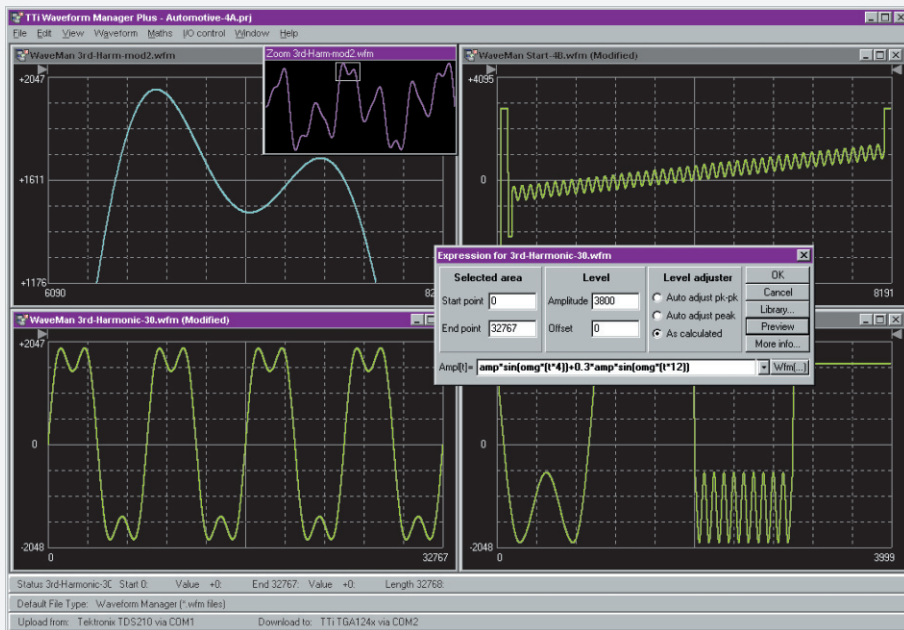# Waveform Manager Plus - *included with all TGA1200 series generators*

Advanced waveform creation, editing and management software

- ▶ *Full waveform building tools including standard waveforms, mathematical expressions, and freehand drawing.*
- ▶ *Operates under Windows 95, 98, Millennium, NT, 2000 and XP.*
- ▶ *Supports vertical resolutions up to 16 bits (65536 points).*
- ▶ *Supports horizontal resolutions to over one million points.*
- ▶ *Provides waveform import and export via clipboard functions.*
- ▶ *Directly supports waveform upload from some Tektronix DSOs.*
- ▶ *Supports download and upload via RS-232, GPIB and USB.*

WAVEFORM BUILDING TOOLS

TOOLKIT

Waveforms can be built in any number of sections using any combination of the following: Standard waveforms, mathematical expressions, drawn waveforms, uploaded waveforms, imported waveforms (using clipboard), existing stored waveforms.
Note: Waveform section limits can be defined via moveable cursors which can be dragged or positioned numerically.

STANDARD WAVEFORMS

The following waveforms are available directly from the Waveforms dialogue box: Sine, square, triangle, pulse, ramp, sinc [sin(x)/x], gaussian, exponent, noise.
Note: The mathematical expression for any standard waveform can be examined by opening the expression editor window.

EXPRESSION EDITOR FUNCTIONS

The following mathematical operators are available within the expression editor: Add, subtract, multiply, divide, x^n, sin, cos, arcsin, arccos, abs, $\log_{10}$, $\log_e$, e^n, square root, floor, ceiling, random, pulse, in conjunction with constants and waveforms.
Note: The expressions used for each section of a waveform are retained and can be displayed in a drop-down window.

EXPRESSION LIBRARIES

The mathematical expressions used for waveform creation can be stored in libraries. A default library is created for each project which includes a number of useful examples including waveshapes and modulations.

WAVEFORM DRAWING FUNCTIONS

Waveforms can be created or edited using freehand drawing and/or point to point line drawing.

SMOOTH

Waveforms can be smoothed using a running average filter. Start and end points can be specified as well as the number of points to average.

WAVEFORM EDITING/CONVERSION

TOOLKIT

All of the waveform building tools previously mentioned can be used to edit existing waveforms. In addition waveforms can be manipulated directly using the following functions:

RESIZE WAVEFORM

Allows a waveform to be resized horizontally to any length between 4 and 1M horizontal points.
Note: The vertical resolution of a waveform is automatically adjusted when it is downloaded to the generator. Thus an 8-bit waveform from a DSO will be expanded to 12-bits if it is downloaded to a 12-bit generator (and vice versa).

WAVEFORM MATHEMATICS

The Waveforms Maths function allows waveforms to be combined and manipulated independently of the expression editor. Waveforms can be scaled, offset, added, subtracted or multiplied using dialogue boxes.
Note: Waveforms can also be combined and manipulated within the expression editor giving access to the full range of mathematical functions.

INPUT/OUTPUT FUNCTIONS

FILE FORMATS

Waveforms can be read from and saved as any of the following formats: WFM(binary), NRM (normalised data in ASCII), WAV (WaveCAD), ASC (WaveCAD), DSF (Tektronix DSO).

WAVEFORM DOWNLOAD/UPLOAD

Waveforms can be downloaded/uploaded to/from TTi arbitrary generators (or certain Tektronix DSOs) using either an RS232 or GPIB (IEEE-488) interface or, for the TGA1210x, a USB interface.

CLIPBOARD FUNCTIONS

Waveforms can be imported to the program and exported from the program using the Windows Clipboard.

Waveform import uses the "Text" clipboard format (i.e. numeric lists). This enables waveforms to be imported from spreadsheets such as Excel and from mathematical programs such as MathCad. Values are automatically normalised and re-scaled.
Waveform export creates multiple clipboard formats of Text (normalised numeric values between ±1), Bitmap (as per on-screen display) and Picture (metafile retaining waveform vector properties).
Note: Pictures or bitmaps can be pasted into programs such as Word for documentation purposes.

DISPLAY AREA AND PRINTING

Multiple waveform windows can be open simultaneously. Each window is fully scaleable. Variable zoom is provided with panning from a "navigator" sub-window.
Waveform section limits can be defined via moveable cursors which can be dragged or positioned numerically.
Waveforms can be printed with automatic annotation and scaling.

MANAGEMENT AND UTILITIES

PROJECTS

To maintain good housekeeping, waveforms can be organised into "projects" with separate directory structures. Each project maintains its own library of expressions. Waveforms and expressions can be imported and exported from other projects.

INSTRUMENT SETUP

The instrument setup screen enables options for the waveform generator to be set from the program. Examples of settable options are output amplitude, clock frequency and trigger source.

HELP

Full on-screen Help is available with a hyper linked contents table.

Thurlby Thandar Instruments Ltd. operates a policy of continuous development and reserves the right to alter specifications without prior notice.

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