Midor

Measuring and Balancing Device
User Guide for Mobile Devices with OS Android 7.0 and above

CAUTION!

FROST SENSITIVE DEVICE

Contens

Introduction 5
Midor Instrument Features 5
Midor Pressure Measuring Unit 6
Midor Application Installation 7
Main Application Display 7
Application Setup 7
Context Menu 8
Instrument turn-on 8
Measuring 9
- Authorisation of Location Services in the Android OS 9
- Searching of Pressure Measuring Unit 9
- Measuring Window 10
  - Select Valve 10
  - Valve Presetting 11
  - Medium 11
  - Kv direct setup 11
  - Set Requested Flow 12
  - Medium temperature 12
  - Pressure Measuring Zero, Deaeration of Measuring Hoses 13
  - Quick Record 14

Projects 14
- Working with Projects 14
- Project Window, Project Tab 15
- Project Context menu 15
  - New 15
  - Open 16
  - Save 16
  - Save as 16
  - Mail this Project 16
  - Rename Project 16
- Project Window, Branches Tab 17
- Branches Context menu 17
  - Add Branch 17

Rename Branch ... 18
Move Branch Up ... 18
Delete Branch ... 18
Move Branch Down ... 18
Records ... 19
Record Info Tab ... 19
RECORD Context Menu ... 19
New Record ... 20
Open Record ... 21
Read Record ... 21
Save Record as ... 21
Mail this record ... 21
Export Record as csv ... 22
Export and Mail as csv ... 22
Export Record as xls ... 22
Export and Mail as xls ... 22
RECORD ITEMS Tab ... 22
Heating Calculations ... 23
Calculate Presetting ... 23
Pressure Loss Calculation ... 24
Available Pressure Calculation ... 24
Calculate Valve Authority ... 25
Quick Records Database ... 25
Pressure Measuring Unit Maintenance ... 27
Sintered Filters Replacement ... 27
Batteries Replacement ... 27
Troubleshooting ... 28
Safety and Device Disposal Instructions ... 29
Batteries ... 29
Information for Users on Collection and Disposal of Used Devices and Batteries ... 29
Specifications ... 30

Introduction

The Midor instrument is designed for hydraulic balancing of heating and cooling systems. It allows measuring static pressure, differential pressures and flow in the said systems. Using the differential pressure measured by the measuring component in the system, Midor calculates the flow that runs through the component (balancing valve or measuring orifice). The application corrects the calculated flow also for anti-freeze mixes in cooling systems.
The flow can be measured in all branches of the whole hydraulic system and the whole system can be balanced.

Midor Instrument Features

the core of the instrument consists of the pressure measuring unit that measures pressure in balancing components of hydronic systems and sends the measured values to the Bluetooth Low Energy (hereinafter just BLE) technology in a mobile device with the Android or iOS operating systems. The Midor measuring unit is very robust with a massive heavy-duty frame that can withstand a fall from 2 meters. Inside the measuring unit, there is a hydraulic section with a built-in symmetrical differential sensor for accurate digital processing of measured data. The Midor measuring instrument is very accurate and this accuracy is based on:

- Very accurate measuring of the pressure with a fully differential pressure sensor and 24-bit data processing from the pressure sensor.
- Possibility of resetting the differential pressure for pressure measuring of very low differential pressures. The resetting of measuring is done at the hydraulic bypass of pressure inputs.

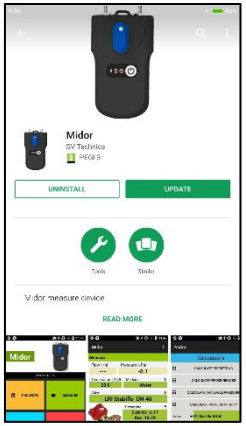
The Midor instrument uses advanced digital technologies that compensate inaccuracies usually occurring in pressure measuring, such as temperature dependencies and measuring non-linearity.
Another feature of the Midor instrument consists in recording measurements. Data from measuring can be recorded independently and directly in the pressure measuring unit. The measuring unit is equipped with a time circuit that allows programming a periodical recording of measurement independently on the application in the mobile device. Once the recording is complete, the measuring unit turns off and the record remains stored in the measuring unit until the application reads it out. Another method of recording consists in recording of current values directly into the mobile device.

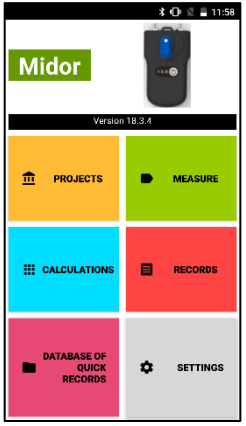
Using the Bluetooth Low Energy transmission, the Midor application communicates with the measuring unit; a user-friendly interface can be handled via the user mobile device. The application processes pressure values and allows displaying the flows in the measured system based on features of balancing components stored in the mobile device's storage. The application stores in the mobile device's storage balancing valves of most leading European producers. If, incidentally, a valve in not contained in the application, you can enter the valve's Kv and the application will calculate the flow from this value.
You can handle the software by direct touching required fields, or you can use the menu in the upper section of the screen.
The user software contains data of valves from many manufacturers, which makes the flow calculation on the required valve easier.

Midor Pressure Measuring Unit

Midor Application Installation

Find the Midor application in Google play and install it in your mobile device.



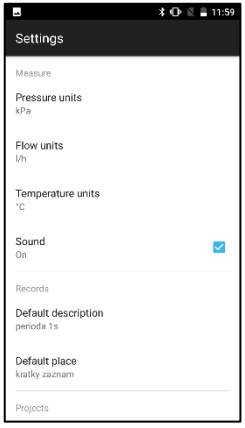


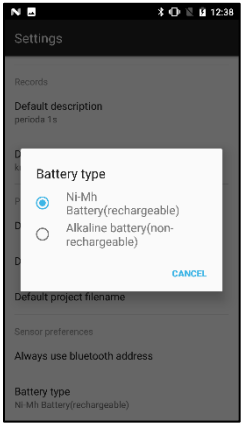
Main Application Display

On the home page of the application are buttons that directly navigate to the different parts of the Midor application.

Application Setup

Press the ***Settings*** button in the introductory window where you can set up the initial features of the application.
In the ***Measuring*** section, these are units for measuring the pressure, flow and temperature. Further, you can turn on/off here the sound for the whole Midor application.
Turn on/off the sound in the Midor application by pressing the ***Sound*** button.
In the ***Records*** section, you can enter Initial description, Initial record location.
In the ***Projects*** section, you can enter Initial project name, Initial branch name, Initial project file name.
In the Sensor preferences, the Bluetooth address of the pressure unit is





Stored after activating the Always use the selected device option in Measuring. After the application installation is complete, this item remains empty. When you will be measuring with the automatic connection of one unit without searching and you will want to connect another pressure unit, you must delete this field.
Once the Battery type is selected, enter the used AAA battery type in the pressure unit. This setup is very important for the correct calculation a display of the battery condition indication. You can find the battery type on the battery. Almost all rechargeable batteries sized AAA are of the NiMH type. Well-known and of high quality are Eneloop batteries from Panasonic.

Context Menu

If you will press icon on arbitrary application window, the menu related to relevant window appears. This menu is called Context menu.

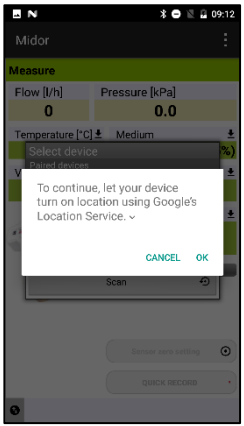
Instrument turn-on

Very Important! Warning!

When switched on, the instrument initialises itself. This take several seconds and the green light indicator on the instrument is flashing quickly during the initialisation. Do not establish the Bluetooth connection with the measuring instrument until this light indicator stops flashing and is on steadily. If the green light indicator fleshes with 1 second period, there is an error in the BLE module initialisation. Try to switch off the instrument, wait for several seconds and turn it on again.

Measuring

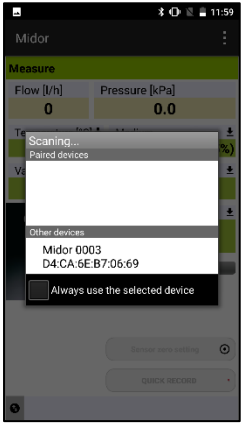
Once the ***Measuring*** button is selected, a window is displayed on the introductory screen for searching and connecting with the measuring unit.



Authorisation of Location Services in the Android OS

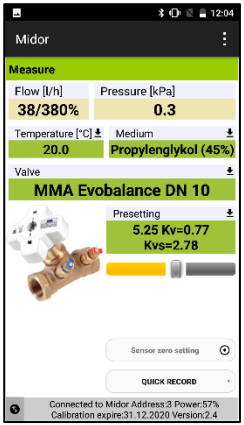
Following changes in Google Play Services, Android OS now requires authorisation of Location Services when using Bluetooth technology. This can be turned on manually in the mobile phone settings under Personal/Location.

Searching of Pressure Measuring Unit



the Midor application will search for and display available Midor devices. Select your Midor unit from the displayed list using the last four digits of the serial number. This function occurs in many other places in the Midor application. If you check the ***Always use the selected device*** option, the Midor application will connect with this unit automatically and will not search for any other. Once the ***Measuring*** button is pressed, the Measuring screen will appear straight away.
You can cancel the ***Always use the selected device*** from the Application Setup, the ***Sensor Preferences/Always use Bluetooth Address*** option. Here, delete the Bluetooth address of your pressure unit module.

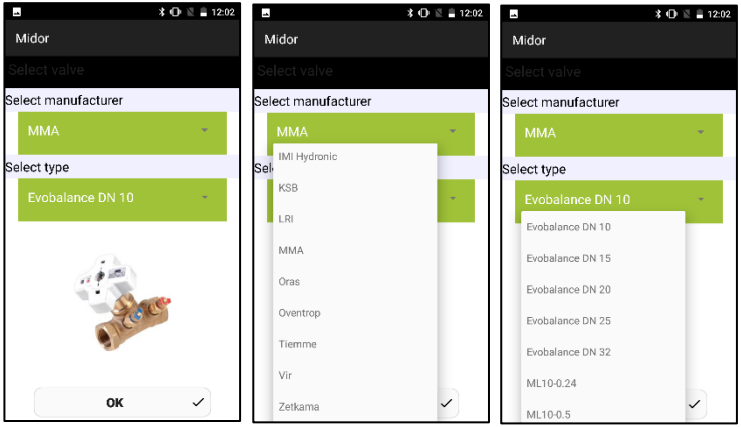
Measuring Window



Based on the differential pressure sensed and the medium measured, i.e. its temperature, valve and its preset, the application displays the differential pressure in measuring points of the attached fitting and the flow through this fitting.
The status line in the screen's bottom displays several important pieces of information:
1. The last four digits of the serial number of the pressure unit connected.
2. The percentage status of the battery of the pressure unit connected.
3. The validity of calibration of the pressure unit connected.
4. The firmware version number of the pressure unit connected.

Measuring Context Menu Tabs

Select Valve



You can select the required valve by pressing the ***Select valve*** selection list.
After clicking on the blue ***Manufacturer*** line, the list of valve manufacturers contained in the Midor instrument database will open. Select the manufacturer required by you. The database of valves in the instrument contains valves from the world's leading manufacturers; when selecting the valve and its preset, the Kv values provided by the manufacturer will be used for the flow calculation. The Kv values are recalculated by the mathematical function from manufacturers' tables.
After clicking on the blue ***Select Type*** line, the list of

valves of the given manufacturer will open. Select the required valve type. For simpler orientation and selection, also the picture for each valve type will be displayed for you.

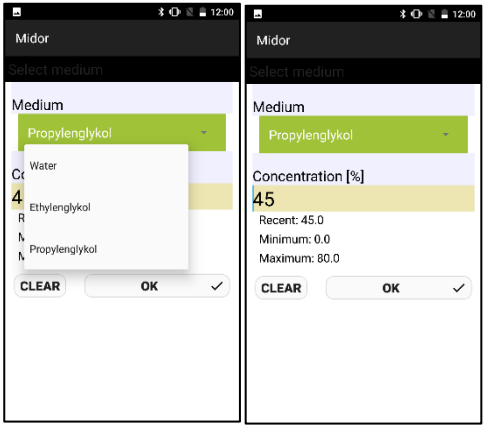
Valve Presetting

You can change the valve preset from the ***Change presetting*** selection list. For every valve, the preset field displays the interval in which you can enter the preset.

Medium

You can select the heat-transfer medium of the measured system by pressing the ***Select Medium*** selection list.

If you select as the medium the Ethylenglycol or Propyleglykol ant-freeze mix, you will have to enter the given anti-freeze mix concentration in the ***Concentration*** field. Then, the application will recalculate the flow calculation using this value. Also, you can find under the ***Concentration*** field data on the extent in which the concentration can be specified and entered.



Kv direct setup

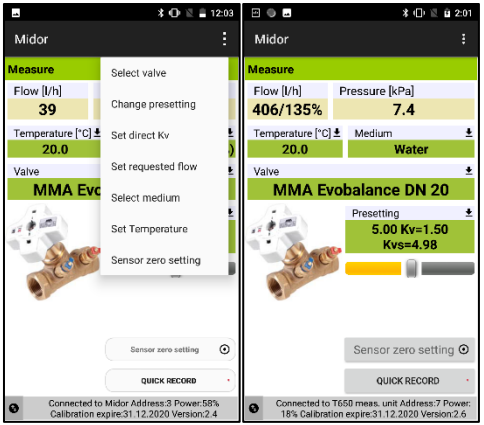
In case the database of valves does not contain the valve you require you can measure the flow using the Kv direct specification. You can obtain the table with preset values and Kv values from the documentation of the respective valve manufacturer.

Set Requested Flow

This function is used for displaying the actual/requested flow ratio at the measured valve (the lambda quantity in the proportional balancing method). This way you can easily and quickly set up the requested flow through the valve.

Once the value of requested flow is entered, the flow value in absolute units / the percentage ratio from the previous paragraph will be displayed in the Flow field in the Measuring screen.

If you set up the requested flow value back to zero, the Flow field in the Measuring window will show just the flow value in absolute units.

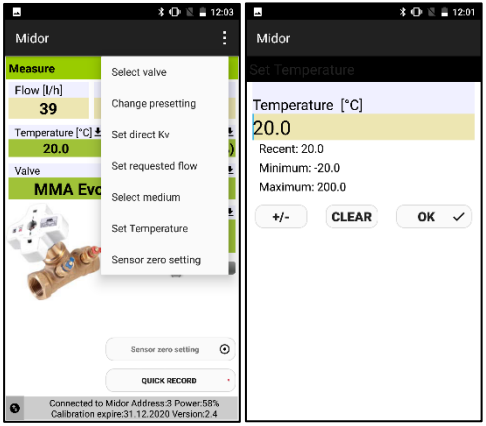


Medium temperature

Specify the temperature of the medium in the measured system by pressing the ***Set Temperature*** selection list.

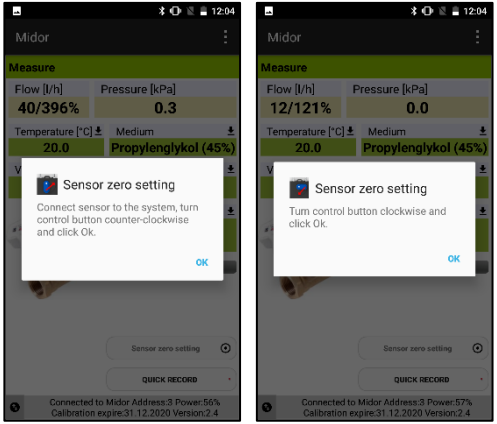
Fill in the temperature data manually in the **Temperature** field.

For water medium, the effect of the temperature on the flow calculation is negligible. If an anti-freeze is selected as the medium, the temperature specification is necessary for the flow calculation!!!



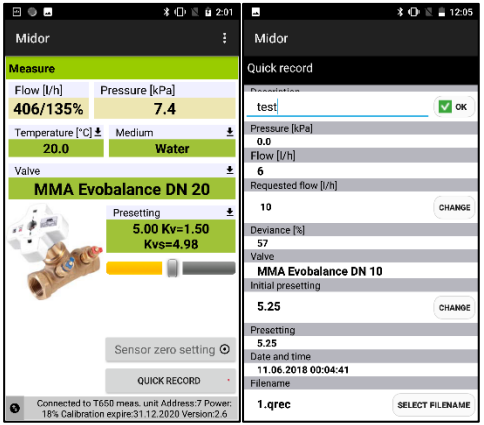
Pressure Measuring Zero, Deaeration of Measuring Hoses

For measuring low differential pressures (under 500 Pa), it is necessary to reset the pressure measuring of the measuring unit.
The reset function will be activated from the ***Sensor zero setting*** selection list. You will be led through the reset procedure by gradually emerging pictures. By rotating the pressure reset knob to the left, the pressure inlets are hydraulically connected and physically there is zero pressure difference between them. In the pressure measuring unit, the zero pressure value is set. Then, turn the reset button to its default position.
The connection of the pressure inlets can also be used to bleed the connection hoses of the measuring unit. For media temperatures above 50 ° C, venting of less than 10 seconds is recommended to avoid unnecessary heating of the pressure unit measuring circuits.



Certain settings under the ***Measuring*** window, such as the ***Medium temperature***, ***Valve selection*** or ***Valve presetting***, can be set directly by tapping on the required fields. Valve presetting can also be changed using a slider under the displayed pre-setting value.

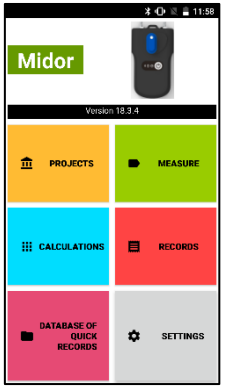
Quick Record



Selecting the ***Quick Record*** button navigates to a new window where additional details of the recording such as the name or value of the required flow through can be added in the relevant fields. The initial pressure value on the measured valve prior to recording can also be added. The last field in the Quick Recording window can be populated with the name of the folder where the recording will be saved, if left empty the record will be saved in a default location.

Projects

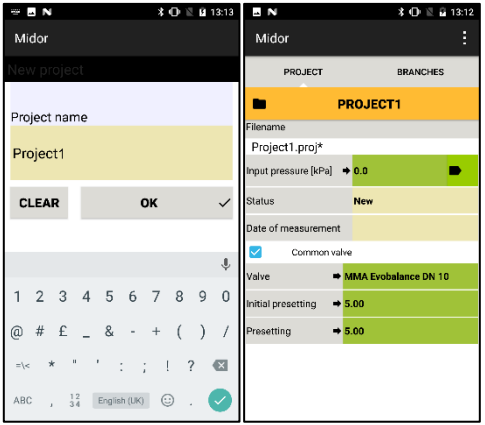
Working with Projects



The project management in the Midor measuring instrument makes the work in the real technology easier. You can prepare the project you need to measure directly in the Midor measuring instrument. You can then store two values for each branch of the project - the initial status of the branch before balancing and its status after balancing. From the data of the whole project you can then print a report on the project status before balancing and the report on balancing.
For the project measurement you select the respective project and branch. The Midor measuring instrument will set the valve and its preset automatically and you are ready for measuring. The measured data will be again stored automatically in the project's correct fields.
You can find in the Projects introductory screen two tabs - ***Projects*** and ***Branches***.

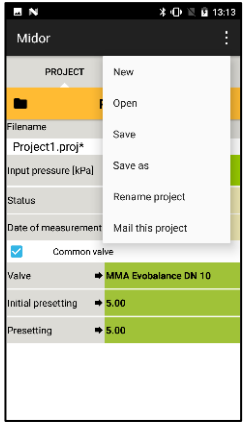
Project Window, Project Tab

Selecting the Projects button navigates to a new window where the name of a new project can be entered. If you need open saved projects, use ◁ Android button.



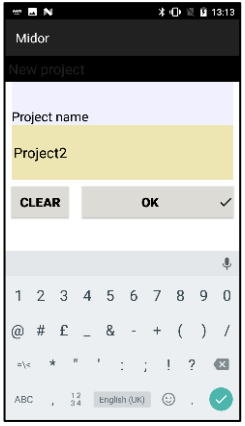
Project Context menu

It has some items, where you can work with projects - ***New***, ***Open***, ***Save***, ***Save as, Rename Project, Mail this project.***



New

Once the New button is selected from the selection list, a screen is opened in which you specify and enter the new project name and confirm with the ***OK*** button.
After that, the introductory Projects screen is reopened which already shows the new file name for storing the new project.



Open

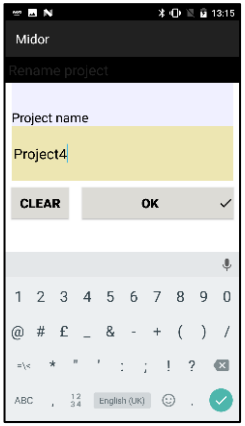
Select from the selection list an already existing project which you want to open.

Save

You will store the existing project with the existing name.

Save as

Enter the new name for storing the existing project, confirm with the ***OK*** button.



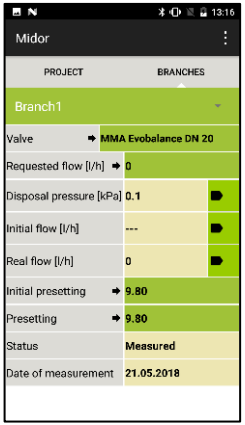
Mail this Project

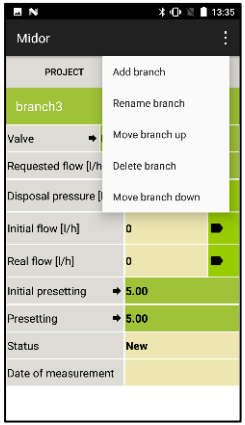
The existing project will be exported in the .xml format and send via Mail.
In order to have this function available, you have to have the Mail client application set up in your mobile device. Once this tab is selected, Mail client the ***Send*** form is displayed. The project file is already appended in new mail. Fill in the recipient's address, the Mail subject, text, and, if appropriate, the signature. The Mail message will be sent off after pressing the Send button.

Rename Project

Write the new project name for renaming, confirm with the ***OK*** button.

Project Window, Branches Tab





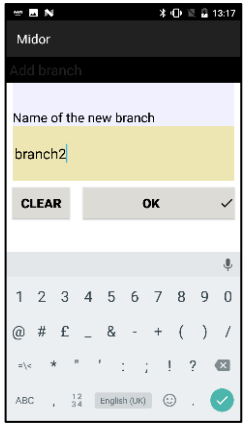
Once the ***Branches*** tab is selected, a screen is displayed where you can set up or measure parameters of individual branches.
In the first field in this screen, you can specify and enter the branch name, or, using an arrow key, you can select the branch you want to be displayed from the existing branches.
In other fields, you can enter the Valve used in the given branch and specify and enter the Flow requested. The other three fields contain the measured quantities - ***Disposal pressure***, ***Initial flow***, ***Actual flow***. The other two fields are used for specifying and entering two values - ***Initial preset*** and ***Preset***. The remaining fields are filled in automatically.

Branches Context menu

Here, you can work with branches: ***Add branch***, ***Rename branch***, ***Move branch up***, ***Delete branch***, ***Move branch down***.

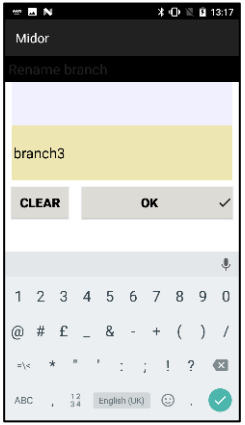
Add Branch

A screen is opened in which you specify and enter the new branch name and confirm with the ***OK*** button.



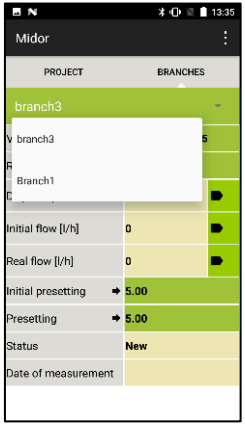
Rename Branch

A screen is opened in which you specify and enter the branch new name and confirm with the ***OK*** button.



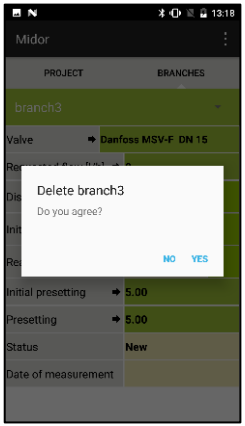
Move Branch Up

You can move the existing branch one position up in the list of branches. You can verify this in the list of branches by selecting the arrow at the branch name.



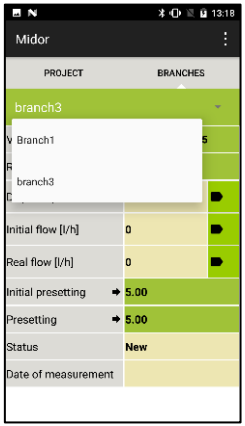
Delete Branch

You can delete the branch which is currently being edited.



Move Branch Down

You can move the existing branch one position down in the list of branches. You can verify this in the list of branches by selecting the arrow at the branch name.



Records

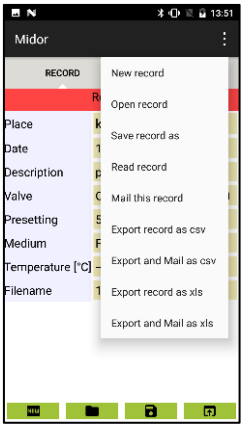
The Midor pressure unit is equipped with the function of independent periodical data recording. This function may make the project diagnostics easier especially for irregular or long-time processes.
The recorded data contains the record description, date, time, selected valve, valve preset, medium, temperature of the medium while recording, pressure and flow. Recordings can be read into the mobile device and further exported and analysed in tables or diagrams. Last but not least, tables and diagrams can be printed from the data exported like this and reports compiled on the hydraulic system balancing.
You can find two tabs in the introductory Recordings screen – ***RECORD INFO*** and ***RECORD ITEMS***.

Record Info Tab

RECORD Context Menu

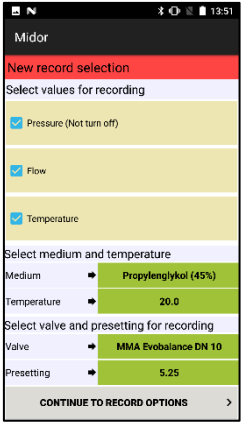
Here you can work with records using respective tabs - ***New record***, ***Open record***, ***Save record as***, ***Read record***, ***Mail this record, Export record as csv, Export and mail record as csv***, ***Export record as xls, Export and mail record as xls.***

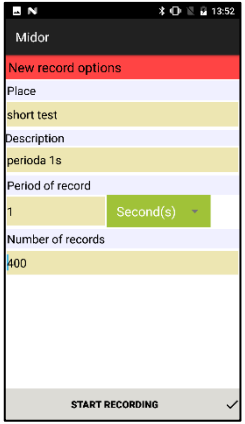
The Record window has several action icons for basic operations such as ***New Record***, ***Open Record*** or ***Read Record*** located on the bottom of the screen.



New Record

From the ***New*** selection list, a screen is open where you can select what quantities you want to record. The pressure recording is always mandatory and cannot be deactivated. Once the quantities to be stored are selected, you select the medium and its initial temperature in the two subsequent fields. The last two fields of this screen are designed for specifying and entering the valve on which you are measuring and its preset. You confirm the entry by the ***Continue to record options*** button. Another screen opens in which you specify and enter the text of the record location and description. The last two fields are used for entering the interval in which the selected quantities should be measured and saved, and how many times the record should be repeated. You can activate new recording by clicking on the ***Start recording button***.



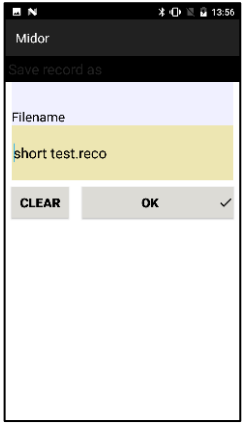


Open Record

From the ***Open record*** selection list, a new screen opens in which the list of records stored by the Midor application in the mobile device is shown. Once a record is selected in the list, the screen with data of this record opens, and the data is available for further processing, e.g. to be sent off via Mail. You can see on the ***Record Info*** tab the data from the previous paragraph; the recorded data can be seen on the ***Record items*** tab.

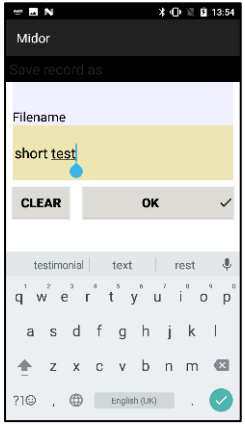
Read Record

From the ***Read record*** selection menu, you can read a record from the pressure measuring unit. The ***Read Record*** option will test whether the measuring device is currently recording. If yes, the application will ask to terminate the recording. You must wait until the preprogrammed recording has finished if you choose ***No***. After reading, a line opens into which you have to enter the name under which the record will be stored. The file name extension is added automatically.



Save Record as

From the ***Save record*** selection menu, a screen opens with the field into which you enter the new name and confirm your entry with the ***OK*** button.



Mail this record

In order to have this function available you have to have the Mail client application set up in your mobile device. Once this tab is selected from the ***Mail this record***, the Send Mail client form is displayed where the recordings file is already appended. The recording file format is .xml. Fill in the recipient's address, the Mail subject, text, and, if appropriate, the signature. The Mail message will be sent off after pressing the ***Send*** button.

Export Record as csv

Record will be exported in csv format and saved ***to Internal Storage Midor/Export*** folder.

Export Record as xls

Record will be exported in Microsoft xls format and saved to ***Internal Storage Midor/Export*** folder

Export and Mail as csv

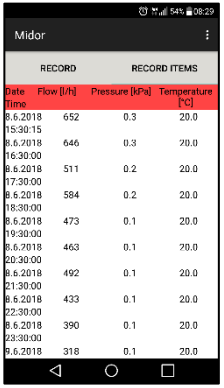
Record is exported as in previous paragraph and will be send via Mail. Only the file in attachment is in csv format.

Export and Mail as xls

Record is exported as in previous paragraph and will be send via Mail. Only the file in attachment is in xls format.

RECORD ITEMS Tab

You can read a record from the measuring unit or open a record from the mobile device.
Once the ***Record Items*** tab is selected, a screen appears where you can see the measured values along with the date and time of recording.

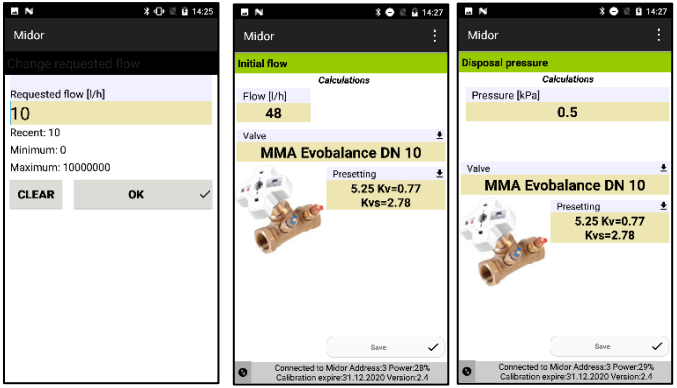


Heating Calculations

Heating engineering calculations allow and make easier solutions of partial tasks and calculations in balancing hydraulic systems. There are the following four calculations in the Midor application:
1. Preset calculation - calculates the valve preset for the flow requested in the current branch.
2. Pressure loss calculation - calculates the pressure loss on the valve for the requested flow and preset.
3. Available pressure calculation - The “available pressure” is understood to be the minimum pressure in the branch after the requested flow is attained for the given preset.
4. Valve authority calculation - The valve authority is the ratio between the pressure drop on the fully opened control valve and the pressure in the whole branch in percent. This quantity helps in dimensioning the valve and evaluating whether the given valve is suitable for the branch. For the optimal use of the system regulation, this should be in the range of 50 up to 100%. When this value is less than 50%, the valve is not dimensioned properly.
Press the Calculationsin the application’s main menu. Select the requested valve and its preset in the respective selection fields of the Calculations introductory screen..

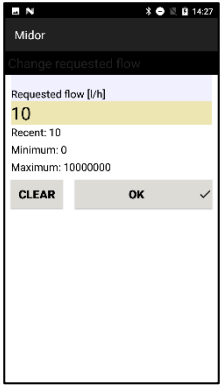
Calculate Presetting

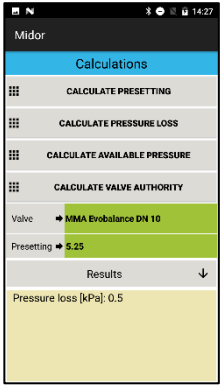
It calculates the valve preset in the current branch for the requested flow.
Enter the requested flow in the first Preset calculation screen and confirm the entry with the ***OK*** button. Confirm with the ***Save current measured flow*** button in the next screen. Close fully the control valve in the next screen. Confirm the measured pressure value with the ***Save current disposition pressure*** button. Based on the measured values and the requested flow, the Midor application calculates the needed valve preset and displays the result in the main ***Calculations*** window in the ***Results*** section of the screen.



Pressure Loss Calculation

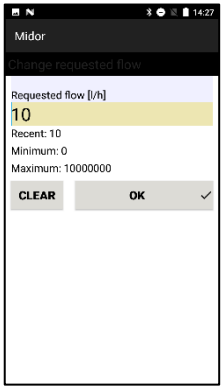
Enter the requested flow in the first ***Pressure loss calculation*** screen and confirm the entry with the ***OK*** button. The application calculates the pressure loss on the valve with the given preset and requested flow and displays the result in the ***Calculations/Results*** section of the screen.

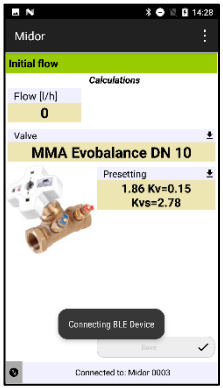


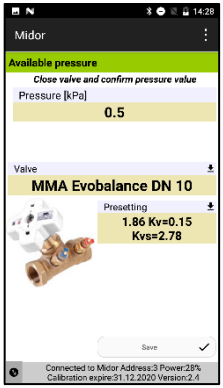


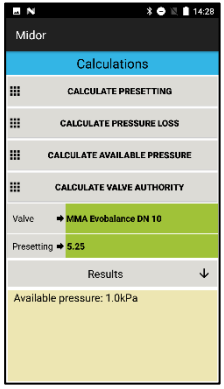
Available Pressure Calculation

Enter the requested flow in the first ***Available pressure calculation*** screen and confirm the entry with the ***OK*** button. Confirm saving of the current measured flow with the ***Save*** button. Confirm saving of the measured disposition pressure with the fully closed valve with the ***Save*** button in the next screen. The result will be displayed in the ***Calculations/Results section*** of the screen.



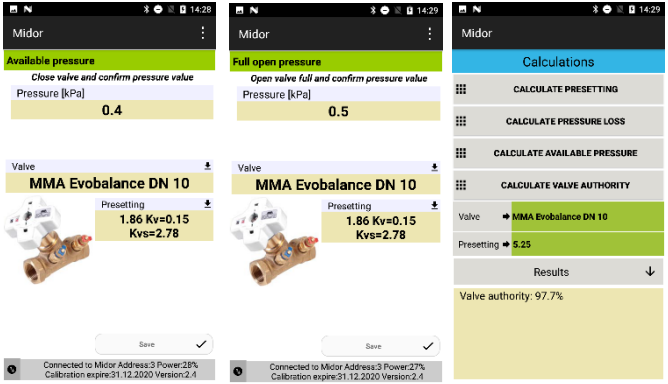






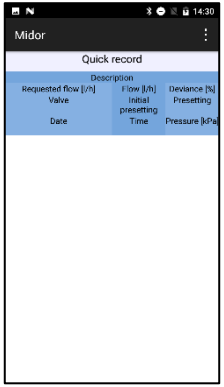
Calculate Valve Authority

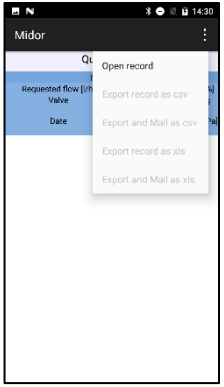
Measure the available pressure in the first ***Valve authority calculation*** screen with the valve closed, and confirm with the ***Save*** button. Measure the available pressure in the next screen with the valve fully open, and confirm with the ***Save*** button. The result will be displayed in the bottom section of the introductory ***Calculations*** screen.



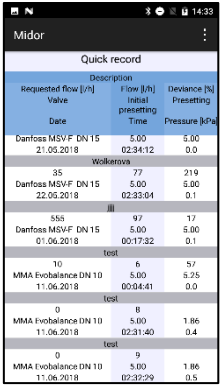
Quick Records Database

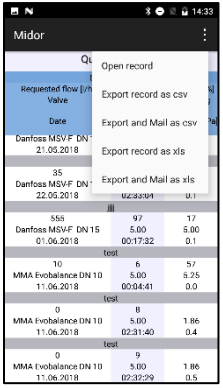
Selecting the Quick Record Database button navigates to a new window where previously saved recordings from the Quick Recording window can be browsed. Recordings are saved sequentially into one file, unless previously specified to be saved elsewhere. The default file is saved in the Internal Memory/ MIDOR/Quick Records folder. An empty form is displayed upon opening of the Quick Record Database. The required file can then be opened from the Quick Record Database menu using the Open command. The rest of the Quick Record Database menu options are the same as in the menu for standard recordings, which is described under the Recording section.


14:30
Midor
Quick record
Description
Requested flow [l/h]
Valve
Flow [l/h]
Initial presetting
Time
Deviance [%]
Presetting
Date
Pressure [kPa]


14:30
Midor
Open record
Export record as csv
Export and Mail as csv
Export record as xls
Export and Mail as xls

14:30
Open record in directory: QuickRec...
..
Parent directory
1.qre
Last change: 23.05.2018 - 07:20:29
1.qrec
Last change: 11.06.2018 - 12:05:13


14:33
Midor
Quick record
Description
Requested flow [l/h]
Valve
Flow [l/h]
Initial presetting
Time
Deviance [%]
Presetting
Date
Pressure [kPa]
Danfoss MSV-F DN15
21.05.2018
5.00
02:34:12
5.00
0.0
Wolkenva
35
77
219
Danfoss MSV-F DN15
22.05.2018
5.00
02:33:04
5.00
0.1
lll
555
97
17
Danfoss MSV-F DN15
01.06.2018
5.00
00:17:32
5.00
0.1
test
10
6
57
MMA Evobalance DN10
11.06.2018
5.00
00:04:41
5.25
0.0
test
0
8
MMA Evobalance DN10
11.06.2018
5.00
02:31:40
1.86
0.4
test
0
9
MMA Evobalance DN10
11.06.2018
5.00
02:32:29
1.86
0.5


14:33
Midor
Open record
Export record as csv
Export and Mail as csv
Export record as xls
Export and Mail as xls
555
97
17
Danfoss MSV-F DN15
01.06.2018
5.00
00:17:32
5.00
0.1
test
10
6
57
MMA Evobalance DN10
11.06.2018
5.00
00:04:41
5.25
0.0
test
0
8
MMA Evobalance DN10
11.06.2018
5.00
02:31:40
1.86
0.4
test
0
9
MMA Evobalance DN10
11.06.2018
5.00
02:32:29
1.86
0.5

Pressure Measuring Unit Maintenance

Sintered Filters Replacement

For the correct function of the instrument, replace regularly the sintered filters in the pressure inputs. Unscrew the pressure input using the 13 mm wrench, replace the clogged filters with a new set, screw the pressure inputs back and tighten.

Batteries Replacement

Unscrew the screws on the battery cover (refer to page 8), remove the cover and insert new batteries following the technical parameters. If you insert batteries of a different type, do not forget to change the battery type in the Midor application.

Troubleshooting

Fault	Rectification
The instrument cannot be turned on	Check batteries, replace batteries
The green light indicator is fleshing with 1 second period (0.5 of a second is on + 0.5 of a second is off)	The Bluetooth module initialisation is faulty. Turn the instrument off and on.
A slow response to the pressure change in inputs, the measured value when the pressure inputs are free is higher than 1 kPa	The replacement of filters in the pressure inputs. Reset pressure measuring.
The pressure unit Bluetooth search is not functional, or the Midor application is unable to connect with the pressure unit in the Measuring window	Check the Mobile device setup. If you have the Midor pressure unit paired with the mobile device, unpair it. BLE does not pairing of the Bluetooth device as the previous version required; quite contrary, the pairing impedes the connection making.
The application does not connect with the pressure unit in the measuring window, BLE communications stops	Turn off the pressure unit and on again, repeat the requested application's function. Turn off the Bluetooth in the mobile device, turn it on again, and repeat the requested application's function.
I have entered the "Always use selected device" option and want to measure with a different pressure unit.	In the Midor application setup go to the ***Sensor setup/Always use Bluetooth address***. Here, you will see the BT module address recorded by your option. Delete the address, and the application will again search through all pressure units.

Safety and Device Disposal Instructions

Batteries

- Incorrect handling with batteries may cause spillage of the electrolyte and fire.
- When disposing of batteries, contact local authorities or dealers and get information on the correct way of disposal.
- Do not expose batteries to heat and fire.
- Do not leave batteries in the car exposed to direct sunshine with windows and doors closed.
- Do not dismantle batteries and short-circuit them.
- Do not use batteries with the packing damaged.
- In case of incorrect replacement of batteries there is the threat of explosion.
- Only use the battery type recommended by the manufacturer for replacement.

Information for Users on Collection and Disposal of Used Devices and Batteries

This symbol on the device, packing or in appended documents means that the used electric and electronic devices cannot be disposed of in the common communal waste.
For correct disposal, recovery and recycling of used products and batteries, please give them over to respective collection locations in compliance with the national legislation and directions 2002/96/EC and 2006/66/EC.
By ensuring the correct disposal of the product you can help prevent from occurring potential dangerous impacts on the environment and human health that would threaten when the product is not disposed of properly.
Commercial users in European Union may contact their dealers or suppliers.

Specifications

Nominal pressure range*	1,000kPa or 2,000 kPa	Power Consumption	20mA Bluetooth use
Max. Overpressure	120% of nominal pressure	Operating time	45h Max.
Linearity and hysteresis error	0.15% from nominal pressure range	Zeroing of the pressure measurement	Mechanical with hydraulic bypass
Temperature error	0.25% from nominal pressure range	Water Resistance	IP65
Medium temperature**	-5 to 90°C	Calibration Validity	24 months
Ambient temperature	-5 to 50°C	Dimensions (l x w x d)	180x80x52 mm
Storage temperature	-5 to 50°C	Weight	420 g
Wireless data transfer	Bluetooth Low Energy 5.0		
Power supply	AAA Alkaline batteries or NiMH rechargeable batteries		

* optional

** measured at the end of measuring hoses, length 1.5m, Hot water flows thru Midor hydraulic parts during Pressure zero procedure. Maximum time duration of zeroing when temperature of the medium exceeds 50°C is 10 seconds.