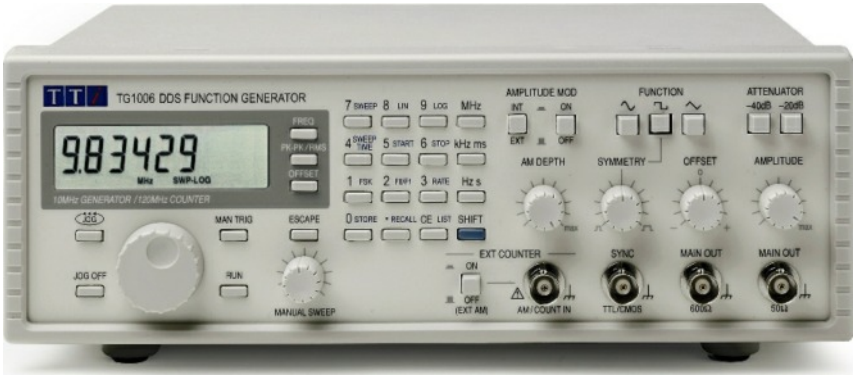
10MHz-es DDS funkció generátor 120MHz-es frekvenciamérővel, TG1006



0.001Hz... 10MHz frekvencia tartomány DDS technika
6-digites, vagy 1mHz beállítási felbontás
1ppm stabilitás és <10 ppm abszolút éves pontosság
Szinusz, négyszög és háromszög hullámformák
Kis torzítású, nagy spektrális tisztaságú szinusz
A frekvencia és amplitúdó/eltolás egyidejű kijelzése
Külső 7-szegmenses kijelzővel rendelkező 120 MHz-es frekvenciamérő
Belső teljes fázisú folyamatos, lineáris, vagy logaritmikus sweep
Kiemelkedő kézi sweep-mód kvázi analóg vezérléssel
AM, FSK és frekvencia soros moduláció
2mV... 20V pp, 50Ω, vagy 600Ω kimenet
Max. 10 frekvencia érték tárolása nem felejtő memóriában

DDS frequency generation

The TG1006 has been developed from the highly successful TG300 and TG550 series of analog function generators. However, the TG1006 uses DDS frequency generation to provide greater accuracy and stability, and to cover a wider frequency range.
DDS (direct digital synthesis) is a technique for generating waveforms digitally using a phase accumulator, a look-up table and a DAC. The accuracy and stability of the resulting waveforms is related to that of the crystal master clock.
When correctly engineered, the DDS generator offers not only exceptional accuracy and stability but also high spectral purity, low phase noise and excellent frequency agility.

Wide frequency and amplitude range

The TG1006 can generate waveforms between 0.001Hz and 10MHz with a resolution of six digits and a one year accuracy better than 10ppm.
Amplitude is variable between 2mV and 20V pk-pk from a source impedance of 50Ω or 600Ω.

Numeric or spin-wheel frequency control

Frequencies can be entered directly from the numeric keypad in units of Hz, kHz or MHz. Alternatively any digit can be incremented or decremented using the spin wheel.

Quasi-analog frequency control

One advantage that analog function generators have over digital ones is that the frequency can be changed using an analog control. This provides intuitive operation which is ideal for the setting up of frequency dependent parameters such as checking filter characteristics.
The TG1006 provides a similar capability via its “manual sweep” mode. A dedicated analog control sweeps the frequency over any defined span in a similar way to an analog generator, but with the added advantage that the span can be precisely controlled and can extend to almost the full range of the generator.

Wide range sweep

All waveforms can be swept over almost the full frequency range (0.1Hz to 10MHz) at a rate variable between 100 milliseconds and more than 15 minutes. The sweep is fully phase continuous and can be linear or logarithmic, single or continuous.

FSK

Frequency Shift Keying provides phase coherent switching between two selected frequencies at a rate defined by the trigger source which can be the front panel key or internal timer (10kHz maximum).

Frequency list and stepping

The generator has non-volatile storage for up to 10 frequency settings. These can be used as random storage for commonly used frequency values, or can be stepped through in sequence as may be required in a repetitive test routine.

AM

Amplitude modulation from 0 to 100% is provided using either an internal 400Hz source or an external source (DC to 20kHz). All waveforms can be modulated.

External frequency counter

In external counter mode the full width of the display is used to provide up to seven digits of resolution.
The frequency range is from 3Hz up to more than 120MHz, and the input sensitivity is better than 50mV rms.
A reciprocal counting measurement system is used which ensures high resolution regardless of input frequency.

Suitable for bench or rack

The generator is housed in a 2U high case with built-in tilt stand. A rack mounting kit is available.

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MŰSZAKI ADATOK

WAVEFORMS

Sine

Range:	1mHz to 10MHz
Resolution:	1mHz or 6 digits
Accuracy:	10 ppm for 1 year; ± 1mHz below 0.2Hz
Temperature Stability:	Typically <1 ppm/ºC outside 18° to 28°C
Output Level:	1mV to 10Vp-p into 50W
Harmonic Distortion:	<0.3% THD to 20kHz (typically 0.1%), <–45dBc to 300kHz, <-30dBc to 10MHz (typically <-35dBc)
Non-harmonic Spurii:	<–55dBc to 1MHz, <–55dBc + 6dB/octave 1MHz to 10MHz

Square

Range:	1mHz to 10MHz
Resolution:	1mHz or 6 digits
Symmetry Control:	20% to 80% 1mHz to 10MHz
Accuracy:	10 ppm for 1 year; ± 1mHz below 0.2Hz
Output Level:	1mV to 10Vp-p into 50W
Rise and Fall Times:	<25ns
Aberrations:	<5% + 2mV

Triangle

Range:	1mHz to 1 MHz
Resolution:	1mHz or 6 digits
Accuracy:	10 ppm for 1 year; ± 1mHz below 0.2Hz
Output Level:	1mV to 10Vp-p into 50W
Linearity Error:	<0.5% to 100 kHz

OPERATING MODES

Continuous

Continuous cycles of the selected waveform are output at the programmed frequency.

Sweep

Carrier Waveforms:	All
Sweep Mode:	Manual, linear or logarithmic, single or continuous.
Sweep Width:	From 0.1Hz to 10MHz in one range. Phase continuous. Independent setting of the start and stop frequency.
Sweep Time:	100ms to 999s (10ms resolution).
Sweep SYNC:	Start of sweep trigger available from SYNC output.
Trigger Source:	The sweep may be free run or triggered from the front panel MAN TRIG key.

Manual Sweep Mode: An analogue control can be used to set any frequency between the sweep start and sweep stop frequencies.

Amplitude Modulation

Carrier Frequency:	From 1mHz to 10MHz.
Carrier Waveforms:	All
Modulation Frequency:	400Hz internal. DC to 20kHz external
External Modulation:	AM/COUNT IN socket

Frequency Shift Keying (FSK)

Phase coherent switching between two selected frequencies at a rate defined by the switching signal source.

Carrier frequency:	From 0.1Hz to 10MHz.
Carrier waveforms:	All
Switch repetition rate:	DC to 10kHz (internal trigger).
Switching signal source:	Manual (front panel MAN TRIG key) or internal trigger generator

Frequency List

Carrier Waveforms:	All
Frequency List:	Up to 10 frequencies from 1mHz to 10MHz
Switching Source:	Manual from front panel MAN TRIG key

OUTPUTS

Main Outputs

Output Impedance:	50Ω and 600Ω (not independent)
Amplitude:	2mV to 20V pk-pk open circuit, (1mV to 10V pk-pk into 50W/600W) in four switch selectable ranges with 20dB vernier control within each range. (Amplitude can be displayed in pk-pk or r.m.s.)
Attenuator:	0, -20dB, -40dB, or -60dB.
Amplitude Flatness:	±0.2dB to 500kHz; ±2dB to 10MHz.
DC Offset Range:	±10V. DC offset plus signal peak limited to ±10V from 50Ω/600Ω; CLIP shows in display when offset plus signal peak exceeds ±10V. DC offset plus waveform attenuated proportionally by the attenuator.
Resolution:	3 digits for both Amplitude and DC Offset.

OUTPUTS (Continued)

SYNC Out

Automatically selected to be either Waveform Sync or Sweep Sync:

Waveform Sync:	A square wave at the main waveform frequency. Symmetry is 50% for sine and triangle waves at MAIN OUT; for square waves symmetry is the same as that of the waveform at MAIN OUT.
Sweep Sync:	Outputs a trigger signal at the start of sweep to synchronize an oscilloscope.
Output Signal Level:	Output impedance 50W nominal. Logic levels of <0.8V & >3V.

INPUTS

AM In

The AM/COUNT IN socket is set to AM input when External AM is selected

Input Impedance:	40kW
Input Sensitivity:	Approximately 2V peak-peak for 100% modulation.
Max. Allowable Input:	±10V

Count In

The AM/COUNT IN socket is set to external frequency measurement when EXT COUNT is selected

Input Impedance:	1MW/20pF
Input Sensitivity:	50mVrms (sinewave)
Max. Allowable Input:	30Vdc/30Vrms to 50Hz/60Hz with respect to ground, reducing to 1Vrms above 1MHz.

DISPLAY FUNCTIONS

The LCD shows generator frequency at a resolution of 4 digits simultaneously with output amplitude/offset, together with various status annunciators.
Alternatively, the generator frequency can be displayed without the amplitude/offset to a resolution of 6 digits. The LCD also functions as the external frequency measurement display with up to 7 digits of resolution.

Internal Measurement Accuracy

Amplitude:	Display shows peak-to-peak amplitude or rms value. Display corrected for attenuator setting. 3-digit resolution, accuracy typically ±5% of full scale.
DC Offset:	3-digit resolution; accuracy typically ±2% setting ±1 digit. Display corrected for attenuator setting.
Frequency Setting:	Resolution up to 6 digits, see Waveforms section for setting accuracy.

EXTERNAL FREQUENCY MEASUREMENT

Frequency Range:	3Hz to >120MHz.
Resolution:	Up to 7 digits
Input Sensitivity:	better than 50mVrms (sinewave).
Measurement Time:	Automatic.
Accuracy:	±1 digit ± timebase accuracy.
Timebase Accuracy:	±5ppm initial error; ± 5 ppm/year ageing rate; typically < 0.1ppm\°C.

GENERAL SPECIFICATIONS

Input

AC Input:	110-120V AC or 220V-240V AC ±10%, 50/60Hz, 35VA max. Installation Category II.

Temperature & Environmental

Operating Range:	+5ºC to +40ºC, 20% to 80% RH
Storage Range:	-20ºC to + 60ºC
Environmental:	Indoor use at altitudes up to 2000m, Pollution Degree 2.

Safety & EMC

Safety:	Complies with EN61010-1
EMC:	Complies with EN61326

Front Panel Display and Setting

Display:	LCD, 8 digits plus annunciators
Data Entry:	Frequency entry by numeric keys or by rotary control.
Stored Settings:	Up to 10 output frequencies may be stored and recalled from non-volatile memory. All frequencies settings including list, FSK and sweep parameters are stored at power down and restored at switch-on.

Physical

Size:	260mm (W) x 88mm (H) x 235mm (D) .
Weight:	1.45kg. (3.2lb.).

Specifications apply at 18°- 28°C after one hour warm-up, at maximum output into 50 Ω. Thurlby Thandar Instruments Ltd. operates a policy of continuous development and reserves the right to alter specifications without prior notice.

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