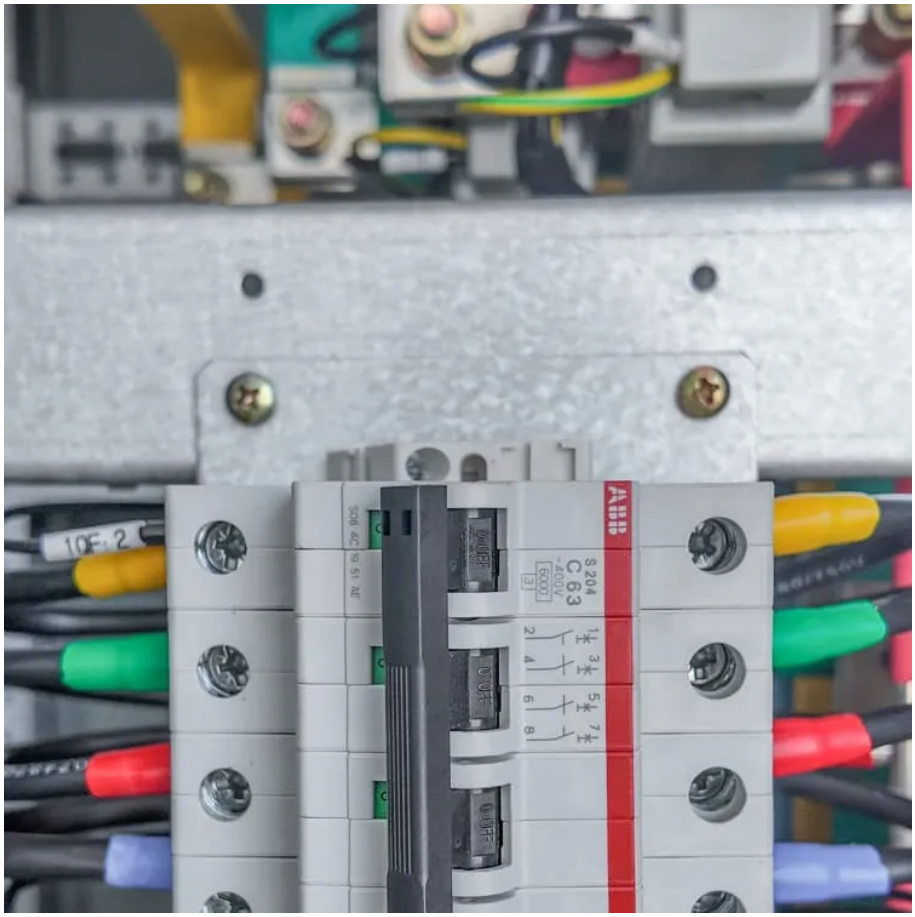
FTMRS SOLAR

# Dds sine wave inverter



## Overview

How does a DDS produce a sine wave at a given frequency?

A DDS produces a sine wave at a given frequency. The frequency depends on two variables, the reference-clock frequency and the binary number programmed into the frequency register (tuning word). The binary number in the frequency register provides the main input to the phase accumulator.

What is a direct digital synthesiser (DDS)?

The most critical component is the sine wave generator (single or multitone) and here a software-based direct digital synthesiser (DDS) can provide full flexibility with extremely fine frequency resolution and clock synchronisation with the dataacquisition system to perform coherent sampling to avoid leakage and FFT window filtering.

How does a DDS work?

The DDS stores sine wave samples, in a memory based LUT and reads them out to generate series of sine and/or cosine wave digital samples. The output wave frequency depends on the sample reading speed and number of samples per wave period. Consider the DDS functionality as storing the full wave period of samples and reading them sequentially.

Can a sine wave be used as a DAC?

While a sine wave is normally used to explain the function and operation of a DDS, it is easily possible to generate triangular or square (clock) wave outputs from modern DDS ICs, avoiding the need for a lookup table in the former case, and for a DAC in the latter case, where the integration of a simple yet precise comparator will suffice.

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