T&T medilogic

MEDIZINTECHNIK GmbH

Manual

medilogic Pressure Measurement

2018-03

CE 0681

Installation medium inside

Contents

1 Important Notice and Hotline

The purchaser may make a backup copy of the software. Except for personal use by the purchaser copying or recording this or parts of it without written consent by T&T medilogic Medizintechnik GmbH is forbidden.
We retain the right to change and improve our products, without obligation to make these changes and improvements for already delivered systems.
We assume no liability or follow liability for loss of data or the consequences thereof in connection with the use of our system.
For further questions You can reach us during office ours from Monday through Friday between 8:00 and 17.00 CET: Hotline Number +49 30 63306340 and 63306341.

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www.medilogic.com
E-Mail: medilogic@medilogic.com

2 Introduction

Dear medilogic User!
Thank You very much for deciding to buy our medilogic system.
We are convinced that the expectations You had when buying this system will be fulfilled after a short getting to know period. To make this getting to know as short as possible we strove to keep this manual as informative and easy to understand as possible without bothering You with unnecessary details.

In this manual we address You the user of the medilogic system in order to provide you with all the necessary information. We use the term ‘customer’ for the person being examined instead of the term ‘patient’ as used in medical context. This takes into account the fact that for medical/orthopaedic care the patient nowadays often is the customer.

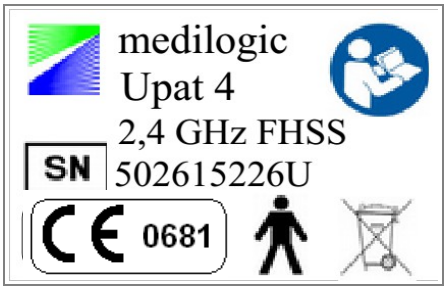
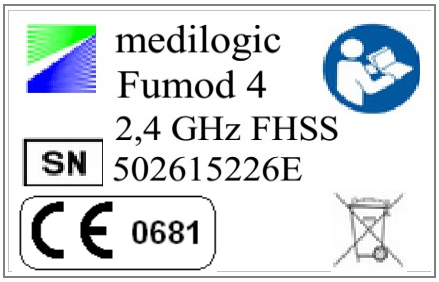
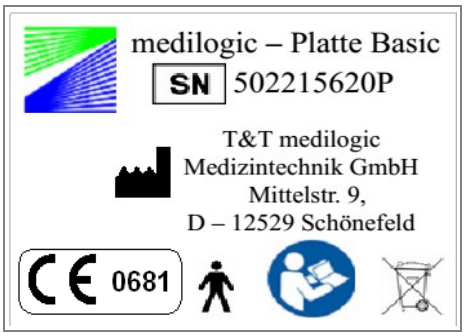
We undertook every effort to make sure that the information herein is complete and accurate. But we can not guarantee for it. Should You notice something amiss or should passages seem misleading to You. Please kindly send us a message, so that we can improve the next edition of the manual accordingly.

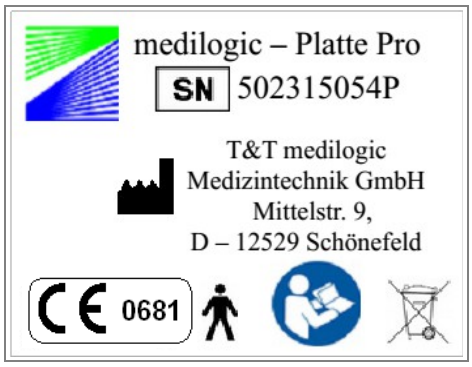
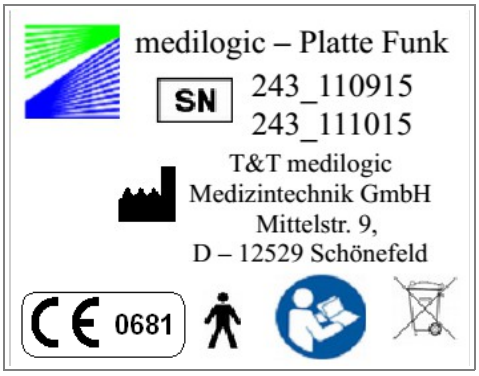
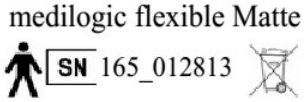
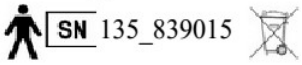
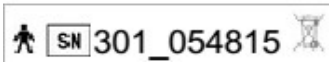
The software and some parts of the hardware for the medilogic foot pressure measurement system and the medilogic platform system are identical, thus the manual applies to both systems. In places where there are differences between the systems they will be explained separately.

2.1 Identifiers

Important information and identifiers relevant for safety You can find on the name plates of the parts of the medilogic pressure measurement system. All signs and symbols are explained in the following table.

CE 0681	CE- Identifier with identification number of the notified body
SN	Serial Number Identifies the device on the name plate Year of manufacture as two digits of the serial number: 5.+6. digit
	Safety Sign: Read the manual!
	APPLICATION PART Type B acc. EN 60601-1
	Disposal NOT in the household waste, but to the collection point for electronic devices or back to the manufacturer
	Name of the manufacturer on the name plate
	USB-Connection to the Computer
	Left Identifies the measuring device for the left foot: red
	Right Identifies the measuring device for the right foot: blue
	Don’t drop. Attention breakable!
	Component contains parts at risk from ESD. Don’t touch electrically conductive parts. Only touch the case.
FC	Identifier NaviLock: The device meets the interference immunity requirements of the Federal Communications Commission USA
CE 1588	Identifier TP Link: CE Identifier with number of notified body
RoHS	Identifier TP Link:Conformity with EU Directive 2011/65 / EU regarding the restriction of the use of hazardous substances
ME06	Identifier TP Link:GOST-R quality certificate of the Russian Federation with identification number of the testing laboratory

Name plate wireless data transmission WLAN	
Name plate USB charger (Cradle)	
Name plate wireless data transmission Upat4	
Name plate wireless data transmission Fumod4	
Name plate pressure measuring platform Basic	

Name plate pressure measuring platform Pro	
Name plate pressure measuring platform Funk	
Name plate seat pressure measurement	
Name plate pressure measuring insole FLEX	
Name plate pressure measuring insole WLAN	

3 medilogic – orthopaedic measuring system for static and dynamic measurement of pressure under the foot

3.1 Application

The intended use for the medilogic product family is as diagnostic help for orthopaedics and sports medicine to record the basic data and afterwards evaluate the load distribution under the foot during walking and standing.

Furthermore is aids in getting the basic data for manufacture, adaption, inspection and documentation of shoe care with the view to load distribution in static and dynamic situations. The medilogic foot scanner can be used to optically capture the sole of the foot.

Basically medilogic must be viewed as an enhancement in the varied interplay between diagnostic an d crafting processes. Thus a comprehensive assessment of the individual situation can not be based on the display of the load distribution alone. It is the responsibility of the user (e. G. physician or orthotist), to compare the conclusions from measurements and further examination like anamnese ,X-Ray or etc.

Thus medilogic enables the optimization of insole and bespoke shoe care (especially for diabetic and rheumatic feet), furthermore the zones of load of the foot can be shown. This supports You in documenting the effectiveness work and can have impact on customer motivation.

With medilogic medical crafts are handed a tool, which facilitates better diagnoses and in-house quality control. medilogic supports You in providing care according to the customers needs with insoles and orthopedic aids.

The medilogic seat pressure measurement is used to record basic static and dynamic data to evaluate the load during sitting. For example customers with spinal cord injury can be tied to the wheelchair due to paralysis, since these often affect the body from chest downwards. According to the degree of disability special seat cushions or individually formed seats and shells can be adapted. With seat pressure measurement potential pressure points can be identified during the production process. The finished product can be checked for effectiveness and corrected if necessary as well as documented.

3.2 Description of the System

The medilogic foot pressure measurement system consists of the pressure measuring insole which is placed inside the customers shoe and the WLAN transmitter module which is connected to the insole and attached to the Leg. From there the recorded data is sent wireless to the WLAN interface of a computer.

The version with the Upat4 wireless data transmission has a customer modem (optionally with integrated data logger, which is attached to the customers back and transmits the data to a second modem connected to a computer. With the medilogic pressure measuring platform the customer modem ist attached to the case of the platform, the customer stand with socks on the platform.
The medilogic pressure measuring platform basic and pro have cable connection directly to the USB port, which transmits the recorded data to the computer. With the wireless version the integrated modem in the platform transmits the data to a modem connected to the computer.

For the medilogic seat pressure measurement the mat is placed underneath the sitting patient and the cables from the flexible mat are connected to the customer modem.

The medilogic software built to run on WINDOWS® displays the recorded values instantly on the computer monitor. Immediately after turning on the measuring devices the recorded data is displayed as graphics on the monitor. The pressure distribution can be displayed as isobaric colour graphic or as three dimensional coloured mountain representation.

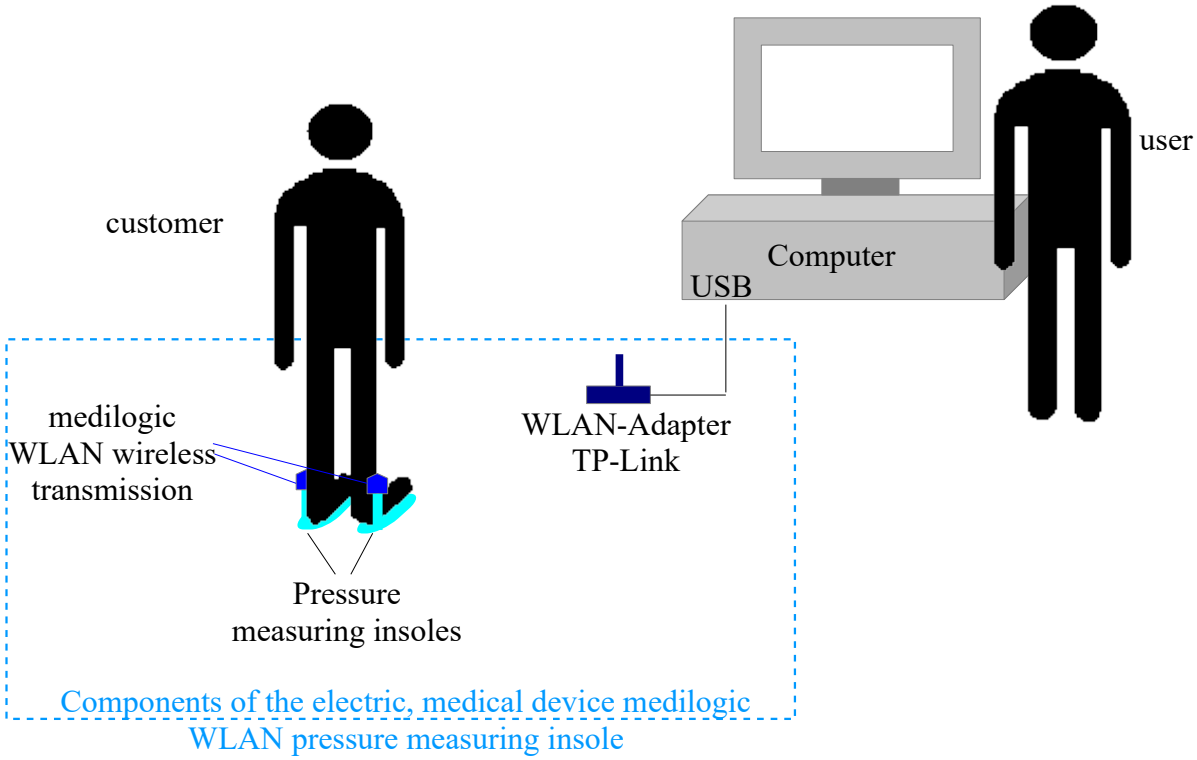
The operation of medilogic is comparable to a recording device. With press of a ‘button’ (mouse click) the measurement (recording) is started. After the recording is done it can be viewed in fast forward, at normal speed, in slow motion or step by step one point in time at a time.

The display of maximum pressures, of the averages, the pressure momentum as well as the path of the centre of pressure as gait line and cyclogram is possible. Images of these can be sent to a printer.

Two recordings can be compared. To store the data on hard disk each recording can be associated with a patient. Later evaluation of the data is always possible. A comprehensive data management function allows for backup, export and import of measurements.

The following graphics represent the system configurations and scope of delivery of the medilogic pressure measurement system in detail:

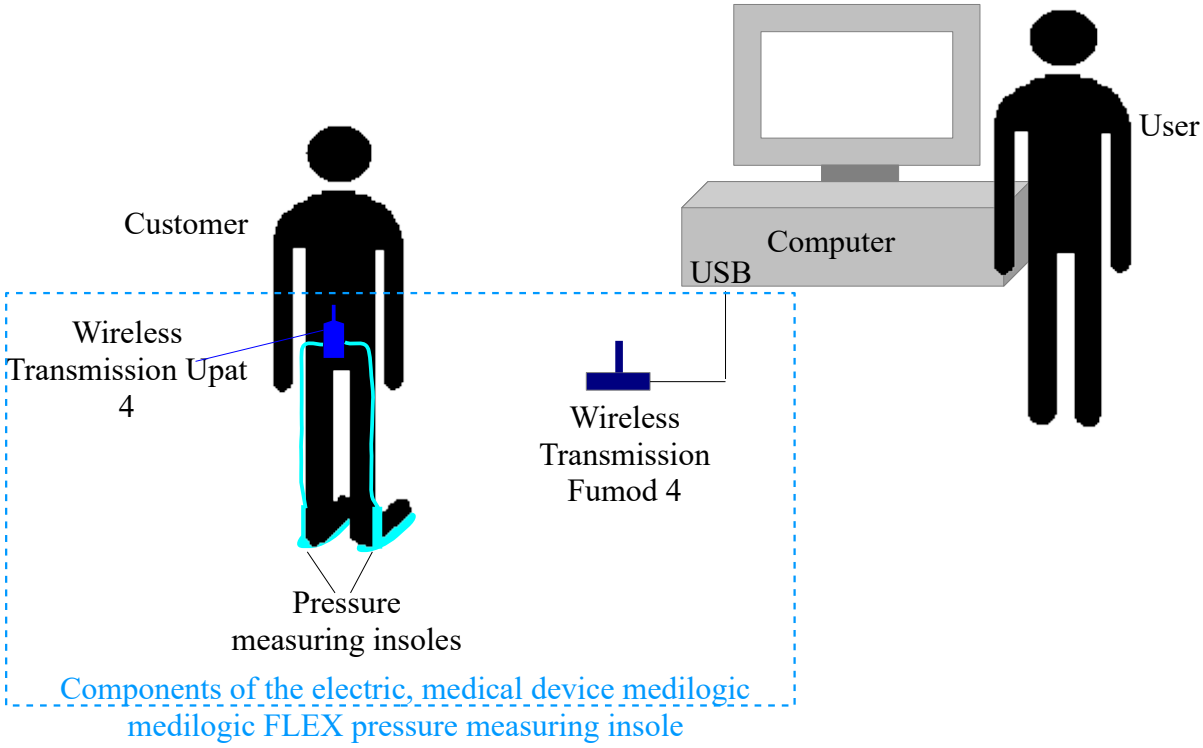
3.2.1 **Schematic Diagram** medilogic WLAN pressure measuring insoles



Scope of delivers of the *medilogic WLAN pressure measuring insole are the following components*:

Num.	***Component***	***Classification***
10	WLAN pressure measuring insoles Size 37/38,...,45/46	Application part type B acc. EN 60601-1
2	medilogic WLAN wireless transmission	Application part type B acc. EN 60601-1
2	USB Charger (Cradle)	accessories
1	WLAN-Adaptor TP-Link: TL-WN 822N	accessories
1	USB-cable 1,45m	accessories
1	USB Adapter NaviLock: 61863	accessories
2	Leg cuff, elastic, velcro: 10cm x 50cm	accessories
1	Manual	accessories
1	medilogic Software CD	Application software
1	System case incl. Foam inlay	packing

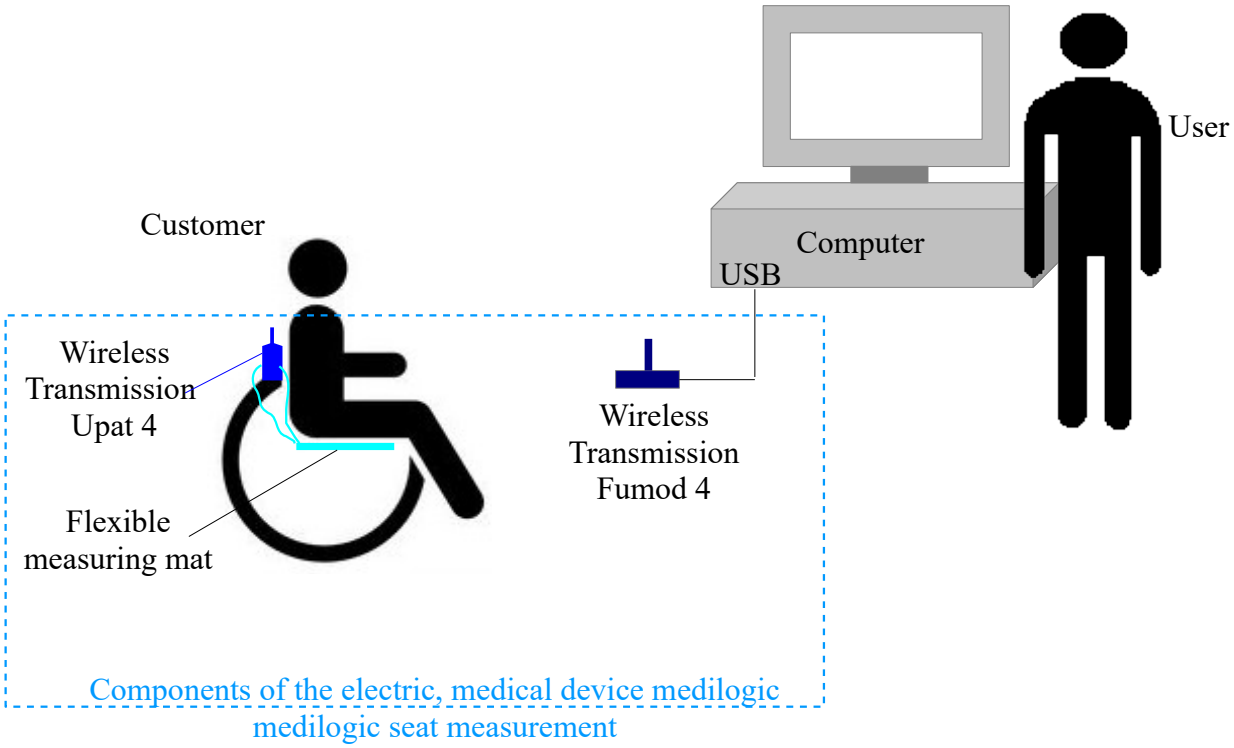
3.2.2 **Schematic Diagram** medilogic Flex pressure measuring insoles



Scope of delivers of the *medilogic* FLEX *pressure measuring insole are the following components*:

Num.	***Component***	***Classification***
10	FLEX Pressure Measuring Insole Gr. 37/38,...,45/46	Application part type B acc. EN 60601-1
1	medilogic wireless transmission Upat 4	Application part type B acc. EN 60601-1
1	medilogic wireless transmission Fumod 4	accessories
1	USB-cable 1,8m	accessories
2	Leg Cuff, elastic, velcro: 10cm x 50cm	accessories
1	Manual	accessories
1	medilogic Software CD	Application software
1	System case incl. Foam inlay	packing

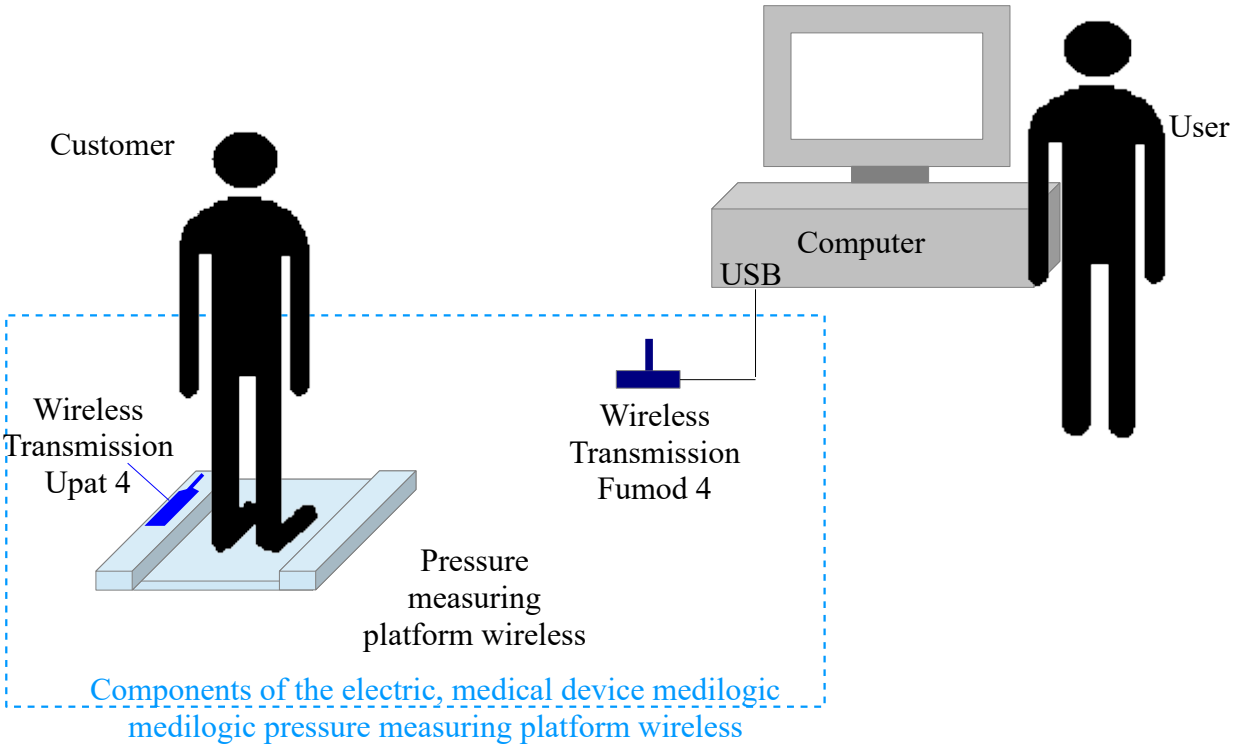
3.2.3 **Schematic Diagram** medilogic Seat measurement



Scope of delivers of the *medilogic* seat *pressure measurement are the following components*:

Num.	***Component***	***Classification***
1	Flexible Measuring Mat	Application part type B acc. EN 60601-1
1	medilogic wireless transmission Upat 4	Application part type B acc. EN 60601-1
1	medilogic wireless transmission Fumod 4	accessories
1	USB-cable 1,8m	accessories
1	Manual	accessories
1	medilogic Software CD	Application software
1	System case incl. Foam inlay	packing

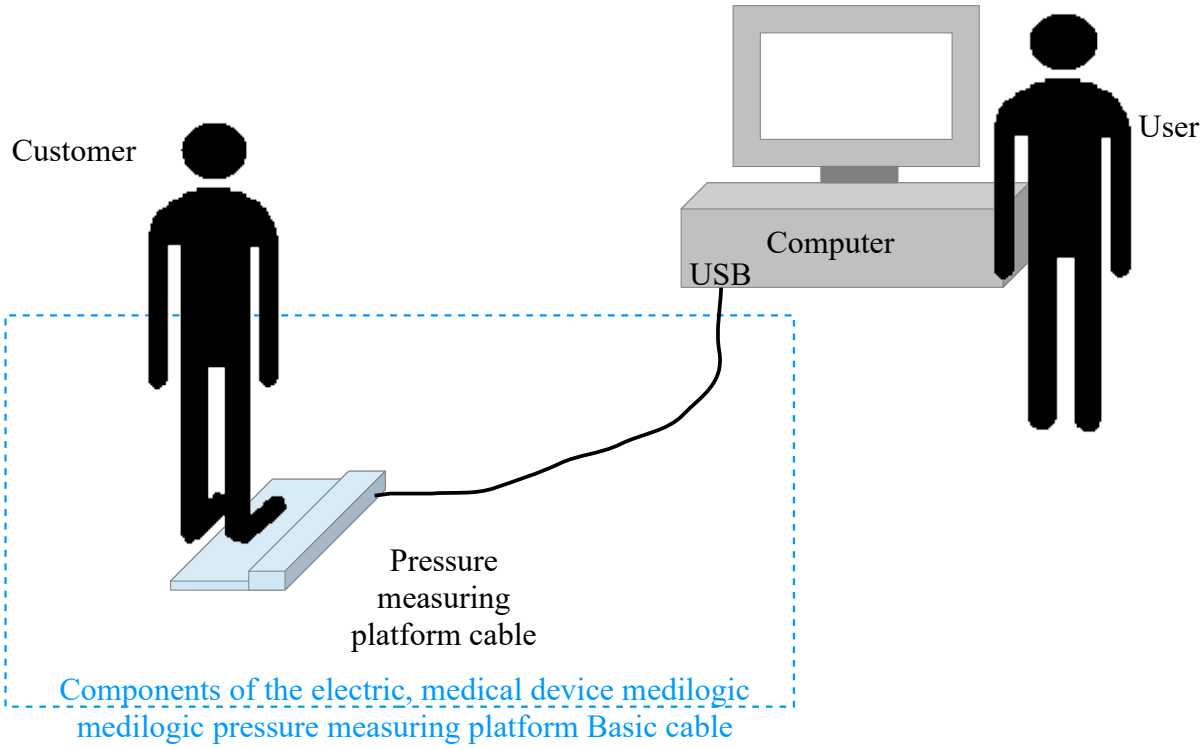
3.2.4 **Schematic Diagram** medilogic pressure measuring platform wireless



Scope of delivers of the *medilogic* wireless *pressure measuring platform are the following components*:

Num.	***Component***	***Classification***
1	Pressure Measuring Platform Wireless	Application part type B acc. EN 60601-1
1	medilogic wireless transmission Upat 4	Application part type B acc. EN 60601-1
1	medilogic wireless transmission Fumod 4	accessories
1	USB-cable 1,8m	accessories
1	Manual	accessories
1	medilogic Software CD	Application software
1	System case incl. Foam inlay	packing

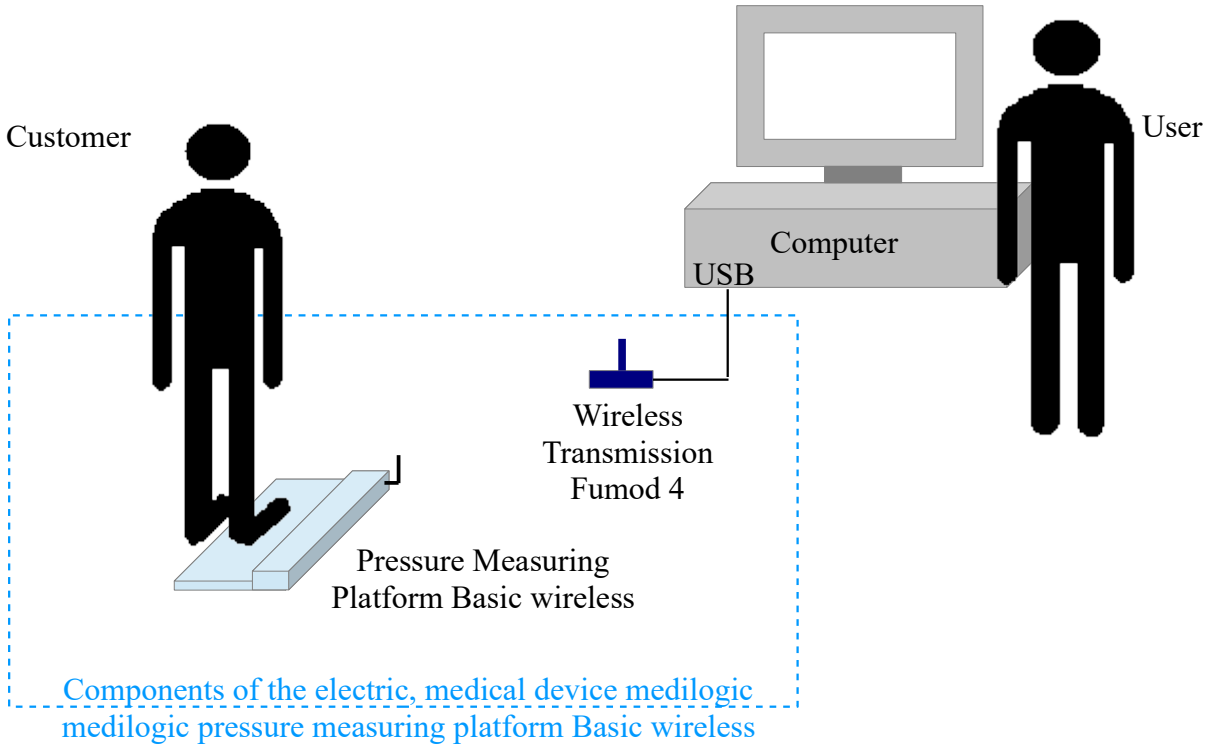
3.2.5 **Schematic Diagram** medilogic pressure measuring platform Basic cable



Scope of delivers of the *medilogic pressure measuring platform Basic cable are the following components*:

Num.	***Component***	***Classification***
1	Pressure Measuring Platform Basic Cable	Application part type B acc. EN 60601-1
1	Manual	accessories
1	medilogic Software CD	Application software
1	System case incl. Foam inlay	packing

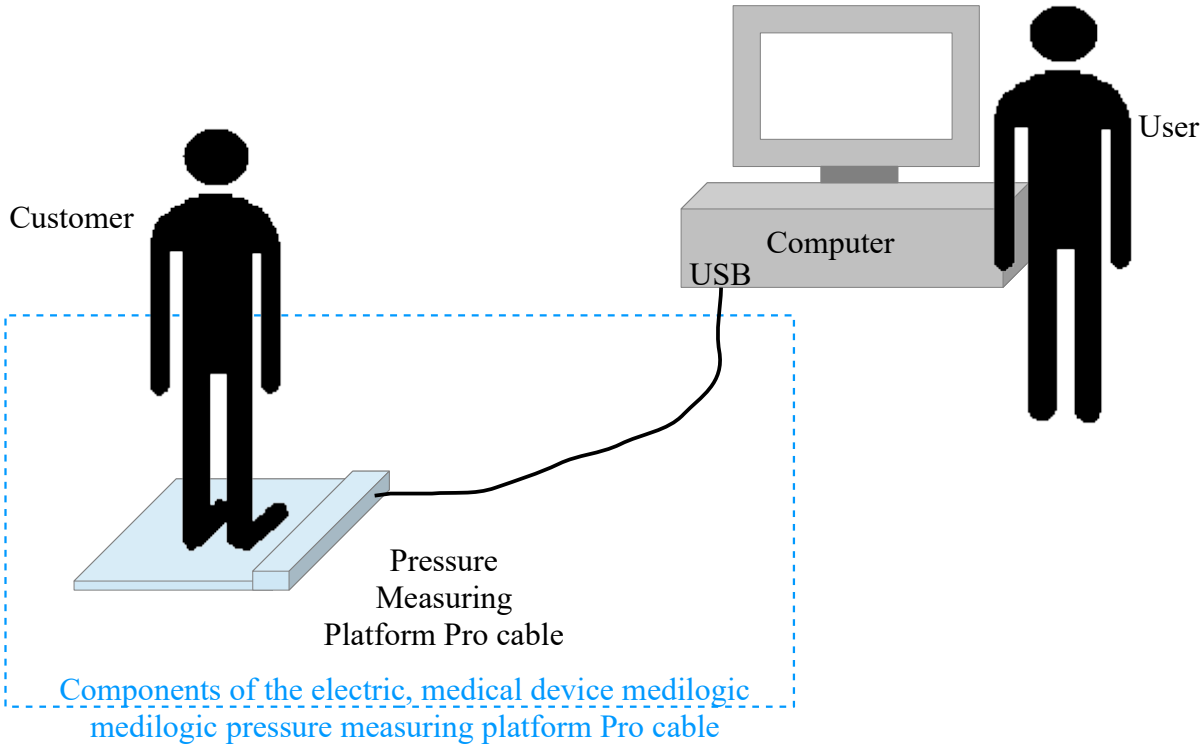
3.2.6 **Schematic Diagram** medilogic pressure measuring platform Basic wireless



Scope of delivers of the *medilogic pressure measuring platform Basic wireless are the following components*:

Num.	***Component***	***Classification***
1	Pressure Measuring Platform Basic Wireless	Application part type B acc. EN 60601-1
1	medilogic wireless transmission Fumod 4	accessories
1	USB-cable 1,8m	accessories
1	Manual	accessories
1	medilogic Software CD	Application software
1	System case incl. Foam inlay	packing

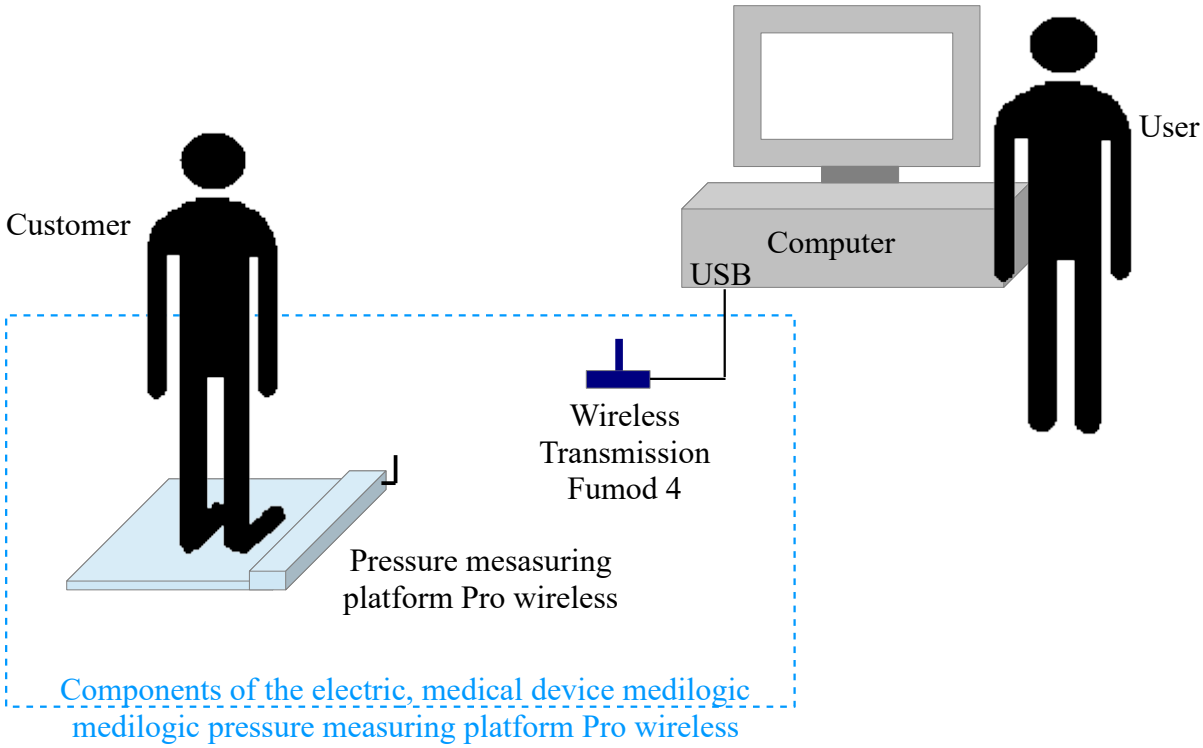
3.2.7 **Schematic Diagram** medilogic pressure measuring platform Pro cable



Scope of delivers of the *medilogic pressure measuring platform Pro cable are the following components*:

Num.	***Component***	***Classification***
1	Pressure Measuring Platform Pro Cable	Application part type B acc. EN 60601-1
1	Manual	accessories
1	medilogic Software CD	Application software
1	System case incl. Foam inlay	packing

3.2.8 **Schematic Diagram** medilogic pressure measuring platform Pro wireless



Scope of delivers of the *medilogic* p*ressure measuring platform Pro wireless are the following components*:

Num.	***Component***	***Classification***
1	Pressure measuring platform Pro Funk	Application part type B acc. EN 60601-1
1	medilogic wireless transmission Fumod 4	accessories
1	USB-cable 1,8m	accessories
1	Manual	accessories
1	medilogic Software CD	Application software
1	System case incl. Foam inlay	packing

3.2.9 Possible Combination of Accessories and Components

The medilogic system can be combined resulting in different system configurations described in the following matrix(possible combinations are marked with an **X**).

	Insole 64	Insole FLEX	Insole WLAN	flexible Mat	platform-wireless	platform Basic-wireless	platform Pro-wireless
Wireless Transmission Upat4 (Upat4/Fumod4)	**X**	**X**	**--**	**X**	**X**	**X**	**X**
Wireless Transmission WLAN	--	**--**	**X**	**--**	--	--	--
Pressure Measuring platform Basic-cable	--	--	--	--	--	--	--
Pressure Measuring platform Pro-cable	--	--	--	--	--	--	--

For the combination of the medilogic foot scanner with the computer system please follow Chap. 4.2.

The minimum requirements acc. Chap. 7.1 apply.

The medilogic software offers easy data entry from the *elektronische Gesundheitskarte (eGK)* via one of these interfaces:

- MTK+ Terminal ST-2052
- eHealth-BCS Tastatur G87-1504
- eHealth-BCS Terminal ST 1503

The medilogic system can not be combined with systems from other companies.

3.3 Contraindications to the Use of the medilogic Pressure Measuring System

The medilogic pressure measuring system may only be used as described in chapters 3.4 application and safety instructions.

The use is not permitted if:

- the customer is not able to safely stand during the measurement period, or safely sit in case of the seat measurement.

3.4 Special Instructions for Use

Using the medilogic system as medical device the following instructions have to be adhered to in order to insure proper and safe use.
The measuring system may only be used and handled by staff trained in the use and handling of the system. Special care needs to be taken to avoid damage to the sensors (insoles of measuring platform) from sharp of pointed objects. Bending the insoles sharply must also be avoided. (see 7)

Safety Instructions

To ensure customer safety the following precautions need to be adhered to. The wireless transmission Upat4 is attached to the customer using the belt delivered with the system in a way that it is firmly in contact with the customers back and freedom of movement is not compromised. The tongues of the insoles must be attached to the lower leg using the Velcro leg cuffs. When the system is used to record fast movements during sports the cables need to be secured to avoid catching on objects.
When used with Customers with walking disorders the user has to monitor the customer carefully to prevent falls during the measurement process.
Using the cable versions of the pressure measuring platforms Basic/Pro or the wireless platform special attention needs to be focused on safely securing the cables to avoid tripping the customer. Avoid pulling on the cable during use or transport under all circumstances.
In order to ensure safety and hygiene the medilogic system may not be used in such a way that the bare skin comes in contact with the sensors. The medilogic system is designed for use over a limited amount of time and should only be attached to the patient for a limited amount of time.
Furthermore the surface of the sensors needs to be disinfected before the are used with the next customer to avoid infections. The cleaning procedures using a moist cloth described in the following section need to be adhered to. Using the medilogic system with fluids is not permitted to prevent endangering the customer, the user or system components. Make sure that no inflammatory wound liquids come in contact with the surface.
To ensure the product features especially the leatherette covering the sensors softeners (phtalates) are necessary. Because the intended use of the system: no direct skin contact, limited application time, ensure that the softeners pose no risk to user or customer. The risk of transition of the softeners into the customer body can be assessed as being small, the usefulness outweighs the residual risk.
The use of the medilogic system with a computer system requires the proper functioning and electrical safety of all computer components. For this the safety instructions chapter 5.3 concerning installation and checking of the computer system under operator responsibility have to be complied with.
The connector to the power grid (or the USB cable) need to be easily accessible for safety reasons in order to completely separate the system from the power grid if necessary.
Using the Li-Ion batteries of the WLAN transmission basic safety instructions have to be complied with: Do not open the devices, do not let the devices get wet, do not charge the device when it is attached to the customer.
The medilogic system is intended to be used in an electro magnetic environment that is controlled for HF disturbances. The user should avoid electro magnetic disturbances by adhering to the instructions in chapter 8.2 concerning operating environment and the recommended minimum distances to HF telecommunication devices.

Cleaning and Disinfection

Clean the sensor surface and the cases using a soft moist cloth without detergents, take special care that no moisture enters the devices; don’t use abrasive detergents or sharp edged objects.
To avoid the transfer of infections via the sensor surface of the pressure measuring system disinfect the surface before and/or after each customer
In order to disinfect the sensor surface (pressure measuring insoles, pressure measuring platforms, flexible mats) wipe them off with disinfectants that can be found in the VAH list (Verbund für Ange-

wandte Hygiene e.V.) according to criteria set out by the DGHM (Deutsche Gesellschaft für Hygiene und Mikrobiologie). Please pay attention to the product description of the disinfectant. Use cloth soaked in disinfectant, do not apply the fluid to the sensors directly. To ensure customer safety and flawless sensor operation make sure that during the cleaning process fluids or impurities can not enter the sensors through faults in the surface.
The user must take care that no damage to the device are present, that could lead to injuries (e.G. sharp edges). Damaged components need to be send to the manufacturer for repair.

Maintenance

- **Charging the Batteries:**

The WLAN transmitters have a Li-Ion battery as power supply. Charging by the user is done with a USB charger that is attached in the same way as the measuring insoles are attached to the transmitter. First put the transmitter on the cradle then make the connection to the USB port or the NaviLock charging adaptor.
Should it be necessary to replace the Li-Ion-Battery this must be done by personal trained by the manufacturer to ensure safety.

- **Changing Block Batteries:**

The medilogic wireless transmission Upat4 and the pressure measuring platforms Pro wireless and Basic wireless have a 9V Alkaline Block Battery as power supply (the USB cable version operate without battery). The battery capacity is monitored by the software as soon as the system starts, should the voltage drop to far a warning is shown in the software. The user can change the battery. Make sure You get a alkaline or lithium battery which offer much longer operation time than cheaper batteries.

- **Calibration:**

The electronics attached to the sensors store calibration tables, which need to be checked regularly (at least once a year) by the manufacturer and adjusted if necessary. For this the system has to be sent to the manufacturer in the system case packed shock protected in a cardboard box.

- **Preventive Inspection:**

Additionally to the cleaning and disinfection mentioned above the user has to make a preventive inspection at least once a year to check that:

- sensor surface is clean, free of crinkles and damages
- transmitter case free of mechanical damage
- platform case free of mechanical damage
- USB-cable and connector free of damage and kinks
- insole cable and connector free of damage and kinks
- battery connector free of damage (wireless transmitter Upat4)

Disposal

The used batteries have to be disposed of according to local laws and regulations
The components of the medilogic pressure measuring system contain electronic parts, they have to be disposed of according to local laws and regulations or sent back to the manufacturer

Storage and Transport

To protest from dust, dirt and moisture and other impurities or damage the system components have to be stored in the system case or a place suitable for storing electronic measuring equipment. Please make sure that the insoles are stored lying flat in the compartment designed to hold them. Under no circumstances may the insoles be stored or transported folded or bent sharply. Transport of the mobile

system components has to be done using the system case or bag designed for that purpose. Store the system case lying flat since especially the platform cases are prone to topple.

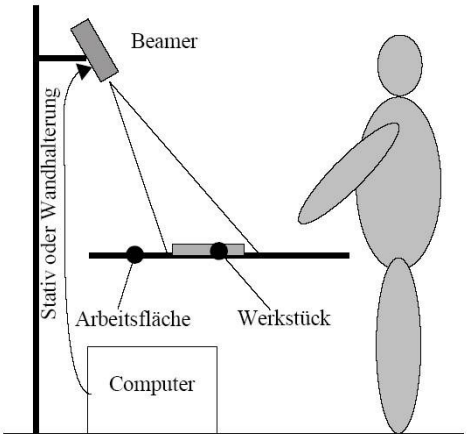
The system case protects the components from shocks and other mechanical damage during transport. Especially sending should only be done in the system case best wrapped around with a cardboard box.

All changes by the user to system components (especially improper repair) and use other than intended can cause failure and void the manufacturers responsibility and guarantee.

Don't drop, Attention breakable!

3.5 medilogic Projection

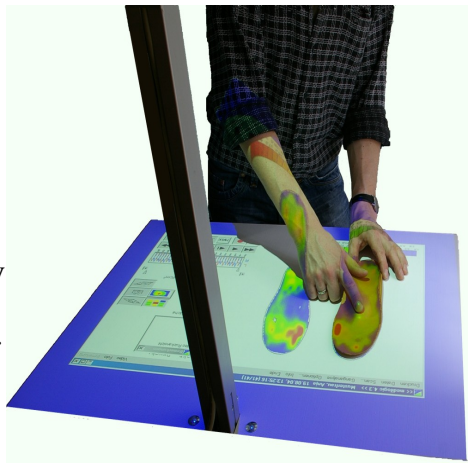
The usefulness of the medilogic foot pressure measuring system gains a whole dimension through projection the load distribution on top of an insole:



Patented Procedure
DE 10 2004 046 3 29

It simplifies the production process by projection 1:1 the representation of the load maxima onto the work piece. Instead of using the traditional paper printout You 'magic' the medilogic pressure measurement directly onto Your worktop. The high intensity projector can make the colour graphics visible even on dark material.

Using the only now available **display to scale of static and dynamic load distribution** onto the outer insole You gain new insights into how Your product interacts with the foot.



The setup is done once during installation of the projection system in such a way that sensors and foot scans are displayed to scale. Since the medilogic software will scale insoles according to size no further adjustment is necessary.

For proper display to scale the following instructions are helpful:

medilogic pressure measuring platform (Funk/Pro/Basic)	Window mode maximized, measuring area (black outline) (48x48)cm²
medilogic pressure measuring insoles FLEX/WLAN	Window mode not maximized. The window size decides the size of display for the insole. Scale the display with an insole or 1:1 print out
medilogic foot scanner	Window mode not maximized. The window size decides the size of display for the insole. Scale the display with 1:1 print out Window size is stored and recalled if 'Options: Display/General: scan window scale for projection' is set.

4 Installation and Commissioning

4.1 Installing the hardware

4.1.1 WLAN-Insoles

The transmission of measuring data is directly between the WLAN module connected to an insole and the computer. Data reception on the computer can be either with a built in WLAN device which is configured by the software for direct connection, or with a WLAN adapter connected to a USB port(TP-Link is part of the accessories). The hardware driver for the WLAN adapter delivered with the system is on the installation media in the 'tools' folder and has to be installed before use.

The WLAN transmitter module switches on as soon as an insole is inserted the WLAN connection is initiated. As soon as the medilogic software is started the selected WLAN adapter is configured for use with medilogic measurements.
Please note that the WLAN interface can now not be used to connect the computer with Your network. Should this be necessary we recommend the use of the WLAN adapter delivered with the system (TP-Link)
Battery status of the WLAN transmitter module is indicated by the upper blinking LED: green means good, yellow/orange low capacity. If the LED turns red it is time to connect the module to the cradle delivered with the system.

4.1.2 Upat4 Wireless Data Transmission

The medilogic system with the Upat4 Wireless Transmission uses two modems for data transmission. One is connected to the computer and called the computer modem. It is connected directly to the USB port.
The other modem is near the customer/patient (for the insole system on the back of the customer) and is called the customer modem. The sensors (insoles, platforms and flexible mats) are connected to the customer modem.
The customer modem, provided it has sufficient power supply, instantly operational without the need for an installation procedure.
The USB computer modem is connected directly to a USB port. The hardware installation is automatic since it is detected as human interface device (HID) the driver is provided by the WINDOWS® operation system.

Note for Windows 8, 8.1 and 10:
The orange LED on the computer modem should blink if the medilogic software is not running, while running it should light up constantly. If that is not the case the function „FuMod4USB-Problembeseitigung für Windows 8.1“ from the installation media has to be started.
The tool can also be downloaded from the medilogic home page: www.medilogic.com

4.1.3 Installation of a Chip-Card Reader (eGK)

This reader only applies to the German medical insurance system.

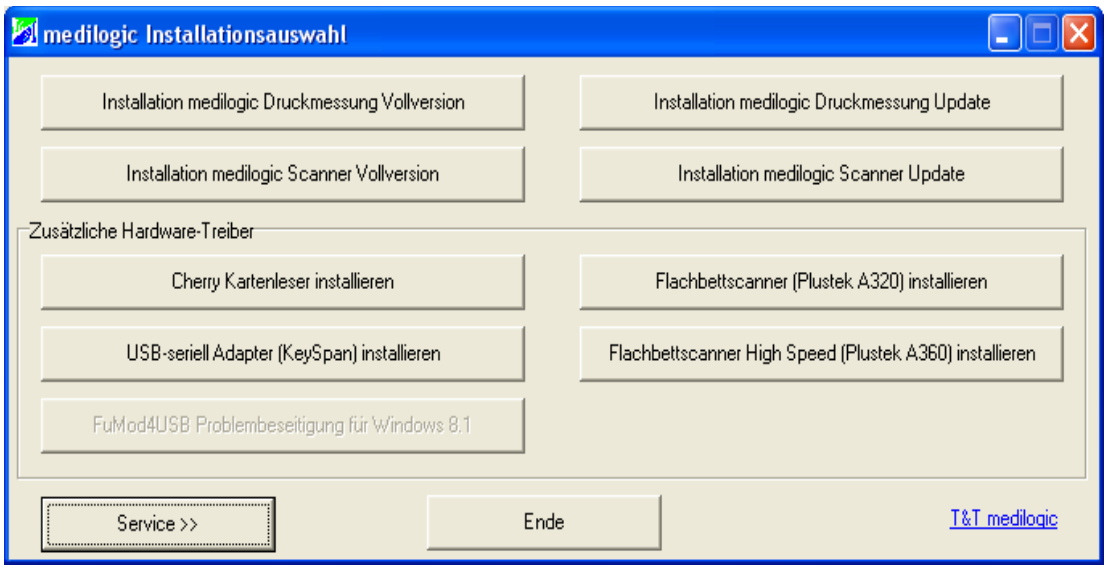
4.2 Installing the software

Before You can start using the medilogic system the software has to be installed to the hard disk of your computer. When purchasing the medilogic system together with computer hardware, the software is pre-installed. In all other cases the following point need to be checked:

- The computer is able to run Windows® operating systems and fulfils the hardware requirements:
  see 7.10 Technical Specifications for the Foot Pressure Measuring System
  see 7.11 Specifications for the Platform Measuring System
- The operating system Windows® 7 / 8 / 8.1/ 10 is already installed. If not, install the operating system first following the instructions that come with it.
- Necessary hard disk capacity.
  The programme for the medilogic pressure measurement system requires 200MB space on the hard disc. At least 10 GB free space are recommended for measurements and the SQL-server. If You use video capture with medilogic we recommend an additional 20 GB of hard disk space.
- *The computer system has to be certified according to IEC 60950 and checked regularly according to BGV A3. The responsibility lies with the operator of the system.*
- *Furthermore operating a medical device (medilogic) with a non-medical device (standard Computer) DIN EN 60601-1-1 and DIN EN 60601-1 need to be adhered to, which also is the responsibility of the operator.*
- During the installation of the software on Your computer admin rights are necessary. Please log in as fully privileged admin.

To install the software on the WINDOWS® operating system just connect the installation media to the computer and start the medilogic setup. The setup will guide You through the necessary steps of the installation.

Installing Version medilogic 5.x for systems with wireless transmission Upat4 and pressure measurement platform wireless / Basic / Pro:



If the setup does not start automatically when the install media is inserted, please open the file explorer find the install media and start the 'autorun.exe' by hand (double click with left mouse button)
A dialogue opens showing the default path for installation on Your hard disk drive (c:\program files\medilogic or c:\program files(86)\medilogic on win7 and above).
If You don't have reason to change that click with the mouse pointer on the large, square setup symbol.

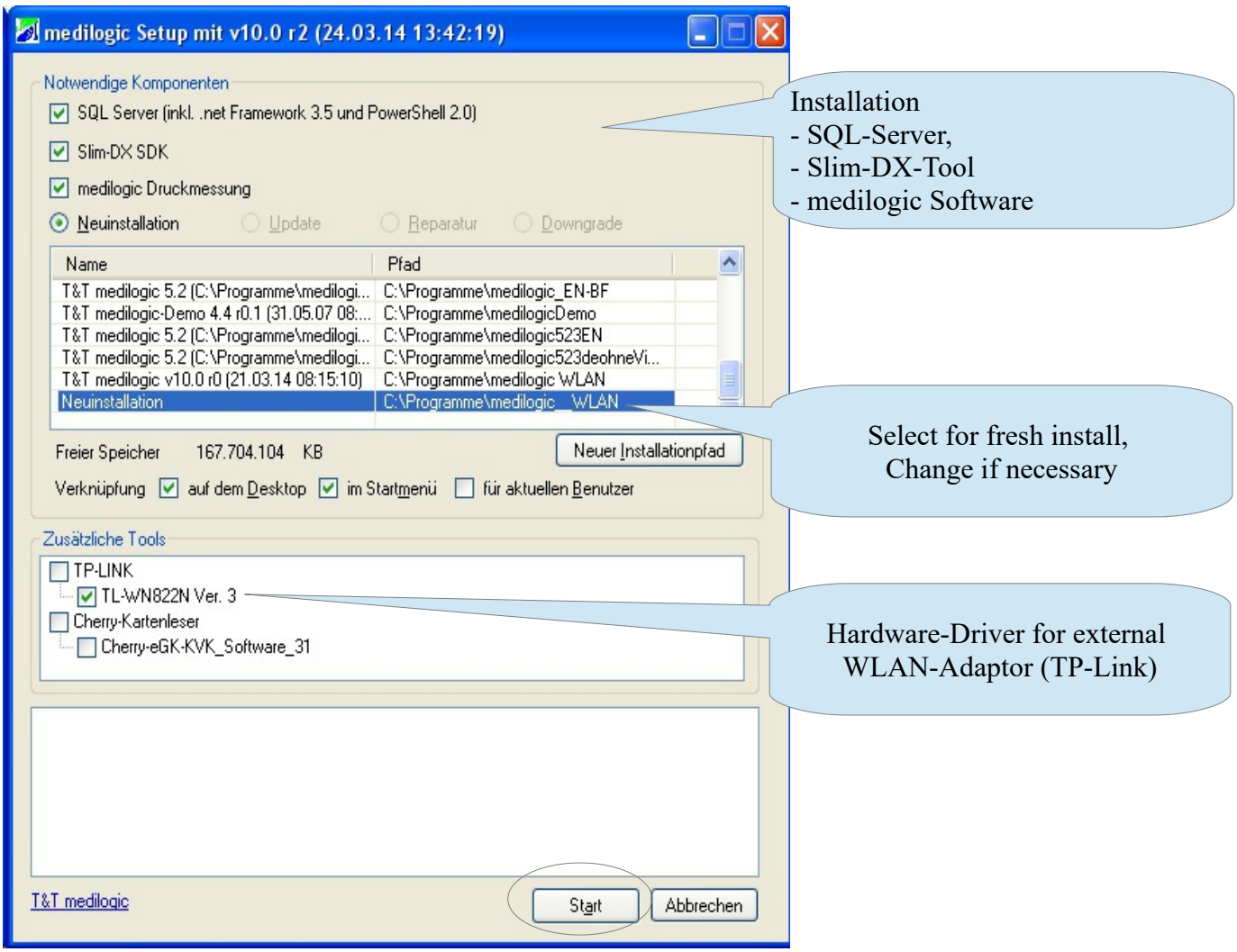
Now all necessary files are copied to the hard disk and the medilogic system is set up. The last dialogue of the installation process asks where You want the icons for medilogic to be placed and which.

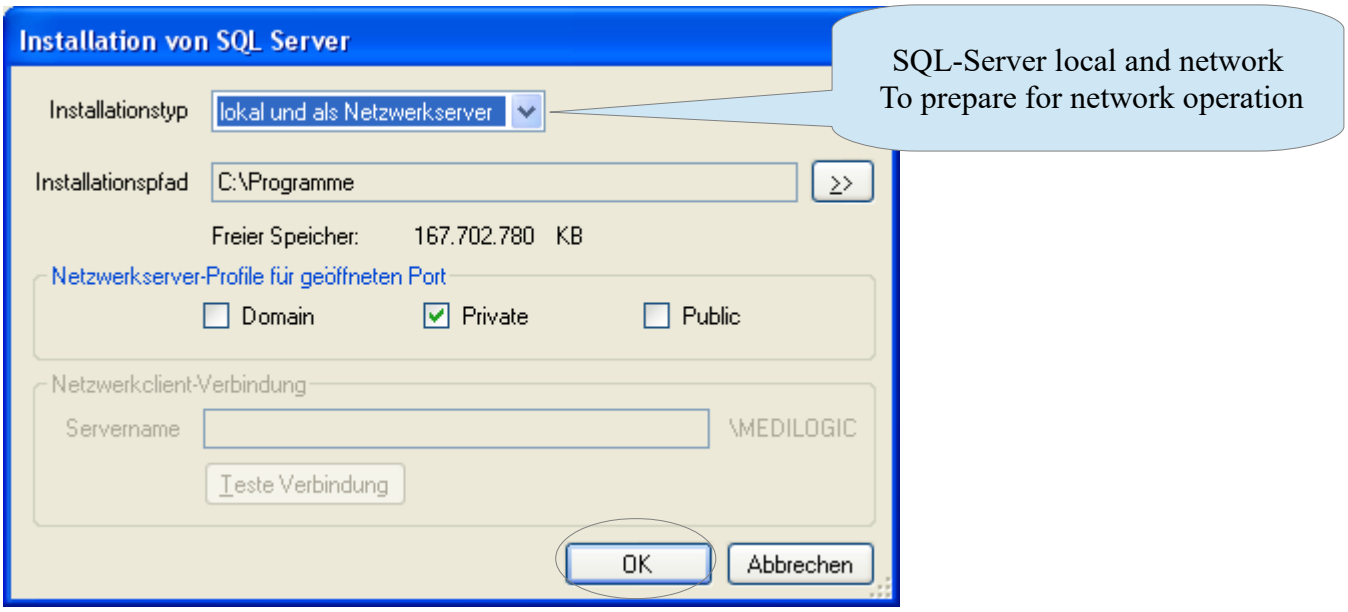
see 4.1.3 Installation of a Chip-
see 6.8.3 „Extra"

Note for Windows 8, 8.1 und 10:
When the medilogic software is not running the orange LED on the computer modem should blink slowly and while the software is running it should be on continuously. If that is not the case please start:
„FuMod4USB-Problembeseitigung für Windows 8.1" from the setup menu shown above.

We also provide the configuration tool as download on our homepage www.medilogic.com.

Installing Version 10.x for Systems with WLAN data transmission:
Using the version 10.x and upwards of the medilogic system for WLAN devices, You need to install the Microsoft SQL- Server and necessary helper programmes. The necessary components are all listed in the selection of the setup programme as shown below.





5 Recording a Pressure Measurement

5.1 Quick Start – Preparation and Measurement

If You are an experienced WINDOWS® user, handling of the programme will come easy to You. The software is designed to be easily understood focusing intentionally on function relevant to everyday use. This eliminates long training. This section will show You the most important steps for preparation and measurement. The details can be found in the corresponding chapters.

Please follow these steps to use the medilogic system:

- ***Setup the Hardware*** see 4.1 Install
- ***Install the software*** see 4.2 Install
- ***Start the medilogic pressure measurement software***:
  Click or double click on the medilogic icon depending on whether the icon is located on the desktop or in the menu. The medilogic software will now start. You can use the system as soon as the software finished loading.
- ***Preparing*** for the measurement: see 7.1
  Insert the insoles in to the shoes (red – left; blue - right), attach with velcro strips to the legs, connect to WLAN transmitter or Upat4 wireless transmitter using the cable attached to the insoles, belt on the transmitter and switch it on (short pressure on the button situated on the side of the case; power LED of the transmitter will light up).
  Connect wireless pressure measurement platform to the Upat4 transmitter and switch it on. The wireless measurement platforms Basic and Pro are switched on by using the switch on the side of the case; the cable version Basic and Pro just have to be connected to the computer to power up.
  The pressure values of the sensors should show up on screen after a short initialisation phase.

  Please use the insoles and platform only wearing socks!

- ***Starting*** a recording/measurement see 6.3
  Recording starts as soon as You press the red recording button.
- ***Saving*** the recording with customer information
  Enter the first name, name and date of birth and further customer data as needed.
- ***Evaluating*** the pressure measurement see 6.2.3 ff.
- ***Printing*** the pressure measurement see 6.4 Print
  Choose the appropriate print out from the menu ‘Print’
- ***Finally*** detach the WLAN transmitter from the insoles or switch of the Upat4 wireless transmitter by pressing the button on the side until the double beep sounds, close the software.

Everything else is easily explored. Enjoy!

5.2 Notes for dynamic pressure measurements (Insole measurement /pressure measuring platform)

These notes represent the condensed knowledge from years of experience and hands on application, they can be used for easier access interpreting the results of foot pressure measurements. We are sure that most experienced users of the pressure measurement will know about this and operate the system accordingly.
The motivation for these notes is to capture the **characteristic** (every day) locomotive patterns of the customers, analyse and evaluate them.

The doctor will often put down on the prescription why an orthopaedic care is prescribed, but it is always advisable to make a short anamnese of Your own. Questions that should be asked concern injuries or illnesses (diabetes, rheumatism etc.) in recent years, current occupation (are there repetitive patterns of movement), pain, leisure activities (esp. sports) and so on. This should result in care like special insoles, that fit the individual load situations as well as possible. At the same time the answers will provide a good basis when the pressure measurement is analysed and evaluated. Many pathologies described by the customer will evoke certain concepts for motion defects with the user that will show up in the pressure measurement.

Often the customers will come for their pressure measurement wearing their best shoes. It is important to instruct the customer to bring their **every day shoes** for the measurement. These will already show the tell tale traces of continuous use. Usually the customer wants to use the insoles in these shoes anyway. These shoes constitute the integral part and basis for the locomotor system of the customer.
Even if these shoes are often rather harmful then helpful for the customer, they are reluctant to switch them for more suitable comfort shoes for reasons like price or fashion reasons. Many times the problems are caused by these insufficient shoes in the first place, for which the customer now seeks an insole solution. In view of that the insole need to take into account the characteristics of these shoes. This is not a good situation, but the shoe belongs to the customer and if he or she can not be convinced that has to be accepted and dealt with.

When conducting a pressure measurement, make sure that the customer has time to adapt to the measuring equipment and situation. There are physiological and psychological reasons for this. From a physiological point of view it is an important fact that biological systems try to minimize the energy needed for any given task. At the begin of locomotion higher friction occurs in the joints and has to be dealt with. This results in higher energy needs at the beginning of any locomotion. Only when the phase of minimized energy consumption is reached has also the point of steady state come .
The psychological components result from the inner agitation from being measured with an unknown technology. Many customers show the signs of this unaccustomed situation. Indicators are very short steps. Most customers loose this nervousness after approx. 20 steps. So we suggest a run in phase of 15 to 20 steps before starting the actual measurement. The same is true for measurements on the platforms. The customer should make some trial rounds with the instruction not to look at the floor.
The results form the run in phase should not be included in later evaluations. Leaving the customer in the dark about when the measurement actually takes place, will also prevent them from tensing and thus changing the gait pattern.
The recording should consist of an uninterrupted sequence of steps. This is only possible using the insole systems. Using the platforms limits the evaluation to a single step. Keep this in mind when evaluating results from a platform measurement, the recorded values could represent an accidental, not typical step, not representing the normal locomotor patterns of the customer.
To get an evaluation representing the customer typical locomotor pattern record 13 to 15 consecutive steps. This precludes the over interpretation of single events like tripping and these events skewing the results.

The **dynamic pressure measurement using the platform** has to be conducted in such a way that the swinging leg does not pass over the case of the platform, but over the free half of the platform (for the platforms wireless and Pro) or over the floor (for Basic platforms).
After roll off of the first foot the customer need to turn around and walk in the opposite direction over the platform hitting it with the second foot. The software will place the feet on screen so that the left foot is displayed left and the right foot on the right hand side.

The wireless transmission of the insole systems eliminates the need for a tread mill. This means that the measurements can be conducted anywhere. Space constraints might make it necessary for the customer to walk in circles. This results in one foot always on the inner curve and the other on the out-

side. If possible limit the number of turns the customer needs to take to avoid single sided locomotion and skewed evaluations. If spacial constraints make multiple turns necessary instruct the customer to walk the figure eight. This results in changing the position of the feet from inside to outside.

Include the customer in the process of evaluation to present the quality of Your service This builds trust with the customer and leads to long term customer loyalty. The customer will get a positive impression that You work according to the latest technology for orthopaedic care.

5.3 Notes for the static foot outline measurement (wireless pressure measurement platform)

Some aspects of making a measurement using the wireless pressure measurement need looking into. Experience with making these measurements have yielded some typical sources for error, which can be avoided heeding theses notes:
The static pressure measurement including the foot outline is controlled by menu described in section

(1) The feet of the customer should be place in the middle of the corresponding halves of the platform. Enough space around the feet should be left to draw the outline.
(2) During the recording of the load in step 2 the position of the feet should not be changed, but it is advisable to instruct the customer to lean on the side being outlined. This will help recording the full area of contact and avoid triggering additional sensor (e.g. from a collapsing foot arch) during the drawing of the outline.
(3) The outline is drawn according to step 3 by continuously dragging the pen with its rounded side over the platform. Take care to move slowly in order to capture enough points around the outline. You can stop and redraw parts of the outline, if not enough points have been recorded for the outline. Especially for the tight curves at the toes an heel attention has to be taken to record a sufficient number of points. Should false points be recorded (e.g. by accidentally putting the hand on the platform) the recording can be redone using the back arrows.
(4) In step 4 touching sensors on the outline will set markers (e.g. the metatarsals) which will show up as red crosses on the outline.
(5) The results for the corresponding foot are displayed and the steps can be repeated if necessary using the backwards arrow.

Compared to the traditional blue print the image of the foot thus obtained offers more information including the pressure distribution. Remember that the customer steps on a soft membrane, which is under a slight tension doing the traditional blue print. This will paint areas blue even if the load applied was minimal. The blue print will show areas, where the foot only touches the ground, but transfers no load. This happens often in the mid part of the foot. These areas are less pronounced using the medilogic pressure measurement platform.

6 Description of the *medilogic* - Software

6.1 *medilogic Systems* - Overview

The description of the programmes is structured in these main parts:

- First are buttons described displayed on the user interface. Buttons give easy access to the most important functions like recording and evaluation. *see 6.3*
- Next the graphics of the programmes are explained. *see 6.4*
- Finally follows a detailed description of menu entries. *see 6.5 ff.*

Since the software of the medilogic insole system and the medilogic platform system are similar in structure and use, they will be explained side by side in this manual. If a feature is only available in one of the programmes this will be marked.
The change between programme modes (e.g. insole and platform) happens automatically when the corresponding sensors are attached and switched on or a measurement is loaded. *medilogic* always starts in the programme mode last used.

The software also integrates control for the *medilogic foot scanner* additionally to the pressure measurement. The menu item 'Scan' provides access to these additional functions. Description of the functions of the foot scanner software are located in a separate manual for that product.

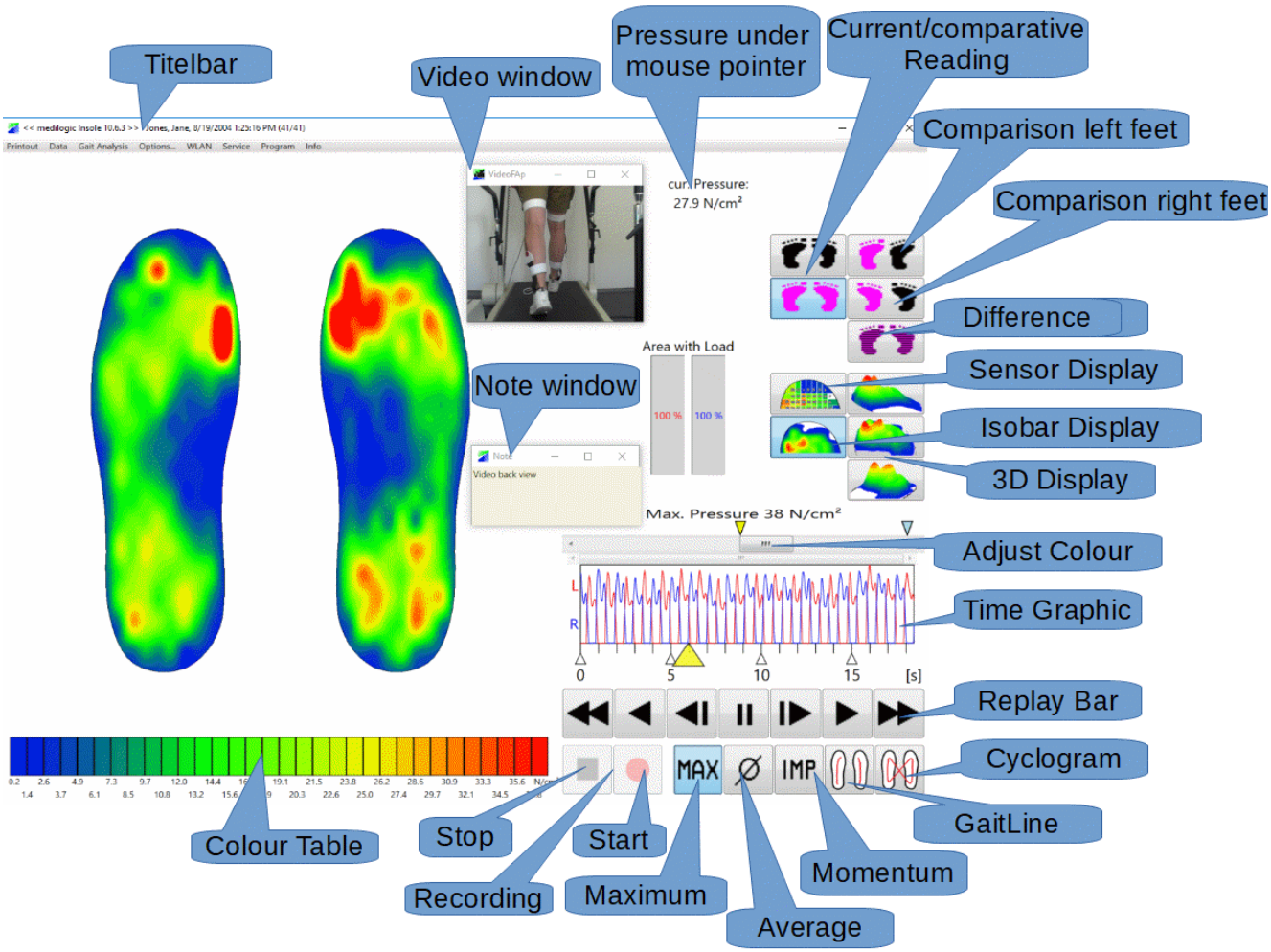
6.2 Buttons of the user interface – New basic programme interface medilogic WLAN

With software version 10.x for You have the option to switch between the new basic programme interface and the classic one. We strove to organize the buttons in such a way that the functions needed most often are easily accessible.
We used the same icons to make the transition as smooth as possible for our long term users.

Following is a overview of the new basic programme interface with labelling of the elements. The buttons described in the following chapter are valid for the classic view and the new basic programme interface, if appropriate the buttons are listed for both programmes:
Left above the text: Symbol for the classic basic programme interface;
Right above the text: Symbol for the new basic programme interface

6.3 Buttons of the User Interface – classic basic programme interface

The programmes of the *medilogic insole measuring system* and the *platform measuring system* are intentionally designed for use that is as simple as possible. The following graphic depicts the most important elements for the *medilogic insole pressure measurement system*. The graphical user interface for the platform measurement system is very similar and described in section *see 6.4* .



The important functions like control of a recording and evaluation can be accessed using the buttons displayed in the user interface. This gives a quick overview of the programmes functionality and shortens the work in phase considerably.
Using the programme is made even more easy by only making the buttons available, that are usable in the current state of the programme. All other buttons are either greyed out and not clickable or not displayed at all.

6.3.1 Recording a Measurement

The button with the red circle („Start“) represents the recording button. A recording is started clicking this button. Always the current measurement is recorded not the comparative measurement.

Note: Recording is only available if the measurement (black feet) is displayed or no comparative measurement is displayed. If the comparative measurement is selected the button is greyed out to indicate that it is not available. By selecting the measurement the button becomes available again.
If trigger mats (optional) are used a small point is displayed within the ‘Start’ button. This indicates that the use of trigger mats is activated. Triggering the mats would now automatically start a recording and stop it with a second trigger impulse.
see 6.8.3 „Extra“

6.3.2 Stopping a Recording

The button with the black square („Stop / Online“) is used to stop a recording and switch the software from replay mode to online display of current values.

A recording can be stopped using this button or is stopped automatically, when the recording time is up. (The standard for the maximum recording time is 60 seconds for insole measurements and 30 for platform measurements)– this can be set in: *see 6.8.3 „Extra“*).
Since shorter recording periods lead to recordings needing less space on the hard drive and the more complex evaluations run faster, recordings should be kept as short as possible.
Note: This button is only available if the measurement (black feet) is displayed or no comparative measurement is displayed. If the comparative measurement is selected the button is greyed out to indicate that it is not available. By selecting the measurement the button becomes available again.
After the recording is stopped it is advisable to save it, if You consider it worth saving.
For every day use it is advisable to automatically display the save dialogue directly after the recording stops. This option is available in: *see 6.8.4 Options*

6.3.3 Outline

➢ only available for *platform measuring system wireless and Pro* (*see 6.4*)
The foot outline in the *medilogic platform measuring system* is a static pressure measurement comparable to the classic blue print.

A click on this button will start the control menu, that helps the user through the process of making a outline measurement. It is easily controlled using three Buttons located on the platform and in the software:

Black Arrow :	„Back“ - one step backwards in the process,
Green Check :	„OK“ - accept the result of the current step and continue
Red Cross :	„Cancel“ - cancel the whole foot outline process

After a short period of load on the pressure measuring platform (loading the foot without lifting it from the platform) the outline can be drawn around the foot with the rounded side of the pen delivered with the system. Drawing of the pen (soft pressure and average speed) is supported by acoustic feed back, which tells You that the currently touche pressure point has been recorded for the outline.
Please read the notes for doing the outline measurement: *see* 5.3 (wireless pressure measurement platform)
After the outline process is finished it is advisable to save the measurement, if You think it is worth saving.

6.3.4 Replaying a Recording

The segmented replay bar is used to play back a recording, either after recording or loading it. I works like most devices for replaying recordings. The arrow direction indicates the play direction:


Slow motion (speed can be set in the dialogue Options/Display-General)


Replay in normal speed (depending on computer speed frames can be skipped)


Fast Forward or Fast Rewind (classic basic programme view only)


Pause (stops the replay at any chosen point in time)

All replay buttons will lock with one short click and reset with a second click (going to pause mode). If the buttons are pressed continuously they will not lock but reset to pause after release.
The option ‘infinite loop’ will start the replay at the beginning as soon as the end is reached.

6.3.5 Loading Measurement/Comparative Measurement

Clicking the grey folder allows You to load a measurement from the database, with the magenta folder You can load a comparative measurement for comparison.
In the classic basic programme interface You can find this function in the menu ‘data’ ‘load data’ and ‘load comparative data’.
The corresponding chapters 6.5.2 and 6.5.3 in this manual give a detailed explanation.

6.3.6 Evaluation Maximum Pressure

The button with "MAX" on it switches to the display of maximum pressure graphics. Now the highest values for every sensor from the whole recording or the currently zoomed period are displayed

6.3.7 Evaluation Average Pressure


The button with the average icon switches the display to averages graphics. Now the average values for every sensor for the whole recording or the zoomed part are displayed.

The method for the average calculation can tailored to incorporate all values or only the values above a certain threshold. This can be set using the menu ‘Options’ ‘Display/General’ ‘Method for Calculation of Averages’. We suggest the setting ‘20% of the maximum’, if You want to evaluate the pressure values from the load phase of a step. *see 6.8.1 Options „Display / General“*

6.3.8 Evaluation Momentum

➢ only available with the *insole measuring system*
The „IMP"- button switches the display to the momentum graphics. (Pressure) Momentum with the physical unit [N s / cm^2] results from the multiplication of pressure [N/cm^2] and time [s]. It is calculated for every sensor and normalised for the step. This evaluation takes into account pressure and time of load.

While the MAX evaluation shows high values that might be short lived, the momentum evaluation shows up values where over an extended period an average load persisted. The combination of both evaluations facilitate the production of optimal insoles, which take into account single peaks and permanent loads.

6.3.9 Evaluation Gait line

➢ only available with the *insole measuring system*
This button will display the gait lines which represent the progression of the centre of pressure for every step as a black line. They are calculated for every foot separately.

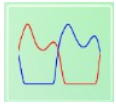
The gait line is a biomechanical evaluation used as a graphical representation of the roll of during walking.

6.3.10 Evaluation Cyclogram

➢ only available with the *insole measuring system*
This will button will display the cyclogram graphics. It is a representation of the progression of the centre of pressure for the body as whole.

Normally the lines have the shape of a butterfly and correspond to the symmetry of the gait. Activating the option „display Cyclogram for MAX,... " displays the progression of the centre of pressure for dynamic platform measurements.

6.3.11 Gait Analysis



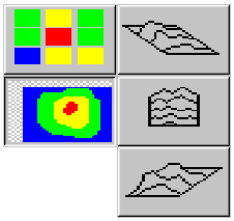
This button gives access to specific evaluations for gait analysis.
In the classic basic programme interface the functions can be found in the menu 'Gait Analysis'. The corresponding chapter 6.6 of this manual gives detailed explanations for these functionalities.

6.3.12 Evaluation I. + II. Step

➢ only available with the *platform measuring system and in classic basic programme view*
(*see 6.4*)

For a dynamic platform measurement this button will display the maximum pressure for first and second step. For this evaluation it does not matter on which half of the platform the customer stepped. We suggest that the left and right half of the platform are used just like during a static measurement. If more than two steps were recorded, the zoom function in the time graphics display can be used to choose two relevant load periods. The first and second step from that period will then be displayed. For this correct detection of steps a minimal pause between the two steps has to exist, where there is no load on the platform.

6.3.13 Switching between Graphics Displays



These Buttons switch between different types of graphic display.(isobaric display, sensor display, 3D-display from different perspectives).
see 6.4.1
see 6.4.2
see 6.4.3

6.3.14 Comparing two Measurements

➢ this functionality is not available with the basic platform systems

The buttons below appear only when a comparative measurement has been loaded. Here You can set up which parts of the two measurements are displayed.

- current measurement (also used for recording a measurement)

- comparative measurement (additionally loaded measurement)

- comparison between the tow left feet from both measurements

- comparison between the tow right feet from both measurements

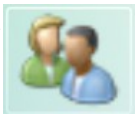
➢ only available with the *insole measuring system*
- difference of values between the current and comparative measurement.
Areas with little difference are depicted in green, increased load in yellow and red and decreased load in blue.
- Due to the maximum resolution of the colour scale the graphic of value differences will show as maximum differences *+/- 50% of maximum pressure.* Higher differences resulting from different foot positions will be shown as the maximum difference of 50% of maximum pressure (e.g. maximum pressure = 64 N/cm² => maximum difference = 32 N/cm²)
- the difference graphic is only valid and useful if the foot position on the insoles is identical for both measurements, so that pressure differences in the same sensor position are evaluated.

If You are looking at a comparison between both left or both right feet, the information about the measurement will be displayed in the title bar and note if the mouse cursor hovers over one of the displayed feet or platform halves. (This display is only available in sensor or isobaric display)
see 6.5.3

6.3.15 Data menu

This button is only available in the new basic programme interface and is used to access the data management functionalities and various export interfaces.
In the classic basic programme interface these can be found in the menu ‘Data’.
The details can be found in chapter 6.5 of this manual.

6.3.16 Customer Details



This button opens the a dialogue to edit customer details(e.g. name, address) and allows You to generate a new customer file prior to starting a measurement.
In the classic basic programme interface this can be found in the menu ‘Data’. Chapter 6.5.5 of this manual gives detailed information.

6.3.17 Print Out

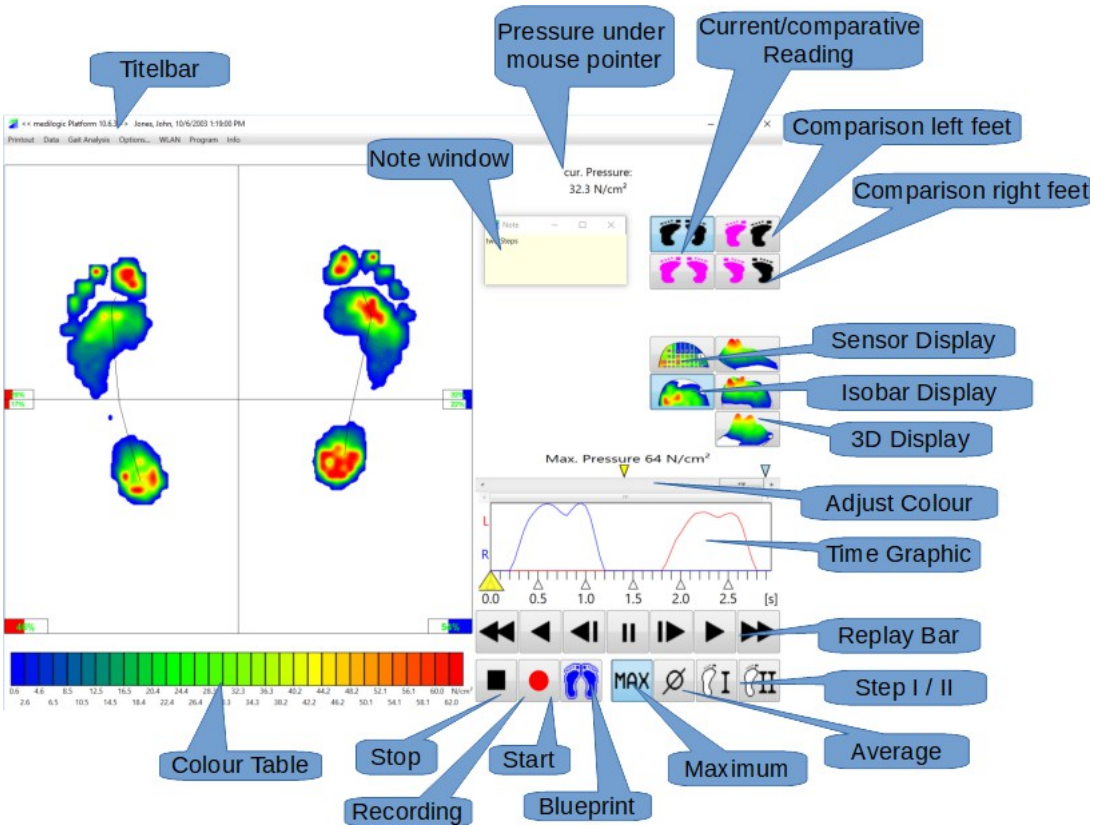
This button will open a list of available print outs.
In the classic basic programme interface this can be found in the ‘print out’ menu. In Chapter 6.7 in this manual You can find detailed information about print outs.

6.3.18 Options

This button gives access to the options for the programme and the configuration of the WLAN data transmission.
In the classic basic programme interface these can be found in them menu ‘Options’. In Chapter 6.8 of this menu holds detailed information.

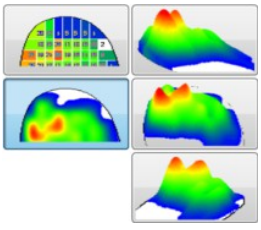
6.4 Display

As mentioned above we have designed the programmes for the insole foot pressure measurement system and the platform system in a way that makes learning and using it as easy and quick as possible. The graphic below shows the most important elements as displayed for the medilogic platform measurement system. The interface for the insole system is very similar and described in section *see 6.3* . The user interface for the medilogic scanner can be found in the chapter *6.4. Scan* of the corresponding manual.



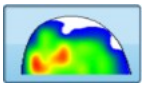
The title bar of the medilogic programme has some basic, important information. The name of the current customer, date and time of the measurement, zoom and insole size (for the insole system only) can be found here.

All buttons are arranged in groups. All main functions during recording and replay can be accessed using these. The details can be found in *see 6.3 B.*We will explain the functions relevant to the display here:

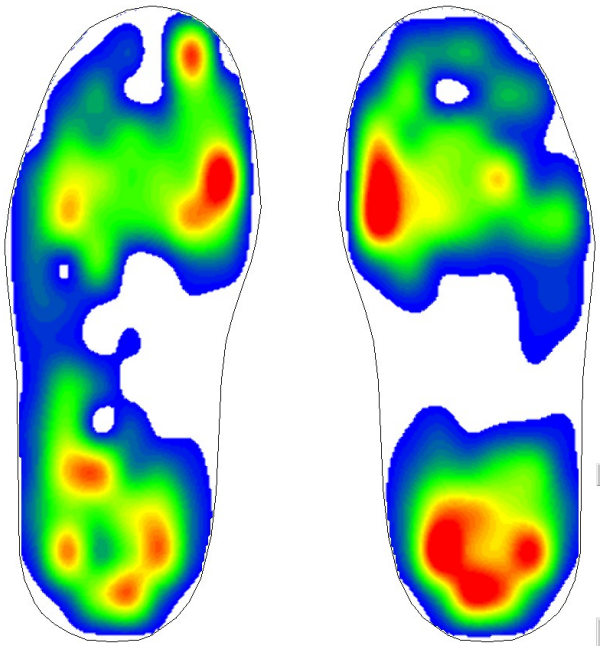


These buttons switch between the different display modes.(colour display, 3D-display with different views and isobaric display).

6.4.1 Isobaric - Display



The isobaric display colour codes the pressure values from the insole or platform systems so that areas with the same colour share the same pressure value. To achieve a higher spatial resolution mathematical algorithms are used to calculate pressure values between the sensors.

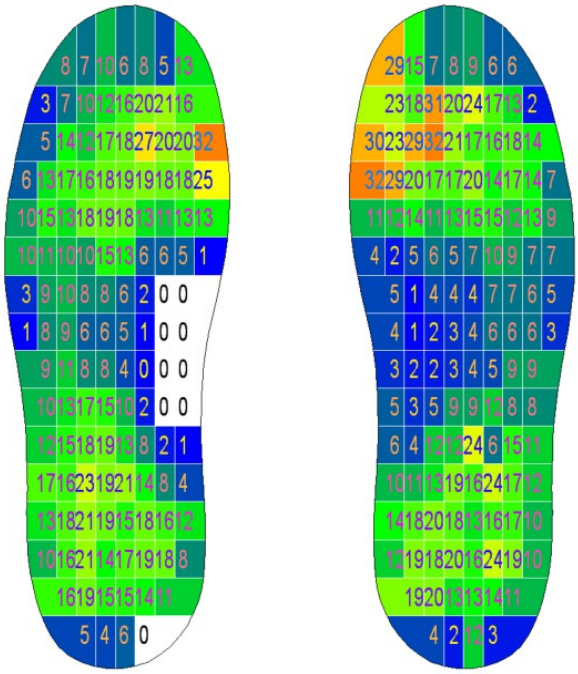


The pressure corresponding to a colour can be read from the colour scale at the bottom of the screen. The relation between colour and pressure is influenced by the zero threshold and maximum pressure set in the programme. Setting the maximum pressure with the slide bar allows You to compare measurements of customers with different weights and still using the full colour range.
This setting can be changed at any time after a recording has been made.

see 6.8.2 „Colour Table“
Hovering the mouse cursor over the isobaric display will show the pressure value at this position on to the right side of the graphic area as ‘current pressure’.

6.4.2 Sensor Display

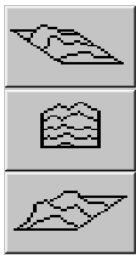
If this display mode is selected the graphic will show the sensors in the insole or platform. Pressures are represented as colours.



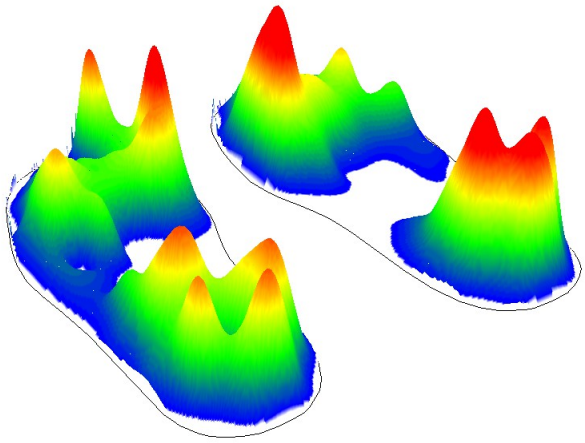
The pressure corresponding to a colour can be read from the colour scale at the bottom of the screen. The relation between colour and pressure is influenced by the zero threshold and maximum pressure set in the programme. Setting the maximum pressure with the slide bar allows You to compare measurements of customers with different weights and still using the full colour range.
This setting can be changed at any time after a recording has been made.
see 6.8.2 „Colour Table“

Inside every sensor field the values can be displayed as numbers (‘Options’ ‘Display/General’ ‘Numeric Value in Sensor’). These values are independent from the settings of zero threshold and maximum pressure. In the 5.x versions this option is only available in the insole programme for readability reasons.
Hovering the mouse cursor over a sensor field will show the value to the right of the graphic as ‘current pressure’.

6.4.3 3D-Display

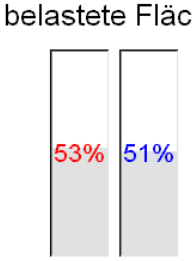


The 3D Display can be set to three predefined view points. It represents the pressure values as colour and hight. The relation between colours and pressures can be read from the colour scale at the bottom of the screen.



The relation between colour and pressure is influenced by the zero threshold and maximum pressure set in the programme. Setting the maximum pressure with the slide bar allows You to compare measurements of customers with different weights and still using the full colour range.
This setting can be changed at any time after a recording has been made.
see 6.8.2 „Colour Table“
Hovering the mouse cursor over the 3D display will show the pressure value at this position on to the right side of the graphic area as ‘current pressure’.

6.4.4 ‘Area with Load’

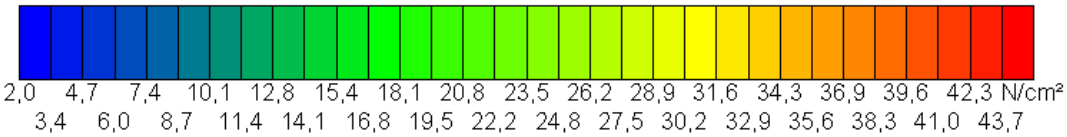


➢ only available for the insole system
This graphic shows how many percent of pressure values are above the zero threshold. This represents the percent of insole area loaded.
If the zero threshold is set to 0.0 N/cm² the graphic vanishes, since it would always read 100%.

6.4.5 ‘Percent of Load’

➢ only available for the platform system
These values represent the percentage of load on the left and right half of the platform. The values are displayed at the bottom of the screen for the 10.x software and at the top for the 5.x software versions.
This requires a measurement where both halves of the platform recorded load of two feet separately. Each foot has to stand or roll over one halve without crossing the middle line.
This lets You evaluate the symmetry of load distribution while standing or walking.

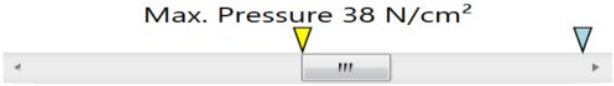
6.4.6 'Colour Scale'



The colour scale shows the relation between colours and pressure values for the isobaric, sensor and 3D display. The lower end is defined by the zero threshold (set in the 'Options') the upper end by the maximum pressure (set with the slider for maximum Pressure).
The numbers underneath the colours represent the dividers between the colours and represent the lowest value for the colour going to the right. The values are rounded to an decimal everywhere they are shown (beneath the colour scale, in a sensor field or under 'current pressure').
The number of colour steps can be set in the 'Options'.
In the new basic programme interface the colour scale can be collapsed using the arrow key on the right hand side. This key can be used to show the colour scale again.
see 6.8.2 „Colour Table"

6.4.7 Adjusting the colour scale using ' maximum pressure'

The relation between colour steps and pressure values can be set using the slider 'maximum pressure' . The setting defines the pressure value (N/cm²)to be represented by the last colour step (dark red). The colour table is scaled accordingly. This allows You to set the optimal colour range for every measurement. This is especially useful if individuals with widely different weights have to be evaluated.

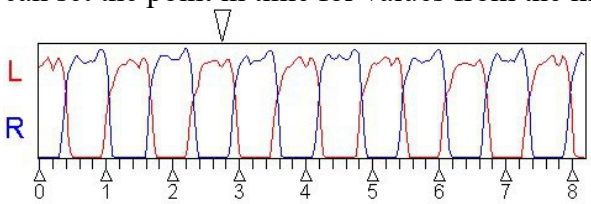


Setting the maximum pressure to the highest value of a measurement ensures the best possible contrast displaying the pressure values. It does not change the numbers.

For most cases it is advisable to set the maximum pressure to the highest pressure occurring in the current measurement, ensuring the best possible pressure representation. This setting can be made by the software automatically, if 'Options' /'Colour Table' /'automatically adjust max. pressure' is set.
The alternative would be to use 'manual adjustment' and set the value by hand.
In the new basic programme interface You can also click and drag the mouse over the colour scale to change the value. Moving the mouse to the right will move the colour spectrum towards red (max. pressure is decreased); reversely moving the mouse to the left shifts the colour spectrum towards blue (max. pressure is increased). see 6.8.2 „Colour Table" function: „max. pressure: Setting the colours for display"
Two markers are available in the classic basic programme interface above the slider. These give quick access to two setting (e.g. for walking and standing) by clicking on them. To change the marker position hold the 'Ctrl' -Key down click on one marker and drag it to the desired potion.
This is also available for the colour scale used with the momentum graphic (max. momentum (Ns/cm^2).

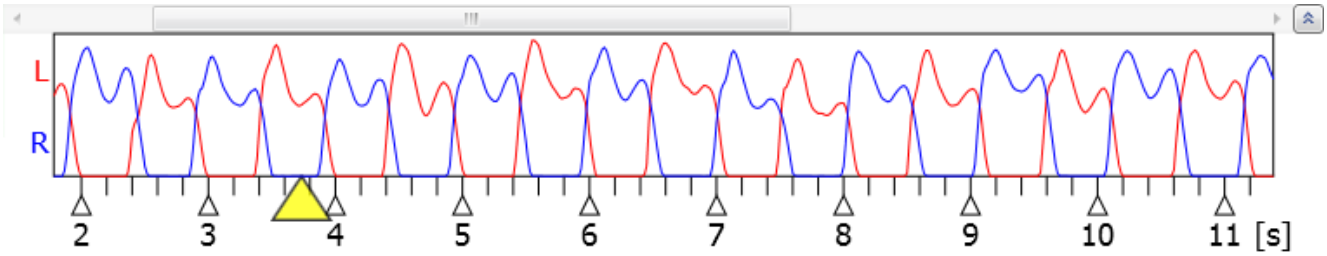
6.4.8 'time graphic'

During recording and replay of a measurement the time graphic is drawn or shown. During replay You can set the point in time for values from the measurement.



This graphic displays the average pressure values for each side (red: left insole/ platform halve; blue right insole/platform halve).
The unit for the x – axis is seconds.

In the classic basic programme interface a white triangle above the time graphic indicates the current position in the measurement for which the values are displayed. The position (and with it the triangle) can be moved using click and drag with the mouse or the buttons from the replay section.
In the new basic programme interface a yellow triangle below the graphic has the same function.
In this interface a scroll bar is displayed above the time graphic, if the measurement is zoomed. The zoomed area can be moved using the scroll bar. The time graphic can in the new interface can be collapsed and unfolded using the arrow key on the right hand side.
In order to zoom in on a period of interest click the mouse on the first point in time and drag it two the last point in time You want to inspect and release the mouse button. This works wit both basic programme interfaces. You can zoom again and again until only three single points in time are visible (marked by little squares).
All evaluations and replay function (replay, slow motion, maximum, average, gait analysis etc.) only are calculated for the displayed period. If the measurement is not saved yet only the zoomed period will be saved.
To look at the whole measurement period again click once anywhere in the time graphic.
The representation is only meant for orientation purposes, a detailed graphic to scale is available in 'gait analysis'/'time graphic'.



see 6.6.3
see 6.4.1
see 6.4.2
see 6.4.3

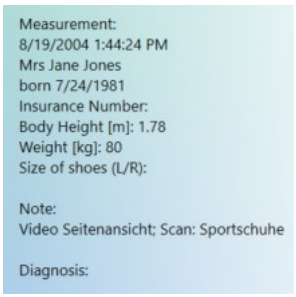
6.4.9 'Note'

For every measurement a note can be displayed, which can be entered while saving the measurement. To hide or show the note set the 'Option'/'Display/General'/'Display Note' *see 6.8.1 Options „Display / General"*) The size and position of the note can be adjusted using the left mouse button by clicking and dragging. With a saved and loaded measurement You can change or enter new information by double clicking on the note. Now You are in edit mode (cursor is blinking) and can write or change the text.
With a right click in the note a context menu will appear with these options:

- *Undo* all changes since entering edit mode
- *Select all* , to select all of the text in the note
- a selection of predefined text blocks to speed up entry of standard texts (diagnoses etc.)
- *Add new text module* , to create a new text block
- *delete text module* , to delete a text block from the list

Clicking anywhere outside the note will end the edit mode.

On the right note as displayed in the new basic programme interface.

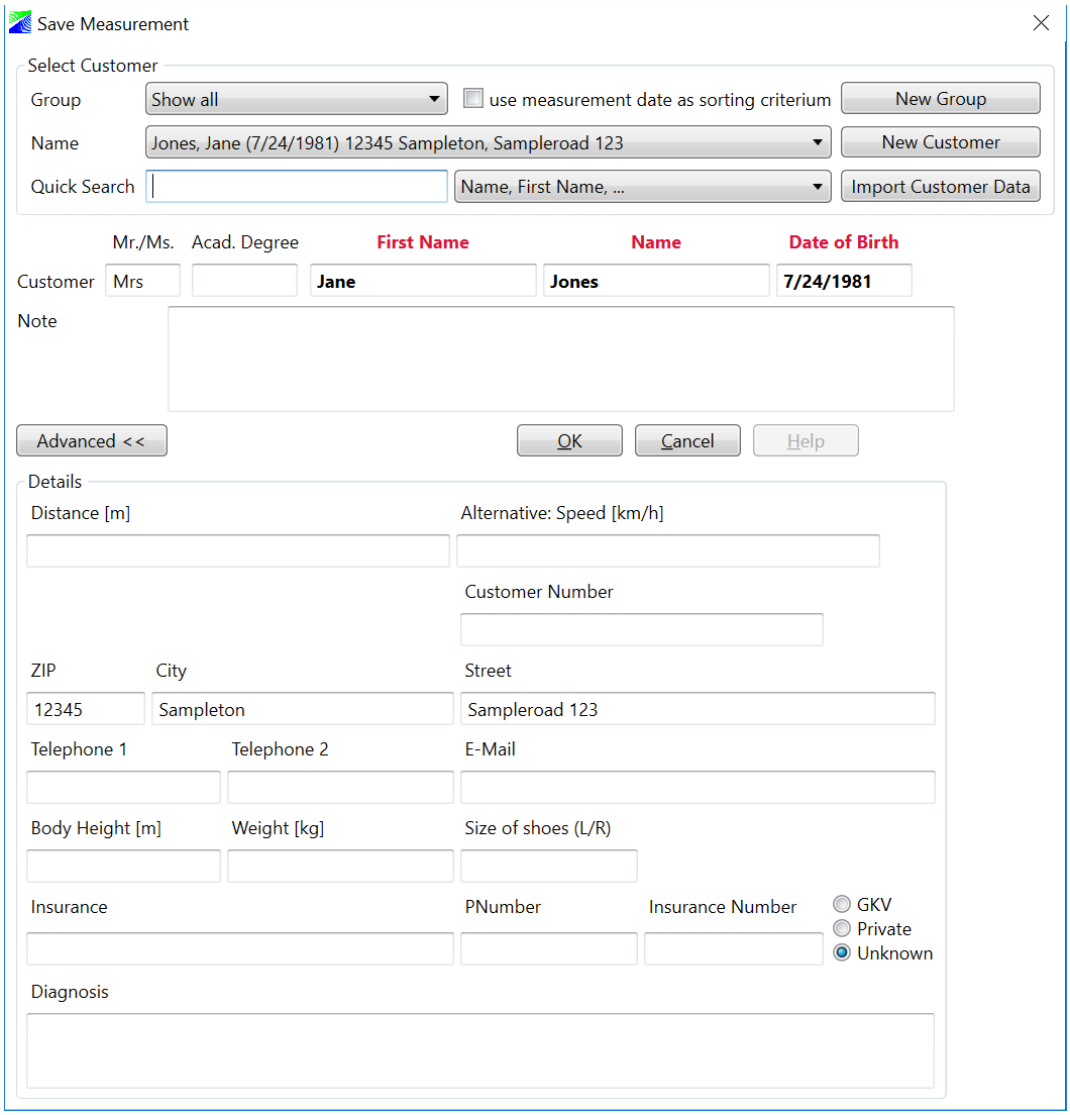


6.5 Data

Measurement data can be saved and loaded for later viewing and evaluation. The 5.x versions of the software save the data to the '\Data' subdirectory of the medilogic programme path or a specified network location. The 10.x versions store the data in the SQL server installed with the system (if not present) either locally or on a network location of Your choice.
Identifying information is first name and name (additionally date of birth) of the customer as well as time and date of recording. Additional information can be saved with the measurement (e.g. note, body weight, email address etc).

6.5.1 Saving Data

After recording has stopped the measurement can be saved. The period of the measurement shown in the time graphics is saved. This offers You the chance to exclude parts at the beginning or end with unwanted data (e.g. customer just starting to walk from standing, or tripping).
see *6.4.8 'time graphic'"*
The 'Save' button (floppy disk symbol) can be used to call up the save dialogue (or the menu 'Data/saving' in the 5.x version). To simply this the dialogue can be called up automatically when the recording stops. This can be set in 'Options' 'Usability' 'Show Save Dialogue after recording'.

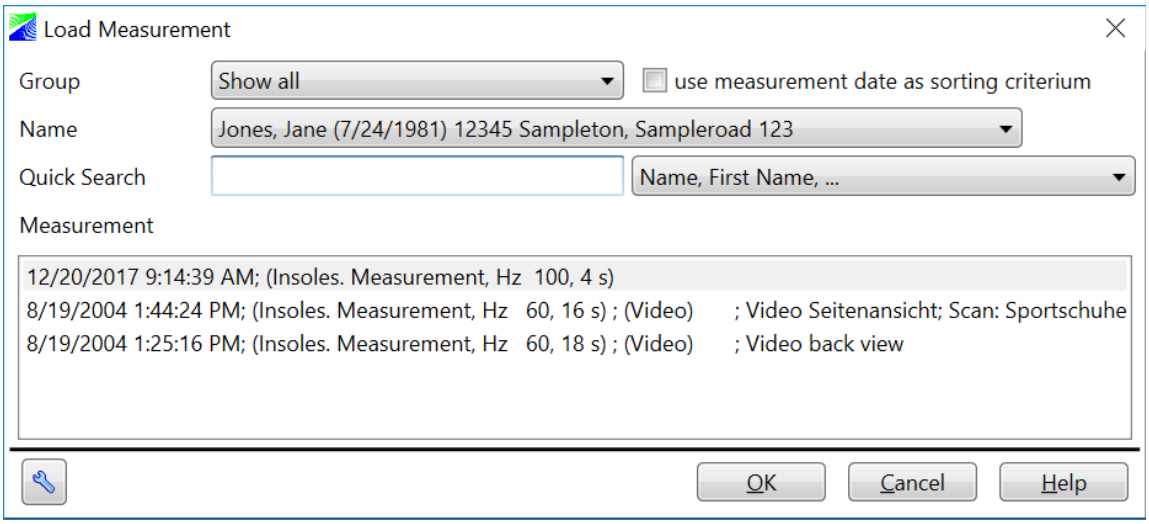


In the middle part of the memory the information about first name and name are mandatory in order to save a measurement. Entering the date of birth will further increase the programmes ability to differentiate Your customers.

The notes are saved for every measurement separately, entry is not mandatory. To speed up the entry of notes and diagnoses text blocks can be inserted using the right mouse button. *see 6.4.9*
The 'Advanced' button unfolds (and folds) an area with additional information about the measurement and the customer (e.g. address). This can also be accessed using the 'Edit Customer Data' dialogue *see 6.5.5* .
If You want to use gait analytical evaluations You need to enter information about the length of the walkway or the treadmill speed as well as body height and weight of the customer. Should You not wish to use these evaluations or evaluation is not possible (e.g. walking very erratic) You can leave these fields empty. To make entry of this information mandatory You can set the check in 'Options' 'Usability' 'make entering body height and weight mandatory'.
The upper part of the dialogue gives access to customers already stored in the system in order to save a new measurement with that customer. Your customers can be grouped to make it easier to locate them, if You want to access all customers select 'show all'. The drop down selection 'Name' list all customers of the selected group in alphabetical order. You can also sort the customers by the date of their last measurement setting the check next to the 'Group' drop down list.
The field 'Quick Search' lets You find a customer by entering first name or name. The search start as soon as You start entering letters and will show information for the first hit immediately. The drop down list lets You choose insurance number or customer number as alternate criteria.
To enter a new Customer click the 'New Customer' button (all fields will be emptied). If You need a new group You can create one by clicking 'New Group', otherwise select the group from the drop down list You wish to associate with the customer.
When the dialogue opens the most recent customers information will be shown. If the information about the customer is correct You can confirm by clicking the 'OK' button. Otherwise use the 'New Customer' button to create a new customer entry and fill in the information necessary.
To jump from field to field use the TAB-key or click into the field of interest.
Note: For quick handling the dialogue will position the cursor in the field 'First Name' hitting the 'ENTER' key will set it to the 'Name' field , then the 'Date of Birth' field the next hit on the 'ENTER' key will operate the 'OK' button and save the measurement.
Saving a measurement is only possible if a new recording has been made, otherwise the access is denied (greyed out). This is meant to prevent saving a measurement twice.
If You configured the medilogic system to access external data bases for customer data ('Options''Extra''External Databases') data entry can be speeded up.

6.5.2 Loading Data

Saved data can be loaded into the software. Thus the data is again available for viewing and evaluation. Please use the ‘Data’’Load’ menu item to do this.



Choose the customer group (or ‘Show all’) and the customer You are looking for from the drop down list ‘Name’. Default sorting criterium is the name, if the check ‘use measurement date as sorting criterium’ is set the customers most recently measured will be listed first. For every day use this eases locating Your customers.
In the list below You can select the desired measurement by clicking on it. The entries show time and date of the measurement, the sensors used, length of the measurement, sampling rate and the note if entered. Using the ‘OK’ button will cause the measurement to be loaded into the software and the dialogue to close.
Note: You can also double click on the measurement for more speedy loading.
The ‘Quick Search’ field lets You locate customers quickly using first name, name, insurance number or customer number.
If You select a measurement made with a different programme mode (e.g. insole, platform) the current one, the software will automatically switch to the needed programme.

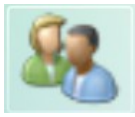
6.5.3 Loading Comparative measurement

For the insole measuring system and the platform measuring system it often is useful to compare two measurement side by side. To do that Use ‘Data’’load comparative measurement’.
The dialogue mirrors the one used for loading a current measurement. (*see 6.5.2*)
After successfully loading a comparative measurement an additional button block is displayed. The black feet represent the measurement first loaded (current measurement), the magenta coloured feet represent the second measurement loaded (comparative measurement)*see 6.3.14*
All evaluations are also available for the comparative measurement. The measurements are compared for the side of the feet or platform halve (left-left or right -right). Use the corresponding buttons to select.

6.5.4 Deleting measurements / Customers / Groups

The menu item ‘Data’’Delete...’ allows You to delete measurements, customer entries and groups no longer needed. Selecting the element to be deleted is analogue to *6.5.2* .
Pressing the button ‘Delete Group’ or ‘Delete Customer’ will delete the customer shown in the drop down list or the group from the drop down list with all its customers. Clicking ‘Delete measurement(s) will delete all measurements selected in the list ‘measurement’. *Please check carefully whether to confirm the confirmation dialogue whether these object should really be deleted*.

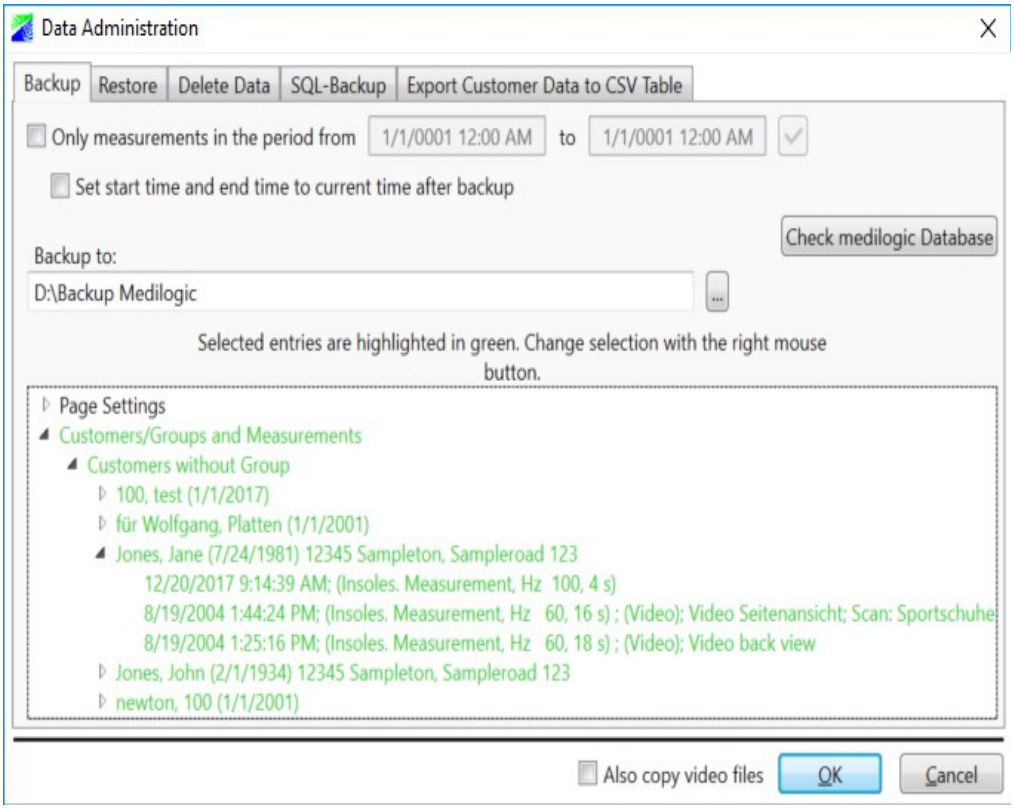
6.5.5 Edit Customer Data



The menu item ‘Data’’Edit Customer Data’ is used to call up the dialogue used to access and edit customer data (e.g. name, address etc.). You can also use it to create new groups or customer entries with the buttons ‘New Group’ ‘New Customer’ before recording a measurement and saving it to the database. Handling is similar to 6.5.1Saving Data. Entry can also be done using external databases *see 6.8.3 „Extra“* The drop down list ‘New Group assignment’ lets you shift customer entries between the groups.
When the dialogue is opened it always presents the customer called up most recently. But You can access any customer from this dialogue.
If any information for a customer has been changed, selecting other customers is denied until the ‘Apply’ button is clicked.

6.5.6 Data Administration (Backup / Restore/ Export Customer data to CSV table)

Making a backup to an external storage device, other computer or server is a good idea for all systems. The menu item ‘Data’ ‘Data Administration’ opens a dialogue to do that.



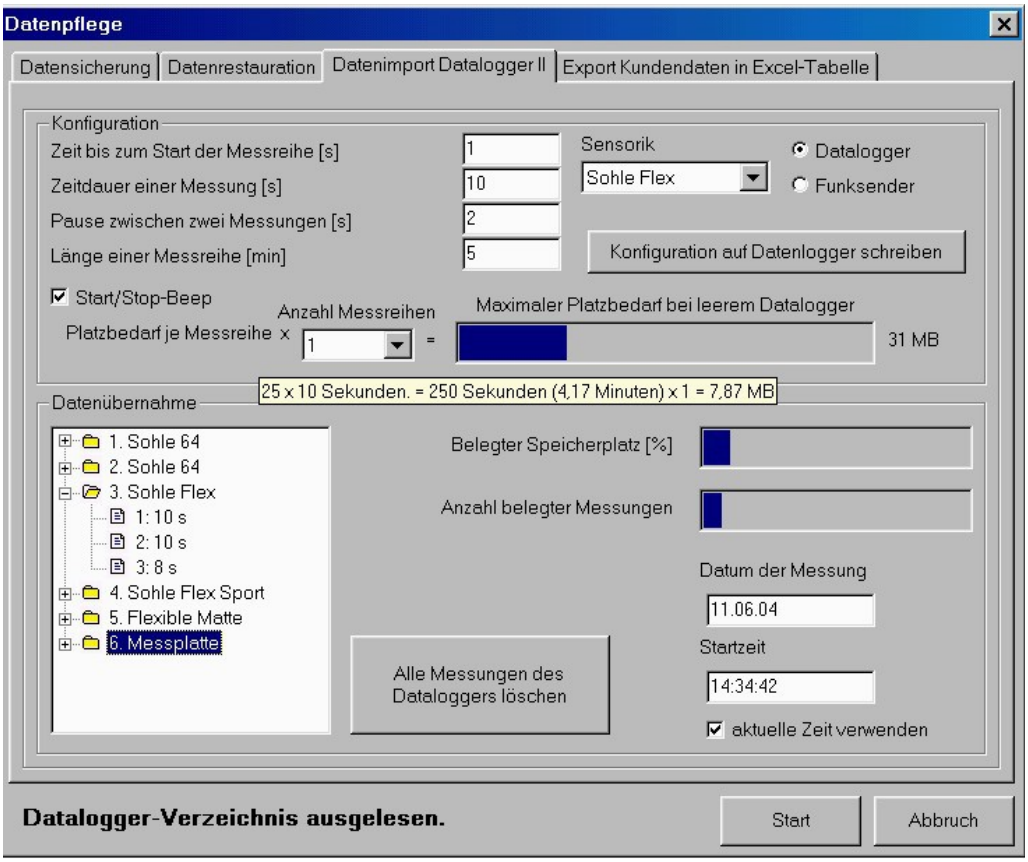
‘Backup’
Data selected by the user can be saved to a location as entered in the field ‘Backup to:’. Information about the customer and the selected measurements as well as printer page settings will be saved . For

the 5.x version a file backup.mdb, a ‘Data’ folder and if applicable the ‘logo.bmp’ are written to the chosen location. The 10x. Version write a file like:
‘medilogic.T&T medilogic_Database_Backup_2017.12.13_10.08.51.tar’
If the check ‘Also copy video files’ is set video files are copied too, please make sure sufficient space is available in the storage location.
It is advisable to check the medilogic data base for consistency using the button ‘Check medilogic Database’, to avoid backing up corrupted data.
Note: Only use this process to backup data, copying by hand can lead to the loss of customer data.

‘Restore’
The reverse process to backup is data restoration (‘Restore’). Data is retrieved from the location entered in the field ‘Restore from’. The medilogic software has to find the file(s) that were created by the backup process.

„Data logger“
The medilogic data logger (optional auxiliary only available with UPAT 4 systems) integrates data saving in the Upat4 wireless transmitter. Whether data is transmitted or stored is selected in the tab ‘Data logger’ where You can choose between data logger or wireless transmission on the right hand side.
To configure the data logger the Upat4 transmitter needs to be switched on without sensors attached to it.
At the bottom of the dialogue the current communication status with the data logger is shown. To record in data logger mode set the option in this dialogue an switch on the Upat4 transmitter with sensors attached to it. The recording as configured starts immediately.

- Configuring the Data Logger
Opening the dialogue with the transmitter switched on and no sensors attached will start a readout of the current configuration from the data logger.



In the upper part of the dialogue on the right hand side choose the option ‘Data Logger’. The relevant parameters became available for editing. The schedule for recording measurement(s) can be detailed using the parameters. You need to specify the sensors You intend to use in the drop down list ‘Sensors’. Default selection is Flex-Sohle (insole), other sensor are available in the list.
If in doubt please contact hotline support for correct settings.
‘Run of measurements’ describes measurements made consecutively according to the parameters set, normally for one customer. After configuring and switching on the device, connect the sensors and switch on again, this will start the run of measurements.
The following parameters are available for a run of measurements

Time before start of run of measurements	Defines the delay between the moment of switch on and the start of the first recording.
Duration of one measurement	The duration for a recording period, identical for all recordings in the run
Pause between recordings	Defines the interval between two recordings
Over all duration	Defines the over all time for the run of measurements, this includes the pause intervals
Start/Stop-Beep	Defines whether the Upat4 sounds are suppressed. Suggested if You think the irritate during the run of measurements

Using these parameters the programme estimates the amount of storage space required. The blue bar at the bottom of this section shows the amount of space planned in relation to the amount available. The calculation can be viewed hovering the mouse over the bar. Should the planned space exceed the available space the bar will turn red.
After setting the parameters for the configuration You need to click the button ‘write configuration to data logger’ to transfer the information from the software to the data logger. In order to do this the Upat4 transmitter needs to be switched on without sensors attached. The configuration now written can be read back from the data logger when it is next connected to the software (no sensors attached).

- Recording with the Data Logger

After the configuration has been written to the data logger as described above, it can now operate independently from the PC.
To prepare for recording it is advisable to switch the Upat4 transmitter off, connect the sensors and then switch the Upat4 transmitter back on again.
When the Upat4 transmitter is switched on a short series of beeps indicates that it is in data logger mode.
The run of measurements starts immediately. As set in the configuration the recording starts after the set delay. The start of a recording is indicated by a short beep the end by two short beeps. These sounds can be deactivated in the configuration.
Pressing down the button on the side of the Upat4 transmitter longer will switch off the device and stop recording and run for measurements immediately.
Note: Before changing the type of sensors You use You must set them in the data logger configuration and transfer it to the device.(see Kap 6.5.6 (Backup / Restore/ Export Customer data to CSV table))

- Receiving Data from the Data Logger

To read the data from the data logger use the lower part of the data logger dialogue called ‘Data retrieval’ . The Upat4 transmitter has to be switched on without any sensors attached. An overview recordings for the sensor type selected will be shown.
To retrieve a recording select it using the left mouse button. You can enter time and date of the recording, if left empty current time and date are used. ‘Start’ begins the process of transfer.

After finishing the recording is displayed and can be saved providing the information about the customer. The space used and the number of recordings is provided as additional information.
The storage space an the data logger can be freed using the button ‘delete all measurements from the data logger’.

„Export Customer data to CSV table“
This function will convert the customer information from the data base and export it to a csv-file readable with spreadsheet software like LibreOffice Calc. You can use the customer information in other applications, for example to generate a serial letter using LibreOffice Writer. You can export the whole data set or select only some customer. see *6.5.5*

6.5.7 Save to.. ; Import from...

To transfer a measurement currently loaded use the menu item ‘Data’’Save to...’ to save it to USB-Stick, network drive or similar. The target directory set in ‘Options’’Extra’ has to be writeable and provide enough storage space. measurements stored in the location can be imported into the software using the menu item ‘Import from...’
If specified in the options the measurement will be deleted after successful import and display.

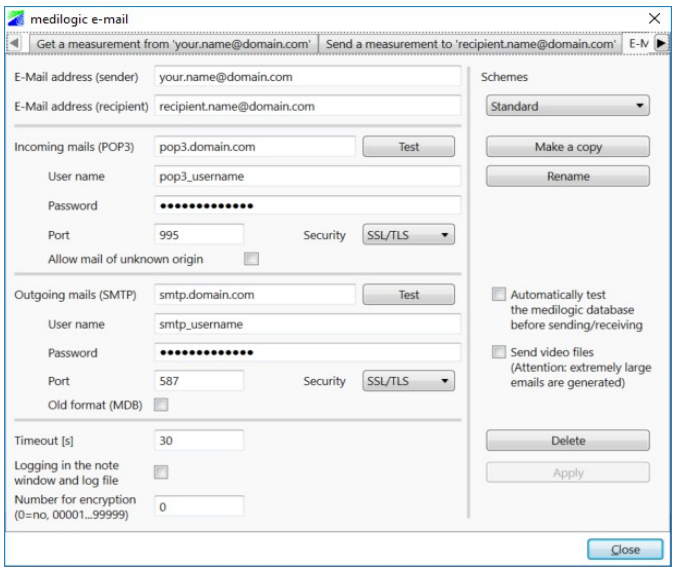
6.5.8 E-Mail

This menu item gives access to a dialogue for sending and receiving measurements using e-mail. After receiving the measurements can be viewed and evaluated in medilogic software.

How does E-Mail work – a short introduction
You need to have an e-mail account with a provider of Your choice with at least one email address. We also assume that You use this address only to transfer data for the medilogic system. Since there are a lot of free email providers out there, this poses no limitation and makes handling much more comfortable.
Lets assume Bob wants to send Alice an e-mail, then they have to follow the steps below:

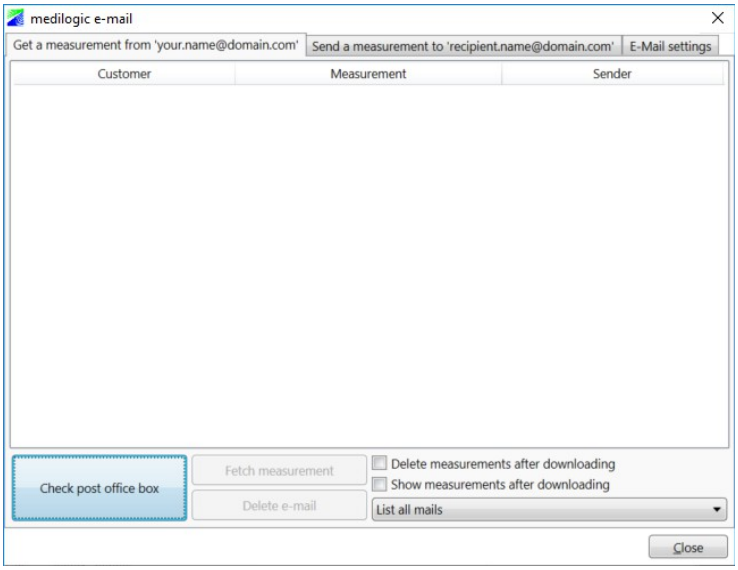
1. Bob presses the ‘send’ button when the e-mail is ready for sending. The software now connects Bobs computer with the server of his e-mail provider. Between the computers the SMTP (Simple Message Transfer Protocol) is used to transfer the email. This simple protocol provides no authentication mechanism. Since many providers now insist on one to prevent spam and phishing we need one of the following methods. „POP before SMTP“ will use the information provided to receive email to send it, so Bob will have to receive mail first providing username and password. „SMTP_Auth“ is the SMTP enhanced with an authentication mechanism, it is the usual method nowadays and therefore default.
2. After successful authentication by Bob the e-mail gets send.
3. Bobs provider will send the e-mail to a POP server used by Alice where it waits for retrieval.
4. Alice clicks the ‘Check Post Office Box’, the Software connects to the POP Server and retrieves the e-mail after successful authentication.

E-Mail Settings
As You can see from the preceding section some settings are necessary to successfully send and receive e-mail. You find these clicking the menu item ‘Data’’E-Mail’.
Should You not have the information needed here please contact Your e-mail provider.
For data security reasons we strongly suggest encryption. To do this please enter a 5 digit security code and send it to the receiver of the e-mail, otherwise the data can not be read and imported into the medilogic software.
Should the remainder of the window not be self-explanatory please contact hotline support



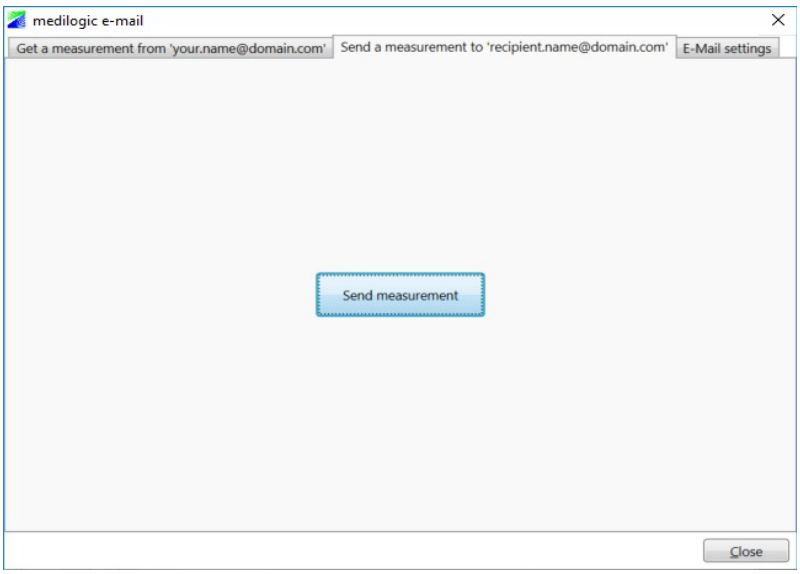
Fetch e-mail from your.name@domain.de

After entering the POP3 information in the e-mail settings, check whether e-mails are available for retrieval. If that is the case the buttons 'Fetch measurement' and 'Delete e-mail' become available.
The check 'Clear measurements after downloading' will cause the software to delete the e-mail from the server after successful retrieval. 'Show measurements after downloading' will display the measurement after it was successfully retrieved.
To save time You can limit the number of e-mails listed.



Send measurement to recipient.name@domain.de

After entering the SMTP information in the E-Mail settings and the recipients e-mail address, You can send the measurement currently loaded using the 'send measurement' button.
Note: If the time graphic shows a zoomed period, only that will be sent



6.5.9 Exporting Data to External Programmes

This menu item allows You to write the currently displayed measurement to file, which can be read by external programmes. Export to csv-file writes the current measurement so that it can be opened with spreadsheet programmes like LibreOffice Calc and evaluated using statistical or other tools.
The load distribution measurement can also be exported for a number of computer aided milling systems: ID:CAM, pedcad,IETEC, ComfortSpline or Ortho-Fit. For pedcad- and ComfortSpline-export the evaluation average load distribution is used with a threshold of 80% ignoring all values below that. For the IETEC-exportes the average of pressure maxima from all steps are used.
To enhance the display for the ID:CAMSystem set the check 'Increased Sensor Resolution'. If You routinely export measurements You can set the check 'Automatically export when saving a measurement'
see 6.8.1 Options „Display / General": Methods for Average Calculation

Export Data to CSV-Table
The menu item 'Data''Export' opens a dialogue to export the currently loaded measurement to a csv table. As 'Path' enter or select the desired location.
Six sets of files are generated if appropriate:
Name_firstName_DateOfBirth_time of recording_

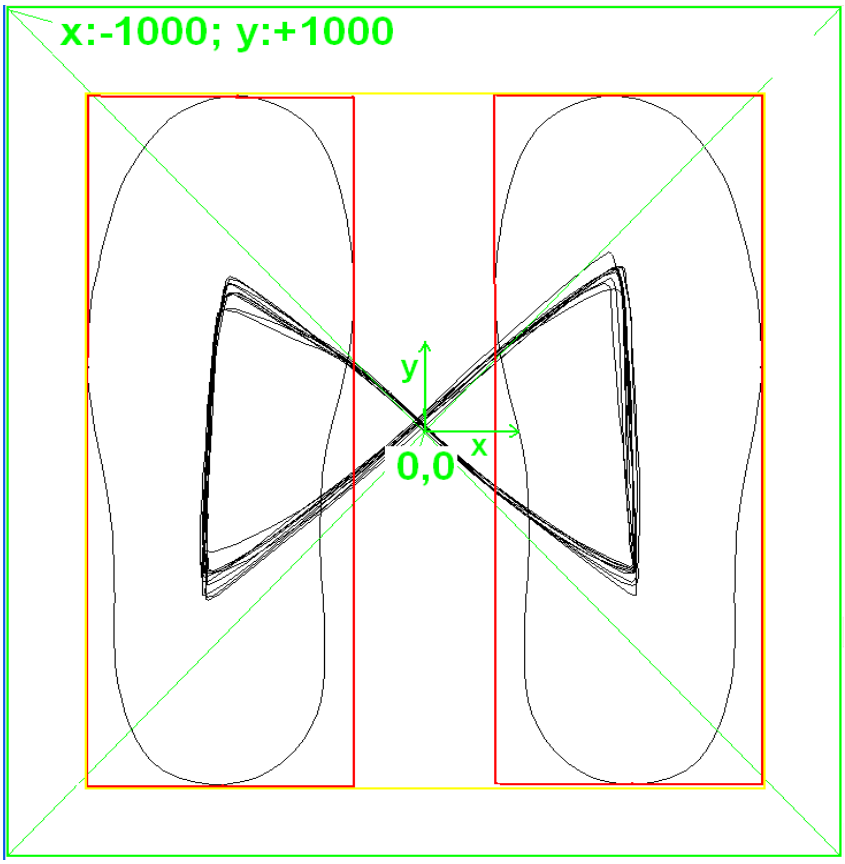
_CYCL.CSV	→ COP coordinates of cyclogramme
_FFT.CSV	→ Fast Fourier Transform
_GL_L.CSV	→ COP coordinates of gait line left
_GL_R.CSV	→ COP coordinates of gait line right
_L.CSV	→ sensor values left
_R.CSV	→ sensor values right

To import the data to the spreadsheet programme select ';' as field separator in the dialogue displayed before import.
The sensor values are the raw ADC (Analog Digital Converter) values from the system (unless the check 'in metric unit of measurement N/cm², otherwise ADC value' is set, which is available 10.x upwards).
To calculate N/cm² from the ADC values follow these steps:

1. Find out the maximum Pressure the system is calibrated to (the maximum Value the slider ‘maximum pressure’ allows)For insole an platform measurement typically 64 N/cm².
2. Calculate N/cm² from ADC values (Digits):

$$\text{Pressure Value}\left[\text{N/cm}^2\right]=\frac{\text{csv}-\text{value}\left[\text{ADC Digit}\right]*\text{max . pressure}\left[\text{N/cm}^2\right]}{255\left[\text{ADC Digit}\right]}$$

ONLY use the export of gait line and cyclogram when the display mode is set to an isobaric display (either 2D or 3D)
The coordinate system below is the frame of reference:

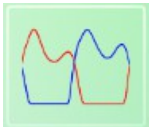


6.5.10 Link a Scan with a currently loaded Measurement

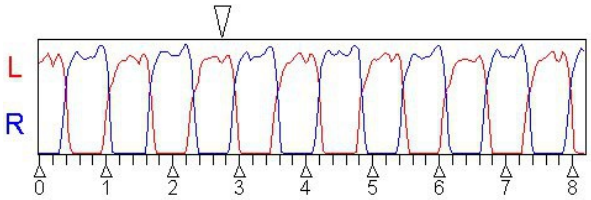
For advanced evaluation the measurement currently loaded (insole/platform) can be overlayed with scan image made with the foot scanner. In order to do this You need to link the scan with the measurement using the menu item ‘Link Scan to currently loaded measurement’.
The overlay function is only available with the 2D isobaric Display and activated using the check in the upper right hand corner of the screen. To adjust the overlay a slider is right next to the checkbox.
You can position the Scan for each foot separately using the mouse:
Left mouse button to move.
Right mouse button to rotate.

Note: The position of the scan images can be reset by holding the ‘0’ (Zero) key down and hovering the mouse over the graphic are.

6.6 Gait Analysis

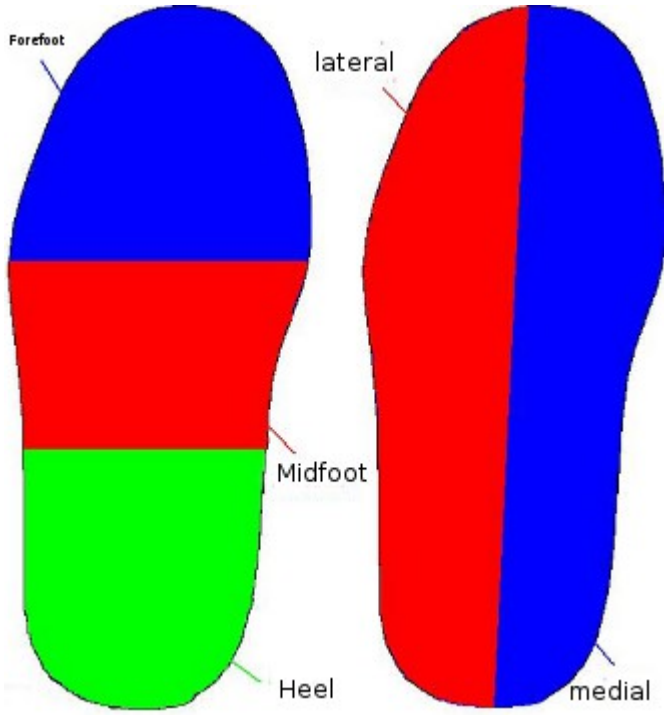


Measuring and evaluating the human locomotor behaviour is interesting in the fields of orthopaedics, surgery, neurology, work-, accident and sports medicine and many related fields. For diagnosis, therapy and rehabilitation reliable and reproducible information is indispensable.
The aim of technically aided gait analysis is the measurement and evaluation of characteristic values to optimize the human locomotor behaviour. The results have to be presented in a user friendly manner.
In the field of prosthetics for example measurements can show how a prosthesis is loaded and adjusted to be an adequate limb replacement.
Optimizing orthesis optimization is also possible. Gait analysis is used to document and optimize healing and rehabilitation.
Note: For gait analytical measurement well defined conditions are indispensable. There are two ways to achieve that. Either You use a defined walk way with known length or the measurement is done on a treadmill with known speed.
An important basis for the gait analysis is to calculate customer specific average step:



During recording a number of steps are recorded. Using mathematical algorithms the average step is calculated.
see 6.4.8

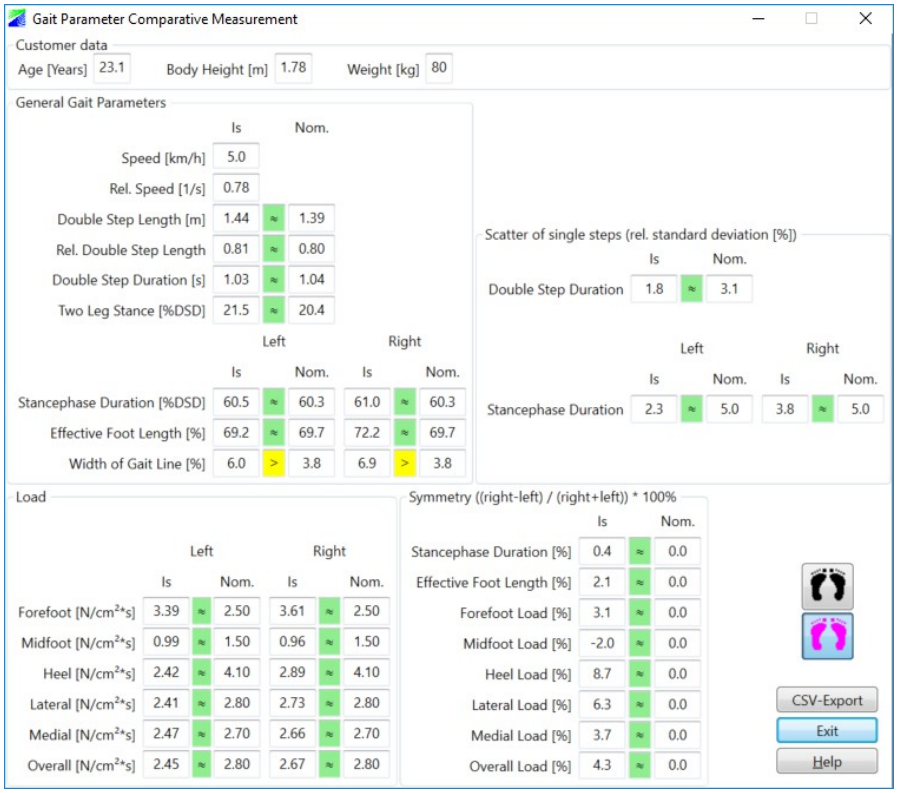
The process used eliminates steps that vary to much from the average. Four valid steps are necessary to calculate the average step, if the algorithm can not find at least that many the average step can not be calculated. Using the zoom function a period without erratic steps can be selected making the calculation possible. *see 6.4.8*
Pressure sensors from defined areas of the insole are combined and the average step calculated for these areas. The average step is also calculated for every sensor separately.
Note: The attribution of areas is the mirror image for the right foot



6.6.1 Gait Parameters

➢ only available for the insole system

From long years of experience in the field of technically aided gait analysis we identified meaningful parameter for practical application when evaluating human gait. The parameters mainly have their origin in load distribution under the foot. Further parameters are time based like speed, stance phase duration and step length (calculated from speed).



The upper part of the dialogue displays basic customer data like age, body height and weight. The lower part displays the gait parameters in four sections.

To give the user a quick overview the calculated parameters are compared to a database from test persons with normal gait patterns compiled by T&T medilogic. The colour coding indicates the position of the current parameter in relation to the norm. Green signals that the parameter is within the normal range. Yellow means as slight to middle deviation and red a strong deviation.

The value the customers parameters is compared to is the average of the comparison group. The internal data base uses about 800 measurements from 164 test candidates at different speeds. So parameters that are influenced by speed are evaluated correctly.

This internal database is continuously updated by T&T medilogic. It is a valuable tool to evaluate gait parameters.

Note: The colour red does not necessarily signify a pathological condition, but only that the parameter deviates strongly from the comparison group.

The parameters from the comparison group are only valid for evaluation walking not running. The parameters for running are being developed at the moment.

The section ‘General Gait Parameters’ hold parameters for the basic gait properties.

Speed is a vital value for quantitative gait analysis. Human beings instinctively choose the speed which is adequate for their locomotor abilities. Very low speeds are indicators for pathological condi-

tions. Many gait parameters are dependent on speed, so that comparing different measurements is only valid if recorded at comparable speeds (e.g. before and after care).
Speed is also dependent an body height. Big people generally walk faster than small. It has therefore proven useful to calculate the relative speed which takes into account the body height of a person. v_{rel} is defined:

$$v_{rel} = \frac{v}{L_0} \text{ in [1/s].}$$

A complete gait cycle starts with the heel strike of the first foot and ends with the heel strike of the same foot. This is called a double step. The double step length L is the way covered during a double step. This is obviously also dependent on body height.
The relative double step length L_{rel} is defined as:

$$L_{rel} = \frac{L}{L_0}.$$

A short double step length is indicative of insecurities during walking.
Double step duration is the time needed to complete one double step. The reciprocal value is the double step frequency.
Two leg stance is the part of a double step when both feet are on the ground. A high value is indicative of insecurities during walking.
The stance phase duration is calculated for each leg separately. It represents the percentage of the double step when the foot is on the ground. For patients with impairments to one side (e.g. prosthesis or injury) the stance phase duration for that side is often shorter then that of the other side.
Effective foot length is calculated from the average gait line and related to the insole length. It shows how much the foot is used for roll off. People with impaired ability to lift the fore foot have a very short effective foot length.
Width of the gait line evaluates the variation of the gait line to the in medial and lateral direction. It is calculated relative to the width of the insole. It is a good indication how much the steps vary. A very narrow gait line can be indicative of tiredness of impaired coordination. Lesions to the ankle joint often lead to very narrow gait lines.
The section to the left of the first evaluates scatter.
Scatter of the double step duration and stance phase (left and right) is used to evaluate the evenness of the gait. Large scatter indicates insecure gait.
The lower left section deals with load.
To calculate load the area beneath the pressure – time curve of the average step. The loads are calculated for different areas of the foot see *6.6.2*
The following abbreviations are used:

StD	stance phase duration
P_V	average pressure under the forefoot
P_M	average pressure under the mid foot
P_F	average pressure under the heel
P_A	average pressure under the lateral part of the foot
P_I	average pressure under the medial part of the foot
P_G	average pressure under the whole foot

The loads are calculated as follows:

forefoot: $I_V = \int_0^{StD} P_V dt$ ***lateral***: $I_A = \int_0^{StD} P_A dt$

$$\textbf{\textit{Mid foot}}: I_M = \int_0^{StD} P_M dt \qquad \textbf{\textit{medial}}: I_I = \int_0^{StD} P_I dt$$

$$\textbf{\textit{Heel}}: I_F = \int_0^{StD} P_F dt \qquad \textbf{\textit{whole}}: I_G = \int_0^{StD} P_G dt$$

The section bottom left contains symmetry parameters
Every time a gait parameter can be calculated for each foot separately it is also possible to calculate a symmetry parameter. Assuming P_R is a parameter for the right foot and P_L for the left foot a symmetry S can be calculated as follows:

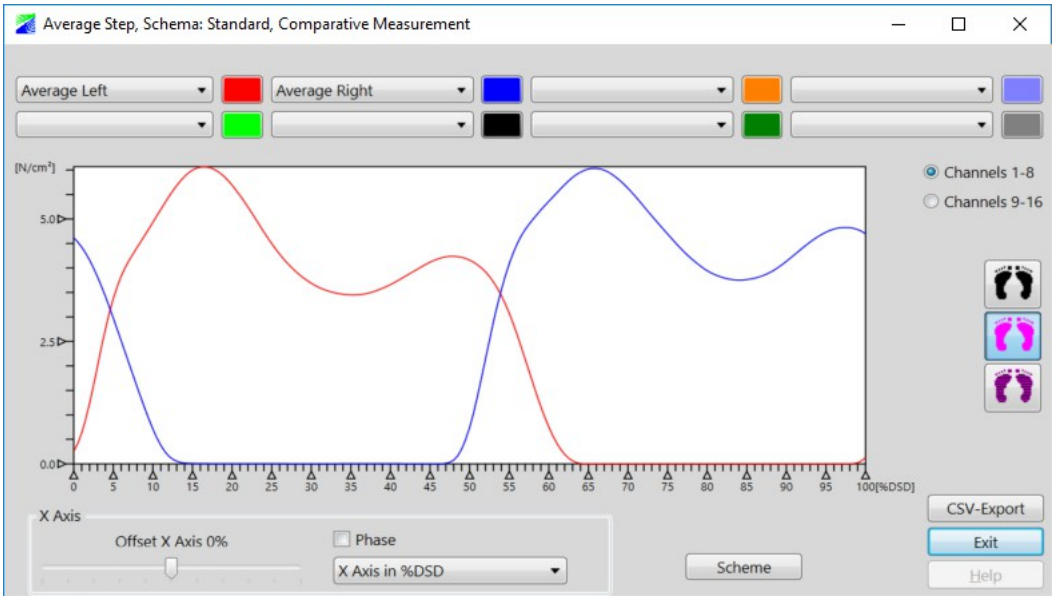
$$S = \frac{(P_R - P_L)}{(P_R + P_L)} \times 100 \text{ in } [\%]$$

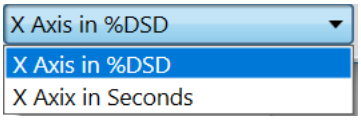
Symmetry parameters for stance phase duration, effective foot length and loads are displayed.

If You have loaded current and comparative measurement You can compare them directly in this dialogue using the buttons with the coloured feet to switch between the measurements or calculate the difference.
The button ‘csv export’ stores the parameters displayed on the hard disk in the csv format (separator ‘;’).
Printout of the gait parameters is possible when the gait parameter dialogue is open via ‘Print’’Gait parameters’

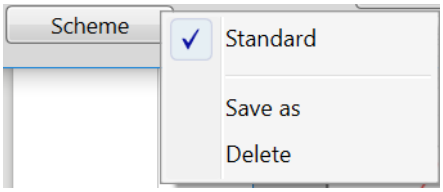
6.6.2 ‘Average Step’

➢ only available with the insole system
The dialogue ‘Average Step’ displays one step, the result of averaging all valid steps of the current measurement *see 6.6*
The drop down lists in the upper part of the dialogue are used to select relevant channels (e.g. heel area, whole foot etc.) to be displayed in the graphic below. Up to 16 channels can be displayed simultaneously using colours that can be chosen by clicking on the button to right of every drop down list.
If You have loaded a comparative measurement the buttons with the coloured feet at the right side can be used to switch between the measurements of show both together (symbol of striped feet, bottom most button). The left four drop down list are used for the current measurement (black feet) the left four for the comparative measurement (magenta feet).
The slider at the bottom left can be used to shift the start point of the double step. On click on the arrow in the middle will reset the slider to the default (left heel strike as start point)
Activating the check phase will eliminate the phase difference between left and right step, which can now be viewed side by side.





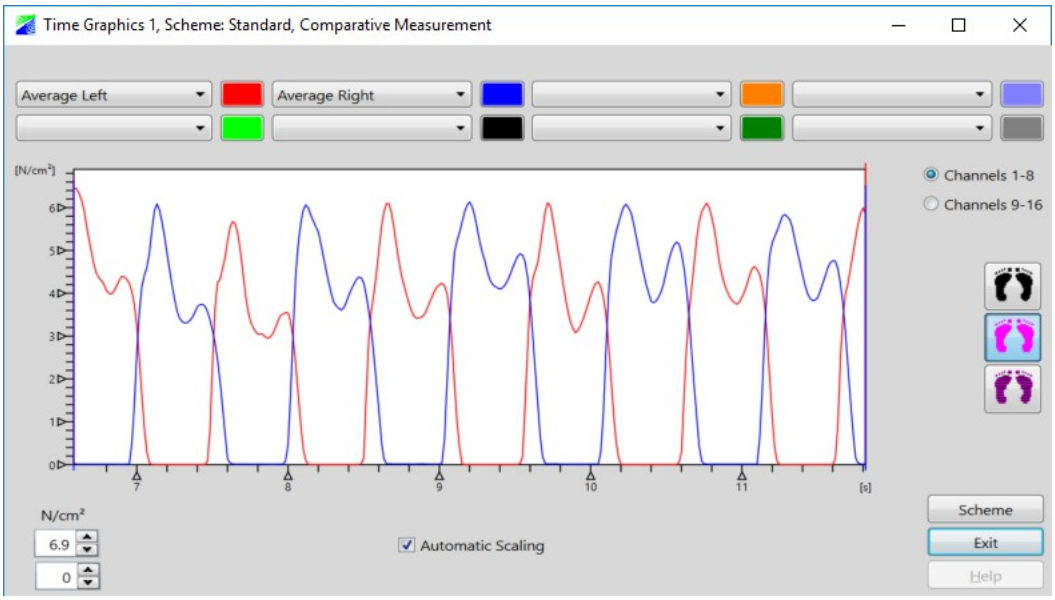
The x axis can be set to % double step duration (% DSD) or time in seconds.



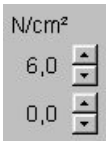
All adjustments made to elements in this dialogue can be saved to a scheme, which makes using different settings easy.

You can print the results using the menu item ‘Print’’Average Step’ as long as the average step dialogue is open.

6.6.3 ‘Time Graphic’



This dialogue displays the pressure values for the whole measured period. In the upper part of the window eight drop down lists give access to different sensor values or areas (heel, forefoot etc.)
For the platform system only four channels are available for average left and right of the current and comparative measurement.
Clicking on the menu item 'Gait Analysis''Time Graphic' repeatedly will open multiple instances of this dialogue. This can be useful for complex evaluations.
The period displayed in this dialogue is the same displayed in the main window. That means a zoomed view in the main window results in a zoomed view in this dialogue.
Changes to zoom in the main window get passed right away to this dialogue without the need to reload it.

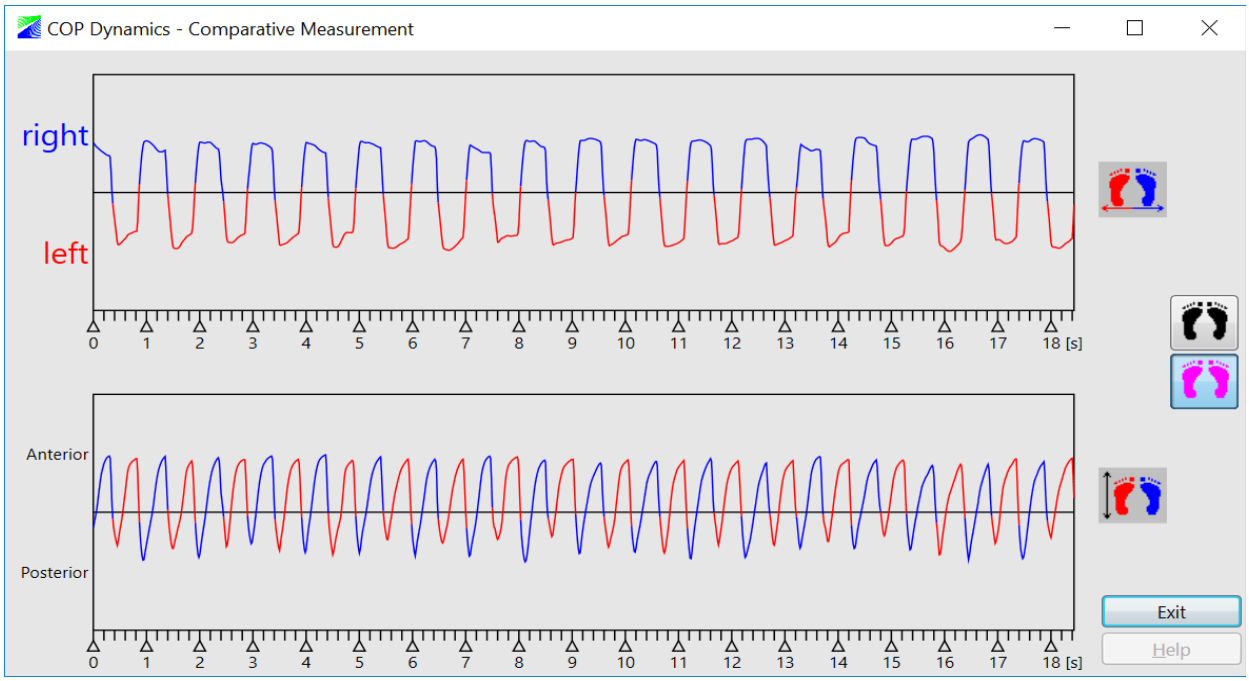


The sliders underneath the graphic area allow You to change the minimum and maximum value displayed on the y axis. The setting can be saved with a scheme (*see 6.6.2* The check 'automatic scaling' uses the graphic display to the fullest.

If You loaded current and comparative measurement the coloured feet on the right hand side let You switch between the measurements or show both of them side by side. The left drop down lists are used for the current the right ones for the comparative measurement.
You can print the results using the menu item 'Print''Time Graphic' as long as the average step dialogue is open.

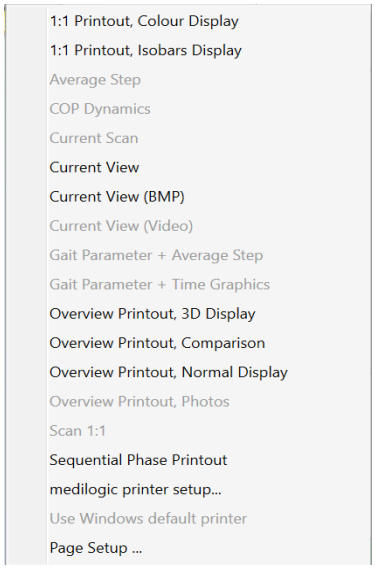
6.6.4 'DSP Dynamics

➢ only available in the insole system.
The menu item 'Gait Analysis''DSP Dynamics' opens a dialogue with two place-time graphics.



The upper graphic displays the progression of the centre of pressure between left and right foot. The progression corresponds directly to the step frequency.
The bottom graphic displays the progression of the centre of pressure in anterior – posterior direction. The frequency is twice that of the step frequency.
The colour red is used for the left side the colour blue for the right.
If current and comparative measurement have been loaded the coloured feet at the right side of the dialogue can be used to switch between measurements (black – current, magenta - comparative)
You can print the results using the menu item 'Print''DSP Dynamics' as long as the average step dialogue is open.

6.7 Print



Basically every graphic displayed on Your screen can be sent to the printer. Additionally relevant information about the customer and the measurement are added.
There are various options to print the information from the screen to a printer installed on the WINDOWS® Operating system
Note: Like in all the menus items not available at the moment are greyed out and not selectable. The gait analytical evaluations can only be printed when the corresponding dialogue is open.

The printer can be selected using the menu item ‘Print’ ‘medilogic Printer setup’.

6.7.1 Print Current View

This will create a printout of the graphic currently displayed and include the relevant information about the customer (e.g. first name, name, note etc). This insures that the printout can later be attributed a customer. If the current measurement has not been saved yet the information about the customer is left empty. To avoid this save any measurement before printing. Independent of that the company logo is put on the printout.
If You use the video option You can print the current view with a picture from the video associated with that point in time (‘Current View (Video)’).

6.7.2 Print - 1:1 Sensor, Isobaric Display

The graphic currently displayed on Your screen is sent to the printer for printout in real size. This is available for all graphics except the 3D displays. The medilogic software will check the paper size currently in use in Your printer and calculate whether the printout will fit on one page. If the picture should exceed the available space the image will be printed on two pages.
Two printout schemes are available for isobaric and sensor display respectively.
For space considerations the company logo is not printed .

6.7.3 Print – Sequential Printout

This printout sends a time sequence of the pressure distribution measurement to the printer. Comparable to a video sequence a number of single pictures will be printed showing the pressure distribution at different points in time during roll off. If there are more than two steps (one for the left and one for the right foot) You get shown a dialogue asking You to mark images for printout.

6.7.4 Print – Overview Normal, 3D, Comparison

Four images are put on one page and send to the printer. Basically any graphic displayed on the screen can be sent to the printer.
The print menu hold different configurations for the overview printout. The are identified by the name next to overview. Should You need additional overview printouts please contact the hotline.
The company logo will also be put on the overview printout, making it an ideal handout for Your customer.

6.7.5 Print – Gait Parameters, Average Step, Time Graphic, DSP Dynamics

All printouts for gait analytical evaluations are only available, if the corresponding dialogue is open. The information displayed is put into a printable format and sent to the printer. Some preconfigured printouts with different configurations are available, should You need another configuration please contact our hotline.
The company logo can also be printed out.

6.7.6 Print to bmp file

Printouts can be saved as *.bmp files instead of being printed on paper. These files can then be sent to external programmes. The first time this function is used the subdirectory ‘pictures’ in the medilogic path (normally ‘c:\programme files(86)\medilogic\’). Here the bmp files will be put with a filename concatenated like that: name_firstName_DateOfBirth_current_number.

6.7.7 Setup Printer

The menu item ‘Print’’medilogic printer setup’ calls up the standard WINDOWS® dialogue used for choosing end configuring a printer. Here You can set the paper size, the orientation (must be set to portrait) and the print quality. The print quality influences printout speed and colour use.
Other parameter that can be set up are printer specific. If in doubt consult Your printer manual.
When printing to a black and white printer the software will switch from colour table to greyscale for a short moment to display pressure gradients as detailed as possible.
To speed up printout for every day use ‘Options’ ‘Usability’ ‘Suppress Printer Dialogue Before Printing’. The printout will now start immediately without the need to confirm the printer settings.

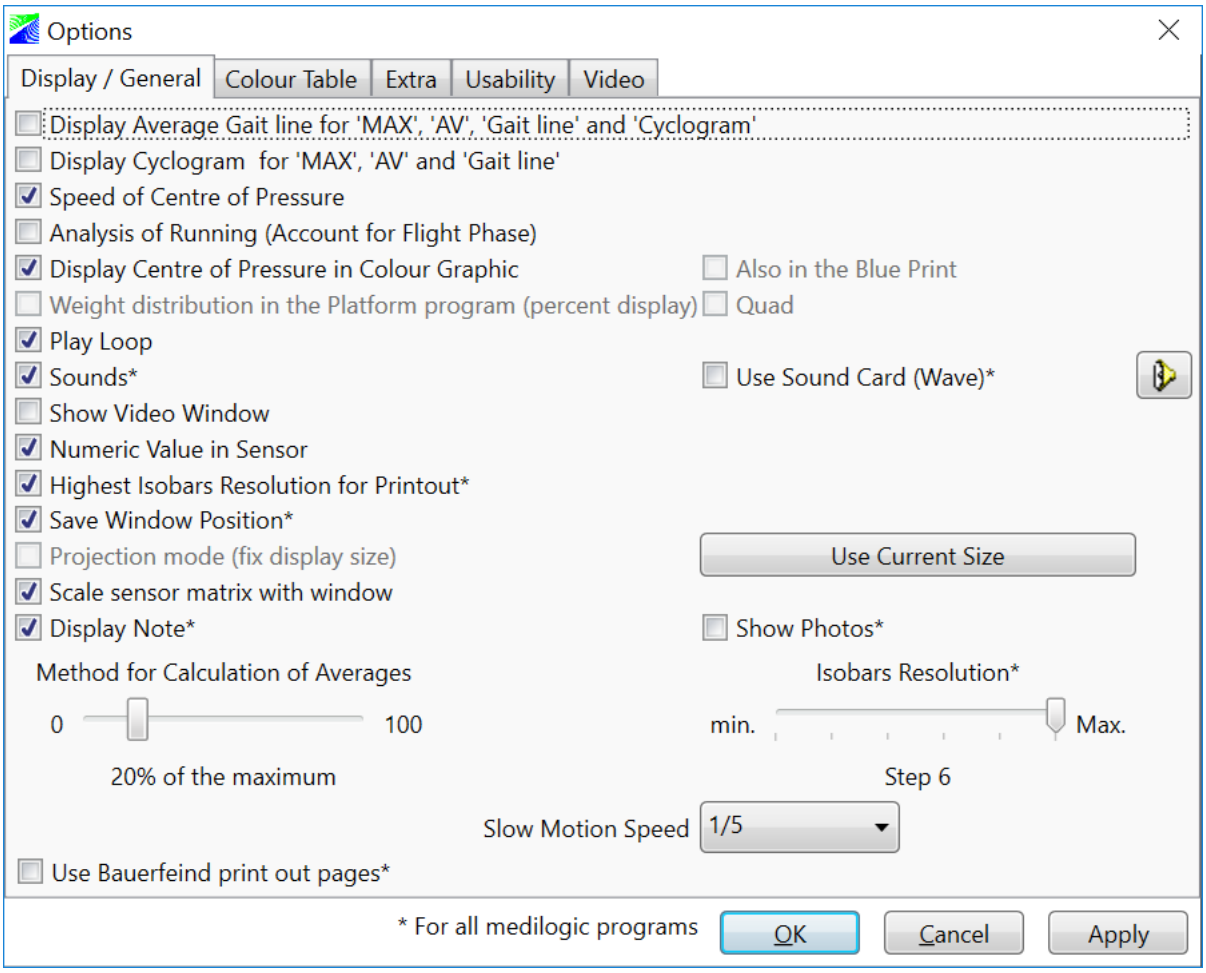
6.7.8 Including a Company Logo

The medilogic software can add Your company logo to printouts. By default it is displayed in the upper right hand corner. Your company logo should be in the bitmap format and have the name logo.bmp. It replaces the default logo.bmp in the medilogic path (normally ‘c:\programme files(86)\medilogic\’). You can save the printer settings and Your logo.bmp when making a backup.
(*see 6.5.6*) .

6.8 *Options*

The menu item opens a dialogue that lets You change settings to adapt the medilogic software to Your needs. If an option is activated that is indicated by the check in front of it. Clicking on the check will set and reset it. The setting are saved when You click 'OK' or 'Apply' and loaded at the next start of the programme. Options marked by '*' indicate that they are applied to the insole and platform programme and have to be set only once in either programme.
Some options are only valid for pressure measurement so if the 'Scan Only' (5.x version) is activated the irrelevant options are greyed out. The same is true for the 10.x versions if You access the scanner functions.

6.8.1 Options „Display / General"



Option: „Display Average Gait 'MAX', 'AV', 'Gait Line' and Cyclogram"
This option will overlay the maximum graphic, average graphic, gait line, cyclogram with the average gait line.

Option: „Display Cyclogram for 'Max' 'AV' and Gait Line"
The cyclogram depicts the progression of the centre of pressure of the body over the measurement period. Normally it has the shape of a butterfly and can be overlayed over the maximum graphic the average graphic and the gait line. *see 6.3.10*

Option: „Speed of Centre of Pressure"
The gait line is coloured from blue (slow) to red (fast) to indicate the speed of the centre of pressure at any given moment.

Option: „Analysis of Running (Account for Flight Phase)“
This will force continuous lines for the cyclogram even if both feet are in the are and the centre of pressure can not be calculated. In addition to that lines dividing left/right and forefoot/heel are shown to facilitate the interpretation of the cyclogram.

Option: „Display Centre of Pressure in Colour Graphic“
The current centre of pressure is displayed as cross hair in colour graphic.

Option: „Also in Blue Print “
Refers to the option above and will show it in the blue print evaluation as well.

Option: „Weight Distribution in the Platform Programme (percent display)“
This option will show to percent displays with corresponding bars at the bottom of the graphic.
To indicate the load distribution between left and right side.

Option: „Quad“
Additionally to the option above for percent displays show the load distribution for left/right and forefoot/heel areas.

Option: „Play Loop“
When replaying a measurement the replay will not stop when it reaches the but start at the beginning again. If the period has been zoomed into only the part shown will loop.

Option: "Sounds"
This option activates the audio signal the medilogic programme put out when starting or when sensors are connected. They give screen independent information about the state of the programme and alert You to messages.

Option: "Use Sound Card (Wave)"
This option will send the sounds to the sound card instead of the internal speaker. These wave files sound smoother than the beeps from the internal speaker. You can test the sounds using the button to the left.

Option: "Show Video Window"
If a video source is connected to Your computer (e.g. a webcam) this option will display a window which shows the video from that source. This option can be purchased separately as software update. To control recording and replay use the same buttons as for recording and replaying a measurement. After recording a video the file is compressed and saved to hard disk, depending on computer speed
see 6.8.5 Options „Video“

Option: "Numeric Value in Sensor"
This will put the pressure value for every sensor in the coloured field representing that sensor in the sensor graphic. For the platform programme this option is only available for the 10.x versions.

Option: „Highest Isobars Resolution for Printout“
For speedy recording and evaluation of measurement it can be helpful (esp. for slow computers) to set the isobars resolution to a lower then maximum level. For the best possible printout the highest resolution is desirable and since it is only used just before the printout will not take up too much time.

Option: „Save Window Position“
This option saves the window position when the software is closed and reopens them in the same position when the software starts again. After installation this option is not selected, should You wish to use this function please activate it.

Option: „Projection mode (fix display size)“
If You use medilogic projection the display size has to be adjusted to ensure 1:1 projection of pressure distribution. This option will save the setting and call it up with every start of the programme.
The button ‘Use Current Size’ will overwrite the value saved with that of the current window.

Option: „Scale Sensor Matrix with Window“
If this option is set the sensor matrix is scaled with the programme window. If You have a 16:9 screen aspect ratio we suggest not using this option to avoid distorted display of insole or platform graphics.

Option: „Show Note“
Set this option to display the note in a separate window *see 6.4.9*

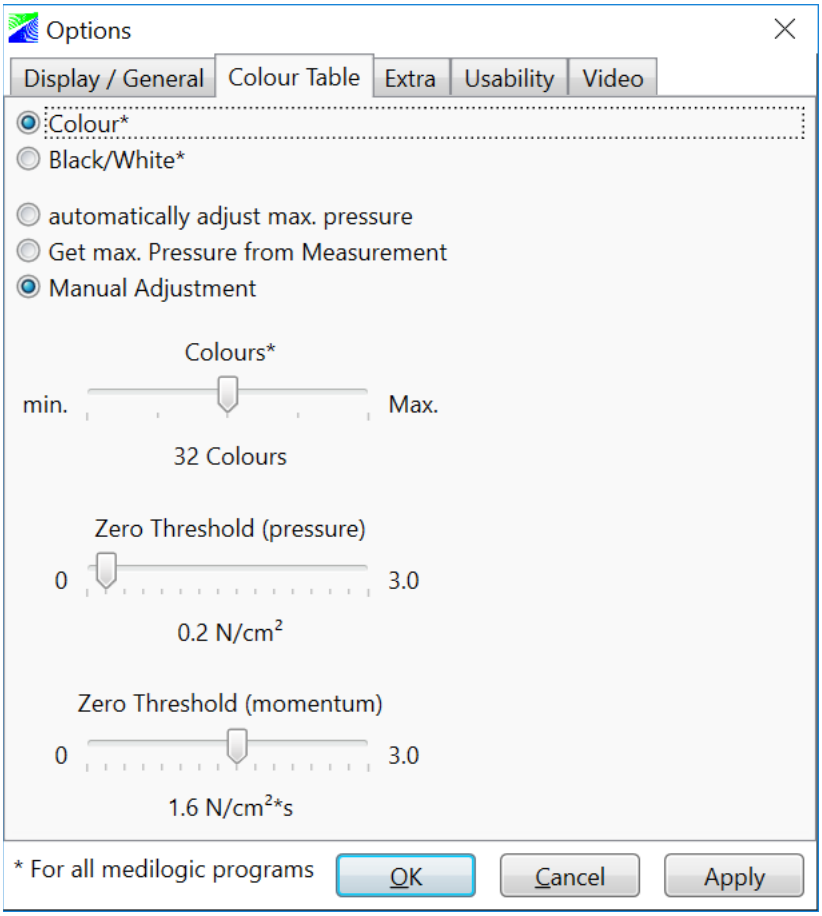
Option: „Show Photos“
You can associate up to nine photos with a measurement. The photos can be used for documentation purposes and come from a digital camera or if You use the video option as frames from the video window. The photos associated with a measurement will be displayed if the measurement is loaded. A special print scheme will send them to Your printer.

Option: „Method for Calculation of Averages“
This option influences the display of average pressures (*see 6.3.7*)) . The threshold is set to eliminate values below the number indicated beneath the slider. This helps to discern between periods with little pressure (e.g. swing phase) and periods with higher values (e.g. stance phase). A threshold value of 20% should be ideal to eliminate the swing phase from the average calculation. In other words: the setting of 20% will only calculate the average from the stance phases.
Setting the slider all the way to the right causes a special average calculation needed for Export used with theIETEC milling machine. An average is calculated using the averages of all maximum values. For every step and sensor the maximum value is detected separately and from these values an average is calculated.

Option: „Isobars Resolution“
The higher the isobars resolution the more computing power is needed to display it. Should You notice lag in displaying or recording pressure distributions, please choose a lower resolution. This will speed up the display process.

Option: „Slow Motion Speed“
This set the ratio at which the measurement is slowed down compared to normal speed. The frame rate for normal speed is calculated and multiplied with the values set in the drop down list. To achieve correct timing even with a slow machine frames may be dropped.

6.8.2 Options for „Colour Table“



Option : „Colour – Black/White“
If You use a black and white display it is important to set this option. The pressure will then be coded according to a grey scale. If You print to a black and white printer the software will automatically switch to this mode for a short period to generate the correct grey scale.

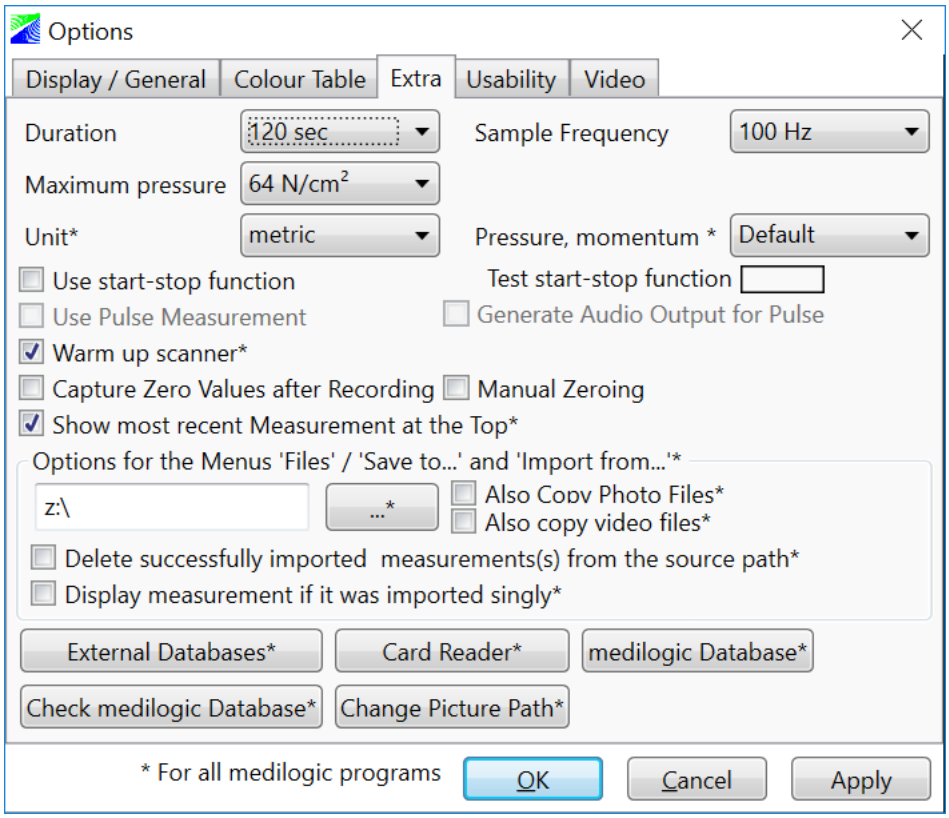
Option: „Automatically adjust Max. Pressure“/'Get Max. Pressure from measurement'/'Manual Adjustment'
These three options influence how the max. pressure slider works. The option we suggest is to let the programme automatically adjust the colour distribution. That way the programme will parse the measurement when it is loaded and set the colour red to that value. This displays the measurement the highest number of colours available.
Getting the max. pressure value from the measurement will read the value set by the user when saving the measurement. The measurement will then be displayed with the value set be the user.
The third option is to set the max. pressure value manually. The programme will not touch that value except to call up the value set by the user in the previous session. This is useful if You want to have a fixed relation between colour and pressure. With this setting You can compare two measurements by just looking at the colours.

Option: „Colours“
This set the number of colours used to display pressure distributions between 8 and 128. The more colours are used the more computing power is needed. For the average computer 32 colours is a good setting . If You stet the number of colours higher than 32 that number is used, but the colour scale at the bottom of the screen stays at 32 intervals, because of readability. *see 6.4.6*

Option: „Zero Threshold (Pressure / Momentum)“
Only the values above the set zero threshold are displayed as colours. The colour scale starts with the value set here. It can be set separately for pressure (N/cm²) and momentum (N/cm² * s) graphics.
see 6.4

6.8.3 Options „Extra“

Normally the software and system are setup by a technician sent by the company, he or she will make the proper adjustments in this section. Should You feel uncertainty concerning these settings, please don’t hesitate to contact the manufactures hotline.



Option: „Duration“
The maximum recording duration is set with this option. Keep in mind that this directly influences the amount of storage space You need for each measurement. Use the amount of time suitable for the task. For insole measurements we suggest 60 s for platform measurements 20 s.

Option: „Sample Frequency“
The number of samples per second is set by this option. Like the option ‘Duration’ this setting influences the storage space required for each measurement. A higher sample frequency will let You catch shorter events. For sports measurements the WLAN system offers up to 400Hz the Upat4 system 300Hz.
For a standard insole measurement during walking 60Hz are sufficient. The platform measurements are stored with a sampling frequency of 20 Hz.

Option: 'Unit'
For users in the anglophonic world this option can be set to English in order to display pressure units and speed in English units.

Option: 'Use start-stop function'
For gait analytical measurements on a walk way we offer wireless trigger mats to start and stop a recording. Setting this option activates the use of trigger mats to control recording. The function of the triggers can be tested in the dialogue. The field 'Test start-stop function' will light up when a trigger is activated. A small red dot is added to the recording button in the software. If a trigger signal has been received it turns green.

Option: 'Use Pulse Measurement'
Signals from the additionally available heart rate sensors can be saved with a measurement.

Option: 'Generate Audio Output for Pulse'
When a signal from the pulse measurement has been received an audio signal is generated.

Option: „Capture Zero Values after Recording"

For special applications of the medilogic system like in sports locomotor analysis the values of the foot in unloaded phases can be subtracted as zero values. The smallest values from the whole measurement are identified for each sensor and subtracted from all the values in the measurement.

Option: „Manual Zeroing"

If this option is set the recording button (red circle) will turn yellow indicating that the zero values are being captured. A second click on the button will start the actual recording.

Option: „Show most recent Measurement at the Top"

The dialogue for loading current and comparative measurements will sort the measurements according to their recording date and time, if this option is set.

Option: "Show Scan Window Automatically When loading a Pressure Measurement'
This option is only available in the 5.x version and will open a scan window, if a scan is associated with the measurement being loaded.

Option: 'Options for the Menu 'Data'/'Save to...' and 'Import from...'
Speedy data exchange for mobile storage devices can be preconfigured using these options. Choose a removable storage device, where You want to save or restore the measurements. Decide whether to save images and videos to this location as well. Make sure there is enough space on the device, especially for the last to options.

Option: „Delete successfully imported measurements(s) from the source path"
The measurement is deleted from the storage device after it has successfully been imported.

Option: „Display measurement if it was imported singly"
If only one measurement was in the location specified above, display it immediately after importing.

Option: „DX-Diag"
The graphic module directX supplied by WINDOWS® is used to display the isobaric display and the 3D graphics. This button (only available in the 5.x versions) lets You start the diagnosis tool and configure directX. It can be helpful to deactivate the option directDraw and direct3D in the tab 'Display'.

Option: „medilogic Database"
This button will call up a dialogue that lets You choose the location of the medilogic database, to which measurements and customer information are stored. You can point the software to server on Your network. From now on data will be saved and retrieved from this location. Multiple instances of the medilogic software on computers in different locations can access the same database and thus share the information without the need for a backup and restore process for synchronisation. This al-

lows You to work on measurements and customer information simultaneously from different locations. The information currently changed on one computer is protected from change made at a different location, to prevent conflicts.
Changes that do not pertain to customer information or measurements (e.g. Options or printouts) get stored in a local database.

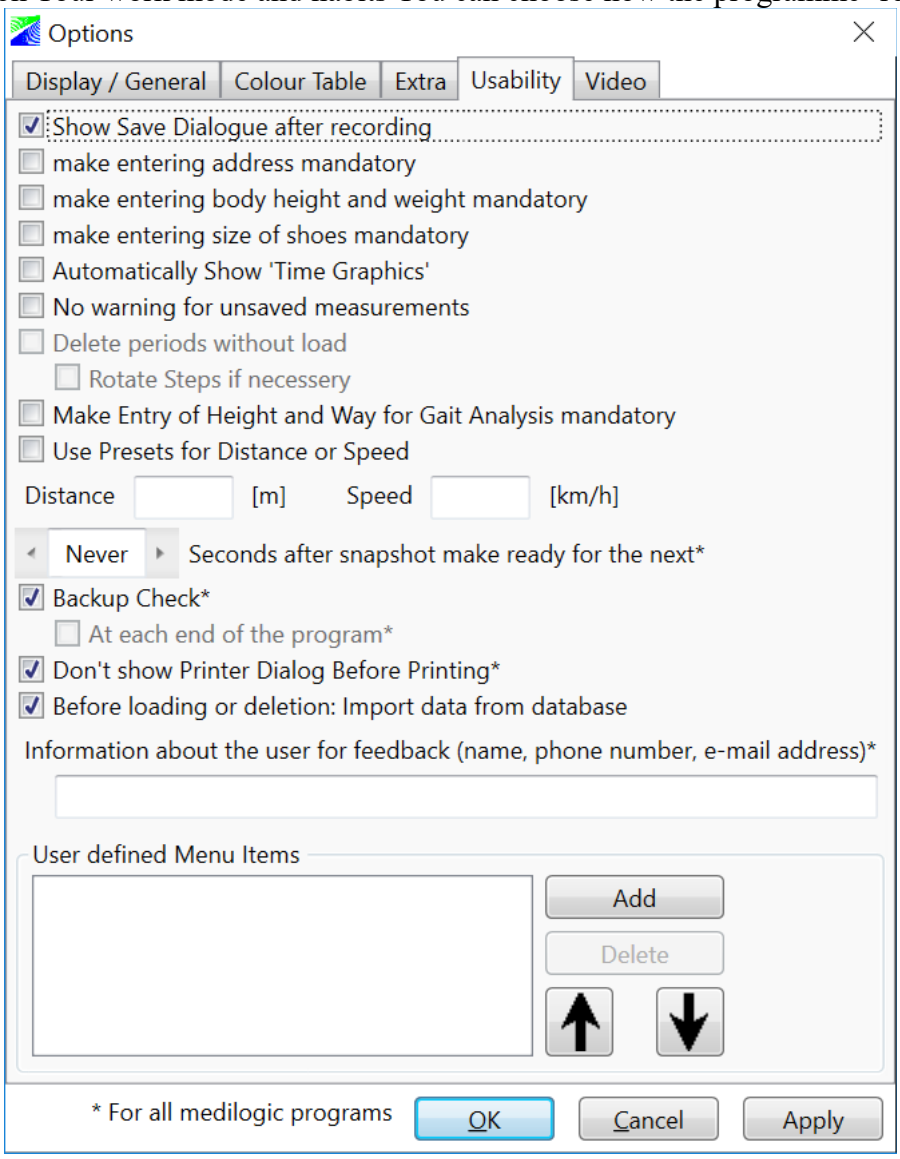
Option: "Check medilogic Database"
To check the database for inconsistencies concerning measurements and customer information click this button. This check should be done regularly and always before making a complete backup.

Option: 'External Databases'
This option lets You set up import of customer data from external databases. This is mainly meant to speedily enter customer data already existing in other programmes.
You can choose from a number of databases and programmes for which we have programmed an interface. Select a database name from the drop down list and activate the check 'use'. You can choose more than one database to import customers from.
The field 'database path' lets You set the path to the external database, if the database is installed at the default location You can leave the entry as it is. If not You can use the button 'Search for Database' to locate it. The same is true for the field 'Database file'.
Should the database You use not be in the drop down list please contact the manufacturer of the medilogic system.

Option: "Change Picture Path"
This option lets You choose a path where the printout scheme 'Current View (BMP)' put the image file. The default directory is the 'pictures' - path in the medilogic programme directory.

6.8.4 Options 'Usability'

These options category contain programme settings which can streamline Your everyday work. Depending on Your work mode and habits You can choose how the programme 'reacts'.



Option: 'Show Save Dialog after recording'

The save dialogue opens automatically as soon as a recording is stopped, either by clicking the stop button or when the maximum recording duration is reached. If You choose not to save the measurement just recorded (e.g. You want to do it again) , click on 'Cancel' to return to the main window and the online mode.

Option: 'make entering address mandatory'

If You want to save an address with every customer set this option to make entering the information mandatory.

Option: 'make entering body height and weight mandatory'

For gait analytical evaluations the information about body weight and height is necessary and can be made mandatory setting this option

Option: 'make entering size of shoes mandatory'

If You need the information about the shoe size, setting this option will prevent the save dialogue from being closed without this information. The field is marked red.

Option: 'Automatically Show Time Graphics'
The evaluation 'Gait Analysis/Time Graphics' opens automatically after a recording is finished. The save dialogue might appear before that if the option (see above) is set.
This might be useful for a dynamic platform measurement so that the time-load graphic is opened for immediate inspection.

Option: "Ignore unsaved measurement when using start-stop function"
If You use the trigger mats provided additionally by medilogic to start and stop recordings, this option will overwrite existing unsaved measurements. This prevents the save dialogue from delaying the start of the recording, If You use this option make sure to save recordings right after stopping them.

Option: „Delete periods without load"
➢ only available in the platform programme
Periods during the measurement where no load is detected are deleted. This allows You to make several steps over the platform and save them as consecutive steps. This will save storage space and make handling the measurement easier.see 7.2.2

Option: „make entering body height and weight mandatory"
➢ only available in the insole programme
Information necessary for gait analytical evaluations will be checked for completeness. This is to prevent the user accidentally forgetting to enter the information and thus preventing gait analytical evaluation.
If only the basic evaluations are needed (Max, Avg, Gait Line, Cyclogram) information about body height and weight are not necessary and the option can remain unchecked.

Option: „Pre fill distance or speed for gait analysis"
This allows You to save default values for Your gait analysis measurement. The value will be filled in when the save dialogue is opened. This is useful if You have a standard walk way or preset speed on the treadmill.

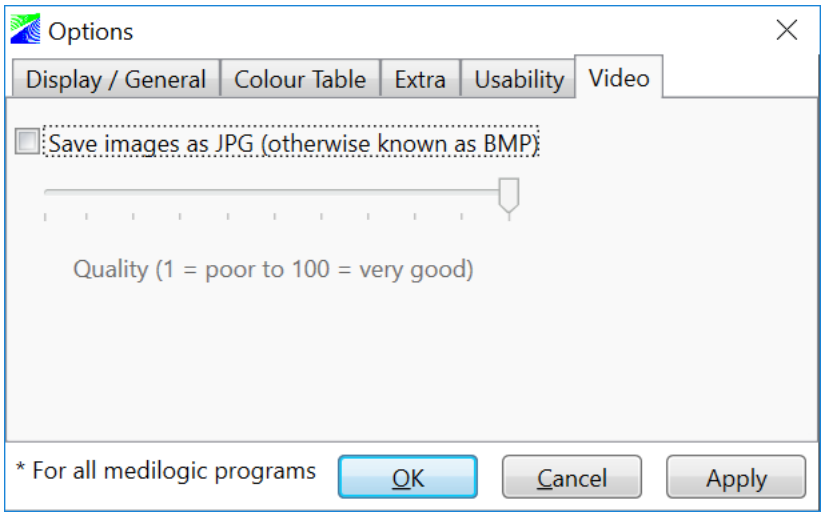
Option: „Backup Check"
This option ensures that the programme checks regularly whether a backup has been made. If no backup has been made after 20 measurements or one week the programme will prompt the user to make a backup. This check is performed when the software starts and finishes. If You answer 'Yes' the backup dialogue will open and You can change the settings. Clicking 'Start' will make a backup.
see 6.5.6

Option: „Suppress Printer Dialogue before Printing"
If You use the same printer with the same settings for all medilogic printout, this option will skip the printer setup dialogue for faster printing.

Option: „User defined Menu Items"
To quickly access sub menu items (e.g. like a printing scheme) You can define the menu items needed most often and put them in the menu bar on the right hand side. This makes Your every day handling of the medilogic system much faster.

6.8.5 Options „Video“

If You use the medilogic system with the video (*see 6.8.1 Options „Display / General“)* option (additionally available) You can save the current frame and store it in the photo dialogue. By default the images are saved as bmp the checkbox ’Save images as JPG’ compresses the images according to the jpeg standard. The quality slider sets the compression rate which is inversely related to storage space uptake.



Only relevant for the 5.x version:
The videos have to be compressed to conserve storage space on Your hard drive. There are a number of compressors available. The default is the ‘Indeo’ compressor.
You can set the size of the video window, depending on the video source used. This allows You to adapt the video window to the space available on Your screen.
For webcams we suggest the setting ‘1:1 no conversion’. To access the settings available for Your video device use the right mouse button to click the video window, showing the live view.

7 Description of Hardware Components

7.1 Pressure Measuring Insoles

7.1.1 Description

The insoles of the medilogic foot pressure measurement system are intended to be used to measure the pressure distribution inside the shoe under the foot for static and dynamic loads. The loads are recorded for left and right foot in correct temporal relation. Should You need insoles that differ from the standard outlines (e.g. for comfort shoes), we can manufacture insoles according to Your specifications.

7.1.2 Intended Use

Choose an insole according to the foot size of the customer and put them inside the shoes. The tongue of the insoles is on the outside (lateral) of the lower leg and needs to be attached using the velcro straps provided. The insole marked red is intended for the left foot, the one marked in blue for the right foot.

Make sure that the medilogic insole is not larger then the insole of the shoe and not much smaller, since this would lead to unrealistic values. Make sure that there are no sharp objects (e.g. nails, small stones) inside the shoe that could penetrate the insole and destroy it.

Don't try to adjust the position of the insole inside the shoe by pulling on the tongue, rather let the customer step out of the shoe again and hold the tongue while the customer steps into the shoe again.

Attach the insoles to the lower leg of the customer and connect them to the transmitter (WLAN or Up-at4 transmitter on the belt).

The transmitter will read when switched on what kind of insoles are connected. The information is sent to the computer. The information about the outline of the insole is used to display the insole correctly.

Consequences for You:

- If no insoles are connected to the transmitter no insoles will be displayed.
- With the U2 wireless transmitter the device needs to be restarted if the insoles have been changed, which usually happens between one customer and the next. Otherwise the wrong information is used for the recording

see 7.6

7.1.3 Sensor Principle

The sensors are surface resistive pressure sensors, that means with rising load the electric resistance of the sensors goes down. To achieve maximum accuracy each sensor is calibrated individually. The resulting calibration tables are stored in the insole electronics.

The calibration tables have to be checked regularly. We suggest at least once a year or after 5000 loads/steps (what ever comes first) a computer based polybaric calibration is done by the manufacturer.

7.2 Wireless Pressure Measuring Platform

7.2.1 Description

The medilogic wireless pressure measuring platform is used for easy recording of static an dynamic load distribution under the foot. The measurement is especially useful to document the foot status before and after care. The option of capturing the outline of the foot makes it the ideal companion to the medilogic insole foot pressure measuring system.
The wireless pressure measuring platform uses the Upat4 wireless transmitter (Upat4/Fumod4). This means that it is not a cable system giving You more freedom of placement.

7.2.2 Intended Use

After the programme has finished loading and the transmitter has been switched on the customer needs to take off the shoes and stand on the platform. During a static recording it might be useful to ask the customer to shift the weight to load all areas of the foot.
To record a dynamic measurement with the pressure measuring platform make sure that the customer leg not on the platform swings over the free half of the platform NOT over the case holding the electronics (wireless and Pro platform). For the Basic version the foot should swing over the floor.
After roll off of one foot the customer turns around to step on the platform with the second foot.
The software will put both feet on screen side by side, toes pointing upwards so that the left foot is on the left side and the right foot on the right.
see 7.6

7.3 Pressure Measuring Platform Pro

The medilogic pressure measuring platform Pro is available as cable version directly connected to the USB port of Your computer or with a wireless transmission.
The cable version is supplied with power from the USB port and needs no additional power source.
The size and properties of the sensor field for the medilogic pressure measuring platform Pro are the same as for the wireless pressure measuring platform.

7.4 Pressure Measuring Platform Basic

The pressure measuring platform Basic is available with a cable connection to the USB port of Your computer or a wireless transmission.
The cable version is supplied with power from the USB port and needs no additional power supply.
The pressure measuring platform Basic is designed for capturing dynamic load distributions under the foot that is rolling off on the platform. The sensor resolution is the same as that of the wireless pressure measuring platform.
The following functions are NOT available for the medilogic pressure measuring platform Basic:

- on screen comparison
- capturing the foot outline
- video option

Please heed the advice in sections 7.2.2 *Hinweise zum dynamischen Messablauf*

7.5 Pressure Measuring Seat Mat

To record load distributions during sitting e.g. on a cushion or in a shell we offer flexible measuring mats in different sizes. The mats contain depending on size and shape up to 480 sensors. The mats use the wireless transmission (Upat4/Fumod4). Thus they are not hindered by cable connections and can be used with the maximum amount of freedom.

7.6 Wireless Transmitter Upat4

The wireless transmitter for the medilogic system in the Upat4 version can be attached to the customers back using the belt provided or to the platform using the velcro strips an the back of the case.
The insoles or platform are connected to the transmitter using the attached cables. The pressure values are sent via the cable to the transmitter. This eliminates hindering cable connections between customer and computer.
Switch on the transmitter by pressing down the black button on the side of the device. Two short beeps will sound and the power - LED will light up. The transmitter is ready for use.
After the transmitter has been switched on it will immediately start to send data to the wireless transmitter Fumod4 attached to the computer. A orange LED shows the current state (blinking = ready but not yet in use; continuously on = activated by the medilogic software and ready to transmit). Whenever data is received on the computer the green LED will light up.
To switch the transmitter Upat4 off hold down the black button for approx. three seconds. The device will emit a long beep and switch off once You release the button, the LED is switched off.
The integrated energy saving mode will switch off the transmitter Upat4 after five minutes. 15 seconds before that it starts beeping in regular intervals. Pressing once on the black button keeps the transmitter Upat4 on for five more minutes. During recording You can press the <F2> key to keep it on for another five minutes. Starting and stopping a recording will also keep the transmitter Upat4 alive for five more minutes.
Note: Power supply for the transmitter Upat4 is a 9V standard block battery. When purchasing batteries look for alkaline or lithium batteries, these have a much higher capacity resulting in longer operation hours.
When the battery reaches a low level, a message will be displayed by the software and the LED on the transmitter Upat4 starts blinking.
Should the supply voltage drop under a level for correct operation the transmitter Upat4 will switch off automatically and can only be switched on again when a new battery has been inserted.
To change the battery open the lid on the back side of the transmitter Upat4. Carefully remove the battery contacts to avoid ripping them off. Connect the new battery observing the correct polarity an put it in the battery compartment. Please note batteries have to be disposed off according to local regulations.
see 8.1.2 „Battery of the Upat4 is low

7.7 Wireless Transmitter Fumod4

The wireless transmitter Fumod4 for the medilogic foot pressure measuring system in the version Upat4 and the for the platform system has to be attached to a USB-port of Your computer using the cable provided.
Switching it on and off is done by the software/computer. If it is switched on this is indicated by an orange LED (blinking=ready for use, but not yet activated by the software; continuously on = activated by the software an ready for use). The reception of data is indicated by the green LED on the transmitter Fumod4.
Note: for Windows 8, 8.1 and 10
Should the orange LED not blink while the software is off or not light up continuously when the software is running, the USB interface needs to be reconfigured. Start the function „FuMod4USB-Problembeseitigung für Windows 8.1“ from the medilogic install medium.
You can also download the tool from our homepage www.medilogic.com.

7.8 WLAN-Transmitter

For a completely cable free data transmission a WLAN transmitter is connected to the left and right insole respectively. These transmitters transfer the data to a WLAN interface on Your computer and thus provide online display on the screen.
A built in rechargeable battery is the power supply for the WLAN transmitter. The charging status is indicated by the upper LED. Green = charge OK, if it turns orange or red first connect the transmitter to the USB cradle and then connect the cradle to the computer USB port.
The lower LED indicated data transmission: when an insole is connected the initialisation phase is indicated by orange blinking, after that the data transmission starts. Continuous green light indicates that a recording has not been started by the software. During recording the LED blinks green.
To restart the transmitter disconnect and reconnect the insole.

7.9 Technical Specifications of the Foot Pressure Measuring System – WLAN-Pressure measuring insoles

Insole:
Max. 240 surface resistive SSR-sensors per insole (depends on size and shape)
Available standard sizes : 19/20,...,49/50 (EU)
Individual outlines can be manufactured
Measuring range: 0,6 bis 100 N/cm² (default: 64 N/cm²;max. allowed load: 200 N/cm²)
Max. measuring error ± 5% FSO

Calibration:
Computer base polybaric calibration table capturing by the manufacturer
Calibration interval: once a year or after 5.000 loads/step whatever comes first

Sample Frequency:
50 to 100 Hz ; maximum 400 Hz for the sports version

WLAN Insole:
Weight: 125g including transmitter
Dimensions of the WLAN transmitter incl. Connector :90mm x 60mm x 20mm
Power supply: internal Li-Ion-battery (Type PL103450P: 3,7V / 1.800mAh); Charging of the battery only using the USB cradle provided. Replacement of the battery only by the manufacturer!

WLAN Wireless Transmission:
Frequency: 2,4 GHz
Range: max. 100m in the open, inside buildings approx. 25m

Connections:
USB-connection of the USB cradle to the computer or the adapter Navi Lock
Operation only with the power adapter provided: USB 5V / 2A (Hersteller: NaviLock, Typ: 61863).
Disconnection from the supply network by pulling out the power connector

Environmental conditions:
Storage/Transport: Don't drop. Breakable*!* 
-20 bis +40°C; 20-80% rel. humidity, not condensing; 700-1060hPa atm. pressure

Operation: +5 bis +30°C; 20-80% rel. humidity, not condensing, 700-1060hPa atm. pressure

Test certificates:
EMC test report according to DIN EN 60601-1-2
Registered with the Landesgesundheitsamtes Reg.-Nr. DE/CA 76/H 00024/01

FDA Reg.-No. *003995459* ; *Owner Operator Number: 10037104, Medical Device Listing : D125603*

Computer System (minimum configuration):
Computer built later then 2005:
- 8 GB RAM
- x86 compatible Processor
- Colour Monitor/LCD-Display with at least 1.024x768 Pixel, DirectX 8.1
- Colour Printer
- 1 free USB-port for WLAN-Adaptor or internal WLAN-interface
- add. 1 USB-interface if printer needs to be connected directly
- *add. 1 free USB-port for connection of video source*
- Operating: Windows® 7, 8, 8.1, 10

7.10 Technical Specifications for the Foot Pressure Measuring System –Insole Measurement incl. Upat4 Data Transmission

Insole:
Max. 240 surface resistive SSR-sensors per insole (depends on size and shape)
Available standard sizes : 19/20,...,49/50 (EU)
Individual outlines can be manufactured
Measuring range: 0,6 bis 100 N/cm^2 (default: 64 N/cm²;max. allowed load: 200 N/cm²)
Max. measuring error ± 5% FSO

Calibration:
Computer base polybaric calibration table capturing by the manufacturer
Calibration interval: once a year or after 5.000 loads/step whatever comes first

Sample Frequency:
60 (optional 50 Hz for video synch.) Maximum 300Hz for the sports version

Wireless Transmitter Upat4:
Weight: 180g
Dimensions:145mm x 60mm x 30mm
Power Supply: 9V Standard-Block Battery

Wireless Transmitter Fumod4:
Weight: 150g
Dimensions: 93mm x 75mm x 28mm
USB-interface to the computer incl. Power supply via USB

Wireless Data Transmission:
Frequency: 2,4 GHz
Range: max. 100m (outside), inside buildings approx. 25m

Connections:
USB connection to the Computer
Disconnection from the supply network by pulling out the power connector

Environmental conditions:
Storage/Transport: Don't drop. Breakable*!*
-20 bis +40°C; 20-80% rel. humidity, not condensing; 700-1060hPa atm. pressure

Operation: +5 bis +30°C; 20-80% rel. humidity, not condensing, 700-1060hPa atm. pressure

Test certificates:
EMC test report according to DIN EN 60601-1-2
Registered with the Landesgesundheitsamtes Reg.-Nr. DE/CA 76/H 00024/01

FDA Reg.-No. *003995459* ; *Owner Operator Number: 10037104, Medical Device Listing : D125603*

Computer system (minimum configuration):
Computer system approved according to IEC 60950
PC Pentium at least 1,6 GHz, 256 MB RAM, mouse,
(for video option: Pentium 4 at least 2GHz, 512 MB RAM)
Monitor/LCD-Display with at least 800x600 Pixel and 16 Bit colour depth, DirectX 8.1
Colour Printer
1 free USB-Port for data transmission

- add. 1 USB-interface if printer needs to be connected directly
- *add. 1 free USB-port for connection of video source*
- Operating: Windows® Vista, 7, 8, 8.1, 10

7.11 Technical Specifications for the Platform Measuring System / Seat Pressure Measuring System incl incl. Upat4 Data Transmission

Pressure measuring platform Funk:/ Pro
4096 surface resistive SSR-sensors
Measuring area: 480mm x 480mm
Dimensions: 630mm x 530mm

platform Basic (wireless/USB-cable):
2048 surface resistive SSR-sensors
Measuring area: 480mm x 240 mm
Dimensions: 550mm x 400mm
Meas. range: 0,6 bis 100 N/cm² (default: 64N/cm²;max. allowed load: 200 N/cm²)
Maximum Error ± 5% FSO

Seat Pressure Measuring System

240 to 480 surface resistive SSR-Sensors
Measuring area: div. sizes
305mmx200mm to 758mmx808mm
Meas. range: 0,6 bis 100 N/cm² (default: 64N/cm²;max. allowed load: 200 N/cm²)
Maximum Error ± 5% FSO

Sample Frequency: 20 Hz ***Sample Frequency: 60 Hz***

Calibration:
Computer base polybaric calibration table capturing by the manufacturer
Calibration interval: once a year or after 5.000 loads/step whatever comes first

Wireless Transmitter Upat4:
Weight: 180g
Dimensions:145mm x 60mm x 30mm
Power Supply: 9V Standard-Block Battery

Wireless Transmitter Fumod4:
Weight: 150g
Dimensions: 93mm x 75mm x 28mm
USB-interface to the computer incl. Power supply via USB

Wireless Data Transmission:
Frequency: 2,4 GHz
Range: max. 100m (outside), inside buildings approx. 25m

Connections:
USB connection to the Computer
Disconnection from the supply network by pulling out the power connector

Environmental conditions:
Storage/Transport: Don't drop. Breakable*!* 
-20 bis +40°C; 20-80% rel. humidity, not condensing; 700-1060hPa atm. pressure
Operation: +5 bis +30°C; 20-80% rel. humidity, not condensing, 700-1060hPa atm. pressure

Test certificates:
EMC test report according to DIN EN 60601-1-2
Registered with the Landesgesundheitsamtes Reg.-Nr. DE/CA 76/H 00024/01

FDA Reg.-No. *003995459* ; *Owner Operator Number: 10037104, Medical Device Listing : D125603*

Computer system (minimum configuration):
Computer system approved according to IEC 60950
PC Pentium at least 1,6 GHz, 256 MB RAM, mouse,
(for video option: Pentium 4 at least 2GHz, 512 MB RAM)
Monitor/LCD-Display with at least 800x600 Pixel and 16 Bit colour depth, DirectX 8.1
Colour Printer
1 free USB-Port for data transmission

- add. 1 USB-interface if printer needs to be connected directly
- *add. 1 free USB-port for connection of video source*
- Operating: Windows® Vista, 7, 8, 8.1, 10

8 Appendix:

8.1 Possible System Messages and what they mean

The medilogic programme catches occurring errors automatically and displays them on screen. The most important of these and what to do are explained here in short.

8.1.1 Message: 'Error connecting to FuMod4USB / Channel 0. No FuMod4USB found on this channel

This message might appear at the start of the software. It indicates that the software was unable to make a connection to the transmitter Fumod4. If You use the software just to view and evaluate measurements You can ignore the message (Click 'OK').
If You want to record a pressure measurement check the following to establish a connection to the transmitter Fumod4

- The transmitter Fumod4 is connected to the USB-port of Your computer
- The operating system has detected the transmitter and the medilogic software has activated it (orange LED continuously on)

Note: for Windows 8, 8.1 and 10
Should the orange LED not blink while the software is off or not light up continuously when the software is running, the USB interface needs to be reconfigured. Start the function „FuMod4USB-Problembeseitigung für Windows 8.1" from the medilogic install medium.
You can also download the tool from our homepage www.medilogic.com.

8.1.2 Message „Battery of the Upat4 is low"

Depending on the battery type used only a limited number of recordings are still possible. The power LED on the transmitter Upat4 starts to blink.
Replace the battery with a new 9V standard block *see 7.6*

8.1.3 Message „UPAT not connected or switched on"

This message indicates that the software is temporarily unable to connect to the transmitter Upat4.
To remedy this:

- Switch on the transmitter Upat4 (power LED lights up)
- Check that the transmitter Fumod4 is connected and activated (orange LED is on continuously)
- For the cable version of platform Basic and Pro check that the cable is connected to the USB port of Your computer

8.1.4 Message „No sensors connected!"

This indicates that the software was able to connect to the transmitter Upat4 via the transmitter Fumod4 but no information about connected sensors (insole/platform) was transmitted.
Please check the following;

- The insole or platform cables are connected securely to the transmitter Upat4
- The plugs connect with an audible click. If not carefully bend the lever up carefully.
- Switch the transmitter Upat4 off and on again *see 7.6*

8.1.5 Message: „No wireless interface found“

This indicates that the programme was unable to detect a WLAN interface.
Make sure that the WLAN adaptor is connected (TP-Link via USB cable) or the internal WLAN interface is activated.
After You made sure that has happened got to ‘WLAN’ /’Find Transmitter’ clicking the button ‘Options’. All available WLAN adaptors will be listed with currently active medilogic transmitters. Please choose the appropriate one.

8.1.6 Message : „Your Computer has no WLAN interface configured for the medilogic transmitter network 'A...'“

This message might appear at the start of the software if the WLAN adaptor is not configured correctly to be used as data transmission for the sensors.
You have the following choices when asked whether to reconfigure the adaptor:

Yes - The IP address and subnet mask of Your hardware will be reconfigured, please make sure that the WLAN Adaptor is not needed to access Your network.

No - A new search is started to detect a suitable WLAN adaptor. You should connect the TP-Link or activate Your internal WLAN adaptor

Cancel – Starts the software without WLAN adaptor. You can now only view and evaluate measurements not record new ones.

8.2 Radiation and safety distances - manufacturer's declaration for EMC

For safety reasons, the following tables must be observed with regard to EMC (Electromagnetic Compatibility). They are part of the certification according to the standard EN 60601-1-2 and taken from it accordingly.
Portable and mobile RF communications equipment (radios) should not be used closer to any part of the medilogic pressure measuring system, including the connecting leads, than the recommended safety distance specified in the tables below.
In the following tables ME device is used for 'Medical electrical device' and describes the devices described in this manual *medilogic pressure measuring system version WLAN-pressure measuring insoles, pressure measuring insoles with wireless data transmission Upat4,pressure measuring platform wireless, pressure measuring platform Pro (cable/wireless), pressure measuring platform Basic (cable/wireless).*

8.2.1 Cable Lengths of auxiliaries

connecting cable	*length*
USB – connection to the computer for Fumod4	180 cm
USB – connection to the computer for cradle	105 cm
USB – connection to the computer WLAN-Adaptor TP Link	145 cm
USB – connection to the computer for platform Basic-cable / Pro-cable	260 cm
Cable connecting the insole to the transmitter Upat4 (Upat4) (cable length varies with insole size)	72 bis 142 cm

8.2.2 Electromagnetic emissions: manufacturer's declaration and guidelines (Table 1 according to EN60601-1-2)

Guidance and manufacturer's declaration - electromagnetic emissions		
The ME device is intended for use in an electromagnetic environment as specified below. The user of the ME device should ensure that he is operating in such an environment.		
EMI measurements	**Conformity**	**Electromagnetic environment - guidelines**
RF emissions to CISPR 11	Group 1	The ME device uses RF energy only for its internal function. Therefore, its RF transmission is very low and it is unlikely that neighbouring electronic devices will be disturbed.
HF emissions to CISPR 11	Class B	The ME device is suitable for use in facilities other than residential and those directly connected to the public utility network that also supplies buildings used for residential purposes
Transmission of harmonics according to IEC 61000-3-2	Not applicable	
Transmission of voltage fluctuations / flicker according to IEC 61000-3-2	Not applicable	

8.2.3 Electromagnetic immunity: manufacturer's declaration and guidelines (Table 2 according to EN 60601-1-2)

Guidance and manufacturer's declaration - electromagnetic immunity			
The ME device is intended for use in an electromagnetic environment as specified below. The user of the ME device should ensure that he is operating in such an environment.			
immunity	**IEC 60601 test level**	**Matching level**	**Electromagnetic environment - guidelines**
Static electricity discharge (ESD) according to IEC 6100-4-2	± 6 kV contact discharge ± 8 kV air discharge	± 6 kV contact discharge ± 8 kV air discharge	Floors should be wood, concrete or ceramic tile. If the floor is covered with synthetic material, the relative humidity must be at least 30%
Fast transient electrical disturbances / bursts according to IEC 61000-4-4	± 2 kV for power lines ± 1 kV for power lines	Not applicable	The quality of the supply voltage should be that of a typical business or hospital environment.
Surge voltages / surges according to IEC 6100-4-5	± 1 kV Voltage outer conductor outer conductor ± 1 kV Voltage outer conductor ground	Not applicable	The quality of the supply voltage should be that of a typical business or hospital environment.
Voltage dips, short-term interruptions and fluctuations in the supply voltage according to IEC 61004-11	< 5% U_T (> 95% dip of U_T) for 1/ 2 period 40% U_T (60% dip of U_T) for 5 periods 70% U_T (30% dip of U_T) for 25 periods < 5% U_T (>95% dip of U_T) for 5s	Not applicable	The quality of the supply voltage should be that of a typical business or hospital environment. If the user of the ME device requires continued operation even in the event of power interruptions, it is recommended that the foot scanner be powered from an uninterruptible power supply or a battery.
Magnetic field at the supply frequency (50 / 60Hz) according to IEC 601114-8	3 A/m	Not applicable	Mains frequency magnetic fields should be the typical value found in the business and hospital environment.
Note: U_T is the mains AC voltage before the application of the test levels			

8.2.4 Electromagnetic Immunity: Manufacturer's Declaration and Guidelines for Non-Life-Causing ME Equipment (Table 4 according to EN 60601-1-2)

Guidance and manufacturer's declaration - electromagnetic immunity			
The ME device is intended for use in an electromagnetic environment as specified below. The user of the ME device should ensure that he is operating in such an environment.			
Immunity	**IEC 60601 test level**	**Matching level**	**Electromagnetic environment - guidelines**
Conducted RF interference according to IEC 610004-6 Radiated RF interference according to IEC 61000-4-3	$3V_{RMS}$ 150kHz to 80MHz 3V/m 80MHz to 2,5GHz	3V 3V/m	Portable and mobile radios should be used no closer to the ME device, including the wires, than the recommended safe distance calculated using the equation applicable to the transmit frequency. **Recommended safety distance in meters:** $d = (3{,}5/3) * \sqrt{P}$  $d = (3{,}5/3) * \sqrt{P}$ 80MHz to 800MHz $d = (7/3) * \sqrt{P}$ 800MHz to 2,5GHz with P as the nominal power of the transmitter in watts (W) according to the transmitter manufacturer and d as the recommended safety distance in meters (m). The field strength of stationary radio transmitters should be lower than the compliance level at all frequencies according to an on-site survey. In the vicinity of devices bearing the following icon, interference is possible.
Note 1: At 80 MHz and 800 MHz, the higher frequency range applies. Note 2: These guidelines may not be applicable in all cases. The spread of electromagnetic quantities is influenced by absorption and reflection of buildings, objects and people.			
[a] The field strength of stationary transmitters, e.g. Base stations of radio telephones and land mobile radios, amateur radio stations, AM and FM radio and television stations can not be theoretically accurately predicted. In order to determine the electromagnetic environment with respect to the stationary transmitters, a study of the electromagnetic phenomena of the location should be considered. If the measured field strength at the location where the ME device is used exceeds the above compliance levels, the ME device should be observed to verify its intended function. If unusual performance is observed, additional measures may be required, such as: a changed orientation or another location of the ME device. [b] Over the frequency range of 150kHz to 80MHz the field strength should be less than 3V / m.			

8.2.5 Recommended separation distances between portable and mobile HF telecommunications equipment and the ME device (Table 6 according to EN 60601-1-2)

Recommended safety distances between portable and mobile HF telecommunications equipment and the ME device

The ME device is intended for operation in an electromagnetic environment in which the RF disturbances are controlled. The user of the ME device may thereby help to avoid electromagnetic interference by maintaining the minimum distance between portable and mobile RF telecommunications equipment (transmitters) and the ME equipment, depending on the output power of the communication equipment as indicated below.

Rated power P of the transmitter W	**Guard distance, depending on the transmission frequency** m		
	150kHz to 80MHz $d = (3{,}5/3) * \sqrt{P}$	**80 Mhz to 800MHz** $d = (3{,}5/3) * \sqrt{P}$	**800MHz to 2,5GHz** $d = (7/3) * \sqrt{P}$
0,01	0,12	0,12	0,23
0,1	0,37	0,37	0,74
1	1,17	1,17	2,33
10	3,69	3,69	7,38
100	11,67	11,67	23,33

For transmitters whose maximum rated power is not specified in the table above, the recommended guard distance d in meters (m) can be obtained using the equation associated with each column, where P is the transmitter maximum power rating in watts (W) as specified of the transmitter manufacturer.

Note 1: At 80 MHz and 800 MHz, the higher frequency range applies.

Note 2:These guidelines may not be applicable in all cases. The spread of electromagnetic quantities is influenced by absorption and reflection of buildings, objects and people.

8.3 EU guarantee certificate

Dear customer,
We would like to thank you for choosing a medilogic system. We are sure that you will be satisfied with your choice as this product has been designed to meet your needs and ensure trouble-free use.
In addition to the manufacturer's two-year statutory warranty period for defects due to defective materials or faulty processing, we hereby certify the additional EU manufacturer warranty specified below.

Warranty:

1. This warranty is only valid upon presentation of the original invoice. It is important that the information contained is complete and legible.

2. The warranty is not valid if the serial number on the product has been altered or removed in any way or is illegible.

3. The system must be sent insured to the manufacturer's address. In order to avoid transport damage, it is necessary to package the device well. To do this, use the system case in which the system was delivered. The costs for the return transport of the repaired or exchanged product shall be borne by the manufacturer.

Legal warranty obligation of the manufacturer:

The warranty period begins on the date of delivery of the system to the customer and ends two years after that date.

The manufacturer is responsible for defects or defects due to faulty materials or incorrect processing.

Consumables such as Batteries, pressure measuring soles are excluded from the statutory warranty, unless they have been proven to have been faulty at delivery.

Additional EU warranty:

The additional EU manufacturer's warranty begins on the date of delivery of the system to the customer and ends one year after that date.

In addition to the statutory warranty, the manufacturer guarantees faultless operation of the complete system, including pressure sensors subject to wear / tear.

The precondition for this guarantee is the intended use of the system as explained in this manual, observing all precautionary and safety instructions.

The manufacturer checks the complete functionality and in particular the calibration of the sensor system at the end of the additional manufacturer's warranty by a free service maintenance. For this purpose, the system will be sent to the manufacturer at the request of the customer and returned after verification by the manufacturer. At the same time, the current medilogic software version will be made available to the customer free of charge as an update.

The following items are expressly excluded from this warranty:

a) Batteries in the transmission equipment

b) Damage caused by misuse or misuse of the product. The system should be used according to the directions in the instructions for use.

c) Malfunctioning of the software caused by any manipulation of the computer after proper installation by the manufacturer.

d) Damage due to repairs performed by unauthorized service personnel or by the customer himself.

e) Transport damage due to inadequate or incorrect packaging.

f) Damage caused by accident and damage caused by lightning, water, fire, or intentional damage.

Manufacturer: T&T medilogic Medizintechnik GmbH
Mittelstr. 9,
D-12529 Schönefeld, Germany

T&T medilogic
MEDIZINTECHNIK GmbH