DXF to G-Code converter for Quilters

DXFG converts a 2-dimensional CAD drawing from DXF (.dxf) format to a machine tool cutting line (or, in this case, sewing line) in g-code format. Both these formats are the industry-standard for their application. G-code files can also be created by hand with any ASCII text editor. Files in DXF format can be created by most CAD programs, for example the free CadStd Lite (www.cadstd.com) which is used as an example here.

Once you have a pattern file (see below) start DXFG by running dxfg.exe. Click "Open DXF File" to read in your file. The translation listing will appear in the main window. If there are errors, then return to CadStd and correct them. You can find a more detailed listing of the last file converted and any error messages in dxfg.txt.

Once you have a clean conversion click "Save G-Code file" to write it out to a file with the same name but a .txt suffix. To download this to the machine, connect the PC to the machine's USB port and copy (eg cut and paste, or drag and drop) the pattern file into the machine's PATTERNS folder. You can organise the patterns by creating subfolders, indeed it is important to do so as the number of files or subfolders in any one folder is limited to 16 to keep the menus from becoming unmanageable.

Creating a pattern

Start CadStd by double-clicking mammut.cad. This will open a Mammut sewing template. Only lines, polylines and arcs are recognised by DXFG as part of the line. Any other content in the drawing, such as text, 3-D objects, spline curves or closed shapes are ignored. In CadStd this means only these drawing tools should be used.

This template will start with the following settings: grid on, layer=7, snap-to-grid on, units=millimetre. Save your drawing by using "File/Export", selecting DXF format and ensuring all options are unchecked. You can re-open and edit existing dxf files by double clicking or by "File/Open". (Avoid "File/Save", this will save in .cad format, which is not recognised by DXFG). You cannot convert g-code files back to CAD formats with any of these tools. It is not essential to use a grid, metric or otherwise, but it makes it easier to avoid gaps, and makes the g-code more readable. Where a sewn segment is not an exact number of stitches, the size of last stitch is adjusted by the controller to fit. Arcs are specified by two end points and a centre of curvature, if you manually edit a g-code arc, you must ensure that the centre remains on the median of the end points.

Pattern editing

The lines must form a continuous path. Small gaps (under 1mm) will be assumed to be junctions, larger gaps will be treated as an error. The line should start at X=0, Y=0, and end with X=0. Line segments can be drawn in any order and in either direction, DXFG will attempt to sort them into a continuous path. Crossings are permitted, but placing two segment junctions at the same point makes the route ambiguous and is an error. To achieve continuity in CadStd, type explicit millimetre vertex coordinates in the X and Y boxes at the bottom (you'll probably want to check the "abs" box: the default is relative coordinates) or use the "snap to end" mode when plotting vertices graphically.

Condensed stitch and jumps.

"Layers" in CAD correspond to drawing colours, and to stitch size in sewing. 8 layers are recognised. Layer zero (black) represents non-sewing movement. Layer 7 (red) represents 100% of the stitch size set by the operator. Layers 1-6 represent various sizes of condensed stitch as shown in the table. Select the desired layer before drawing, with the layer selector.
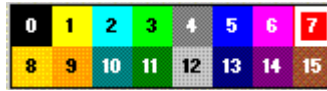
Layer	Stitch
0	None
1	10%
2	15%
3	25%
4	33%
5	50%
6	70%
7	100%

To change the layer of a line already drawn, use the change-layer tool. Most editing tools like this in CadStd will ask for objects to be selected when first clicked, then will perform the action on the selected object(s) when clicked again.

Where cut-to-length markers (stamp, label, etc) are used, the mark will always be applied to cut at the start of the pattern, and the drawing must be arranged suitably. The sewing controller applies compensation for the physical offset of the marker and mark reader devices from the sewing and cutting points: the pattern designer need not consider this.