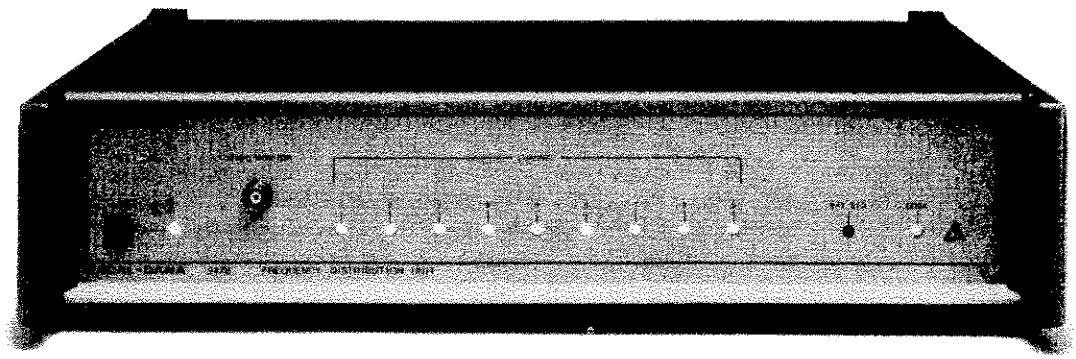

Introduction

Time and frequency management is vital for the efficient operation of today's instrumentation, communications and navigation systems. These and many other areas demand extreme precision in time and frequency control. The Model 9478 is a low-cost frequency distribution system that meets these requirements.

Frequency Standard or Distribution System

Designed for laboratory applications or for specialized test systems, the Model 9478 can be used either as a precision frequency standard or as a comprehensive distribution system.

In applications where a number of different instruments are configured in a test system (e.g., a frequency synthesizer, a universal counter, a pulse generator and a microwave counter), compatibility problems often arise when comparative measurements are made. Hence, it is often necessary to operate these instruments from a common time base. The instruments may have different frequency standard input requirements. Instruments may require 1, 5, or 10 MHz external time bases. In the past, special interfaces were required to operate the instruments from a common standard. The 9478 is the ideal choice for this frequent system need.

Operates from Internal or External Oscillator

The Model 9478 distribution system can be supplied with a range of internal precision, oven-controlled crystal oscillators, or it can be phase locked to an external signal derived from a master oscillator or atomic frequency standard. The system will automatically lock to an external signal above 100 mV, and with a standard frequency of 1, 5 or 10 MHz. "In lock" indication is provided together with a front panel 10 MHz monitor output.

Nine Isolated Outputs

The system outputs are positioned on the rear panel. The standard configuration consists of nine fully isolated, independently buffered outputs: three outputs at 1 MHz, three at 5 MHz and three at 10 MHz. It is a very simple procedure to configure the system to provide any combination of these frequencies at the output sockets. Front panel LED status indication of each output is given together with a single "NAND" TTL-compatible alarm signal.

The standard outputs are at a level of 1 volt rms when terminated in 50 ohms. Special care has been taken to ensure low distortion and best possible purity. When used with an external standard, the internal high level crystal oscillator is phase locked to the external signal to reduce noise and unwanted sidebands.

The system, which is designed to be cascaded to provide as many outputs as required, is a cost-effective approach to Standard Frequency distribution.

Frequency Standards
Frequency Distribution Systems
Model 9478

Specifications

Input

Frequency[1]: 1, 2, 2.5, 5, or 10 MHz

Level: 100 mV to 1 V rms

Impedance: 50 ohms

[1]Within ± 10 ppm for auto phase lock

Output

Frequency: 1, 5 and 10 MHz

Quantity: 9 (standard configuration 3 at each frequency)

Level: 1 V rms into 50 ohms

Impedance: 50 ohms

Harmonics: < −30 dB (into 50 ohms)

Spurious: < −80 dB (into 50 ohms)

Accuracy

External Timebase: Automatic phase lock to input frequency

Internal Timebase

Standard: Better than $\leq 3 \times 10^{-9}$ per day

Option 04B: Better than $\leq 5 \times 10^{-10}$ per day

Temperature Coefficient

Standard: Better than $\pm 3 \times 10^{-9}$/°C

Option 04B: Better than $\pm 6 \times 10^{-10}$/°C

Status Indicators

Input

Status Indication (Front Panel): "External Input" and "In Lock" LEDs

Status Signal (Rear Panel): TTL-compatible signals for External Input and In Lock

Connector: Rear panel, BNC

Output

Status Indication (Front Panel): Monitor LED for each channel

Status Signal (Rear Panel): TTL-compatible alarm signal indicates failure of any channel

Monitor Output: A low-level 10 MHz signal is provided on the front panel

General

Power Requirements

Voltage: 100, 115, 230, 240 VAC ± 10%

Frequency: 45–440 Hz

Power Consumption: Approximately 15 VA

Operating Temperature: 0°C to +55°C

Storage Temperature: −40°C to +70°C

Dimensions: 89H × 427W × 345D mm
(3.5H × 16.8W × 13.6D inches)

Weight: 4 kg (8.8 lb)

Ordering Information

Model 9478 Frequency Distribution System

Options

04B: Oven oscillator (5×10^{-10}/day aging rate)

60: Rack mount kit

65: Chassis slides/rack mounting adapters