MCT-250 Metering and Control Transponder

Description
The MCT-250 Distribution Line Carrier (DLC) transponder is a two-way device designed to monitor and report the status of up to four status inputs. The transponder may also be used to monitor system voltage at its remote location.

When used as an outage detector, the MCT-250 can detect the presence (or absence) of voltage on the load side of a protective device (reclosers or fuses) on the distribution line. When interrogated by the Central Station, the MCT-250 can report outage detection for a three-phase feeder plus a nearby single-phase tap.

The MCT-250 has the same load survey capability as the MCT-240. It also features a feedback load control (FLC) accumulator with variable interval. The accumulator holds the most recent completed interval data for retrieval by the Central Station. Data may be in the form of volt-squared hours, kilowatt hours or any metered quantity represented as pulses from a KYZ pulse initiator.

Up to 48 intervals of load survey data collected in 1 of 4 downloadable interval times (5, 15, 30 or 60 minutes)

Pluggable mounting using standard 6-blade meter socket

Standard meter sealing ring and security seals can be used

Standard white meter cover to minimize solar heat load

Electronic modules replaceable in meter shop

Unique and metering group addressing capability

Self protecting transmitter

Operating LED status indicators including test, power, 4 status, Y, and Z

Applications

Dry Contact Sense
The MCT-250 may be used to sense dry contacts. The MCT provides an isolated 22 Vac power source to provide a small current flow when the contacts close. The voltage coil of the interposing relays is chosen to match the source, for example, the source may be 120 Vac in which case the interposing relay coil would be rated for 120 Vac.

Refer to Figure 1 for a sample application for dry contact sense.

Voltage Monitoring
The MCT-250 may be applied to monitor system voltage as a stand-alone function. It will also perform this task when being used to monitor status inputs.

Voltage monitoring is performed in the MCT by accumulating KYZ pulses from a transducer or volt-squared hour meter and storing the data in a variable (5, 15, 30 or 60 min.) feedback load control interval, programmable by the system operator. When interrogated by the Central Station, the MCT sends back an accumulated pulse count for the most recent interval. Upon receipt, an appropriated multiplier is applied to convert the pulses to an average voltage value over the interval.

Refer to Figure 2 for a sample application for voltage monitoring.
Operation:
When the MCT-250 is used to sense a dry contact it provides an isolated 22 Vac voltage source to provide a small current flow when contacts close. An LED indicator located on the face of the MCT-250 lights when the corresponding contact is closed.

Specifications

Communication:
- Distribution Line Carrier (DLC)
- Receive and Transmit (two-way)
- Westinghouse EMETCON Protocol
- Carrier Frequency 9.6 or 12.5 kHz
- Modulation: Coherent Phase Shift Keying (CPSK)
- Data Rate: 70 to 80 bps
- Error Detection: Six Bit BCH Code on each transmission

Code Approval:
- FCC Verified (Part 15, Subpart J, Class B)

Surge Protection:
- Surge Protection: ANSI C37.90A

Operating Range:
- Temperature: -40 to +55 degrees C
- Humidity: 0 to 100% (noncondensing)

Power Requirements:
- 240 Vac, +10 percent, -20 percent, 60 Hz, single phase without neutral
- (Operating voltages of 120 and 208 Vac are also available)

Dimensions:
- Depth: 7.5 in. (19.1 cm)
- Diameter: 6.57 in. (17.2 cm)
- Weight: 3.75 lb. (1.8 kg)

Accessories
- LOAD CONTROL EXTENSION CABLE – Style Number 7302C76G04, 4 leads per cable, 48” long, includes 2 x 4-PIN connectors to mate with MCT-250P OUTPUT leads, cable to be cut in field (one cable is included with each MCT-250P)
- MCT-250P SOCKET (includes sealing ring), Style Number 2D25504G08

Figure 1 – Sample Circuit for MCT-250 used for Dry Contact Sense
Operation:
The MCT-250 voltage monitor uses DLC communications to return circuit voltage readings to the Central Station. A standard distribution transformer or potential transformer may be used to provide 120 volts to the voltage transducer. A distribution transformer must be used to provide power to the MCT-250 to ensure a clear communication path for DLC signal.

The output of the transducer is a low level DC current which is proportional to the AC voltage input. The DC signal is fed into the pulse converter which produces a train of standard KYZ metering pulses. The pulse frequency is proportional to the DC input. This pulse train is fed into the MCT-250 which counts the pulses over a specified time interval (typically 15 minutes). When requested by the Central Station, the MCT-250 reports the number of pulses accumulated over the most recent interval. When the pulse count is received by the Central Station it applies an appropriate multiplier to calculate the integrated voltage level for the specified time interval.

Figure 2 – Sample Circuit for MCT-250 Used as Feeder Voltage Monitor with Transducer Input

Model and Style Numbers

<table>
<thead>
<tr>
<th>Model Number</th>
<th>Package Style</th>
<th>Carrier Frequency</th>
<th>Voltage</th>
<th>Status Inputs</th>
<th>LED Indication</th>
<th>Control Relays</th>
<th>Style Number</th>
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</thead>
<tbody>
<tr>
<td>MCT-250</td>
<td>Pluggable</td>
<td>12.5 kHz</td>
<td>240 Vac</td>
<td>4</td>
<td>Power, Test, Y, Z, &amp; 4 Status</td>
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