

Operation Manual

DIAcheck Series C1 / C2 / C4





For *In-Vitro* Diagnostic use



Instrumentation and reagents for human coagulation and hemostasis Copyright © 2018, Dialab GmbH, Austria OPM Revision 4
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Updates

Operator's Manual	Software
Version	Version
1	1.01.42 (first release)
2	1.01.43
3 (minor correction on OPM)	1.01.43
4	1.01.45

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Warranty

The DIAcheck series is warranted for a period of one year after delivery or first installation. It covers any defects in material, functionality or workmanship. The first installation must be registered online to www.dialab-reg.com (see chapter "Registration")

The warranty expires in case of failures caused by

- Accidident, neglect maintenance & serivce, abuse or misuse.
- Using unauthorized reagents, consumables or spare parts
- Unauthorized service. Any repair or service must be performed by authorized persons.

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1. INTRODUCTION

This device left the factory in fault-free condition regarding its safety and engineering functionality. To maintain this condition and ensure risk-free operation, the operator must comply with the safety warnings and information in this Operator's Manual.



Use the DIAcheck series only in compliance with the instructions in this Operator's Manual. Otherwise, the manufacturer shall exclude the liability for any damages to the DIAcheck series, patients or operators.

1.1 SYMBOLS

The following standard symbols are used in this manual:

Symbol	Meaning	Explanation		
Courier	Info	Key on keypad		
CAPS	Info	Screen message.		
0	Read	Indicates important information and tips.		
⇒	Info	Describes reaction of DIAcheck series to operator input.		
<u>^</u>	Warning	Risk of possible health damage or considerable damage to equipment, if warning is not heeded.		
4	Danger	Potential risk to operating personnel or equipment due to electric shock.		
	Biohazard	Equipment can be potentially infectious due to the samples and reagents used.		
	Laser Radiation	Avoid direct eye exposure		

1.2 VIEWS OF THE DEVICE



FIGURE 1: TOP VIEW



FIGURE 2: REAR VIEW



FIGURE 3: SIDE VIEW

Home Screen

Coloured Touch Display

Complete area is prewarmed to 37°C

- 1 x Reagent position Ø24mm
- 1 x Reagent position Ø22mm
- 1 x Reagent position Ø22mm, stirred
- 2 x Reagent positions Ø13mm
- 20 x Cuvette incubation positions
- 4 x Cuvette measurement positions (depend on C1/C2/C3 version)

5V: Power in PC: LIS or PC

SERVICE: Software update PRINTER: Serial printer

BARCODE: Handheld barcode scanner

1.3 CONSUMABLES / ACCESSORIES

Single cuvettes			
Reagent adapter Ø 24,5 → 22,5 mm			
Stirring magnets, P=4			
External CCD-Barcode Reader			
only connectable, if no internal Barcode-Reader is built-in			
Thermal printer 60mm			
TECAM Smart Software			
Patient management, Monitoring, Research, Statistics, Mirror print			
function, LIS communication (ASTM-1394)			
Protection foil, Clean tissue, Pick-off			

1.4 INTENDED USE



The **DIAcheck series** is designed to carry out coagulometric tests such as PT, PTT, TT, fibrinogen, single factor tests, chromogenic and immunoturbidimetric tests (for instance Antithrombin, D-dimer etc.) on human citrated plasma. The instrument has to be used for the expected purposes and in perfect technical condition, by qualified personnel, in working conditions and maintenance operations as described in this document. It is designed for laboratory use or clinical environment and trained users. It is not intended for home use.

1.4.1 COMPARE OF DIACHECK SERIES

The DIAcheck series include three different versions called C1, C2, C4

	C1	C2	C4
DIAcheck series Family			
Reagent and Optic block	prewarmed to 37°C		
Cuvette prewarm	10x	20x	20x
Reagent prewarm, 24mm	1x	1x	1x
Reagent prewarm, 22mm	2x	2x	2x
Microtubes prewarm	2x	2x	2x
Reagent stirrer	No	1x	1x
Printer, RS232	Yes		
Barcode Scanner, RS232	Yes, external or integrated 1D Barcode scanner		
LIS, USB	Yes		
Firmware Update, USB	Yes		

Measurement			
Optic channels	1	2	4
Optic wavelength	620nm (RED)	405nm (UV)	405nm (UV)
Cuvette, total volume	Single, 75μL	Single, 75μL	Single, 75μL
Global Clotting Assays	PT+aPTT+Fib+TT	PT+aPTT+Fib+TT	PT+aPTT+Fib+TT

Special Clotting Assays	-	All factors	All factors
Chromogenic Assays	-	AT, PC	AT, PC
Latex enhanced Assays	D-Dimer	D-Dimer	D-Dimer
Whole Blood Testing	Yes (PT INR+%)	No	No
DOAC monitoring (based on anti IIa and anti Xa)	No	HEP,LMW,APIX, RIVX,EDOX,DABI	HEP,LMW,APIX, RIVX,EDOX,DABI

Software features			
Reagent Dual LOT manage two different lots for each test	No	Yes	Yes
Reagent Barcode Input LOT+Expiry or Positive LOT detection	Yes	Yes	Yes
Test Calibration LOT, expiry and upto 5 points for each test	Yes	Yes	Yes
Patient Barcode Input patient ID by barcode scanner upto 16char	Yes	Yes	Yes
Result Database save recent 200 results onboard	No	Yes	Yes
Double Determination Run patient twice and display mean value	No	Yes	Yes
Stopwatch function count up or down incubation time	1x	2x	4x
Result Identification Patient ID or sample ID or Auto ID	Yes	Yes	Yes
Real Time Clock	Yes	Yes	Yes
Change language EN, ESP, ITA, FR, DE - further on option	Yes	Yes	Yes
Start test at reagent addition No expensive starter pipette required	Yes	Yes	Yes
Visualize Reaction Curve Tecmoni Software required	Yes	Yes	Yes
Test Calibration Service Calibrate new lot of reagents by barcode	Yes	Yes	Yes
Link to LIS over USB or network/ASTM TECAM SMART Software required	Yes	Yes	Yes

1.4.2 TEST METHODS

Following test are provided to detect of the human coagulation system, which can be bleeding or thrombosis and the monitoring of anti-coagulation drugs like Heparin or Marcumar.

Toot	Name Spe	Consider and Mathematical	DIAcheck series			
Test		Specimen	Method	C1	C2	C4
PTB	Prothrombin Time	blood	clot	Yes	No	No
PT	Prothrombin Time	plasma	clot	Yes	Yes	Yes
APTT	Activated Partial Prothrombin Time	plasma	clot	Yes	Yes	Yes
FIB	Fibrinogen	plasma	clot	Yes	Yes	Yes
TT	Thrombin Time	plasma	clot	Yes	Yes	Yes
AT	Antithrombin	plasma	chromogen	No	Yes	Yes
DD	D-Dimer	plasma	immuno	Yes	Yes	Yes
PC	Protein C	plasma	chromogen	No	Yes	Yes
Factors	Factors II, V, VII, VIII, IX, X, XI, XII	plasma	clot	No	Yes	Yes
AF2	anti Ila	plasma	chromogen	No	Yes	Yes
AF10	anti Xa	plasma	chromogen	No	Yes	Yes
HEP	Heparin	plasma	chromogen	No	Yes	Yes
LMH	Low molecular heparin	plasma	chromogen	No	Yes	Yes
APIX	Apixaban	plasma	chromogen	No	Yes	Yes
RIVX	Rivaroxaban	plasma	chromogen	No	Yes	Yes
EDOX	Edoxaban	plasma	chromogen	No	Yes	Yes
DABI	Dabigatran	plasma	chromogen	No	Yes	Yes

1.4.3 SPECIMEN COLLECTION

Type: Human citrated plasma

Collection: Veinvein puncture, 1:10 mixed sodium citrate 3.2%

(0.105M)

Centrifugation: 10min at 1500g

Storage: Max 4h after collection at room temperature

Bilirubin: < 50mg/dl Hemoglobin: < 9000mg/l Triglyceride: < 2500g/l



In case of differences to the boxinserts of the reagent, always follow the instructions on the box insert.

1.4.4 PRINCIPLE OF MEASURMENT

The detection of plasma clotting is based on a photometric principle. No mechanical aids like mixing bars are required. Blood plasma is filled into a cuvette. Special reagents are added, which initiate the blood coagulation. The cuvette is transmitted by ultra violet light during the coagulation process. When the sample starts to clot a change of light absorbance is measured. The time from measurement start to change of light (turning point) is called clotting time and expressed in seconds [s].

The conversion of coagulation time into a specific test unit is one using a linear, hyperbolic, semi-logarithmic or double-logarithmic interpolation of the stored calibration points. The current mathematical model is printed out in "TEST SETUP." Values outside the calibration range are calculated by extrapolation and flagged as " * ".

Unit	Info	Decimal places	Maximum value
S	seconds	1	-
%	activity	1	180.0
υ	units	0	999
INR	Int. ratio	2	30.00
R	ratio	2	30.00
NR	polish ratio	0	180
mg/dl		0	900
g/l		2	10.00
IE/ml	Int. Units	2	10.00
mg/l		2	10.00
μg/ml		3	7.000
ng/ml		0	7500
μg/l		0	7500
IU/mL	Int. Units	2	10.00

R = clotting time / normal time

NR = 100 *(normal time/clotting time)

INR = Ratio ISI (International Normal Ratio)

IU/mL = IE/mL = International Units (1.00 IU/mL = 100 % activity)

1.4.5 CLOTTING METHOD (PT, APTT,..)

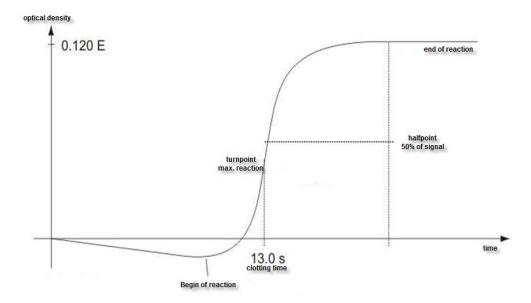


FIGURE 4: DETERMINATION OF TURNING POINT IN CLOTTING METHOD

The final reaction in the coagulation cascade is the transformation of fibrinogen into fibrin catalyzed by thrombin. Fibrin formation results in clouding (higher turbidimetric level) in the sample, which is measured by the photometer and stored as the extinction. The result in seconds is the time from the start of the reaction to the time of half rate of change (halfpoint).

1.4.6 CHROMOGENIC METHOD (ANTITHROMBIN):

The change of optical signal is not caused by clot reaction, but by the release of color particles (pNA) which causes a yellow color. The change of color is measured at 405nm and expressed as "dE/60sec" and proportional to the concentration or activity of analyte.

1.4.7 IMMUNTURBIDIMETRIC METHOD (D-DIMER):

The change of light is caused by Antigen – Antibody reactions, which scatter the light. The antibodies are linked to latex particles to amplify the optical reaction. The change of light is proportional to the concentration of antigen like D-Dimer and expressed as dE/120sec

1.5 SAFETY INFORMATION

1.5.1 SAFETY INFORMATION FOR OPERATION



Use only the cleaning and rinsing liquids approved by the manufacturer. Failure to do so could result in faulty measurements or malfunctions of the **DIAcheck series**. Prevent reagents from leaking into the Analyzer. Failure to do so may result in damage to the instrument and result in expensive maintenance work!



Carry out control measurements at regular intervals to ensure that the analyzer continues to function faultlessly.



If the instrument is used in a manner not specified by the manufacturer, the protection impairment could be affected!



Please read the Operation manual in its entirety prior to operation, in order to ensure a high level of performance and to avoid errors by user.

1.5.2 SAFETY INFORMATION FOR MATERIALS



Use only Dialab approved and labeled material like cuvettes, spare parts or reagents for which the instrument is intended and validated for.



Consumables like cuvettes or yellow tips are intended as single-use items. Multiple use may result in false results due to contamination. Follow the instructions on the reagent package circulars. Incorrect handling may result in falsified results.



Do not use materials after their date of expiry. Especially expired IVD reagents may cause false results.



Check correct function of manual pipette every year to ensure accurate results.

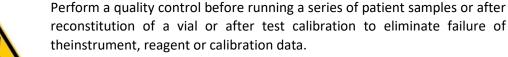
1.5.3 SAFETY INFORMATION REGARDING RISK OF HEALTH

Bleeding or Thrombosis

Diagnosis and medication of human coagulation system based on false results may lead to critical bleeding or thrombosis. For risk reduction it is essential to follow the hints below.

Regarding risks:

Caused by faulty condition of the instrument, reagent or calibration data:





Caused by imprecise pipet:

Validate your pipette every year and label it with the last date of validation.

Caused by false assignment of target values:

Run interlaboratory quality control standards.

Caused by purified water:

Use only high purified water to reconstitute controls or reagents. Check visualy that the water is free of any particles.

Caused by expired reagent:

Do not use IVD reagents or other materials after their expiry date.

Infectious Material

Consider all surfaces and materials which might be in contact with plasma or other biological liquid as potentially contaminated with infectious material.

Avoid contact:

Wear medical infection grade protective gloves for all works involving potential contact with infectious material and use each pair of gloves only. Use a hand disinfectant product, e.g. Sterillium®, to disinfect your hands after completion of the work.



Dispose:

Dispose infectious materials, such as cuvette waste and liquid waste, in compliance with your local regulations governing for infectious materials.

Hygienic conditions:

Validate your hygienic management system according to German GLP federal bureau for good laboratory practice or similar quality standard. Any waste material must be considered as potentially infectious. Direct contact must be avoided. Protective gloves during operation, service or cleaning are required.



LED Light Radiation

Avoid direct eye exposure.

The internal CCD barcode scanner is assigned to EN 55022:2010 class B, EN 62471:2008.

1.5.4 SAFETY INFORMATION FOR CLEANING, MAINTENANCE AND SERVICING

Authorized service only!



Carry out only the measures listed in this operator's manual for maintenance, repair and replacement. Improper manipulation of the device will void the manufacturer's liability obligations and may make service calls necessary, including payments which are not covered by warranty. Only the authorized Customer Service may carry out servicing. Only original replacement parts may be used. Before doing any servicing on the instrument, it is very important to thoroughly disinfect all possibly contaminated parts.

∧

Cleaning and decontamination

Before the instrument is removed from the laboratory for disposal or servicing, it must be decontaminated. The procedure is described in chapter "Cleaning and maintenance" and should be performed by authorised well-trained personnel only, observing all necessary safety precautions

Cleaning certificate required!



Instruments to be returned have to be accompanied by a decontamination certificate issued by the responsible laboratory manager. If a decontamination certificate is not supplied, the returning laboratory will be responsible for charges resulting from non-acceptance of the instrument by the service centre, or from authority's interventions.



Regard all surfaces and materials which might be in contact with plasma or other biological liquid as potentially contaminated with infectious material.

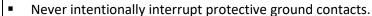


Avoid any direct contact with decontaminants or disinfections.

1.5.5 ELECTRICAL SAFETY

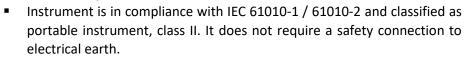
Precautions:

- Avoid spilling liquids into system. In case of spilled liquids disconnect the system from power, then clean and dry all contaminated parts.
- Remove the power cord before opening the instrument.
- Do not touch any electronic parts during operation.
- Do not operate system without proper connection to grounding.



- Never remove housing elements, protective covers or secured structural elements, since doing so could expose parts carrying electric current.
- Make sure surfaces such as the floor and workbench are not moist while operating the device.
- Check electrical equipement regulary. Defective leads or socket must be replaced without delay.

Connection to power:





- Make sure the operating voltage setting is correct before connecting the device to the power mains. Read chapter "installation" about electrical conditions.
- The power cord always has to be easily accessible during normal operation.

EMC Statement:



The **DIAcheck series** it suitable for use in domestic and industrial establishments. It was tested according to standards IEC 61326-1:2013 and IEC 61326-2-6:2013, It is in compliance with the requirements

Emission: EN 55011, Class B, Group1 Immunity: EN 6100-4 -2,3,4,5,6,8



The maximum length of cables to external devices like printer, barcode or LIS must be less than 3m to keep compliance with EMC

1.5.6 RECYCLING OF THE INSTRUMENT



The system must be decontaminated before being transported to an authorized disposer for electrical waste.



The instrument must be recycled as required by guideline WEEE (2002/96/EG).

2. INSTALLATION OF THE DIACHECK SERIES

2.1 SCOPE OF DELIVERY

Contents of standard delivery package:

•	1 Pc	DIAcheck instrument
•	1 Pc	Power Supply
•	2x100 Pcs	Single cuvettes
•	5 Pcs	Reagent container, Ø22,5mm
•	5 Pcs	Reagent tubes, Ø11mm
•	1 Pc	Operation Manual (not on picture below)
•	1 Pc	Display protection foil
•	1 Pc	System ID-Card

FIGURE 5: STANDARD DELIVERY PACKAGE (PICTURE WILL FOLLOW)

Optional available:

- External Thermal Printer
- External Barcode scanner
- Printer cable
- TECAM Smart Software

2.2 CONDITIONS OF OPERATION

Ambient conditions:

Operating Temperature 15°C to 30 °C Humidity < 70% rel. humidity

Elevation above NN sea level < 3,000m Free of dust Grade 2

Impact resistance According to IEC/EN 61010-1, 8.2.2

Not allowed Vibrations, direct sun light and direct exposure

to air condition.

Electrical conditions:

100-240 VAC, 47 - 63Hz, no earthing required (Class-2)

Electrostatic Discharge (ESD):

No special requirements for ESD protection (shoes etc.)

Storage conditions:

0 - 50°C, max. 12 months in original package.

Transport conditions:

No special conditions required. The general regulations for transport can be used.

Hygienic conditions:

Validate your hygienic management system according to international applied Good Laboratory Practice (GLP) or similar quality standard. Any waste material must be considered as potentially infectious. Direct contact must be avoided. Protective gloves during operation, service or cleaning are required.

Device environment:

No special requirements. Instruments is suitable for or use in domestic and industrial establishments.

2.3 FIRST INSTALLATION

Inspect the packaging of the **DIAcheck series** and accessories for any visible external damage. If the packaging is damaged, contact the transport company so that any damage to the device or accessories can be assessed.

The instrument is ready to use and don't need a specific procedure.

First installation procedure:

- 1. Unpack and place instrument in conformity with conditions of operation (see previous chapter).
- 2. Install assessory (Protection foil, printer, barcode, Tecam see next chapters)
- 3. Plug in power 5V.
- 4. Wait until green Status (approx. 15 min). The instrument is now ready to use.
- 5. Register instrument online for start of warranty period.
- 6. Activate 500 cuvettes (see chapter-5 "ticket system").



Keep the original packaging material for purposes of later transport



maximum length of cables to external devices like printer, barcode or LIS must be less than 3m to keep compliance with EMC

2.4 SWITCHING ON AND OFF

Switching on

Connect with power supply

Important Information:

The instrument requires about 15 minutes to heat up the optic block to 37°C. Afterwards it is ready for measurement, indicated by a green dot in the top right corner of the display. If the status symbol does not turn green, even after wating for 25 minutes, press the status symbol to see the device status to identify the problem.

Switching off

The device supports no power switch. It must be disconnected from power. To do this, unplug the power adapter from the socket on the device first and then disconnect the power supply.

Standby

The system switches to standby after 2 minutes of idle operation. In standby mode, the display brightness is reduced to save display life time and reduce power consumption. The next touch anywhere on the display disables the standby mode.

Sleep

Open menu and touch the "sleep" button:

The menu bar is displayed on top of screen and only available, if no measurement is ongoing. The power consumption during sleep is 0,2W.

Wakeup

To wake the device up from sleep, touch the display.



The system can be disconnected under any operation situations. There is no risk of system damage

2.5 DISPLAY PROTECTION FOIL

Requirements:

Type: Touchseinsitive Protection foil, clean tissue wet and dry, Peel-off-

plate

Size: same as Display (4,3")

Installation:

Ready to fix on display, as described in the Inlay (clean display with clean tissues wet and dry and fix protection foil carefully)

2.6 EXTERNAL THERMAL PRINTER

Requirements:

Type: Serial RS232 Printer
Power: external supply, 24V 1.5A

Cable: 2 x Sub D9, female, straight, max length 3m

Interface: RS232, 9600 Baud, 8, 1, No

Installation:

The printer is ready to plug in. No settings are required.



Do not plug power supply of printer (24V) to DIAcheck series. It will destroy the instrument! Double check before you plug-in.

2.7 EXTERNAL BARCODE SCANNER

Requirements:

Type: Serial handheld scanner
Power: 5V DC over cable, PIN-9
Cable: Included to scanner

Interface: RS232 9600 Baud, 8, 1, No

Setting: no handshake or protocol. Barcode must be finished with carriage

return.

Installation:

The scanner is ready to plug in. no settings are required.

2.8 TECAM SMART

Requirements:

License: TECAM SMART fingerprint and activation code.

Cable: USB, type A to B, max 3m

Interface: USB

Setting: no handshake or protocol. Barcode must be finished with carriage

return.

Installation:

a) Disconnect the device from PC.

b) Run setup.exe.

c) Confirm when asked to install DIAcheck series driver.

d) Connect device with PC.

e) Start TECAM

Further information available in chapter "7" or online help file of TECAM.

2.9 REGISTRATION

The instrument must be registered online for warranty or service issues

1) Open weblink www.dialab-reg.com

or scan QR Code on ID-Card

2) Enter SIN + PIN of device

Both can be seen on instrument license plate (Type label) or during startup or on info screen (touch green or red LED on home screen)

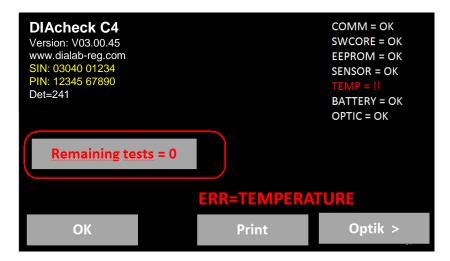


FIGURE 6: SYSTEM INFORMATION

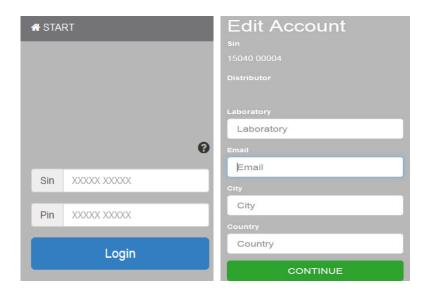


FIGURE 7: REGISTRATION OF DIACHECK SERIES

3. OPERATION OF THE DIACHECK SERIES

3.1 HOMESCREEN

After boot or home button following screen is displayed

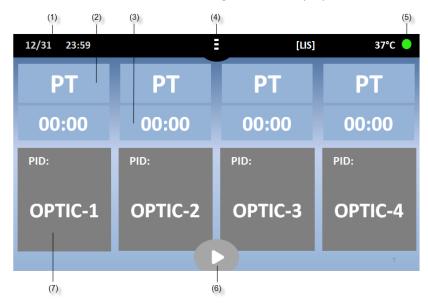


FIGURE 8: HOMESCREEN DIACHECK SERIES C4

UI Element	Element Name	Use Function
(1)	Date & Time	Edit date
(2)	Current test	Change test
(3)	Stopwatch	Start/Reset stopwatch or countdown
(4)	Menu or Home	Open menu or return to main
(5)	Status Dot	Show device status/Open system information
(6)	Multistart	Activate all channels
	Optic-Button	Channel-1 is idle. Touch to enter new PID and activate
(7) — —	Active	Channel is active. Touch or add reagent to start
	Blinking orange	Ongoing measurement. Touch to stop measurement
	Current result	Touch to enter new PID

Other functionality:

[LIS]	Visible, if connected with LIS	
Green LED	System is ready for measurement	
Red LED	Indicate system problems. No measurement is possible.	
37.0°C	Temperature on reagent block.	
Grayed buttons	Use function is not possible during measurement.	
Reduced brightness	Screensaver mode. Touch to reactivate.	
Long touch	Repeat current function	
Green	Green = Ready to measure, no problems	
Yellow	Yellow = Ready to measure, minor problems	
Red	Red = Not ready to measure, major problems	

3.2 INPUT PATIENT IDENTIFICATION

Call: Homescreen/Optic button



FIGURE 9: INPUT PATIENT ID

Button	UI Element	Use Function
Numeric keys	0-9, C, X	Change or delete PID.
Increment	-1 / +1	Increment PID. Use long touch feature for easy change.
Hi-Sense	Hi-Sense	Enable very high detection sensitivity. Useful for high diluted or lipemic samples or "+++" results.
Additional:		
Long touch	-	Press button > 2sec.
Sample barcode	-	Set PID to barcode

3.3 TEST SELECTION

Call: Homescreen/Test button



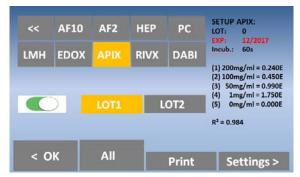


FIGURE 10: TEST SELECTION DIACHECK SERIES C2/C4

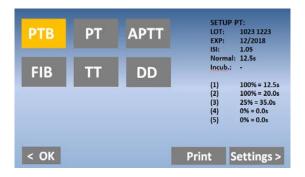


FIGURE 11: TEST SELECTION DIACHECK SERIES C1

Button	UI Element	Use Function
Toot kovo	PT – F12	Select test.
Test keys	>> <<	Change test table
On / Off	On / Off	Activate two LOTs per test (not available
	OII / OII	for DIAcheck C1).
LOT 1/2	LOT 1 / LOT 2	Load calibration of LOT 1 or LOT 2 from memory.
ОК	< OK	Confirm test for current channel.
All	All	Confirm test for all channels.
Settings	Settings >	Change test calibration.
Print	Print	Print current test testup.
Scan reagent		Select current test and lot.
barcode	-	A long beep indicates an invalid barcode or LOT.
SETUP PT	Test Information	Calibration data of current lot and test.
	Box	Red values indicate invalid data.

3.4 MEASUREMENT



FIGURE 12: SCREEN DURING MEASUREMENT

Button (7) during measurment	
PID	Patient identification number (max 16 numbers).
Result	PT = 12.5s, 115% 0,91 INR.
	+++ = no clot reaction detected within runtime.
FlagFehler! Textmarke nicht definiert.	f = very low fibrinogen (weak clot).
	F = very high fibrinogen (strong clot).
	* = Result is out of calibration.
	X = double value deviate more than 15%.
Err	T = temperatue not 36 - 38°C.
	E = reagent expired.
	S = light intensity too low.
mOD	Current optical absorbance. A change of value > 50mOD indicates an ongoing clot reaction.
Timer	Current time of measurement.

3.5 SYSTEM SETTINGS



Menu and functions depend on instrument version C1 or C2/C4!

Call: Homescreen/Menu button

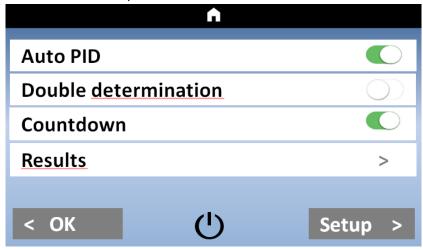


FIGURE 13: QUICKMENU DIACHECK SERIES C2/C4

Button	UI Element	Use Function
Auto PID	Toggle Auto PID	Enable/Disable the Auto PID feature.
Double determination	Toggle Double determination	Enable/Disable Double determination.
Countown	Toggle Countdown	Switch between Stopwatch and Countdown mode.
Results	Results Button	Open the result history.
Setup	Setup Button	Open the system setup.
ψ	StandBy	Put the device into sleep mode.
ок / ♠	OK / Home Button	Return to the home screen.

Auto PID:

Using the Auto PID mode enables the user to let the device choose a consecutively numbered ID for every measurement. By setting the ID manually you set the start ID. Every new channel activation automatically sets the ID to the next higher number.



Auto PID mode must be enabled to use the Multistart feature!

Double determination:

When using double determination mode, the channels 1/2 (DIAcheck C2) respectively channels 1/2 and 3/4 (DIAcheck C4) are combined to perform a test using the same ID twice. Both results are combined by calculating the mean value.

Countdown:

Use the stopwatches in countdown mode. The period of countdown is defined by incubation time of test (see "test settings"). When Countdown mode is enabled, the stopwatches count down give alarm 5sec before zero.

Results:

Pressing the Results button opens the result history screen.

Setup:

Pressing the Setup button opens the system settings.



Pressing the Sleep Button sends the device into the sleep mode. To wake the device up, touch anywhere on the screen.

OK Button / 👚 :

Pressing the OK or Home Button returns to the home screen.

Call: Homescreen / Menu / Setup



FIGURE 14: SYSTEM SETTNGS DIACHECK SERIES C2/C4

Setting/Buttons	UI Element	Use Function
Date	Date < >	Set system date, use long touch on "<" ">" to scroll
		through the values faster.
		Short touch on date change the format (EU / US)
		Long touch on date reset to defaut date
Time	Time < >	Set the system clock. Long Touch the time to reset to
		default.
Language	< >	Select the system language DE/EN/ESP/ITA/FR/RO.
Mixer	< >	Some reagents like PT sediment and need to be stirred
		Select here the mixer intensity (Low/Normal/High).
		Insert vial and magnetic stirbar into middle position.
		Change speed until stirbar ensures proper mixing.
Temp	<	> Correct the actual current temperature of the reagent
	Temperature	block. Long touch the temperature value will reset to
		default. Detailed information can be read in chapter
		"Adjust temperature".
OK / ♠	OK / Home	Return to the home screen.
Info	Info	Open system information.

Call: Homescreen/Menu button

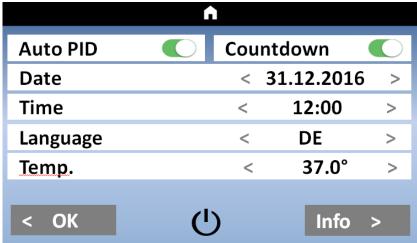


FIGURE 15: MENU / SYSTEM SETTINGS DIACHECK C1

Setting/Buttons	UI Element	Use Function
Auto PID	Toggle Auto PID	Enable/Disable the Auto PID feature.
Double determination	Toggle Double determination	Enable/Disable Double determination.
Date	Date < >	Set system date, use long touch to scroll through the values faster. Touch the date to change between mm/dd/yyyy and dd.mm.yyyy mode. Long touch the date to reset to default.
Time	Time < >	Set the system clock. Long Touch the time to reset to default.
Language	< >	Select the system language DE/EN/ESP/ITA/FR/RO.
Temp	< > Temperature	Correct the actual current temperature of the reagent block. Long touch the temperature value to reset to default. Detailed information can be read in chapter "Adjust temperature".
OK / ♠	OK / Home	Return to the home screen.
υ	Sleep Button	Put the device into sleep mode.
Info	Info	Open system information.

The functionality of the options on the setup screen for the **DIAcheck C1** are the same as for the **DIAcheck C2** and **DIAcheck C4**. For detailed information about the available functions see the setup screen for the **DIAcheck C2** and **DIAcheck C4**.

3.6 TEST SETTINGS

Call: Homescreen / Test button / Settings

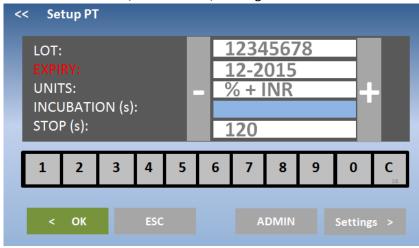


FIGURE 16: TEST SETTING 1FEHLER! TEXTMARKE NICHT DEFINIERT.

Setting/Buttons	UI Element	Use Function
LOT	LOT Number field	Press the LOT text field to enter or change LOT number.
Expiry	Expiry date field	Press the expiry date value to select the field
Units	Result Units field	Press the unit values to select the field.
Incubation	Incubation time field	Press the incubation value to select the field.
Stop	Stop time field	Press the stop time value to select the field.
In/Decrement	+ or -	Change the value of the selected field.
Numeric keys	0 - 9 and C	Keys for LOT entry. C=Clear
ОК	< OK	Save settings and exit screen.
ESC	ESC	Exit to test selection without saving.
Admin	Admin	Open advanced test settings. Only visible for administrator user.
Settings	Settings >	Open test calibration settings (Screen test settings 2)
Barcode:	LOT barcode entry	Scan reagent barcode to input LOT and expiry.

LOT:

Enter the LOT of the used reagent for the selected test. If dual LOT is used, use the test selection screen to choose LOT 1 or LOT 2. Both LOT numbers have individual test settings.

Expiry:

Enter the expiry date of the reagent for the selected test (and LOT).

Units:

Select the units used for the test results. The available unit is predefined for each test.

Incubation

Required waiting time until adding final reagent and start measurement. The time is used for countdown.

Stop:

Some samples do not clot. Afer stop time instrument breask measurement and report "+++" (no clot detect)

Call: Homescreen / Test button / Settings / Settings

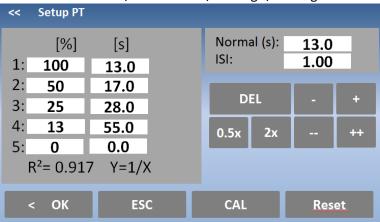


FIGURE 17: TEST SETTING 2

Setting/Buttons	UI Element	Use Function
Calibration curve values	Value fields	Press a calibration value to select the field.
Increment	+, -, ++,	Change values in small or big steps.
Decrement	., , ,	Use long touch to repeat change
Double/Half	0.5x 2x	Half or duplicate values
Delete	DEL	Delete the selected value.
Reset	Reset	Reset all values to default.
Calibrators	CAL	Shift all calibration points according to serial dilution
		(1:1 1:2 1:4)
OK	< OK	Save settings and exit screen.
ESC	ESC	Exit screen without saving.

Calibration curve:

Input of Calibration points. Minimum 2 points, maximum 5 points.

Normal:

Reference value for normal clotting time like for PT (MNPT). Only shown, if unit is selected.

ISI:

International sensititivity index of PT reagent. Value is stated on reagent label.

R²:

Linearity of calibration depending on mathematic

R ² <0.5	not linear	Y=LIN	linear interpolation
R ² <0.9	moderate linear	Y=1/X	reciprocal linear interpolation
R ² >0.9	high linear	Y=logXY	double logarithm interpolation

3.7 REVIEW RESULTS



Menu not available for version C1

Call: Homescreen / Menu / Results

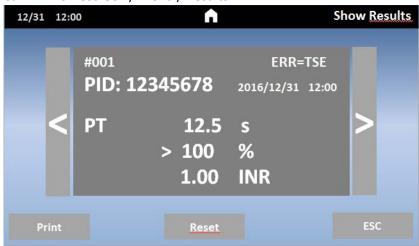


FIGURE 18: REVIEW RESULTS DIACHECK SERIES C2/C4

Setting/Buttons	UI Element	Use Function	
Result selection	<,>	> Navigate the results.	
Print result	Print	Print the shown result.	
Reset view	Reset	Reset the result view to most recent result.	
ESC	ESC	Exit screen.	

The result review screen shows the last 200 measurements made with the device. The most recent result is shown first. If the result history exceeds 200 values, the oldest measurement result is overwritten.

4. BASIS COAGULATION TESTS



This section describes only rudimental how to run basic clotting tests on DIAcheck series. Correct procedure may be different for specific reagents. Read and follow always the procedure in boxinsert of reagent kit.

4.1 QUICKGUIDE OF PT DETERMINATION

How to run a PT measurement:

- 1. Switch on instrument and wait for green state (~ 15min until 37°C).
- 2. Reconstitute PT reagent and wait 30-60 min before next step.
- 3. Place PT vial into reagent block + stirring bar and let incubate for at least 5min.
- 4. Change test of channel 1 to "PT" by pressing on the current test.
- 5. Place empty cuvette into optic.
- 6. Pipet 25µL of sample into cuvette.
- 7. Press "00:00" to start the stopwatch and wait 30 seconds.
- 8. Press "OPTIC-1" and enter a PID or scan a sample barcode.
- 9. Add 50μ L PT reagent, when "Active" is blinking. The measurement will start automatically when adding the reagent.
- 10. Wait for result or touch optic button to abort.

Multi-Activation (not for DIAcheck C1)

- 1. Open menu and set Auto PID = On.
- 2. Place empty cuvettes into each channel and pipet 25µL of sample to each cuvette.
- 3. Press button multistart.
- 4. Add 50µl PT in to each cuvette from left to right.

How to calibrate a PT

- 1. Reconstitute calibrator and wait 15-30min before continue with next step
- 2. Calibrators

The target value of calibrator is state at certificate. I assume 100% as example IBS, Owrens or $NaCl_2$ solution can be used as sample diluent

- a. 100%: Pipet 100µl calibrator into empty tube
- b. 50%: Pipet 100µL 100% calibrator + 100µL diluent into empty tube
- c. 25%: Pipet 100µL 50% calibrator + 100µL diluent into empty tube
- d. 12.5%: Pipet 100μL 25% calibrator + 100μL diluent into empty tube
- Run all 4 calibrators like patients and write down the clotting time (double determination is recommended)
- 4. Enter PT settings and enter
 - a. correct LOT, Exp (read Barcode of vial label)
 - b. set UNITS to "INR + %"
 - c. Input Normal Time (=100% result) + ISI (see vial)
 - d. Input % calibration

4.2 QUICKGUIDE OF PT-B DETERMINATION

How to run a PT-B measurement from finger blood:

- 1. Switch on instrument and wait for green state (~ 15min until 37°C).
- 2. Change test to "PTB" by pressing on the current test.
- 3. Reconstitute PT-B with component-1 (Diluent) and wait 30-60 min before next step.
- 4. Add component-2 (CaCl₂) to PT-B and wait again for 30-60 min before next step.
- 5. Place empty cuvette into optic or pre-incubation.
- 6. Pipet 150µL of PT-B into cuvette. The cuvette must be used within the next 10min.
- 7. Close PT-B vial and store in the refrigerator until next use. The reagent is stable for 30 days.
- 8. Press "OPTIC-1" and enter a PID or scan a sample barcode.
- 9. When "active" is blinking, pierce the finger and pipet 15μL capillary blood from finger into cuvette.
- 10. Measurement should start. It is important to mix in the cuvette. For this lower the pipet into cuvette and pump 10-15x up and down. Stop mixing latest when countdown is zero.

How to calibrate a PTB

- 1. Reconstitute calibrator with 1.7mL and wait 15-30min
- 2. Calibrators

The target value of calibrator is state at certificate. I assume 100% as example IBS, Owrens or NaCL solution can be used as sample diluent

- a. 100%: Pipet 100µl calibrator into empty tube
- b. 25%: Pipet 100µL 100% calibrator + 500µL diluent into empty tube
- 3. Run all calibrators like patients and write or print the clotting time
- 4. Enter PTB settings and enter
 - a. correct LOT, Exp
 - b. set UNITS to "INR + %"
 - c. Input Normal Time (=100% result) + ISI (see vial)
 - d. Input % calibration

4.3 QUICKGUIDE OF APTT DETERMINATION

How to run an aPTT measurement:

- 1. Switch on instrument and wait for green state (~ 15min until 37°C).
- 2. Change test to "APTT" by pressing on the current test.
- 3. Place CaCl into instrument let incubate for at least 5min.
- 4. Place empty cuvette into optic or pre-incubation.
- 5. Pipet 25µL of sample into cuvette.
- 6. Pipet 25µL of cold aPTT reagent into cuvette.
- 7. Press "00:00" to start the stopwatch and wait 180 seconds.
- 8. Short before end of incubation press "OPTIC-1" and enter a PID or scan a sample barcode.
- 11. Add 25µL CaCl, when "Active" is blinking. The measurement will start automatically.
- 12. Wait for result or touch optic button to abort.

4.4 QUICKGUIDE OF FIB DETERMINATION

How to run a FIB measurement:

- 1. Switch on instrument and wait for green state (~ 15min until 37°C).
- 2. Change test to "FIB" by pressing on the current test.
- 3. Reconstitute FIB reagent and wait 30-60 min before next step.
- 4. Place FIB vial not into reagent block. Room temperature is ok.
- 5. Place empty cuvette into optic.
- 6. Pipet 10μL of sample into cuvette.
- 7. Pipet 90µL of IBS buffer into cuvette.
- 8. Press "00:00" to start the stopwatch and wait 30 seconds.
- 9. Press "OPTIC-1" and enter a PID or scan a sample barcode.
- 10. Add $50\mu L$ FIB reagent, when "Active" is blinking. The measurement will start automatically when adding the reagent.
- 11. Wait for result or touch optic button to abort.

How to calibrate a FIB

- 1. Reconstitute calibrator and wait 15-30min before continue with next step
- 2. Calibrators

The target value of calibrator is state at certificate. I assume 300mg/dL as example

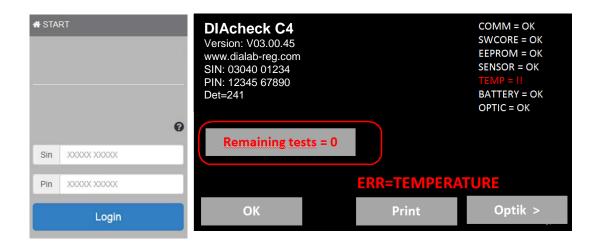
a. 600mg/dL: Pipet 50μl calibrator + 200μL IBS buffer into empty tube
 b. 300mg/dL: Pipet 50μl calibrator + 4500μL IBS buffer into empty tube
 c. 150mg/dL: Pipet 50μl calibrator + 950μL IBS buffer into empty tube
 d. 75mg/dL: Pipet 50μl calibrator + 1950μL IBS buffer into empty tube

- 3. Run all 4 calibrators
 - a. Add 50µL of calibrator into cuvette
 - b. Add 25μL of FIB reagent to start measurement. Write clotting times to paper or print,
- 4. Enter FIB settings and enter
 - a. correct LOT, Exp
 - b. set UNITS to "mg/dL"
 - c. Input mg/dl calibration

5. TICKET SYSTEM

1) Login to ticket system

webpage: www.dialab-reg.com



Enter SIN and PIN of instrument! This information can be found on instrument license plate (Type label) or on info screen.

FIGURE 19: TICKET SYSTEM, LOGIN

2) Input Voucher

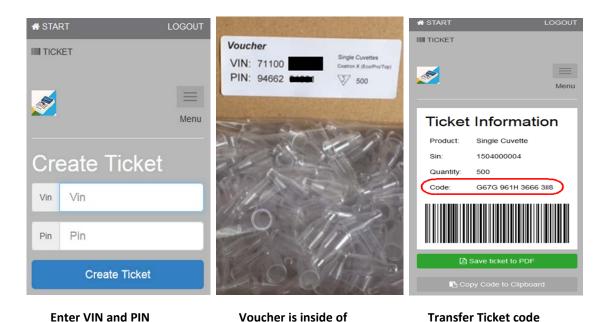


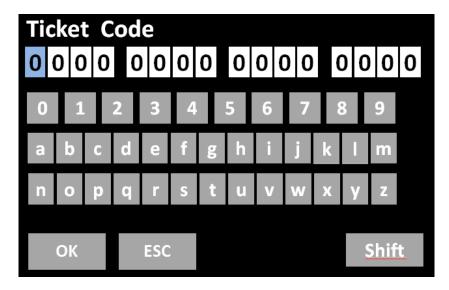
FIGURE 20: TICKET SYSTEM, VOUCHER

of voucher

cuvette box

to instrument

3) Transfer ticket code to instrument



Open info screen (touch blinking RED LED) and then "Remaining tests=0". The code can be transferred by manual input, barcode scanner or TECAM SMART software.

FIGURE 21: TICKET SYSTEM, INPUT CODE

4) Using TECAM SMART software

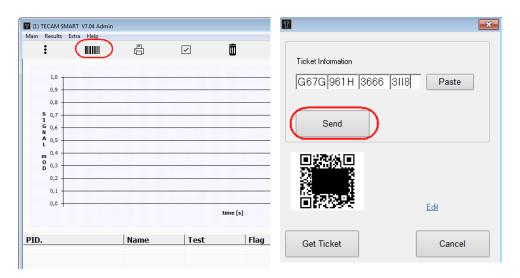


FIGURE 22: TICKET SYSTEM, TECAM SMART

- a) Use your mobile device and scan QR code or "Get ticket", if TECAM is connected to internet
- b) Follow dialogue according to chapter (1)
- c) Copy Paste the code and "send" to instrument

6. SERVICE FUNCTIONS



Only for authorized and trained persons. Unqualified modifications can cause troubles and misfunction of the system!

6.1 SYSTEM INFORMATION

Call: Homescreen / green or red LED

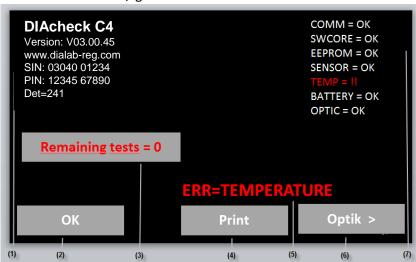


FIGURE 23: SYSTEM INFORMATION

UI Element Element Name Use Function	
(1) - System version information	
(2) OK Return to homescreen	
(3) Remaining tests Number of activates cuvettes. Touch to activate new cuvette	S
(4) Print Print out of system informatio	n
(5) ERR message Show current error	
(6) Optik Check optic system	
(7) - System error information	·

System information

Version of software, URL link to register or ticket system, system ident number (SIN), product ident number (PIN). SIN+PIN is required for login to ticket system.

Remaining tests=0

Latest at zero the system will stop operation and require to activate new cuvettes. How to do – see next chapter.

ERR messages:

COMM= communication to LIS SWCORE = software memory overflow

EEPROM= EEPROM/memory error SENSOR = temperature sensor

TEMP= temperature not 36-38°C BATTERY = CR2032 on mainboard below 3V

OPTIC= optical system out of range RED =system not ready to measure

YELLOW =system ready to measure, minor problems

6.2 OPTIC CHECK

Call: Homescreen / green or red LED / Optic

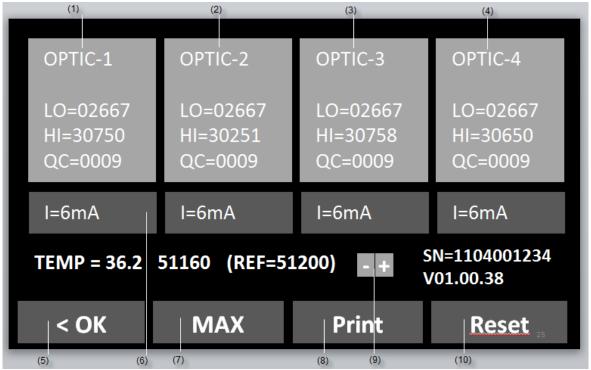


FIGURE 24: OPTIC CHECK

But	ton	Caption	Use Function	
(1)-	(4)	OPTIC xx	Reset QC value	
(5)		I=mA	Display and chang	ge intensity of LED
(6)		OK	Return to homes	creen
(7)		MAX	Set all LED to max	k. intensity (42mA)
(8)		Print	Print system repo	ort (see next chapter)
(9)		+ / -	Change temperature	
(10)		Reset	Reset all channels and re-calibrate optic	
Infor	mations on scree	n	Fault condition	Troubleshoot
Infor	mations on scree		Fault condition > 2900	Troubleshoot Replace optic board
		en LED is off		
LO	optic signal, wh	en LED is off en LED is on	> 2900	Replace optic board
LO HI	optic signal, wh	en LED is off en LED is on ignal	> 2900 < 28000	Replace optic board Remove cuvette and touch "RESET"
LO HI QC	optic signal, wh optic signal, wh noise of optic si	en LED is off en LED is on ignal ntensity)	> 2900 < 28000 > 30	Replace optic board Remove cuvette and touch "RESET" Touch button "OPTIC"
LO HI QC mA	optic signal, wh optic signal, wh noise of optic si power of LED (i	en LED is off en LED is on ignal ntensity) °C	> 2900 < 28000 > 30 not [3 - 12mA}	Replace optic board Remove cuvette and touch "RESET" Touch button "OPTIC" Remove cuvette and touch "RESET"

6.3 SYSTEM REPORT

Call: Homescreen / green or red LED / Print

SYSTEM REPORT

22.08.2017

 System:
 DIAcheck

 Version:
 V3.01.45

 SIN:
 03040 01234

 PIN:
 12345 67890

TEMP: 37.0°C

50981 (target=50992)

Optic:

Lo	Hi	mA	Qc	
1:2698	28822	5	6	ОК
2:2698	29822	6	3	OK
3:2698	30822	7	1	OK
4:2698	29822	6	0	OK

PT= 26
aPTT= 8
FIB= 17
DD= 0
AT= 0
TOTAL 101

Date of report

name of system software version system ident number product ident number

temperature of optic and digital value of thermosensor

Optical values

Lo= LED off
Hi= LED on
mA= LED power
Qc= noise of optic
OK= no fault

!!= fault condition

count of performed tests

Fault condition are described in chapter "optic check"

6.4 ADJUST TEMPERATURE

Call: Homescreen / Menu / Temperature

- 1. Switch on device and wait approx. 15min until system show 37°C on screen.
- 2. Fill a reagent tube/vial with 2 ml water and place it in a reagent position. Place a digital thermometer in the reagent tube and let warm-up for approx. 10 min.
- 3. Press menu

Change current system temperature to value of thermometer. Wait 10min and repeat procedure.

Typical problems:

Malfunction / Error	Possible cause	Measures
System heat not up to 37°C	Sensor calibration is out of range	Reset to factory default as described in chapter "Hidden Function"
System show 0.00°C	Sensor is out of range	Ambient temperature must be 0 – 45°C.
	Sensor or optic LED board is defect	Replace LED board.

6.5 FIRMWARE UPDATE



Only for authorized and trained persons. Sudden interruption of power or data communication during update procedure will cause device not to boot anymore. In this case, the instrument can be restored only by JTAG interface.

- 1. Download flashdisk.exe from manufacturer website. Contact local distributor to receive correct URL address.
- 2. Flashdisk.exe is a selfrunning Winzip archive. A double click will start the update dialogue. Some antivirus software may block selfrunning archiv. In this case extract the file to your desktop and execute "Flash.exe"



FIGURE 25: SCREENSHOT OF XFLASH TOOL

- 3. Confirm "Start Update"
- 4. Remove USB cable from instrument and confirm
- 5. Connect USB cable to instrument USB "Service" (=second USB port from left)

Flash will now identify the instrument and display "CONTINUE". Abort Flash, if no instrument is found and install device driver "FT232.exe" manually. The file is included in the flashdisk archive.

- 6. Confirm "Start Update". After this command the firmware will be transmitted to instrument. There is no way to interrupt. After around 120s the update will be finished.
- 7. Remove power and afterward USB cable from service port. Now connect power to instrument. It should boot and show correct firmware version.

6.6 OVERVIEW OF MAINBOARD

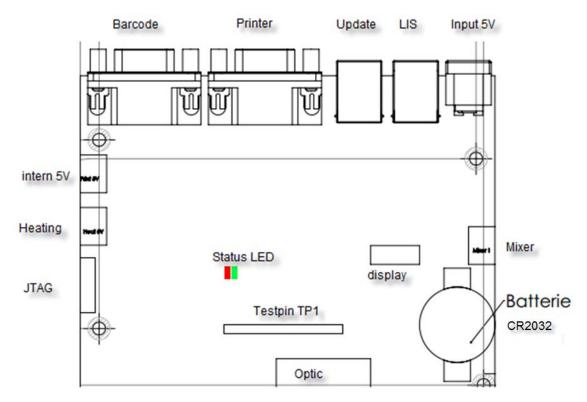


FIGURE 26: MAINBOARD

Testpin Function:

TP1 = Systick Interval, must toogle each 1ms

TP2 = indicate reading of SD24

TP3 = draw homescreen

TP4 = Write to EEprom

TP5 = Read from to EEprom

Other = not used

Status LED:

green, permanent = everything OK

red, permanent = EEPROM error defect optic unit and/or mainboard

green, blink = Battery < 3.0V battery expired red, blink = Temp sensor Optic not connected

6.7 TYPICAL FAILURES

Malfunction / Error	Possible cause	Measures	Ву
System not ready	different	Open system info and	User
		check red errors	
Remaining tests = 0	No cuvette activated	Create a ticket	User
ERR=Comm	Mainboard defect	replacement	Authorized
			service
ERR=SWCORE	Software failure or bug	Update firmware	User
ERR=Sensor	Temp sensor defect	Replacement of optic	Authorized
			service
ERR=Temp	Temperature out of 36-	Wait 15min	User
	38°C		
ERR=Optic	Optic channel blocked or	Remove cuvette from	Authorized
	LED defect	optic or clean optic or	service
		replace optic	
ERR=Battery	Battery low power	Replacement	Authorized
			service

False results	Possible cause	Measures
	True, patient anti coagulated or bleeding	Remove cuvette and check with needle for clot
No or false clot detected	Reagent defect	Check reagent with eyes for flakes or clots. Run control plasma to verify. Prepare new vial. Check diluent/water
	Instrument missed clot	Increase MAX time
	Low fibrinogen or optical interference (lipemic, bilirubin, haemolytic)	Repeat but activate hi-sense option
False result (INR, %, mg/dl,)	Method not correct calibrated	Check calibration data and correct LOT

7. HIDDEN FUNCTIONS

7.1 RESET TO FACTORY DEFAULT

System factory reset procedure:





WELCOME SCREEN +

FACTORY DEFAULT

How to reset to factory default:

- 1. Press 3sec to spinner during boot up
- 2. Select "OK" Switch on device and switch to home screen
- 3. Confirm the reset

Date, temperature and test calibration must be adjusted after a factory reset!!

Default values:

- Temperature sensor = 51000
- Mixer = 1;
- Language = EN;
- Double determination = OFF;
- Auto PID = ON;
- Countdown = OFF;
- All results stored on board are deleted
- All test calibration data are reset to default

Test calibration:

How to reset to factory input a PT calibration:

- 1. Switch on device and switch to home screen
- 2. Touch any test button
- 3. Change test to "PT" and touch "Setup" or scan barcode of PT vial
- 4. Enter LOT, expiry and select Units to "% + INR"

7.2 LOGIN AS ADMIN

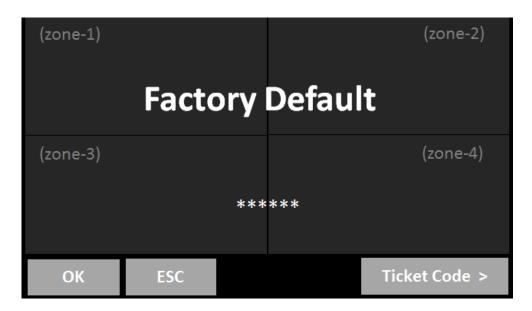


FIGURE 27: ADMIN LOGIN

- 1. Break welcome screen: Long press on spinner icon
- 2. Touch alternative: zone 1, 2, 1, 2, 1, 2

As admin following functions are enabled:

Change test protocol (see next chapter)

7.3 CHANGE TEST PROTOCOL

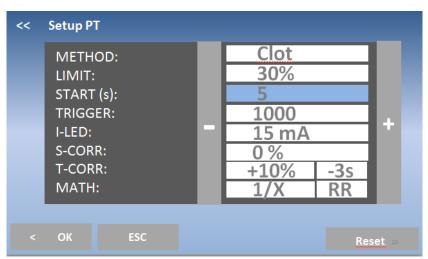


FIGURE 28: TEST PROTOCOL

Setting	Select	Function
METHOD	CLOT/CHROM	Clot = clotting assay Chrom = chromogenic or immunturbimetric test
	CLOT method: 30-70%	Definition of clotting time 30% =shorter results, close to start of reaction 70% =longer results, close to end of reaction
Limit		Definition of signal inlinearity or high dose
	CHROM method: 25mE – 500mE	Example: Signals more then 50mE of endpoint are D-Dimer positives.
Start (s)	3-255s	Deadtime = First point of detection.
Autostart/ Trigger	100 – 5000	Sensitivity of autostart
		100 = very sensitive. Risk of self start
		5000 = very insensitive. Risk of no start
I-LED	3-42 mA	Initial LED power during start of test.
		Very clear tests like FIB require just 5-10mA
		Very turbid tests like DD require 15-25mA
		The best LED power is set automatically during measurement. The initial signal isrequired to avoid
		adjustments.
S-Corr	+-200%	Mathematically correction of signal
		0% = no correction
		100%= signal doubled
		Can be helpful, if systems measure false short or prolonged clotting time.
T-Corr	+-70%	Clotting time correction
	+- 15s	Eg. T-Corr=+20% - 3s, Result = 10s is corrected to 12s - 3s= 9s.
		Can be helpful to improve correlation to competitors or golden standard
Math	LIN, 1/X, logX,LogXY	interpolation between calibration points
	POINT/LINE	point to point interpolation or regression line,

8. WORKING WITH TECAM SMART

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Detailed information about installation and operation be be read in the online manual of TECAM. This is just a quick overview.

TECAM software is a small local LIS and combines laboratory data management, quality control and research purpose in one. It connects the DIAcheck to the "big" LIS and and manange results in an own local database. Flexible filters allow QC with Levey-Jennings graph and Westgard analysis. Each result can be traced back to reagent lot and calibration.

Features	Smart
Receive result from analyser	The results can be reported and manage in a locl database
Receive reaction curve	Visualize the optical reaction for research, result verification or failure analysis
Patient information	Connect Patient-ID with name and other information.
LIS communication	Talk to LIS with ASTM-1394 standard protocol Receive from LIS: Patient information Send to LIS: Results
Statistical analyze (QC)	Power filters allow quality evey-Jennings graph and Westgard analysis for controls as well as for patients
integrated TECMONI	This is a powerful research tool to visualize raaction curve in real time. It is a great tool for reagent development or adapting nee tests to instrument
Mirror print	Instead of expensive portable thermo printer, use TECAM as printer
Ticket system	Activation of cuvette in its easiest way. Connect to ticket system, receive ticket and send to instrument



FIGURE 29: TECAM SMART

9. CLEANING AND MAINTENANCE

9.1 GENERAL CLEANING INFORMATION

- Clean with a lint free cotton cloth or stick
- Never pure any liquid into optic, working area or touch display
- Keep the device free of dust and moisture.
- If the device is soiled with liquids, remove the soiling with an absorbent cloth.
- If a liquid has accidentally been spilt or pipetted into a measurement channel, remove power immediately and clean the measurement channel with pipette and a lint-free cloth. Check the function of the optics in the menu SERVICE



Regard all surfaces and materials, which might be in contact with plasma or other biological liquid as potentially contaminated with infectious material.



Avoid any direct contact with decontaminants or disinfections.

9.1 CLEANING

- Use microfiber tissue only and no liquid to clean the screen
- Clean and wipe up all spills around the working area with 5-10% diluted bleach detergent or water.

9.2 DECONTAMINATION

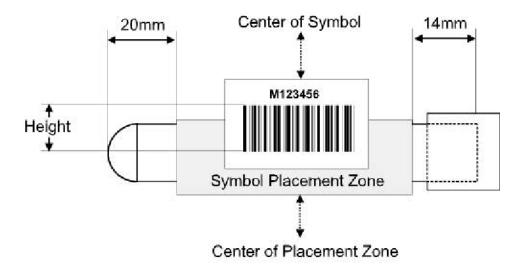
- Use 30% diluted bleach and commercial disinfectant (e.g. Bacillol®AF)
- Decontaminate working area. Don't apply liquid on display.

9.3 REGULAR MAINENTANCE

• No maintenance required

10. APPENDIX

10.1 BARCODE GUIDELINE



Specification of label:

Label length: 50 - 70 mm
 Label height: 20 - 30 mm
 Barcode length: 40 - 60 mm
 Barcode height: 10 - 20 mm
 Quiet zone: >5mm

- Resolution/module: 5 -20mils (0.2 – 0.5mm)

Ratio: min. 1:2,5 to 1:3 (two dimensional codes)
 Quality Level A or B according to ANSI X3.192 -1990

Accepted codes:

Code 128
 EAN 128
 Code 39
 Code 39

Code 93
 2/5 interleaved
 4 – 13 characters, no checksum
 2 characters, no checksum

10.2 TECHNICAL DATA

A			
Analyzer			
Display		capacitive touch sensitive TFT 4.3" 480x272	
Measurement system	em	1-4 independent measurement channels	
	wavelength of LED 405 nm		
Cuvette		single channel cuvette for optical detection	
Positions (prewarm	ned)	5 reagent positions at 36.5 – 37.5 °C	
		20 cuvette positions at 36.5 – 37.5°C	
Reaction volumes		Minimum total volume is 75 μl	
Barcode scanner			
CCD Scanner		max. power = 120mA	
		pulse period = 330/s	
Class B EN 55022:2	010,	wavelength = 617 nm	
EN 62471:2008		best distance = 80 -120mm	
Accepted codec		EAN (8,13, 128), Code (39,93,128),	
		Codabar, Interleaved 2 of 5	
Power supply			
Nominal Input Volt	age	100 – 240VAC, 47-63Hz	
Maximal Input Curi	rent	0.7A rms	
Output Power		5V DC, 3.3A	
Batterie (mainboar	rd)	Lithium CR2032 3V	
Power consumptio	n	max. = 14W sleep < 0.5W	
Dimensions			
Size (W x D x H)		225 x 150 x 90 mm	
Weight		1.04 kg (without power supply)	
Ambient condition	ıs		
See chapter "Instal	lation"		
Noise output			
Operating noise		max. 50 dBA	
Interfaces			
RS232 (Barcode)		Sub-D9, female; 9600 Baud/8/1/N; Pin-9	
		powered with 5V DC. For external	
		handheld barcode scanner, serial printers	
RS232 (Printer)		Sub-D9 female; 9600 Baud/8/1/N; For	
,		serial printers	
USB (Service, Firmy	ware Update)	Type-B, female, 115200 Baud/8/1/N	
USB (LIS)	,	Type-B, female, 115200 Baud/8/1/N; For	
(2.3)		LIS communication	
Typical performan	ce data		
Test	CV.	Range	
PT	<3%	0-30 INR	
APTT	<3%	15 – 420s	
FIB	<7%	50-999mg/dL	

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