Honeywell

Experion PKS
Honeywell FSC Integration Reference

Release 431

Honeywell

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Planning considerations for installing and configuring Honeywell FSC controllers

This reference provides the information you need to set up, configure, and test FSC 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 Honeywell FSC controller. Complete each step before commencing the next.

Steps	Go to
Determine FSC configuration	Architectures for Honeywell FSC
Setting up the communications parameters using the FSC configuration software	Communication settings for Honeywell FSC
Use FSC configuration software to set SER numbers	Assigning SER numbers for sequence of events
Use Quick Builder to define channels	• Honeywell FSC channel and controller reference • "Build channels" topic in the *Quick Builder User's Guide*
Use Quick Builder to define controllers	• Honeywell FSC 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 communications	Testing Honeywell FSC communications with the server
Troubleshooting communication errors	Troubleshooting Honeywell FSC communication errors for a serial controller
Use Quick Builder to define points	Defining a Honeywell FSC address for a point parameter

Related topics

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Devices supported by the Honeywell FSC interface

The server supports serial and Ethernet FSC controllers.

The server communicates with:

- Serial controllers using a point-to-point or multi-drop RS-232 link and FSC Modbus protocol
- Ethernet controllers using a proprietary protocol based on the Modbus protocol

Serial devices supported by the Honeywell FSC interface

The server supports the following serial FSC controller configurations:

FSC-100	A single rack.
FSC-100R	Two identical racks. Basically parallel FSC-100 configuration.
FSC-101	May consist of several racks.
FSC-102	Two Central parts and single I/O.
FSC-101R	Two Central parts and redundant I/O.
FSC-202	Two Central racks and redundant I/O.

Ethernet devices supported by the Honeywell FSC interface

The server supports the following Ethernet FSC controller configurations.

FSC-1oo1D	Single Central Part with single Ethernet connection
FSC-1oo1D	Single Central Part with redundant Ethernet connection
FSC-1oo2D	Redundant Central Parts with single Ethernet connection to each Central Part

Other documentation for Honeywell FSC

This reference provides only supplemental information to interface FSC controllers with the server. For detailed information about installing and configuring FSC controllers, see the manufacturer's documentation.

FSC-specific terms

FSC	Fail-safe controller.
SER	Sequence of events recorder.
SER channel	An FSC setting required so that the server can extract SOE data from the controller. The server uses the SER channel to poll for SOE data.
SOE	Sequence of events.
Base SER Number	The unique ID assigned to a serial (non-Ethernet) controller so that the server can extract SOE data from that controller.

Differences between serial and Ethernet controllers

The server supports serial and Ethernet FSC controllers. However, these two controller types are different, and following differences apply:

• Serial controllers use Modbus; whereas Ethernet controllers use a proprietary protocol based on Modbus.

• The diagnostic scan rate is not configurable in Ethernet controllers.

• The Base SER is not required for Ethernet controllers.

• There is a separate test utility for each type of controller.

• System Information and Extended Diagnostics are available for Ethernet controllers.

Architectures for Honeywell FSC

Honeywell FSC interface supports connection to the server via serial or Ethernet connection.

Serial connections for Honeywell FSC

The server communicates with serial controllers using a point-to-point or multi-drop RS-232 link and FSC Modbus protocol.

Point-to-point configuration

A point-to-point configuration consists of a controller with a single COM module connected to a port on the server through a serial link.

Figure 1: Point-to-point configuration

Multi-drop configuration

A multi-drop configuration consists of a redundant FSC controller with two COM modules connected on the same serial link which connects to a single port on the server.

Note that this type of configuration does not constitute server communications redundancy, but it does provide a means of talking to a redundant FSC system across a single channel.
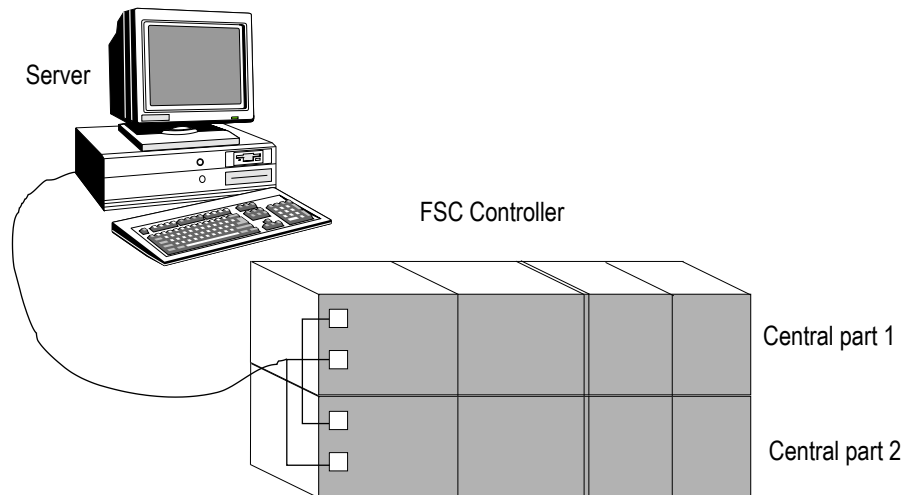
Figure 2: Multi-drop configuration

FSC network configuration

Using an FSC network configuration, a single FSC controller manages the data that the server requests or controls. One controller, designated as a 'master' controller, is responsible for gathering SOE data from the FSC network. This enables SOE data from any networked controller to be obtained from the master controller.

A master controller is also useful for time synchronization. The master controller is responsible for time synchronization on the FSC network—synchronizing the time on the master controller also synchronizes the time on 'slave' controllers. See the topic titled "About time synchronization on Honeywell FSC controllers" for more information.

Figure 3: FSC network

Redundancy for serial controllers

Serial FSC controllers support communication redundancy. This is not the same as the multi-drop configuration. Communication redundancy involves a separate physical connection to communicate with the FSC controller.

Related topics

Ethernet connections for Honeywell FSC

The server communicates with Ethernet controllers using a proprietary protocol based on the Modbus protocol. Process data connections to the FSC are made on TCP port 51000. Information scan connections to the FSC are made on TCP port 51001.

> **Attention**
> Connecting or configuring a single FSC Ethernet controller to multiple servers is not a supported configuration.

Point-to-point configuration

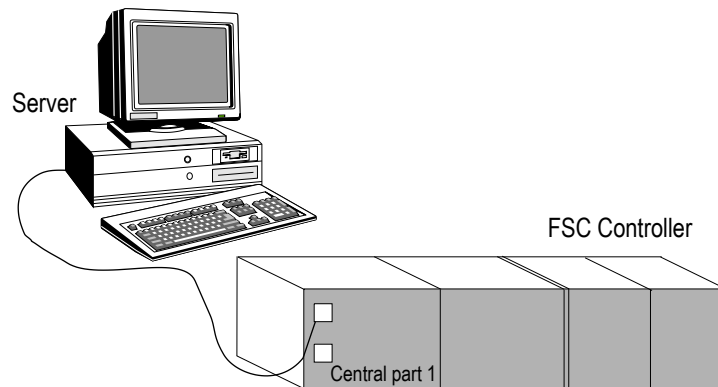A point-to-point configuration consists of a controller with a single COM module connected to a port on the server through an Ethernet link.
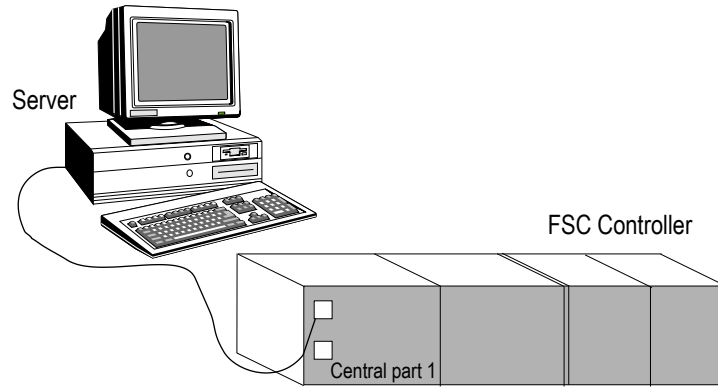
Figure 4: Point-to-point configuration

FSC network configuration

Using an FSC network configuration, a single FSC controller manages the data that the server requests or controls. One controller, designated as a 'master' controller, is responsible for gathering SOE data from the FSC network. This enables SOE data from any networked controller to be obtained from the master controller.

A master controller is also useful for time synchronization. The master controller is responsible for time synchronization on the FSC network—synchronizing the time on the master controller also synchronizes the time on *slave* controllers. See the topic titled "About time synchronization on Honeywell FSC controllers" for more information.
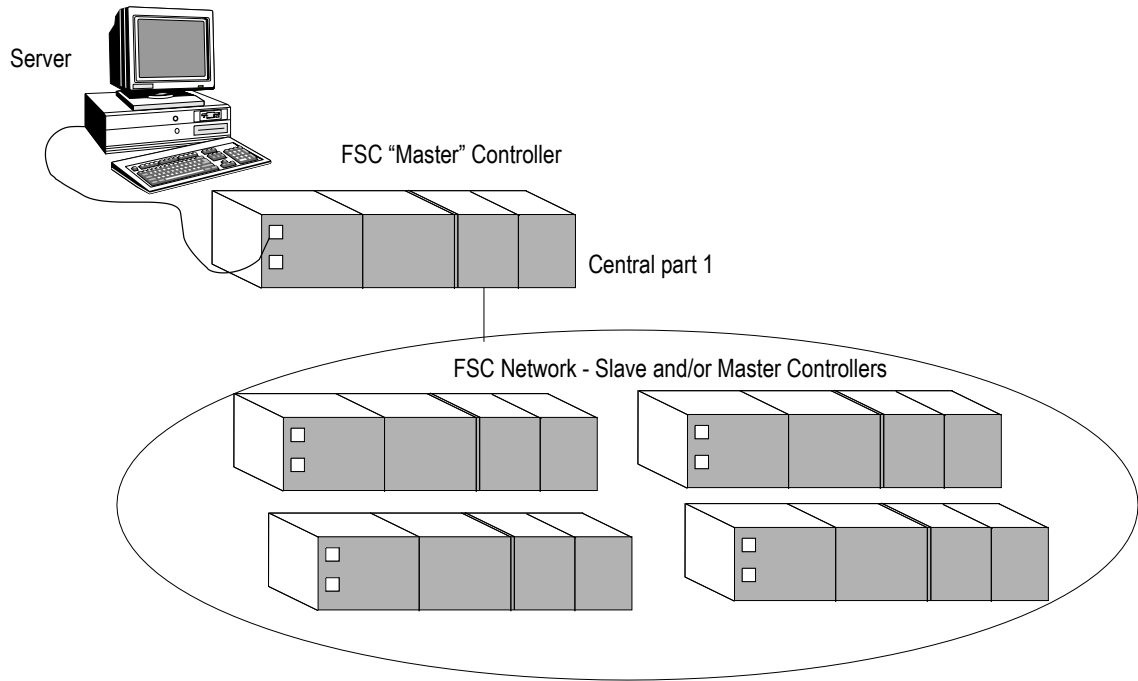

Figure 5: FSC network

Redundancy for Ethernet controllers

Ethernet FSC controllers support communication redundancy. Communication redundancy involves a separate physical connection to communicate with the FSC controller.

The server supports the following redundancy options:

- Redundant connection to a single Central Part via a single, redundant 10018/E/E COM module
- Redundant connection to redundant Central Parts via a single, non-redundant 10018/E/1. COM module on each Central Part
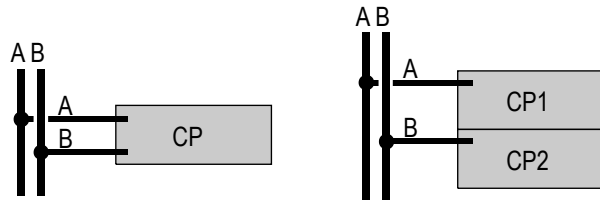
Figure 6: Redundancy options

Related topics

Communication settings for Honeywell FSC

The communication settings are specific to the controller type (serial or Ethernet).

Related topics

"Serial connection settings for Honeywell FSC" on page 15
"Ethernet connection settings for Honeywell FSC" on page 16

Serial connection settings for Honeywell FSC

The RS-232 connection is made to the controller's COM module, which can be of the following types:

*   10004/./.
*   10014/./.

Communication address

To communicate with a serial FSC controller, the server uses a *communication address*, which can be calculated using the FSC System number specified when configuring the controller.

You use the FSC configuration utility, **FSC Navigator**, to specify the FSC System number, which must be unique within a system of FSC controllers.

The *communication address* is equal to four times the FSC System number.

Modbus data tables and function codes

Serial FSC controllers use the following Modbus data tables and function codes.

In Quick Builder, you need to define a separate 'logical' controller for each data table to which the server needs access. For example, if the server needs access to the Discrete Output table and the and Input Register table, you need to define two logical controllers.

Table 1: Modbus data tables

Data table	Server addressable range
Discrete (digital) Output (coils)	00001–08192 (read/write)
Discrete (digital) Input (contacts)	10001–18192 (read only)
Input Register	30001–38192 (read only)
Holding Register	40001–48192 (read/write)

Serial FSC controllers support the following Modbus protocol function codes:

Table 2: Modbus function codes

Function code	Description
01	Read output status
02	Read input status
03	Read output registers
04	Read input registers
05	Force Single Coil

Function code	Description
06	Preset Single Register

Related topics

"Main properties for a Honeywell FSC controller" on page 24

"Ethernet connection settings for Honeywell FSC" on page 16

"Defining a Honeywell FSC address for a point parameter" on page 30

Ethernet connection settings for Honeywell FSC

The Ethernet connection is made to the controller's 10018/E/1 or 10018/E/E COM modules.

Communication address

To communicate with an Ethernet FSC controller, the server uses a *communication address*, which can be calculated using the FSC System number specified when configuring the controller.

You use the FSC configuration utility, **FSC Navigator**, to specify the FSC System number, which must be unique within a system of FSC controllers.

The *communication address* is equal to four times the FSC System number.

Ethernet data tables

Ethernet FSC controllers use the following Modbus data tables.

In Quick Builder, you need to define a separate 'logical' controller for each data table to which the server needs access. For example, if the server needs access to the Coils table and the Registers table, you need to define two logical controllers.

> **Attention**
>
> The following points can only be built on an SOE only controller:
>
> - FSC variables with a SER sequence number, but without a DCS address. This includes FSC variables with a SER sequence number which are located in a FSC network. See the section "FSC network configuration" in the topic titled "Ethernet connections for Honeywell FSC" for more information.
> - FSC system events. See the topic titled "Reserved SER numbers" for more information.

Table 3: Ethernet data tables

Data Table	Server Addressable Range (DCS address)
Coils (FSC types: I, O)	1–8192
SOE Only	N/A
Registers (FSC types: BI, AI, BO, AO)	10001–18192

Related topics

"Ethernet connections for Honeywell FSC" on page 12

"Main properties for a Honeywell FSC controller" on page 24

"Serial connection settings for Honeywell FSC" on page 15

"Defining a Honeywell FSC address for a point parameter" on page 30

Assigning SER numbers for sequence of events

FSC controllers have SOE (*Sequence of Events*) capabilities. If you want the server to record a controller's SOEs in its SOE log, you need to assign an SER (*Sequence of Events Recorder*) number to each internal address.

> **Attention**
> In the case of a serial FSC controller, you need to define a *Base SER* for the controller.

To record a controller's SOEs in its SOE log

1 Assign an SER number to each internal address you want the server to record. (It is recommended that you assign SER numbers in a tight block for each controller.)
   You use the FSC configuration utility, **FSC Navigator**, to assign SER numbers.

2 When defining the controller in Quick Builder, select the **SOE Enable** check box. (If you define several logical controllers, only select this for one controller.) See the topic titled "Main properties for a Honeywell FSC controller" for more information.

3 Assign a separate point, in Quick Builder, to each SER number. A point can only have one SER number associated with it.

Related topics

"Main properties for a Honeywell FSC controller" on page 24
"Defining a Honeywell FSC address for a point parameter" on page 30

Reserved SER numbers

FSC controllers reserve the following SER numbers for system events. If you want the server to log these system events, you need to assign points to them that are reserved for system events.

SER Number (serial)	SER Number (Ethernet)	System Event
Base SER	0	All forces cleared
Base SER + 1	1	FSC System Fault
Base SER + 2	2	SER Buffer Full
Base SER + 3	3	SER Buffer Empty
Base SER + 5	5	Force Event

> **Attention**
> - Base SER + 4 (4 in the case of Ethernet) is not a valid event.
> - The 'SER Buffer Empty' event cannot be stored in server SOE. If a point is defined with this SER number, it is ignored.
> - To be logged on to the SOE display when using an Ethernet FSC controller, the System Events must be built on a SOE only controller. This is because System Events have no DCS address associated with them.

Interpreting SOE lines

The following fields of the server's SOE file are populated for each SOE with a matching SER number:

Field	Description
Date & Time	The date and time given to the SOE by the controller.

Field	Description
Source	The server's point ID that corresponds with this SOE.
Condition	The SER number associated with this SOE.
Action	Only applicable to Ethernet controllers. Information indicator dependent on the types of SER. See the section below titled "Action descriptions."
Description	The server's point description.
Value	The value returned in the SOE (if applicable).
	For a status point built against a coil, this displays the appropriate state descriptor for that point. Indeterminate values display either blank or zero.

Action descriptions

Event Type	FSC Data Type	FSC Description	Server-action Field
Event Report[1]	Any		N/A[2]
Process Variable Event	Boolean	True to False	F
		False to True	T
	Analog	Low	LO
		Healthy	HLT
		High	HI
Process Variable Force Event	Boolean	Force Set	SET
		Force Cleared	CLR
	Analog	Force Set	SET
		Force Cleared	CLR
Diagnostic Event	Diagnostic Event		N/A

---

[1] System events. See the topic titled "Reserved SER numbers."

[2] Actions that are not applicable or indeterminate appear as --.

Honeywell FSC channel and controller reference

This section describes the configuration and addressing information specific to Honeywell FSC 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 FSC channel" on page 20
"Port properties for a Honeywell FSC channel" on page 22
"Main properties for a Honeywell FSC controller" on page 24
"Optimizing Honeywell FSC scanning performance" on page 27
"Planning considerations for installing and configuring Honeywell FSC controllers" on page 5

Main properties for a Honeywell FSC channel

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

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

> **Attention**
> If you use both serial and Ethernet Honeywell FSC controllers, you need to create a separate channel for each type of controller.

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) × *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 FSC channel

The Port tab defines the communication-related properties for a channel. The **Port Type** for FSC controllers can be:

- *serial*. Only applicable to a directly-connected serial FSC controller. A serial communications interface, such as RS-232. See the section below titled "Serial port properties" for more information.
- *Terminalserver*. Only applicable to a serial FSC controller that communicates with the server via a terminal server. See the section below titled "Terminal Server port properties" for more information.
- *LANVendor*. Only applicable to an Ethernet FSC controller. See the section below titled "LANVendor port properties" for more information.

Serial port properties

Attention

Only applicable to serial FSC controllers.

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: • *CRC16_0* or *CRC16_1* (if Cyclic Redundancy Check (CRC) is set) • *ONESCOMP* or *TWOSCOMP* (if Longitudinal Redundancy Check (LRC) is set) • *XOR* (If exclusive or is set)
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	**For RS-232** • **Enable RTS/CTS flow control**. Stops a receiver from being overrun with messages from a sender by using RTS/CTS flow control. • **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. **Note:** No options are available for RS-422. **For RS-485**. The server does not support RS-485 for FSC controllers.

Terminal Server port properties

> **Attention**
> Only applicable to serial FSC controllers.

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. Select the value that matches the setting on the communication device: • *CRC16_0* or *CRC16_1* (if Cyclic Redundancy Check (CRC) is set) • *ONESCOMP* or *TWOSCOMP* (if Longitudinal Redundancy Check (LRC) is set) • *XOR* (If exclusive or is set)

LANVendor port properties

> **Attention**
> Only applicable to serial FSC controllers.

Property	Description
Port Name	Leave blank.

Redundant port properties

A communications link being used as a redundant link requires an additional port definition for the redundant port. After you complete the port definition, enter the same kind of port definition for the redundant port.

Main properties for a Honeywell FSC controller

The **Main** tab defines the basic properties for a Honeywell FSC 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 channel on which the controller communicates with the server.
	If you use both serial and Ethernet controllers, you must select a serial/terminal server channel for a serial controller, and a LANHoneywell channel for an Ethernet controller.
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*.
Dynamic Scanning Fastest Scan Period	Select the **Dynamic Scanning** check box to enable dynamic scanning of all point parameters on this controller. The default setting for this check box is selected.
	Define the fastest possible scan period (in seconds) that dynamic scanning will scan point parameters on this controller. The default is *15* seconds.
	The dynamic scanning period does not affect the static scanning rate for a parameter. For example, if the scanning rate for a parameter is 10 seconds, and the dynamic scanning rate for the controller is 15 seconds, the parameter will still be scanned at a period of 10 seconds.
Communication Address	Set this to four times the FSC System number. The FSC System number is set using the FSC configuration utility, FSC Navigator. See the section "Communication address" in the topic titled "Serial connection settings for Honeywell FSC."
FSC Type	Shows the controller type, which corresponds to the type of channel (serial or Ethernet) selected in **Channel Name**.

Property	Description
Data Table	The data table that this controller addresses. • Serial controller, see the section "Modbus data tables and function codes" in the topic titled "Serial connection settings for Honeywell FSC" • Ethernet controller, see the section "Ethernet data tables" in the topic titled "Ethernet connection settings for Honeywell FSC"
Diagnostic	Applicable only to a serial controller. The value, in seconds, between diagnostic polls. The default is *60* seconds. To disable diagnostic polls, set the value to *0*.
Base SER	Applicable only to a serial controller. The base address for this controller. See the topic titled "Assigning SER numbers for sequence of events" for more information.
IP Address 1 IP Address 2	The controller's Ethernet addresses.
SOE Enable SOE Rate	Select **SOE Enable** if you want SOE data. Specify the time, in seconds, between polls for SOE data in **SOE Rate**. Only one logical controller per physical FSC controller can have **SOE Enabled**. If an SOE only controller is built, this should be the only logical controller with SOE enabled for that particular physical FSC controller. The **SOE Rate** must be a minimum of *5* seconds and defaults to *30* seconds. See the topic titled "Assigning SER numbers for sequence of events" for more information.
Sync Enable Sync Time	Select **Sync Enable** if you want to synchronize the controller time with the server time. Specify the time, in minutes, since midnight before synchronizing in **Sync Time**. The default is *-1* (no synchronization). See the topic titled "About time synchronization on Honeywell FSC controllers" for more information.
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*.

Related topics

About time synchronization on Honeywell FSC controllers

You can synchronize the time of FSC controllers with the server.

The **Sync Time** parameter is specified in minutes since midnight. When the assigned time is reached, the server sends a synchronization command with the current time to the controller.

If you define several 'logical' controllers for a particular controller, you can specify a different synchronization time for each logical controller, in order to synchronize the physical controller at different intervals in the day.

Related topics

Optimizing Honeywell FSC scanning performance

The maximum amount of data that can be acquired from an FSC controller is influenced by the rate of sending scan packets to the controller. An understanding of FSC scan packets will help you configure points so that optimal data acquisition performance is achieved, by maximizing the amount of data acquired with each scan packet.

The scan packets that have been built can be listed by using the list scan utility, **lisscn**. Listing scan packets helps verify the scanning strategy. See the *Server and Client Configuration Guide* for usage of **lisscn**.

Related topics

Honeywell FSC points reference

This section describes how to configure points for a Honeywell FSC 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 FSC address for a point parameter" on page 30

Defining a Honeywell FSC address for a point parameter

The format for an FSC data table address is:

ControllerName Address

Part	Description
ControllerName	The name of the FSC controller.
Address	The address in the controller where the value is recorded. The address syntax can be either: • Address syntax for coils and registers • Address syntax for SOE only points See the relevant sections below for more information.

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

Address syntax for coils and registers

Address [*Format*|*BitNumber*] [SER *SerNumber*]

Part	Description
Address	The server addressable memory address within the controller's data table. • Serial controller, see the section "Modbus data tables and function codes" in the topic titled "Serial connection settings for Honeywell FSC" • Ethernet controller, see the section "Ethernet data tables" in the topic titled "Ethernet connection settings for Honeywell FSC"
Format	(Optional) Select an appropriate format to read raw values. **To scale** See the section below titled "Scaling with data formats." **To read without scaling** Select a format of *C16*, or enter a *0*, to read all 16 bits in the register without scaling. To read less than 16 bits without scaling, enter the starting bit number (1 to 15). If you are not using scaling, the point range is still used for PV indicator bar height only (the PV indicator bar is on the Point Detail display on Station). **To read floating point values** The supported floating point formats are specific to the controller type: • Serial, see the section below titled "IEEEFP formats for serial controllers" • Ethernet, see the section below titled "Data formats supported for Ethernet controllers" Select format IEEEFP to read two consecutive registers as a single precision floating point number.
BitNumber	(Optional) For Input register and Holding register data tables, a starting bit number can be specified. The valid range is 0 (default) to 15 where 0 is the right most bit in the 16-bit register. Analog and accumulator point parameters can read up to 16 bits. Status point parameters read 1, 2, or 3 consecutive bits.
SerNumber	The SER number. See the topic titled "Assigning SER numbers for sequence of events" for more information.

❗ Attention

For a status point with an OP configured with four output states (that is, across two consecutive coils), control of the OP is carried out by executing separate writes to each of the two coils. Therefore, a value is written to the first coil then another immediately to the second coil. FSC controller logic should be programmed to make allowance for these two separate writes operations.

Example

Analog point

PV source	*161 U4095 SER 1000*
SP destination	*162 U4095*
Mode destination	*25 1*

Status point

PV source	*26*

Accumulator point

PV source	*171 C16*

IEEEFP formats for serial controllers

Format	Description
IEEEFPB	Bytes are big endian format (this is the same as IEEEFP)
IEEEFPBB	Bytes are byte-swapped big endian format
IEEEFPL	Bytes are little endian format
IEEEFPLB	Bytes are byte-swapped little endian format

❗ Attention

- IEEEFP numbers use two data addresses to hold the number, address and address -1. Do not specify address -1 (the lower address) as the point parameter address.
- When configuring PLC data tables, do not assign overlapping data addresses if floating point values are used and do not set an IEEEFP address to 1.

Data formats supported for Ethernet controllers

FSC types: BI, BO

Format	Description
S8B	Short signed integer
S16B	Signed word
S32B	Signed long integer
IEEEFP	IEEE Floating point

FSC types: AI, AO

Format	Description
FSC020MA	0 - 20 mA
FSC420MA	4 - 20 mA

Format	Description
FSC05V	0 - 5 V
FSC15V	1 - 5 V
FSC010V	0 - 10 V
FSC210V	2 - 10 V

Scaling with data formats

Parameter values with addresses in the Input register and Holding register data tables can be scaled with a data format. Select the format that corresponds to the counts that have been set in the PLC register.

> **Attention**
> If auxiliary parameters have a data format type that requires scaling (U4095, U999, and so on), they will take the same range as the PV.

The data format tells the server how to interpret the register value. Raw values in the PLC register tables can be scaled by the 0% and 100% point range values in order to convert them into engineering units (EU).

To select a format for scaling, you select the format that corresponds to the counts that have been set in the register where the point parameter value is sourced.
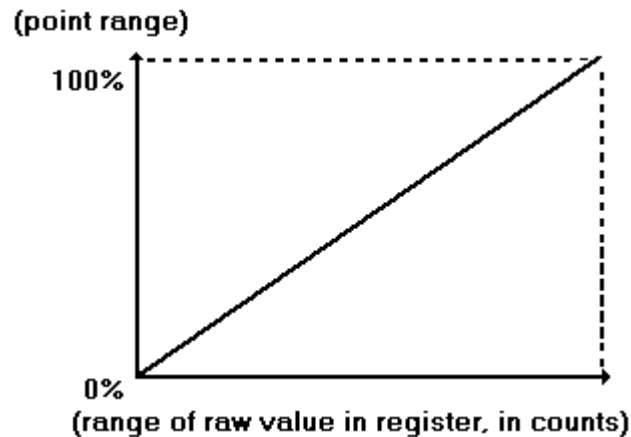
Figure 7: Scaling raw data

Address syntax for SOE only points

POS: *Index* SER *SerNumber*

Part	Description
Index	The server's internal position allocated to this point. It must be unique. Range = 1–8192
SerNumber	The SER number. See the topic titled "Assigning SER numbers for sequence of events."

Related topics

"Planning considerations for installing and configuring Honeywell FSC controllers" on page 5
"Serial connection settings for Honeywell FSC" on page 15
"Ethernet connection settings for Honeywell FSC" on page 16
"Assigning SER numbers for sequence of events" on page 17

Troubleshooting Honeywell FSC issues

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

Related topics

Accessing diagnostics for an Ethernet controller

System information and extended diagnostic data are accessible from Station for FSC Ethernet controllers.

System information

To access FSC System Information, double-click the PV of an FSC Ethernet controller point. Alternatively, click **Details** in the Controller Status, which shows the **Ext Diagnostics** tab, then click the **System Info** tab for the required link.

The system information and extended diagnostic information is updated automatically every 50 seconds. You can manually refresh the information by clicking the **Refresh** button.

If the diagnostic data cannot be retrieved from the FSC Ethernet controller, the most recent diagnostic data from the controller will continue to be displayed until the new data is obtained. If successive attempts to obtain diagnostic data from the controller fail, then an alarm message will be generated in the Alarm Summary.

Extended diagnostics

To access FSC Extended Diagnostics, click the **Details** button in the Controller Status. This shows up to 18 extended diagnostics messages for each FSC Ethernet controller link. Each message represents a hardware or software fault associated with that particular controller.

If an extended diagnostic message is present for a controller, an alarm with a value of `Message(s) Available` will be present in the Alarm Summary. To see the Extended Diagnostic information for an alarm from the Alarm Summary, double-click the alarm to call up the Controller Status, then click the **Details** button.

Testing Honeywell FSC communications with the server

Two diagnostic utilities, **fsctst** (for serial controllers) and **fscetst** (for Ethernet controllers), are included as part of the server software. These utilities test communications between the server and an FSC controller. Channels and controllers must be downloaded from Quick Builder before testing.

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.
- The server need not be running while using the utility as long as the database service is running. If making a connection through a terminal server, the server daemon service should also be running.
- The server is not communicating with your controllers. The test utilities might interfere with communications.

  To stop the server, enter the command at the command prompt:

  ```
  hscserver /load
  ```

  Answer '**y**' to every prompt. This unloads the server, but leaves the database in memory.

To run the fsctst utility

1 Open a Command Prompt window.
2 Type **fsctst** 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 using the utility, type **?**.
4 To check if your controllers are present, use the **find a,b** command. This command locates all FSC controllers on the channel with IDs between a and b.
   For example:

   ```
   C:\>fsctst
   Enter LRN or device name of channel
   chn01
   Enter command:
   find 1,4
   FIND device with id   1 to   4, at 28-May-98  14:06:52

   Device   1 ?
   Device   2 ?
   Device   3 ? ...responding
   Device   4 ?
   Enter command:
   q
   ```

   To the left of the channel name is the channel number. The name of the channel will be the letters '*chn*' followed by the two-digit channel number. For example, your Honeywell FSC channel '*COM3*' might be channel number *1*. Its device name will be '*chn01*.'

To run the fscetst utility

1 Open a Command Prompt window.
2 Type **fscetst** 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 using the utility, type **?**.

Related topics

"Planning considerations for installing and configuring Honeywell FSC controllers" on page 5

Troubleshooting Honeywell FSC communication errors for a serial controller

If any errors are encountered, review the previous sections.

Error	Description
0106 (Device Timeout)	No response was received from the controller.
8102 (MODBUS error 2 - illegal data address)	You either specified an illegal address or an illegal number of addresses.

After you have verified that the server is communicating with the controller, you can build points to reference controller addresses.

❗ Attention

Remember to enable the channel from the **SCADA Controllers** display.

Related topics

"Planning considerations for installing and configuring Honeywell FSC controllers" on page 5

Troubleshooting Honeywell FSC communication errors for an Ethernet controller

Ensure scan packets are optimized. See the topic titled "Optimizing Honeywell FSC scanning performance" for more information.

If there are several *logical* controllers on a channel, make sure that there is no more than one that has SOE enabled.

Related topics

"Optimizing Honeywell FSC scanning performance" on page 27

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How to report a security vulnerability

For the purpose of submission, a security vulnerability is defined as a software defect or weakness that can be exploited to reduce the operational or security capabilities of the software.

Honeywell investigates all reports of security vulnerabilities affecting Honeywell products and services.

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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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For support, contact your local Honeywell Process Solutions Customer Contact Center (CCC). To find your local CCC visit the website, https://www.honeywellprocess.com/en-US/contact-us/customer-support-contacts/Pages/default.aspx.

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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