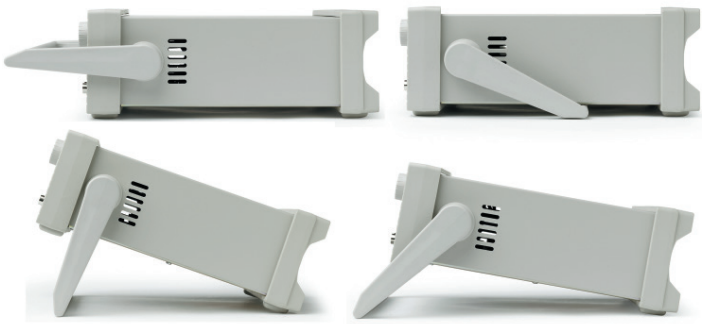
TGF3000 Series - Mechanical | Supplied Software

BENCH-TOP OPERATION

The generators are highly compact and use a minimum of bench space.

Protective mouldings guard against knock damage and a multi-position stand angles the instrument conveniently as well as providing a carry handle.

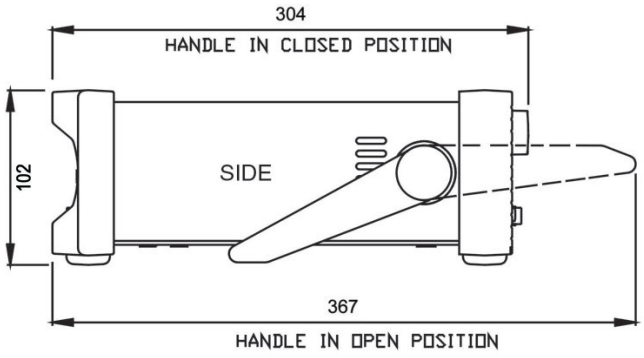


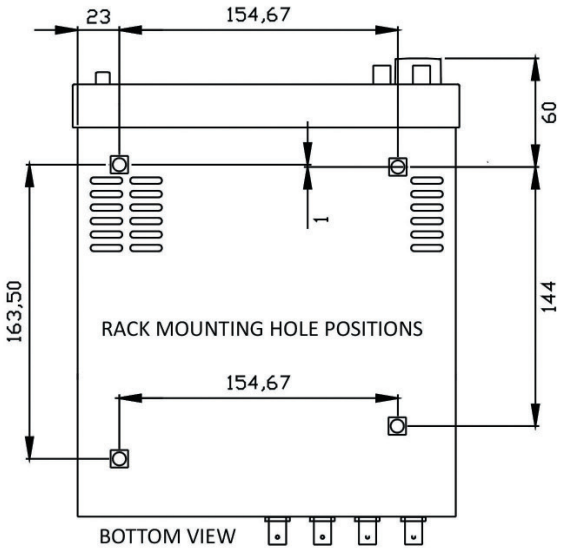
RACK MOUNTING

For system applications the generators can be rack mounted.

With the protective mouldings and handle removed the size is half rack width by 2U high.

A 2U rack mounting kit is available suitable for one or two instruments.





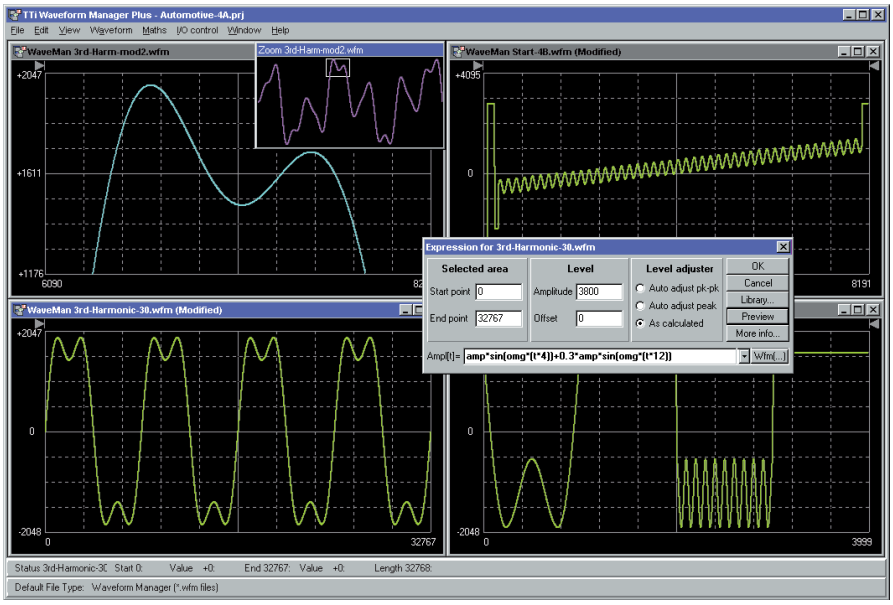
WAVEFORM SOFTWARE

Both generators are supplied with Waveform Manager Plus software for Windows.

This PC software enables complex arbitrary waveforms to be created and edited.

Waveforms can be built in any number of sections using any combination of standard waveforms, mathematical expressions, drawn waveforms, uploaded waveforms, imported waveforms and existing stored waveforms.

Waveforms can be transfered to the generator using either the Flash drive interface or the bus interfaces.



Technical Specifications - TGF3162 | TGF3082

General specifications apply for the temperature range 5°C to 40°C. Accuracy specifications apply for the temperature range 18°C to 28°C after 30 minutes warm-up, at maximum output into 50Ω. Typical specifications are determined by design and are not guaranteed. Information is subject to change without notice.

WAVEFORMS

Standard Waveforms	Sine, Square, Ramp (Variable Symmetry), Triangle (50% Ramp symmetry), Positive Ramp (100% Ramp symmetry), Negative Ramp (0% Ramp symmetry), Pulse, Noise (Gaussian), PRBS*, DC, Sin(x)/x, Exponential Rise, Exponential Fall, Logarithmic Rise, Logarithmic Fall, Haversine, Cardiac, Gaussian, Lorentz, D-Lorentz, 4 User Defined Arbitrary Waveforms.

SINE	TGF3162	TGF3082 (where different)
Frequency Range:	1µHz to 160MHz	1µHz to 80MHz
Frequency Resolution:	1µHz, 15 digits	1µHz, 14 digits
Output Level:	≤ 50MHz 10mVp-p to 10Vp-p into 50Ω ≤ 100MHz 10mVp-p to 5Vp-p into 50Ω ≤ 160MHz 10mVp-p to 2.5Vp-p into 50Ω	≤ 80MHz 10mVp-p to 5Vp-p into 50Ω N/A
Amplitude Flatness (1V p-p relative to 1kHz):	≤10MHz: ±0.1dB ≤100MHz: ±0.2dB ≤160MHz: ±0.6dB	≤80MHz: ±0.2dB N/A
Harmonic Distortion (1V p-p)	≤ 10MHz -60dBc ≤ 50MHz -50dBc ≤ 160MHz -36dBc	≤ 80MHz -40dBc
Total Harmonic Distortion DC to 20kHz:	<0.05% (Typical)	<0.07% (Typical)
Non-Harmonic Spurii:	-65dBc	
Phase Noise:	-113dBc/Hz (10MHz, 1V p-p, 10kHz offset)	

SQUARE	TGF3162	TGF3082 (where different)
Frequency Range:	1µHz to 50MHz	
Frequency Resolution:	1µHz, 14 digits	
Output Level:	10mVp-p to 10Vp-p into 50Ω	
Rise and Fall Times:	5ns Fixed	10ns Fixed
Aberrations (Typical):	±5% of amplitude	
Jitter (RMS):	<30ps (cycle to cycle)	

RAMP	TGF3162	TGF3082 (where different)
Frequency Range:	1µHz to 5MHz	
Frequency Resolution:	1µHz, 13 digits	
Output Level:	10mVp-p to 10Vp-p into 50Ω	
Linearity Error:	<0.1% to 200kHz	<0.1% to 100kHz
Variable Symmetry:	0.00 % to 100.00 %, 0.01% resolution	

Pulse	TGF3162	TGF3082 (where different)
Frequency Range:	1mHz to 20MHz	
Frequency Resolution:	1mHz, 11 digits	
Output Level:	10mVp-p to 10Vp-p into 50Ω	
Aberrations (Typical):	±3% of amplitude	±5% of amplitude
Jitter RMS:	<30ps (cycle to cycle)	
Rise and Fall Times: (Rise time = Fall time)	Range: 10ns to 1ms (10% to 90%) Resolution: 100ps ; Accuracy: ±500ps ±0.01% of period	
Width:	Range: 25ns to 999.999999975s Resolution: 100ps; Accuracy: ±200ps ±0.01% of period Duty: 0.01% to 99.99%, 0.01% resolution	

Arbitrary	TGF3162	TGF3082 (where different)
In built arbitrary waveforms (Sin(x)/x, Exponential Rise, Exponential Fall, Logarithmic Rise, Logarithmic Fall, Haversine, Cardiac, Gaussian, Lorentz and D-Lorentz). Up to 4 user-defined waveforms may be stored in non-volatile memory. Waveforms can be defined by downloading of waveform data via remote interfaces or from the instrument's front panel.		
Waveform Memory Size:	8192 points	
Vertical Resolution:	16 bits	14 bits
Frequency Range:	1µHz to 80MHz	1µHz to 40MHz
Frequency Resolution:	1µHz, 14 digits	
Output Level:	10mVp-p to 10Vpp into 50Ω (5Vpp max. above 50MHz)	
Sampling rate:	800MSa/s	400MSa/s
Point to Point Jitter:	1.25ns Typical	2.5ns Typical
Rise and Fall Times:	<5ns	<8ns
Effective Analogue Bandwidth (-3dB):	100MHz	62.5MHz

Technical Specifications (continued)

NOISE	TGF3162	TGF3082 (where different)
Gaussian White Noise: Noise can also be used as modulating waveform.		
Bandwidth (-3dB):	100MHz	62.5MHz
Noise crest factor (Vp/Vrms):	5.16	6.4
Output Level:	10mVp-p to 10Vpp into 50Ω	

PRBS	Standard on TGF3162	Optional on TGF3082 with GU3082
Bit Rate:	1mbps to 50Mbps, 1µbps resolution	
Sequence Length:	$2^m - 1$, where m = 7, 9, 11, 15, 20, 23, 29 or 31	
Rise and Fall Times	5ns Fixed	
Output Level:	10mVp-p to 10Vpp into 50Ω	

Harmonic Waveforms	Standard on TGF3162	Optional on TGF3082 with GU3082
Harmonic waveforms can be defined and stored in user-defined arbitrary waveform locations		
Frequency Range:	1µHz to 80MHz	1µHz to 40MHz
Frequency Resolution:	1µHz, 14 digits	
Harmonic Order:	1 to 50, Up to 16 different harmonics order can be defined	
Harmonic Amplitude:	0.0% to 100.0% of output amplitude, 0.1% resolution	
Harmonic Phase:	-360.0 to +360.0 degrees, 0.1 degree resolution	
Output Level:	10mVp-p to 10Vpp into 50Ω, (5V p-p max above 50MHz)	

Internal Frequency Reference	
Initial Setting Error:	<± 1ppm
Oscillator Ageing Rate:	<± 1ppm first year
Temperature Stability:	<1ppm over the specified temperature range

MODULATION	TGF3162	TGF3082 (where different)
AM (Amplitude Modulation) Normal & Suppressed Carrier		
Carrier Waveforms:	Sine, Square, Ramp, Pulse, Noise, Arb, PRBS* (max. carrier frequency 50MHz)	
Max. Carrier Frequency	50MHz	25MHz
Modulation Source:	Internal/External	
Internal Modulating Waveforms:	Sine, Square, Positive Ramp, Negative Ramp, Triangle, Gaussian Noise, DC, Sinc, Exponential Rise, Exponential Fall, Logarithmic Rise, Logarithmic Fall, Haversine, Gaussian, Lorentz, D-Lorentz, Cardiac, User Defined Arbs, PRBS*	
Internal Modulating Frequency:	1µHz to 10MHz, 1µHz resolution	
Amplitude Depth:	0.00% to 100.00%, 0.01% resolution	
FM (Frequency Modulation)		
Carrier Waveforms:	Sine, Square, Ramp, Arb	
Modulation Source:	Internal/External	
Internal Modulating Waveforms:	Sine, Square, Positive Ramp, Negative Ramp, Triangle, Gaussian Noise, DC, Sinc, Exponential Rise, Exponential Fall, Logarithmic Rise, Logarithmic Fall, Haversine, Gaussian, Lorentz, D-Lorentz, Cardiac, User Defined Arbs, PRBS*	
Internal Modulating Frequency:	1µHz to 10MHz, 1µHz resolution	
Frequency Deviation:	DC to Fmax/2, 1µHz resolution	
PM (Phase Modulation)		
Carrier Waveforms:	Sine, Square, Ramp, Arb	
Modulation Source:	Internal/External	
Internal Modulating Waveforms:	Sine, Square, Positive Ramp, Negative Ramp, Triangle, Gaussian Noise, DC, Sinc, Exponential Rise, Exponential Fall, Logarithmic Rise, Logarithmic Fall, Haversine, Gaussian, Lorentz, D-Lorentz, Cardiac and User Defined Arbs, PRBS*	
Internal Modulating Frequency:	1µHz to 10MHz, 1µHz resolution	
Phase Deviation:	-360.000 to +360.000 degrees, 0.001 degree resolution	
ASK (Amplitude Shift Keying)		
Carrier Waveforms:	Sine, Square, Ramp, Pulse, Noise, Arb, PRBS* (max. carrier frequency 50MHz)	
Source:	Internal/External (via TRIG IN)	
Internal Modulation:	2mHz to 10MHz (50% duty cycle square)	
FSK (Frequency Shift Keying)		
Carrier Waveforms:	Sine, Square, Ramp, Arb	
Max. Carrier Frequency	50MHz	25MHz
Source:	Internal/External (via TRIG IN)	
Internal Modulation:	2mHz to 10MHz (50% duty cycle square)	

Technical Specifications (continued)

BPSK (Binary Phase Shift Keying)			
Carrier Waveforms:	Sine, Square, Ramp, Arb		
Modulation Source:	Internal/External (via TRIG IN)		
Internal Modulation:	2mHz to 10MHz (50% duty cycle square)		
PWM (Pulse Width Modulation)			
Carrier Waveforms:	Pulse		
Modulation Source:	Internal/External		
Internal Modulating Waveforms:	Sine, Square, Positive Ramp, Negative Ramp, Triangle, Gaussian Noise, DC, Sinc, Exponential Rise, Exponential Fall, Logarithmic Rise, Logarithmic Fall, Haversine, Gaussian, Lorentz, D-Lorentz, Cardiac and User Defined Arbs, PRBS*		
Internal Modulating Frequency:	1µHz to 10MHz, 1µHz resolution		
Pulse Width Deviation:	0% to 100% of pulse width, 0.01% resolution		
SUM (Additive Modulation)			
Carrier Waveforms:	Sine, Square, Ramp, Pulse, Noise, Arb, PRBS*		
Max. Carrier Frequency	50MHz	|	25MHz
Modulation Source:	Internal/External		
Internal Modulating Waveforms:	Sine, Square, Positive Ramp, Negative Ramp, Triangle, Gaussian Noise, DC, Sinc, Exponential Rise, Exponential Fall, Logarithmic Rise, Logarithmic Fall, Haversine, Gaussian, Lorentz, D-Lorentz, Cardiac, and User Defined Arbs PRBS*		
Internal Modulating Frequency:	1µHz to 10MHz, 1µHz resolution		
Ratio:	0% to 100%, 0.01% resolution		

***NOTE:** References to PRBS within the Modulations section refer only to the TGF3162 or TGF3082 with option GU3082

TRIGGERED BURST	**TGF3162**	|	**TGF3082 (where different)**
Each active edge of the trigger signal will produce one burst of the waveform.			
Carrier Waveforms:	Sine, Square, Ramp, Pulse, Noise, Arb, PRBS*		
Maximum Carrier Frequency: (subject to carrier waveform	50MHz (finite cycles), Fmax(infinite),	|	25MHz (finite cycles), Fmax(infinite)
Sine, Square, Ramp, Pulse, Arb:	A fixed number of cycles, specified as number of cycles are generated at every trigger event.		
PRBS:	A fixed number of bits, specified as number of cycles are generated at every trigger event.		
Noise:	Noise is reset to its start condition at every trigger event. Allows generating same random noise sequence.		
Number of Cycles:	1 to 2147483647 and infinite.		
Trigger Repetition Rate:	2mHz to 50MHz internal, dc to 1MHz ext.	|	2mHz to 25MHz internal, dc to 1MHz external.
Trigger Signal Source:	Internal from keyboard or trigger generator, External from TRIG IN or remote interface.		
Trigger Start/Stop Phase:	-360.000 to +360.000 degrees, 0.001 degree resolution. Phase offset cannot be set for Noise and PRBS waveforms.		

GATED	**TGF3162**		**TGF3082 (where different)**
Waveform will run while the Gate signal is true and stop while false.			
Carrier Waveforms:	Sine, Square, Ramp, Pulse, Noise, Arb, PRBS*		
Maximum Carrier Frequency: (subject to carrier waveform	50MHz (finite cycles), Fmax(infinite),	|	25MHz (finite cycles), Fmax(infinite)
Trigger Repetition Rate:	2mHz to 50MHz internal, dc to 1MHz ext.	|	2mHz to 25MHz internal, dc to 1MHz external.
Gate Signal Source:	Internal from keyboard or trigger generator, External from TRIG IN or remote interface.		
Gate Start/Stop Phase:	-360.000 to +360.000 degrees, 0.001 degree resolution. Phase offset cannot be set for Noise and PRBS waveforms.		

SWEEP		
Frequency sweep capability is provided for both standard and arbitrary waveforms.		
Carrier Waveforms:	Sine, Square, Ramp, Arb	
Sweep Mode:	Linear or logarithmic, triggered or continuous.	
Sweep Direction:	Up or Down	
Sweep Range:	From 1µHz to Fmax. Phase continuous. Independent setting of the start and stop frequency.	
Sweep Time:	1µs to 500s (9 digit resolution).	
Sweep Trigger Source:	The sweep may be free run or triggered from the following sources: Internal from keyboard or trigger generator. Externally from TRIG IN input or remote interface.	

TRIGGER GENERATOR	**TGF3162**	|	**TGF3082 (where different)**
Internal source square wave source adjustable in 10ns steps, 11 digit resolution. Each channel has its own trigger generator. Channel 1 trigger is available for external use from the MAIN OUT 2 socket when Channel 2 is configured to output Channel 1 sync waveform and sync source is set to trigger.			
Frequency/Period Range	2mHz to 50MHz / 20ns to 500s	|	2mHz to 25MHz / 40ns to 500s