

POWER SYSTEM ACCESSORIES

KOHLER POWER SYSTEMS

Monitor III Software



Software for Monitoring and Control of:

- Decision-Maker™ 550 generator set controller
- Decision-Maker™ 340 generator set controller
- Decision-Maker™ 3+ generator set controller
- MPAC™ 1000 automatic transfer switch controller
- M340 and M340+ automatic transfer switch controllers
- PM340 Power Monitor

New Features

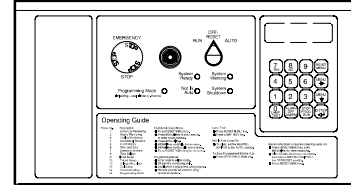
- Now monitor Kohler® Decision-Maker™ 3+ generator set controllers and MPAC™ 1000 automatic transfer switch controllers as well as 550 generator set controllers and 340 series devices with one software package
- View the status of all devices on one site overview screen
- Password-protected data access: Guest, User, and Supervisor levels
- Ethernet capability
- Software kits include hardware for either local or remote communications

Standard Software Features and Functions

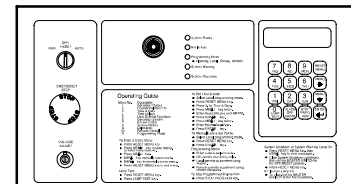
- Monitor and control the power system's generator sets and transfer switches from a personal computer using a single software package
- Monitor and control systems through a Windows®-based graphical user interface
- Monitor and control systems over a local area network, remotely via a modem connection, or through an Ethernet connection
- Connect up to 247 controller devices on a local area network
- Monitor data from multiple devices on the same local area network simultaneously
- Start or stop the engine from a remote PC
- Read trip points, time delays, and system parameters on all controllers
- Adjust trip points, time delays, and system parameters on Decision-Maker™ 550 and MPAC™ 1000 controllers
- Assign inputs and outputs on Decision-Maker™ 550 and MPAC™ 1000 controllers
- View ECM data for ECM-equipped engines
- Device data windows automatically update

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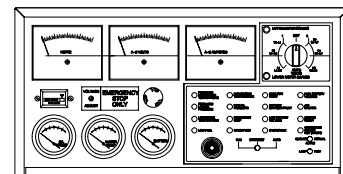
Applicable Controllers



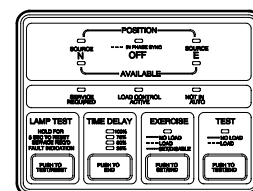
Decision-Maker™ 550
Generator Set Controller



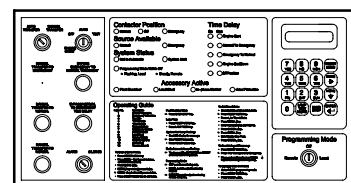
Decision-Maker™ 340
Generator Set Controller



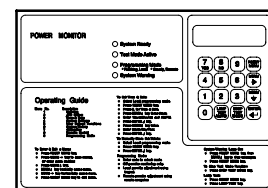
Decision-Maker™ 3+
Generator Set Controller



MPAC™ 1000
Transfer Switch Controller



M340+ Transfer Switch Controller
(shown with available options)



PM340 Power Monitor

Monitoring and Control System Features

Minimum System Requirements

Create custom screens containing data windows that display system information, controller settings, and operating status for connected generator sets, transfer switches, and power monitors. For more information, see TP-6347, Monitor III Software Operation and Installation Manual.

- Easily select, create, arrange, or delete data windows.
- Create data windows for multiple devices in a network on the same screen.
- Create and save multiple screen configurations for different applications.
- Change controller settings, time delays, and system parameters on Decision-Maker™ 550 controllers and MPAC™ 1000 transfer switch controllers.
- Assign inputs and outputs on Decision-Maker™ 550 controllers and MPAC™ 1000 transfer switch controllers.
- View system run time history for most devices.
- View up to 100 recent events including engine starts, faults, shutdowns, and warnings for the Decision-Maker™ 550 controllers and MPAC™ 1000 transfer switch controllers.

- 133 MHz or higher Intel® Pentium®-compatible CPU
- 32 MB RAM
- CD-ROM drive and 75 MB hard drive space available for installation
- 800 x 600 or better color monitor (1024 x 768 recommended)
- Windows® 2000 or Windows XP® operating system with Internet Explorer version 4.0 or higher
- COM port numbered between 1 and 255, capable of baud rate 9600 or 19200 (for direct local connection)
- PC network interface card (NIC) (for applications using ethernet connections only)
- Adobe® Acrobat® or Adobe® Reader® (to display the Help file)

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Decision-Maker™ 550 Generator Set Controller

All of the following information is available through Decision-Maker™ 550 controller communications. “Read only” indicates parameters that can be monitored but not adjusted through Monitor III. “Read and write” indicates parameters that can be monitored and adjusted using Monitor III.

Monitoring

- Date and Time (read and write)
- Engine Info (read only)
 - Battery ECM voltage
 - Coolant Level
 - Coolant Pressure
 - Coolant Temperature
 - Engine speed (RPM)
 - Fuel last run consumption
 - Fuel pressure
 - Fuel burn rate, liters/hr. or gal./hr.
 - Fuel temperature
 - Intake air filter diff. pressure
 - Intake air temperature
 - Oil pressure
 - Oil level
 - Oil temperature
 - Oil crankcase pressure
- Event History (read the 100 most recent events)
 - Faults
 - Warnings
 - Shutdowns
 - Input activation
 - Output activation
 - Time and date of each event
- Electrical Information (read only)
 - % of rated kW
 - Current, L1, L2, L3
 - Frequency
 - Line-line voltage
 - Line-neutral voltage
 - Total kVA, L1, L2, and L3
 - Total kVAR, L1, L2, and L3
 - Total kW, L1, L2, and L3
 - Total power factor, L1, L2, and L3
- Maintenance (read only)
 - kW hours, total and since last maintenance
 - Last maintenance date
 - Last run start date
 - Last run start time
 - Loaded/unloaded run time, total and since last maintenance
 - Number of starts, total and since last maintenance
 - Operating days
 - Run time, total and since last maintenance
 - Run time loaded and unloaded, total and since last maintenance
- Maintenance and Manual Operations (password-protected access)
 - Engine run time (read and write)
 - Set run time button
 - Reset maintenance records button
 - Start engine button
 - Stop engine button
 - Reset faults button

System Parameters

- Generator Info (read and write)
 - Battery voltage (nominal)
 - Connection, wye or delta
 - kW rating
 - NFPA 110 default settings, enabled or disabled
 - Phase, single or three
 - Nominal frequency
 - Nominal voltage
 - Operating mode, standby or prime power
- System Info (read only, except user-defined as noted)
 - Alternator model number
 - Controller serial number
 - Engine model number
 - Final assembler's clock number
 - Final assembly date
 - Generator set serial number
 - Generator set model number
 - Genset name (optional user-defined equipment name)
 - Load description (optional user-defined description)
 - Location (optional user-defined description)
 - Serial number entered during setup
 - Specification number
 - Version number for the controller's application code
- Trip Points (read and write)
 - High battery voltage
 - load shed output
 - Low battery voltage
 - Overfrequency
 - Overspeed
 - Overvoltage
 - Underfrequency
 - Undervoltage
- Time Delays (read and write)
 - Crank on
 - Crank pause
 - Engine cooldown
 - Coolant temperature override selection box (setup window)
 - Engine start
 - Load shed
 - Maximum crank cycles
 - Overvoltage
 - Starting aid
 - Undervoltage

Decision-Maker™ 550 Generator Set Controller, continued

Inputs

Assign up to 7 analog inputs and 21 digital inputs.

- Analog Inputs (read and write)
 - High shutdown value
 - High warning value
 - Inhibit time
 - Low shutdown value
 - Low warning value
 - Shutdown delay
 - Shutdown enabled
 - Warning delay
 - Warning enabled
- Digital Inputs (read and write)
 - Warning
 - Shutdowns, type A and B
 - Voltage raise
 - Voltage lower
 - Variable PF (power factor) mode
 - Remote shutdown
 - Remote reset
 - Air damper
 - Low fuel (level or pressure)
 - Field overvoltage
 - Idle mode active [engine control module (ECM) only]
 - Battleswitch
 - Ground fault
 - Battery charger fault
 - High oil temperature (non-ECM)
 - Low coolant level
 - Low coolant temperature (not user-selectable)
 - Enable synch (not user-selectable)
 - AFM (air-fuel module) shutdown (Waukesha only)
 - Knock shutdown (Waukesha only)
 - Detonation warning (Waukesha only)
 - Detonation shutdown (Waukesha only)
 - Low fuel shutdown (Waukesha only)
 - Breaker closed (not user-selectable)

Outputs

Assign up to 31 relay driver outputs (RDOs). Define any event as a common fault, except as noted

- Relay Driver Outputs (RDOs), System Events, and Common Faults (read and write)
 - AC sensing loss
 - Air damper control
 - Air damper indicator
 - Air/fuel module (AFM) remote start
 - Air temperature signal loss
 - Alternator protection shutdown
 - Analog inputs 1-7
 - Battery charger fault
 - Breaker trip
 - Critical overvoltage
 - Defined common fault (not selectable as common fault)
 - Delay engine cooldown
 - Delay engine start

- Digital inputs 1-21
- EEPROM write failure
- Emergency power system (EPS) supplying load
- Emergency stop
- Fuel valve relay
- Generator running
- Ground fault
- High air temperature shutdown
- High air temperature warning
- High battery voltage
- High coolant temperature shutdown
- High coolant temperature warning
- High oil temperature shutdown
- High oil temperature warning
- In synch
- Internal fault
- Load shed kW over
- Load shed overtemperature
- Load shed underfrequency
- Locked rotor
- Loss of ECM communications
- Loss of field shutdown
- Low battery voltage
- Low coolant level
- Low coolant temperature shutdown
- Low coolant temperature warning
- Low fuel
- Master switch error
- Master switch not in AUTO
- Master switch off
- Master switch open
- Block heater control (for future MDEC applications)
- Yellow alert (for future MDEC applications)
- Red alert (for future MDEC applications)
- NFPA 110 fault
- No coolant temperature signal
- No oil pressure signal
- Oil pressure shutdown
- Oil pressure warning
- Oil temperature signal loss
- Overcrank
- Overcurrent shutdown
- Overcurrent warning
- Overfrequency
- Overpower shutdown
- Overspeed
- Overvoltage
- Prelube relay
- Protective relay common (for switchgear applications)
- Reverse power shutdown (for switchgear applications)
- Software-controlled relay driver outputs (SCRDOs) 1-4
- Speed sensor fault
- Starting aid
- System ready
- Underfrequency
- Undervoltage
- Weak battery

Decision-Maker™ 340 Generator Set Controller

All of the following information for Decision-Maker™ 340 generator set controllers can be monitored through Monitor III.

A Modbus/KBUS converter is required for this device.

- Electrical Info
 - Current, L1, L2, and L3
 - Frequency
 - Percent of alternator kilowatt rating
 - Power factor
 - Total kilowatts
 - Voltage, line-to-line and line-to-neutral for all phases
- Common fault selections
- Auxiliary inputs
 - Delay time before posting events
 - Description
 - Inhibit time after engine starting
- Engine parameters
 - Battery voltage
 - Coolant temperature
 - Engine speed
 - Oil pressure
- History, total since initial startup and since last maintenance record reset
 - Days of operation
 - Last run time (duration)
 - System startup date and time
 - Energy delivered, kilowatt hours
 - Last start date
 - Last start time
 - Number of starts
 - Run time loaded
 - Run time unloaded
 - Shutdown history, date and description (code)
- Relay driver output assignments
- Manual Operations
 - Reset faults
 - Engine run time
 - Set run time (start engine)
- System information
 - Controller serial number
 - Generator set name
 - Load description
 - Location
 - Model number
 - Number of phases
 - Generator set serial number
 - Specification number
- System status
 - Generator set kilowatt rating
 - Battery voltage (12 or 24), nominal
 - Generator status (stopped/running/cranking)
 - Master switch position
 - Programming mode
 - System status including current shutdown or warning
 - System voltage (nominal)
 - System frequency (nominal)
- Date/Time
- Time delay settings
 - Crank on
 - Crank pause
 - Engine cooldown
 - Engine start
 - Maximum number of crank cycles
 - Overvoltage
 - Undervoltage
 - Starting aid
- Trip point settings
 - Low battery voltage
 - High battery voltage
 - Overfrequency
 - Underfrequency
 - Overspeed
 - Overvoltage
 - Undervoltage

Decision-Maker™ 3+ Generator Set Controller with Communications

All of the following information for Decision-Maker™ 3+ generator set controllers can be monitored through Monitor III. The Decision-Maker™ 3+ controller with communications (red main logic board) and the Modbus® communication board are required.

- ECM Information (for ECM-equipped engines only)
 - Communication protocol, J1939, MTU, or MTU with VSG
 - DC voltage at ECM (analog)
 - ECM hours of operation
 - ECM fault code
- Engine Information (analog)
 - Engine speed, RPM
 - Coolant temperature (ECM-equipped engines only)
 - Fuel temperature (ECM-equipped engines only)
 - Charge air temperature (ECM-equipped engines only)
 - Oil pressure (ECM-equipped engines only)
 - Fuel pressure (ECM-equipped engines only)
 - Charge air pressure (ECM-equipped engines only)
- Manual Operations
 - Start engine button
 - Stop engine button
 - Reset faults button
- DIP Switch Settings
 - Overspeed: 50/60 Hz or 60/70 Hz
 - Temperature cooldown: enabled or disabled
 - Crank mode: continuous or cyclic
 - Engine: non-ECM, DDC/MTU, J1939, or MTU with VSG
- Status (indicators on or off to show the following)
 - Run mode
 - Generator running
 - System ready
 - Lost ECM communications
 - Common fault
 - High coolant temperature
 - Low coolant temperature
 - Low oil pressure
 - Not in auto
 - Emergency stop
 - Master switch error
 - Overcrank
 - Overspeed
 - Locked rotor
 - No AC voltage
 - Speed sensor fault
 - Intermittent speed sensor
 - Air damper switch
 - Low fuel
 - High battery voltage
 - Low battery voltage
 - Battery charger
 - ATS emergency on
 - User input #1
 - User input #2
 - ECM red alarm
 - ECM yellow alarm

MPAC™ 1000 Automatic Transfer Switch Controller

Monitoring and Setup

The following information can be monitored and adjusted for both the Normal and Emergency sources.

- Voltage Set Points (read and write)
 - Overvoltage dropout, in % of nominal and volts
 - Overvoltage pickup, in % of dropout and volts
 - Undervoltage pickup, in % of nominal and volts
 - Undervoltage dropout in % of pickup and volts
 - Debounce time, seconds
- Frequency Set Points (read and write)
 - Overfrequency dropout, in % of pickup and Hz
 - Overfrequency pickup, in % of nominal and Hz
 - Underfrequency pickup, in % of nominal and Hz
 - Underfrequency dropout in % of pickup and Hz
 - Frequency dropout time, seconds
- Time Delays
 - Source N engine start
 - Source E engine start
 - Source N engine cooldown
 - Source E engine cooldown
 - Preferred to standby
 - Standby to preferred
 - Acquire standby source
 - In phase monitor synch
 - Off to standby, programmed-transition mode
 - Off to preferred, programmed-transition mode
- Date/Time
 - Date
 - Time
 - Synchronize with computer button (setup only)
 - Automatically adjust for daylight saving time checkbox (setup only)
- Exerciser
 - Mode: manual, calendar, or calendar w/manual override
 - Next exercise start date
 - Next exercise start time
 - Manual exercise period
 - Loaded/unloaded
 - Run time
 - Manual exercise disable button (setup only)
 - Manual exercise set/end button (setup only)
 - Exercise time remaining
- Exercise Calendar Mode
 - Event number
 - Next start date
 - Start time
 - Run time
 - Loaded/unloaded
 - Interval
 - Repeat rate (setup only)
- Manual Operation (password-protected access)
 - Peak shave start/stop buttons
 - System test start/stop buttons
 - Programmed transition transfer to OFF button
 - Programmed transition resume normal operation button
 - Modbus-controlled relay outputs on/off toggle
- Load Control, I/O module outputs (read and write)
 - Disconnect before transfer time delay, Normal to Emergency and Emergency to Normal
 - Reconnect after transfer time delay, Normal to Emergency and Emergency to Normal
- Programmable Inputs
 - Forced transfer to off
 - Peak shave mode
 - Inhibit transfer
 - Remote end time delay
 - Remote test
 - Low battery voltage
 - Remote common alarm
 - Bypass contactor disable
 - 3 source system disable
- Programmable Outputs and Common Alarms
 - Preferred source available
 - Standby source available
 - Contactor in preferred position
 - Contactor in standby position
 - Contactor in off position
 - Contactor in source N position
 - Contactor in source E position
 - Not in auto
 - Load control active
 - Low battery on standby source
 - Exerciser started
 - Test mode active
 - Peak shave active
 - Non-emergency transfer
 - Load bank activate
 - Start source N generator
 - Start source E generator
 - In phase monitor waiting for synch
 - Common alarm
 - Source N undervoltage
 - Source N overvoltage
 - Source N loss of phase
 - Source N phase rotation error
 - Source N overfrequency
 - Source N underfrequency
 - Source E undervoltage
 - Source E overvoltage
 - Source E loss of phase
 - Source E phase rotation error
 - Source E overfrequency
 - Source E underfrequency
 - Failure to acquire standby
 - Failure to transfer
 - I/O module comms lost
 - I/O module not found
 - Aux. switch fault
 - Aux. switch open
 - Load control outputs 0-8
 - Modbus controlled RDO 1-4
 - 3 source system disable

MPAC™ 1000 Automatic Transfer Switch Controller, continued

Monitoring

The following information is displayed for both the Normal and Emergency sources.

- Source Info, Normal and Emergency
 - Voltage, line-to-line
 - Voltage, line-to-neutral
 - Frequency
 - Phases, single or three
 - Selected rotation (ABC or CBA)
 - Actual rotation (ABC or CBA)
 - System voltage (nominal)
 - System frequency (nominal)
- System Info (read only except as noted)
 - Designation (optional user-defined equipment name)
 - Location (optional user-defined description)
 - Load branch (optional user-defined description)
 - Load description (optional user-defined description)
 - ATS serial number (factory-set)
 - Contactor serial number (factory-set)
 - Controller serial number (factory-set)
 - Software version numbers, controller, PIC chip, and I/O modules
- System Summary
 - System state
 - Contactor position
 - Preferred source, N/E
 - Mode of operation, gen-utility, gen-gen, utility-utility
 - Transition mode, open/programmed
 - Extended engine start time delay, enabled/disabled
 - Preferred source available
 - Standby source available
 - Supervised transfer, mode and switch position
 - Commit to transfer, enabled/disabled
 - Peak shave delay bypass, enabled/disabled
 - In phase monitor, enabled/disabled
 - Rated current
 - I/O modules expected
- Event History
 - Lost preferred source: last time, date, and duration
 - Faults
 - Input activation
 - Output activation
 - DIP switch position changes
 - Test button activation/release
 - Time and date of each event
 - Save history button to save event log to a text file
- Maintenance Records
 - Time not in preferred, total and since reset
 - Time in standby, total and since reset
 - Operation time, total and since reset
 - Switch transfers, total and since reset
 - Lost preferred source, total and since reset
 - Failures to transfer, total and since reset
 - System start date
 - Last maintenance reset date
 - Transfer time, N to E, mS
 - Transfer time, E to N, mS
- DIP Switch Settings
 - Transfer inhibited/permitted
 - Test loaded/unloaded
 - Exercise inhibited/permitted
 - Manual exercise 1 week/2 week
 - Exercise loaded/unloaded
 - Commit/no commit to transfer
 - Phase rotation ABC/CBA
 - Spare switch on/off

M340 and M340+ Transfer Switch Controllers

All of the following information for M340 and M340+ transfer switch controllers can be monitored through Monitor III.

A Modbus/KBUS converter is required for this device.

- Date/Time
- Frequency Setpoints, % of Nominal and Hz for Source N and Source E
 - Overfrequency dropout
 - Overfrequency pickup
 - Underfrequency pickup
 - Underfrequency dropout
- Maintenance History
 - Time not in normal position, total and since maintenance
 - Time in emergency, total and since maintenance
 - Days of operation, total and since maintenance
 - Number of transfers, total and since maintenance
 - Last maintenance date
 - System start date
 - Exercise time remaining
 - Last exercise date
 - Last outage date
 - Last outage time
 - Last outage duration
- Manual Operations
 - Engine run time
 - Set run time button (starts engine)
- Source Info for Source N and Source E
 - Line-to-line voltage
 - Frequency
 - System voltage
 - System frequency

- System Info
 - ATS name
 - Location
 - Load description
 - Branch
 - ATS serial number
 - Controller serial number
 - Number of phases
 - Switch size
- System Summary
 - Alert code
 - Switch position
 - Programming mode
 - System status messages
- Time Delays
 - Engine start
 - Normal to emergency
 - Emergency to normal
 - Engine cooldown
 - Before emergency
 - After emergency
 - Sequence to emergency
 - Return to emergency
 - Before normal
 - After normal
 - Sequence to normal
 - Return to normal
- Voltage Setpoints, % of Nominal and Volts for Source N and Source E
 - Overvoltage dropout
 - Overvoltage pickup
 - Undervoltage pickup
 - Undervoltage dropout

PM340 Power Monitor

All of the following information is available through PM340 Power Monitor communications. Parameters can be monitored but not adjusted through Monitor III.

A Modbus/KBUS converter is required for this device.

- Analog Inputs
- Auxiliary Inputs
 - Description
 - Inhibit time
- Date/Time
- Electrical Info
 - Voltage, line-to-line
 - Voltage, line-to-neutral
 - Current, L1, L2, L3
 - Frequency
 - Total kW
 - Total kVAR
 - Power factor
 - Power supply voltage, VDC
- History
 - Run time, normal
 - Run time, emergency
 - Run time, off
 - Event history, date and event description (code)
- Manual Operations
 - Engine run time
 - Set run time button (engine start)

- System Info
 - Generator set name
 - Location
 - Load description
 - Model number
 - Specification number
 - Generator set serial number
 - Controller serial number
- System Summary
 - System status
 - Switch position
 - Contactor position
 - Programming mode
 - Test mode timed
 - Test mode active
 - ATS rating
 - Nominal voltage
 - Nominal frequency
 - Phases
 - Connection type

Connection Types

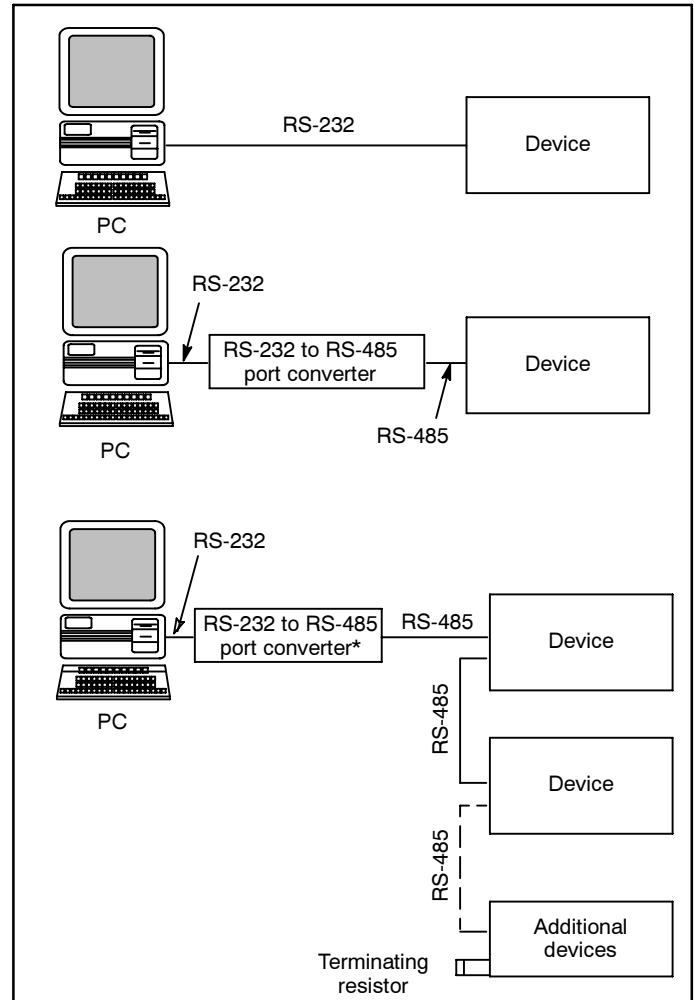
A personal computer (PC) can communicate with generator set controllers, transfer switch controllers, and power monitors using local, remote modem, or remote network (Ethernet) connections.

Connection Notes:

- A device in the following diagrams is any generator set controller, transfer switch controller, or power monitor listed on page 1 of this document. All devices must be configured for Modbus communication.
- The Decision-Maker™ 340, M340, M340+, and PM340 Power Monitor require Modbus/KBUS converters.
- Remote network (Ethernet) connections require a Modbus/Ethernet converter.
- RS-232 connects up to 15.2 m (50 ft.) from PC's serial port.
- RS-485 connects up to 247 devices with a maximum total cable length of 1220 m (4000 ft.). Use a terminating resistor on the last device in the network. See EIA standards.
- The 550 controller can act as an RS-232 to RS-485 port converter when the controller is located within 15 m (50 ft.) of the PC.
- The Decision-Maker™ 3+ and MPAC™ 1000 controllers must use RS-485 connections for Monitor III communications.

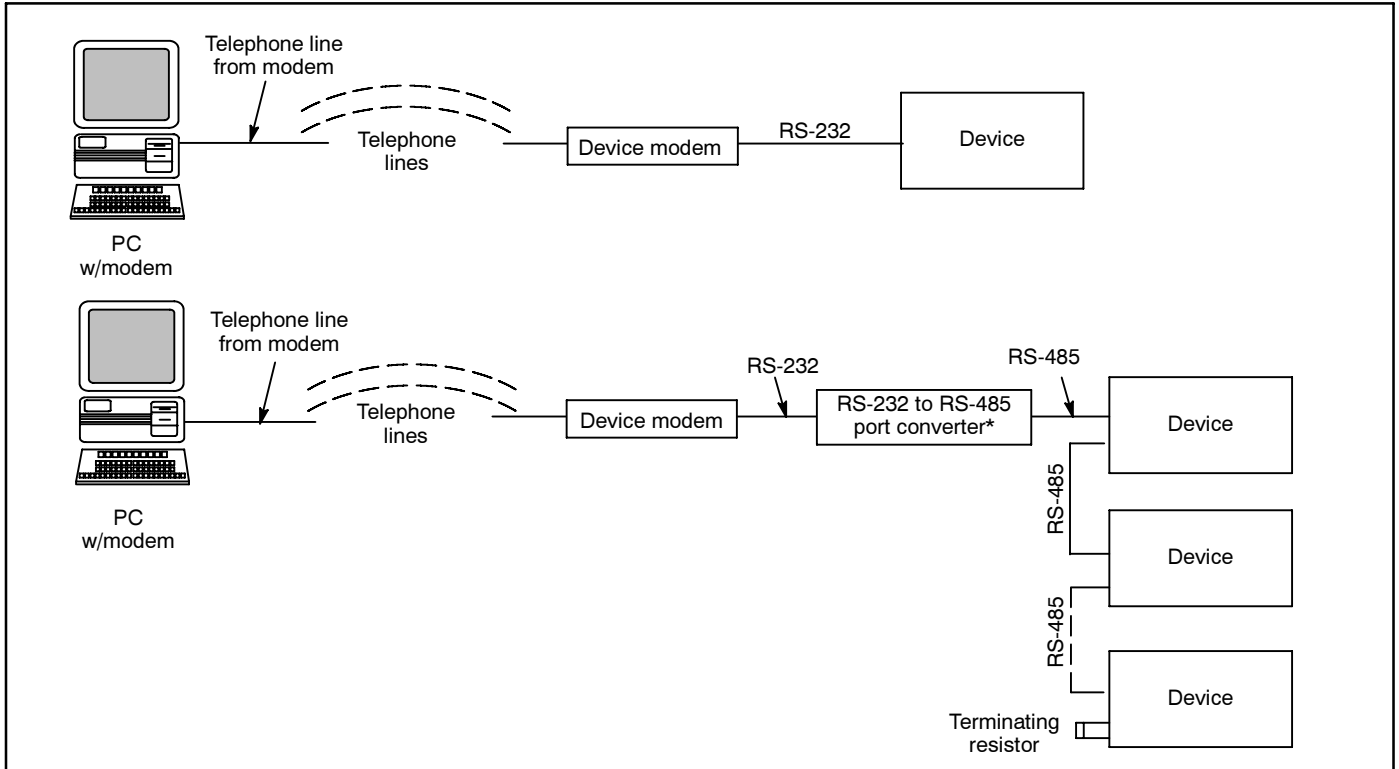
Local Connections

A PC connects directly to a device or network of devices with an RS-232 cable or an RS-485 cable.



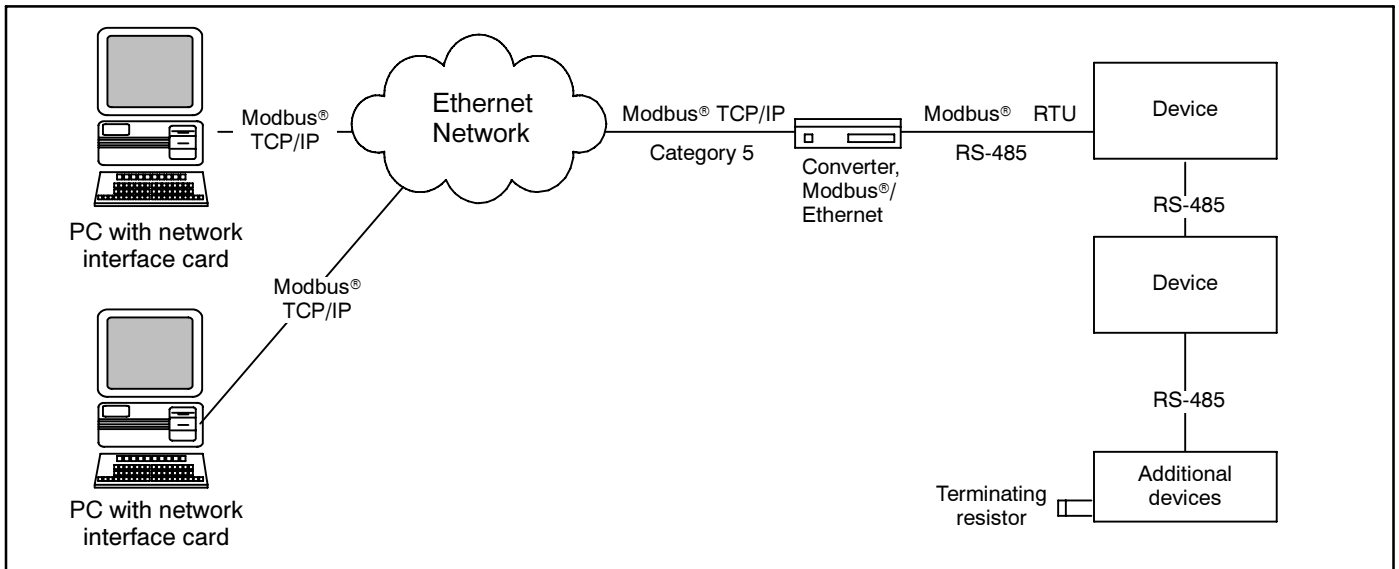
Remote Modem Connections

The PC and device(s) are connected by modems. The PC communicates with the device or device network via a telephone network, and the PC can be located anywhere a telephone line can be accessed.



Remote Network Connection (Ethernet)

APC with a network interface card is connected to the Ethernet network. The devices are connected together using RS-485 connections and connect to the Ethernet network through a Modbus®/Ethernet converter. The PC can be located anywhere the site's Ethernet network can be accessed.



Network Communication Products and Accessories

- Monitor III software kit with hardware key. Includes:
 - Software CD-ROM
 - Null modem cable
 - Network termination resistor
 - Operation manual and connection instructions
- Monitor III software kit with hardware key and device modem for remote connections. Includes:
 - Software CD-ROM
 - AT modem cable
 - Device modem, 120VAC/60Hz, 19.2k baud
 - Optical isolator
 - Converter, RS-232/RS-485
 - Connector, 9-pin/25-pin
 - Null modem, 25-pin
 - Network termination resistor
 - Operation manual and connection instructions
- Device modem kit, 220VAC/50Hz, 19.2k baud
- RS-232/RS-485 port converter
- Null modem cable, 9-pin/9-pin
- Modbus®/Ethernet converter kits (RS-485/RJ-45 connectors; required for TCP/IP connections). Includes DC adapter with universal AC plug
- Modbus®/KBUS converter kits* for the following devices (required for Modbus® communication):
 - Decision-Maker™ 340 generator set controller
 - M340 and M340+ transfer switch controller
 - PM340 power monitor
- Modbus® communication board for Decision-Maker™ 3+ generator set controllers (required for Modbus® communication)

* Modbus®/KBUS converter kits are not required for the Decision-Maker™ 550, Decision-Maker™ 3+, or MPAC™ 1000 controller.
Modbus® is a registered trademark of Schneider Electric.

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