

Systems Integration

Modbus 250 Driver on the PXC Series Platform

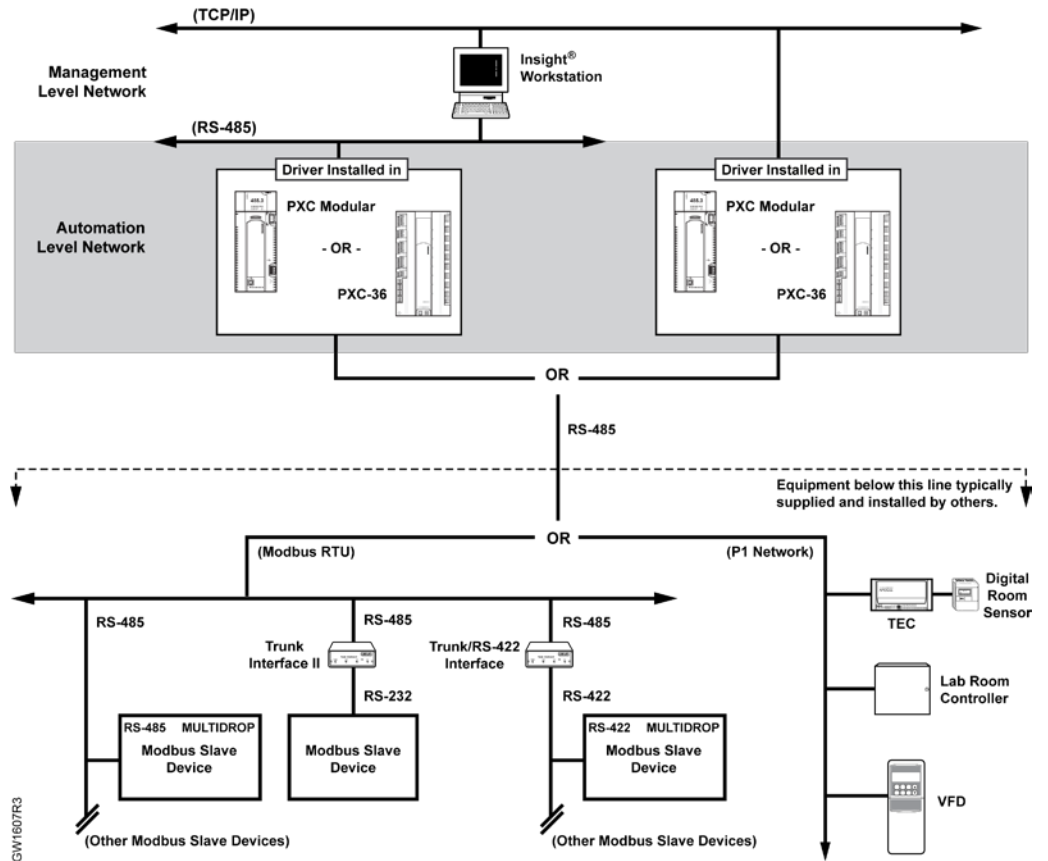


Figure 1: System Architecture—Modbus 250 Driver in RTU Master Mode (Firmware 2.x).

Notes on System Architecture

The Modbus 250 Driver in RTU Master Mode (Figure 1) with Firmware 2.x, supports the following:

- Three physical FLNs (FLN 1 through FLN 3) on PXC Modular hardware, which can be used for connecting and addressing either Modbus RTU or P1 devices on RS-485 FLNs.
- Up to two physical FLNs (FLN 1 through FLN 2) on PXC-36 hardware, depending on the ALN chosen, which can be used for connecting and addressing either Modbus RTU or P1 devices on RS-485 FLNs.

- With Firmware 3.5 and later, one physical FLN (1) on the BACnet/IP PXC-24 and PXC-16 hardware can be used for connecting and addressing either Modbus RTU or P1 devices on RS-485 FLNs.
- Up to 247 device addresses per FLN.
- TX-I/O Modules.
- Maximum of 8,000 APOGEE points per driver.
- Maximum of 250 Modbus points per driver.

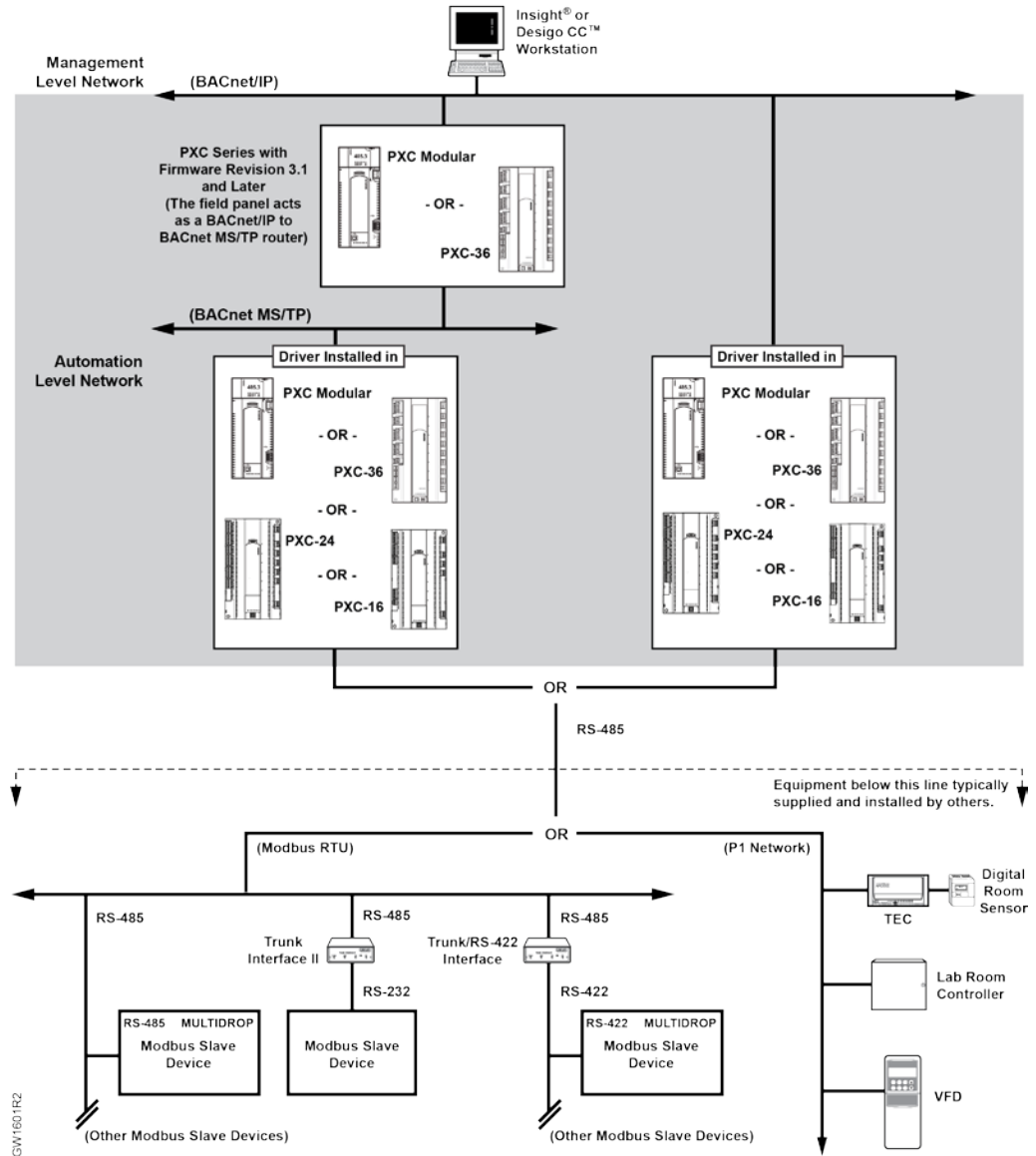


Figure 2: System Architecture—Modbus 250 Driver in RTU Master Mode (Firmware 3.x).

Notes on System Architecture

The Modbus 250 Driver in RTU Master Mode (Figure 2), with Firmware 3.x, supports the following:

- BACnet MS/TP or BACnet/IP ALN on Firmware 3.x.
If the driver is on a BACnet MS/TP network, you can use a standard field panel with Firmware Revision 3.1 or later as a router to connect to an Insight workstation. Do not use an Integration Driver as the router.

- Three physical FLNs (FLN 1 through FLN 3) on PXC Modular hardware, which can be used for connecting and addressing either Modbus RTU or P1 devices on RS-485 FLNs.
- Up to two physical FLNs (FLN 1 through FLN 2) on PXC-36 hardware, depending on the ALN chosen, which can be used for connecting and addressing either Modbus RTU or P1 devices on RS-485 FLNs.
- With Firmware 3.5 and later, one physical FLN (1) on the BACnet/IP PXC-24 and PXC-16 hardware can be used for connecting and addressing Modbus RTU or P1 devices on RS-485 FLNs. In addition, the Ethernet port can be used for Modbus TCP or Modbus RTU over IP.
- Up to 247 device addresses per FLN.
- TX-I/O Modules.
- Maximum of 8,000 APOGEE points per driver.
- Maximum of 250 Modbus points per driver.

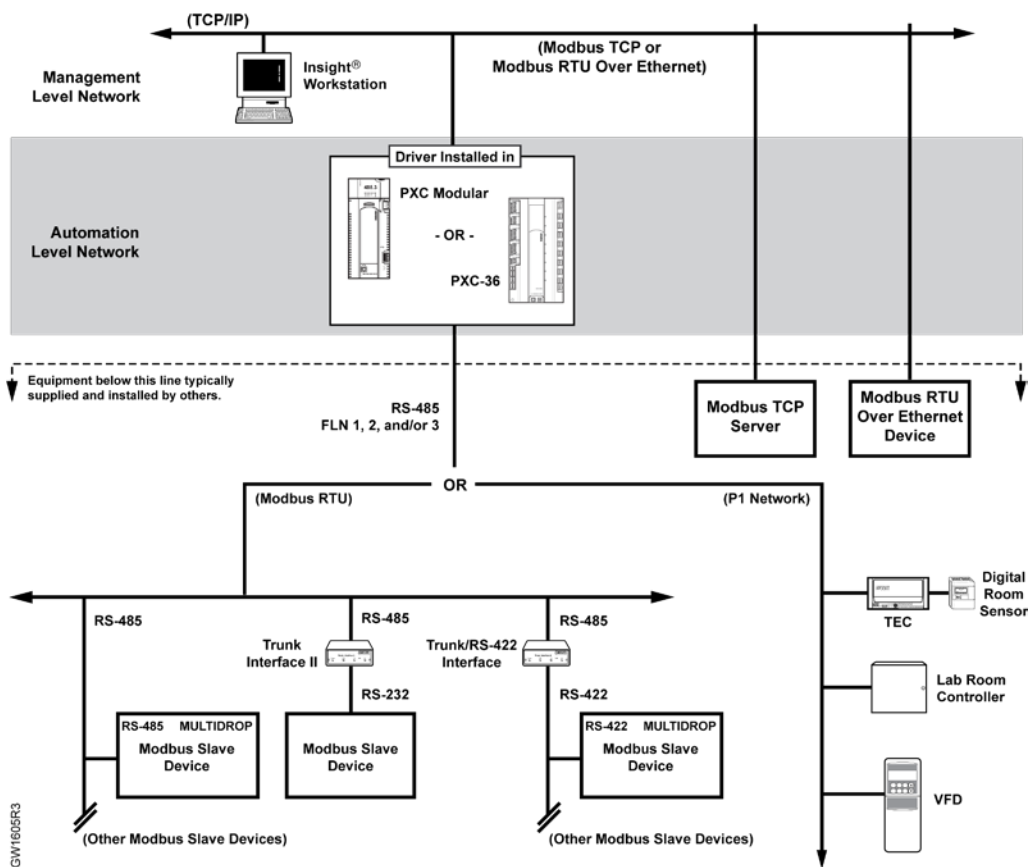


Figure 3: System Architecture—Modbus RTU Master, Modbus TCP Client, and Modbus RTU over Ethernet on Firmware Revision 2.x.

Notes on System Architecture

The Modbus 250 Driver as RTU Master, Modbus TCP Client, and Modbus RTU over Ethernet on Firmware Revision 2.x (Figure 3) supports the following:

- Three physical FLNs (FLN 1 through FLN 3) on PXC Modular hardware can be used for connecting and addressing either Modbus RTU or P1 devices on RS-485 FLNs.
- Up to two physical FLNs (FLN 1 through FLN 2) on PXC-36 hardware, depending on ALN chosen, can be used for connecting and addressing either Modbus RTU or P1 devices on RS-485 FLNs.
- Up to 95 virtual FLNs (6 through 100) for mapping devices through an Ethernet TCP/IP network.

- Up to 95 virtual FLNs (6 through 100) for mapping devices accessed through Modbus RTU over Ethernet. Diagnostic Point 50 identifies which FLNs are used for RTU communication (at and below the set value) and which FLNs are used for TCP communication (above the set value).
- Up to 247 device addresses per FLN.
- TX-I/O Modules.
- Maximum of 8,000 APOGEE points per driver.
- Maximum of 250 Modbus points per driver.

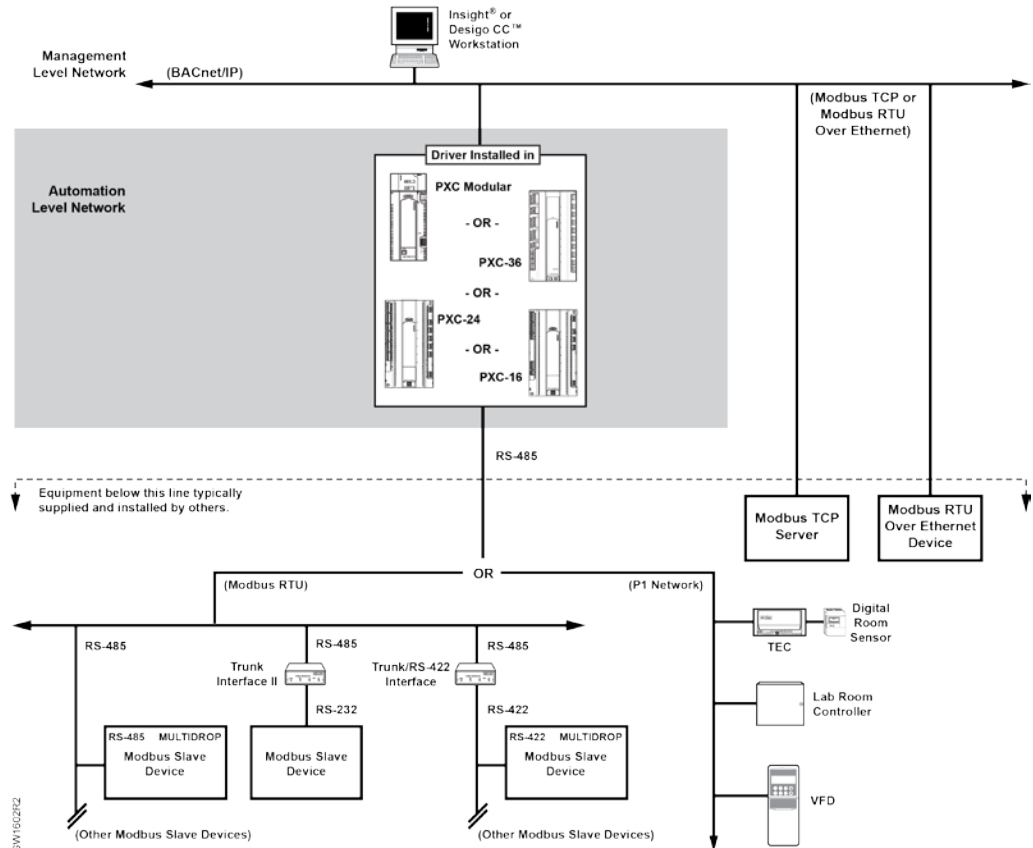


Figure 4: System Architecture—Modbus RTU Master, Modbus TCP Client, and Modbus RTU over Ethernet on Firmware Revision 3.x.

Notes on System Architecture

The Modbus 250 Driver as RTU Master, Modbus TCP Client, and Modbus RTU over Ethernet on Firmware Revision 3.x (Figure 4) supports the following:

- BACnet MS/TP or BACnet/IP ALN on Firmware 3.x.
If the driver is on a BACnet MS/TP network, you can use a standard field panel with Firmware Revision 3.1 or later as a router to connect to an Insight workstation. Do not use an Integration Driver as the router.
- Three physical FLNs (FLN 1 through FLN 3) on PXC Modular hardware can be used for connecting and addressing either Modbus RTU or P1 devices on RS-485 FLNs.
- Up to two physical FLNs (FLN 1 through FLN 2) on PXC-36 hardware, depending on ALN chosen, can be used for connecting and addressing either Modbus RTU or P1 devices on RS-485 FLNs.
- Up to 95 virtual FLNs (6 through 100) for mapping devices through an Ethernet TCP/IP network.
- Up to 95 virtual FLNs (6 through 100) for mapping devices accessed through Modbus RTU over Ethernet. Diagnostic Point 50 identifies which FLNs are used

for RTU communication (at and below the set value) and which FLNs are used for TCP communication (above the set value).

- Up to 247 device addresses per FLN.
- TX-I/O Modules.
- Maximum of 8,000 APOGEE points per driver.
- Maximum of 250 Modbus points per driver.



NOTE:

The limit of 250 Modbus points per driver does not apply to I/O, addressing, diagnostic, and P1 application points.

Functionality

The Modbus 250 Driver provides communication between the APOGEE® Automation System and the vendor's Modbus system.

The Modbus 250 Driver can be loaded into PXC Modular or PXC-36 hardware. The driver is a microprocessor-based, multi-tasking platform designed for multi-system communication and control.

- When using a P2 ALN, the Modbus 250 Driver communicates with Insight software, other APOGEE field panels and controllers, and the vendor's Modbus system.
- When using a BACnet ALN, the Modbus 250 Driver communicates with Insight workstation software, other APOGEE field panels and controllers, and the vendor's Modbus system.

Through the Insight workstation, the Modbus points can be monitored and commanded. The Modbus points integrated into the APOGEE Automation System can be accessed by system applications, such as Powers Process Control Language (PPCL), scheduling, trending, and alarming.

The Modbus 250 Driver will not affect, in any way, the operating sequence or safeties as factory-programmed into the vendor's Modbus system.



NOTE:

BACnet Field Panel Web Server licenses LSM-FPWEB, LSM-FPWEBPL and LSM-FPWEBPLHST are now retired. Launch Pad must be used instead and is available for free download from Standard Apps/Partner Extranet.

Keys to Success

Ensure that all Modbus equipment to be integrated supports the Modbus RTU or TCP protocols. The Modbus ASCII protocol is not supported.

Benefits

Systems integration brings the powerful facility control capabilities of the APOGEE Automation System together with vendor system. Integrating the Modbus points allows both systems to operate as a single system providing marked advantages in the following:

- Reduced operating and training costs.
- Increased employee productivity.
- Increased diagnostic capabilities to extend equipment life.
- Improved systems information and control.
- Maximized energy savings.

Ordering Information

PXC Modular Series

PXC00-PE96.A	PXC Modular, Ethernet or RS-485 ALN, 96 FLN nodes
PXC00-E96.A	PXC Modular, BACnet/IP or MS/TP ALN, 96 FLN nodes, TX-I/O module support
PXC100-PE96.A	PXC Modular, Ethernet or RS-485 ALN, 96 FLN nodes, TX-I/O module support
PXC100-E96.A	PXC Modular, BACnet/IP or MS/TP ALN, 96 FLN nodes, TX-I/O module support
PXX-485.3	Expansion Module, three RS-485 FLN connections

PXC Compact Series

PXC36-PE.A	PXC Compact, 36 point, Ethernet/IP or RS-485 ALN. Firmware revision 3.5.1 and earlier require an additional license for P1 FLN (LSM-FLN36.A).
PXC36-E.A	PXC Compact, 36 point, BACnet/IP or MS/TP ALN. Firmware revision 3.5.1 and earlier require an additional license for P1 FLN (LSM-FLN36.A).
PXC36-PEF.A	PXC Compact, 36 point, Ethernet/IP or RS-485 ALN. Includes licenses for TX-I/O module and P1 FLN support.
PXC36-EF.A	PXC Compact, 36 point, BACnet/IP or MS/TP ALN. Includes licenses for TX-I/O module and P1 FLN support.
PXC24.2-EF32.A	PXC Compact, 24 point, BACnet/IP ALN, P1 or MS/TP FLN
PXC16.2-EF32.A	PXC Compact, 16 point, BACnet/IP ALN, FLN enabled

Accessories

538-670	Trunk Interface II, 115V
538-675	Trunk Interface II, 230V
538-755	Trunk/RS-422 Interface (115V Power)
538-760	Trunk/RS-422 Interface (230V Power)
536-004	RS-232 Cable

License

LSM-INT-MDBS250	License to enable the Modbus 250 Driver on PXC Modular or PXC-36, BACnet/IP PXC-24 or PXC-16 hardware.
LSM-ADAPT	License to use the Adaptive Control added in FW 3.5.1/2.8.18 and later

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