

# *Blancett*®

## **Active Sensor**

**Frequency to Current  
Frequency to Voltage Converter**

For Use with Turbine Flow Meters

### **INSTALLATION & INSTRUCTION MANUAL**



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# TABLE OF CONTENTS

Introduction.....	3
Specifications .....	3
Connection.....	4
Operation.....	6
Calibration.....	7
Loop Resistance.....	8
Maintenance.....	9
Dimensions .....	9
Troubleshooting Guide.....	10
Statement of Warranty .....	11

**NOTE:** *Blancett reserves the right to make any changes or improvements to the product described in this manual at any time without notice.*

# INTRODUCTION

The Active Sensor is a state-of-the-art, digital signal processing device designed to provide exceptional accuracy at a very affordable price. Designed for use with Blancett turbine meters, the sensor measures and calculates the flow rate to produce an analog current or voltage output representative of the meter's flow rate.

The Active Sensor is offered in two versions:

- The F to I converter provides a 4-20 mA output in a two wire, loop powered setup.
- The F to V converter offers a 0-5 VDC output for those applications where a voltage output is preferred.

# SPECIFICATIONS

	<b>F to I</b>	<b>F to V</b>
Power:	Loop powered, 6 V insertion loss maximum 10 to 30 VDC supply range	10 to 26 VDC supply range
Inputs: Frequency Trigger Sensitivity Frequency Measurement Accuracy	Magnetic Pick-up 0 to 3500 Hz 30 mV p-p ±1%	Magnetic Pick-up 0 to 3500 Hz 30 mV p-p ±1%
Analog Output: Resolution Temperature Drift	4 to 20 mA current loop 1:4000 50 ppm / °C (max)	0 to 5 VDC 1:4000 50 ppm / °C (max)
Environmental: Ambient Temperature Humidity	-22 °F to +158 °F (-30 °C to +70 °C) 0-90% non-condensing	-22 °F to +158 °F (-30 °C to +70 °C) 0-90% non-condensing

## CONNECTION

The 4-20 mA output can drive auxiliary devices (resistive loads) such as displays, recorders and computers, provided that the voltage supplied by the power supply is adequate. Devices must be wired in series with the F to I converter and power supply. The voltage drop across the load(s) and the 6 VDC minimum needed to drive the F to I converter determine the minimum voltage required from the power supply.

Determine the necessary voltage required to adequately drive the F to I converter and auxiliary device(s).

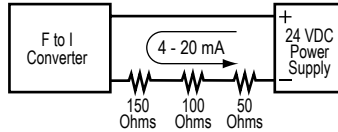
The F to I converter acts as a current controlling device. Thus, the current output remains the same even if the power supply voltage fluctuates or the load resistance changes. The current varies only with respect to the flow rate from the turbine flow meter, as long as the voltage drop across the F to I converter is at least 6 VDC.

The load(s) in the circuit will generally have some electrical resistance, 100 Ohms for this example. The 4-20 mA loop current will produce a voltage drop across each load. The maximum voltage drop across a load(s) will exist when the loop current is 20 mA. The power supply must provide enough voltage for the load(s) plus the 6 VDC minimum insertion loss of the F to I converter.

\*\*See examples on page 4.

## Example 1

Sufficient Power Supply Voltage



Total Load Resistance = 300 Ohms

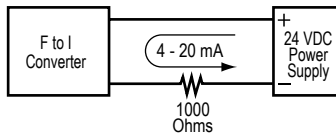
At 20 mA loop current, the voltage drop across the load(s)  
is 6 volts:

$$300 \text{ Ohms} \times 20 \text{ mA} = 6,000 \text{ mV or } 6 \text{ volts}$$

Subtract 6 volts from the 24 volt source to determine that 18 volts is available to power the F to I converter. The 18 volts is within the specified 10 to 30 volt range and is sufficient to power the F to I converter.

## Example 2

Insufficient Power Supply Voltage



Total Load Resistance = 1000 Ohms

At 20 mA loop current, the voltage drop across the load(s)  
is 14 volts:

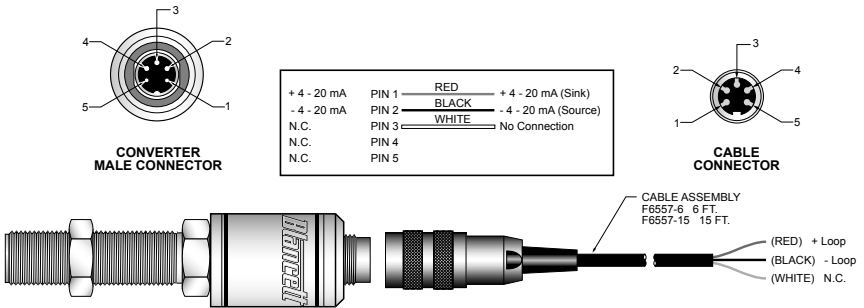
$$1000 \text{ Ohms} \times 20 \text{ mA} = 20,000 \text{ mV or } 20 \text{ volts}$$

Subtract 20 volts from the 24 volt source to determine that 4 volts is available to power the F to I converter. The 4 volts is below the specified 10 to 30 volt range and is not adequate to power the F to I converter. If for example, the power supply voltage was 30 volts instead of 24 volts, the voltage available to power the F to I converter would be 10 volts and within the specified range.

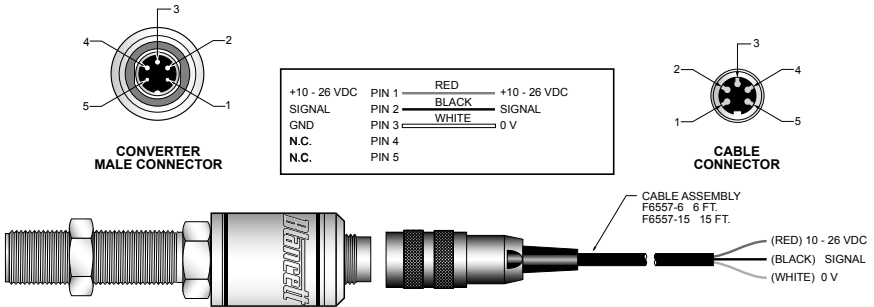
# OPERATION

Once power is applied, the converter will output an analog value representative of the measured frequency from the turbine meters.

Refer to the wiring diagram in **Figure 1** or **2** that corresponds to the converter that you have selected for your application.



**Figure 1**  
*F to I Wiring Diagram*



**Figure 2**  
*F to V Wiring Diagram*

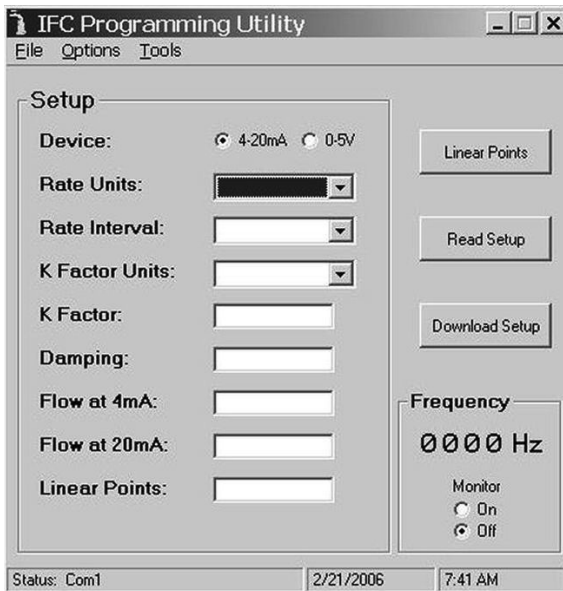
# CALIBRATION

**NOTE:** If your active sensor was purchased with a Blancett turbine meter, the two components ship from the factory calibrated as a set. If the active sensor is a replacement, the turbine's K-factor has changed, or the sensor is being used with some other pulse-generating device, programming will be necessary.

## Requirements:

- IBM Compatible PC running Windows® 95 and newer
- Programming Cable
- Programming Software
- DC Power Supply

After installing the programming software and attaching the programming cable to the active sensor through an available Com Port on your PC, you are now ready to power up your Active Sensor and continue with the calibration procedure. Using a DC power supply, apply 10-26 VDC to the Active Sensor. Run the "IFC Programming" Software shown in **Figure 3**.

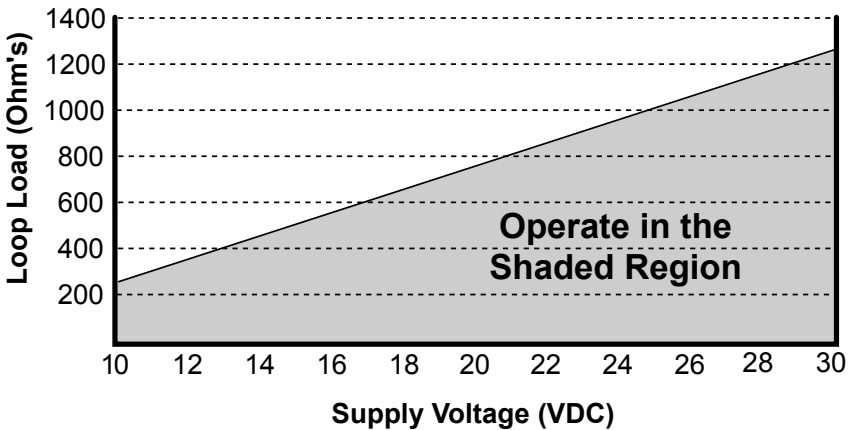


**Figure 3**  
Software Screenshot

Pressing the “Read Setup” button will read the current configuration of your sensor. After entering your desired values for Device Type, K-factor, Rate and Flow Span, press the “Download Setup” button to save your settings. Please consult the factory for any further calibration requirements.

**NOTE:** *If communication fails, please check cabling and/or ComPort address and try again.*

## LOOP RESISTANCE



**Figure 4**  
*Loop Resistance Chart*

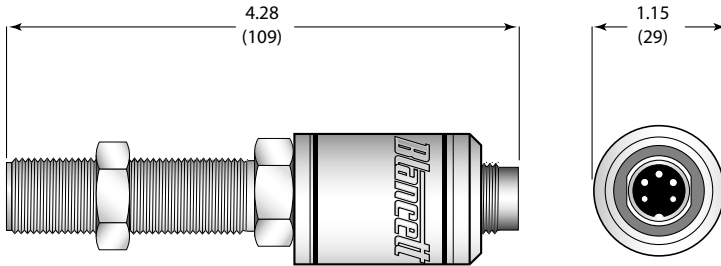


# MAINTENANCE

1. Frequent inspection should be made. A schedule for maintenance checks should be determined by the environment and frequency of use. It is recommended that it should be inspected at least once a year.
2. Perform visual, electrical and mechanical checks on all components on a regular basis.
  - A. Visually check for undue heating evidenced by discoloration of wires or other components, damaged or worn parts, or leakage evidenced by water or corrosion in the interior.
  - B. Electrically check to make sure that all connections are clean and tight, and that the device is operating correctly.

# DIMENSIONS

Inches (mm)



**Figure 5**  
*Dimensions*

## APPENDIX A TROUBLESHOOTING GUIDE

Trouble	Remedy
No Current Output	<ul style="list-style-type: none"><li>• Check polarity of the current loop connections for proper orientation.</li><li>• Make sure receiving device is configured to provide loop current.</li></ul>
Analog output reads a constant reading	<ul style="list-style-type: none"><li>• Make sure there is flow in the system.</li><li>• Verify that the rotor inside the turbine meter turns freely.</li></ul>
Analog output is not stable	<ul style="list-style-type: none"><li>• External noise is being picked up by the sensor. Keep all AC wires separate from DC wires.</li><li>• Check for radio antenna in close proximity. This usually indicates a weak signal.</li></ul>

## STATEMENT OF WARRANTY

Blancett Flow Meters, Division of Racine Federated Inc. warrants to the end purchaser, for a period of one year from the date of shipment from the factory, that all flow meters manufactured by it are free from defects in materials and workmanship. This warranty does not cover products that have been damaged due to defects caused by misapplication, abuse, lack of maintenance, modified or improper installation. Blancett's obligation under this warranty is limited to the repair or replacement of a defective product, at no charge to the end purchase, if the product is inspected by Blancett and found to be defective. Repair or replacement is at Blancett's discretion. A return goods authorization (RGA) number must be obtained from Blancett before any product may be returned for warranty repair or replacement. The product must be thoroughly cleaned and any process chemicals removed before it will be accepted for return.

The purchaser must determine the applicability of the product for its desired use and assumes all risks in connection therewith. Blancett assumes no responsibility or liability for any omissions or errors in connection with the use of its products. Blancett will under no circumstances be liable for any incidental, consequential, contingent or special damages or loss to any person or property arising out of the failure of any product, component or accessory.

All expressed or implied warranties, including **the implied warranty of merchantability and the implied warranty of fitness for a particular purpose or application are expressly disclaimed** and shall not apply to any products sold or services rendered by Blancett.

The above warranty supersedes and is in lieu of all other warranties, either expressed or implied and all other obligations or liabilities. No agent or representative has any authority to alter the terms of this warranty in any way.

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