

D 060



D 060 - Intelligent Analog Input Module

Power Systems Automation



D 060 in a stainless steel enclosure

Introduction

The **D 060** is an intelligent analog input module that uses Digital Signal Processor (DSP) technology. Designed for use with other modules and remote terminal units (RTU), it incorporates additional distribution automation features. The **D 060** can also be used as an autonomous fault detection device.

The **D 060** is integrated with other devices through MODBUS or DNP3 protocols.

Fault Detection

The **D 060** provides phase-to-phase and phase-to-ground fault detection, with local or remote fault indication. The fault type information is also provided with the remote indication. The **D 060** uses two sets of three external toroidal transformers for current sensing, each mounted on the three phases of a distribution feeder. This design allows two sets of phase voltage and current to be read simultaneously, allowing fault detection and measurement on two distinct three-phase sections of the distribution network; for example, on either side of an overhead switch.

This measurement capability also allows the **D 060** to determine the direction of the fault. This information is crucial to the successful operation of self-healing feeder automation schemes.

In addition to indicating faults as phase-to-phase or phase-to-ground, the fault detection capability has two detection functions:

- High over-current detection with high-speed tripping (50, 50N), for extremely fast detection
- Low over-current detection with definite or inverse time (51, 51N), for a higher sensitivity to faults

In addition, the fault direction is determined through the phase angle relationship between the voltage and current when the fault occurs.

For each three-phase section, there are four setting stages that determine how the fault detection function reacts to faults.

Fault indication can be provided through one or more of the following:

- LED indicator on the **D 060** unit
- Remote indication to a local or remote supervisory system, using MODBUS or DNP3 protocols (also indicates whether the fault is phase-to-phase or phase-to-ground)
- A single relay output on the **D 060** (indicates a fault only, not the fault type or section)

The fault indication can also be reset through:

- A local digital input on the **D 060** unit
- A timeout associated with each of the two sections
- Restoration of voltage on each of the feeder sections
- A command from the supervisory system using MODBUS or DNP3 protocols

Measurement Functions

For each of the associated feeder sections, the **D 060** supplies the current RMS value and phase angle for each phase, as well as the averages.

The **D 060** also supplies two sets of three-phase voltage measurements. For each set, it supplies the RMS voltage and phase angle. The ground current for each phase is calculated using the measured three-phase currents of each section. The **D 060** also calculates the real and reactive power, the power factor and the frequency.

As an intelligent analog input module, the **D 060** performs current and voltage auto-calibration. It allows measurement up to 2 p.u., with a precision of 0.5 % (relative to the voltage or current nominal values), as well as fault detection, up to 10 p.u., with a precision of 2 % (relative to the current nominal value) or up to 20 p.u. with a precision of 5 % (also relative to the current nominal value).

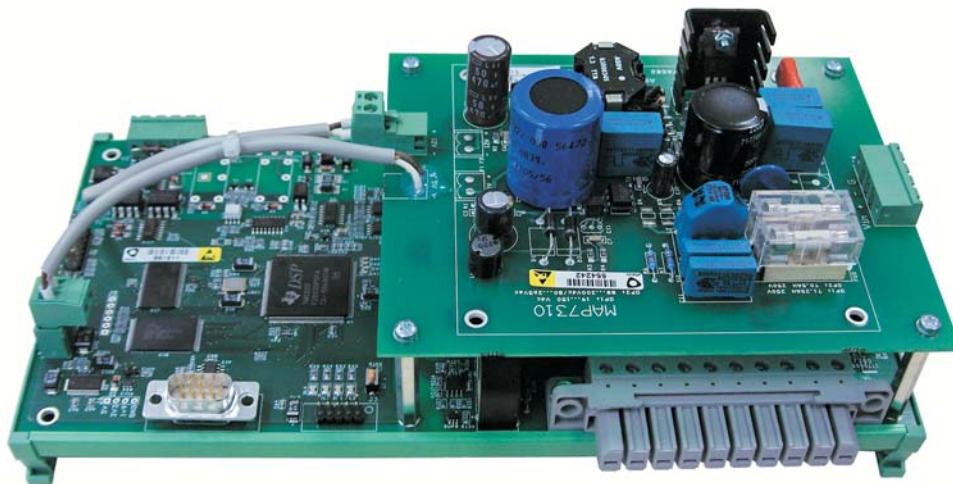
Other Characteristics

The **D 060** automatically performs self-diagnostic functions, providing remote indication of problems through means of a dry contact (digital output).

The **D 060** is compliant with the most demanding electromagnetic compatibility standards, satisfying the EC mark.

D 060 configuration is performed through the front serial port (RJ11), using the provided software configuration tool. Remote configuration is also possible through the communications port, using MODBUS or DNP3 protocols.

The **D 060** is available in a stainless steel enclosure with LED indicators, or can be provided without the enclosure for DIN-rail mounting within an equipment cabinet.



D 060 for DIN-rail mounting

D 060



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