



CorrectionFileConverter 1.20

CorrectionFileConverter.exe converts RTC[®] 4 correction files into RTC[®] 5 correction files and vice versa.

The program can be launched from any directory. The correction files that will be converted or edited can exist in any directory.

The program can be started in GUI mode (dialog mode) or silent mode. The command-line-based "silent mode" requires a non-empty argument list.

Program call: CorrectionFileConverter.exe [PathNameInput [OutPath]]

Revision History

Program versions prior to 1.10 (obsolete) needed the file RTC5Base.dll as well as the MS Visual Studio files MFC71.dll, MSVCR71.dll, MSVCP71.dll and MSVCRT.dll to reside in the same directory as CorrectionFileConverter.exe.

Program version 1.10: RTC5Base.dll as well as the Visual Studio DLLs are now statically linked and no more necessary as separate files.

Program version 1.20: Dialog now have Windows-XP style applied.

Silent Mode

PathNameInput and **OutPath** are separated from another by a <Space> character and cannot contain <Space> characters themselves (even if the character string is enclosed by <">).

PathNameInput is mandatory, OutPath is optional. PathNameInput specifies the to-be-converted file's name and (optional) path. If not absolute (DRIVE:\Path\Name), then the path must be specified relative to the current working directory. If OutPath is specified, then OutPath\Name will be used for output. Otherwise, the input directory will be used.

Name must contain either ".ctb" or ".ct5" as a file extension; the output name will be automatically assigned. The conditions for the dialog mode (described below) also apply to the silent mode. Silent mode, however, relies on error codes (program exit codes) instead of message boxes. Some error codes may occur cumulative.



Error codes:

0	No error
1	Invalid extension (not ctb or ct5)
2	((Input) file not found (file and path must exist)
4	(Output) file not opened (output path must exist)
8	Inverting error
16	Format for 3D correction not supported
32	ABC value out of range

Notes:

Only a single file (but no file lists) can be converted in one run. Existing output files will be overwritten without warning.

Note that not all ct5 header data can be automatically set (see section "Showing Headers" and the examples therein).

Error code 8 can result if the center point of a (user-altered) ctb file is not (0, 0). The inverting routine may then terminate with an error. However the RTC[®]5 software up to DLL version 514 doesn't use these inverse tables. Since DLL version 515 the inverted tables are used only for the back transformation functionality. The correction table itself should remain fully functional. A remark will be output in an additional log file.

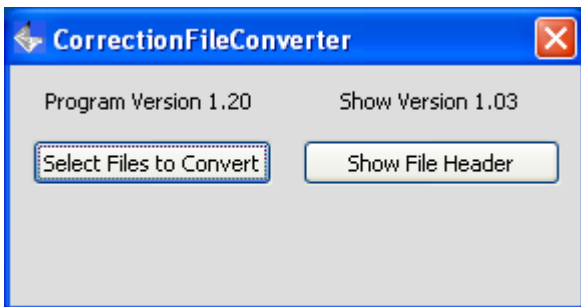
In case of error 16 no ct5 file will be output, but a log file containing a corresponding remark.

In case of error 32 no ctb file will be output, but a log file containing a corresponding remark.



Dialog Mode

To end the program at any time, just click the **close** symbol (x) or press the **ESC** key.



File Selection

“**Select Files to Convert**” opens a standard **File Open** dialog.

Under **File type** you can select which kinds of files to process: only RTC[®]4 files (*.ctb), or only RTC[®]5 files (*.ct5), or both types simultaneously. From the displayed list of files, select one or more. You can also edit the input field, but the file must already exist. Wildcards are permissible for restricting selection. Confirm your selection by clicking **Open**. **Cancel** aborts the selection and indicates this by displaying “Ready”.

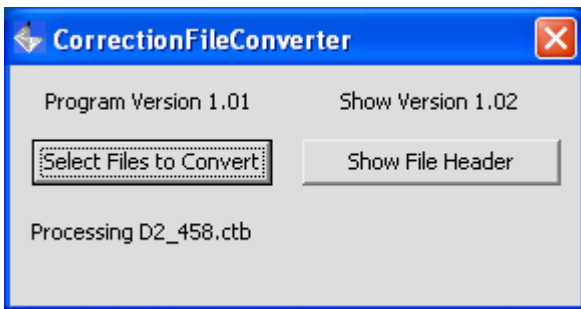
Afterward, a standard **File Save** dialog appears that allows the converted files to be stored in a different user-selectable destination directory, which likewise must already exist. All inputs for a filename will be ignored – but you shouldn’t fully delete the default input string “*. *”. Confirm your selection by clicking **Save**. **Cancel** leaves the source and destination directories unchanged.

Conversion

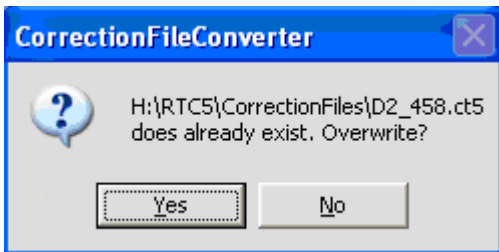
All selected files will now be (sequentially) converted. Files with extension “ctb” will be automatically converted from the RTC[®]4 to the RTC[®]5 format, while those with extension “ct5” will be converted from the RTC[®]5 to the RTC[®]4 format. Extensions are case-insensitive. Files with other extensions will be ignored. During the conversion process, clicking the “Select Files to Convert” or “Show File Header” buttons (see below) has no effect. Here, the only way to immediately end the program (and thus the current conversion) is to click the close symbol (x).



Below the “Select Files to Convert” button, the program displays the **status text** “Processing <Filename>”:

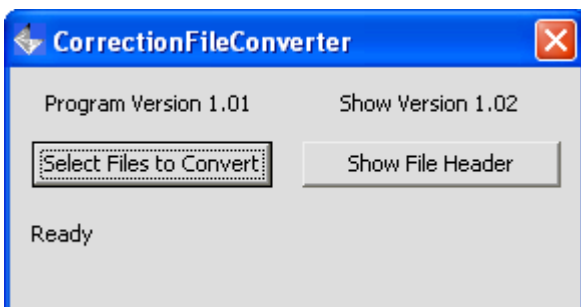


The extension “ctb” will change to “ct5” or vice versa. The filename itself (D2_nnn or D3_nnn) remains unchanged. Before conversion, existence of a similarly-named file in the destination directory will be checked. If found, a **MessageBox** will appear, asking you to confirm (**Yes**) or abort (**No**) overwriting of the existing file.



If you click “No”, conversion of that file will be skipped and the next source file will then be processed. If you click “Yes”, the file will be converted and the existing file in the destination directory will be overwritten.

After the final selected file has been processed, the “Ready” status text will be displayed. Both buttons will again resume their normal functionality.



Note: A MessageBox of the following kind should rarely or never appear: “<Filename>: Error in Inverting: <Error>” (currently only with <Error> = 1). On the one hand, that

indicates the ctb file is corrupt or not a valid RTC[®]4 correction file (e.g. a completely different kind of file that merely has the extension “ctb”). On the other hand, when converting user-created correction files (e.g. via correXion5[®], correXion[®] or CFMP) featuring a zero point offset under some circumstances an "Error in Inverting: 1" may also be created. Such a converted table is nevertheless completely functional besides back transformation. Further “errors” when inverting are currently (in program version 1.20) neither detected nor handled.

Some older 3D correction files created for the RTC[®]2/RTC[®]3/RTC[®]4 contain height tables for Z-axis control. The RTC[®]5 doesn't support such table formats – instead, it uses so-called ABC values for parabolic correction.

This situation is indicated by the following kind of **MessageBox**:

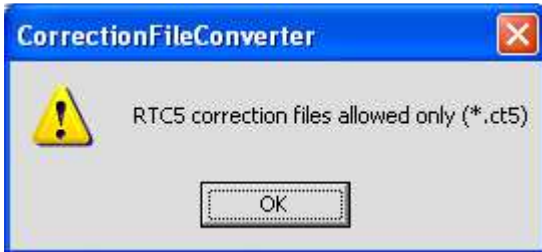


The RTC[®]5 correction file uses a default value of 0 for ABC, so that no 3D operations can be executed without explicitly providing realistic values.

Note: You can edit ABC values (as long as they are 0.0 each) by clicking the “Show File Header” button (see Showing Headers) or (at any time) via subsequent transfer to the RTC[®]5 board using the load_z_table command. The RTC[®]5 manual's 3D section describes how to determine appropriate ABC values. You can also ask SCANLAB for appropriate new RTC[®]5 correction tables.

Showing Headers

The “**Show File Header**” button opens a special dialog box to display the 16 header parameters of the RTC[®]5 file format. A standard **File Open** dialog allows you to select a file with the extension “ct5”. If **Open** is clicked to confirm a selection with a different extension, then the following **MessageBox** appears:

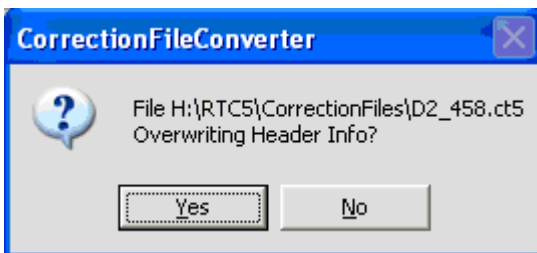


Otherwise, the **RTC[®]5 Header Info** dialog appears. Its **title bar** displays the version number (not necessarily identical to the converter's program version number) as well as the name of the currently-read file (without the path or extension).

The dialog can be closed via the **ESC** key, the **close** symbol (x) or the **Cancel** button, without changing any data in the header. It is not possible to change correction data which were calculated by SCANLAB ab initio, but header data of ct5 files converted from RTC[®]4 ctb files can be partially changed.

Use the tab or enter keys to sequentially navigate across editable fields. Entries will be automatically rounded and/or clipped when necessary.

After significant changes to editable fields, a **Save** button will be activated, leading to a dialog for permanently storing the changed data. Prior to overwriting, a precautionary **MessageBox** appears for user confirmation:



Description of Parameters

If the correction file was loaded onto the RTC[®]5, then the Header Info parameters can also be queried via the RTC[®]5 commands `get_table_para` or `get_head_para`.

However, the return code of these commands is always a floating point number that must be “interpreted” (see the RTC[®]5 manual). The dialog here provides automatic interpretation. The information (from top to bottom) in the left column corresponds to indices 0 – 7; and the right column to indices 8 – 15.

The header data of an original RTC[®]5 correction file is not editable.

In the following table, “No.” is the parameter’s number used with the commands get_table_para or get_head_para (for enquiring the corresponding parameter value). Type indicates the entries accepted for the editable fields.

No.	Name	Type	Remarks
0	2D/3D		0: 2D, 1: 3D
1	Field Calibration	integer (unsigned)	[Bit/mm], should be a multiple of 16
2	Focus Length or Working Distance	floating point	[mm], up to 3 decimal places
3	Stretch X		Image field change with z
4	Stretch Y		Image field change with z
5	Z Correction: A	floating point	Offset Part [\pm 26 Bit]
6	Z Correction: B	floating point	Linear Part [\pm 11 Bit]
7	Z Correction: C	floating point	Square Part [\pm 4 Bit]
8	File No		for ab initio calculations: generated by SCANLAB (data set number); for file conversion: derived from the file name of the converted file (digit sequence directly after the first underscore)
9	Lens Correction Type	integer (unsigned)	Objective is (0) 1: (not) present Distortion: 0: no distortion 1: f progression 2: height table
10	Origin Program Version		Source of table: n \geq 10000: calculated ab initio n \geq 20000: converted from ctb n \geq 30000: reconstructed from txt Program version
11	Inverted Table numerical		Inverse table is (0) 1: (not) present 0: calculated ab initio 1: numerically inverted
12	Calibration Angle	floating point	[Grad], \pm mech. deflection at 96% max.

13	Scan Head Type	rotation field integer	Description Number (returned via get_table_para)
14	Protection Glass Thickness	floating point	Protective glass: Thickness [mm] (2 decimal places)
	Refraction Index	floating point	Refraction index (3 decimal places)
15	Field Limit		(0) 2: (no) field limit

Note: In general, for the RTC[®]5 the numerical values of the Field Calibration (index 1) are 16 times larger than for the RTC[®]4. On the other hand, identical Z-Correction A, B, C values (index 5, 6, 7) can be used for the RTC[®]4 and RTC[®]5.

Example 1: 1-to-1 correction table calculated ab initio

RTC5 Header Info 1.03: Cor_1to1

2D/3D [0/1]	<input type="text" value="0"/>	File No	<input type="text" value="1"/>
Field Calibration [Bit/mm]	<input type="text" value="1"/>	Lens [Yes 1 / No 0] / Correction Type	<input type="text" value="0"/> <input type="text" value="0"/>
Focal Length [mm] Working Distance	<input type="text" value="0.000"/>	Table Origin / Program Version	<input type="text" value="20000"/> <input type="text" value="103"/>
Stretch X	<input type="text" value="0"/>	Inverted Table [1/0] numerical [1/0]	<input type="text" value="1"/> <input type="text" value="1"/>
Stretch Y	<input type="text" value="0"/>	Calibration Angle [mech. degrees]	<input type="text" value="0.000"/>
Z-Correction: A	<input type="text" value="0.0000"/>	Scan Head Type	<input type="text" value="-1"/> <input type="text" value="unknown"/>
Z-Correction: B	<input type="text" value="0.000000"/>	Protection Glass Thickness [mm] / Refraction Index	<input type="text" value="0.00"/> <input type="text" value="0.000"/>
Z-Correction: C	<input type="text" value="0.0000000000"/>	Field Limit [Yes 1/ No 0]	<input type="text" value="0"/>

Save Cancel



Example 2: D2 correction file D2_458.ct5, converted from D2_458.ctb

When converting from a 2D RTC[®]4 correction file, not all information is available for a complete ct5 header. Missing are values for field calibration (Bit/mm), focal length or working distance (mm), mech. scan axes calibration (\pm degree) and the basic scan head geometry (scan head type).

Those fields will therefore be available for editing. The corresponding data can be obtained from the ReadMe.txt file that accompanies the originally supplied RTC[®]4 correction file.

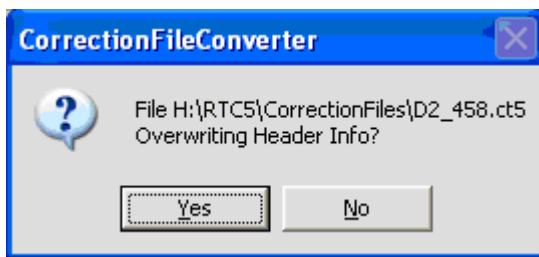
Entries in white fields can be finalized via “enter” or “return” – the dialog will remain open. The input focus then automatically moves to the next editable field (likewise via the tab key). All changes are checked and, if necessary, rounded and/or clipped.

The scan head type can also be changed via the corresponding spin button (arrows).

Caution: These entries are only for informational purposes and not used by the DLL or the RTC[®]5 board. Users are solely responsible for filling these fields with data appropriate for their applications.

RTC5 Header Info 1.03: D2_458			
2D/3D [0/1]	0	File No	458
Field Calibration [Bit/mm]		Lens [Yes 1 / No 0] / Correction Type	0 0
Focal Length [mm] / Working Distance	0.000	Table Origin / Program Version	20000 105
Stretch X	0	Inverted Table [1/0] / numerical [1/0]	1 1
Stretch Y	0	Calibration Angle [mech. degrees]	0.000
Z-Correction: A	0.0000	Scan Head Type	-1 unknown
Z-Correction: B	0.000000	Protection Glass Thickness [mm] / Refraction Index	0.00 0.000
Z-Correction: C	0.0000000000	Field Limit [Yes 1/ No 0]	0
<div>Save</div> <div>Cancel</div>			

If at least one editable field has received data that differs from the originally-read values, then the **Save** button will be activated. This allows changes to the current header to be permanently stored. The dialog will then close. Prior to overwriting, a confirmation **MessageBox** will be displayed:



Example 3: D3 correction file D3_001.ct5, converted from D3_001.ctb

Older 3D correction files for the RTC[®]2/RTC[®]3/RTC[®]4 use so-called height tables for Z-axis correction. This is not supported by the RTC[®]5 (see the Conversion chapter), which instead only uses so-called ABC coefficients (likewise with recent RTC[®]4 correction files) for a parabolic correction equation (see the RTC[®]5 manual). In this case only, the ABC fields will be editable after a conversion, as long as they show 0.0 each.

RTC5 Header Info 1.03: D3_001 ✖

2D/3D [0/1]	<input type="text" value="1"/>	File No	<input type="text" value="1"/>
Field Calibration [Bit/mm]	<input type="text" value="2880"/>	Lens [Yes 1 / No 0] / Correction Type	<input type="text" value="0"/> <input type="text" value="0"/>
Focal Length [mm] / Working Distance	<input type="text" value="465.000"/>	Table Origin / Program Version	<input type="text" value="20000"/> <input type="text" value="105"/>
Stretch X	<input type="text" value="0.00207234"/>	Inverted Table [1/0] / numerical [1/0]	<input type="text" value="1"/> <input type="text" value="1"/>
Stretch Y	<input type="text" value="0.00188769"/>	Calibration Angle [mech. degrees]	<input type="text" value="0.000"/>
Z-Correction: A	<input type="text" value="0.0000"/>	Scan Head Type	<input type="text" value="-1"/> <input type="text" value="unknown"/>
Z-Correction: B	<input type="text" value="0.000000"/>	Protection Glass Thickness [mm] / Refraction Index	<input type="text" value="0.00"/> <input type="text" value="0.000"/>
Z-Correction: C	<input type="text" value="0.0000000000"/>	Field Limit [Yes 1/ No 0]	<input type="text" value="0"/>

Note: At any time, ABC values can be subsequently transferred to the RTC[®]5 via the load_z_table command. The RTC[®]5 manual describes how to determine appropriate ABC values. You can also ask SCANLAB for appropriate new RTC[®]5 correction tables.

The numerical values for ABC are compatible between the RTC[®]4 and RTC[®]5 – the only difference is that the allowable range of values and the number of evaluated decimal places is larger for the RTC[®]5.