

# FMS to TH140/TH140D Integration

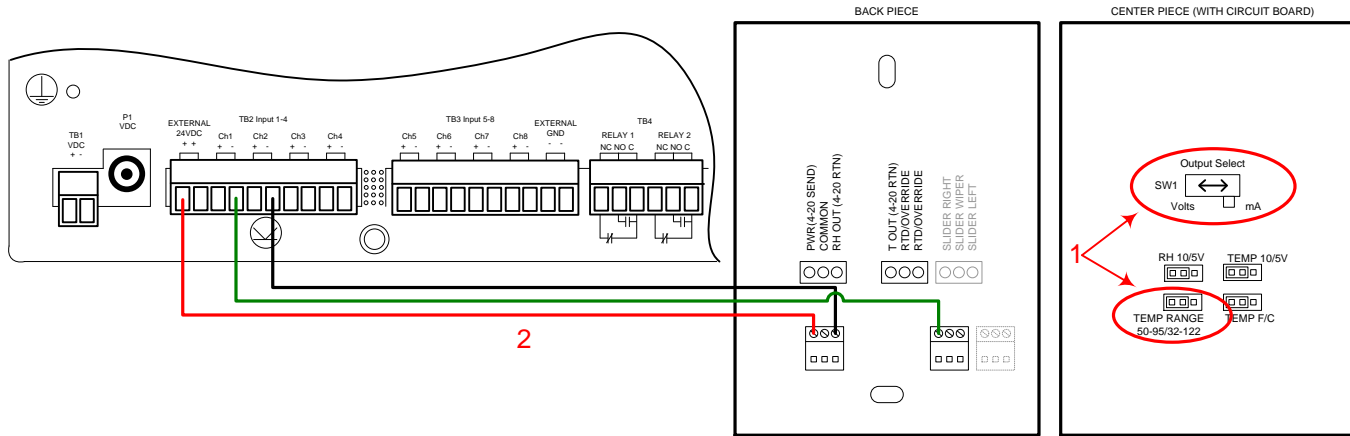


Figure 1.1: FMS Wiring with the TH140/TH140D

## SETUP

1. Set the switch position to mA. Set the temperature range to 50-95 or 32-122. The Sensor is shipped from the factory with the switch in the volts position and the temperature range is set for 50-95F. The switch position must be set to the mA position.
2. Wire the sensor as shown.
3. Configure the Falcon Input channel (temperature) for "Analog 4-20mA" and enter the Gain and Offset values. For the 50-95F range use Gain 11.25, Offset 38.75. For 32-122F range use Gain 22, Offset 10.
4. Configure the Falcon Input Channel (humidity) for "Analog 4-20mA" and enter the Gain of 25 and Offset of -25.
5. Verify the "Calc" Value displays the correct room temperature. The temperature can also be viewed on the Falcon main page.

## TROUBLESHOOTING

1. Calculate the TH140 Output current for temperature.  
Formula for calculating the correct RAW value  
$$\left( \frac{\text{Actual temp} - \text{Sensor Low}}{\text{Sensor High} - \text{Sensor Low}} \right) \times 16 + 4$$
  
Example if Room Temp is 70F and your sensor has a range of 50-95  
$$\left( \frac{70 - 50}{95 - 50} \right) \times 16 + 4 = 11.11$$
2. Measure the current flowing into the Falcon Ch- terminal with a current meter. Verify that it is close to the calculated current (+/-1%)
3. If measured current does not match calculated current then check wiring and check TH140/TH140D jumper and switch settings.
4. Compare the measured current matches the current reading in the Falcon.
5. Check the wiring if the Falcon current reading does not match the measured current reading.
6. If the Falcon current reading matches the measured current and the Falcon calculated value does not match the room temperature then the offset and gain values are wrong. Double check the Gain and Offset values.
7. If the temperature displayed in the Falcon is 1 or 2 degrees above or below the room temperature then adjust the offset by 1 or 2. Do not adjust the gain. Only tweak the offset once the previous troubleshooting steps have been performed.
8. If the Falcon still does not display the correct temperature contact RLE Technologies technical support at 970.484.6510.
9. Use similar troubleshooting procedure except use the following formula to calculate the humidity mA output.

$$\text{mA} = \left( \frac{\text{Room Humidity}}{100} \right) \times 16 + 4$$

Configuration: Input #1  
Submit Changes

Current Readings: Raw = 7.697 mA Calc = 11.1

Select Input type: ANALOG 4-20 MA Physical Digital Alarm ID: 10

Gain: 11 Calculate High Limit2: 0 Alarm ID: 13

Offset: 39 High Limit1: 0 Alarm ID: 11

Hysteresis: 3 Low Limit1: 0 Alarm ID: 12

Unit of Measure: DEG F Low Limit2: 0 Alarm ID: 14

Alarm Delay: 0 Seconds Alarm Dial Out: 0,0,0,0

Label: (Veris) TH140/TH140D Temperature Signal

Label (Digital input normal):

"OR Gate" Relay (1-16) Control: 0 Relay Configuration

"OR Gate" Relay (17-32) Control: 0

Figure 1.2: Temperature Setup  
50 – 95 Degree F Range

Configuration: Input #2  
Submit Changes

Current Readings: Raw = 7.013 mA Calc = 18.5

Select Input type: ANALOG 4-20 MA Physical Digital Alarm ID: 20

Gain: 25 Calculator High Limit2: 0 Alarm ID: 23

Offset: -25 High Limit1: 0 Alarm ID: 21

Hysteresis: 3 Low Limit1: 0 Alarm ID: 22

Unit of Measure: Low Limit2: 0 Alarm ID: 24

Alarm Delay: 0 Seconds Alarm Dial Out: 0,0,0,0

Label: (Veris) TH140/TH140D Humidity Signal

Label (Digital input normal):

"OR Gate" Relay (1-16) Control: 0 Relay Configuration

"OR Gate" Relay (17-32) Control: 0

Figure 1.3: Humidity Setup



# FMS to T120D Integration

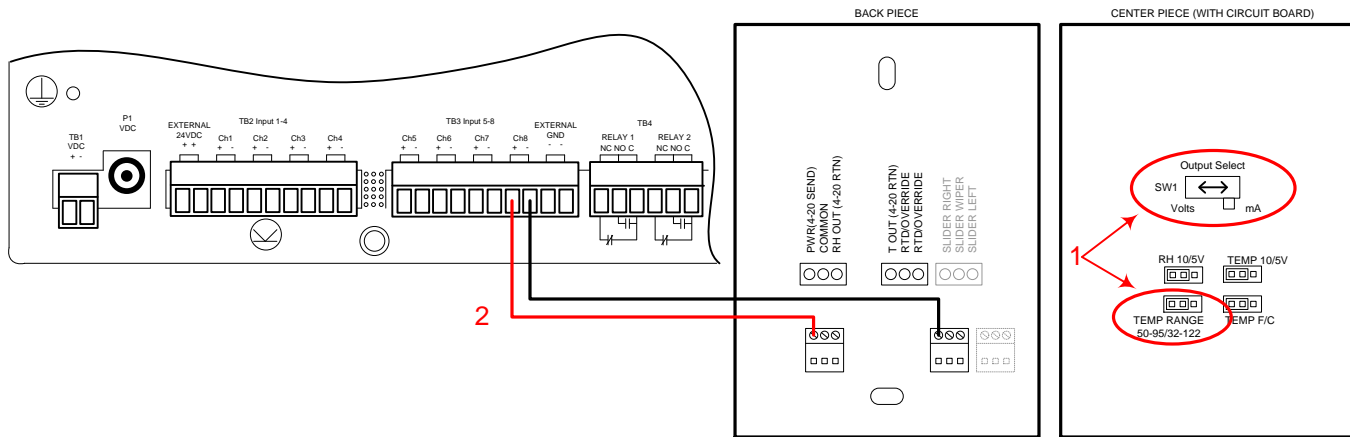


Figure 2.1: FMS Wiring with the T120D

## SETUP

1. Set the switch position to mA. Set the temperature range to 50-95 or 32-122. The sensor is shipped from the factory with the switch in the volts position and the temperature range is set for 50-95F. The switch position must be set to the mA position.
2. Wire the sensor to the CH # being used.
3. Configure the Falcon Input channel (temperature) for "Analog 4-20mA" and enter the Gain and offset values. For the 50-95F range use Gain 11.25, Offset 38.75. For 32-122F range use Gain 22, Offset 10.
4. Verify the "Calc" value displays the correct room temperature. The temperature can also be viewed on the Falcon main page.

## TROUBLESHOOTING

1. Calculate the T120D Output current for temperature.

Formula for calculating the correct RAW value

$$\left( \frac{\text{Actual temp} - \text{Sensor Low}}{\text{Sensor High} - \text{Sensor Low}} \right) \times 16 + 4$$

Example if Room Temp is 70F and your sensor has a range of 50-95

$$\left( \frac{70 - 50}{95 - 50} \right) \times 16 + 4 = 11.11$$

2. Measure the current flowing into the Falcon Ch- terminal with a current meter. Verify that it is close to the calculated current (+/- 1%).

3. If measured current does not match calculated current then check wiring and check T120D jumper and switch settings.

4. Compare the measured current matches the current reading in the Falcon.

5. Check the wiring if the Falcon current reading does not match the measured current reading.

6. If the Falcon current reading matches the measured current and the Falcon Calculated value does not match the room temperature then the offset and gain values are wrong. Double check the Gain and Offset values.

7. If the temperature displayed in the Falcon is 1 or 2 degrees above or below the room temperature then adjust the offset by 1 or 2. Do not adjust the gain. Only tweak the offset once the previous troubleshooting steps have been performed.

8. If the Falcon still does not display the correct temperature contact RLE Technologies technical support at 970.484.6510.

Figure 2.2: 50-95F Range Setup

Figure 2.3: 32-122F Range Setup



# FMS to HEW3MSTA Integration

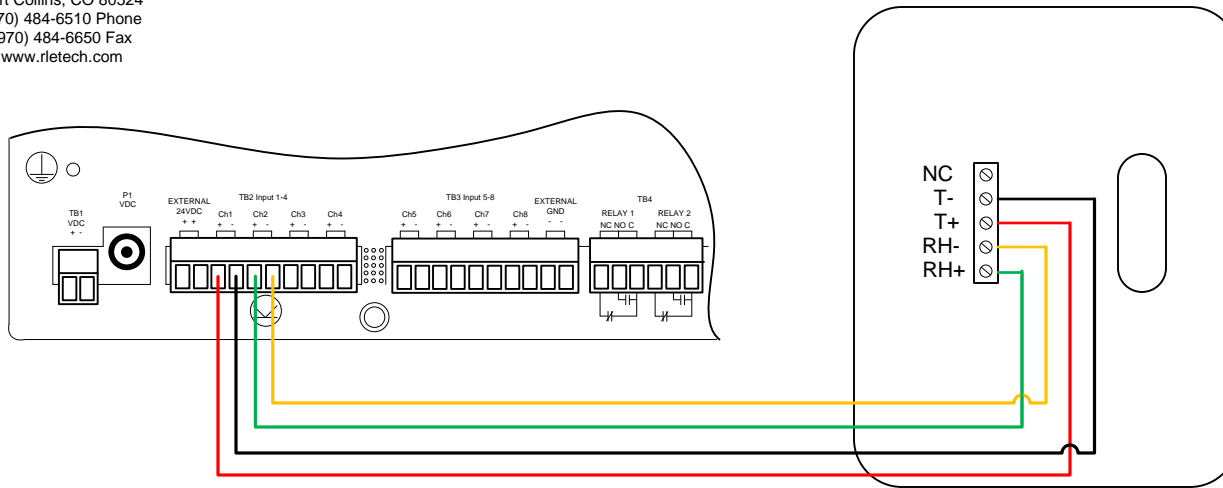


Figure 3.1: FMS Wiring with the HEW3MSTA

## SETUP

1. The temperature range is 50-95 degF
2. Wire the sensor as shown.
3. Configure the Falcon Input channel (temperature) for "Analog 4-20mA" and enter the Gain and Offset values. For the 50-95F range use Gain 11.25, Offset 38.75.
4. Configure the Falcon Input Channel (humidity) for "Analog 4-20mA" and enter the Gain of 25 and Offset of -25.
5. Verify the "Calc" Value displays the correct room temperature. The temperature can also be viewed on the Falcon main page.

## TROUBLESHOOTING

1. Calculate the output current for temperature.  
Formula for calculating the correct RAW value  
$$\left( \frac{\text{Actual temp} - \text{Sensor Low}}{\text{Sensor High} - \text{Sensor Low}} \right) \times 16 + 4$$
  
Example if Room Temp is 70F and your sensor has a range of 50-95  
$$\left( \frac{70 - 50}{95 - 50} \right) \times 16 + 4 = 11.11$$
2. Measure the current flowing into the Falcon Ch- terminal with a current meter. Verify that it is close to the calculated current (+/-1%)
3. If measured current does not match calculated current then check wiring.
4. Compare the measured current matches the current reading in the Falcon.
5. Check the wiring if the Falcon current reading does not match the measured current reading.
6. If the Falcon current reading matches the measured current and the Falcon calculated value does not match the room temperature then the offset and gain values are wrong. Double check the Gain and Offset values.
7. If the temperature displayed in the Falcon is 1 or 2 degrees above or below the room temperature then adjust the offset by 1 or 2. Do not adjust the gain. Only tweak the offset once the previous troubleshooting steps have been performed.
8. If the Falcon still does not display the correct temperature contact RLE Technologies technical support at 970.484.6510.
9. Use similar troubleshooting procedure except use the following formula to calculate the humidity mA output.

Configuration: Input #1  
Current Readings: Raw = 7.697 mA Calc = 11.1

Submit Changes [Next Input >>](#)

Select Input type: ANALOG 4-20 MA Physical Digital Alarm ID: 10

Gain: 11.25 Calculator High Limit2: 0 Alarm ID: 13  
Offset: 38.75 High Limit1: 0 Alarm ID: 11  
Hysteresis: 3 Low Limit1: 0 Alarm ID: 12  
Unit of Measure: DEG F Low Limit2: 0 Alarm ID: 14  
Alarm Delay: 0 Seconds Alarm Dial Out: 0,0,0,0  
Label: Temperature Signal  
Label (Digital input normal):  
"OR Gate" Relay (1-16) Control: 0 Relay Configuration  
"OR Gate" Relay (17-32) Control: 0

Figure 3.2: Temperature Setup  
50 – 95 Degree F Range

Configuration: Input #2  
Current Readings: Raw = 7.013 mA Calc = 18.5

Submit Changes [<< Prev Input](#) [Next Input >>](#)

Select Input type: ANALOG 4-20 MA Physical Digital Alarm ID: 20

Gain: 25 Calculator High Limit2: 0 Alarm ID: 23  
Offset: -25 High Limit1: 0 Alarm ID: 21  
Hysteresis: 3 Low Limit1: 0 Alarm ID: 22  
Unit of Measure: Low Limit2: 0 Alarm ID: 24  
Alarm Delay: 0 Seconds Alarm Dial Out: 0,0,0,0  
Label: Humidity Signal  
Label (Digital input normal):  
"OR Gate" Relay (1-16) Control: 0 Relay Configuration  
"OR Gate" Relay (17-32) Control: 0

Figure 3.3: Humidity Setup

$$\text{mA} = \left( \frac{\text{Room Humidity}}{100} \right) \times 16 + 4$$



# FMS to TEAMS Integration

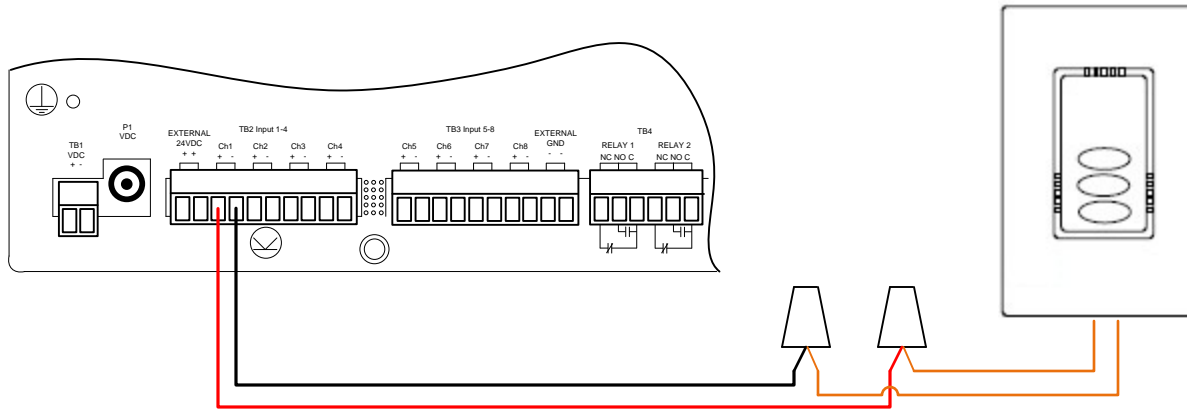


Figure 4.1: FMS Wiring with the TEAMS

Configuration: Input #1      Current Readings: Raw = 7.697 mA Calc = 11.1

     [Next Input >>](#)

Select Input type:             Digital Alarm ID: 10

Gain:  [Calculator](#)      High Limit2:  Alarm ID: 13

Offset:       High Limit1:  Alarm ID: 11

Hysteresis:       Low Limit1:  Alarm ID: 12

Unit of Measure:       Low Limit2:  Alarm ID: 14

Alarm Delay:  Seconds      Alarm Dial Out:

Label:

Label (Digital input normal):

"OR Gate" Relay (1-16) Control:  [Relay Configuration](#)

"OR Gate" Relay (17-32) Control:

Figure 4.2: Temperature Setup  
50 – 95 Degree F Range

## SETUP

1. The temperature range is 50-95 degF
2. Wire the sensor as shown.  
Orange wires are polarity independent
3. Configure the Falcon Input channel (temperature) for "Analog 4-20mA" and enter the Gain and Offset values. For the 50-95F range use Gain 11.25, Offset 38.75.
4. Verify the "Calc" Value displays the correct room temperature.  
The temperature can also be viewed on the Falcon main page.

## TROUBLESHOOTING

1. Calculate the output current for temperature.  
Formula for calculating the correct RAW value  
$$\left( \frac{\text{Actual temp} - \text{Sensor Low}}{\text{Sensor High} - \text{Sensor Low}} \right) \times 16 + 4$$
  
Example if Room Temp is 70F and your sensor has a range of 50-95  
$$\left( \frac{70 - 50}{95 - 50} \right) \times 16 + 4 = 11.11$$
2. Measure the current flowing into the Falcon Ch- terminal with a current meter. Verify that it is close to the calculated current (+/-1%)
3. If measured current does not match calculated current then check wiring.
4. Compare the measured current matches the current reading in the Falcon.
5. Check the wiring if the Falcon current reading does not match the measured current reading.
6. If the Falcon current reading matches the measured current and the Falcon calculated value does not match the room temperature then the offset and gain values are wrong. Double check the Gain and Offset values.
7. If the temperature displayed in the Falcon is 1 or 2 degrees above or below the room temperature then adjust the offset by 1 or 2. Do not adjust the gain. Only tweak the offset once the previous troubleshooting steps have been performed.
8. If the Falcon still does not display the correct temperature contact RLE Technologies technical support at 970.484.6510.



# CT120/CT300/CT800/CT2400 FMS Integration

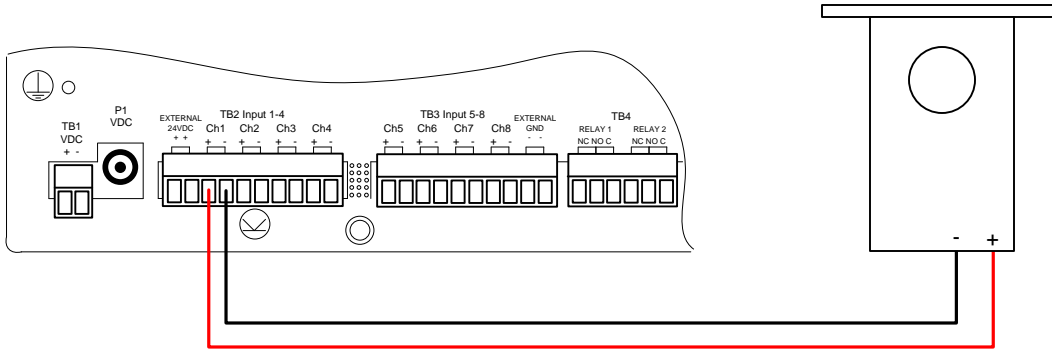


Figure 5.1: FMS Wiring

The screenshot shows the 'Configuration: Input #?' interface. Key fields include:
 

- Input Type: ANALOG 4-20 MA (circled in red with '1')
- Gain: 25 (circled in red with '2')
- Offset: -25 (circled in red with '3')
- Unit of Measure: Amp
- Alarm Delay: 0 Seconds
- Label: CT55 Current Transducer

Figure 5.2: FMS Input Configuration Interface

## FMS Configuration

1. Set Input Type to an Analog 4-20 mA Input.
2. For a 0-100 Amp setting, use a gain of 25 and an offset of -25.
3. For other settings, use the integrated gain/offset calculator.



# PFM FMS Integration

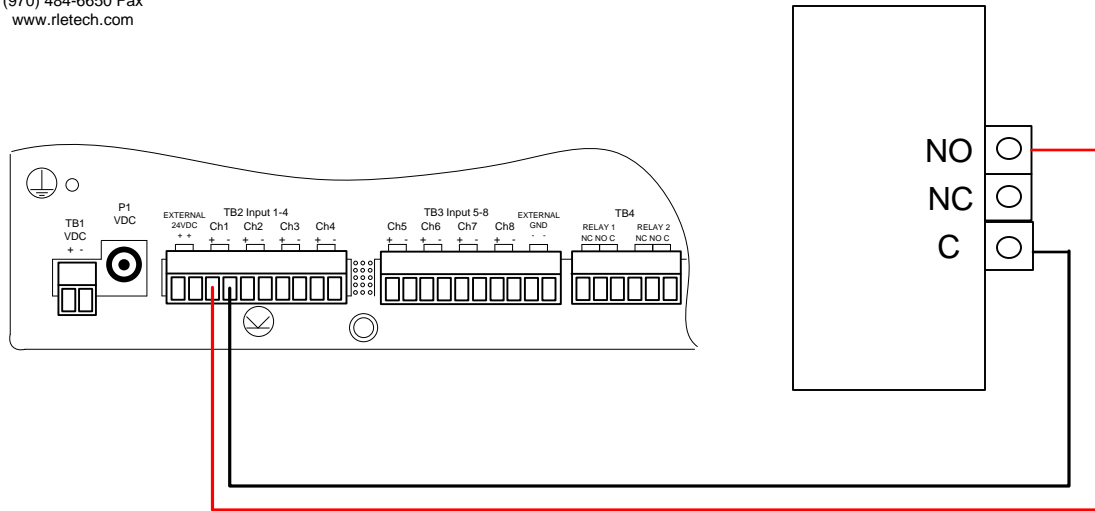
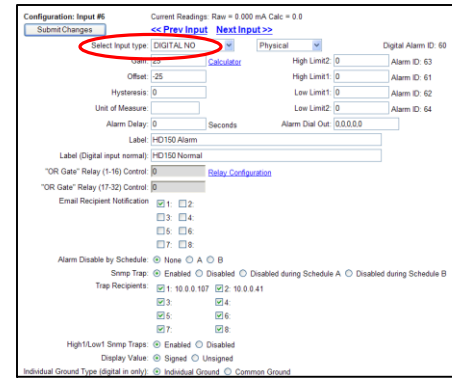


Figure 6.1: FMS Wiring



FMS Input Configuration Interface

## FMS Configuration

Set Input Type to a Digital NO Input type for each PFM Relay Output wired into the Falcon.



# GD100 FMS Integration

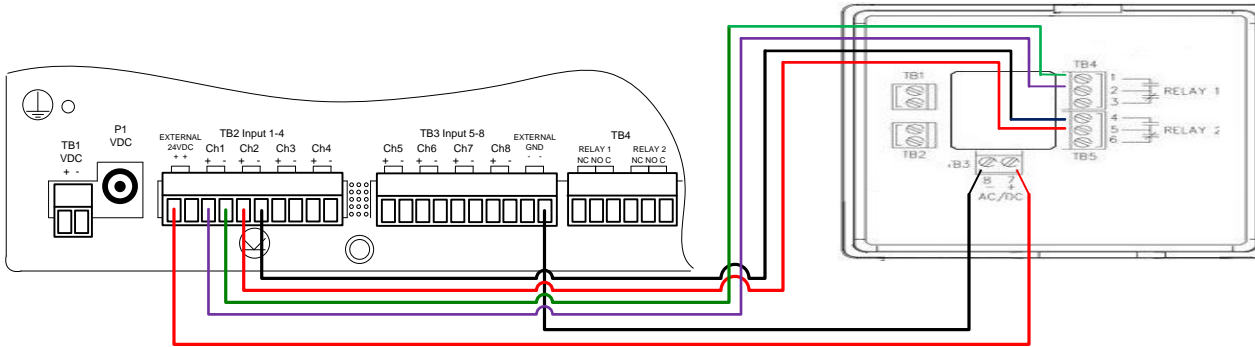
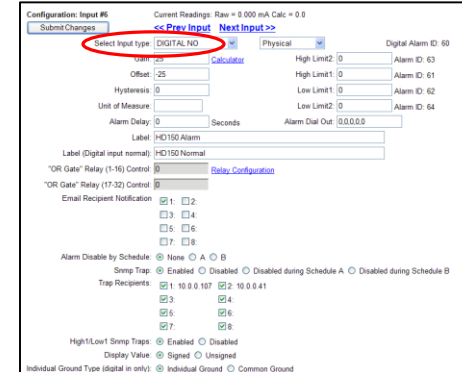


Figure 7.1: FMS Wiring



FMS Input Configuration Interface

## FMS Configuration

Set Input Type to a Digital NO





# AFS-(WM/DM) F200 Integration

104 Racquette Drive  
Fort Collins, CO 80524  
(970) 484-6510 Phone  
(970) 484-6650 Fax  
www.rletech.com

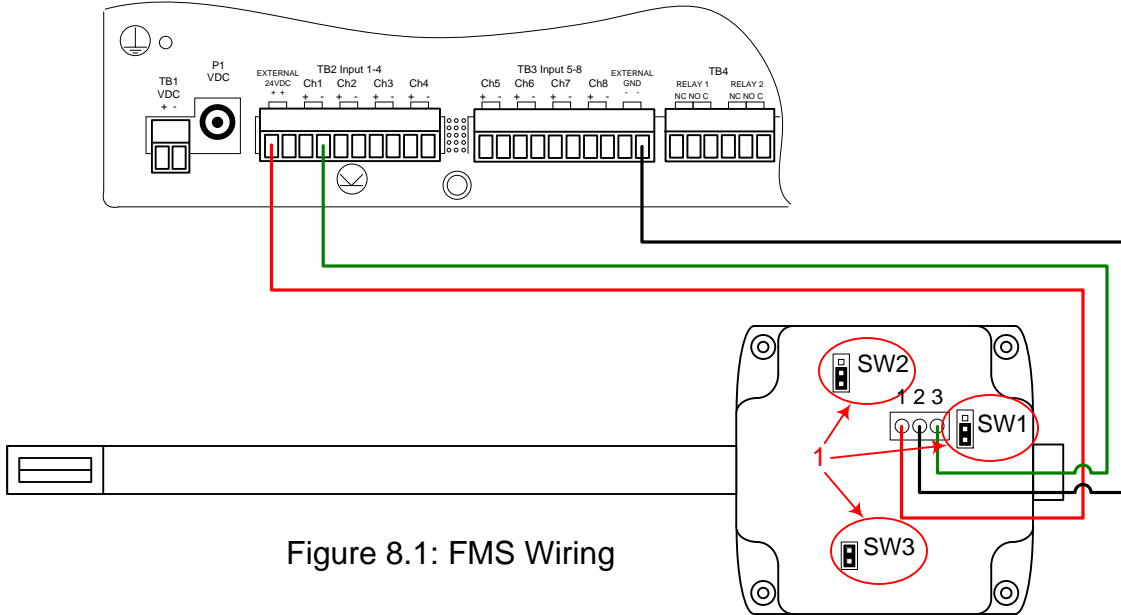


Figure 8.1: FMS Wiring

1. Set Jumper Switches on AFS-XX to appropriate settings.

Output Selection SW1: 4-20mA Output

Working Range SW2: 0-2000 Ft/Min Range  
 0-3000 Ft/Min Range  
 0-4000 Ft/Min Range

Response Time SW3: Fast   
Slow

2. Set FMS Input Channel to an Analog 4-20 mA.

3. For a 0-2000 Ft/Min Range, use a gain of 500 and an offset of -500.

4. For other settings, use the integrated gain/offset calculator.

## FMS Configuration

FMS AFS-xx Input Configuration Interface





# AFS-D FMS Integration

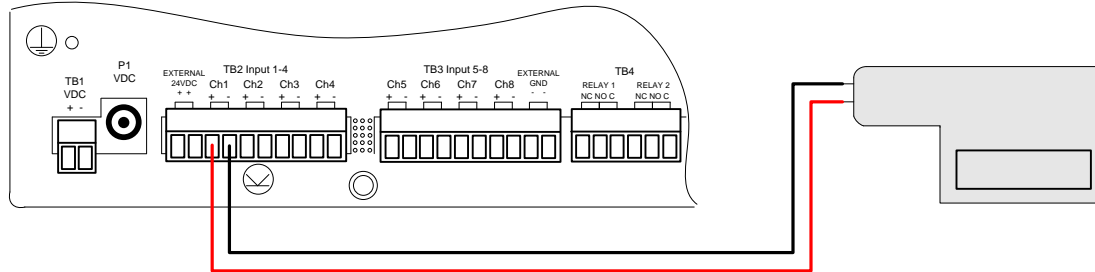
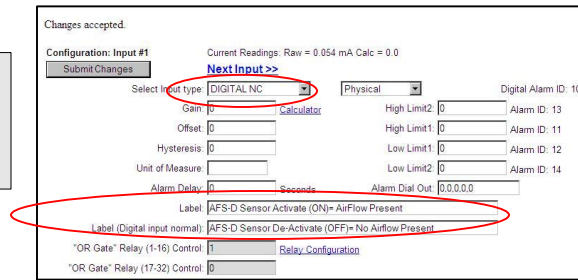


Figure 9.1: FMS Wiring



FMS Input Configuration Interface

## FMS Configuration

Set Input Type to a NC Digital Contact for each AFS-D wired into the Falcon. Assign an on/off label for each sensor connected.



# MD3 FMS Integration

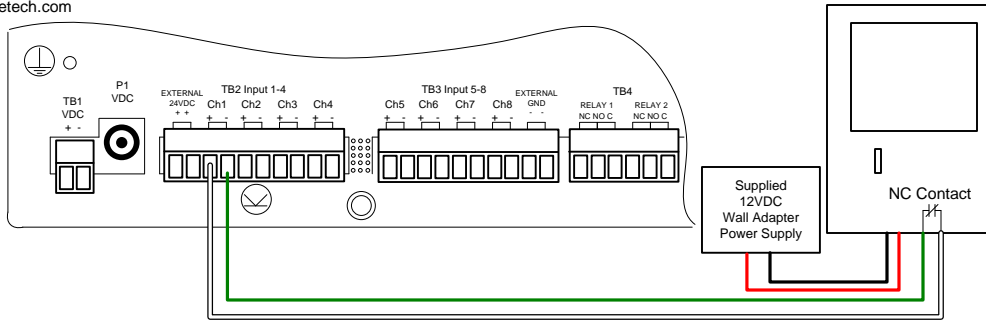
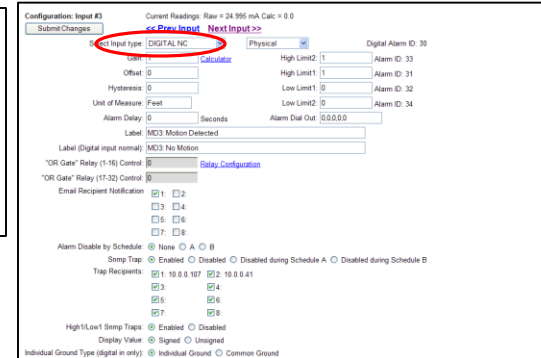


Figure 10.1: FMS Wiring



FMS Input Configuration Interface

## FMS Configuration

Set Input Type to a Digital NC Input Type for each MD3 wired into the Falcon.



# MDS FMS Integration

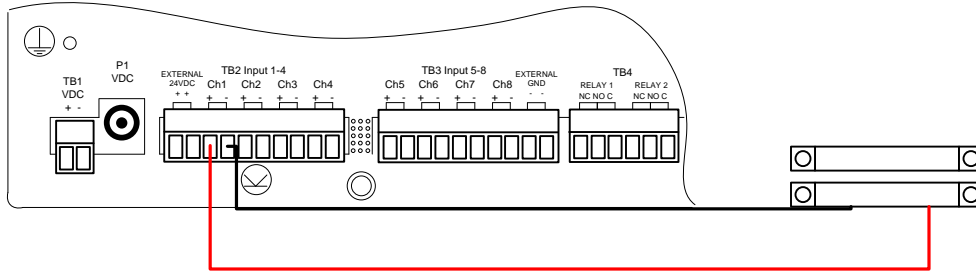
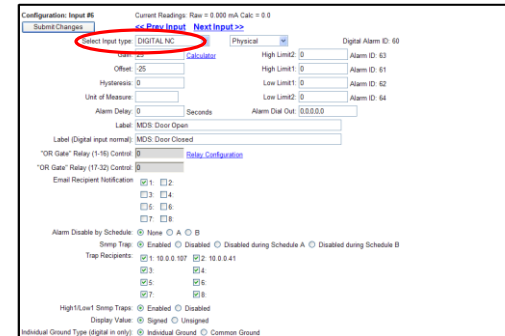


Figure 11.1: FMS Wiring



FMS Input Configuration Interface

## FMS Configuration

Set Input Type to a Digital NC Input Type for each MDS wired into the Falcon.



# SMK FMS Integration

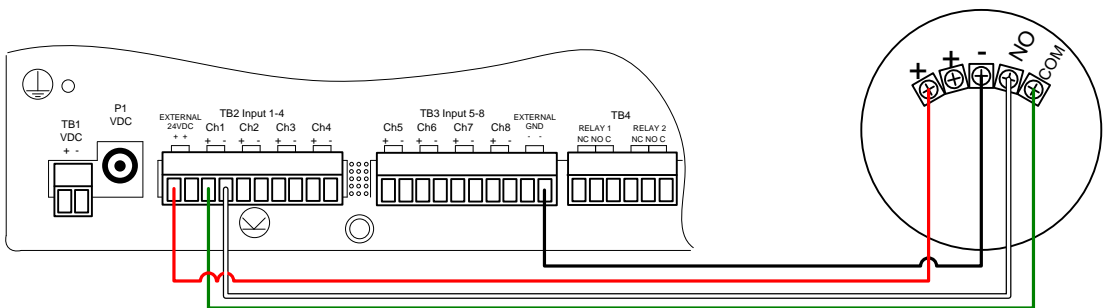
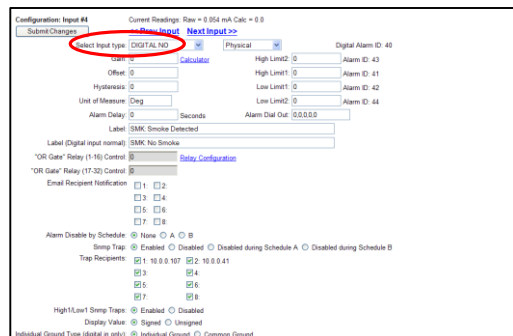


Figure 12.1: FMS Wiring



FMS Input Configuration Interface

**FMS Configuration**  
Set Input Type to a NO Digital Contact for each SMK wired into the Falcon.



# HD150 & HD150-2 FMS Integration

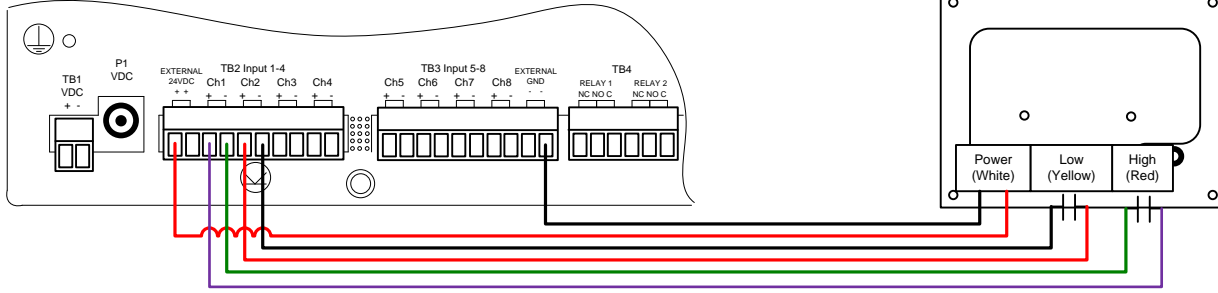
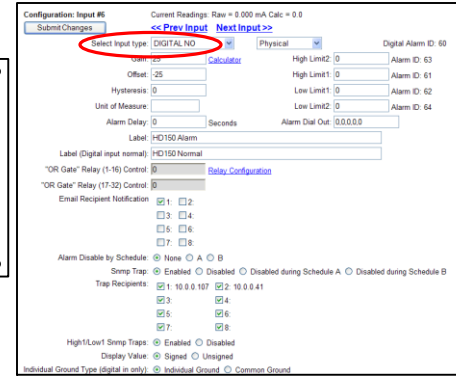


Figure 13.1: FMS Wiring



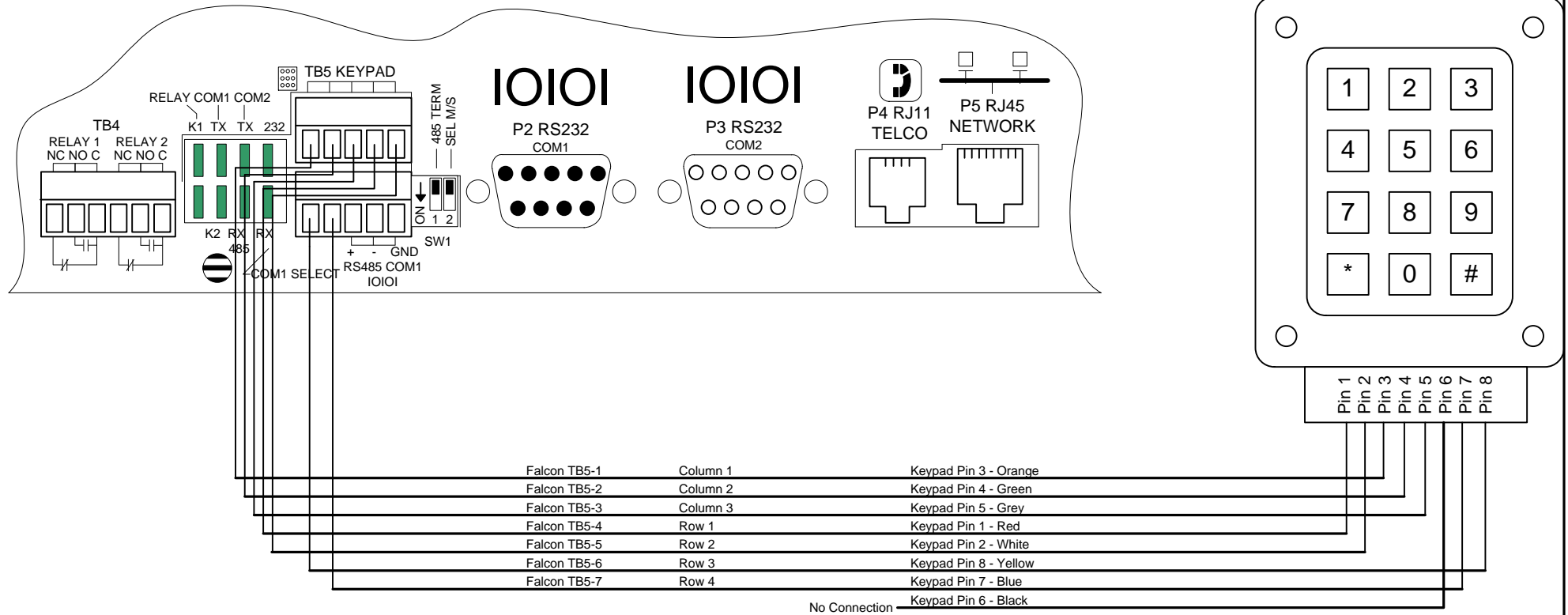
FMS Input Configuration Interface

## FMS Configuration

Set Input Type to a Digital NO Input type for each HD150/HD150-2 Relay Output wired into the Falcon.

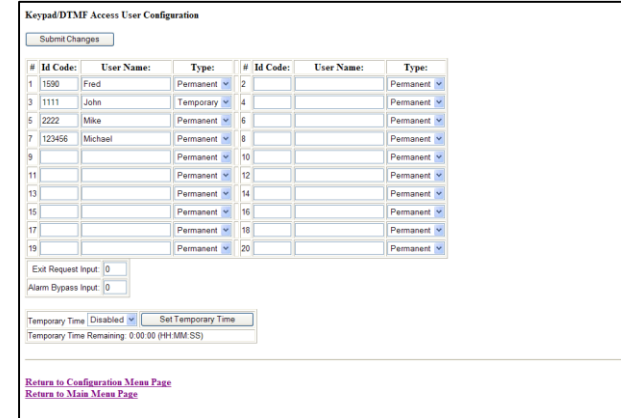


# KPO Falcon Integration



RLE - KPO Keypad

Figure 14.1: FMS Wiring with KPO



**FMS Configuration**  
Enter in Keypad users and corresponding codes in the Falcon's Keypad/DTMF Access User Configuration menu.



# FMS BAPI Temperature/Humidity Falcon Integration

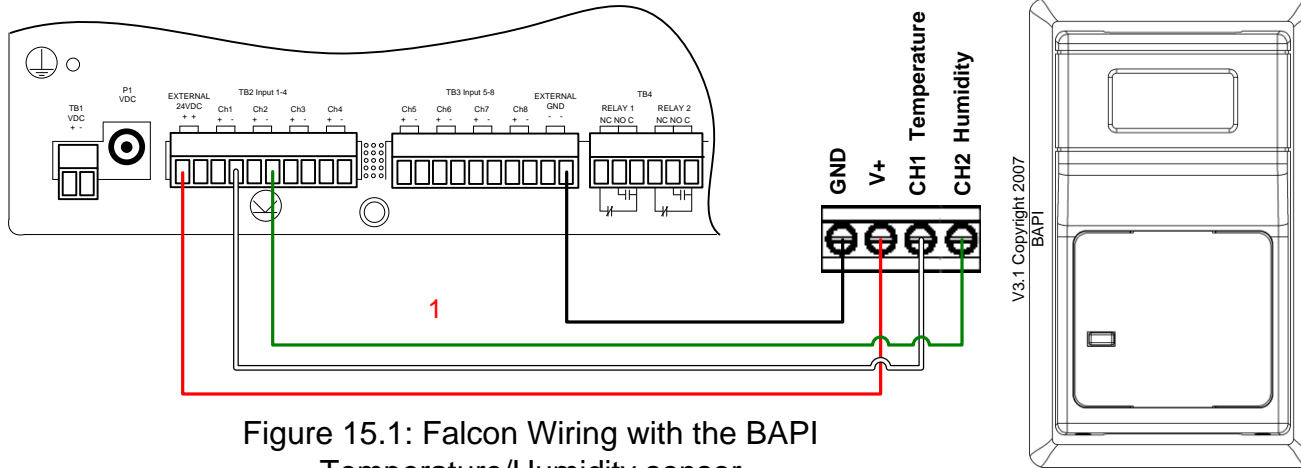


Figure 15.1: Falcon Wiring with the BAPI Temperature/Humidity sensor

## SETUP

1. Wire the sensor as shown.
2. Configure the Falcon Input channel (temperature) for "Analog 4-20mA" and enter the gain and offset values. For the 32-120F range use Gain 22, Offset -10.
3. For other temperature ranges, use the Calculator function on the webpage
4. Configure the Falcon Input Channel (humidity) for "Analog 4-20mA" and enter the Gain of 25 and Offset of -25.
5. Verify the "Calc" Value displays the correct room temperature. The temperature can also be viewed on the Falcon main page.

## TROUBLESHOOTING

1. Calculate the BAPI Output current for temperature.

$$\left( \frac{\text{Actual temp} - \text{Sensor Low}}{\text{Sensor High} - \text{Sensor Low}} \right) \times 16 + 4$$

Example if Room Temp is 70F and your sensor has a range of 32-120

$$\left( \frac{70 - 32}{120 - 32} \right) \times 16 + 4 = 10.90$$

2. Measure the current flowing into the Falcon Ch- terminal with a current meter. Verify that it is close to the calculated current (+/-1%)

3. If measured current does not match calculated current then check wiring and check the BAPI switch settings.
4. Compare the measured current matches the current reading in the Falcon.
5. Check the wiring if the Falcon current reading does not match the measured current reading.
6. If the Falcon current reading matches the measured current and the Falcon calculated value does not match the room temperature then the offset and gain values are wrong. Double check the Gain and Offset values.
7. If the temperature displayed in the Falcon is 1 or 2 degrees above or below the room temperature then adjust the offset by 1 or 2. Do not adjust the gain. Only tweak the offset once the previous troubleshooting steps have been performed.

8. If the Falcon still does not display the correct temperature contact RLE Technologies technical support at 970.484.6510.
9. Use similar troubleshooting procedure except use the following formula to calculate the humidity mA output.

$$\text{mA} = \left( \frac{\text{Room Humidity}}{100} \right) \times 16 + 4$$

Configuration: Home

Configuration: Input #1

Submit Changes

Current Readings: Raw = 13.263 mA Calc = 83.0

Select Input type: ANALOG 4-20MA

Gain: 22

Offset: -10

Hysteresis: 3

Unit of Measure: Deg

Alarm Delay: 0 Seconds

Label: BAPI Temperature Input

High Limit2: 0 Alarm ID: 13

High Limit1: 0 Alarm ID: 11

Low Limit1: 0 Alarm ID: 12

Low Limit2: 0 Alarm ID: 14

"OR Gate" Relay (1-16) Control: 0 Relay: Configuration

"OR Gate" Relay (17-32) Control: 0

Temperature Setup  
32 - 120 Degree F Range

Configuration: Input #2

Submit Changes

Current Reading: Raw = 6.976 mA Calc = 18.6

Select Input type: ANALOG 4-20 MA

Gain: 25

Offset: -25

Hysteresis: 3

Unit of Measure:

Alarm Delay: 0 Seconds

Label: BAPI Humidity Signal

High Limit2: 0 Alarm ID: 23

High Limit1: 0 Alarm ID: 21

Low Limit1: 0 Alarm ID: 22

Low Limit2: 0 Alarm ID: 24

"OR Gate" Relay (1-16) Control: 0 Relay: Configuration

"OR Gate" Relay (17-32) Control: 0

Humidity Setup





# FMS Dwyer Temperature/Humidity Falcon Integration

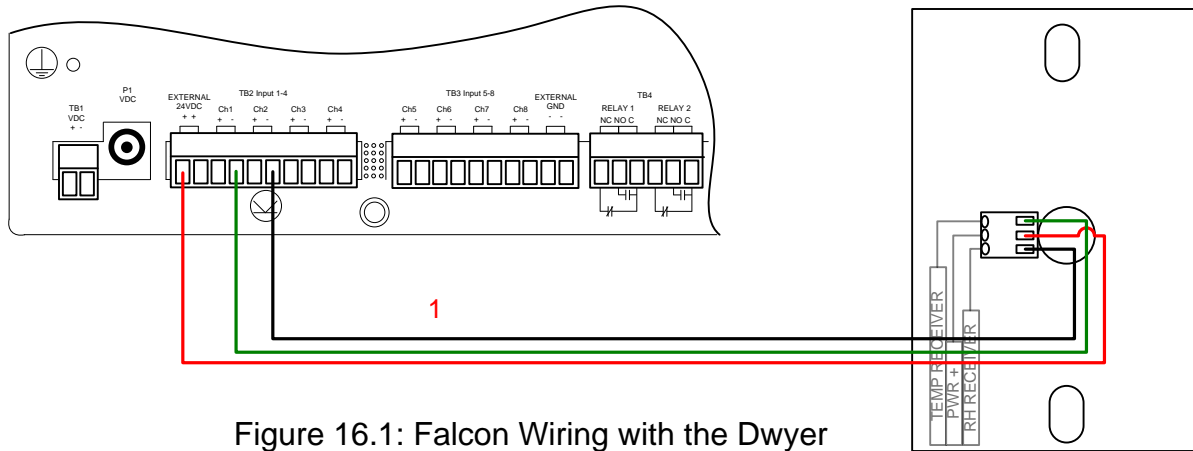


Figure 16.1: Falcon Wiring with the Dwyer Temperature/Humidity sensor

## SETUP

1. Wire the sensor as shown.
2. Configure the Falcon Input channel (temperature) for "Analog 4-20mA" and enter the gain and offset values. For the -40 - 140F range use Gain 45, Offset -85.
3. For other temperature ranges, use the Calculator function on the webpage
4. Configure the Falcon Input Channel (humidity) for "Analog 4-20mA" and enter the Gain of 25 and Offset of -25.
5. Verify the "Calc" Value displays the correct room temperature. The temperature can also be viewed on the Falcon main page.

## TROUBLESHOOTING

1. Calculate the Dwyer Output current for temperature.

( ( Actual temp - Sensor Low ) / ( Sensor High - Sensor Low ) ) x 16 + 4  
Example if Room Temp is 70F and your sensor has a range of -40 - 140

$$\left( \frac{(70 - -40)}{(140 - -40)} \right) \times 16 + 4 = 13.77$$

2. Measure the current flowing into the Falcon Ch- terminal with a current meter. Verify that it is close to the calculated current (+/-1%)

3. If measured current does not match calculated current then check wiring.

4. Compare the measured current matches the current reading in the Falcon.

5. Check the wiring if the Falcon current reading does not match the measured current reading.

6. If the Falcon current reading matches the measured current and the Falcon calculated value does not match the room temperature then the offset and gain values are wrong. Double check the Gain and Offset values.

7. If the temperature displayed in the Falcon is 1 or 2 degrees above or below the room temperature then adjust the offset by 1 or 2. Do not adjust the gain. Only tweak the offset once the previous troubleshooting steps have been performed.

8. If the Falcon still does not display the correct temperature contact RLE Technologies technical support at 970.484.6510.

9. Use similar troubleshooting procedure except use the following formula to calculate the humidity mA output.

$$\text{mA} = \left( \frac{\text{Room Humidity}}{100} \right) \times 16 + 4$$

Configuration: Home

Configuration: Input #1

Submit Changes

Current Readings: Raw = 13.489 mA Calc = 65.1

Select Input type: ANALOG 4-20 MA

Gain: 45.00

Offset: -85.00

Hysteresis: 3

Unit of Measure: Deg

Alarm Delay: 0 Seconds

Alarm Dial Out: 0,0,0,0,0

Label: Dwyer Temperature Input

Label (Digital input normal):

"OR Gate" Relay (1-16) Control: 0

"OR Gate" Relay (17-32) Control: 0

Temperature Setup  
-40 - 140 Degree F Range

Configuration: Input #2

Submit Changes

Current Readings: Raw = 6.976 mA Calc = 18.6

Select Input type: ANALOG 4-20 MA

Gain: 25

Offset: -25

Hysteresis: 3

Unit of Measure:

Alarm Delay: 0 Seconds

Alarm Dial Out: 0,0,0,0,0

Label: BAPI Humidity Signal

Label (Digital input normal):

"OR Gate" Relay (1-16) Control: 0

"OR Gate" Relay (17-32) Control: 0

Humidity Setup

