# System Layouts

Because of the flexibility of the DX80 wireless devices, many different configurations using Gateways, Nodes, GatewayPros, Ethernet Bridges, Modbus slave devices, data radios, data radio repeaters, and/or solar powered systems are possible, both as stand-alone systems and host-connected systems.




DX83 Ethernet Bridge




DX80 Gateway, 900 MHz

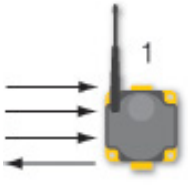


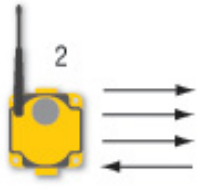

DX80DR9M-H MultiHop Radio

## Stand-Alone Systems

### Mapped Pairs (DX70)

In this system, a DX70 pair is used to map I/O in a simple one-to-one configuration. Inputs on one DX70 are mapped to the outputs of the other device. DX70 kits are configured at the factory and require no additional configuration by the user.




| Item | Model No. | Description |
|---|---|---|
| 1 | DX70G... | DX70 Gateway |
| 2 | DX70N... | DX70 Node |

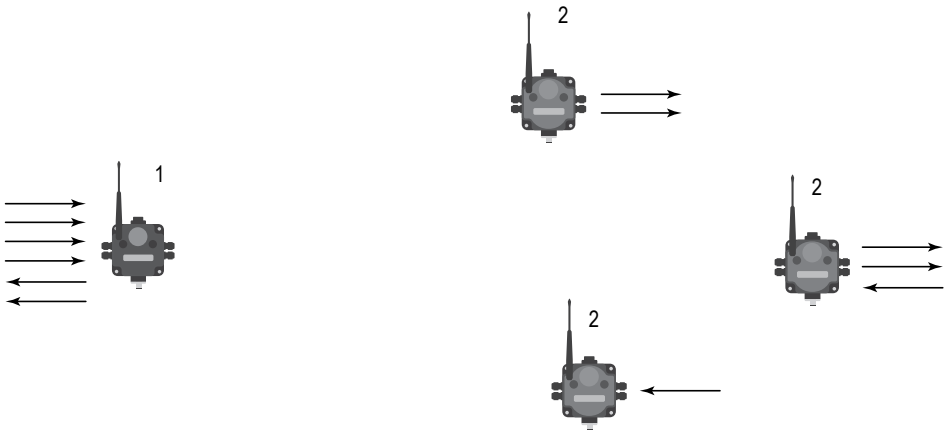


ПРОМЭЛЕКТРОНИКА/ sales@prom-elec.com

## Gateway with Multiple Nodes (DX80)

In this configuration, the Gateway is the master of the wireless network.

Configure this network using the User Configuration Tool (UCT) and RS-485 to USB adapter cable. The UCT is used to map inputs and outputs between Nodes and Gateways.

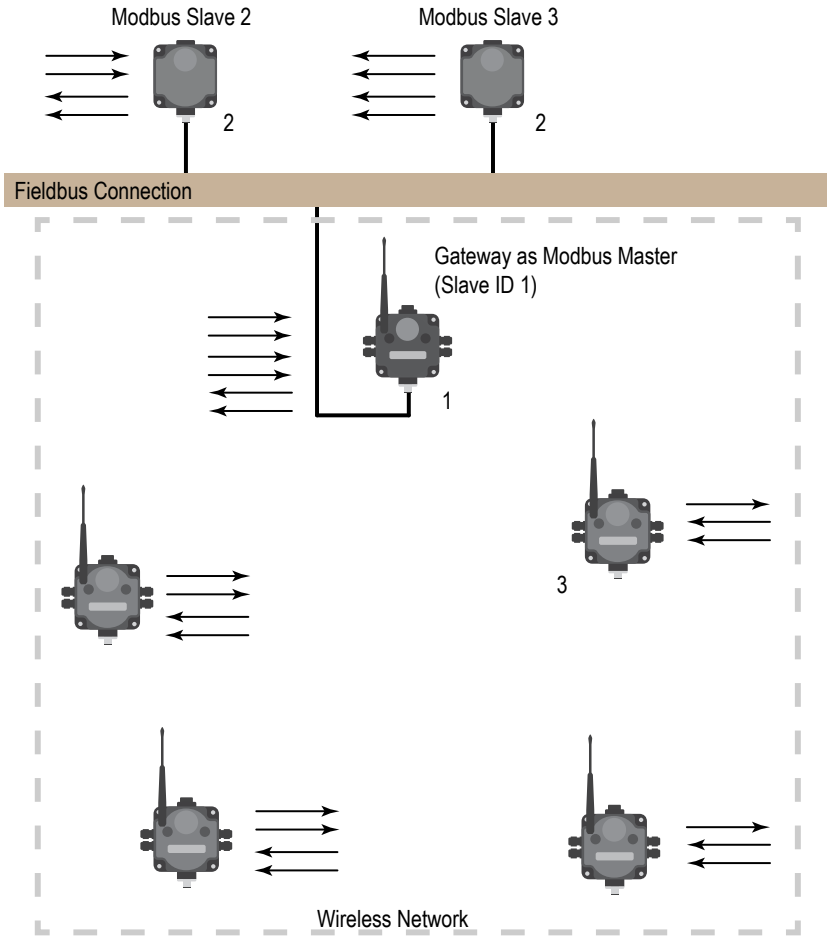



| Item | Model No. | Description |
|---|---|---|
| 1 | DX80G... | DX80 or DX80 Performance Gateway |
| 2 | DX80N... | DX80 or DX80 Performance Node |
| | 81398 | User Configuration Tool (free to download from the *Wireless Products* section of Banner Engineering's website) |
| | BWA-HW-006 | RS-485 to USB adapter cable (not shown) |

## Gateway Configured as a Modbus Master

This example network uses the Gateway as master of the wireless network and master of the Modbus network. This configuration is used when the I/O capacity of the Gateway is exceeded.

The Gateway is configured with a table of mapping entries that allow the DX85 Modbus RTU Remote I/O devices (as Modbus slaves) to be mapped to the wireless Nodes. The DX85 devices add additional I/O points to the network through hard-wired fieldbus connections on the Gateway side.



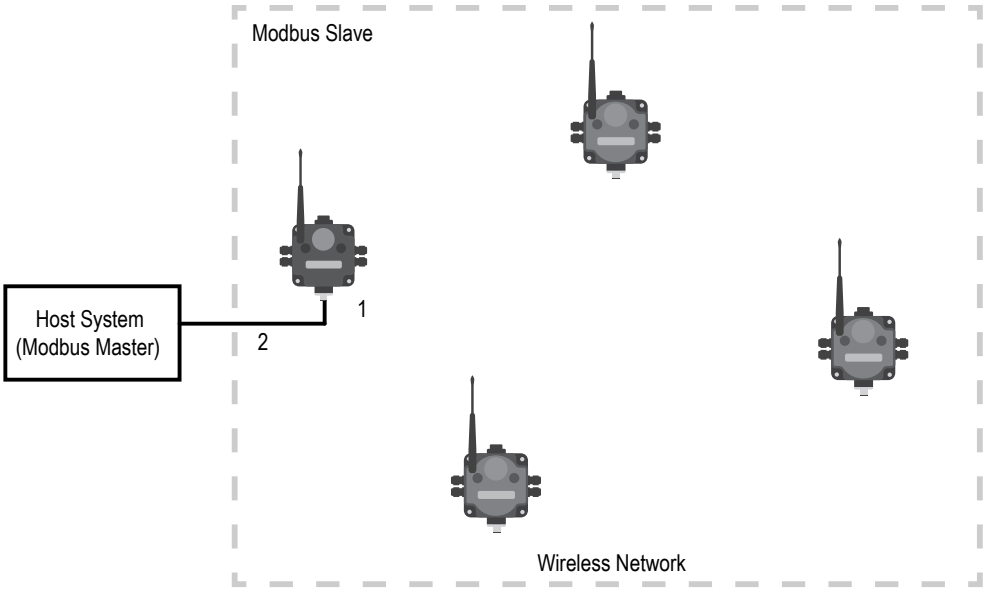

| Item | Model No. | Description |
|---|---|---|
| 1 | DX80G... | DX80 or DX80 Performance Gateway |
| 2 | DX85M... | DX85 Modbus RTU Remote I/O |
| 3 | DX80N... | DX80 or DX80 Performance Nodes or FlexPower Nodes |
| | 81398 | User Configuration Tool (free to download from the *Wireless Products* section of Banner Engineering's website) |
| | BWA-HW-006 | RS-485 to USB adapter cable (not shown) |

# Modbus RTU

## Modbus RTU Host Controlled Operation

A simple host-connected system uses an RS-485 serial cable to connect the Gateway to a host system.

The host system may be a PC or a PLC unit. Because the serial cable is used to connect to a host system, the communications protocol used is Modbus RTU. The wireless network is a Modbus slave. In this configuration, the wireless network collects I/O data and sends it back to a Modbus host system.



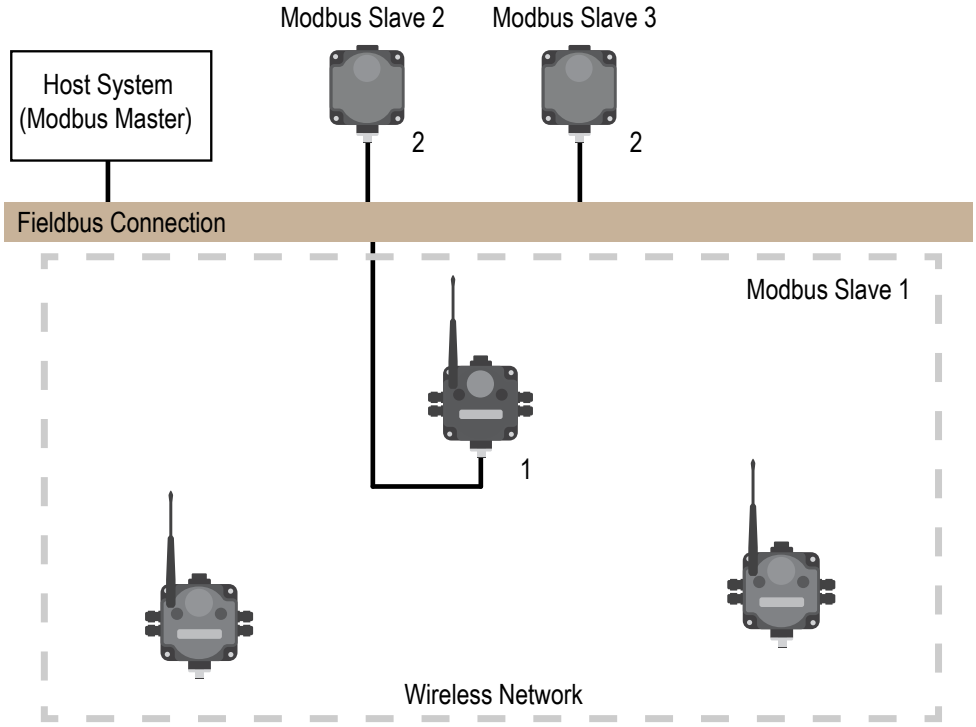

| Item | Model No. | Description |
|---|---|---|
| 1 | DX80G... | DX80 or DX80 Performance Gateway |
| 2 | CSRB-M1250M125.47M125.73 | Cable, RS-485, quick disconnect 5-pin Euro, male trunk, female branches, black |
| | MQDC1-5*** | Cable, RS-485, quick disconnect 5-pin Euro, female single end, lengths vary (not shown) |

## Modbus RTU with Multiple Slave Devices

In the example host controlled configuration, the Gateway is a Modbus slave to the host system, but remains the master of the wireless network.

The Gateway is connected directly to the host system using an RS-485 serial cable. This system may also connect DX85 Modbus RTU Remote I/O devices to the serial cable to expand the available I/O. The Gateway and each DX85 connected as shown below are Modbus slave devices to the host system.

Purpose: This wireless network also collects I/O data and sends it back to a Modbus host system, but adds local wired I/O points.



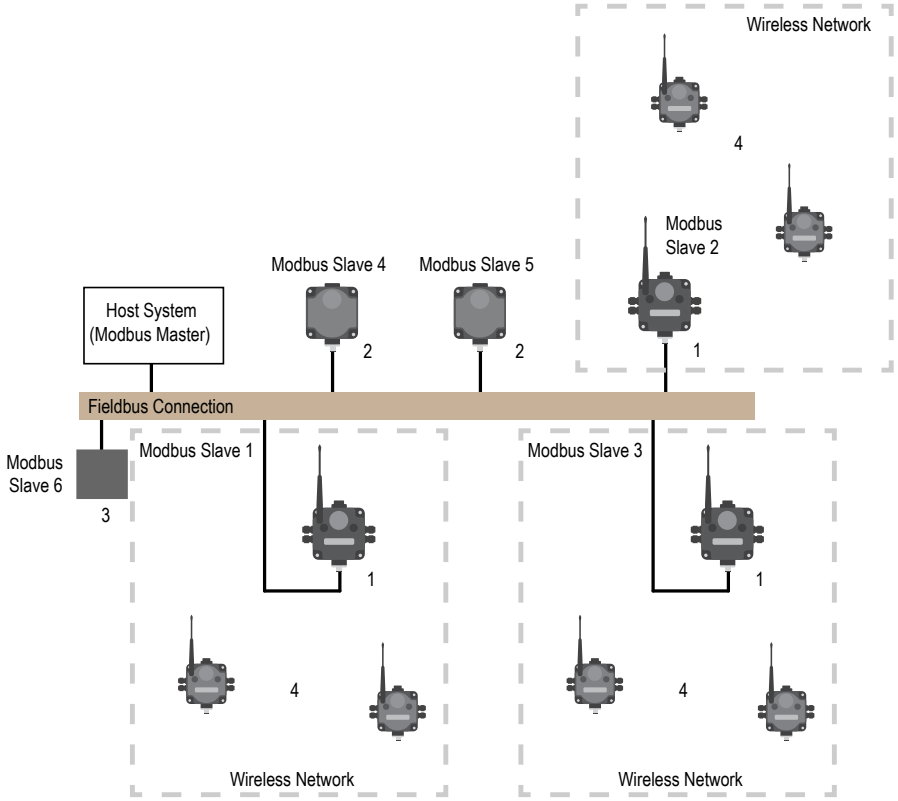

| Item | Model No. | Description |
|---|---|---|
| 1 | DX80G... | DX80 or DX80 Performance Gateway |
| 2 | DX85M... | DX85 Modbus RTU Remote I/O |
| 3 | MQDC1-5*** | Cable, RS-485, quick disconnect 5-pin Euro, female single end, lengths vary (not shown) |

## Modbus RTU with Multiple Slave Devices - Layout 2

In this example host controlled configuration, the Gateway is a Modbus slave to the host system, but remains the master of the wireless network.

The Gateway is connected directly to the host system using a fieldbus connection. This system also connects DX85 Modbus RTU Remote I/O devices and a third-party Modbus slave device to the serial bus to expand the available I/O. The Gateway and each DX85 connected as shown below are Modbus slave devices to the host system.

Purpose: This wireless network collects I/O data and sends it back to a Modbus host system, but adds local wired I/O points and expands the network using a fieldbus connection.



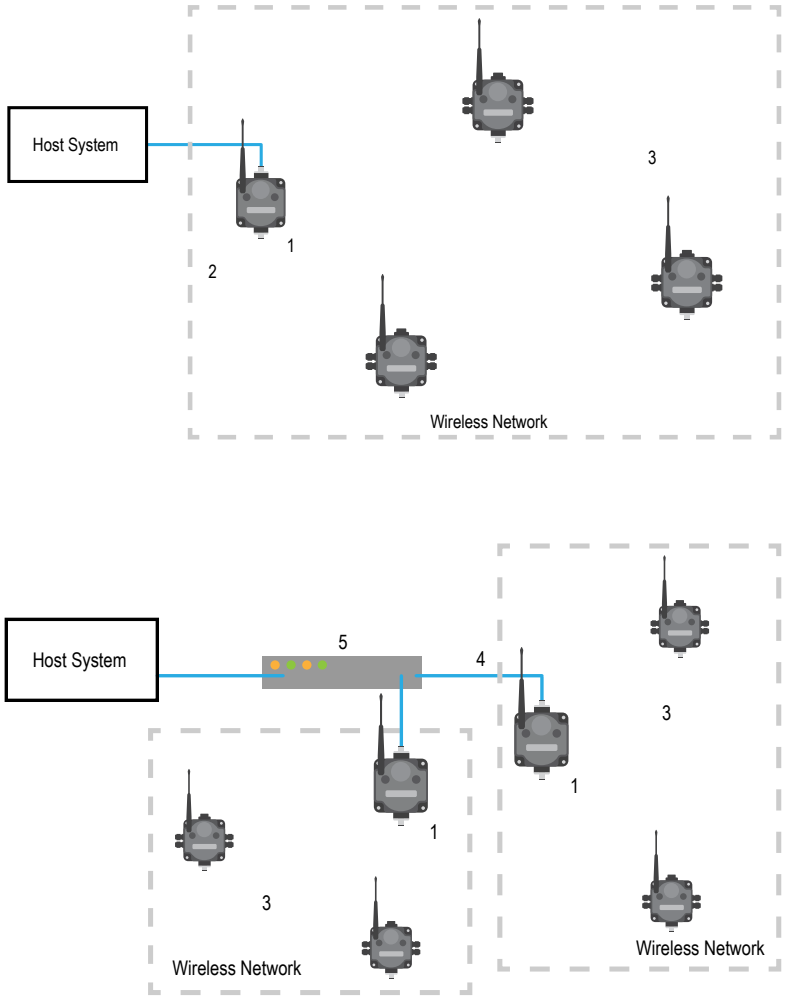

| Item | Model No. | Description |
|---|---|---|
| 1 | DX80G... | DX80 or DX80 Performance Gateway |
| 2 | DX85M... | DX85 Modbus RTU Remote I/O |
| 3 | | Third party Modbus slave device |
| 4 | DX80N... | DX80 or DX80 Performance Nodes or FlexPower Nodes |

# Modbus/TCP and EtherNet/IP

## Host Connected - DX80 GatewayPro

Connect a GatewayPro to a host system using the GatewayPro's industrial Ethernet connection.

To connect the GatewayPro directly to the host system, use a crossover cable. By default, the GatewayPro is a Modbus/TCP or EtherNet/IP™ server. To configure the GatewayPro as a Modbus client device, use the configuration Web pages.



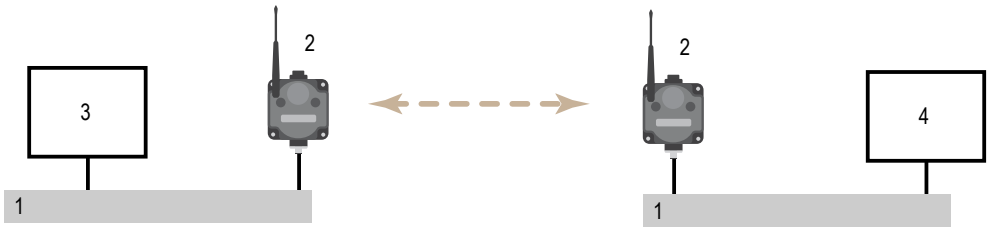

| Item | Model No. | Description |
|---|---|---|
| 1 | DX80P**6S | DX80 or DX80 Performance GatewayPro, Protocol converter or Advanced Config models |
| 2 | BWA-EX2M | Ethernet Cable, M12 Industrial/RJ45, Crossover, 2 m (using Modbus/TCP or EtherNet/IP) |
| 3 | DX80N... | DX80 or DX80 Performance Nodes or FlexPower Nodes |
| 4 | BWA-E2M | Ethernet Cable, M12 Industrial/RJ45, Straight, 2 m |
| 5 | | Ethernet hub or switch box |

# Data Radios

## Data Radios

Data radios extend the range of the Modbus network and keep the network addressing system simple.

In this basic example, the data radios act as a wire replacement to extend the Modbus network.

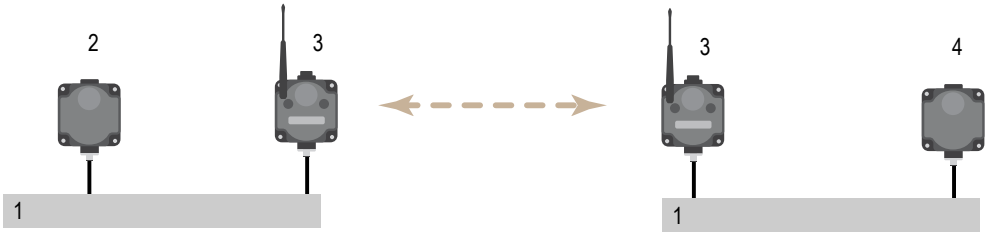



1. Fieldbus connection
2. Data radio
3. Modbus master device
4. Modbus slave device

## Data Radios with DX85 Modbus RTU Remote I/O Devices

In this example network, DX85 Extended Remote I/O devices are wired to the data radios and act as Modbus master or slave devices.

The data radios extend the range of the Modbus network.

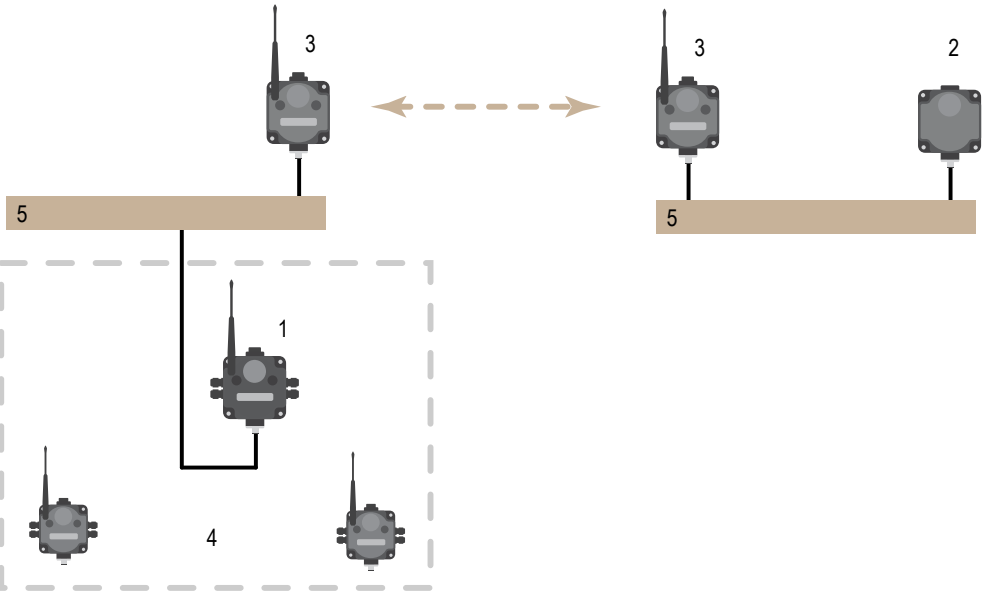



1. Fieldbus connection
2. DX85 as Modbus master
3. Data radio
4. DX85 as Modbus slave

## Data Radios with a Gateway as the Modbus Master

In this example network, the Gateway is both the master for the radio network and the master for the Modbus network.

The DX85 shown is a Modbus slave; the data radios extend the range of the Modbus network.




| Item | Model No. | Description |
|---|---|---|
| 1 | DX80G... | DX80 or DX80 Performance Gateway (configured as a Modbus master for this example) |
| 2 | DX85M... | DX85 Modbus RTU Remote I/O (configured as a Modbus slave for this example) |
| 3 | DX80DR*M-H | MultiHop Data Radio |
| 4 | DX80N... | DX80 or DX80 Performance Nodes or FlexPower Nodes |
| 5 | | Fieldbus connection |