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# HSPC Module Configuration Guide

## Connection to CoriolisMaster FCB400/FCH400 Series



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## Additional information

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[Coriolis Product Page](#)



[CoriolisMaster FCH400 Series](#)



[CoriolisMaster FCB400 Series](#)



**Table 0-1: Related documentation**

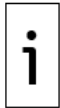
Documents	Document number/ID
TFIO HSPC Module Data Sheet	<a href="#">2108710</a>
TFIO Module User Manual	<a href="#">2101226</a>
CoriolisMaster FCB400, FCH400 Operation Instructions	<a href="#">OI/FCB400/FCH400</a>

# 1 Overview

This guide provides instructions to configure the ABB High Speed Pulse Counter (HSPC) TFIO module for connection with the ABB CoriolisMaster FCB400 or FCH400 series of Coriolis mass flowmeters.

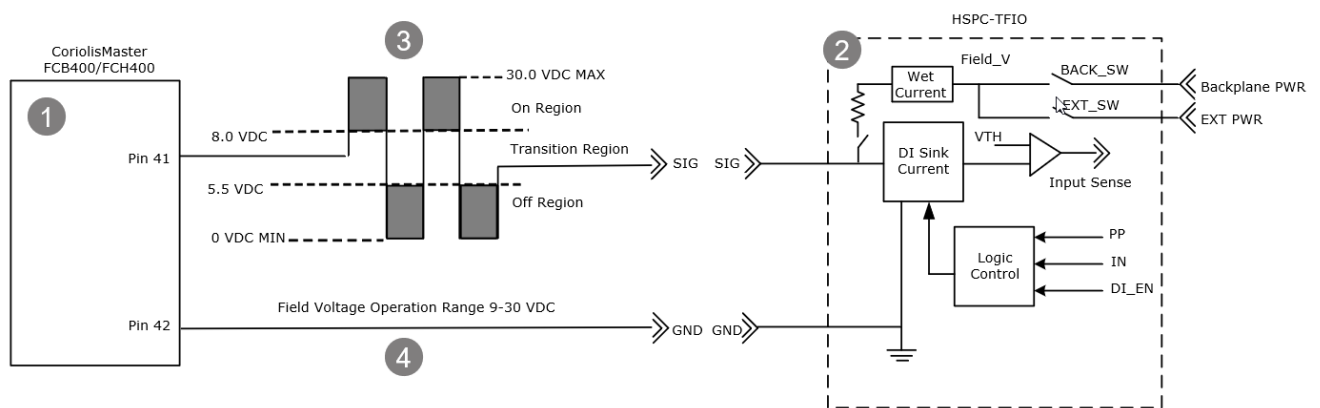
An HSPC module I/O point is configured as a Pulse Input (PI). This Input connects to one of the CoriolisMaster’s Digital Outputs (Digital Output 41/42). [Figure 1-1](#) shows the HSPC module detailed point schematic for the Pulse Input. Please note that to illustrate the acceptable signal range to the HSPC input, a graphical representation of this range is shown.

The CoriolisMaster Digital Output 41/42 supports many configuration options. For this guide, it is assumed that this output is configured as a passive frequency output.



**IMPORTANT NOTE:** Passive outputs (mentioned in the CoriolisMaster documentation) are the same as Open-Collector outputs (mentioned in HSPC documentation).

**Figure 1-1: ABB CoriolisMaster FCB/FCH digital output connected to HSPC digital input**



ID	Description	ID	Description
1	CoriolisMaster FCB400/FCH400 series (DO 41/42)	3	HSPC PI/DI signal range specifications
2	HSPC point schematic (when configured as PI/DI)	4	HSPC field voltage operation range

## 2 Wire the HSPC module input

This procedure describes how to wire an HSPC module point to receive inputs from the CoriolisMaster. Terminal connector J1 is used to illustrate the connection.

Prerequisites:

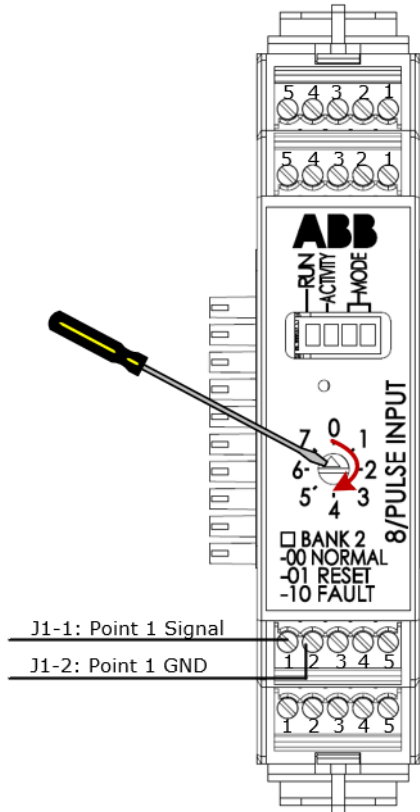
- Tools: Small flathead screwdriver, fine tip marker
- The HSPC module is not powered.
- Review and meet wiring requirements (wire gauge, length, use wire-end ferrules, etc.) See the TFIO Module User Manual (See [Additional information](#)).
- Determine if the module requires a non-default address. If there are other HSPC modules already installed, the new module address must be different from the addresses already assigned to the existing HSPC modules. If there are no other HSPC modules installed, then the new module can keep the default address (00). For address guidelines, refer to the TFIO Module User Manual.

To wire the HSPC (refer to [Figure 2-1](#)):

1. Remove the terminal connector from the HSPC module (For this example, J1). With the marker, make sure you mark pin 1 on the connector as a reference for wiring.
2. Loosen connector screws to prepare wire insertion.
3. Insert the Signal wire in the Signal point (in this example, J1-1).
4. Insert Ground wire in the GND point (in this example, J1-2).

5. Take note of the terminal connector point. This point is configured from the interface. The (J1-1, J1-2) point is identified as **DI1** in PCCU.
6. Tighten connector screws to secure wires.
7. Set module address if not using the default.
  - a. Insert the small flathead screwdriver in the address selector slot.
  - b. Rotate the address selector to the desired address. Ensure the address indicator points to the desired address.

**Figure 2-1: Wire terminals and set address**



8. If powering the HSPC module from an external power supply, go to section [3 Wire the HSPC module power \(if required\)](#).
9. If powering the HSPC module from the flow computer or controller, go to section [4 Wire the CoriolisMaster digital output](#).

### 3 Wire the HSPC module power (if required)

This procedure describes how to wire the HSPC to an external power supply. An external power supply may be required depending on the number of points used and their configuration.

Prerequisites:

- Tools: Small flathead screwdriver, fine tip marker
- Determine the power mode for the HSPC module. This module can operate with backplane power or external power depending on the number of channels used and their configuration. Refer to [Table 3-1](#) for general recommendations. Follow the steps of this procedure only if external power is required.

**Table 3-1: Recommended HSPC power mode per module configuration**

I/O channel configuration	Input configuration (if applicable)	Power Mode configuration
All channels are configured as Pulse Inputs	All inputs are configured with Wetting Current/Pullup: <b>Disabled</b>	Use Backplane
All channels are configured as Pulse Inputs or Digital Inputs	If any of the inputs is configured with Wetting Current/Pullup: <b>Enabled</b>	Use External
All channels are configured as Digital Outputs	Not Applicable	Use External

I/O channel configuration	Input configuration (if applicable)	Power Mode configuration
Mix of channels configured as Pulse inputs or Digital Outputs	Inputs may be configured with Wetting Current/Pullup disabled or enabled.	Use External

- Equipment (if an external power is required for the HSPC module):
  - A power supply with an operating rating of 30 VDC, 5 A (maximum).
  - 5 A fuse
- External power supply is not energized.
- Review and meet wire requirements (wire gauge, length, wire-end ferrules, etc.)

To wire external power supply (refer to [Figure 4-1](#)):



**IMPORTANT NOTE. Prevent short circuit.** Verify that the external power positive and negative connections are wired correctly to the HSPC before energizing the power supply.

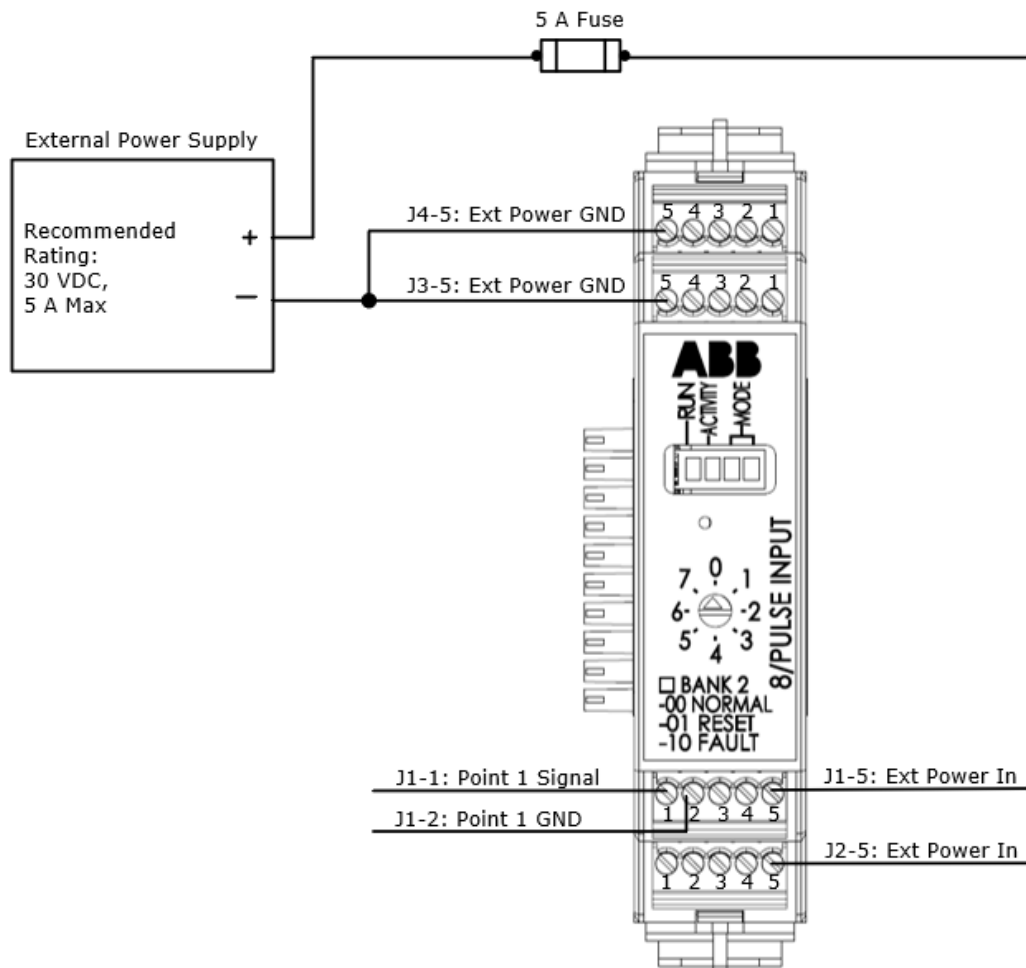
1. Insert External Power In (+) wire in J1-5.



**WARNING – Fire hazard.** Make sure to use a 5 A fuse between the power supply positive (+) terminal and the HSPC module J1-5 terminal. The fuse prevents a fire hazard in the event of a short circuit.

2. Insert External Power In (+) wire in J2-5.
3. Insert External Power GND (-) wire in J3-5.
4. Insert External Power GND (-) wire in J5-5.

**Figure 3-1: HSPC I/O point and external power wiring**



5. Verify correct polarity in all terminal connector wiring.
6. Reinsert terminal connectors on module.
7. Wire the (non-energized) power supply terminals, ensuring correct polarity. Refer to the power supply documentation for details.

## 4 Wire the CoriolisMaster digital output

This procedure shows how to wire one of the CoriolisMaster digital outputs to the HSPC module. This procedure wires Digital Output 1 (pins 41, 42). Digital Output 41/42 supports many configuration options. It is assumed that this output has been configured as a frequency output.

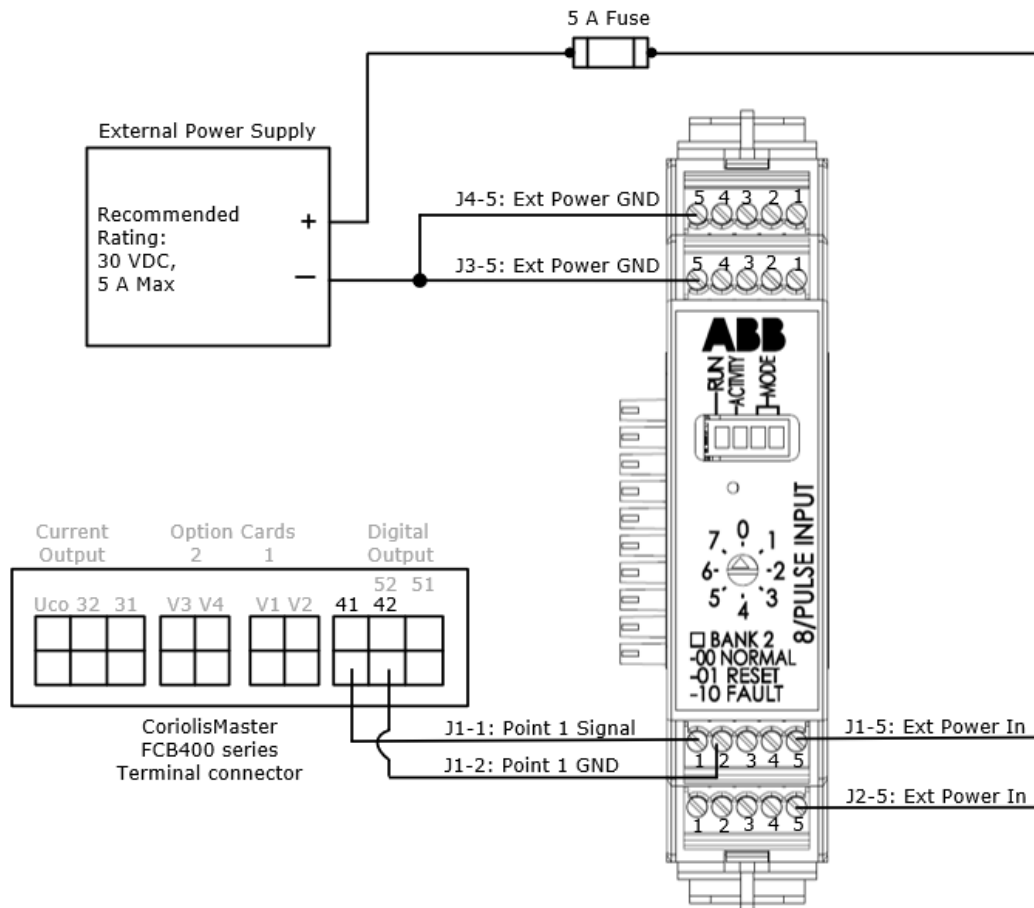
Prerequisites:

- The CoriolisMaster is not powered.
- Review and meet wiring requirements (wire gauge, length, use wire-end ferrules to prepare wire for insertion, etc.) See [Additional information](#).

To wire Digital Output 1 (41/42):

1. Locate the Digital Outputs on the CoriolisMaster terminal connector.
2. Insert the Signal wire from HSPC J1-1 in pin 41.
3. Insert the GND wire from HSPC J1-2 in pin 42. [Figure 4-1](#) shows the HSPC to Coriolis connection.

**Figure 4-1: HSPC Module wired to CoriolisMaster and External power supply**



## 5 Power the HSPC module and CoriolisMaster

This procedure applies power to both the HSPC module and the CoriolisMaster.

Prerequisites:

- All wiring on the HSPC and the CoriolisMaster is complete.

- HSPC terminal connectors are inserted in the module and the module is installed.
- The CoriolisMaster is wired for power. Refer to the CoriolisMaster Operating Instructions for details (See [Additional information](#) for a link to the document).

To apply power:

1. Connect the HSPC module to the flow computer or remote controller TFIO or I2C Bus interface.
2. Apply power (input voltage) to the flow computer or remote controller.
3. If the HSPC module is connected to an external supply, switch on the power.
4. Verify that the HSPC module LED indicators show the module is powered.
5. Apply power to the CoriolisMaster.

## 6 Configure the HSPC input

This procedure enables and configures the HSPC Module from the I/O Interface on PCCU.

Prerequisites:

- The HSPC module has been installed and powered.
- PCCU 7.76 or later must be installed in the laptop/PC used to connect to the flow computer or controller.
- The HSPC has been successfully detected by PCCU.

To configure the HSPC module:

1. Start PCCU.
2. Connect to the flow computer or remote controller with PCCU on Entry Mode.
3. On the PCCU navigation tree, expand **I/O Interface (I/O System)** on the RMC) and then select **TFIO Modules (TFIO-A Modules or TFIO-B Modules)** on the RMC).
4. Select the **TFIO Module State** tab.
5. Verify that the HSPC module is detected. The module should display under the configured address, and it displays as: Available. This indicates that the flow computer or controller has detected the TFIO module in its communication bus, but the module is not yet ready for use.
6. Click on the module address field and select **Online** from the drop-down list.
7. Click **Send**. The State of the TFIO module displays: Online ([Figure 6-1](#)). In this example, the detected module has an address of 00 (default). The module state displays under that address. The navigation tree updates the **ONLINE** modules.

**Figure 6-1: TFIO Module State: HSPC module online**

	Module Type	00	01	02	03	04	05	06	07
7.240.32	DI/DO II	-	-	-	-	-	-	-	-
7.240.64	DI/DO I	-	-	-	-	-	-	-	-
7.240.80	AO	-	-	-	-	-	-	-	-
7.240.112	AI	-	-	-	-	-	-	-	-
7.240.128	RTD/TC	-	-	-	-	-	-	-	-
7.240.160	CIM	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7.240.192	VC	-	-	-	-	-	-	-	-
7.240.48	HSPC I	Online	-	-	-	-	-	-	-
7.240.96	HSPC II	-	-	-	-	-	-	-	-

8. Expand **ONLINE** on the PCCU navigation tree. The list of all online modes displays. In this example, only one module is displayed and is identified by type and address: **TFIO 8/HSPC I:00**. Note that the address label on the module plate uses single digits (0-7). The interface uses 2 digits (00-07).
9. Select **TFIO 8/HSPC I:00**. The **Digital I/Os** tab for the HSPC module displays. Remain on this tab.
10. Configure the wired HSPC module point as a Digital Input (DI):
  - a. Locate the I/O point. In this example, **Digital I/O 1** identifies the module's J1-1 and J1-2 points ([Figure 6-2](#)).
  - b. Click the Type field next to the point used for connection.
  - c. Select: **DI-Power Saving (2.3 MA)** from the drop-down list.
11. Leave the default Debounce setting: **OFF**.

**Figure 6-2: Configure Digital I/O 1 as a Digital Input**

	Description	Type	I/O State	Debounce	DO Initial State	IO Pin Fault
7.48.140	Digital I/O 1	DI - Power Saving (2.3mA)	Open	OFF		Normal
7.48.141	Digital I/O 2	DI - Power Saving (2.3mA)	Open	OFF		Normal
7.48.142	Digital I/O 3	DI - Power Saving (2.3mA)	Open	OFF		Normal
7.48.143	Digital I/O 4	DI - Power Saving (2.3mA)	Open	OFF		Normal
7.48.144	Digital I/O 5	DI - Power Saving (2.3mA)	Open	OFF		Normal
7.48.145	Digital I/O 6	DI - Power Saving (2.3mA)	Open	OFF		Normal
7.48.146	Digital I/O 7	DI - Power Saving (2.3mA)	Open	OFF		Normal
7.48.147	Digital I/O 8	DI - Power Saving (2.3mA)	Open	OFF		Normal

- Click **Send**.
- On the PCCU navigation tree, expand **TFIO 8/HSPC I:00**. Then select **Advanced**.
- Select the **Pulse Input** tab.
- Under the **Wetting Current/Pullup Enable** section, select the value field next to the point. In this example, the point is identified as **DI1**.
- Select **Enabled** from the drop-down list.
- Click **Send**.

**Figure 6-3: Pulse Input Wet Current/Pullup configuration**

	Description	
	-- Debounce Signal Threshold --	
7.48.182	Debounce Threshold	1V
	-- Wetting Current/Pullup Enable --	
7.48.156	DI1	Enabled
7.48.157	DI2	Disabled
7.48.158	DI3	Disabled
7.48.159	DI4	Disabled
7.48.160	DI5	Disabled
7.48.161	DI6	Disabled
7.48.162	DI7	Disabled
7.48.163	DI8	Disabled

- Select the **I/O Pin** tab.
- Click on the value field next to **Field Voltage Selection**, and then select: **Use External** from the drop-down list (Figure 6-4).
- Click **Send**.

**Figure 6-4: HSPC module configuration for External power mode**

	Description	
7.48.180	Field Voltage Selection	Use External
7.49.126	Analog Field Voltage	23.4667
7.49.136	Backplane Current Consumption	0.0314
7.49.137	External Current Consumption	0.3409
7.48.181	Status	

## 7 Verify output from CoriolisMaster

This procedure describes how to verify that the CoriolisMaster is transmitting digital output signals to the HSPC module. Verification is done from the CoriolisMaster local display. For detailed instruction to



configure or operate the CoriolisMaster meters, refer to the CoriolisMaster FCB400, FCH400 Operation Instructions (See [Additional information](#) for a link).

Pre-requisites:

- The CoriolisMaster is powered.
- The CoriolisMaster configuration is complete (Digital Output 41/42 is configured as required).

Use the operator buttons to navigate on the CoriolisMaster local display:

1. Press the left button to navigate to the **Operator Menu**.
2. Navigate and select **Diagnostics**.

**Figure 7-1: CoriolisMaster Diagnostics on the LCD**



3. Scroll down, locate, and select **Output Readings**.
4. Scroll down and locate the **DO 41/42 Freq** (Dig.Out 41/42 Freq.) parameter.
5. Record the displayed value. [Figure 7-2](#) shows an example of a DO 41/42 frequency output of 1000 Hz.

**Figure 7-2: ABB CoriolisMaster DO 41/42 frequency output**



## 8 Verify input detection at the HSPC module

This procedure verifies that the HSPC module receives pulse inputs from the CoriolisMaster.

Prerequisites:

- HSPC module and CoriolisMaster are connected and powered.

To verify pulse detection by the module:

1. On the PCCU navigation tree, expand **ONLINE**, then select **TFIO 8/HSPC I:00**.
2. Select the **Pulse Counts** tab.
3. Verify that the PI 1 Pulse Count matches the frequency output displayed by the CoriolisMaster LCD.

**Figure 8-1: Detection of Pulse Inputs**

The screenshot displays the RMC-100 software interface. On the left is a tree view of the system components. A red arrow points to the 'ONLINE' folder, which contains the 'TFIO 8/HSPC I:00' module, highlighted with a red box. On the right, the 'Digital I/Os' section is open to the 'Pulse Counts' tab, which contains a table with the following data:

	Pulse Input	Pulse Count	Total Pulse Count	Debounce
7.49.100	PI 1	1000	886883	OFF
7.49.101	PI 2	0	0	OFF
7.49.102	PI 3	0	0	OFF
7.49.103	PI 4	0	0	OFF
7.49.104	PI 5	0	0	OFF
7.49.105	PI 6	0	0	OFF
7.49.106	PI 7	0	0	OFF
7.49.107	PI 8	0	0	OFF

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