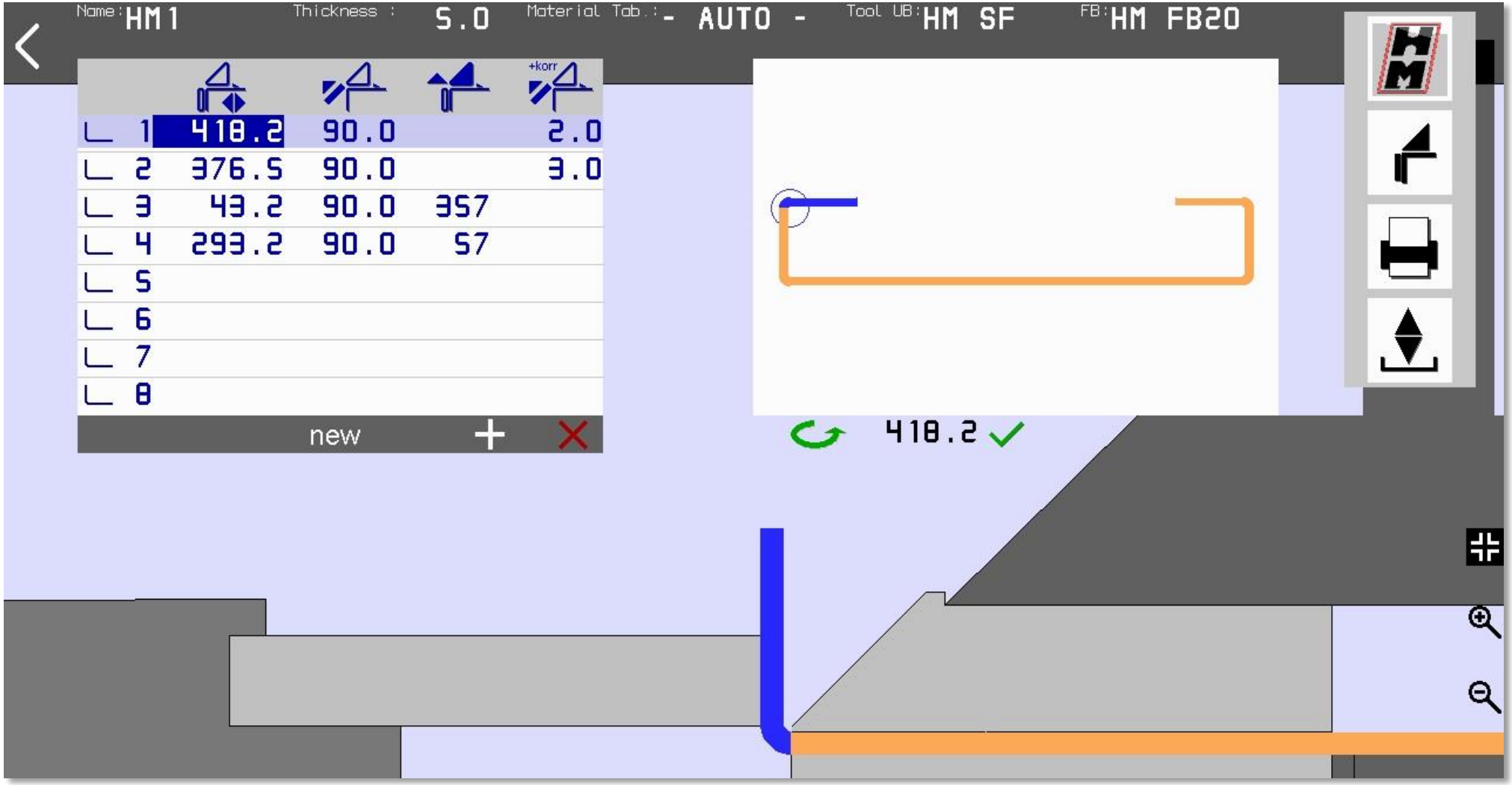
Dr. Hochstrate® Maschinenbau

BEND EDIT

Swing folding



15.01.2020

1 Content

2 Overview

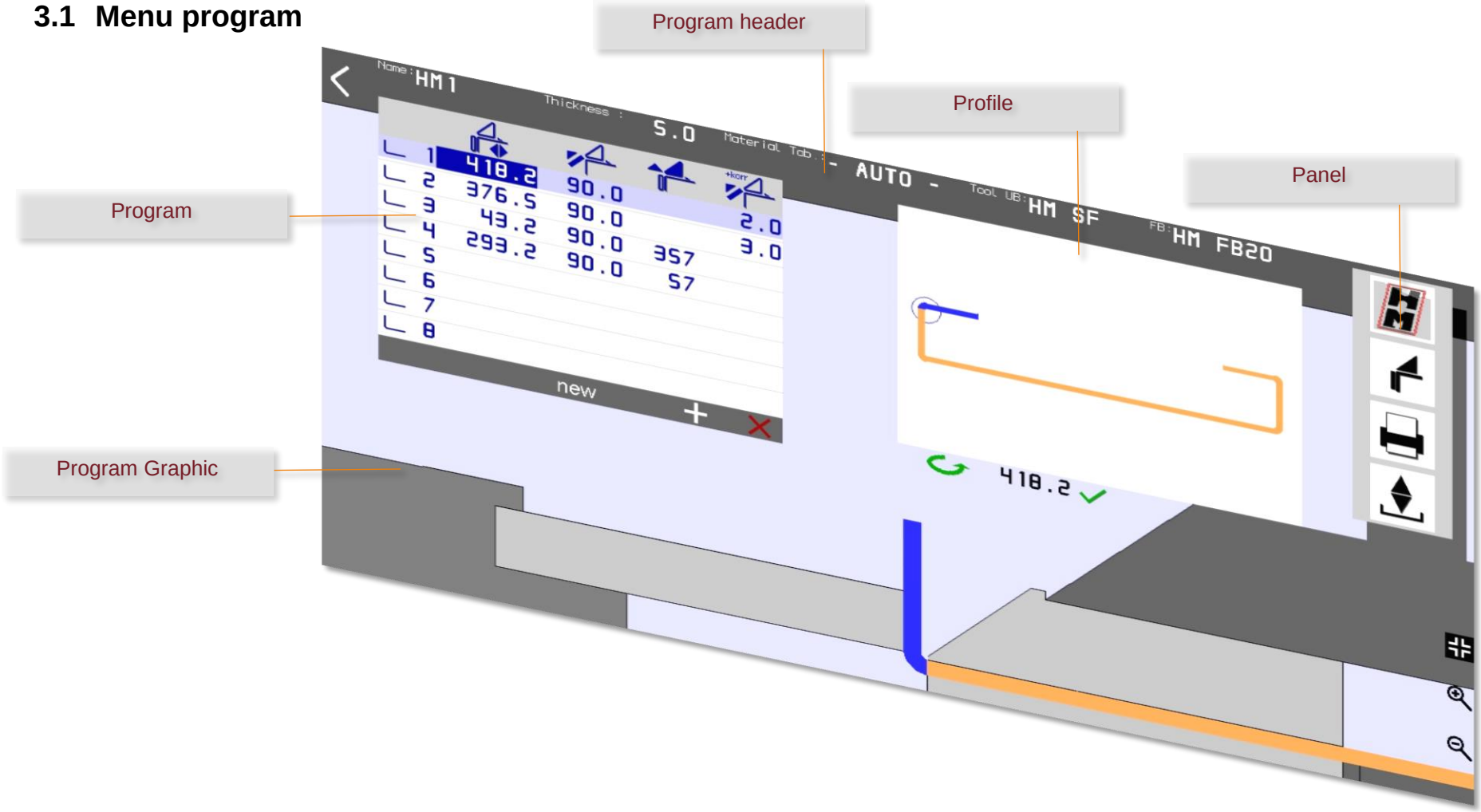
The Software BEND EDIT is a specialized system for folding machines.

The design is aligned on the machines on DR. HOCHSTRATE MASCHINENBAU.

3 Program

In the program menu the angles and positions for the folding sequence will be determined.

3.1 Menu program



3.2 Overview Structure

In the following graphic the structure of the program menu is displayed. If a direct input of the folding sequence or the method by the profile calculation is the preference depends on the experience of the operator and the work piece.

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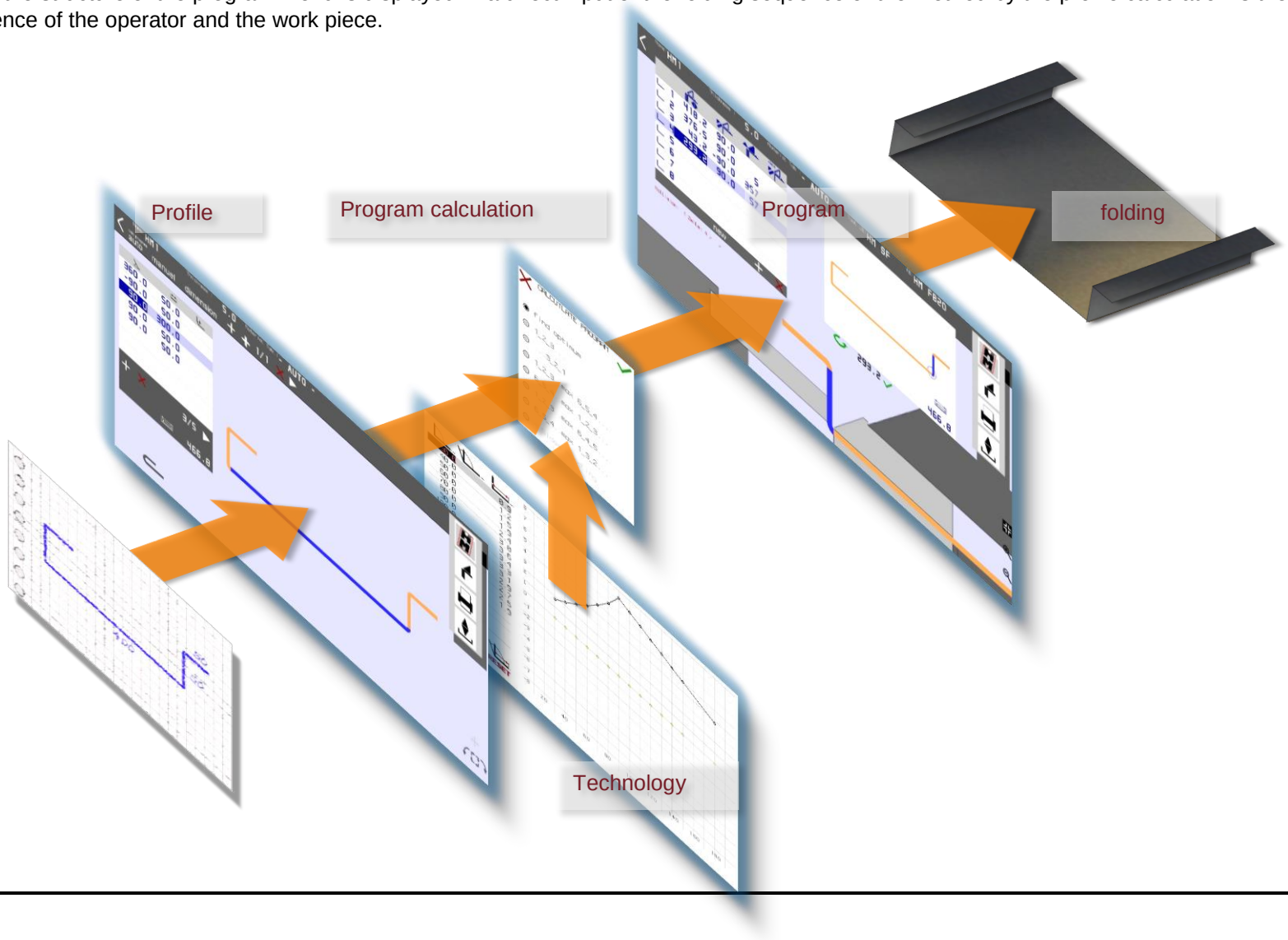


3.3 Usage Program

3.3.1 Program editor

The data of the program editor operate the folding sequences.

Backstop position

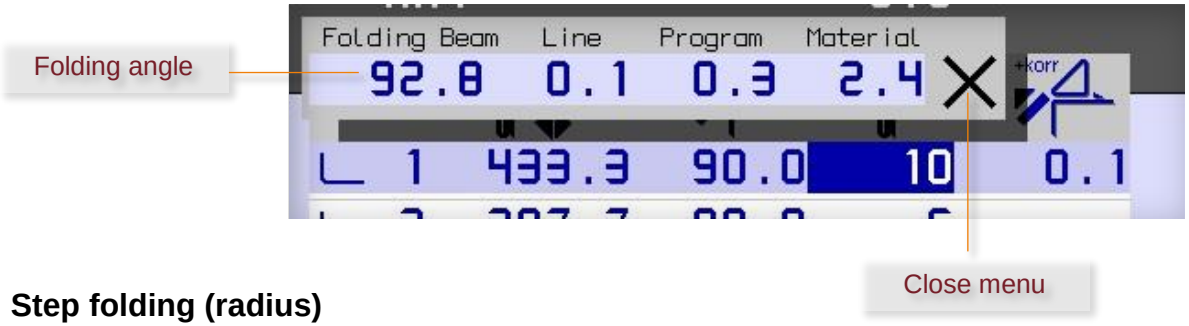
Folding beam angle

Upper beam clamping

Folding beam angle correction

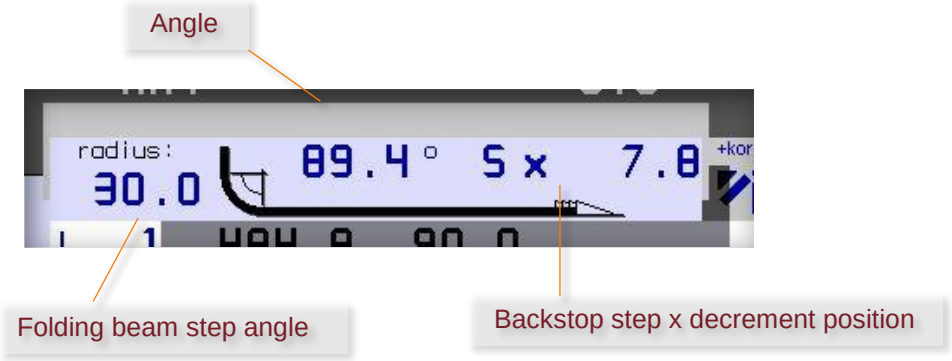
3.3.2 Angle correction

Additional to the correction of the folding angle by the material table the correction could added in a single line or for all lines.



3.3.3 Step folding (radius)

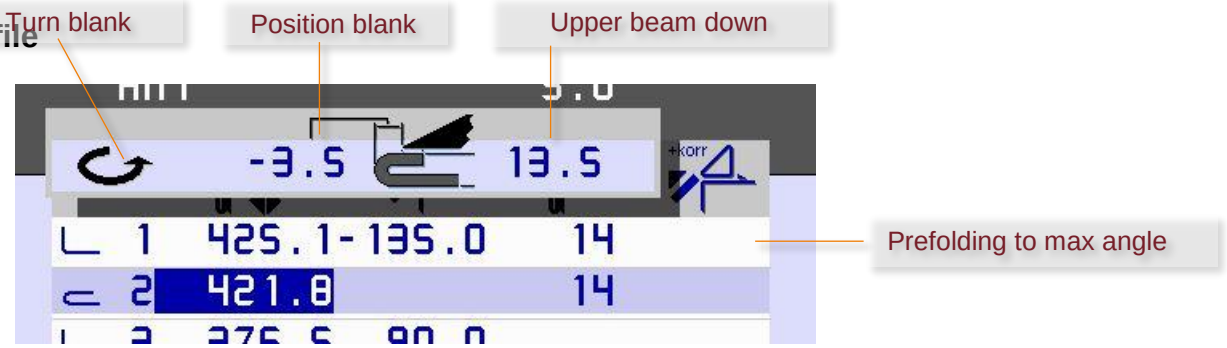
The step folding method could be used to produce bigger radius than possible with the standard cycle. The folding beam will be set on an angle (<25°). The upper beam down stroke will press the radius into the sheet metal. By changing the angle on folding beam and the number of steps and the size of the backstop forward steps the radius and the angle could be influenced.



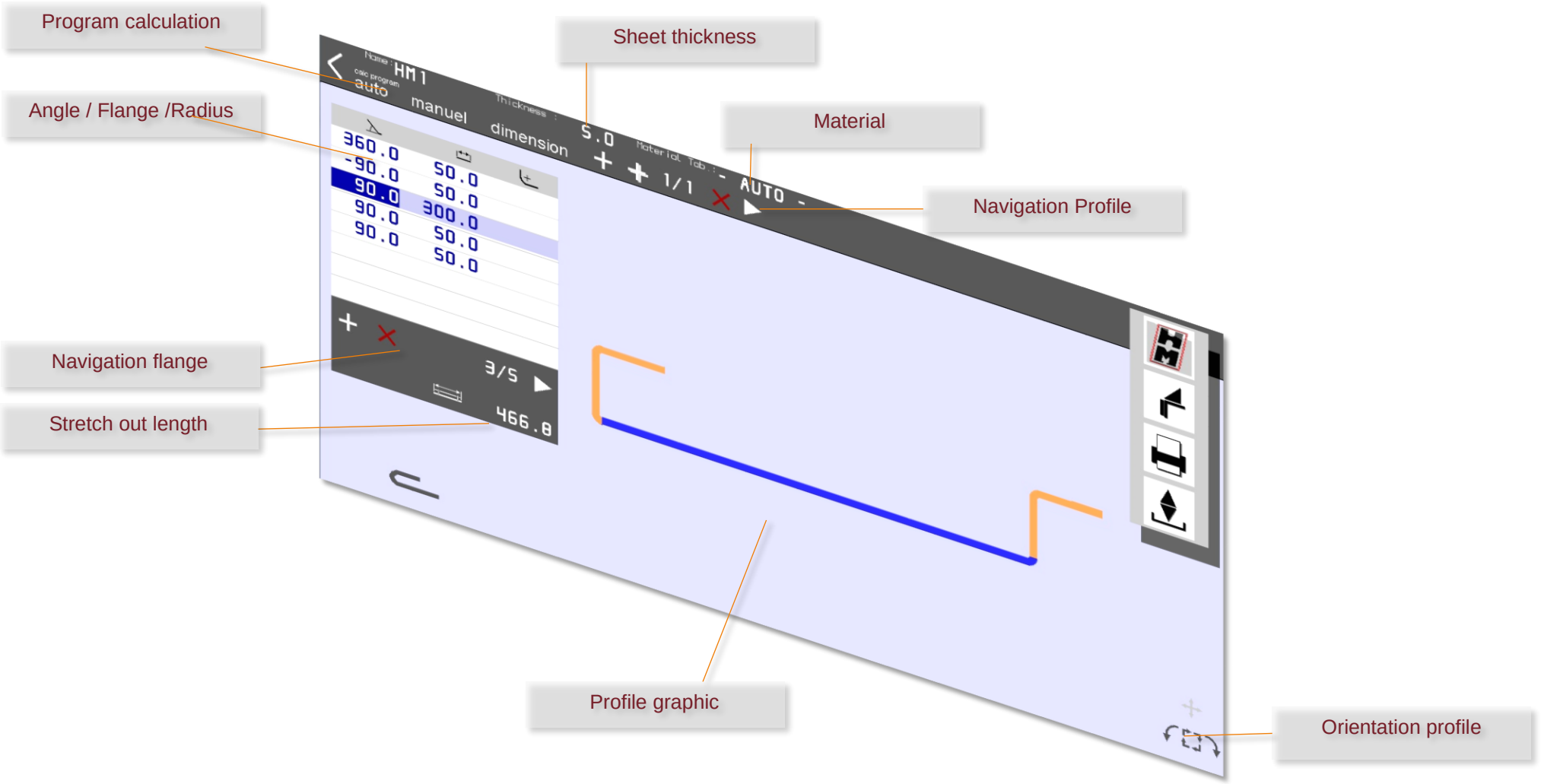
3.3.4 Hemming

The hemming program line sequence a down and up movement of the upper beam. The folding beam remains in the idle position. The backstop position determines the form of the hem, the form could be flat or drop shaped.

3.3.5 Profile



In the profile menu the geometric definition of the folding part can be given here. The profile will be displayed directly. After finishing the profile the folding program could be calculated automatically. In this calculation the current material table will be used.



Navigation Profile

	Insert new profile		Insert new flange
	Copy current profile		Mirroring profile
	Delete current profile		Delete current flange
	Next profile		Next flange

3.4 Automatic Program Calculation

The automatic calculation of the profile into a folding program will be started by pressing **auto** in the profile menu. The process will select the folding sequence with the smallest number of collusions. If a sequence without collusion was found the process ends and the program shows up.

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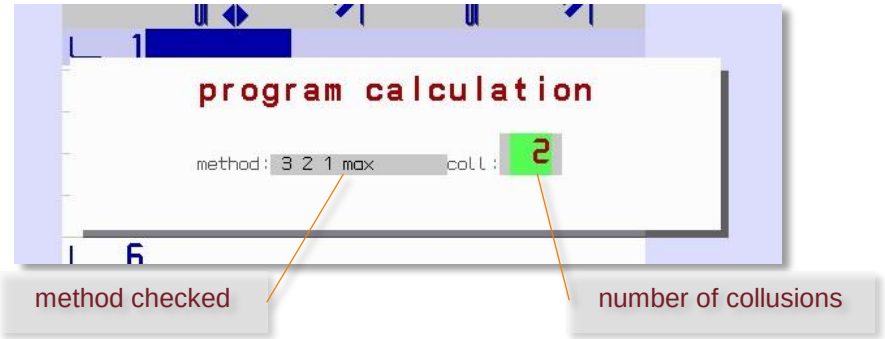
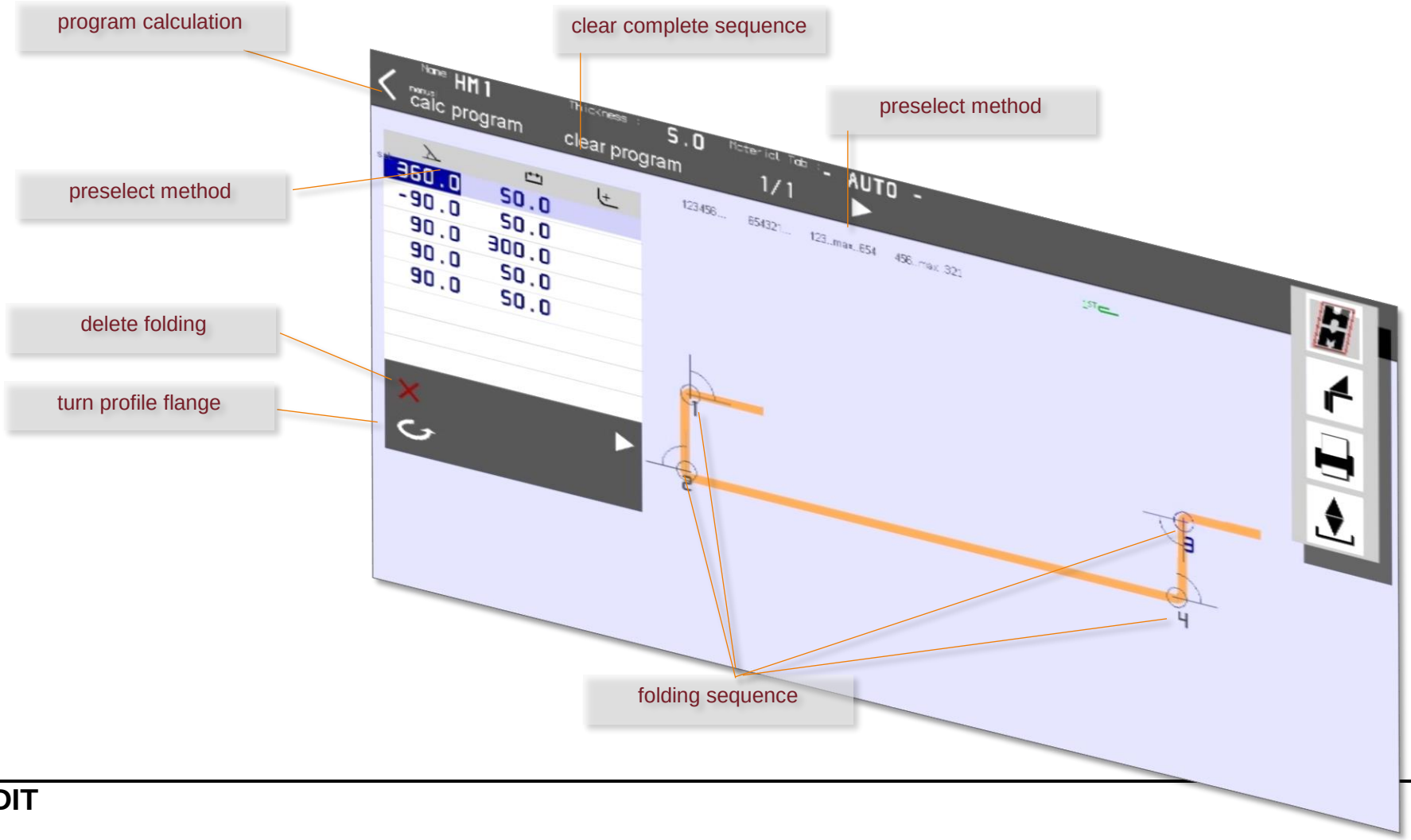


3.5 Manual Program calculation

The manual program calculation will be started by pressing **manual** in the profile menu.



3.6 Dimension program calculation

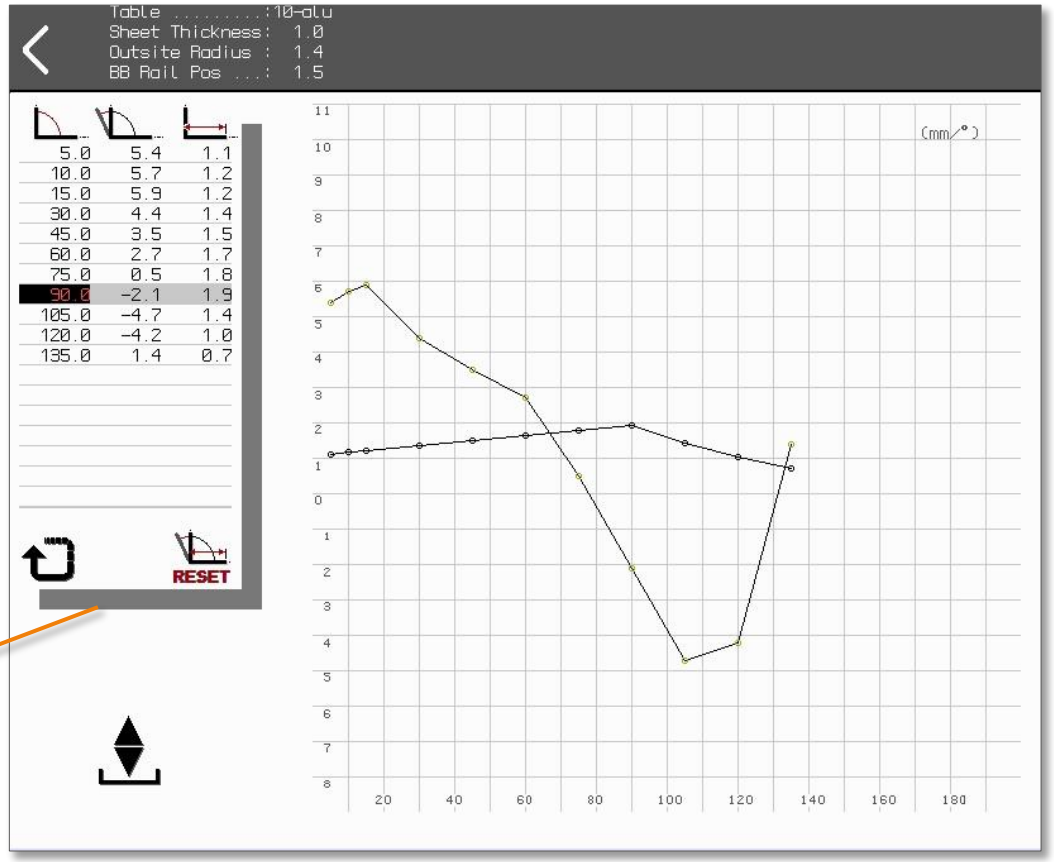
The dimension program calculation will be started by pressing **dimension** in the profile menu and recalculates a folding program with changes in the dimension from the profile

This will not start a new program calculation. It sets the delta dimensions in a calculated program and preserves all adjustments.

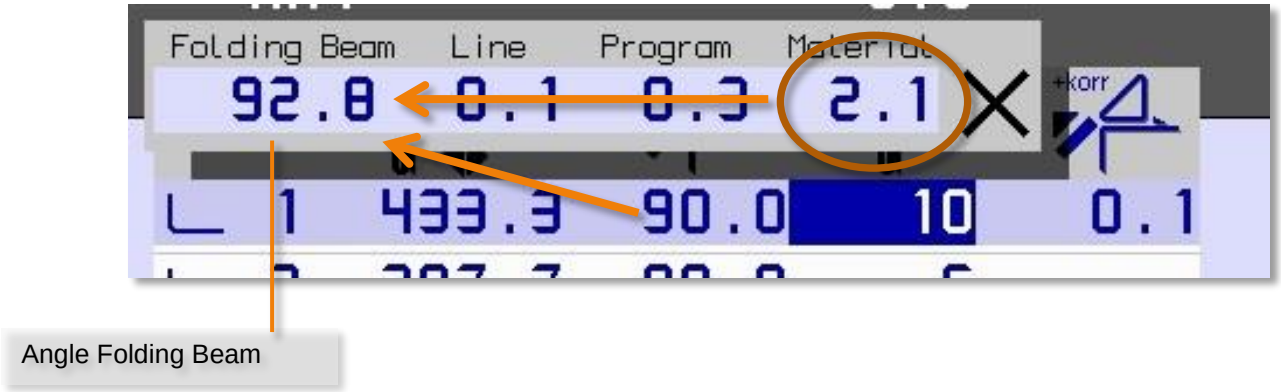
The dimension functions is only available as long as the design of the profile does not change. Adding or deleting flanges prevent the dimension calculation.

4 Technology Table

The technology table supports the preparation of the program in which springback and bending shortening can be entered using experience and measured values for the sheet metal material used:



The necessary overbend angles are assigned to the bending angles. The current angles can be checked in the program:



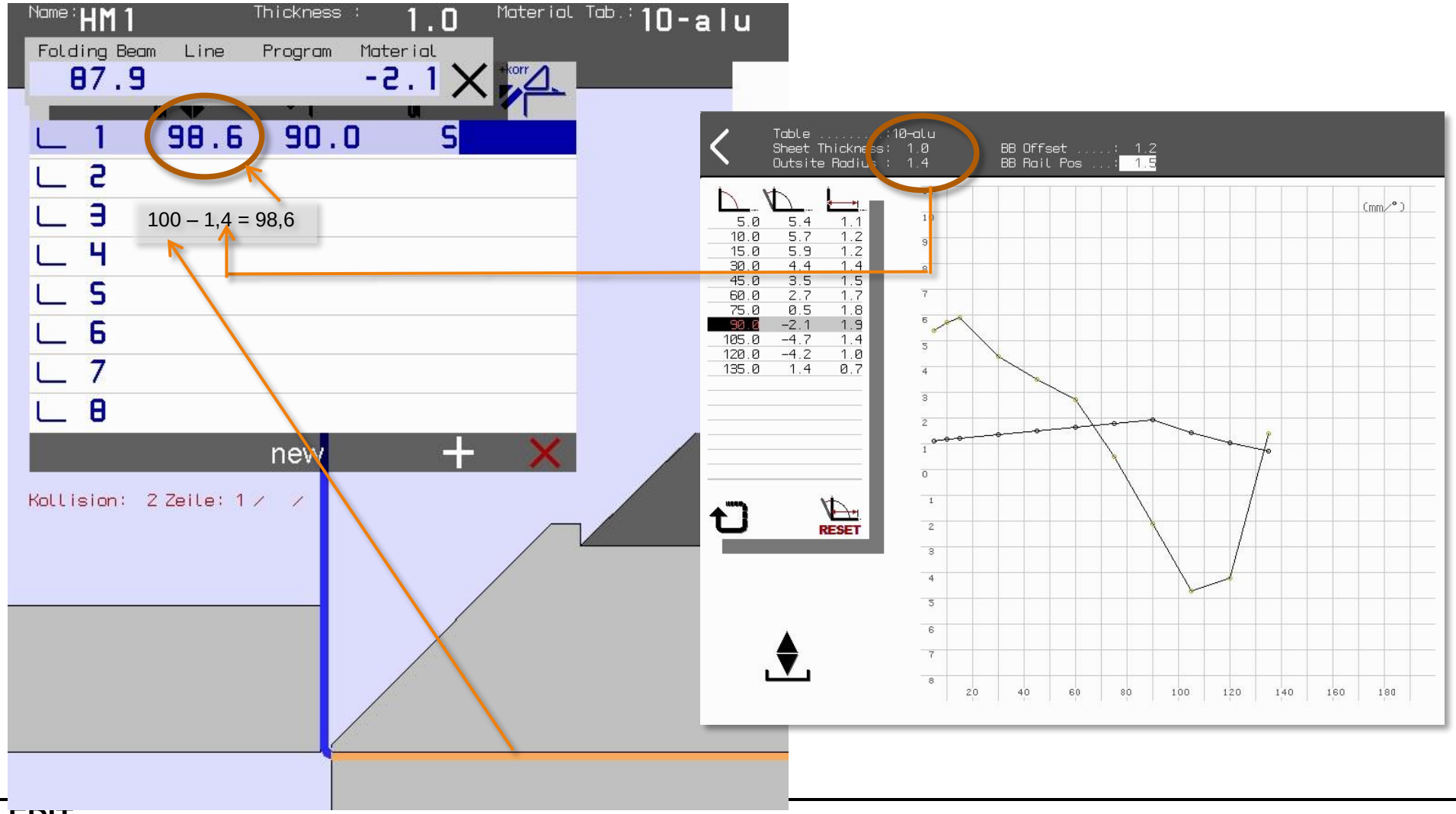
4.1 Bending Shortening

The calculation of the stretched length is based on the values entered in the table.

Example: Flange 100mm + 50mm / Angle 90° -> Stretch out 100,0 + 50,0 – 1,9 = 148,1 mm

4.2 Backstop Calculation

From the backstop dimension of the outer radius is subtracted in order to obtain the correct thigh dimension after bending.



4.3 Create technology table

To create a technology table, either a similar table or an automatically created table can be used as the basis:
1. Enter table name - Material and sheet thickness should be recognizable in the name
2. Measure and enter sheet thickness
3. Measure and enter outer radius
4. The table can now be filled.
5. Save the table in the directory: C: \ BE-TECH-

It is also possible to save in other directories, but then the table is not available via the pull-down list in the program but must be loaded via the file manager.

4.3.1 Springback

In order to determine the springback, the target angle is bent and then the actual angle measured on the material. The deviation is then entered in the table for the corresponding target angle.

Example: Target angle 60 ° - measured on the plate 59 ° the springback of 1 ° is assigned to the target angle 60 ° in the table

4.3.2 Bending Shortening

The default values for bending shortening according to DIN6935 are calculated and entered with the RESET key.

In order to determine the bending shortening, the blanks must first be measured before bending.

The bend should then be made as close as possible to the target angle.
After bending, the two legs are measured.

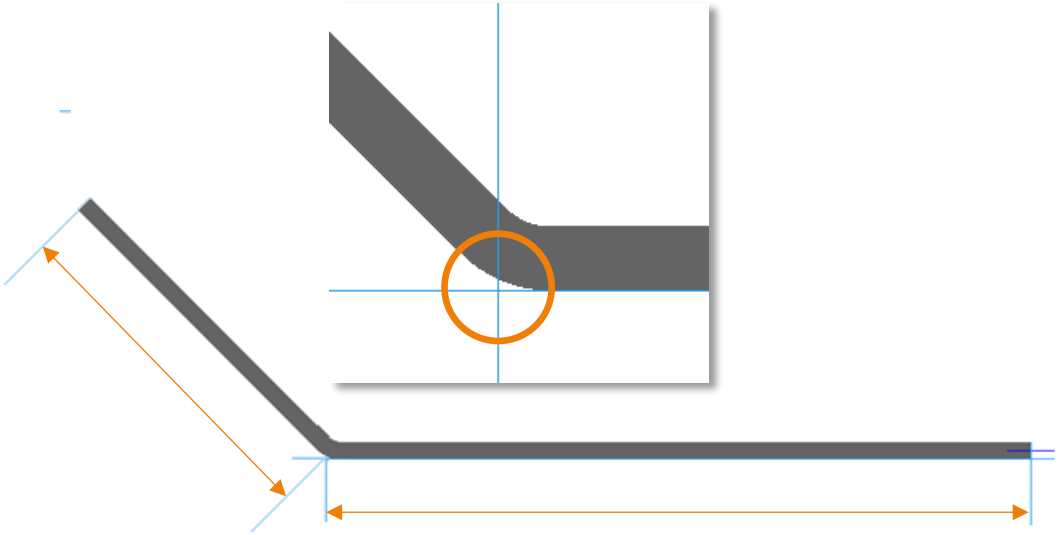
The difference between the sum of the flanges after bending and the blank before bending is entered as bending shortening to the corresponding target angle.

Example: A cut of 150.0mm is bent by 60 °.
The measurement of the flanges gives 49.4mm and 98.9mm => 150.0 - 49.4 - 98.9 = 1.7

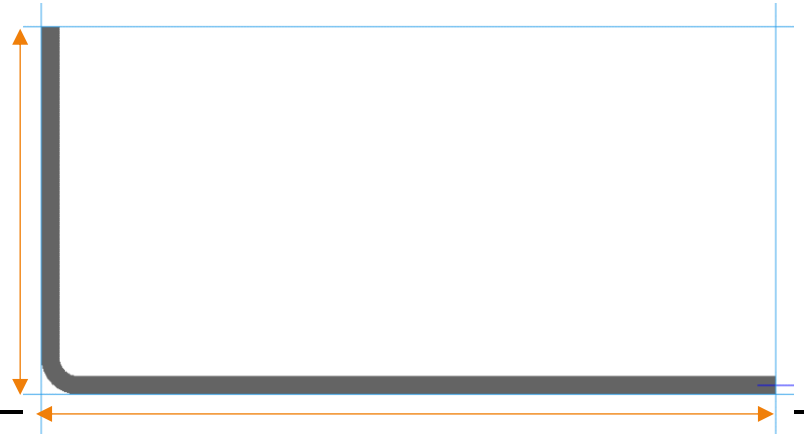
The bending shortening of 1.7 mm is assigned to the target angle 60 ° in the table

4.3.3 Measuring the flange length

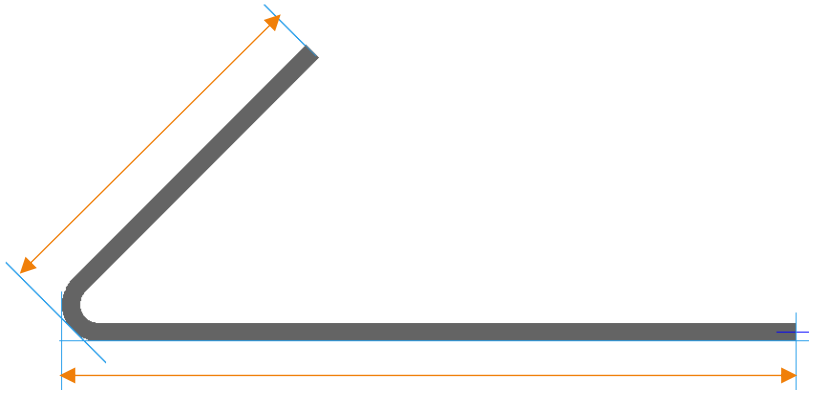
< 90°



= 90°



> 90°



5 Data panel

Setup machine

Write machine executable program C:\BE-HM\HM-PROG.CSV

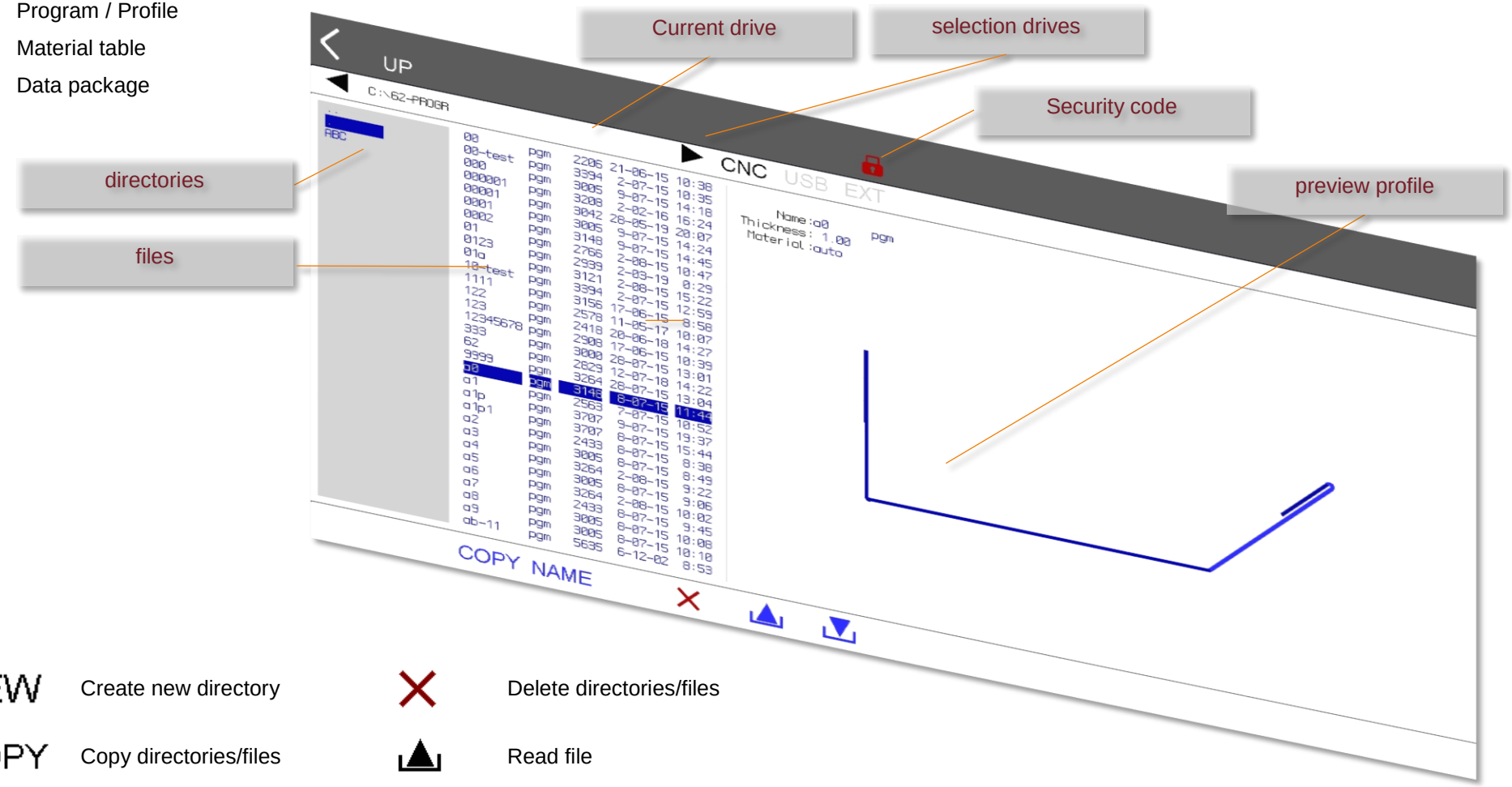
Write printable program and profile file C:\BE-PRINT\

Data management

6 Data management

The storage of the data is operated context sensual. Depending on the current menu the format will be filtered:

.pgm Program / Profile
.tec Material table
.ai1 Data package



NEW	Create new directory	✕	Delete directories/files
COPY	Copy directories/files	▲	Read file
NAME	Rename directories/files	▼	Save file

7 Setup

Machine

Type	Producer identification
max.thickness	Maximum sheet thickness. the permitted sheet thickness could be maller depending on the tool setup
max.length	Maximum folding length
max.position	Maximum backstop depth

graphic offset

upper beam	Upper beam graphic offset
folding beam	Folding beam graphic offset
lower beam	Lower beam graphic offset

upper beam

min. dimension	Software limit switch – negative position
max. dimension	Software limit switch – positive position
down offset	Clamp position upper beam = thickness - down offset
up offset	Opening position upper beam = thickness + up offset
standard tool	Pre selection tool setup on new program

folding beam

min. dimension	Limit switch – negative position
max. dimension	Limit switch – positive position

backstop

min. dimension	Limit switch – negative position
max. dimension	Limit switch – positive position

folding beam adjust

factor	Folding beam adjustment = thickness x factor + thickness + offset
offset	Fixed position of folding beam related to the pivot point

program calculation

max. flange	Limit value flange size for the program calculation. Flanges bigger than this value will change the folding strategy from a line up flanges to a turning sequence
tech standard	Pre selection of the material / technology table on new programs

file manager

security code	Code to secure data handling (delete, rename)

upper beam tools

name:	Tool name for shortcut in program menu
max. angle:	Maximal possible and allowed folding angle
max. thickness:	Maximal possible and allowed material thickness
Calibr.height:	Reference height
Offset height:	Graphic adaption
Radius:	Radius (tool radius on folding edge)

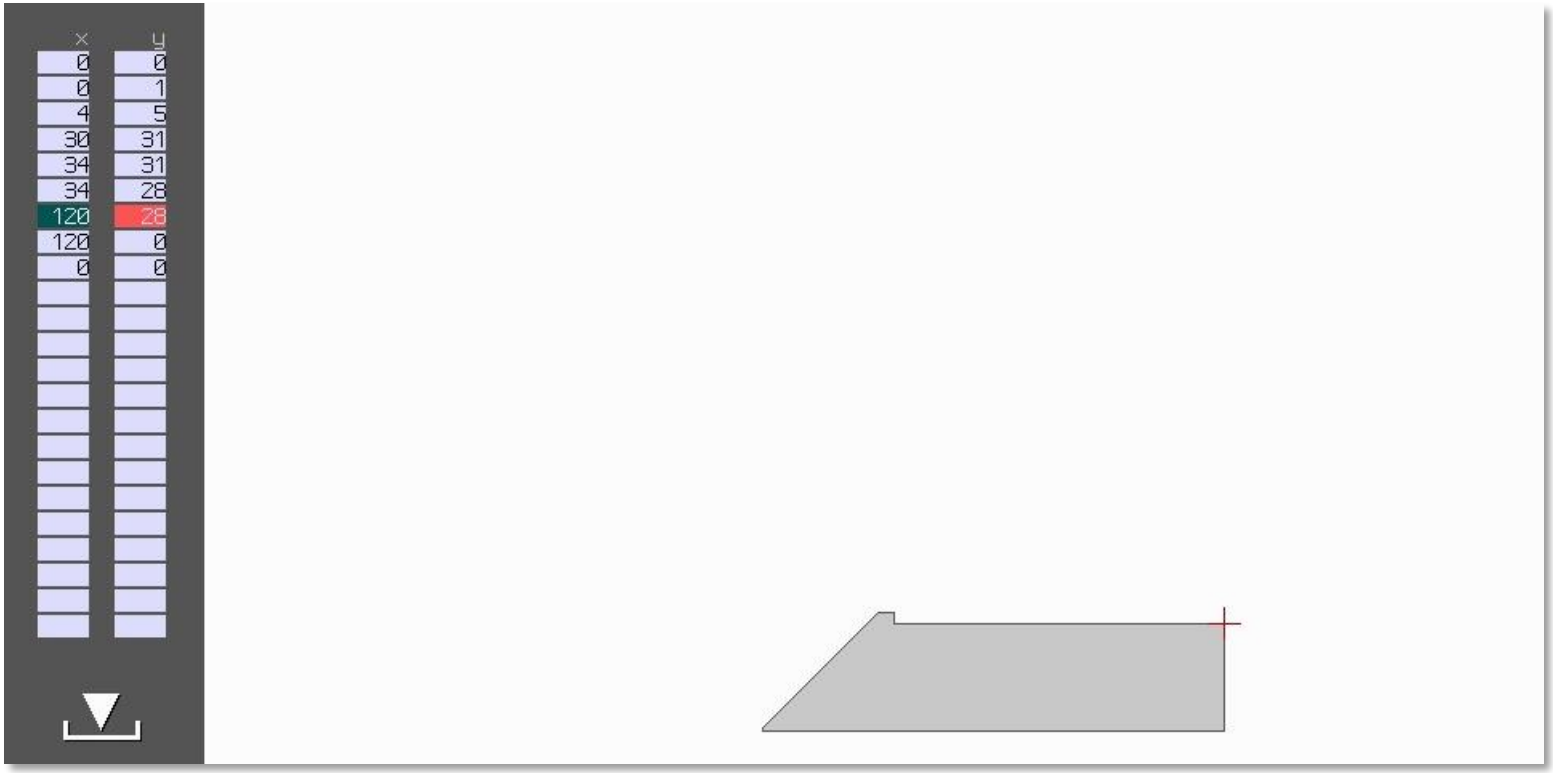
folding beam tools

name:	Tool name for shortcut in program menu
Width:	Width of folding beam tool

7.1 Tool graphic

For individual tools the design of the standard tools could easily be changed.

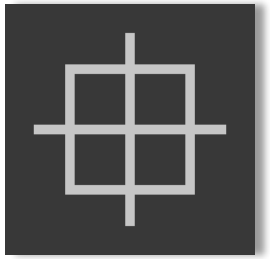
The red cross indicates the current position in the graphic. X = 0 Y = 0 is the folding edge on the machine



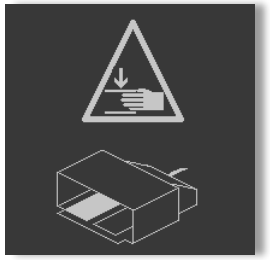
8 Signalling

Turn power on

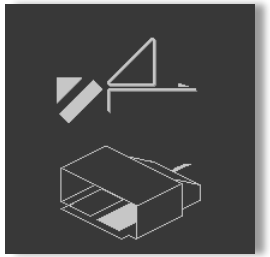
Calibrate machine



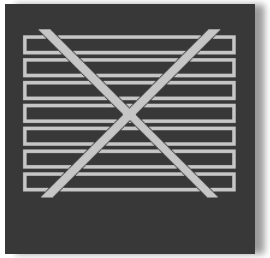
Activate foot pedal for closing upper beam



Activate foot pedal for starting folding beam



Clear data



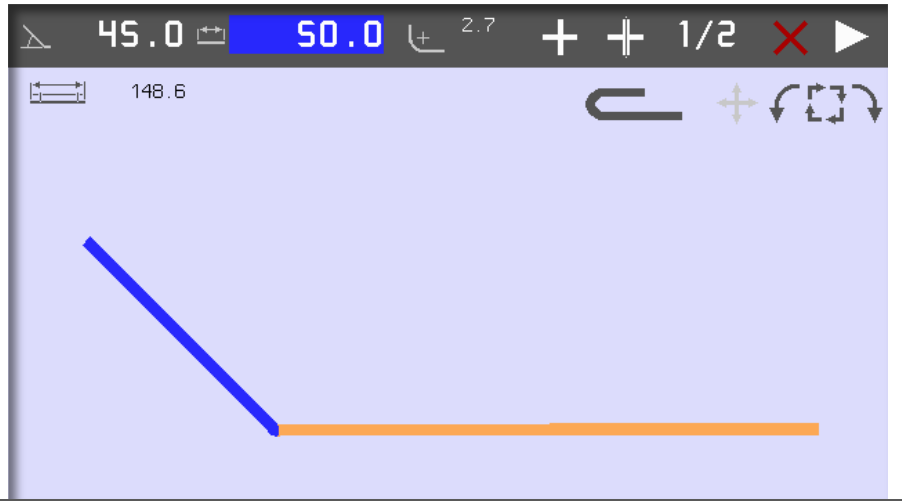
9 Examples

9.1 Example angular sheet

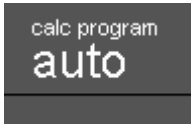
1 **Clear**
program and profile

2 **Input**
name sheet thickness
material

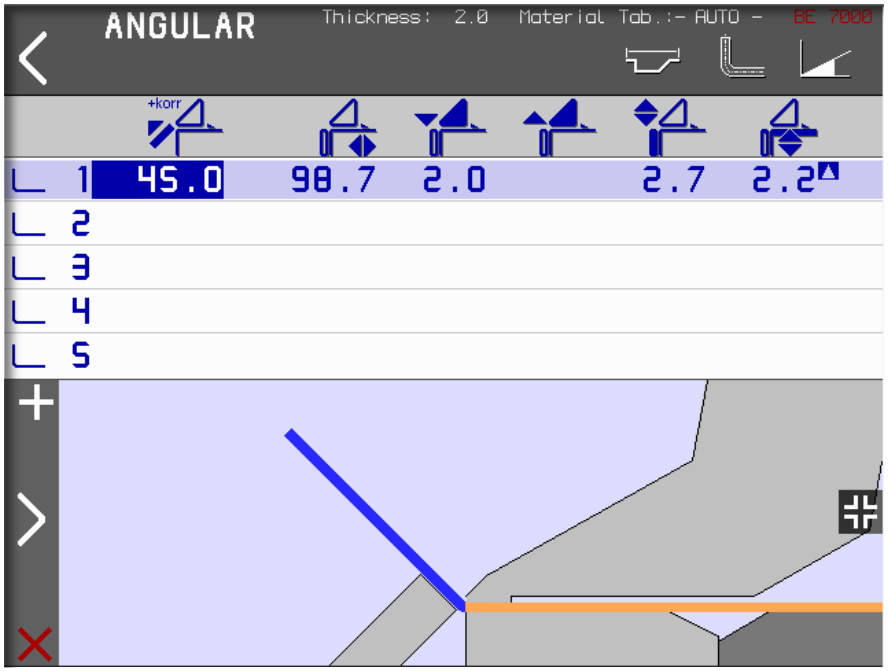
3 **Input**
profile size and angle



4 **Generate program**



5 **Check and start program**

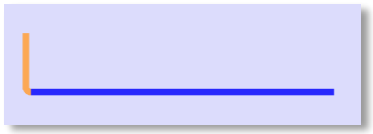


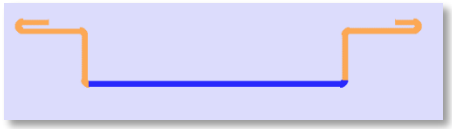
9.2 Example Z-profile with hems

1 **Clear program and profile**

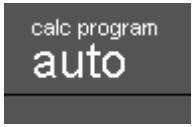
2 **Input name, sheet thickness, material**

3 Input profile

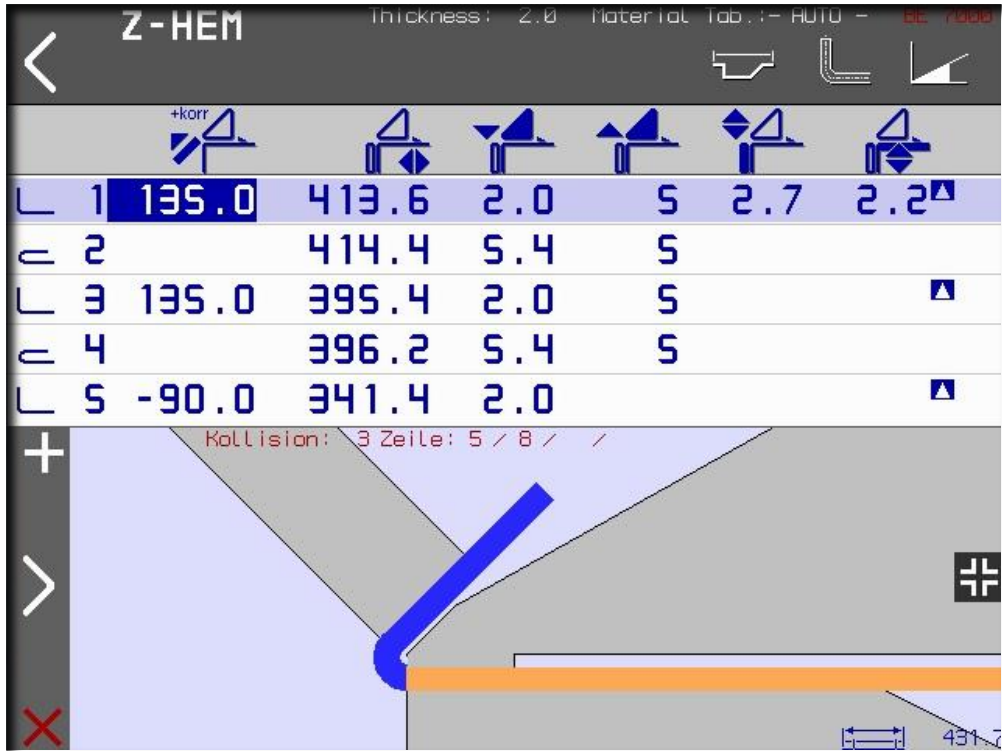




4 **Generate program**



5 **Check and start program**

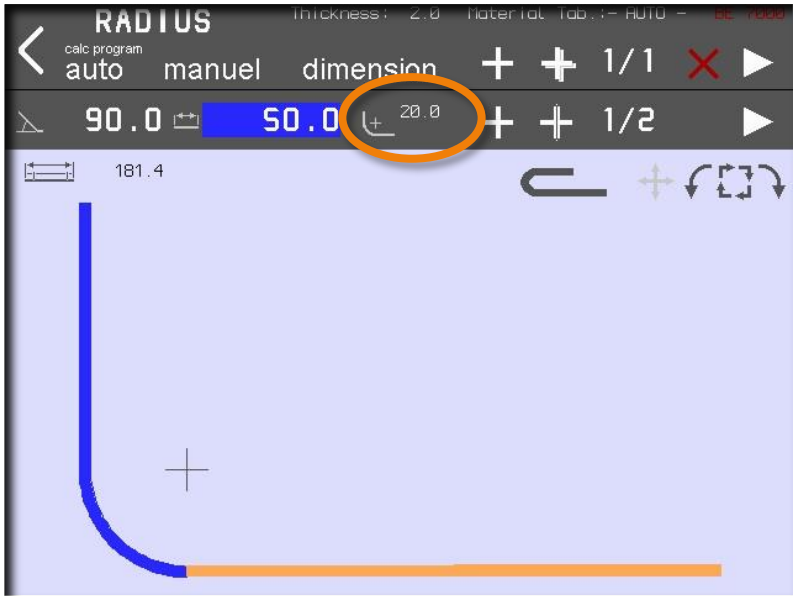


9.3 Example radius bending

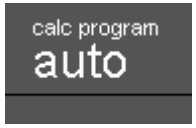
1 **Clear program and profile**

2 **Input name, sheet thickness, material**

3 **Input profile size, angle, radius**



4 **Generate program**



5 **Check and start program**