# ADE7880 (Analog Devices) 3-Phase Energy Metering and Harmonic Measurement IC with Add-on Support for Power Quality Measurement

## Features

* Supports International Electro Technical Commission standards, European Nation Standards and American National Standards Institute’s standards.

IEC 62053-21: Static energy meters for active energy (Class 0 and 1)

IEC 62053-22: Static energy meters for active energy (Class 0, 2S and 0, 5S)

IEC 62053-23: Static energy meters for reactive energy (Class 2 and 3)

EN 50471-1: Electromagnetic Compatibility - emission standard for wire-line telecommunication networks

EN 50471-3: Electromagnetic Compatibility - emission standard for wire-line telecommunication networks

ANSI C12.20: American National Standard for Electricity Meters - accuracy and performance

* Supports Class-1, Class-2 accuracy
* Supports 3 phase 3 wire and 3phase 4 wire (delta, wye) topology.
* Supports measurements of RMS, active, reactive, apparent power, power factor, THD, harmonic distortion of all phases and neutral.
* Less than 1% error in harmonics.
* Supplies total (fundamental and harmonics) active and apparent energy on each phase with less than 0.1% error in reactive and active energy up to dynamic range of 1000-1 and 0.2% error up to 5000-1.
* Supports battery supply for missing neutral pin.
* Internal reference of 1.2V (drift 20 PPM).
* 40-pin lead frame chip scale package.

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## Description/ Features

* 3-phase energy metering IC
* Serial Interface (SPI and I2C)
* 3 pulse outputs (CF1, CF2, CF3)
* In-built second order sigma-delta ADC
* In-built digital integrator
* In-built signal processing circuits to perform total (fundamental active and apparent energy measurement, RMS calculations, fundamental only active and reactive measurements)
* Additionally computes RMS of harmonics
* Supports measurement of total harmonic distortion of all phases voltages and currents
* Fixed DSP core to perform signal processing
* Supports 3 and 4 wire (wye and delta) type 3 phase measurements
* Provides system calibration for each phase, RMS offset correction, phase calibration and gain calibration
* CF1, CF2, CF3 provide wide choice of power information i.e. total active power, apparent power, sum of current RMS values, fundamental active and reactive power
* Waveform sample registers allow access to all ADC’s
* It also supports power quality measurements like short duration transients, angles between phase voltages and currents
* HSDC (high speed data capture port) in parallel with I2C to provide access to ADC’s
* Interrupt pins IRQ0 and IRQ1 to indicate events
* 3 low power modes to ensure energy accumulation while tampering
* Pin compatible with ADE-7854, ADE-7858, ADE-7868, ADE-7878.

## Block Diagram

