Honeywell

Experion PKS
Honeywell DPR Interface Reference

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Honeywell

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Contents

Planning considerations for installing and configuring Honeywell DPR controllers

This reference provides the information you need to set up, configure, and test DPR controller communications with the server.

Revision history

Revision	Date	Description
A	February 2015	Initial release of document.

How to use this guide

These are the steps for connecting and configuring a DPR controller. Complete each step before commencing the next.

Steps	Go to
Connect the cables from the server to the DPR device as shown	Architectures for Honeywell DPR
Set the communication parameters on the DPR device	Communication settings for Honeywell DPR
Use Quick Builder to define a Honeywell DPR channel for the communications link	• Honeywell DPR channel and controller reference • "Build channels" topic in the *Quick Builder User's Guide*
Use Quick Builder to define a controller for each DPR device on the communication link	• Honeywell DPR channel and controller reference • "Build controllers" topic in the *Quick Builder User's Guide*
Download channel and controller definitions to the server	"Downloading items" topic in the *Quick Builder User's Guide*
Test the communications link between the server and the DPR device	Testing Honeywell DPR communications with the server
Use Quick Builder to define points	Defining a Honeywell DPR address for a point parameter

Related topics

"Devices supported by the Honeywell DPR interface" on page 6
"Other documentation for Honeywell DPR" on page 7
"Architectures for Honeywell DPR" on page 8
"Communication settings for Honeywell DPR" on page 11
"Honeywell DPR channel and controller reference" on page 13
"Testing Honeywell DPR communications with the server" on page 22
"Defining a Honeywell DPR address for a point parameter" on page 20

Devices supported by the Honeywell DPR interface

The server supports the following DPR models with the Modbus Communication Option installed:

- DPR3000
- DPR100
- DPR180
- DPR250

The server communicates with the devices via RS-232 or RS-485 connections using the Modbus protocol.

Other documentation for Honeywell DPR

Before using or installing the interface, be sure you have on hand for reference:

- *DPR3000 Communication Options Manual* (EN1I-6127)
- *DPR100 Communication Options Manual* (US1I-6149)
- *DPR180/DPR250 Communication Options Manual* (EN1I-6189)

Architectures for Honeywell DPR

DPR interface supports connection to the server via RS-232, RS-422, and RS-485 serial connection.

- If only one device is required to connect to the server, connect an RS-232 server port to the RS-232 DPR port. If your server has multiple serial ports, one additional DPR device can be connected per serial port.
- If multiple devices need to be connected to the server, RS-422 and RS-485 can be used with either an RS-232 to RS-422/RS-485 converter or a Stallion adapter.

Additional information can be found in the *Communication Options Manual* for your model DPR.

RS-232 cabling

RS-232 can be used to directly connect a single DPR device to a serial port on the server. If your server has multiple serial ports then one additional DPR device can be connected per serial port.

Connect the RS-232 port of the server to the RS-232 port of the DPR. Cabling diagrams for this connection are shown below.

DPR3000

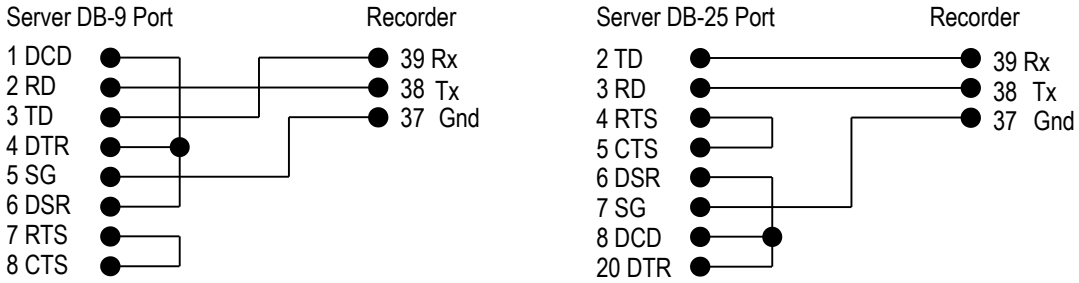

Figure 1: DPR3000 connections

DPR100, DPR180, and DPR250

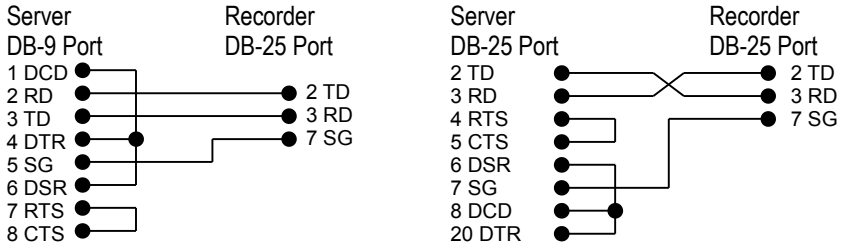

Figure 2: DPR100, DPR180, and DPR250 connections

Using an RS-232/485 converter

Honeywell recommends that you use the Black Box LD485-HS RS-232/485 Interface Converter. This converter has been qualified by Honeywell. Use of another converter may produce unexpected results.

To connect:

- Connect the RS-232 port of the Black Box converter to an RS-232 port on the server using a straight through cable.
- Connect the DPR devices on the RS-485 network to the converter.

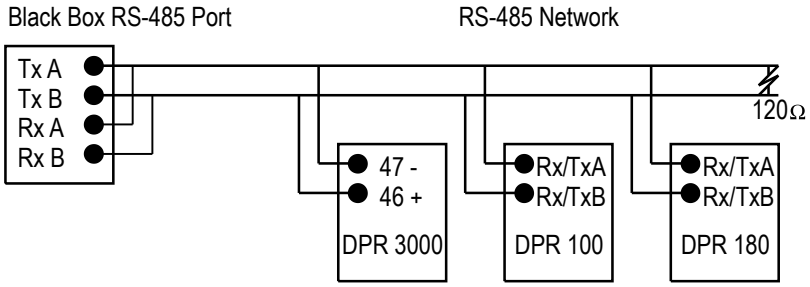

Figure 3: Black Box connections

Black Box settings

Switch	Setting	Description
XW1A	jumper in[1]	Configure RS-232 port as DCE.
XW1B	jumper out	Do not configure RS-232 port as DTE.
W8	B-C	2-wire (half-duplex) operation.
W9	C[1]	0 ms RTS/CTS delay.
W15	B-C	RS-485 transmitter enabled by data.
W5	A-B[1]	RTS/CTS normal.
W17	C	2 ms transmitter enabled time. This is good for 9600 baud. Decrease for higher bauds. Increase for lower bauds.
		A - 30 ms.
		B[1] - 7 ms.
		C - 2 ms.
		D - 0.7 ms.
		E - 0.15 ms.
W16	B[1]	0.1 ms delay before receiver enabled.
Term	ON	RS-485 receiver terminated.
Bias	OFF[1]	Line bias off.

Using an RS-485 adapter

The Stallion EasyConnection adapter with the RS-232/RS-422/RS-485 8-port communications module has been qualified by Honeywell.

To connect:

- Install the adapter and driver in the server as described in the adapters documentation. For more information, see the Stallion-related instructions in the *Supplementary Installation Tasks Guide*.
- Connect a port on the communications module (installed on the server) directly to the RS-485 network to which the DPR controllers are connected.

[1] Denotes non-default value.

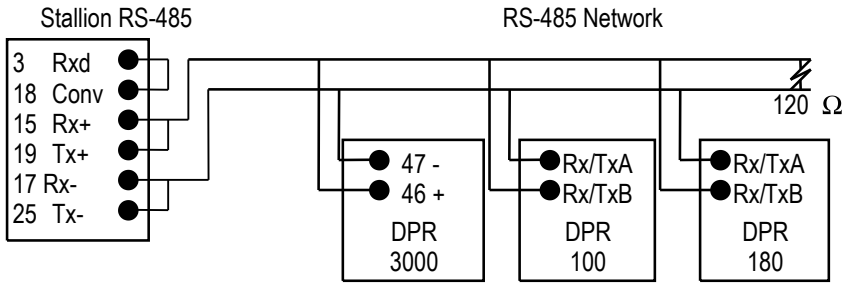

Figure 4: RS-485 connections

Using an RS-422 adapter

The Stallion EasyConnection adapter with the RS-232/RS-422/RS-485 8-port communications module has been qualified by Honeywell.

To connect:

- Install the adapter and driver in the server as described in the adapters documentation. For more information, see the Stallion-related instructions in the *Supplementary Installation Tasks Guide*.
- Connect a port on the communications module (installed on the server) directly to the RS-422 network to which the DPR controllers are connected.

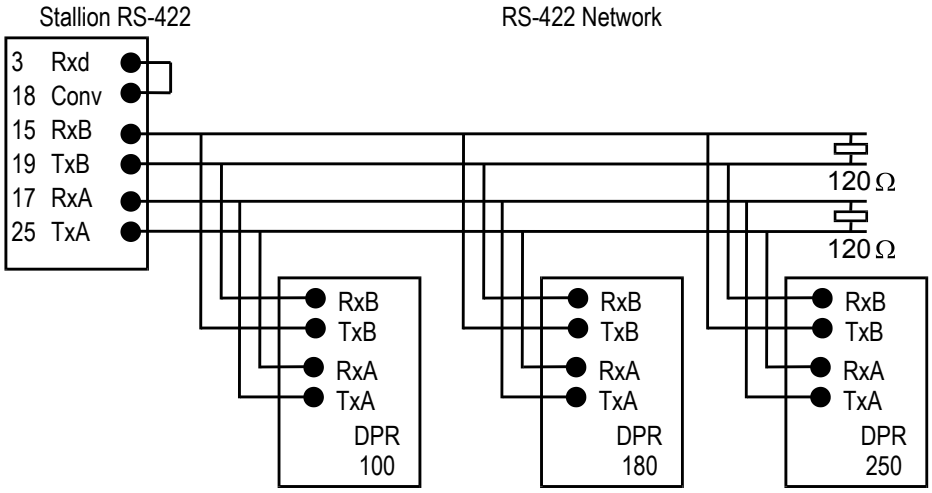

Figure 5: RS-422 connections

Communication settings for Honeywell DPR

Configure the DPR for an appropriate address (ID), baud, data, parity, and stop bits. Consult the *Communication Options Manual* that came with your DPR device for information on how to do this.

Some recommended values are:

Protocol	Controller setting
Connect	RS-232/RS-485/RS-422[2]
Address	1[3]
Baud	9600
Bits	8
Stop	1
Parity	None

Check the switch positions on the Communication Option board of the DPR device to make sure they are correct for either RS-232 or RS-485.

DPR3000			
RS-232		**RS-485**	
SW1	N/A	SW1	0
SW2	N/A	SW2	0
SW3	RS-232	SW3	Other

DPR100, DPR180, and DPR250			
RS-232		**RS-485**	
SW1	Left	SW1	Left
SW2	Left	SW2	Left
SW3	Right	SW3	Left

Consult the *Communication Options Manual* for your model DPR about where the switches are located.

[2] Not applicable on the DPR3000. Value depends on how you have cabled up the devices.

[3] If the DPR device is connected to a RS-422/RS-485 network then the address should be unique for each device on the network.

Honeywell DPR channel and controller reference

This section describes the configuration and addressing information specific to Honeywell DPR channels and controllers.

In addition to the information contained in this reference, and for help to build channels and controllers, see the section titled "Building controllers or channels" in the *Quick Builder User's Guide*.

Related topics

“Main properties for a Honeywell DPR channel” on page 14

“Port properties for a Honeywell DPR channel” on page 16

“Main properties for a Honeywell DPR controller” on page 18

“Planning considerations for installing and configuring Honeywell DPR controllers” on page 5

Main properties for a Honeywell DPR channel

The Main tab defines the basic properties for a Honeywell DPR channel.

For information about how to create a channel, see the topic titled "Building controllers and channels" in the *Quick Builder User's Guide*.

Property	Description
Name	The unique name of the channel. A maximum of *10* alphanumeric characters (no spaces or double quotes). Note: In Station displays, underscore characters (_) appear as spaces.
Description	(Optional) A description of the channel. A maximum of *132* alphanumeric characters, including spaces.
Associated Asset	The Tag Name of the Asset to be associated with the alarm group.
Marginal Alarm Limit	The communications alarm marginal limit at which the channel is declared to be marginal. When this limit is reached, a high priority alarm is generated. To change the priority of the alarm system wide, see the topic titled "Configuring system alarm priorities" in the *Server and Client Configuration Guide*. To change the priority of the alarm for one channel, see the topic titled "About configuring custom system alarm priorities for an individual channel or controller" in the *Server and Client Configuration Guide*. A channel barometer monitors the total number of requests and the number of times the controller did not respond or response was incorrect. The barometer increments by two or more, depending on the error, and decrements for each good call. To calculate an acceptable marginal alarm limit, use the formula: Square root of the number of controllers on the channel × Marginal Alarm Limit defined on those controllers (Normally, you specify the same value for all controllers on a channel). For example, if there are 9 controllers on the channel and their Marginal Alarm Limit is set to *25*, the value would be *3* (which is the square root of 9) *x 25 = 75*.
Fail Alarm Limit	The communications alarm fail limit at which the channel is declared to have failed. When this barometer limit is reached, an urgent alarm is generated. To change the priority of the alarm system wide, see the topic titled "Configuring system alarm priorities" in the *Server and Client Configuration Guide*. To change the priority of the alarm for one channel, see the topic titled "About configuring custom system alarm priorities for an individual channel or controller" in the *Server and Client Configuration Guide*. Set this to double the value specified for the channel Marginal Alarm Limit.
Connect Timeout	The length of time that the server attempts to connect to the controller. The server will stop trying to connect to the controller once the timeout period passes. The default value *10* seconds. Use the default value unless the communications line has a high error rate, or unless you are using modems.
Read Timeout	The length of time that the server will wait for a reply from the controller. The server will stop waiting once the timeout period passes. The default value is *2* seconds. Use the default value unless the communications line has a high error rate, or unless you are using modems.
Item Type	The type of channel specified when this item was created.
Last Modified	The date and time the channel properties were modified.
Last Downloaded	The date and time the channel was last downloaded to the server.

Property	Description
Item Number	The unique item number currently assigned to this channel, in the format *CHNcc*, where *cc* is the channel number. You can change the item number if you need to match your current server database configuration. The number must be between *01* and the maximum number of channels allowed for your system. For more information about setting the maximum value, see the topic titled "Adjusting sizing of non-licensed items" in the *Supplementary Installation Tasks Guide*.

Port properties for a Honeywell DPR channel

The Port tab defines the communication-related properties for a channel. The properties vary according to the selected **Port Type**:

- *Serial*. A serial communications interface, such as RS-232. See the section below titled "Serial port properties."
- *TerminalServer*. A communications link that enables controllers with a serial interface to be connected to a LAN. See the section below titled "Terminal Server port properties."
- *LANVendor*. Not applicable for DPR.

Serial port properties

Attention
The Serial Port settings must match the settings on your communication devices.

Property	Description
Serial Port Name	The device name of the serial port.
Baud	The number of data bits per second. The default is *9600*.
Number of Data Bits	The number of data bits used for transmission. The default is *8*.
Stop Bits	The number of stop bits used for transmission The default is *1*.
Parity	Defines parity verification of each character and must match configuration on the end device. The default is *NONE*.
Checksum	The type of checksum error detection used for the port. Select the value that matches the setting on the communication device.
XON/XOFF	The type of XON/XOFF software flow control used to stop a receiver from being overrun with messages from a sender. The types are: • *Input* (use XON/XOFF to control the flow of data on the receive line) • *None* (default) • *Output* (use XON/XOFF to control the flow of data on the transmit line)

Property	Description
Handshaking Options	**RS-232** • **Enable RTS/CTS flow control**. Select if you want to use RTS/CTS for flow control to stop a receiver from being overrun with messages from a sender. • **Detect DCD**. Select if the Data Carrier Detect communication status line of the COM port requires monitoring (usually when using modem or microwave linking). When selected, the communications fails if the desired COM status line is not high—for example, on a dial-up link connection for a modem. • **Detect DSR**. Select if the Data Set Ready communication status line of the COM port requires monitoring (usually when using modem or microwave linking). When selected, the communications fails if the desired COM status is not achieved. **RS-422.** No options available. **RS-485** • **Enable Stallion RS-485 Half Duplex**. Select if you are using Stallion EasyConnection RS485 communication. Do not select if you are using RS-422 communication. • **Echo (Required for RS-485 2-wire ports)**. Select so that the server expects the messages it sends to the port on the transmit line to be echoed back on the receive line. For example, select this if you are using a Stallion EasyConnection adapter. For RS-485 connections using a Black Box Converter, leave the check box clear (no echo).

Terminal Server port properties

Property	Description
Terminal Server TCP Host Name Terminal Server TCP Port No	The name and port number of terminal server to which the channel is connected. You can specify either a TCP host name or an IP address, but it must match the TCP host name used when you installed and internally configured the terminal server.
Idle Timeout	The time, in seconds, the channel waits for a successful connection to the server before closing the connection. A value of *0* indicates that the connection is never closed.
Checksum	The type of checksum error detection used for the port. Not applicable for this channel. Select *NONE*.

Main properties for a Honeywell DPR controller

The **Main** tab defines the basic properties for a Honeywell DPR controller.

For information about how to create a controller, see the topic titled "Building controllers and channels" in the *Quick Builder User's Guide*.

Property	Description
Name	The unique name of the controller. A maximum of *10* alphanumeric characters (no spaces or double quotes). Note: In Station displays, underscore characters (_) appear as spaces.
Description	(Optional) A description of the controller. A maximum of *132* alphanumeric characters, including spaces.
Associated Asset	The Tag Name of the Asset to be associated with the alarm group.
Channel Name	The name of the channel on which the controller communicates with the server. (You must have already defined a channel for it to appear in this list.)
Marginal Alarm Limit	The communications alarm marginal limit at which the controller is declared to be marginal. When this limit is reached, a high priority alarm is generated. To change the priority of the alarm system wide, see the topic titled "Configuring system alarm priorities" in the *Server and Client Configuration Guide*. To change the priority of the alarm for one controller, see the topic titled "About configuring custom system alarm priorities for an individual channel or controller" in the *Server and Client Configuration Guide*. A controller barometer monitors the total number of requests and the number of times the controller did not respond or response was incorrect. The barometer increments by two or more, depending on the error, and decrements for each good call. The default value is *25*.
Fail Alarm Limit	The communications alarm fail limit at which the controller is declared to have failed. When this barometer limit is reached, an urgent alarm is generated. To change the priority of the alarm system wide, see the topic titled "Configuring system alarm priorities" in the *Server and Client Configuration Guide*. To change the priority of the alarm for one controller, see the topic titled "About configuring custom system alarm priorities for an individual channel or controller" in the *Server and Client Configuration Guide*. Set this to double the value specified for the controller Marginal Alarm Limit. The default is *50*.
Controller Type	Select one of the following: • DPR3000 • DPR100 • DPR180 • DPR250
Device Address	Enter the device network address.
Item Type	The type of controller specified when this item was created.
Last Modified	The date and time the controller properties were modified.
Last Downloaded	The date and time the controller was last downloaded to the server.
Item Number	The unique item number currently assigned to this controller, in the format *RTUnnnnn*. You can change the item number if you need to match your current server database configuration. The number must be between *01* and the maximum number of controllers allowed for your system. For more information about setting the maximum value, see the topic titled "Adjusting sizing of non-licensed items" in the *Supplementary Installation Tasks Guide*.

Honeywell DPR points reference

This section describes how to configure points for a Honeywell DPR controller using Quick Builder.

In addition to the information contained in this reference, and for help to build points, see the section titled "Building and configuring points" in the *Quick Builder User's Guide*.

Related topics

“Defining a Honeywell DPR address for a point parameter” on page 20

Defining a Honeywell DPR address for a point parameter

Notes

- Do not configure points that reference addresses that are outside the addresses provided for each controller. This might result in errors when the server attempts to read these addresses.
- If using a raw Modbus address to reference data (for example, *0200h*), make sure you include the data format when applicable (that is, IEEEFP or, for status information, bit number).
- If the drift deadband is set to anything other than 0, changes in the field might not appear on the server. Field changes need to be greater than that specified by the drift deadband before the change is reflected in the server.

For **PV Source Address**, **Source Address**, and **Destination Address** the format for a Honeywell DPR controller address is:

ControllerName Address

Part	Description
ControllerName	The name of the Honeywell DPR controller.
Address	The address in the controller where the value is recorded. Address syntax can be entered as either: • DPR3000 syntax • DPR100 syntax • DPR180 syntax • DPR250 syntax

If you would like help with the address, you can use the Address Builder. To display the Address Builder, click ... next to **Address**.

Related topics

“Planning considerations for installing and configuring Honeywell DPR controllers” on page 5

Troubleshooting Honeywell DPR issues

This section describes troubleshooting tasks for Honeywell DPR that you can perform either on the server or from any Station.

Related topics

“Testing Honeywell DPR communications with the server” on page 22
“Troubleshooting Honeywell DPR communication errors” on page 23
“Troubleshooting Honeywell DPR point configuration errors” on page 24
“Troubleshooting Honeywell DPR scanning errors” on page 25

Testing Honeywell DPR communications with the server

You use the Honeywell DPR test utility, **dprtst**, to test communications between the server and the DPR controller after you have downloaded channel and controller definitions to the server database.

Prerequisites

- Set up the controller.
- Connect all cables.
- Define the controller and channel in Quick Builder.
- Download the Quick Builder definitions to the server, without errors.
- Ensure the channel is out of service.

Attention
The server need not be running while using the utility as long as the server database service is running.

To run the dprtst utility

1. Open a Command Prompt window.
2. Type **dprtst** and then press Enter.
3. Follow the directions as prompted.
   You can read and write data to all registers that can be addressed by the server.

   For help while using this utility, type **?**.

Example

```
C:\>dprtst

Enter LRN or device name of channel
chn01
Enter command:
find 1,4
FIND device with id   1 to   4, at 16-Sep-97 14:06:52
Device   1 ?
Device   2 ?
Device   3 ? ...responding
Device   4 ?
Enter command:
Q
```

Next steps

After verification that the server is communicating with the DPR device, you can build points to reference controller addresses.

Related topics

“Planning considerations for installing and configuring Honeywell DPR controllers” on page 5

Troubleshooting Honeywell DPR communication errors

If you encounter any errors, review the configuration steps.

Diagnostic check

```
Error code 0106 (Device Timeout)
```

Cause

No response was received from the device.

Diagnostic check

```
Error code 8102 (MODBUS error 2 - illegal data address)
```

Cause

You either specified an illegal address or an illegal number of addresses.

Troubleshooting Honeywell DPR point configuration errors

Error	Description
84E0h	You specified an invalid address for this type of device.
8426h	You specified an invalid data format for this type of device.

Troubleshooting Honeywell DPR scanning errors

Errors can be viewed by opening logs.

Error	Description
0106h	A request to the device timed out. This could be caused by communication setup problems (for example, wrong address and/or baud).
8102h	An invalid address has been reported by the DPR device. This could be caused by user specifying the wrong address, the wrong data type or the wrong device type.

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- Send an email to security@honeywell.com.

  or

- Contact your local Honeywell Process Solutions Customer Contact Center (CCC) or Honeywell Technical Assistance Center (TAC) listed in the “Support and other contacts” section of this document.

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Training classes

Honeywell holds technical training classes on Experion PKS. These classes are taught by experts in the field of process control systems. For more information about these classes, contact your Honeywell representative, or see http://www.automationcollege.com.

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