



# RMS - AGS

The screenshot displays a control panel for the RMS - AGS system, organized into three main vertical sections: CD Zone, AGS / RMS / RGP-CD, and Flat Zone.

- CD Zone:** Shows Disc GAP [mm] at 0.56, Rotor position [mm] at 10.38, DTM [°C] at 30, TVD [%] at 0, and a Set point of 1.34 with the Gap controller Off.
- AGS / RMS / RGP-CD:** Features two vertical gauges: VIM [mm/s] at 0.0 and MPM [MW] at 10.8. It also displays Sum Alarm Status as RMS OK and AGS Alarm, and FeedGuard Status as Activated. The Valmet logo and user authentication (Auth.: Admin.) are present at the bottom of this section.
- Flat Zone:** Shows Disc GAP [mm] at 0.75, Stator position [mm] at 7.44, DTM [°C] at 28, TVD [%] at 2, and a Set point of 1.66 with the Gap controller Off.

At the bottom of the panel, there are four blue buttons: MENU, RMS Display, a question mark icon, and Alarms.

GMS CE Panel-PC Ver. 2.6  
for RMS-CD, RMS-SD, RMS-RS1

## Manual

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## 1 Overview

The GmsCE program shows signals and parameters from units in the measurement system for measurement and control of the AGS sensor in a pulp refiner. An AGS sensor consists of a Disc Clearance sensor (TDC sensor), vibration sensor and a measure- and adjustment mechanism for moving of the measurement tip relative to Stator segments. The purpose with an AGS sensor is to simplify the calibration and make it possible to do so during production without disturbing the process. Recurring calibrations of the sensor is necessary after a certain operation time due to the wear of the sensor and the segments.

The program consists of steering logic for accomplishing an automatic calibration of the AGS sensor. The program is a GUI application which consists of buttons and text boxes and all commands are triggered through pressing of buttons on the touch screen.

The operator navigates from a normal top view window down through the program structure according to the menu choices that are presented to finally reach the searched function.

The Program runs on a Panel-PC which is based on the Windows CE 6.0™ operating system from Microsoft.

The program GMS CE is included in a measurement called GMS, Gap Measuring System, which communicates with some of the modules in the RMS system.

DCA-RM1 (Disc Clearance Amplifier) is a measurement module for the plate gap. See the DCA-RM1 manual for more information.

ACM-RM1 (AGS Control Module), communicates with the AGS sensor which measures the touch point vibration, the tip position and controls the movement of the tip. The ACM also controls the functions for the measuring of the plate gap and the plate gap temperature, i.e. the functions that exist in the DTM-RM1. DTM-RM1 is withdrawn from the RMS rack when AGS sensor is used and is replaced with an ACM-RM1. See the ACM-RM1 manual for more information about this unit.

DCU-RM1/DCU-RM2 (Display and Control Unit), a steering and control unit with the plate gap controller. The unit forwards the refiner's rotor position, A and B chamber pressures (HPM), the oil temperatures (OTM), vibrations (VIM) and the motor power (MPM).

The units communicate with each other using a CAN-bus. The Panel-PC uses UDP (IP based protocol) to communicate with the hardware units through a CAN to Ethernet Converter, CEC-DM1. See the abbreviation chapter at the end of this document for descriptions for the abbreviations in the text.

## 2 Security

It can be pointed out that all safety regarding the measurement signals and logic are as before located in the measurement modules which are suited for its purpose. The Panel PC and the accompanying software have the sole purpose of showing measured values, altering parameters and providing sequences for AGS calibration, etc. This means that the Panel PC can be turned off without any consequences for the operation of the refiner.

## 3 Screensaver

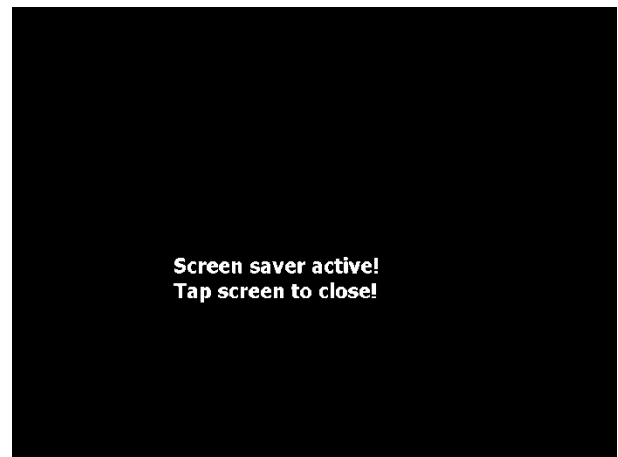
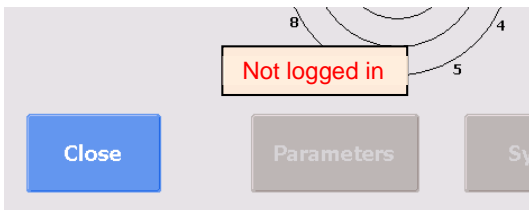
After some inactivity the screensaver will start. To close it, tap somewhere on the screen.

## 4 Login / Logout

Use the Login button to enable chosen functions. Remember to log out after to avoid mistakes.

### Dimmed buttons

A pop-up text will appear when a dimmed button is tapped to explain the reason why not activated.



## 5 Display readout

### 5.1 Normal view

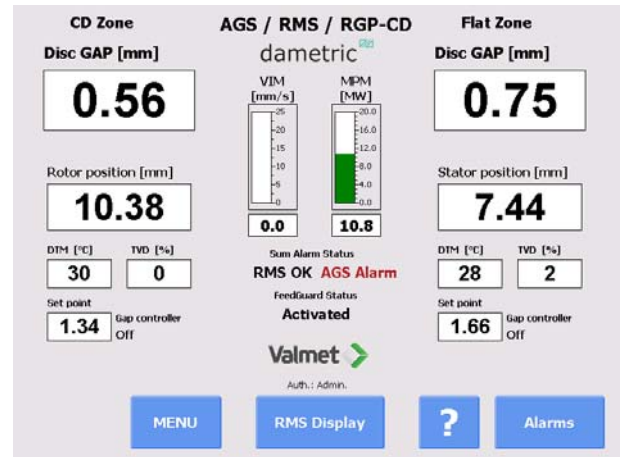
In the normal view, the most important signals for the refiner status are shown. This picture shows two sides. If the system only contains one side, this view will change accordingly.

**MENU** By pressing the MENU button the other program functions can be reached, e.g. calibration of the AGS sensor.

**RMS Display** Opens a window in which an extended set of signals for the refiner are shown.

**?** By first pressing the "?" and then one measure value or button a help text is shown. Under "System Settings" other languages can be selected for the help texts.

**Show alarms** The button is shown only if an alarm is active and when activating the Show alarms function, the alarms are shown in a separate window.

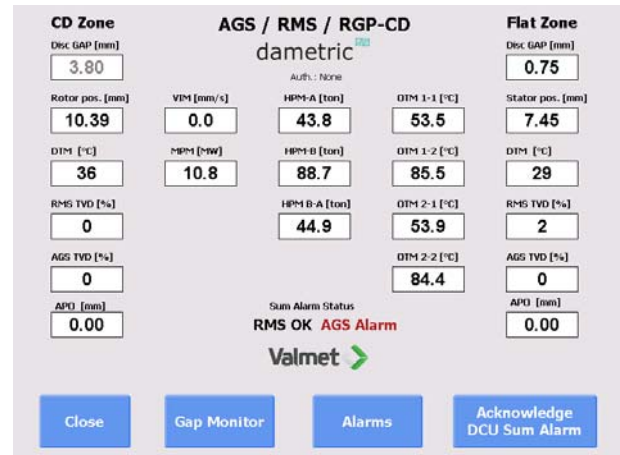


### 5.2 RMS Display

The RMS Display window shows all refiner signals that are measured by the RMS system. The units must be enabled in the DCU-unit to get proper values.

#### Gap Monitor (only RMS-SD1 and RMS CD1)

The Gap monitor button opens a window to monitor the gap controller.



#### 5.2.1 Gap Monitor (only RMS-SD and RMS CD)

The signals for monitoring the gap controller are shown. Signals within parenthesis are the limits for the gap controller alarms.

**Trend** This will start a trend window which will show the signals and the gap controller actions.

**Enter** This button is visible if a gap controller alarm has occurred. By pressing it, the alarm is cleared (same as pressing the Enter button on the DCU-RM2 unit).



## 6 Program Functions

The program functions are divided into the following main groups.

### 6.1 Menu Window

#### AGS Calibration and Service

This function includes the auto- and coarse calibration of the AGS sensors.

**Service** The functions in the Service menu are for altering parameters and to be able to calibrate the system's measurement functions.

The program gives you a good overview over the functions and which settings exist for each function.

All settings and adjustments are stored in a permanent memory for respective measurement module for a safe function even if there is a power failure. The parameter settings that are under the Service menu are placed in a table format for respective function for fast and simple handling.

**Logger** This opens a window with functions for managing log files and extracting them to an external USB stick.

**Resistance mon.** A window to examine the resistivity measurement (only applicable if the resistivity measurement is enabled).

**System Settings** In this part are settings that control the GMS-CE program logic. The settings are stored in a file on an external memory (Compact Flash) in the Panel PC.

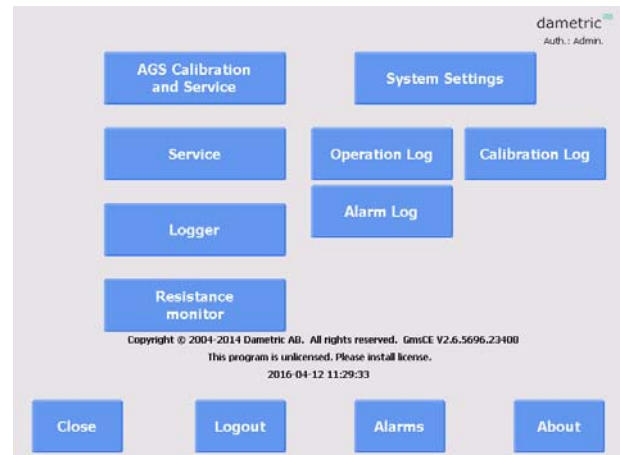
**Calibration Log** Performed calibrations are stored to make it easier to perform service and diagnostics when something unpredicted occurs. These logs can be read by this function.

**Alarm Log** Possible alarms are stored to make it easier to do service and diagnostics when something unpredicted occur. These logs can be read by this function.

**Login** The Login makes it possible to login to the different authorization levels which give more or less access to the different settings and functions within the system.

**About** A short description of the system.

**Auth:** The login status is displayed.



## 6.2 AGS Calibration and Service

In this menu the following functions can be reached:

**Auto Calibrate** The AGS sensors must be calibrated when they are mounted in the refiner and running in production mode to achieve an accurate plate gap. The calibration sequence is described in a separate document.

**Coarse Calibrate** This calibration function is used when a new tip has been mounted.

**Tip Replacement** The function for tip replacement is reached here.

**Holder Exchange** Use this function to exchange the holder or the AGS house.

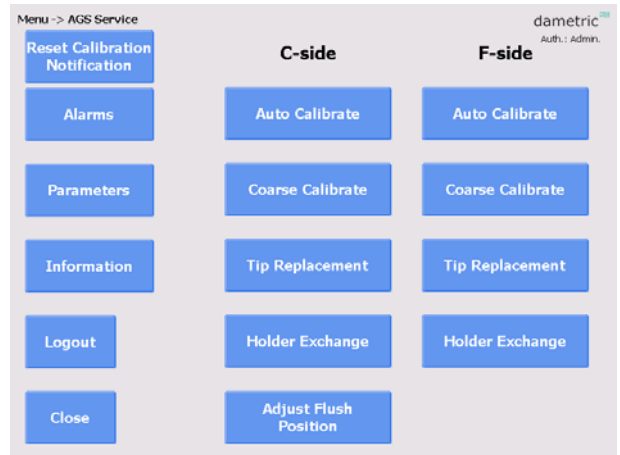
**Parameters** Used to view and edit the calibration parameters.

**Information** Descriptive information about the functions in this window.

**Login/Logout** Log in (or log out) to enable protected functions.

**Reset Calibration Notification** This button is only showed if it is time to perform an AGS calibration. Using this function, the notification will be postponed to a later date.

The *Tip Replacement*, *Holder Exchange* and *Coarse Calibrate* functions are available when you have logged in using the calibration code under "Systems Settings". The *Coarse Calibrate* button is disabled after the sensor is calibrated to prevent the calibration to be unintentionally destroyed.



### 6.2.1 AGS Auto Calibrate

Calibrates the AGS sensors.

Consult the "GmsCe20Ags Calibration EN.pdf" for details.



### 6.2.2 Coarse Calibrate

Coarse calibration is performed when a new tip is mounted. This calibration will be performed automatically in the tip exchange sequence. Consult the "GmsCe20Ags Calibration EN.pdf" for details.

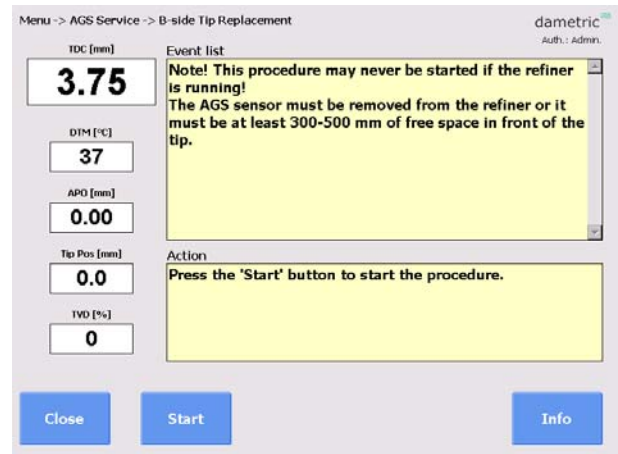


### 6.2.3 Tip Replacement

When the tip is worn out you use this sequence driven function to change to a new tip.

Consult this manual for details:

*AGS-XXX ServiceManual EN.pdf.*

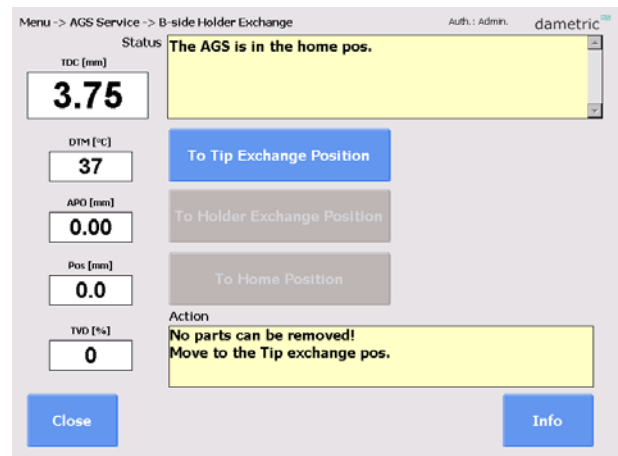


### 6.2.4 Holder Exchange

This procedure is used to replace the holder or the head of the AGS sensor.

Consult this manual for details:

*AGS-XXX ServiceManual EN.pdf.*





### 6.3 Service

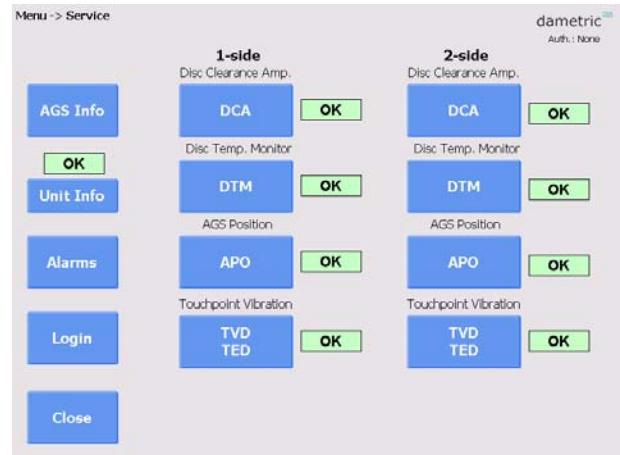
The Service menu shows the functions that are used in the AGS/RMS-system. (In case of the RMS-SD system, only one side is displayed.)

By pressing on one of the measurement functions, the underlying parameters and calibration can be reached. Some of the functions, e.g. the calibrations, are protected against unintentional harm to the system and can be done only after that the calibration code has been entered.

**AGS info** Displays all relevant AGS sensor information.

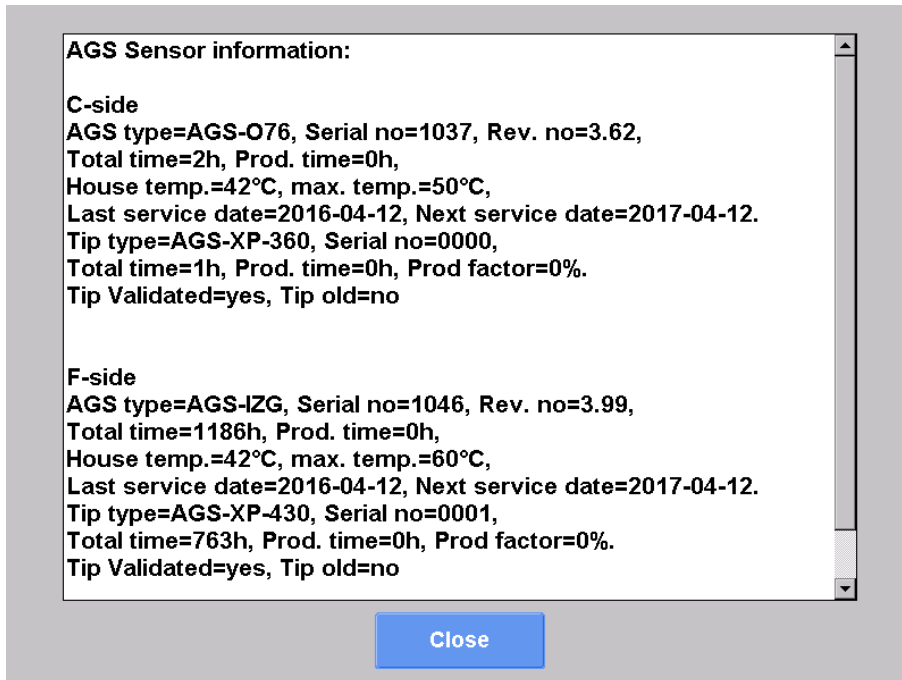
**Unit info** Press the button to display the serial numbers and revisions of both software and hardware for all RMS units.

**Alarm** Use the button to view the current alarm list.



#### 6.3.1 AGS info

Use the button to display additional information about the AGS sensors.



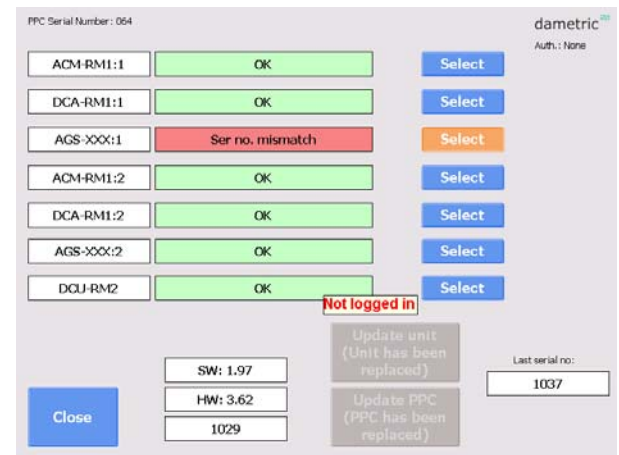
**6.3.2 Unit info**

This function is used to make sure that the different hardware units in the system are functioning correctly. If a unit is replaced, the program will notice this, by comparing the serial numbers, and the user must resolve how the user parameters should be handled. The user parameters are stored for every unit in the system. When replacing a unit it is thus possible to choose if the stored parameters should be written to the unit (recommended), or if the new unit's parameters should be transferred to the panel pc. This requires service authorization.



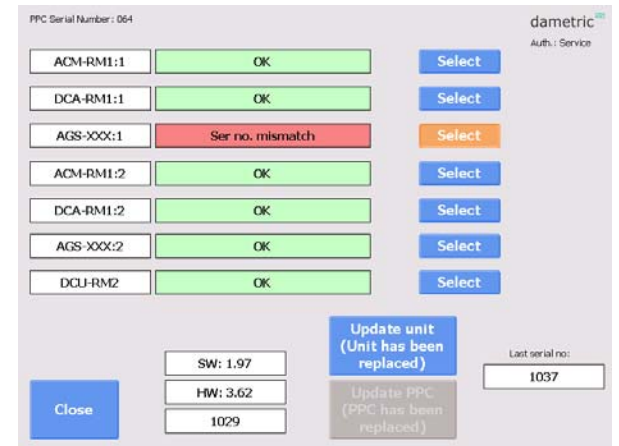
**6.3.2.1 Serial number mismatch**

The mismatch information will be shown is a unit has replaced and the serial number does not match the serial number in the database.



**6.3.2.2 User parameter update**

Press **Update unit** to copy the parameters from the database into the new unit. If database is empty (somebody missed to take a backup), instead activate **Update PPC** to read the parameters from the new unit.



**6.3.3 DCA – Disc Clearance Amplifier**

**Parameters** (logged in as service)

Here you can alter parameters that belong to the DCA measurement function.

**System** (system logged in).

Here you can alter hardware related parameters that belong to the DCA measurement function.



**6.3.4 DTM – Disc Temp. Monitor**

**Span Cal** (logged in as service)

Function for span calibration.

**Zero Cal** (logged in as service)

Function for zero calibration.

?

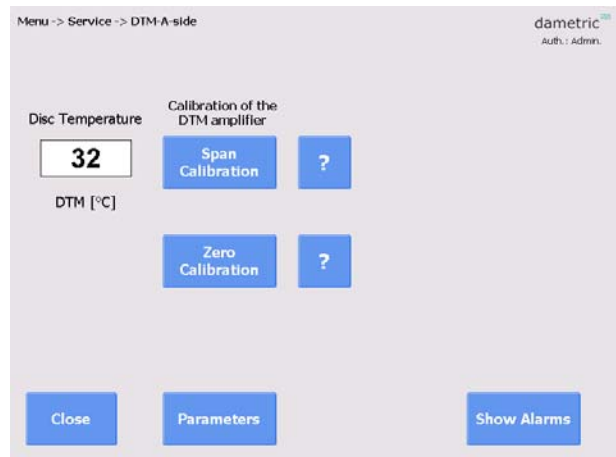
A help text for the calibration sequence is presented on the screen.

**Trim 4mA** (logged in as service)

Function for signal current calibration at 4.00 mA.

**Trim 20mA** (logged in as service)

Function for signal current calibration at 20.0 mA.



**6.3.5 APO – AGS Position**

The AGS position and the absolute position of the dip are shown together with the actual temperature inside the AGS head. The temperature should be below 70°C (160°F) to maintain expected life time of the AGS head.

**Move to home**

If the tip is not in the home position (APO=0.00) it can be moved by pushing the button.

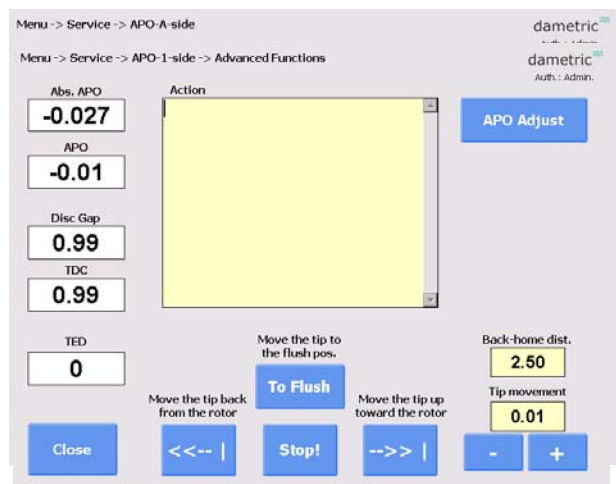
Note! The gap reading will be changed.

**Parameters** (logged in as service)

Here you can alter parameters that belong to the APO measurement function.

**System** (logged in as administrator)

Here you can alter hardware related parameters that belong to the DCA measurement function.



### 6.3.6 APO – AGS Position - Advanced Functions (logged in as service)

This function makes it possible to manually move the tip which is used for maintenance/development of the measurement system.

#### APO Calibrate

The operator can calibrate the APO measurement circuit. Note that the sensor tip must not be mounted during this calibration.

#### APO Adjust

With this command the positioning system of the AGS sensor is adjusted against the tip and holder of the AGS sensor. This is done by moving backwards towards a mechanical stop which is normally 2.50 mm behind the sensors home position (in level with the stator segment) and then move the tip to the home position.

- First control that the distance (Back-home-distance) is set ok.
- Press the 'APO Adjust' button.  
The adjustment sequence can be followed in the text window.
- Check the distance between the tip and the brass edge of the holder. This distance must be 23.00 (+0.00/-0.05) mm and if not, the user must first change the back-home distance and then adjust the APO again. The back-home distance is changed in the Service – APO window and by pressing the Parameters button. Change the Apo Distance to an appropriate value around 2.50 mm.

#### If logged in as administrator:

- To Flush** Command for moving the tip to the home position.
- <<--|** Command for moving the tip a chosen distance apart from the rotor.
- >>|** Command for moving the tip a chosen distance towards the rotor.
- Stop!** Stop the movement.
- +/-** Select a movement distance between 0.01 and 1.00 mm.

### 6.3.7 TVD / TED – Touchpoint Detector

In this menu there are functions for measurement of the touch point signal. The parameters for limits and sensitivity can be edited.

TVD (Touchpoint Vibration Detector) measures the vibration caused when the tip hits the rotor while the TED (Touchpoint Electric Detection) measures the resistance between the tip and the rotor. The TED signals are only displayed if the TED function is enabled.

#### TVD-signals (logged in as service)

The settings and results are displayed.

#### TED Graph (logged in as service)

A graph with values divided in 12 sectors of the rotor is displayed if the TED function is enabled.

#### Move tip (logged in as administrator)

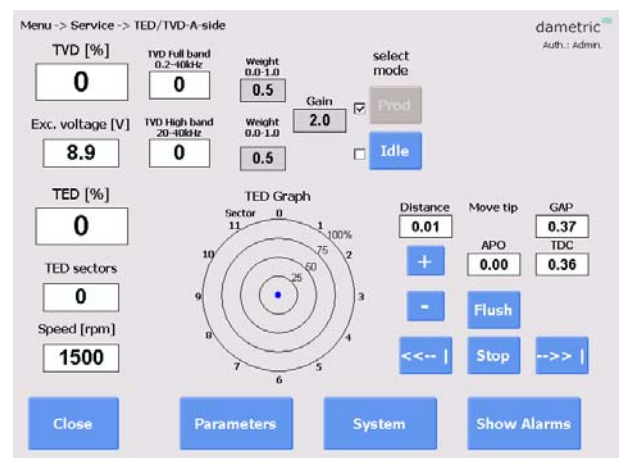
A number of functions is shown to move the tip to be able to investigate how the tip position will affect the TVD and TED measurement.

#### Parameters (logged in as service)

Here you can alter parameters that belong to the TVD and the TED measurement functions.

#### System (logged in as administrator)

Here you can alter hardware related parameters that belong to the TVD measurement function.



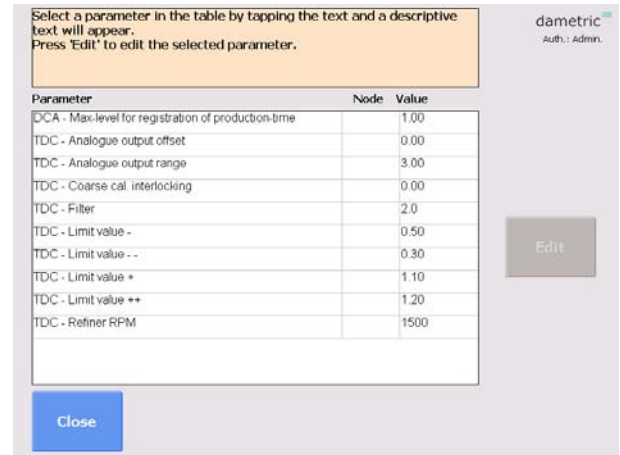
## 7 Parameters

This is an example of the parameters for the DCA function is shown. Every parameter is shown with a short description and the allowed max- and min values. Furthermore, the node from where the parameter belongs to is also shown. There is also a possibility to copy the parameter settings to a XML file for printing or archiving.

As the list can be rather long, the parameters from respective node can easily be unselected from the list by a single press on a button.

To alter a parameter, do like this:

- Select the parameter by marking its name (a description of the parameter is shown at the top of the screen).
- Press the **EDIT** button and a new window with a key pad is shown.
- Enter the new value by using the key pad on the screen.
- Press the **SAVE** button. The program will give a warning if the entered value is outside its allowed range.



## 8 System settings

Some parts of the functionality are protected by a password.

### 8.1 Login

Allows the user to login with a password to give access to restricted parts of the system.

### 8.2 System tab

#### 8.2.1 Service info

Address, phone and e-mail for service.

#### 8.2.2 Refiner ID

Defines a unique id for the installation, which is used when transferring files to an external USB memory.

#### 8.2.3 Program log

Displays program related events.

#### 8.2.4 Refiner type

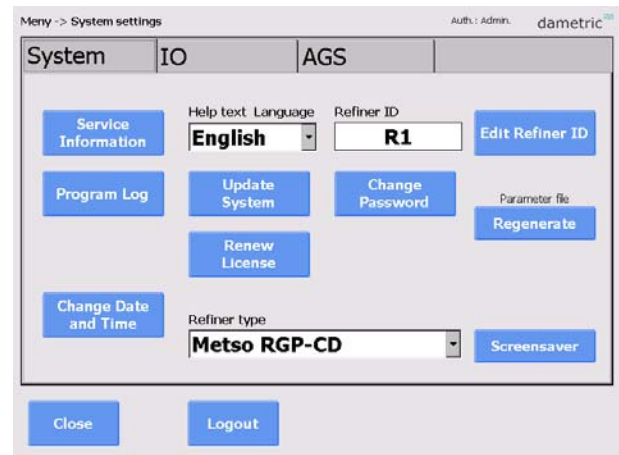
Select the refiner type.

#### 8.2.5 Upgrade System

Updates the current version of the program from a newer version located on an external USB memory.

#### 8.2.6 Activate/Renew License

Activates or renews the license from an external USB memory.



### 8.2.7 Regenerate

Regenerates the parameter definition file if it is suspected to be corrupt or outdated. GmsCE will restart. This requires administrator authorization and should only be run when the units are replaced or upgraded.

### 8.2.8 Change Date and Time

Press the + and – buttons to change the date and time. Press Save to save the changes and restart the system.

### 8.2.9 Screensaver

This changes the start time for the screensaver.

## 8.3 IO-tab

### 8.3.1 Touch panel calibration

Calibrates the touch screen. Follow the instructions given.

### 8.3.2 CEC Configuration

Selects the IP address for the CEC-DM1 used in the system.

### 8.3.3 Backup

Performs a backup of data- and system files to the internal system memory attached to the cabinet.

This allows for a complete restoration in case of a replacement of the panel pc.

### 8.3.4 Password

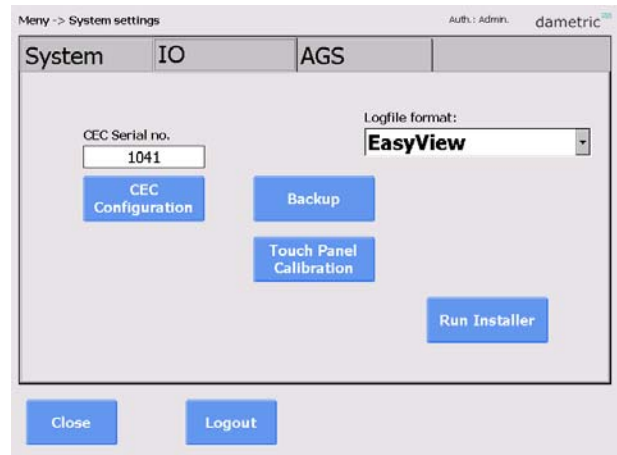
Changes the passwords for the different accounts.

### 8.3.5 Run Installer

Starts the installer, giving access to the old version (1.x) of GmsCE. Only do this if there are problems with the new version (2.x).

### 8.3.6 Logfile format

Selects the format of the logfiles.



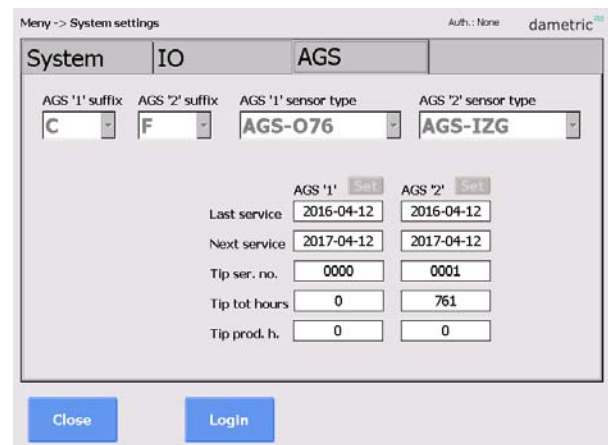
## 8.4 AGS-tab

### 8.4.1 AGS 1 Suffix, AGS 2 Suffix.

Select a suffix for each AGS-sensor depending on the placement of them in the refiner. For example “C” for a sensor in the CD zone. The selection does not alter the functionality but only for display purposes.

### 8.4.2 AGS sensor type

Select the desired AGS type.



## 9 Calibration log

In the calibration log calibration events can be shown.

### Home – Up – Down

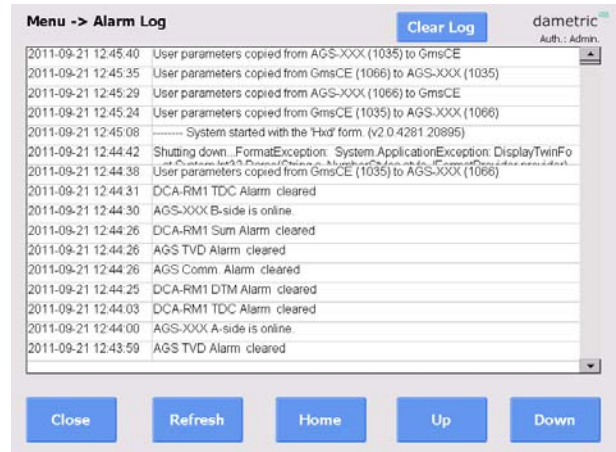
Used for navigating the list.

### Row content

Tap a row to present the content in a larger view.

### Clear log (if logged in as administrator)

Clear the log content.



## 10 Alarm log

To make it easier for trouble shooting all alarms that occur are listed here.

## 11 Logger

The logger window provides functionality for managing log files.

### 11.1 Graph

Displays a realtime graph containing the most common parameters.

### 11.2 Save last 15 minutes

Saves a log file containing about 15 minutes of buffered data from the most common parameters.

### 11.3 Start logging/Stop logging

Starts a continuous logging of the most common parameters. This continues until it is stopped by the user, or until the maximum time of 10 hours is reached, which results in the logger stopping by itself.

### 11.4 Copy files

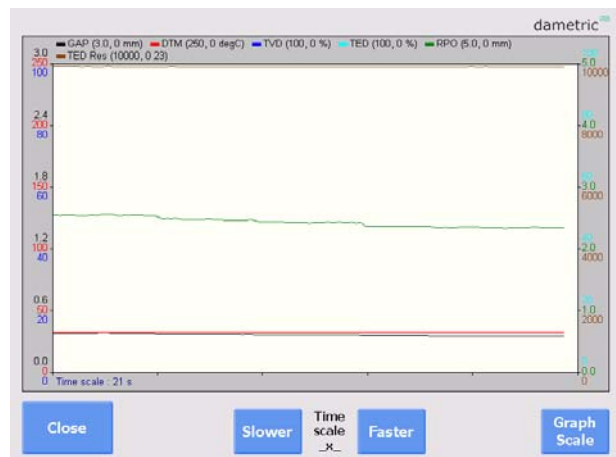
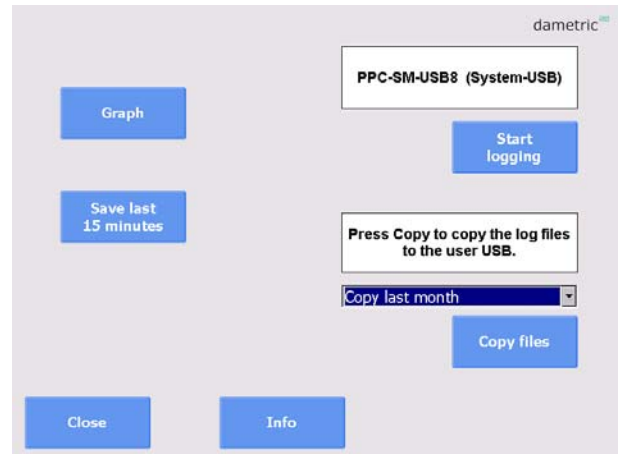
Used to copy files from the Panel PC to your USB memory stick. Mount the memory stick into the free USB, select time range (copy everything – last year – last month) and press ‘Copy files’.

### 11.5 Graph

A trend graph showing the gap, touch point vibration and rotor position.

### Slower/Faster

Changes the speed of the live graph.



### 11.6 Graph scale

Select a parameter and then change the limits. Default scale reverts to the factory defaults. The column Data shows the current range of values for each parameter. This can be useful when determining the limits. Select Auto scale to automatically determine the limits. Note that your selection will not be save when you close the trend window.

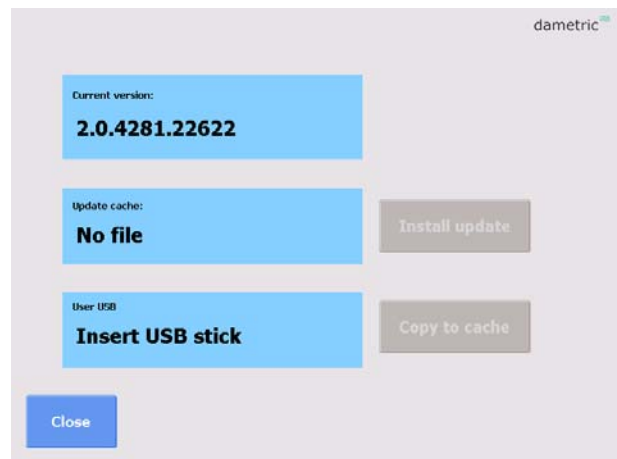


## 12 Updating the system

### 12.1 Update System

This function is used when updating the system files.

- Connect the USB memory to connector on the panel PC.
- The new files must be located in a folder called GmsCE\Update\.
- Select Copy to cache to copy the files to the panel PC.
- Select Install update to perform the actual upgrade. GmsCE will restart.

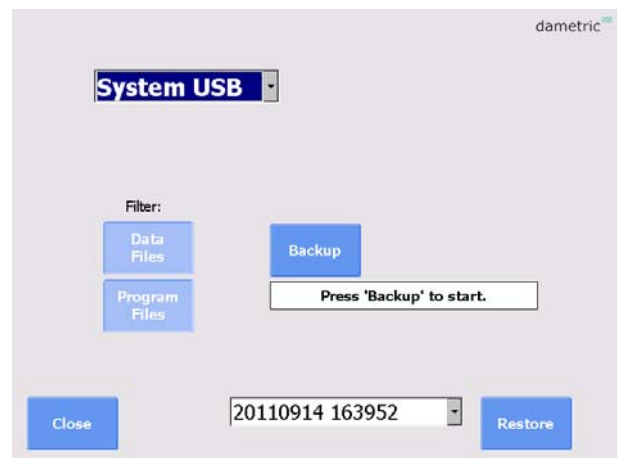


### 12.2 Backup and Restore

This function is used to perform backups and restorations of data- and systemfiles.

- Attach the USB memory to the panel PC.
- Select Backup to start the process.

As default, all important files will be copied to the internal system memory. This allows for a complete restoration of the program after change of the panel PC.



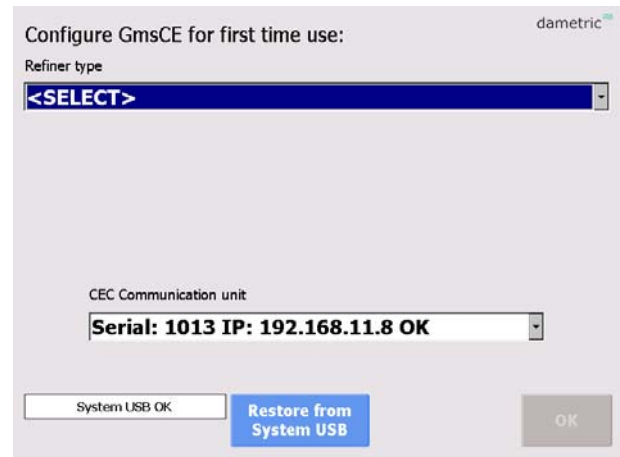


## 13 Startup of the system

### 13.1 Startup of GmsCE for the first time

The first time the program is started you will be asked to specify the type of refiner used as well as the serial of the used CEC-DM1 unit.

If the panel PC is a new one, but in an existing system, it is possible to restore everything from the internal system memory, belonging to the cabinet. In this case it is not necessary to choose refiner and CEC, since this information will be found in the restored files.

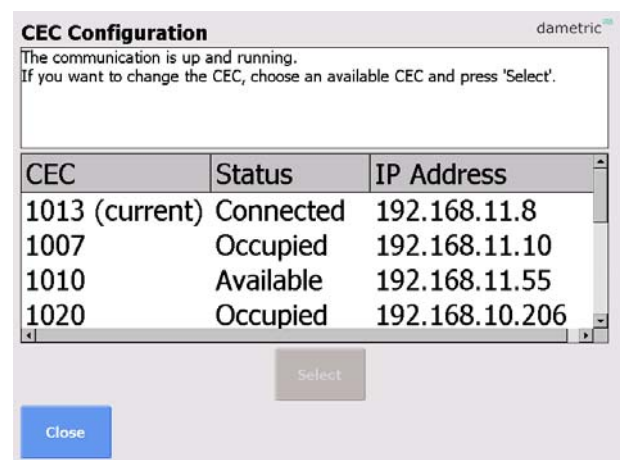


### 13.2 Configuration of the CEC-DM1

Select *CEC Configuration* from the System Settings-window.

Choose a CEC-unit by tapping on it in the list. Press *Select* to connect to the CEC.

If the system fails to start because the CEC is not properly installed, it is necessary to rescan the parameters (*Scan Retry* from the startup window).



## 14 Abbreviations

**CE™**. Operating system from Microsoft.

**UDP – User Datagram Protocol**. A connection less protocol for transferring of individual packets over IP.

**TDC - True Disc Clearance**. Plate gap measured with a sensor placed in level with the stator segment.

**AGS - Adjustable Gap Sensor**. A TDC sensor with moveable tip which can be moved forward and backwards for calibration.

**GMS – Gap Monitoring System**. A measurement system for measure and presentation of the signals in a refiner, e.g. the plate gap and plate gap temperature.

**DTM – Disc Temperature Monitor**. The plate gap temperature measured inside in the plate gap with a TDC- or AGS sensor.

**TVD – Touch point Vibration Detector**. A measure on the touch point signal between the disc plates. The signal is used to define the zero position (plate gap = 0) and is the basis of the zero calibration of a TDC- or AGS sensor.

**APO – AGS Position**. A signal for the position of the tip in a AGS sensor. It is zero when the tip is in level with the stator segment. The signal is increased when the tip is moved towards the rotor and decreased when it is behind the segment edge.

**RPO – Rotor Position**. A signal for the rotor axial position. (for LC refiners).

**HPM – Hydraulic Pressure.** A signal for hydraulic pressure for positioning of the stator in a Twin-60 refiner.

**DCA – Disc Clearance Amplifier.** Measurement module for the plate gap and plate gap temperature.

**ACM – AGS Control Module.** Acts as a link between the AGS (Adjustable Gap Sensor) and the CAN-interface.

**CEC - CAN to Ethernet Converter.** A unit than converts the Ethernet data to the CAN-bus connecting the RMS units.

## 15 Contact

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