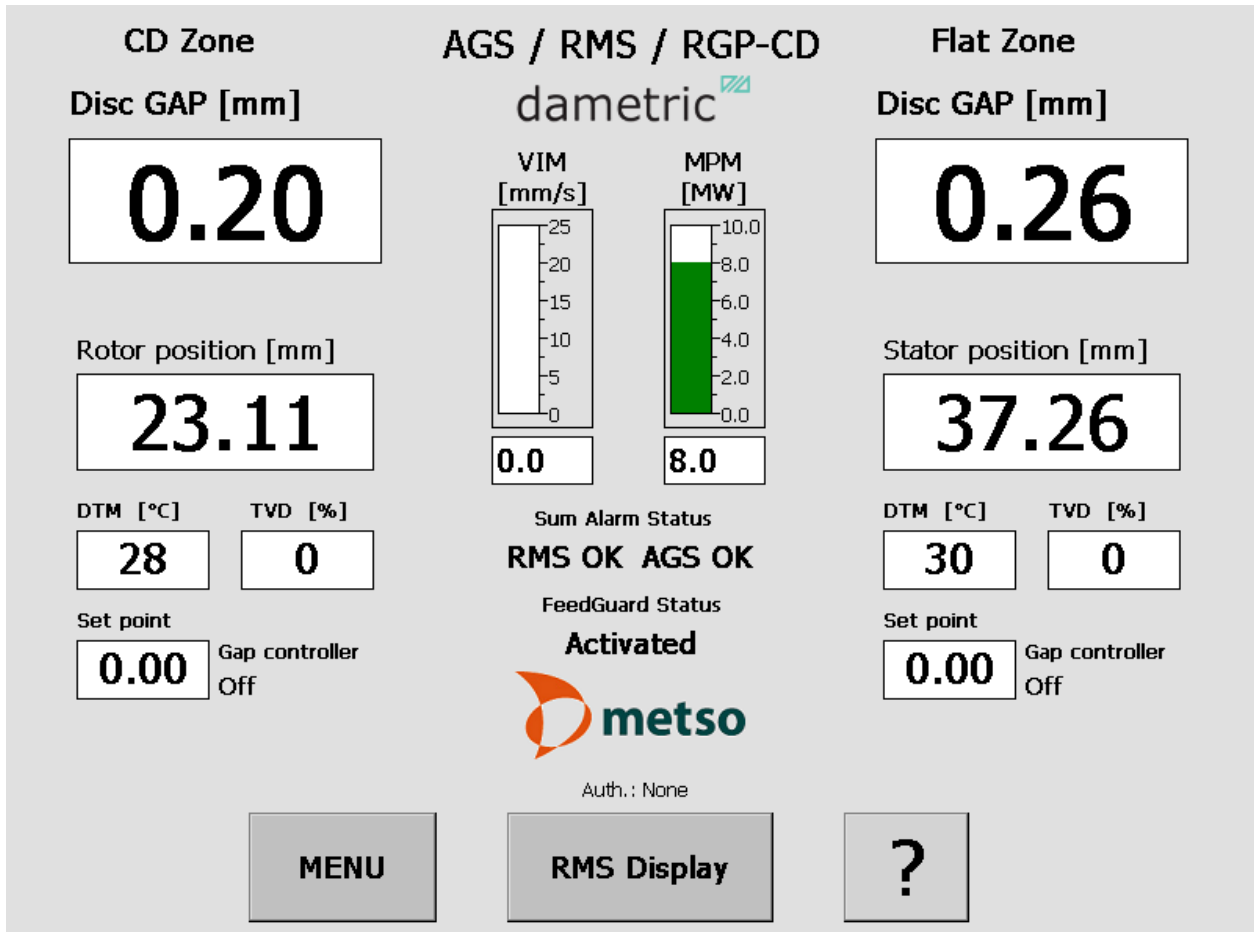




RMS - AGS



GMS CE Panel-PC for RMS-CD

Manual

Table of contents

1	OVERVIEW	3
2	SECURITY	3
3	DISPLAY READOUT	4
	Normal view.....	4
	RMS Display.....	4
	Gap monitor	4
4	PROGRAM FUNCTIONS.....	5
	Menu Window.....	5
	AGS Service.....	5
	AGS Auto Calibrate.....	6
	Coarse Calibrate	6
	Tip Replacement.....	6
	Holder Exchange.....	6
	Service	7
	DCA – Disc Clearance Amp.....	7
	DTM – Disc Temp. Monitor	7
	APO – AGS Position	8
	TVD / TED – Touchpoint Detector	9
5	PARAMETERS	9
6	SYSTEM SETTINGS.....	10
	Login	10
	System Tab.....	10
	IO Tab	10
	AGS Tab	11
7	CALIBRATION LOG	11
8	ALARM LOG.....	11
9	TREND.....	11
	Time Scale.....	11
	Settings	11
	Trend Logger.....	11
	Trend settings	12
10	SELECT THE CEC UNIT.....	12
11	ABBREVIATIONS	13
12	CONTACT	13

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 system which is 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 a circuit board inside the AGS sensor which measures the touch point vibration, the tip position and controls the movement of the tip with a stepping motor. 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-RM2 (Disc 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 use a CAN-bus to communicate between each other. 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 security regarding the measurement signals and logic are placed in the measurement modules which are suited for its purpose. The Panel PC and its software have as its task to show measured values, alter parameters and to provide sequences for example AGS calibration. This means that the Panel PC can be closed off without that no measure signals fail to come or get changed which would affect the refiner mode of operation.

3 Display readout

Normal view

In the normal view, the most important signals for the refiner status are shown.

MENU

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

RMS Display

This button opens a form in which an extended set of signals for the refiner are shown.

This form also has an entry to a form to monitor the gap controller.

?

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

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

RMS Display

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

Gap Monitor

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

Gap monitor

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

Start

Press the start button to start to log the signals. The log is closed automatically after 5 minutes.

Trend.

This will start a trend form which will show the signals and the gap controller actions.

Parameters

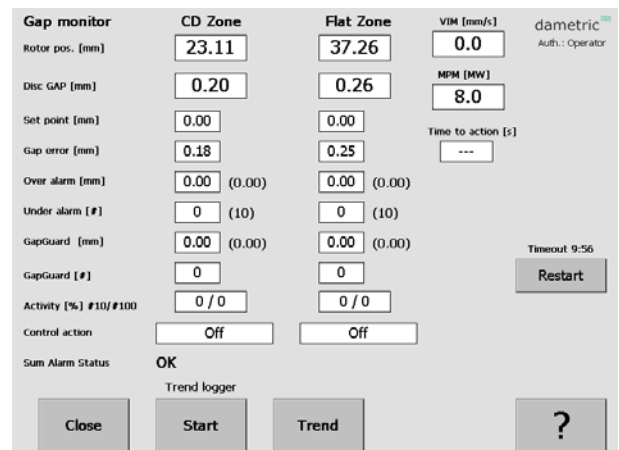
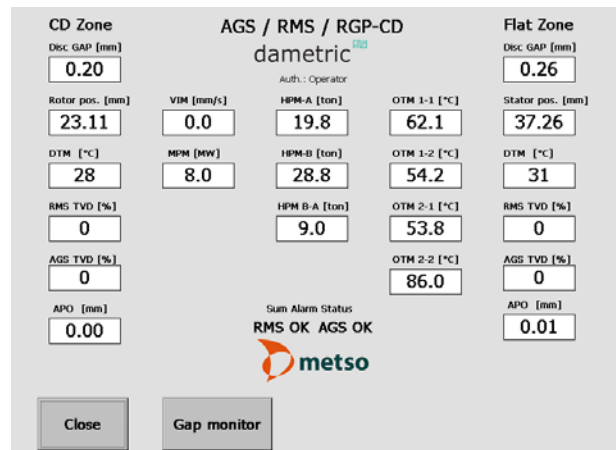
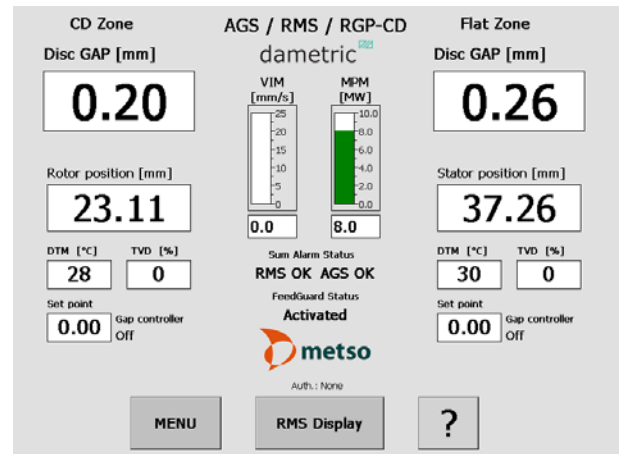
Opens a form to view and edit the gap controller parameters.

Restart

Press this button to reset the timer for automatic logout (60 minutes).

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).



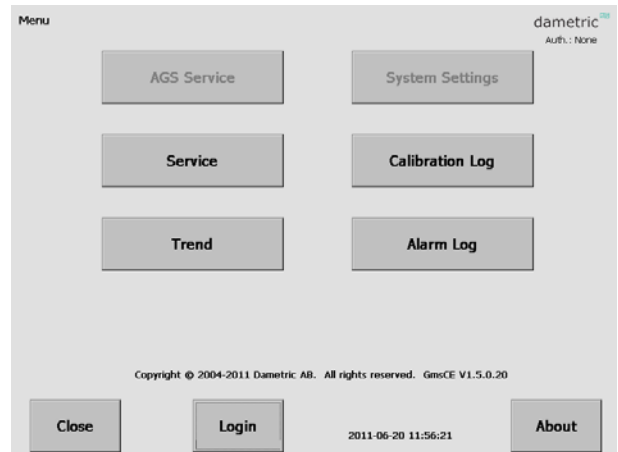
4 Program Functions

The program functions are divided into the following main groups.

Menu Window

AGS 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 what settings possibilities there are 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.

Trend The Trend tool shows a trend over the most common signals in the system.

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 do 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.

AGS 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.

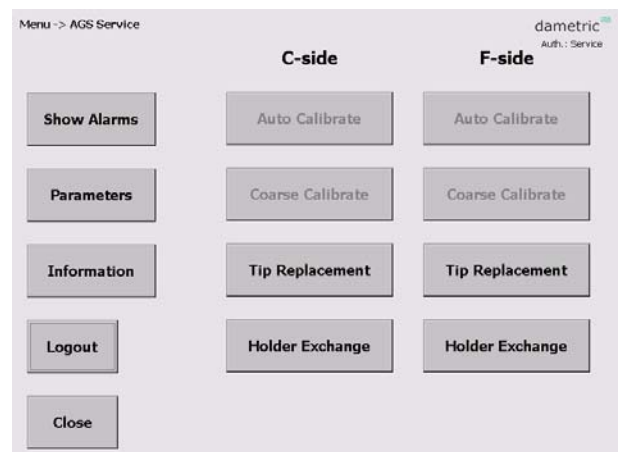
Holder Exchange Use this function to exchange the holder or the AGS house.

Parameters Used to view and edit the calibration parameters.

Information Descriptive information about the functions in this form.

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

The *Tip Replacement*, *Holder Exchange* and *Coarse Calibrate* functions are available at first 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 unintentional destroyed.

AGS Auto Calibrate

Here you can calibrate the AGS sensors which are done with automation.

Consult the “GmsCeAgs-Calibration_Eng.pdf” for details.

Coarse Calibrate

Coarse calibration is performed when a new tip is mounted. This calibration done in the sequence when tip is exchanged.

Consult the “GmsCeAgs-Calibration_Eng.pdf” for details.

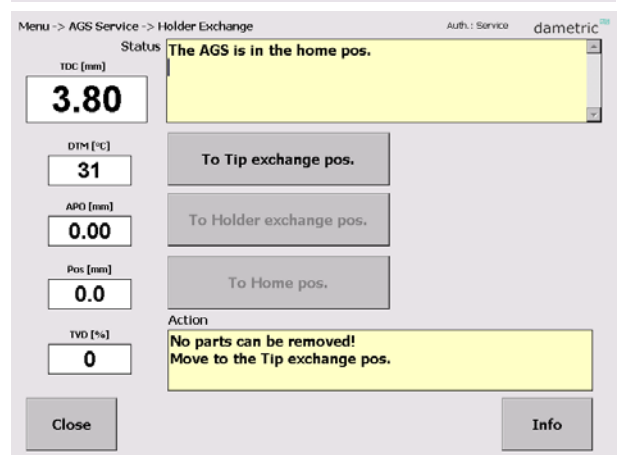
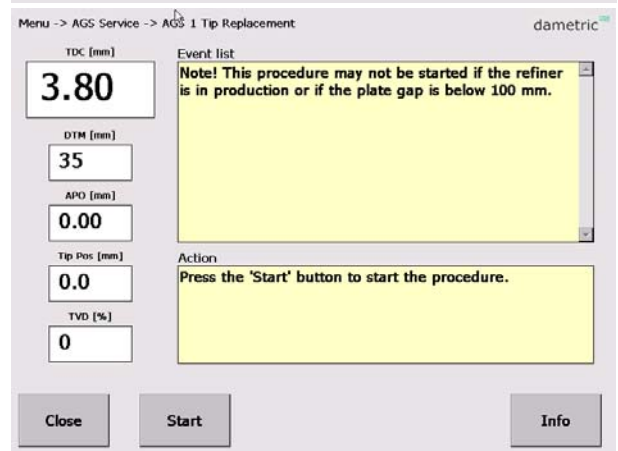
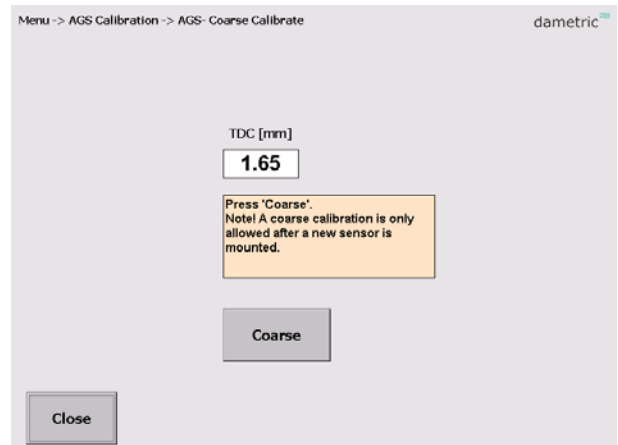
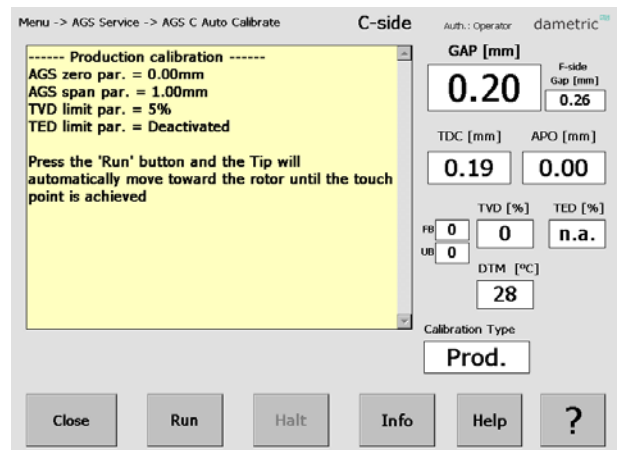
Tip Replacement

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

Consult the “AGS-XXX-ServiceManual_Eng.pdf” for details.

Holder Exchange

This procedure is used to replace the holder or the head of the AGS sensor. Consult the “AGS-XXX-ServiceManual_Eng.pdf” for details.

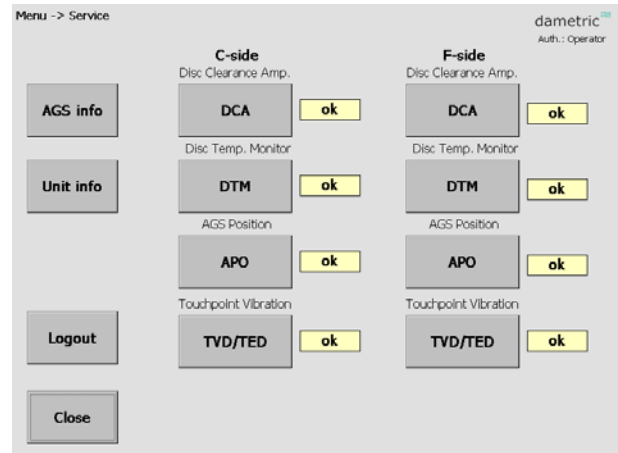


Service

The Service menu shows the functions that are used in the AGS/RMS-system.

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.



DCA – Disc Clearance Amp.

Parameters (logged in as service)

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

System (only shown when you are system logged in). Here you can alter hardware related parameters that belong to the DCA measurement function.



DTM – Disc Temp. Monitor

Span Cal (logged in as service)

Function for span calibration.

Zero Cal (logged in as service)

Function for zero calibration.

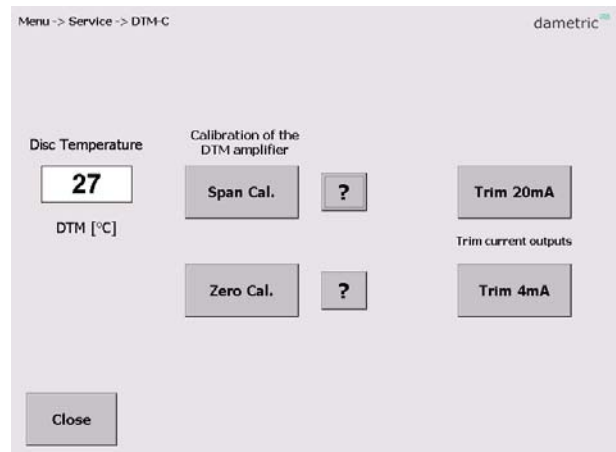
?
A help text for the calibration sequence is presented on the screen.

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.



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.

Parameters (logged in as service)

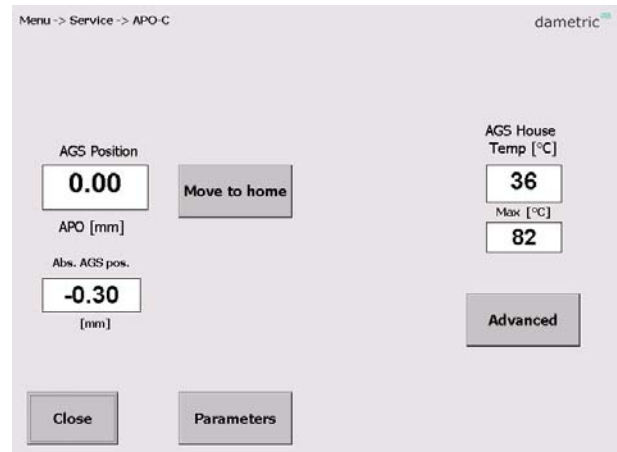
Here you can alter parameters that belong to the APO measurement function.

System (only shown is logged in as administrator)

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

Advanced Functions (logged in as service)

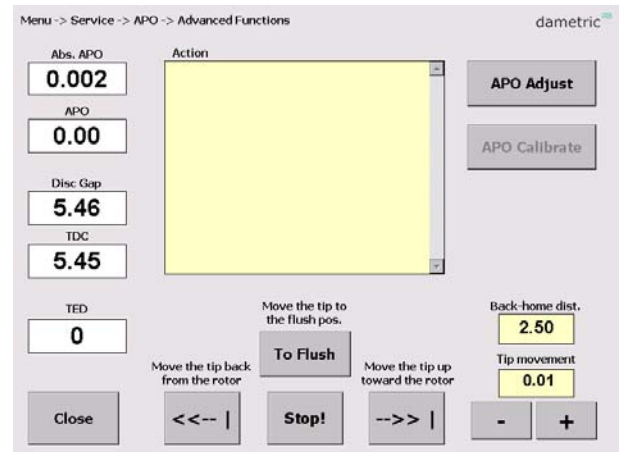
This function makes it possible to manually move the tip which is used for maintenance/development of the measurement system.



APO 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 done in the Service – APO form and by pressing the Parameters button. Change the Apo Distance to an appropriate value around 2.50 mm.



If logged in as administrator:

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

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 move distance between 0.01 and 1.00 mm.

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)

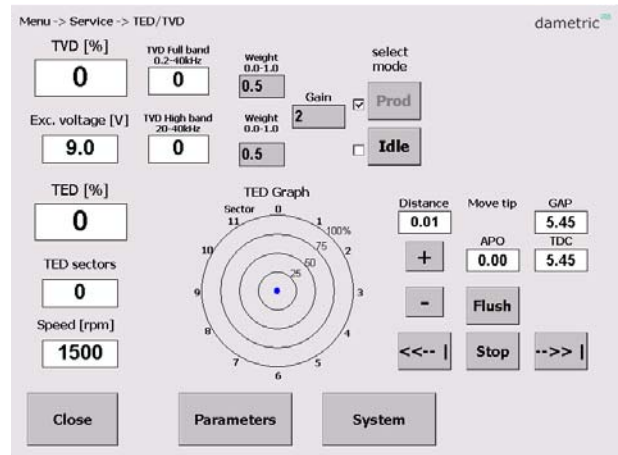
A number of functions is shown to move the tip to be able to investigate how the tip position will affect the TVD and TED measurement.

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.



5 Parameters

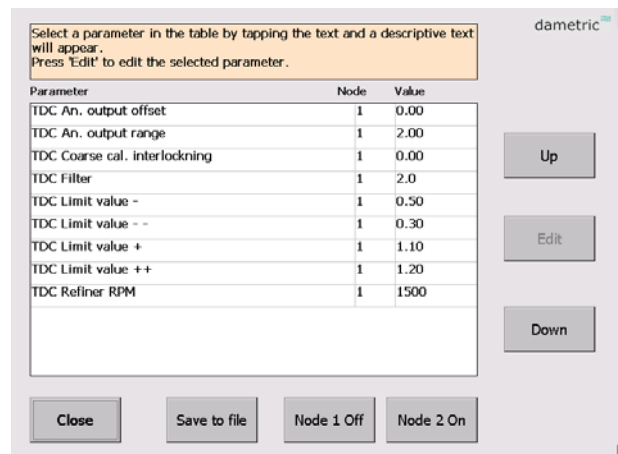
This is an example of the parameters for the DCA function is shown. Every parameter is shown with a short description and the allowed max- and min values. Furthermore, the node from where the parameter belongs to is also shown. There is also a possibility to copy the parameter settings to a XML file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

The parameter values are stored into a XML file when the **Save to file** button is pressed.



6 System settings

Some of the functions are protected with a password and are thereby not available when one doesn't have the right authorization.

Login

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

System Tab

Service info

Address, phone and email contact data for service and maintenance.

Program log

Shows the program related errors and events.

Help text language

Select language for the help texts.

Refiner ID

Defines a unique id for the installation which is used when transferring files to the external memory stick. This makes it possible to handle several installations. Press the 'Edit Refiner ID' button to change the id.

Refiner type

Selects the refiner type. Note – the GMS program will restart if a different type is selected.

Regenerate

Use this button read new parameters from the hardware units. This is only used if the hardware is updated or changed and new signals have been added. The parameters are stored in a XML-file which is used each time the program is started.

Log AGS cal.

When this function is activated, the measure data regarding the AGS calibration are logged.



IO Tab

CEC Serial no. / Select CEC

Function for selecting the CEC-DM1 that is used in the system.

File Browser

Function for copying of XML and log files to a USB stick.

Password (if logged in as administrator)

Here one can change the password of the different login accounts.

Upgrade System (if logged in as administrator)

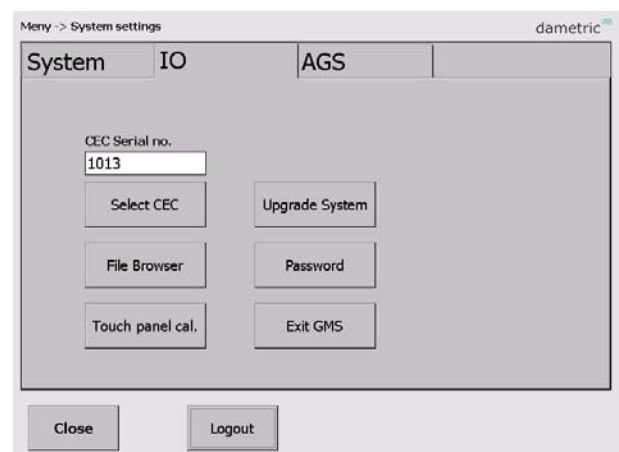
This procedure is described in a separate manual.

Touch panel cal.

Calibrate the touch screen, press the button and follow the instructions.

Exit GMS (if logged in as administrator)

This will end the GMS program.



AGS Tab

AGS 1 Suffix, AGS 2 Suffix

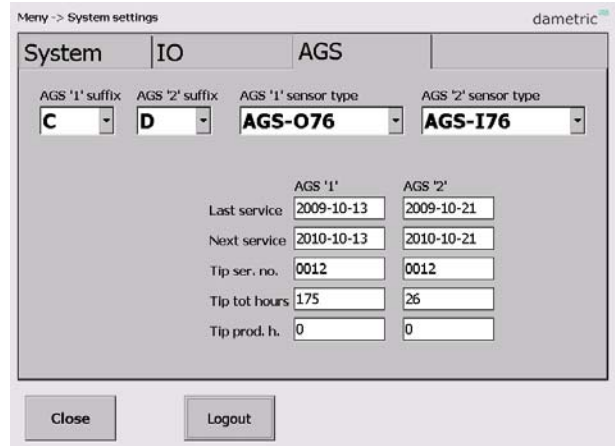
Set a suffix for each AGS sensor depending on the location in the refiner. E.g. “C” for a sensor in the CD zone. This will not affect the functionality but it is only used in the notation of the presented measurement signals and logged functions.

AGS sensor type

Select the sensor types used in this refiner.

AGS “1”, AGS “2”

The actual service dates and the current operation hours are shown.



7 Calibration log

In the calibration log calibration events can be shown.

Home – Up – Down

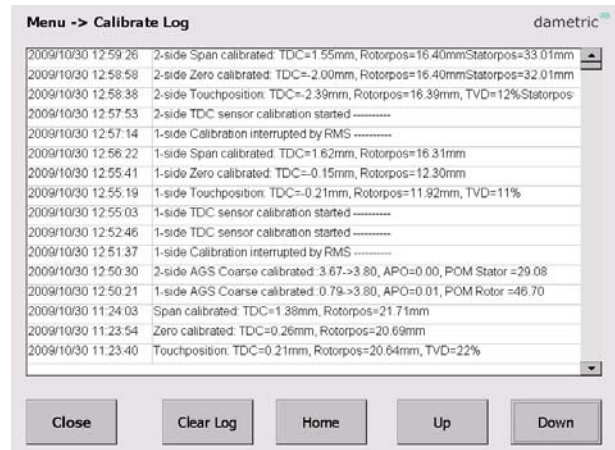
Used to scroll in the list.

Row content

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

Clear log (if logged in as administrator)

Clear the log content.



8 Alarm log

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

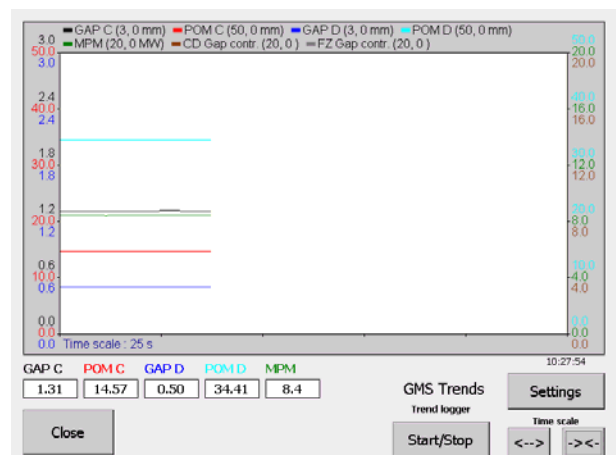
9 Trend

A trend picture shows the plate gap, the rotor position, the main motor power and the control actions by the RMS gap controller. The scales can be set for each line by the Settings button. The gap controller lines have the following fixed setting:

	Enabled	Idle	Tog.	Apart	GapGuard
Conical zone	0	5	4	6	7
Flat zone	0	2	1	3	4

Time Scale

Press the Time Scale button to change between three different time scales, app 7 – 14 – 66 s.



Settings

Use this function to set the scale ranges and the offsets.

Trend Logger

It is possible to log the parameters to a log file. The function is started and stopped with the **Start/Stop** button.

Trend settings

Parameter Up/Down

Use the Up/Down buttons to scroll selected parameter in the parameter list. Selected parameter is shown with the Parameter and Unit boxes.

Range, Up/Down

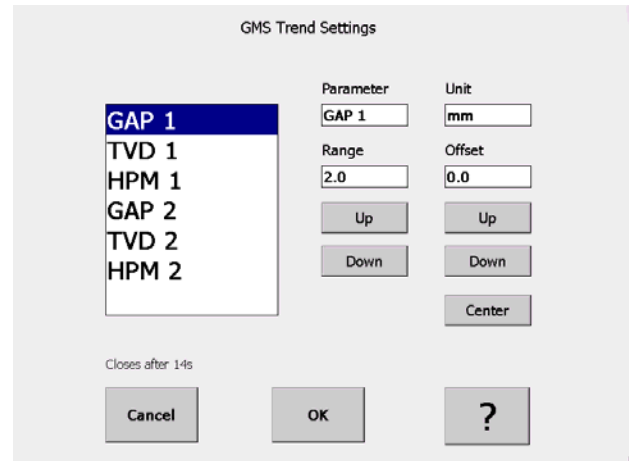
Step between five pre-set ranges for the actual parameter.

Offset, Up/Down

Increase/decrease the offset with a pre-set value.

Center

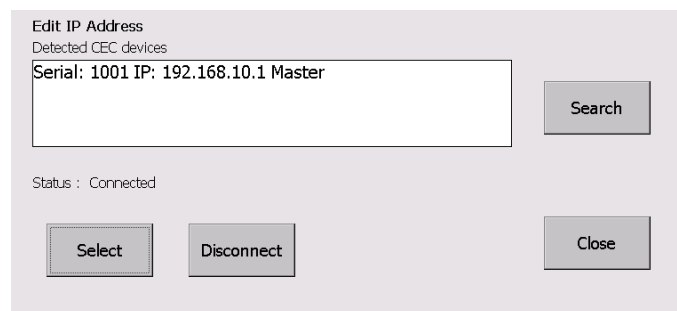
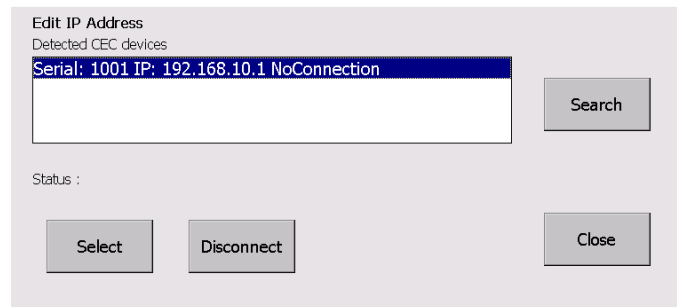
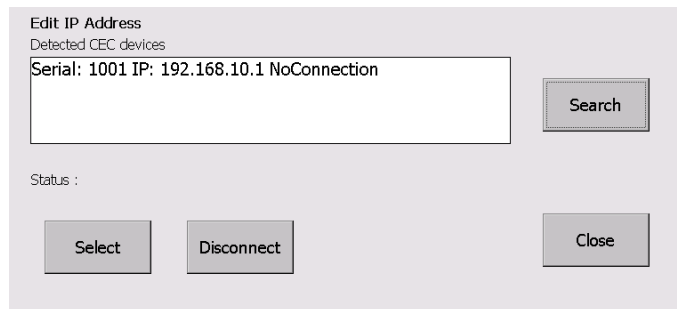
Press the Center button to adjust the offset so that the measure value comes in the middle of the scale.



10 Select the CEC unit

The Panel-PC must establish a network connection with the CEC-DM1 unit. The CEC (Can to Ethernet Converter) is the interface between the Ethernet (UDP) on the Panel-PC and the CAN bus from the hardware units. The CEC selection is stored in an XML-file in the computer and is read automatically when the system starts. The connection has to be manually done if the computer or the CEC is changed.

- Press 'Menu' and log in as Service.
- Press the 'System Settings' button, select the 'IO' tab.
- Press the 'Select CEC' button.
- Press the 'Search' button. At least one CEC unit should be shown. If more than one CEC, check the serial number for identification.
- Tap the CEC unit in use and then press the 'Select' button. The Status should then read "Connected".
- Press 'Close'.



11 Abbreviations

CE TM. 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.

12 Contact

Development, production and service:

Dametric AB

Jägerhorns Väg 19, SE141 75 Kungens Kurva, Sweden

Phone: +46-8 556 477 00 Telefax: +46-8 556 477 29

e-mail: service@dametric.se www.dametric.se

