

Montgomery County Public Schools Facilities Guide

DIVISION 16 – ELECTRICAL

SECTION 16440 SWITCHBOARDS

PART 1 – GENERAL

- A. For all new and modernization projects, electrical service characteristics should be 480/277v, 3 phase, 4 wire. Deviation from this standard requires approval by the MCPS Division of Construction.
- B. For an addition to an existing facility, if the additional connected load and existing maximum demand load (provided by power company), exceed 80% of existing incoming main electrical service than it is preferred that existing electrical service be upgraded if feasible. Otherwise, the existing service can be utilized provided that the electrical designer coordinates with the local power company, notifying it that the additional electrical load is to be added.
- C. Building service switchboard/Main distribution panel shall have six disconnects with the building load divided into four main disconnects with the remaining two left as space for future use.
- D. Engineer must use connected load for all load calculations. the designer shall perform fault current calculations before sizing the over-current protection for panelboards, chillers, distribution panelboards, etc.
- E. Engineer shall submit a preliminary service application to the Utility Company with 5 copies of preliminary electrical site drawings at the completion of the design development drawings.
- F. Engineer shall submit a revised service application to the Utility Company with 5 copies of the electrical site drawings at the completion of the 100% contract drawings.
- E. All bus bars in switchgear shall be copper. Aluminum is not acceptable.
- F. All switchboards shall be circuit breaker type. (switch/fuse type is not preferred).
- G. Provide transient voltage surge suppressor (TVSS) at switchboard for the protection of AC electrical circuits from the effects of lightning-induced currents, substation switching transients, and internally generated transients resulting from inductive or capacitive load switching.
- H. Engineer must use connected load for all load calculations.
- I. Provide a 5 year warranty for all circuit breakers to include parts and labor.
- I. Provide data acquisition system for all main circuit breakers. See Standard data acquisition system cut sheet on the following pages.
- J. Provide space in the Main Electrical Room for a future DC to AC inverter for future photovoltaic connection to the main grid power. Provide two 4" empty conduits from the future DC to AC inverter to the nearest corridor accessible ceiling space.
- K. Acceptable Manufacturers: Square D, Eaton/Cutler-Hammer, Siemens, General Electric.

Twelve setpoints are configurable for 1-second operation. Each setpoint can be triggered on the over or under conditions you specify.

These setpoints to trigger:

- Data logging
- Digital outputs
- Clearing and reset functions
- Pulse outputs
- Call-back (9350)

Software Integration

The meters can be easily integrated within an energy management or SCADA system to provide remote display of all measured parameters at a PC workstation, as well as remote configuration and manual control capabilities.

WinPM.Net

The meters are compatible with our Microsoft® Windows® 2000-based WinPM.Net power monitoring software. WinPM.Net web-enabled software displays real-time and logged data and offers manual control/configuration capabilities. It provides enterprise-wide data sharing in a secure networked environment.

Internet Connectivity

MeterM@il

When equipped with an Ethernet port, the 9330 and 9350 can automatically e-mail alarm notifications or scheduled status updates. MeterM@il messages can be received like any e-mail message, at a workstation, cell phone, pager or PDA. Data logs can also be sent on an event-driven or scheduled basis via e-mail, while conveniently accommodating firewall restrictions.

WebMeter®

An on-board Web server, when combined with an Ethernet port, offers quick and easy access to real-time energy and basic power quality information without special software. Built-in web pages display a range of energy and basic power quality information through any web-enabled device and even support basic meter configuration tasks.

Communications

RS-485 Ports

The 9300 is equipped with a single RS-485 port, while the 9330 and 9350 can have two RS-485 ports, depending on the communications options selected.

- Optically isolated
- Baud rates up to 19,200 bps
- Compatible with WinPM.Net power monitoring software and supports Modbus RTU
- The 9330 and 9350 also support DNP 3.0

Infrared Data Port

A front panel optical port is offered on all models in the 9300 series.

- Compatible with an ANSI C12.13 Type II magnetic optical communications coupler and can operate at baud rates up to 19,200 bps
- For infrared energy pulsing or communication with our own power monitoring software

Ethernet Port (optional)

All meters in the 9300 series can be ordered with an optional 10Base-T port for direct access to metering information via an Ethernet LAN/WAN.

- Protocol: ION®, Modbus TCP
- Baud rate: up to 10 Mbps
- Ping and Telnet diagnostic services
- EtherGate allows the 9330 and 9350 to act as a gateway, allowing the direct transfer of data between an Ethernet network and up to 31 RS-485 devices

PROFIBUS Port (optional)

PROFIBUS DP Standard protocol support via sub-D 9 pin female connector is offered exclusively on the 9300.

Internal Modem

The 9330 and 9350 offer an optional, space saving, internal modem which helps reduce cost and improve reliability by replacing external modems and RS-485 to RS-232 converters.

- Baud rates from 300 bps to 33,600 bps
- "ModemGate" feature lets the remote master station access the meter and up to 31 other devices connected to the RS-485 loop through a single internal modem
- Compatible with WinPM.Net power monitoring software and supports Modbus RTU or DNP 3.0
- RJ-11 or a captured wire connector
- The 9350 is offered with a call-back feature for quick alarm response

Interoperability

The 9330 and 9350 can concurrently communicate via multiple protocols so you can use its advanced features to extend an existing Modbus, DNP or WinPM.Net network. Logs and real time values are also available through Modbus. In addition, the meters are fully supported by UTS MV-90® through serial and Ethernet.

Simple Configuration Tools

The 9300 series is based on patented technology which ensures the longevity of your metering solution because it can adapt as your needs change.

The measurements and other functions of the meters are provided by modules.

You can quickly add or rearrange functions with drag-and-drop icons and a few clicks of a mouse. Imagine new features and build them.

Inputs/Outputs*

The 9300 series offers a variety of analog and digital I/O combinations. The analog I/O option can be specified for any 9300 series meter, allowing you to monitor a wide range of conditions, such as flow rates, device cycles (RPM), fuel levels, oil pressures and transformer temperatures. You can output energy pulses to an RTU or perform equipment control operations.

Status Inputs

Four optically isolated digital inputs on the 9330 and 9350 meters can monitor status, count transducer pulses, breaker trips and pulses from any external "volts free" dry contact.

Digital Outputs

9300 series meters are equipped with 4 fully programmable digital output ports, suitable for pulsing or controlling relays. An optional extension board provides external relays that can be controlled by the digital outputs. The Infrared Data Port and/or a rear panel LED can also be used for energy pulsing.

Relay Extension Board

Optional Digital Output Extension Board extends the four digital outputs to allow relay control. A range of relay options are available. (Please contact Siemens.)

Example 9330 Communication Connections

