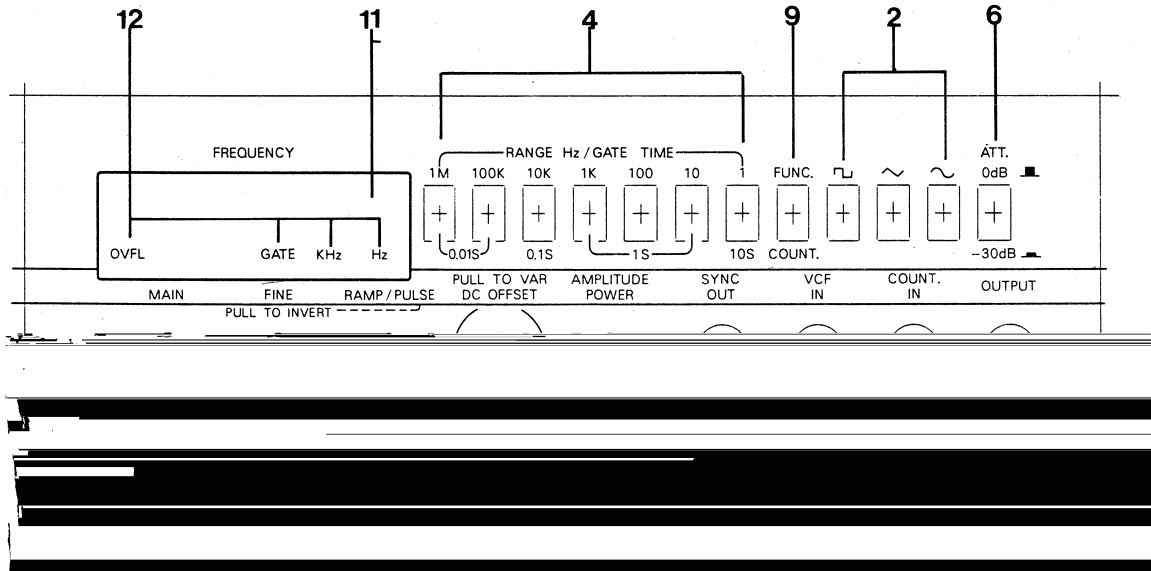


# Digital Function Generator Model 8112

FRONT PANEL of the MODEL 8112

Figure - 1



## SPECIFICATIONS

### GENERATOR

Waveforms: Sine, Square, Triangle, Pulse, Ramp  
 Frequency: 0.1 Hz - 2MHz, 7 Ranges  
 Display: 6 Digits with Hz, KHz, Gate, OVFL  
 Freq. Error: Counter Accuracy  
 Output Impedance:  $50\Omega \pm 10\%$   
 Output Level: 5mVpp (min) to 20Vpp Continuously Variable (open circuit)  
 Attenuator: 0dB, -30dB  
 DC Offsets:  $\pm 10$  Volts Continuously Variable (open circuit)  
 Duty Cycles: 5% ~ 95% Continuously Variable with 50% Calibrated Switch  
 Distortion: <1%, 1Hz ~ 100KHz  
 Triangle Linearity: <1%, 1Hz ~ 100KHz  
 Rise/Fall Time: <100nS  
 Sync Out: 3Vpp (open circuit), Tr < 25nS  
 VCF in: 0 - 5 Vdc Control Frequency to 1000:1

### COUNTER

Range: 10Hz ~ 100MHz  
 Gate Time: 0.015, 0.1 S, 1S, 10S Controlled by Range switch  
 Accuracy:  $\pm (1 \text{ Count} + \text{Time Base Accuracy})$   
 Sensitivity: 25mVrms(10Hz - 10MHz), 50mVrms(10Hz - 100mHz)  
 Attenuator: 0dB, -30dB  
 Max. Allowable Input: 150Vrms(DC + Peak AC)  
 Impedance:  $1m\Omega // 100pF$   
 Time Base: 10mHz,  $\pm 10ppm$  (0°C - 40°C)  
 Display: 6 digits 7 segment LED display. LED Indicators for Gate, Overflow, Hz, KHz

## **GENERAL**

Dimension: 251 (W) x 92(H) x 288(D) mm  
Weight: 1.6Kg  
Power: 115V/230V  $\pm$ 10%, 50/60Hz, 12VA  
Accessory: Test Lead - ACS-003 BNC to Alligator Clip Cable 1 pcs

## **INTRODUCTION**

The Topward 8112 is a portable, bench type multi-purpose digital function generator/counter capable of producing 5 different waveforms. These are Sine, Square, Triangle, Pulse and Ramp.

The model 8112 features: Adjustable frequency range from 0.1 Hz to 2 MHz in 7 ranges, variable output amplitude from 5 mV to 20 Vpp, variable symmetry/duty cycle from 5% to 95% in the Ramp/Pulse mode, continuous or externally controlled outputs, DC offset between -10V to +10V can be added to all output waveforms, inverted and attenuated output, built-in 100 MHz frequency counter with 25 mV input sensitivity.

## **FRONT PANEL DESCRIPTION**

The following is an explanation of the function of the front panel controls and connectors. Please refer to the above figure for location of each control/connector.

1. **POWER/AMPLITUDE** - This is the main power switch and the amplitude adjustment knob. Turning the control clockwise will increase the amplitude.
2. **FUNCTION** - This bank of switches is used to select the output waveform. Only one of these switches can be depressed at a time.
3. **FREQUENCY CONTROL** - This pair of knobs is used to adjust the output frequency. The frequency is dependent upon the setting of this pair of knobs and the RANGE/GATE FINE switches (4). Pulling out the FINE control knob (3) will invert the pulse output.
4. **RANGE/GATE TIME** - This bank of switches is used to select the frequency range produced. At the same time, the counter gate time is changed.
5. **RAMP/PULSE** - This knob is used to adjust the duty cycle of the Square or Triangle waveforms. When the knob is turned to CAL. (fully CCW position), the duty cycle is fixed at 50%. Otherwise, the duty cycle is adjustable between 5 to 95%.
6. **ATTENUATOR** - When this push button is out, the output/input signal is unchanged. If the switch is depressed, the Output/Input signal is reduced by 30 dB (Generator output / Counter input).
7. **DC OFFSET** - This knob allows a variable DC voltage between -10V to +10V to be added to the output signal. Note that the knob has to be pulled out for the offset to affect the signal. When the control is pushed in, no offset voltage is added.
8. **OUTPUT** - This connector provides the output signal for all waveforms.
9. **FUNC/COUNT** - When the switch is out, the 6 digits DISPLAY (11) shows the generator frequency. When the switch is in, the DISPLAY (11) shows the input frequency of counter.
10. **COUNTER IN** - This is the input connector for the 100MHz frequency counter. FUNC/COUNT switch (9) must be depressed.
11. **FREQUENCY DISPLAY** - This is a 6 digits LED display that shows the output frequency of the main generator or the input frequency of the counter.

12. INDICATORS - OVFL, GATE, KHz, Hz LEDs enunciate frequency overflow, gate time and frequency units in KHz, Hz.

13. VCF IN - This input is used to modulate the main frequency to 1000:1 with an external source of 0 - 5VDC.

14. SYNC OUT - This connector supplies a TTL compatible output signal which is unaffected by either the FUNCTION (2) or AMPLITUDE (1) controls. The output frequency is the same as that of OUTPUT signal (8).

## **OPERATING INSTRUCTIONS**

### **1. Instrument Turn-on**

A. Connect the 8112 to an AC power source and turn on the POWER switch (1).

### **2. Main Generator**

A. Select the desired waveform using the FUNCTION switch (2). To generate a ramp or pulse output, turn on the RAMP/PULSE knob (5) and set the desired duty cycle.

B. Set the desired frequency with the FREQUENCY control (3) and the RANGE switches (4).

C. Adjust the output amplitude with the AMPLITUDE control (1) to the desired level. If a very small signal is required, depress the ATTENUATOR switch (6).

D. Set DC Offset voltage with the DC OFFSET control (7).

E. Use the SYNC output terminal (14) if TTL compatible level is required.

F. Pull out the INVERT switch (3) to introduce a 180 degree phase shift.

### **3. Voltage Controlled Frequency**

A. Supply a trim voltage between 0 and 5 VDC to the VCF IN terminal (13). The main frequency will be varied over 1000:1.

### **4. Frequency Counter**

A. Push in the FUNC/COUNT switch (9).

B. Apply input signal to COUNT IN (10).

C. Select GATE TIME (4) for best resolution.

D. Use ATTENUATOR (6) for large input signal to avoid damage to the instrument.

## **OPERATING CAUTIONS**

To assure operation within the published specifications, allow the unit to warm up and stabilize for at least 20 minutes.

Failure to observe the operating procedure listed below will result in damage to the unit.

Do not supply more than 10 Volts ( AC + DC ) into:

Output terminal (8)

VCF IN terminal (13)

SYNC terminal (14)