cable Paper feed, for int. Printer	1 Pc
19 055 00	Keyboard CD2	1 Pc
19 060 00	Casing cpl.CD2/LX2	1 Set
38 422 07	Operation manual	1 Pc
38 442 07	Warranty sheet	1 Pc
38 452 07	Installation report	1 Pc
38 462 07	Service manual	1 Pc

12.0 ASSEMBLING INSTRUCTION

12.1 Technical / mechanical drawings

12.1.1 Casing cpl.



upper casing part (white)

lower casing part (blue)

Fixation for Autopipette holder (M3)

12.1.2 Power Supply UP30431

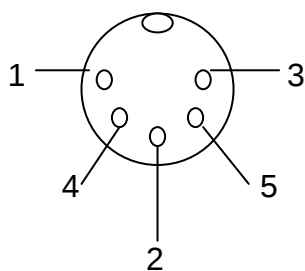
Secondary Power output primary power input



Power input: 100 Vac to 250 Vac

Frequency: 50-60 Hz

Power output:	PIN 1:	Ground	
	PIN 2:	Ground	
	PIN 3:	+ 5 Vdc	3 A
	PIN 4:	- 15 Vdc	1,6 A
	PIN 5:	+ 15 Vdc	0,3 A

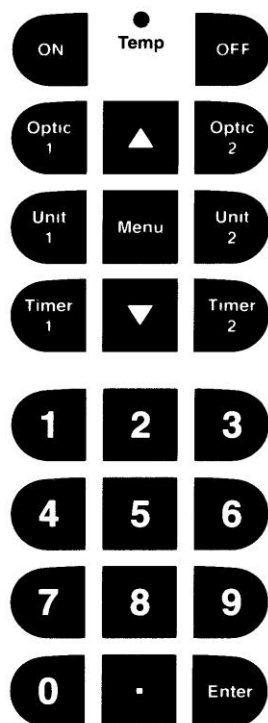


Approvals:	UL:	5T23 / E 134642
	CSA:	Level 3 / LR 58948
	TÜV/GS:	S 9579103
	CE	
	IEC950, IEC380	

Remark: Please use only the original Power Supply UP 30431. DiaMed does not take over any warranty in case other than the original Power Supply is used.

12.1.3 Keyboard, TECO COATRON M2

COATRON M2

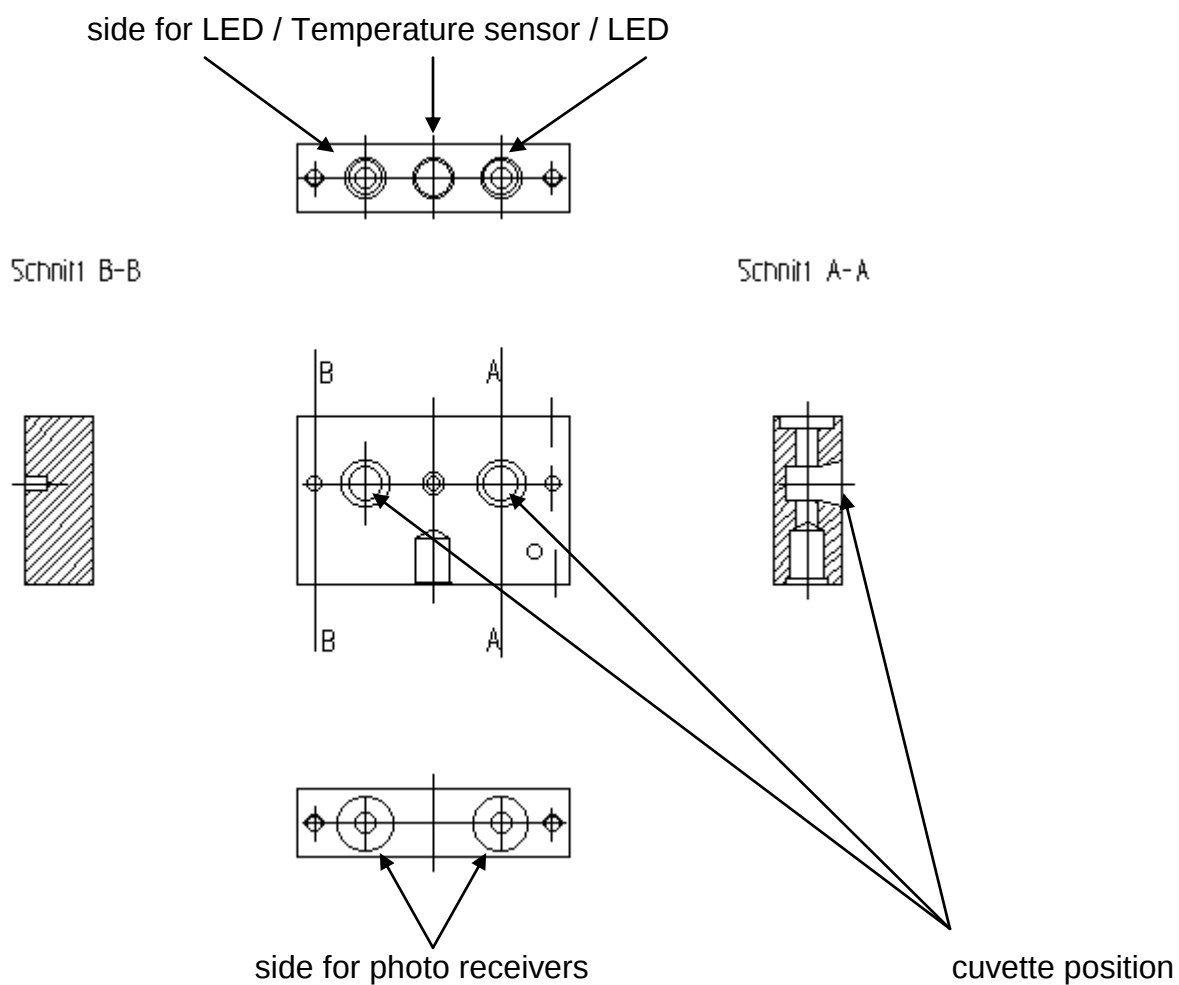


TECO MEDICAL INSTRUMENTS,
PRODUCTION + TRADING GMBH



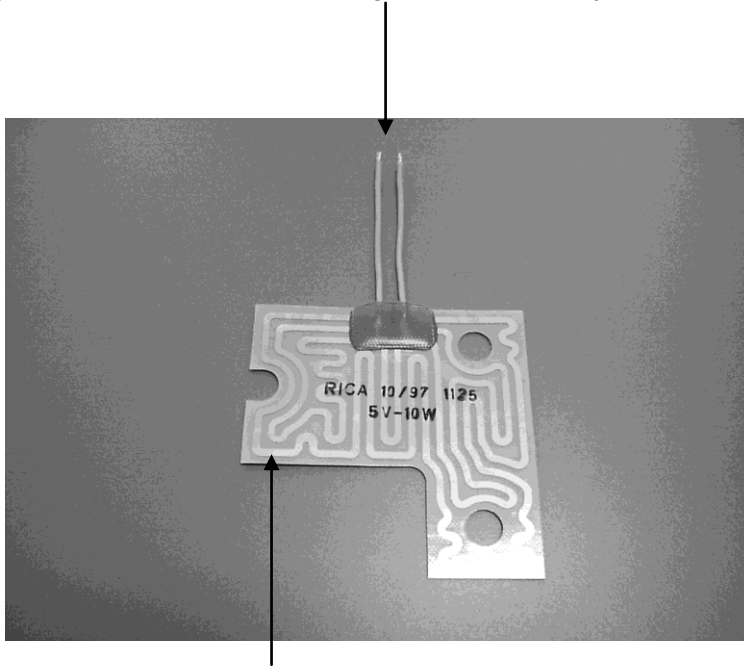
WARNING: REMOVAL FROM CASING WILL DESTROY THE KEYBOARD !

12.1.4 Optic block (w/o boards)



12.1.5 Heating foil

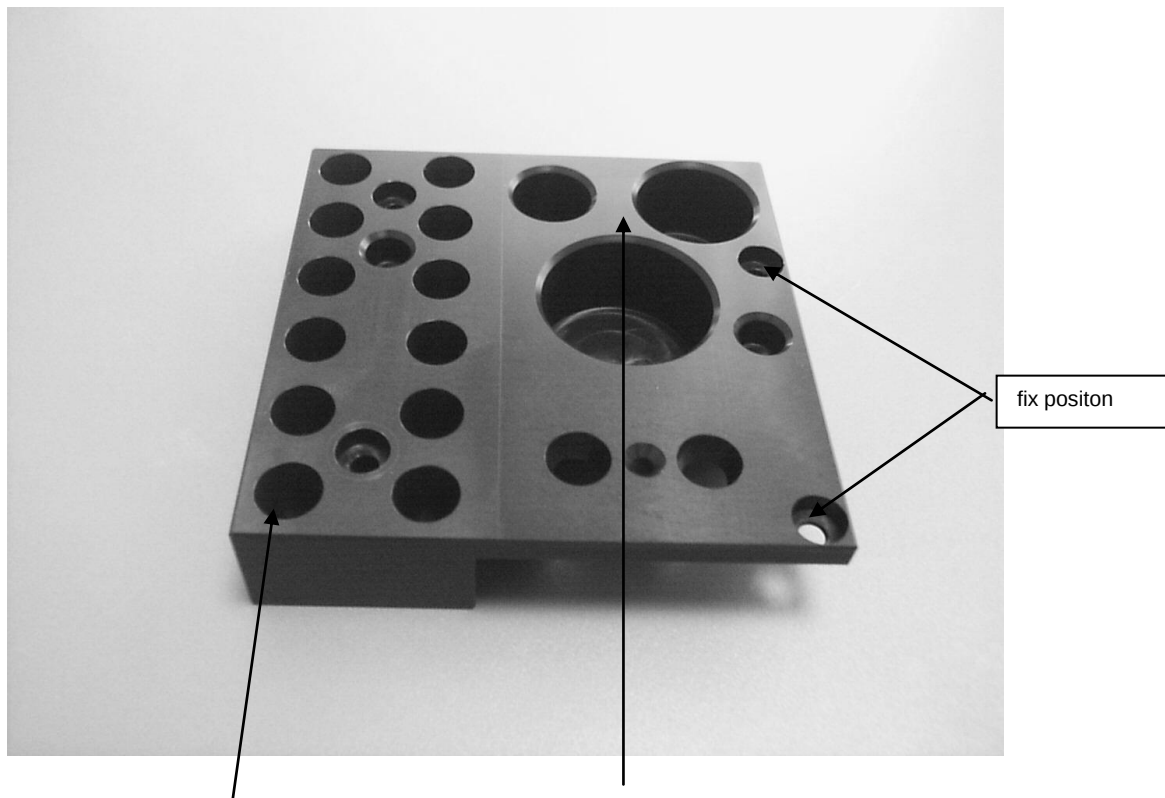
2 pole cable to connect the heating foil on the PCB System



backside is self glued, for fixation on the heating block, remove protection film

Technical data:	Voltage:	+ 5 Vdc,
	Power:	10 Watts

12.1.6 Heating block

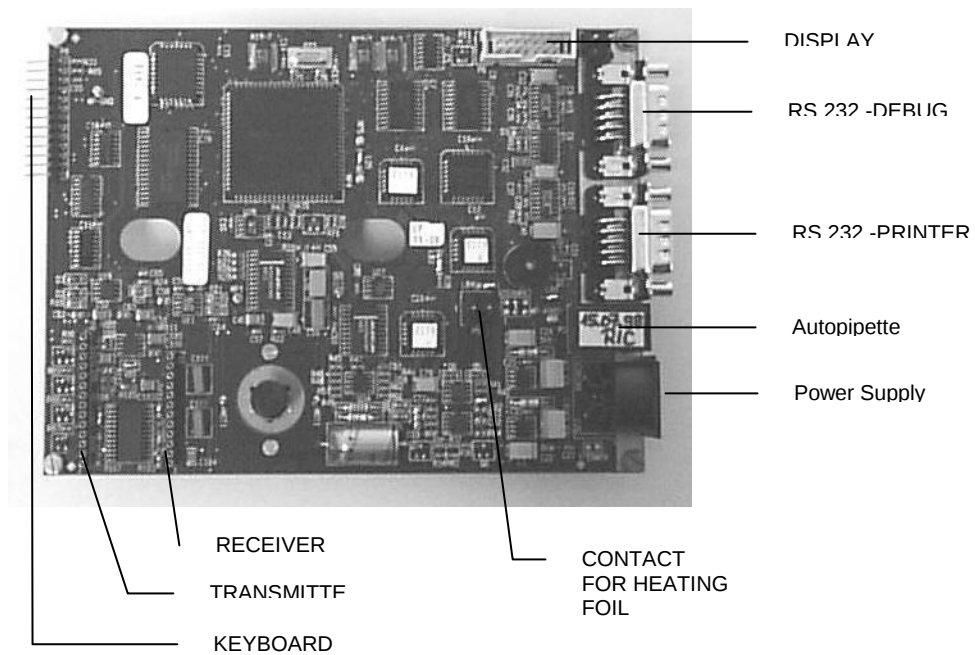


12 pre-warming positions for cuvettes
for Double micro cuvettes

3 reagent pre-warming positions
Ø 30mm stirred, Ø22,5mm, Ø16mm

The heating block is made from aluminium, fixed with 4 screws on the lower casing part

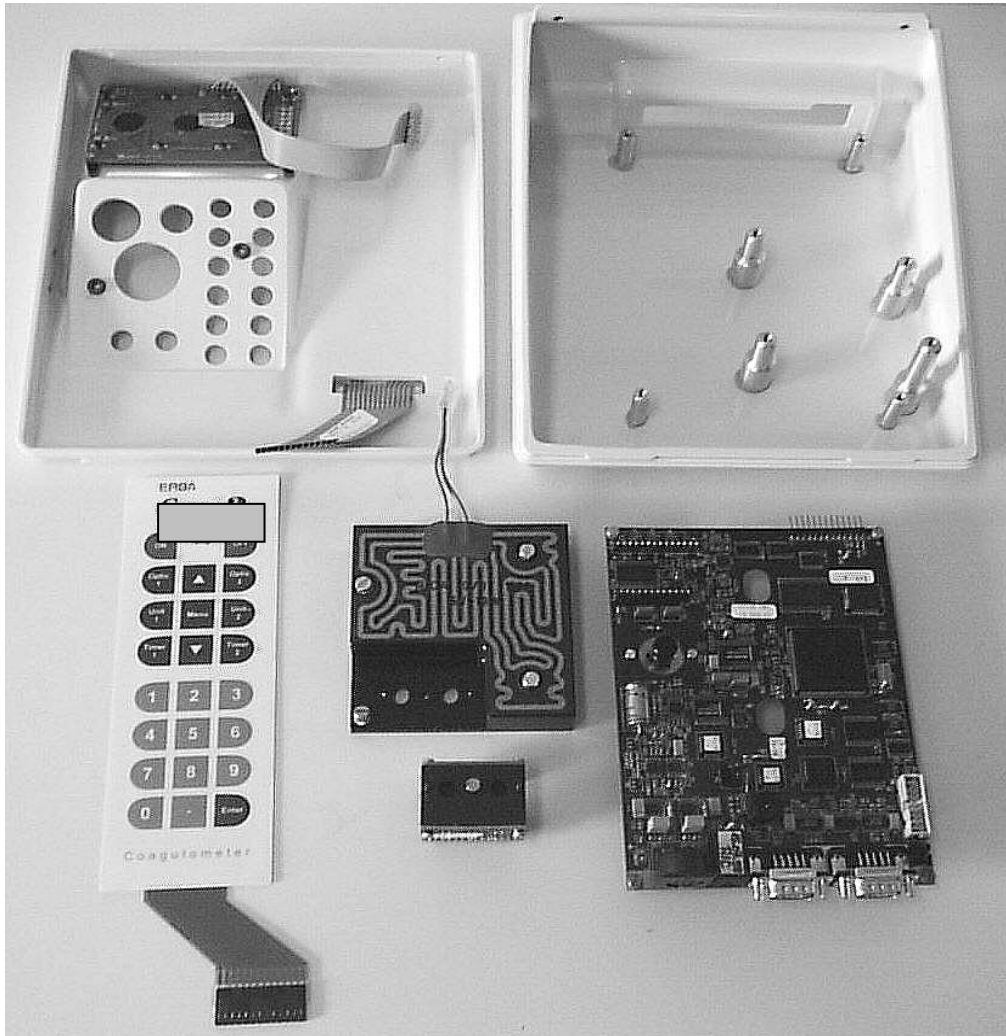
12.1.7 Mainboard



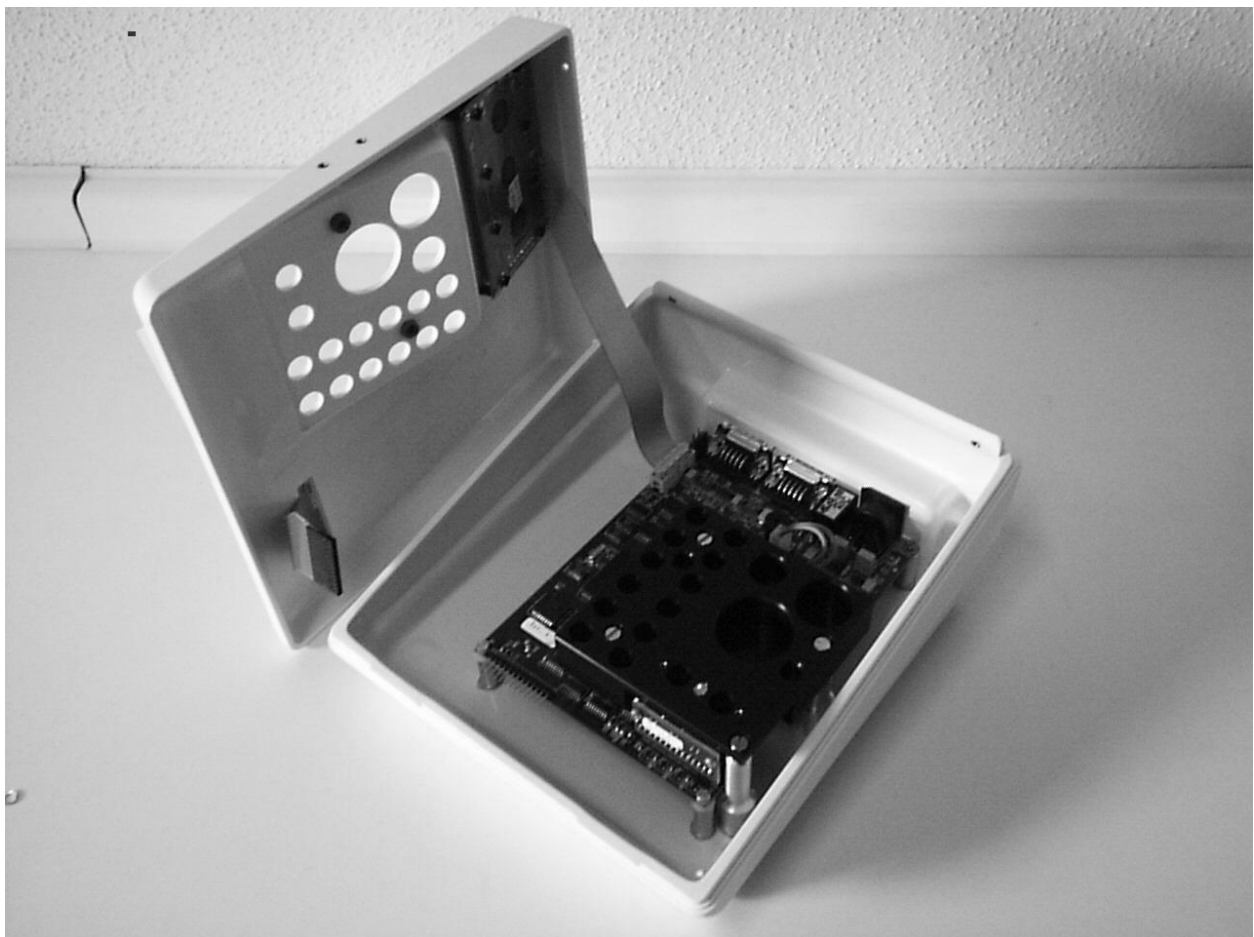
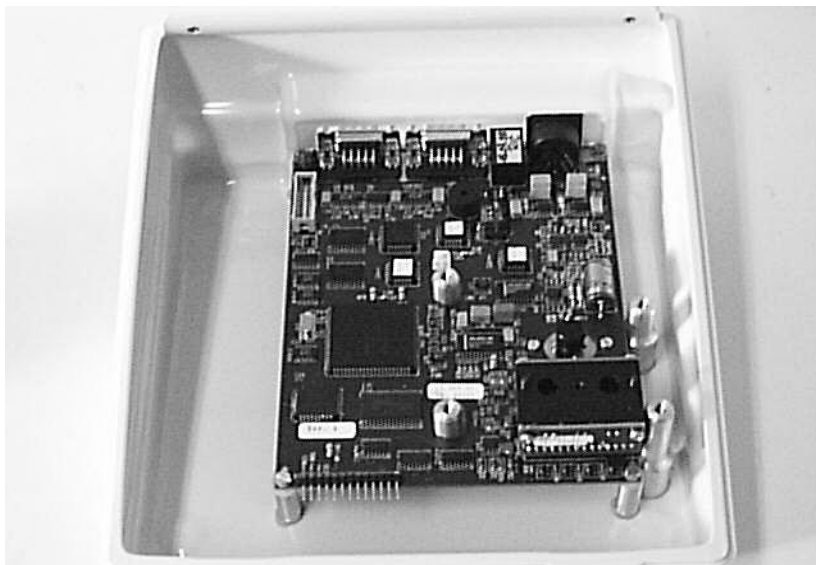
12.2 Assembling of TECO COATRON M2

WARNING: Touch of electronic devices only when electrical grounded !!.

Overview of all required parts:



1. Fix main board to casing lower part with 4 screws (M3x6)
2. Fix complete optic block to main board (2 connection lines)
3. Fix heating foil to thermo block (self adhesive)
4. Fix thermo block to optic block (4 main screws M4 and one small screw M3)
5. Connect heating-foil to main board (no polarity)
6. Fix keyboard to casing, upper part
7. Connect display and keyboard to main board and close the instrument (2 screws on backside)
8. If required, flash program on analyzer (see chapter 7.1)
9. Connect analyzer to power-supply and switch on
10. Perform a memory + bios reset.
11. Adjust temperature (see chapter 6.2)
12. Run through quality control



12.3 Quality Control of TECO COATRON M2

(The next 6 pages can be used as the official quality report)

QUALITY CONTROL REPORT TECO COATRON M2

Model ID - No.:

Serial - No.:

Customer:

Remarks:

QC according to Final-Test-Specification PA 06.004

QC PASSED

☐

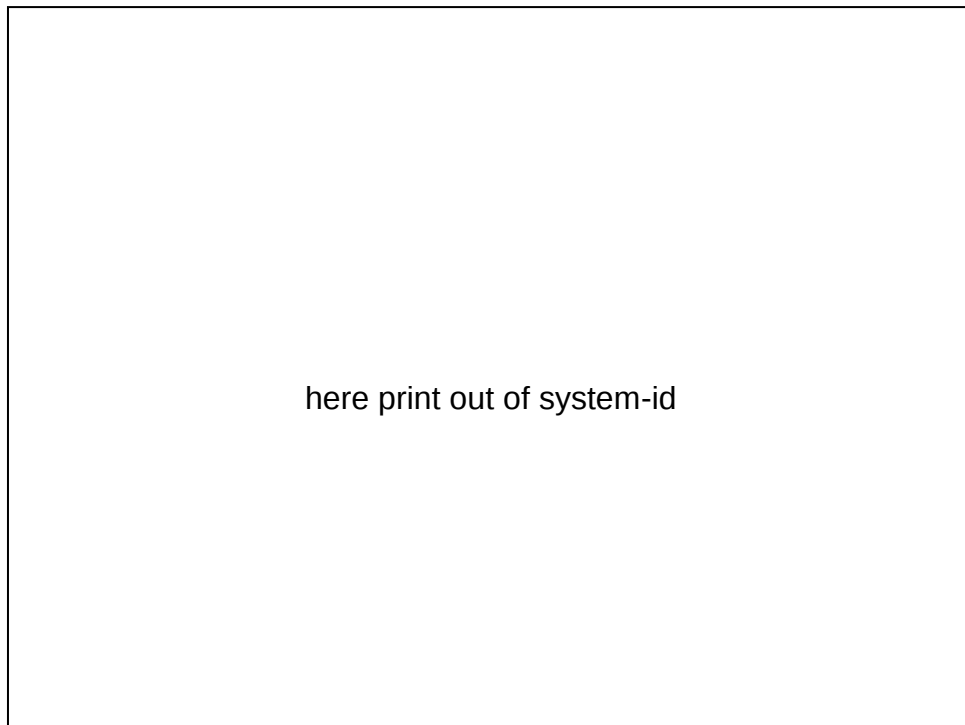
QC FAILED

☐*

* see error list on page 6

Date:	Date:
Checked by:	Approved by:

1. SYSTEM IDENTIFICATION



2. FUNCTION TESTS

- After the first switch-ON, all system-parameters had been reseted. ☐
- Reagent stirrer works ☐
- LCD (display) shows all characters and dots ☐
- Display contrast is O.K. ☐
- Keys going well and switching correctly ☐
- Signal is O.K. ☐
- The system temperature is stable at 37,0°C and the green LED lights (after warm-up 15minutes) ☐
- The autopipette is detected ☐
- The printer interface is correctly setted and works ☐

3. TEMPERATURE

measured with a calibrated thermometer:

on the reagent heating position:

(limits: 36,9°C to 37,5°C)

4. QUALITY REPORT

Choose **SERVICE** - Menu and press „**UNIT 2**“

here print out of quality report !

- Quality - Report **PASSED** (Errorlevel CH1/CH2 = 0)
- Quality - Report **FAILED** (Errorlevel CH1/CH2 > 0)

☐☐

5. REAL „WET“ TEST WITH REAGENTS

5.1 PT-Test

	Manufacturer	Lot. No.	Exp. date	mean	Range
PT-reagent	DiaMed			-----	ISI* =
Normal	DiaMed				
Abnormal	DiaMed				

* ISI = International Sensitivity Index

Results of measuring:

Normal	OPTIC Channel 1	OPTIC Channel 2	mean	CV (< 5%)
Unit: s				
INR*				

* INR = International Normalized Ratio

Abnormal	OPTIC Channel 1	OPTIC Channel 2	mean	CV (< 5%)
Unit: s				
INR				

5.2 Fibrinogen - Test

	Manufacturer	Lot. No.	Exp. date	mean	Range
Fib. reagent	DiaMed			-----	-----
Buffer	DiaMed			-----	-----
Normal	DiaMed				
Abnormal 1	DiaMed				

Calibration curve values:

Unit: mg/dl					
Unit : s					

Normal	OPTIC Channel 1	OPTIC Channel 2	mean	CV (< 5%)
Unit: s				
Unit: mg/dl				

Abnormal	OPTIC Channel 1	OPTIC Channel 2	mean	CV (< 5%)
Unit: s				
Unit: mg/dl				

6. BURN-IN TEST (>12h) ☐

7. FINAL TEST

Appearance:

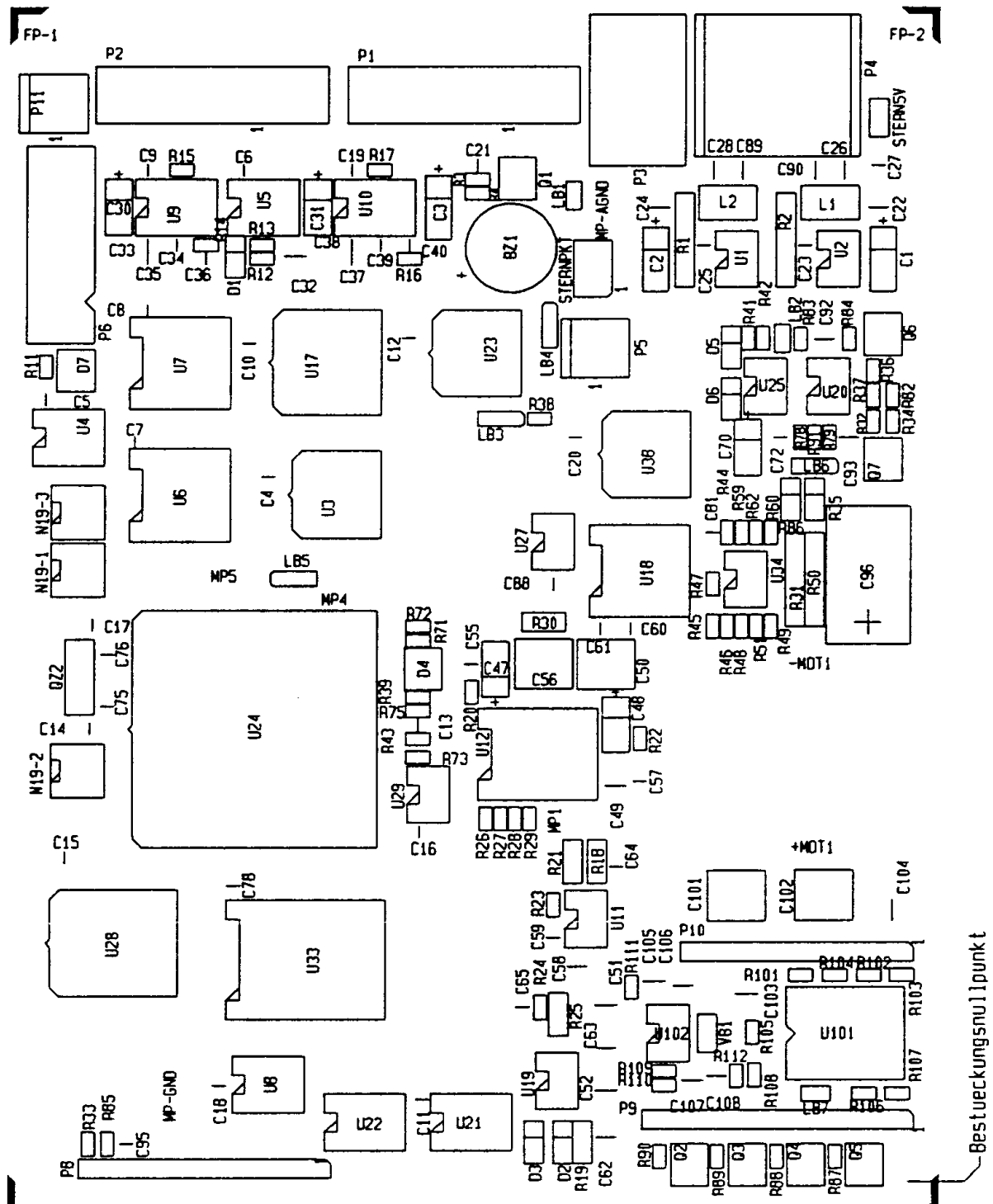
- no scratches or dirt on the casing ☐
 - no color errors ☐
 - all labels are correctly placed ☐
 - serial number is correct ☐
 - all rubber feet are placed ☐
 - cuvettes and reagent container easy to insert/remove ☐
 - casing screws have a safety color point ☐
-

8. ERROR LIST

Error	repaired/part exchanged	sign

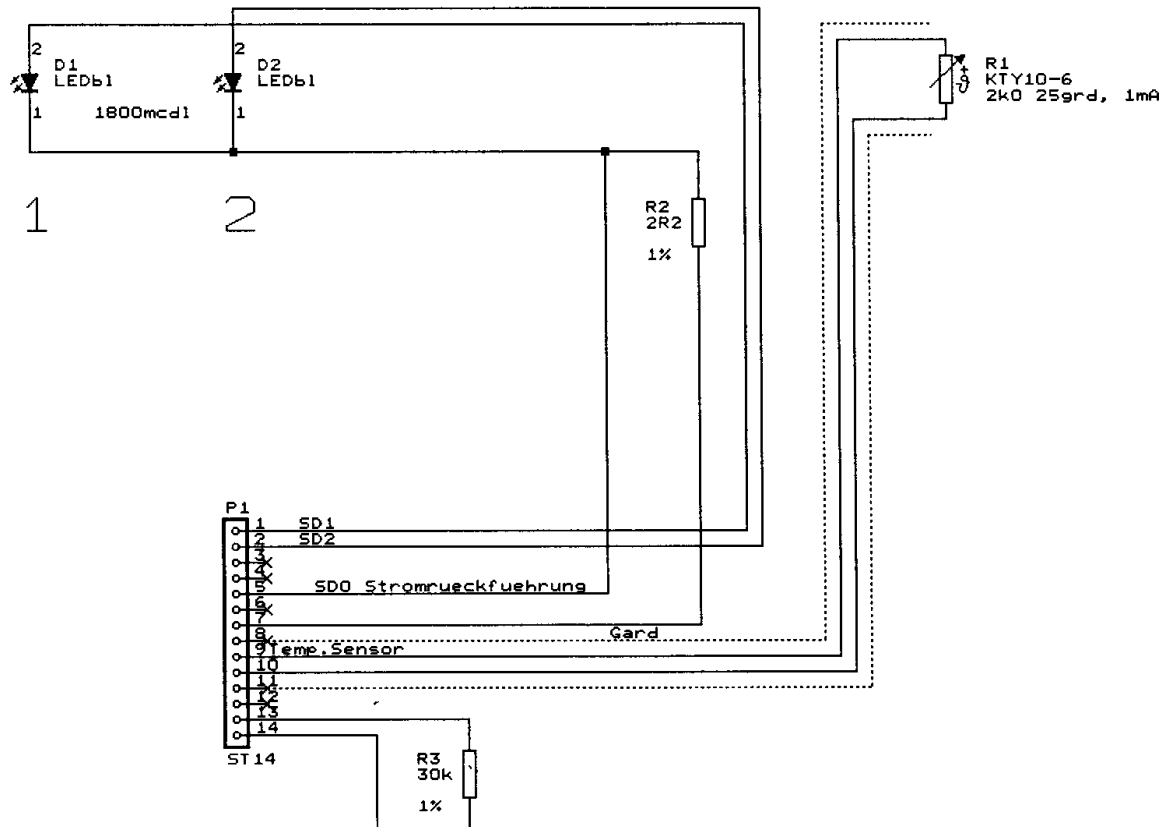
Date:	Checked by:	
-------	-------------	--

12.4.2 Mainboard (Layout)

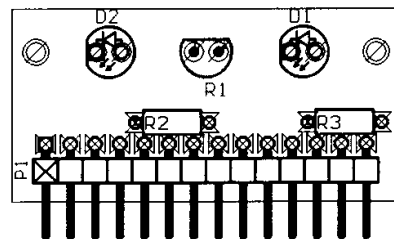


12.4.3 PCB Transmitter

Electrical circuit

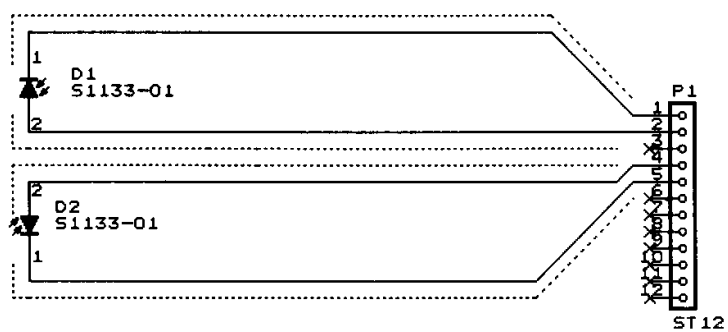


Transmitter (Layout)



12.4.4 PCB Receiver

Electrical circuit



Receiver (Layout)

