

DAC-300T series

The complete shear control

Operation Manual V1, EN

Delem

Everything under control

Preface

This manual describes the operation of the Delem control type DAC-300T and is meant for operators who are instructed for operation of the total machine.

Limited warranty

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1. Introduction

The DAC-300T series is a programmable touch control for industrial cutting machines.

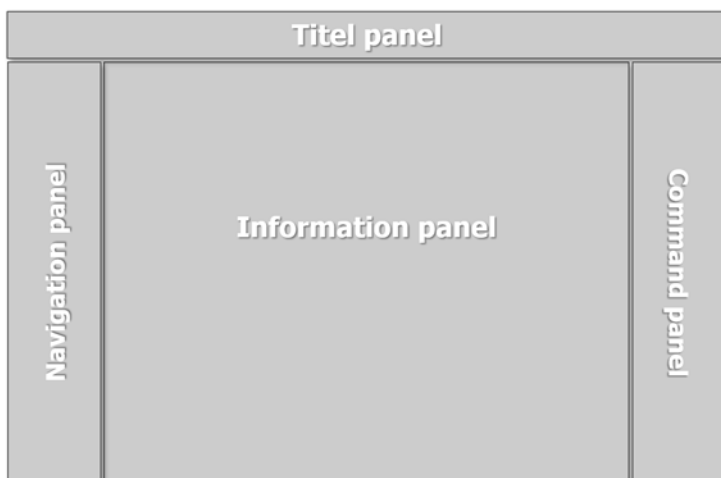


Its user-friendly user interface is mainly based on icons, making it a fast and easy to program control. The high-quality widescreen TFT Color LCD display has a size of 7" and is equipped with an energy saving LED backlight. The industrial grade glass panel with PCT technology ensures a safe, reliable and accurate operation, even when wearing gloves in a sheet metal production environment.

2. Using the DAC-300T

2.1 User interface layout

The user interface of the DAC-300T is based on the proven Delem touch interface introduced in the Delem press brake controllers. In the picture below the main layout of the screen is explained. This layout is applicable for all the operating modes for the DAC-300T, making the navigation easy and recognizable.



Navigation panel

- Direct access to all main functions
- Logically sorted to work step by step
- Recognizable in every mode

Title panel

- User level indication
- Product information
- Service row info
- Optional machine indicators

Information panel

- Large working area
- Context sensitive keyboard

Command panel

- Functions and soft keys belonging to the specific active function

In order to select a menu item or parameter simply tap the screen once at the position of the icon. If it is necessary to pan (for example in product select menu), keep your finger on screen and move in the desired direction. Pan is available to scroll in horizontal as well as vertical direction.

2.2 Available menus

The DAC-300T has several modes for programming and operation:



Program selection

Select an existing program, or create a new program.



Automatic mode

Execute a program, or program step parameters.



Manual mode

Execute a single program step.



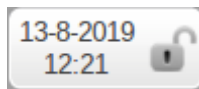
Settings

Several control settings.

The several modes are explained in detail in chapters 3 to 6.

2.3 Key lock

The control is equipped with a key lock function, to prevent unauthorised programming.



It depends on the machine if this lock is accessible over the touch screen interface (upper left corner) or an external physical key switch.

To lock or unlock the controller, tap the key lock to open the on screen keyboard. Enter code 42 and press enter. You will see the status of the key lock is toggled from closed to open or from open to closed.

If the control is unlocked (key lock is open), it can be programmed as described in this manual. If locked (key lock closed), the following restrictions apply:

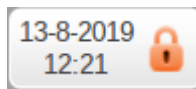
- programs cannot be created or edited
- programs cannot be deleted

The following actions are still possible when the control is locked:

- programs can be selected (if they consist of one or more steps),
- programs can be executed,

- settings can be changed,
- axes can be moved in manual movement mode,
- in the manual mode it is still possible to program and execute one step.

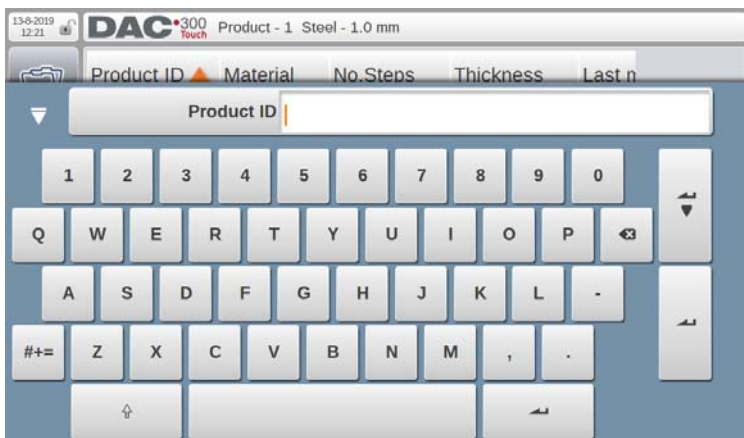
There is a second code available for the key lock function. When code 21 is entered instead of code 42 the user interface is blocked. This can be used to block the machine from unauthorized use without switching the machine off. This special blocked stage can be recognized by an orange colored key lock symbol:



To release the controller for normal operation, tap the key lock symbol and enter code 21 followed by enter.

2.4 On screen keyboard

The DAC-300T has a build in on screen keyboard as displayed below.

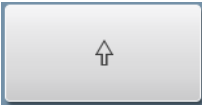


Besides the numerical and alphanumeric keys there are some additional keys:



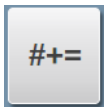
Keyboard close

Close the on screen keyboard.



Caps lock

Switch between lower- and upper-case characters.



Special characters

Switch the keyboard between normal and special characters.



Enter key

This function confirms the entered value, keeps the cursor on the selected input field and afterwards automatically closed the keyboard. This is useful when entering a single value.



Enter-Next key

This function confirms the entered value, selects the next input field and keeps the keyboard open. This is useful when entering multiple values.

Special characters (like á, à, â, ã, ä, å, æ) are also supported. They appear when keeping a character (like 'a') pressed for about 2 seconds.

3. Program selection mode



By tapping the navigation button Program selection, the control is switched to program selection mode.

13-9-2019 12:21		DAC-300 Touch		Product - 1 Steel - 1.0 mm	
Product ID	Material	No.Steps	Thickness	Last n	
Demo	1 Steel		3	1.0 05-06-	new program
Product	1 Steel		1	1.0 13-08-	+ edit

3.1 Select a program from memory

To select an existing program from the memory of the DAC-300T, simply tap on the program to select it. When the program is successfully loaded the DAC-300T will display an information message on the screen that the program is loaded. To execute this selected program, tap on the Automatic mode icon.

3.2 Copy/rename/delete a program from memory

Over the Edit function a selected program can be manipulated:

Copy

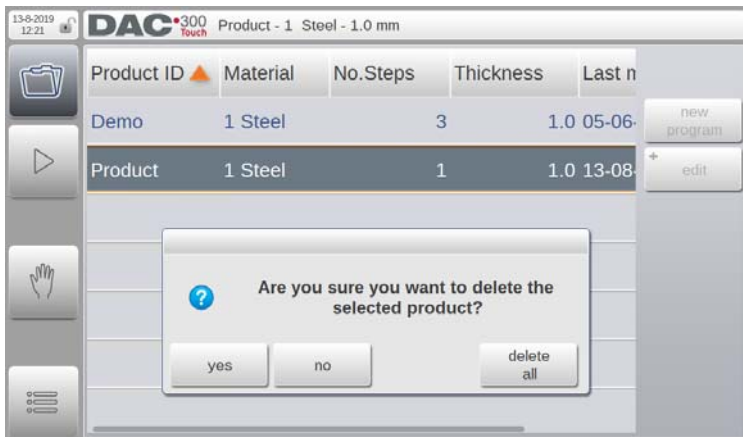
Create a copy of the selected program. When making a copy the DAC-300T will prompt the keyboard for the user to provide a new name.

Rename

Change the name of the selected program. When renaming the DAC-300T will prompt the keyboard for the user to provide a new name.

Delete

Remove the selected program from the memory. When deleting a program from memory the DAC-300T will prompt a pop-up to confirm the Delete action. This to prevent an accidental delete action. This action is permanent!



Delete all


Remove all programs from the memory. When deleting all the stored programs the DAC-300T will prompt a pop-up to confirm the Delete all action. This to prevent an accidental delete all action. This action is permanent!

3.3 Create a new program

To create a new program, select the new program soft key. The DAC-300T will open the keyboard so the program name can be entered. If an already existing name is entered the DAC-300T will prompt a message and asks if the existing program should be over written or not. In case the name was unique the DAC-300T will switch automatically to the automatic mode screen. In automatic mode the several program steps can be defined. See for details chapter 4.

3.4 Column sorting and changing column positions

Column sorting and changing column width/position are available in program selection and automatic mode all steps screens.

Product ID 	Material	No.Steps	Thickness	Last n
Demo	1 Steel		3	1.0 05-06-

Column sorting

To Sort the data tap shortly in the middle of the column header. To change from ascending to descending tap shortly in the middle of the column header again. The column that is sorted is marked with an orange arrow (see the Product header above).

Changing column width

To change the width of a column, tap on the right end of the column header. A box around the column should appear to indicate that column width mode is active. While keeping the screen pressed move left or right to change the column width.

Changing column position

To change the position of a column, tap in the middle of the column header for 3 seconds. After 3 seconds the column color

will invert to indicate that column position mode is active. While keeping the screen pressed move left or right to change the column position.

4. Automatic mode

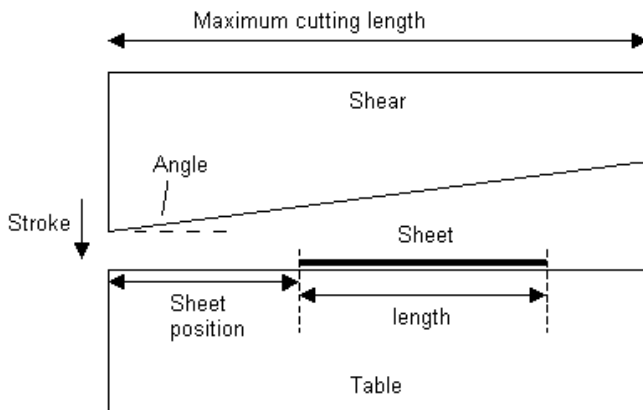


By tapping the navigation button Automatic mode, the control is switched to Automatic mode.

In Automatic mode a cutting program can be defined or edited as explained in chapter 3.

This chapter describes all possible parameters that can be programmed for a program step. Note that most of these parameters are machine configuration dependent; it might be that some of the parameters shown are not present in the user interface.

Below displayed picture indicates the basic functions that might be present on the machine:



4.1 Properties

The 'Properties' tab defines the general parameters that apply for all program steps.



M

Material number

The material of the sheet. There are 6 material types available. The material type will be used for angle, gap and force calculation. The corresponding values depend on the manufacturer settings. In case of force control, material properties can be programmed in Settings mode, as described in paragraph 6.2.



Thickness

The thickness of the sheet.



X-correction

General correction on X-axis position. This correction is valid for each step in the program.



Sheet position

Position of the sheet on the cutting table. Depending on the machine settings this parameter can also be found in the 'All steps' tab (programmable per cutting step).



Stock counter

To count the number of products. If programmed to 0, the counter will increase after each finished product. If programmed higher than zero, the counter will count down. When it has reached 0, the control will stop. The stock counter will be reset to the initially programmed value when 'start' is pressed.



Retract

Backgauge retract distance.

4.2 All Steps

In the 'All Steps' tab the actual program step parameters are defined. A program consists of minimum 1 program step and maximum of 25 steps.



Start programming by entering values in the parameter fields. Some parameters are set automatically: angle, gap, stroke and force. All cutting step parameters can be changed if desired, including the pre-computed ones. If there are more parameters available than fits the screen, use the pan function to make the parameters visible. If desired, the order of parameters can be changed, see paragraph 3.4.

A single step can be inserted or deleted at any point in the program.

Insert step

Select the number of the step after which one a step should be inserted (To add a step select the last step in the program). Press the 'insert step' soft key; a copy of the selected step will be inserted. The cursor will automatically move to the new step.

Mark step

Select the number of the step that should be moved or swapped. Press the 'mark step' soft key. Then select the next program step and press the 'move step' soft key to move the marked step to the selected position, or press the 'swap steps' soft key to swap the marked step with the selected step

Delete step

Select the number of the step that should be deleted. Press the 'delete step' soft key; the selected step will be deleted. The succeeding steps are shifted up.

A complete program can be deleted in the program selection mode.

4.3 All steps parameters

Each line represents one step. The first column contains the step number.



X-axis park position

With this parameter the backgauge can be set to its park position. This is for example applicable for de-coiling applications. When the parameter is set to disable the normal backgauge function is available. When set to enable the backgauge is moved automatically to its park position, and the X-axis parameters are made read-only.



X2-axis park position (DAC-362T only)

With this parameter the X2-axis can be set to its park position. When the parameter is set to disable the X2-axis function is available. When set to enable the X2-axis is moved automatically to its park position, and the X2-axis parameters are made read-only.



X-axis position

The desired backgauge position for this step. A positive value is an absolute position. A negative value is interpreted as a chaining value (a relative value). See also the parameter 'Chaining mode' in Settings mode, as described in paragraph 6.4.



X2-axis position (DAC-362T only)

The desired X2-position for this step. For the function of the X2-axis refer to the machine manual. A positive value is an absolute position. A negative value is interpreted as a chaining value (i.e. a relative value). See also the parameter 'Chaining mode' in Settings mode, as described in paragraph 6.4.



X-axis speed

The travel speed of the backgauge. It is programmed as a percentage of the maximum speed.



X2-axis speed (DAC-362T only)

The travel speed of the X2-axis. It is programmed as a percentage of the maximum speed.



Cutting length

The length of the sheet to be cut.



Cutting angle

The desired angle value of the cutting blade. The angle is automatically computed from material type and thickness; it can be changed if desired.



Sheet position

Position of the sheet on the cutting table, programmable per step. Depending on the machine settings this parameter can also be found in the 'Properties' tab (programmable per program).

FD

Function output

Binary value for the programmable digital outputs. The number of available outputs depends on machine settings. The name also depends on machine settings, and is FD by default.



Return to Sender function (DAC-36xT only)

Function to return the cutted part to the front of the machine after cutting:

- Disable -> RTS function inactive
- Enable -> RTS function active

This function is automatically disabled when the programmed sheet thickness is larger then a pre-programmed limit by the machine manufacturer.

CY

Step repeat

The number of times this step is to be repeated.

PS

Part support (DAC-36xT only)

Backside part support function on/off:

- Disable -> Part support function inactive
- Enable -> Part support function active



Gap

Gap distance between the cutting blade and the table. The gap is automatically computed from material type and thickness; it can be changed if desired.



Stroke length

Stroke distance for this cut. Depending on machine settings, the stroke length is programmed as a distance or as a percentage of the maximum stroke. The stroke distance is automatically computed from sheet position, angle and cutting length; it can be changed if desired.



Cutting force (DAC-36xT only)

The desired force necessary for cutting the sheet. A computed value is offered, based on current settings; it can be changed if desired.



Clamping force (DAC-36xT only)

Force with which the sheet is clamped on the table. A computed value is offered, which is a percentage of the cutting force; it can be changed if desired. The percentage can be changed in Settings mode, as described in paragraph 6.4.

4.4 Program execution

When all the program steps have been programmed (or an existing program is selected) the program can be executed to cut the actual sheet metal parts. To switch to execution mode, press the green start button located in the upper right corner; this can be done on the 'Properties' tab or the 'All steps' tab.

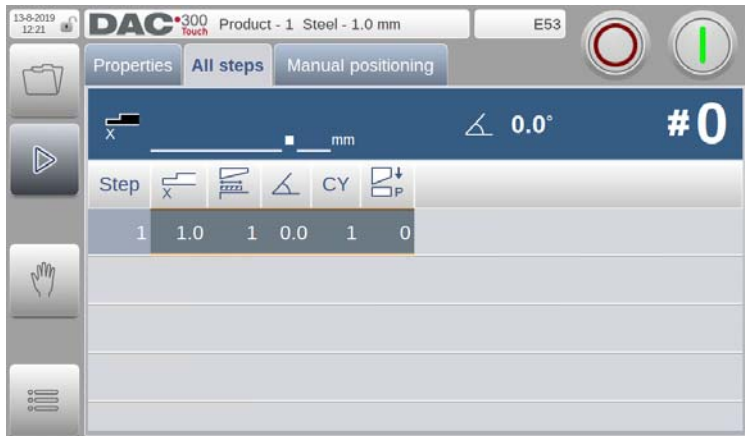


To start a program, press 'Start'. The control will begin execution of the step on which the cursor is placed.



To stop execution, press 'Stop'.

When the control is started in 'All steps' the screen will look like below:



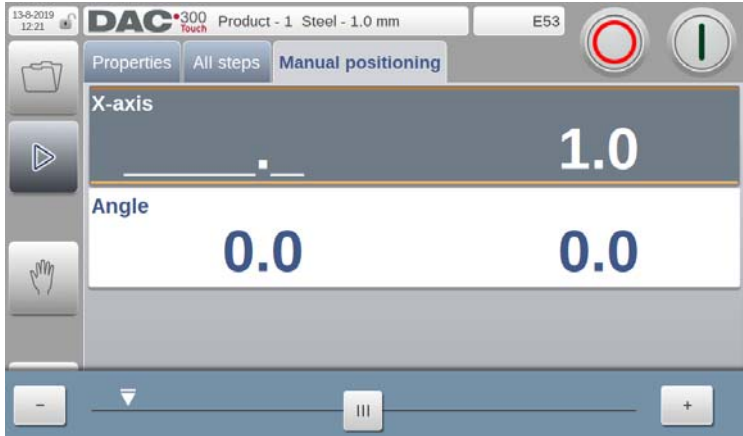
It highlights the active program step, actual X-axis position and the value of the stock counter.

A program is repeated until 'Stop' is pressed or until the stock counter (#) has reached 0 after down counting.

A program can only be started when the machine is ready. The 'CY' parameter indicates the status of the step repeat counter (only if CY is programmed larger then 1).

4.5 Manual positioning

On the 'Manual positioning' page in Manual mode and Automatic mode a slider at the bottom of the screen can be used to position the axis.



The distance moved with the slider determines the speed of the axis. When the slider is released, the axis stops. The buttons at each end of the slider can be used to fine-tune the axis position. When "sliding" the beeper gives feedback that the axis is moving.

5. Manual mode



By tapping the navigation button Manual, the control is switched to Manual mode.

In this mode one cutting step can be programmed and executed.

This chapter describes all possible parameters that can be programmed for a cutting step. Note that most of these parameters are machine configuration dependent; it might be that some of the parameters shown are not present in the user interface.

5.1 Manual mode parameters



The position of the parameters in the manual screen can be altered. To change the position of a parameter, keep its tile

pressed until its high-lighted and drag it to the desired position. Release the tile to fix the new position.

M

Material number

The material of the sheet. There are 6 material types available. The material type will be used for angle, gap and force calculation. The corresponding values depend on the manufacturer settings. In case of force control, material properties can be programmed in Settings mode, as described in paragraph 6.2.



Thickness

The thickness of the sheet.



Cutting length

The length of the sheet to be cut.



X-correction

General correction on X-axis position.



Sheet position

Position of the sheet on the cutting table.



X-axis position

The desired backgauge position.



Retract

Backgauge retract distance.



X-axis speed

The travel speed of the backgauge. It is programmed as a percentage of the maximum speed.



X-axis park position

With this parameter the backgauge can be set to its park position. This is for example applicable for de-coiling applications. When the parameter is set to disable the normal backgauge function is available. When set to enable the backgauge is moved automatically to its park position, and the X-axis parameters are made invisible.



X2-axis position (DAC-362T only)

The desired X2-position. For the function of the X2-axis refer to the machine manual.



X2-axis speed (DAC-362T only)

The travel speed of the X2-axis. It is programmed as a percentage of the maximum speed.



X2-axis park position (DAC-362T only)

With this parameter the X2-axis can be set to its park position. When the parameter is set to disable the X2-axis function is available. When set to enable the X2-axis is moved automatically to its park position, and the X2-axis parameters are made invisible.



Return to Sender function (DAC-36xT only)

Function to return the cutted part to the front of the machine after cutting:

- Disable -> RTS function inactive
- Enable -> RTS function active

This function is automatically disabled when the programmed sheet thickness is larger then a pre-programmed limit by the machine manufacturer.

PS

Part support (DAC-36xT only)

Backside part support function on/off:

- Disable -> Part support function inactive
- Enable -> Part support function active

FD

Function output

Binary value for the programmable digital outputs. The number of available outputs depends on machine settings. The name also depends on machine settings, and is FD by default.



Cutting angle

The desired angle value of the cutting blade. The angle is automatically computed from material type and thickness; it can be changed if desired.



Gap

Gap distance between the cutting blade and the table. The gap is automatically computed from material type and thickness; it can be changed if desired.



Cutting force (DAC-36xT only)

The desired force necessary for cutting the sheet. A computed value is offered, based on current settings; it can be changed if desired.



Clamping force (DAC-36xT only)

Force with which the sheet is clamped on the table. A computed value is offered, which is a percentage of the cutting force; it can be changed if desired. The percentage can be changed in Settings mode, as described in paragraph 6.4.



Stroke length

Stroke distance for this cut. Depending on machine settings, the stroke length is programmed as a distance or as a percentage of the maximum stroke. The stroke distance is automatically computed from sheet position, angle and cutting length; it can be changed if desired.



5.2 Program execution

When all the manual mode parameters have been programmed the single cut can be executed. To switch to execution mode, press the green start button located in the upper right corner.

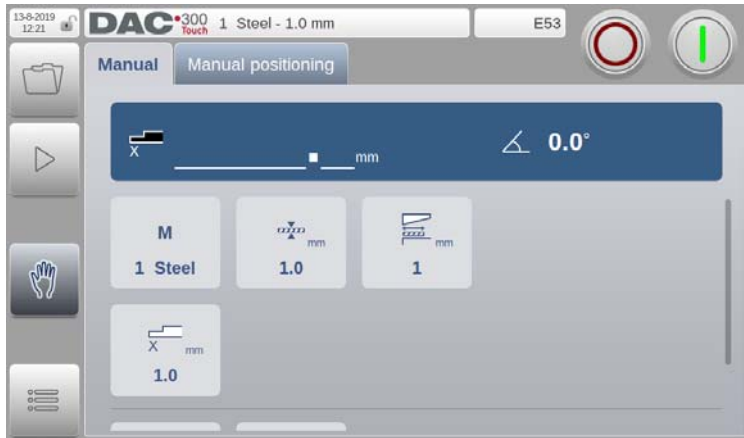


To start this cutting step, press 'Start'.



To stop execution, press 'Stop'.

When the control is started the screen will look like below:



5.3 Manual positioning

The manual positioning function of the axis in Manual mode is identical to the manual positioning in Automatic mode, see paragraph 4.5.

6. Settings mode

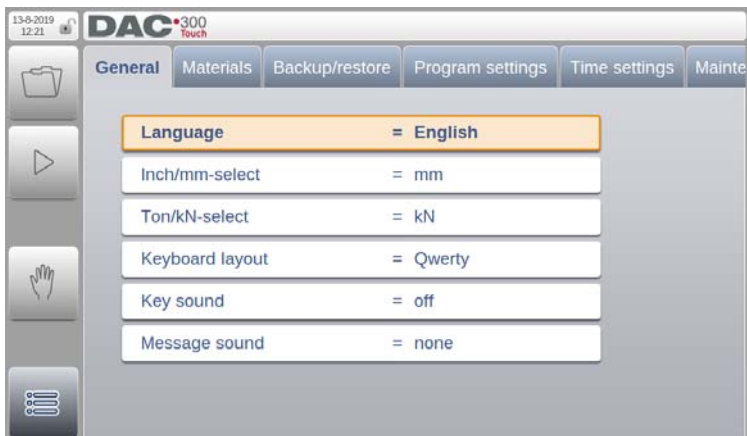


By tapping the navigation button Settings, the control is switched to Settings mode.

The Settings mode of the control gives access to all kind of settings which influence the programming of new products and programs.

The settings are divided across several tabs logically organizing the different subjects. In the following sections the available tabs and detailed settings are discussed. Navigation through the tabs can be done by just tapping them and selecting the required item to adjust. Since there can be more tabs than the screen can show in one view, dragging the tabs in horizontal direction enables to view and select all available tabs.

6.1 General



Language

The user interface language can be selected from the list. There are more available languages than initially shown. Scroll vertically by dragging the list up and down to see all available languages. Tap to select the desired language for the user interface.

Inch/mm-select

Select to use either Millimeters or Inches as the unit to be used.

Ton/kN select (DAC-36xT only)

Select to use either Ton or kN as the main unit to be used for all force data.

Keyboard layout

Upon choice one can select Qwerty, Qwertz or Azerty keyboard layout. Default layout is Qwerty.

Key sound

Switch the sound function of the input panel on or off. Default sound is on.

Message sound

When the Key sound is off it is still possible to have an acoustic alert in case of a message or warning.

- All messages: acoustic alert in case of any message
- Errors + Warnings only: acoustic alert only in case of an error or warning
- Errors only: acoustic alert only in case of an error
- None: No acoustic alert in case of any message

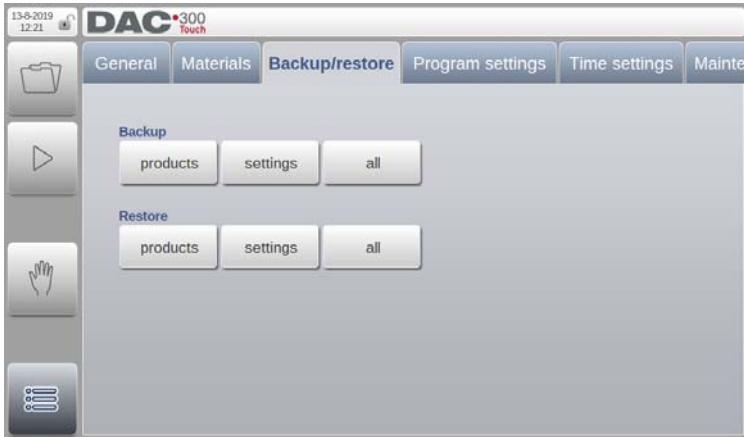
6.2 Materials

ID	Material name	Shear stress
1	Steel	80.00
2	Aluminum	26.00
3	Zinc	0.25
4	Stainless steel	87.00
5		0.00
6		0.00

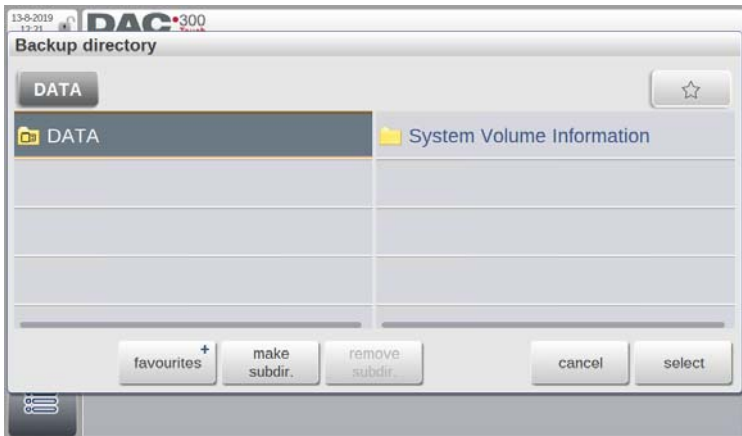
Shear stress values for 6 different materials can be programmed. The values must be programmed in kN/mm², regardless of the dimension and force setting in the 'General' tab.

Note: This parameter is only present if cutting force control has been enabled.

6.3 Backup / restore




When backup (restore) products, settings or all is selected for the first time a new window with a file browser is opened. In this window you can browse through the directory structure of your backup device. Tap the directory name on the right part of the file browser to look inside a subdirectory. To move one level up, tap the name on the left part of the file browser.




Favourites -> add to favourites

With 'add to favourites' it is possible to mark one or more specific directories as favourite. If there are favourite directories

defined a  button will be present in the upper right corner. By tapping this button, the defined favourites are presented, making a quick selection of the directory possible.

Favourites -> edit favourites

In this screen the defined favourites can be given a logical name. Next time when opening the favourites by tapping the

 button it will be displayed using this logical name. Favourites that are no longer needed can be deleted by tapping the 'delete' soft key.

Make subdir.

Create a new subdirectory

Remove subdir.

Remove an existing subdirectory

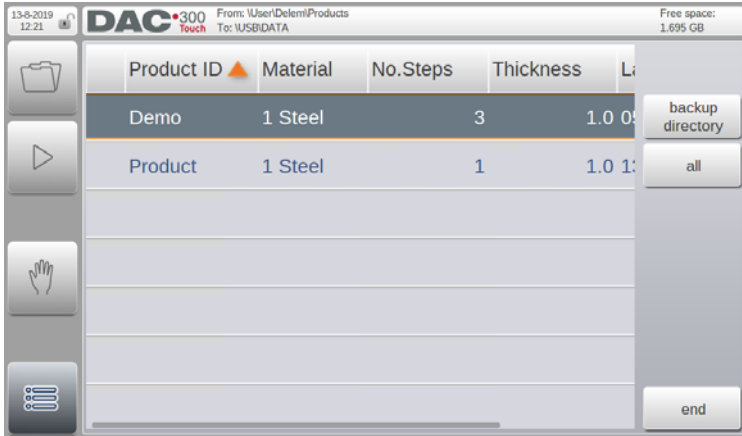
Cancel

Exit the file browser screen

Select

Select the directory you are currently in

When the desired backup (restore) directory is selected a new window showing all the available products present in the memory is opened.



To backup (restore) a single product simply tap on the product to store it on the back-up device.

To backup (restore) all products choose the 'all' soft key.

6.4 Program settings



Thickness measurement (DAC-36xT only)

Enable or disable sheet thickness measurement.

When switched off, the information from the sensor will be ignored and only the programmed values for angle, gap, clamping force and cutting force will be used.

When switched on, the parameters for angle, gap, clamping force and cutting force are not visible. The first time the calculated values for angle, gap and force are used. After the thickness has been measured, these values are re-calculated. If necessary, also the angle and gap are re-positioned.

When the start button is pressed, the actual reading of the thickness sensor is also displayed. In case the deviation between the measured thickness and programmed thickness is larger than the value set in the machine parameters, the control will go to stop. Also, a message will be displayed indicating the actual measured thickness.

Note: This parameter is only present if sheet thickness measurement has been enabled.

Clamping force factor (DAC-36xT only)

The clamping force is computed as a percentage of the cutting force. Program the percentage at this parameter.

Note: This parameter is only present if force control has been enabled.

Chaining mode

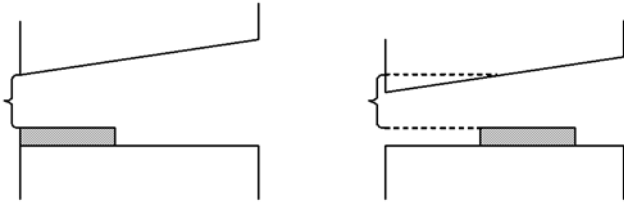
Set the desired chaining mode for the X-axis.

- off: the programmed X-axis value is relative to the previous programmed position.
- on: the programmed X-axis value is relative to the actual position.

In a cutting program, a chaining value is entered as a negative value.

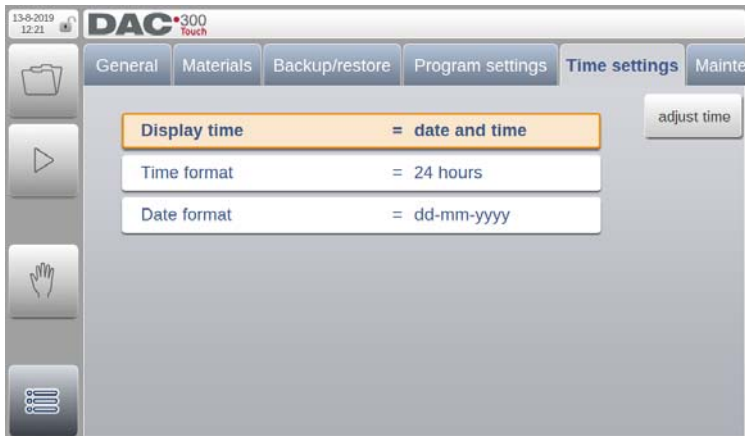
Opening above sheet

With this parameter the opening above the sheet after a cut can be programmed.



6.5 Time settings

In the 'Time settings' tab, the date and time as displayed in the upper left corner of the screen can be changed.



Display time

Display date and time, time only or no time at all on the title panel.

Time format

Display the time in 24 hours or 12 hours format.

Date format

Display the date in dd-mm-yyyy, mm-dd-yyyy or yyyy-mm-dd format.

Adjust time

To adjust the date and time. Adjusting the date and time will also adjust the date and time of the operating system.

6.6 Maintenance

On this tab maintenance related functions are located. Next to the machine hour counter and the machine stroke counter also functions to calibrate the backgauge and to store diagnostic data can be found here.



Hours

The number of hours the machine is running.

Strokes

The number of strokes the cutting beam has executed.

Lock screen

To lock the screen, and e.g. clean the screen without changing anything. The screen is unlocked automatically after 5 seconds.

Create .dat-file

Tapping Create .dat-file will store the most important product and control data, by default on the connected USB stick. This information can be helpful for the maintenance support.

Calibrate axes

Program the current position of the X-axis. This soft key is only available in case there is no reference system for this axis installed on the machine.

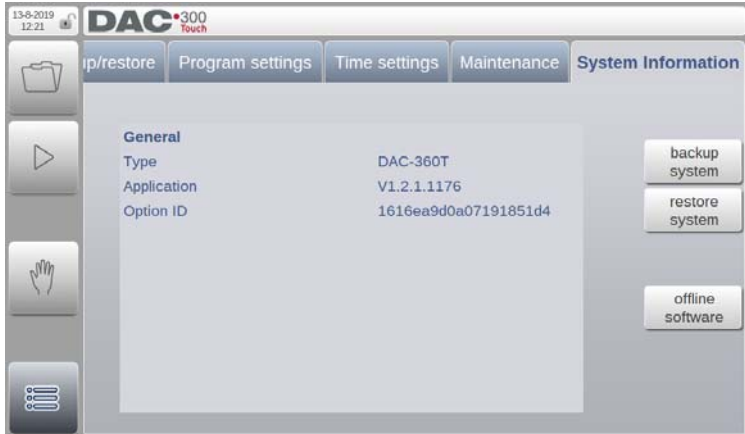
After power-down, the control will retain the actual position value and automatically assume the same position value after power-on. After power-on, verify the axis position. If necessary, correct the position by changing this parameter.

Restart controller

This will reboot the DAC-300T system.

6.7 System information

On this tab system information can be found. It shows the actual software version; software update functionality is available here as well.



Update software

With 'update software' the control can install a software update set from a USB stick. The directory browser will help to select the desired update and initiate the installation process.

Backup system

The backup system function makes a complete system backup to a USB stick. A unique time stamped file is written on the USB stick. This backup holds Delem software, OEM specific data as well as the user's files.

Restore system

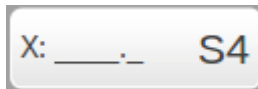
The restore system function can be used to restore an earlier made backup of the system. During the process selection of what will be restored can be done.

Offline software (DAC-36xT only)

The offline software function generates an offline software setup file on a USB stick. This setup can be used to update an existing offline software. Using the matching offline software version with the control software ensures optimal compatibility of functions.

7. Diagnostics

If the service row is pressed for 2 seconds in Automatic mode or Manual mode the DAC-300T will enter its built-in diagnostic mode.



The diagnostic mode can be switched off by tapping the service row again. These diagnostic screens are intended to be used on request of a service engineer from the machine manufacturer.

7.1 Axis state



The programmed position, actual position and control state for the X-axis, angle, gap, stroke and force are displayed.

Mentioned below are the possible machine states:

- S0 -> Stopped
- S1 -> Positioning

- S2 -> Wait for ST low
- S3 -> Wait for EOS
- S4 -> Wait for UDP
- S5 -> Wait for STEP high
- S6 -> Wait for Retract
- S7 -> Wait for safe X

7.2 Inputs and outputs

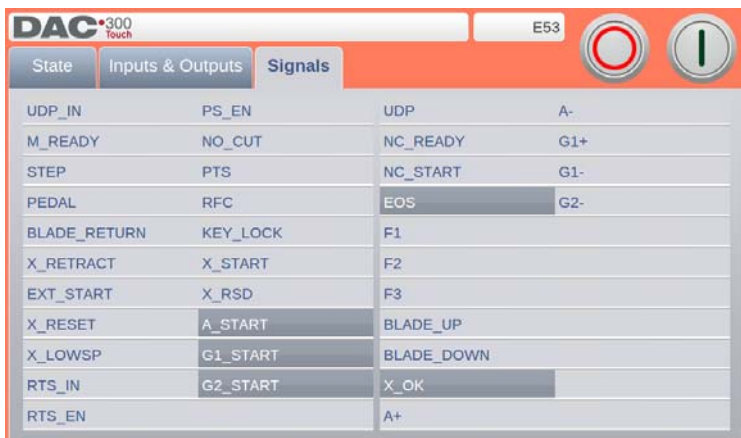
Inputs			Digital				Outputs				Analog		AD
										DA	Offset		
5	13	29	1	9	17	21	25	OUTA1	0	0	11	10	
6	14	30	2	10	18	22	26	OUTANA1	0		12	10	
7	15	31	3	11	19	23	27	OUTANA2	0		13	10	
8	16	32	4	12	20	24	28				14	10	

Encoder

1	0 Ref off
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The status of all inputs, outputs and encoders is displayed.

7.3 Signals



State	Inputs & Outputs	Signals	
UDP_IN	PS_EN	UDP	A-
M_READY	NO_CUT	NC_READY	G1+
STEP	PTS	NC_START	G1-
PEDAL	RFC	EOS	G2-
BLADE_RETURN	KEY_LOCK	F1	
X_RETRACT	X_START	F2	
EXT_START	X_RSD	F3	
X_RESET	A_START	BLADE_UP	
X_LOWSP	G1_START	BLADE_DOWN	
RTS_IN	G2_START	X_OK	
RTS_EN		A+	

The status of all digital input and output signals is displayed.

INTENTIONALLY

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INTENTIONALLY

LEFT

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INTENTIONALLY

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Delem

The DAC-300T is a complete, versatile unit
for control of industrial shears.