Differential Sensor

User Manual

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PREFACE

This document describes the installation, configuration and operation of TASC Systems' Differential Sensor.

Hardware described in this document is subject to ongoing development and improvement. Consequently, there may be minor discrepancies between the information in this document and the performance and design of the hardware and software.

The user should ascertain that this product is suitable for the intended application. TASC Systems Inc. accepts no responsibility, liability for misuses or damage resulting from the inappropriate use of the product described herein.

Before connecting any equipment to the Differential Sensor, the user is advised to read this document in its entirety. Application of voltages in excess of the built-in protection could seriously damage the sensor and/or equipment it is connected to.

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RELATED DOCUMENTS

Summit User Manual (050-015-01120

siteVIEW APEX User Manual (050-015-01100)

SCCU siteCOMMANDER/RSM Configuration Utility User Manual (050-015-0055)

siteCOMMANDER User Manual (015-050-0002)

REVISION HISTORY

Revision	Date	Changes
R00	February 2009	Original document
R01	September 2009	Updated content and added images
R02	December 2009	Added interface drawing
R03	July 2010	Adjusted shunt connections
R04	November 2016	Connections to Summit
R05	May 2017	Adjust chassis ground gauge

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1.0   PRODUCT OVERVIEW

Figure 1 - Differential Sensor

TASC System's Differential Sensor is made to easily interface to current shunts used in remote monitoring applications. With its low power requirements and compact frame, the Differential Sensor does not consume valuable space or power. The differential sensor transforms a small input differential voltage into a 0-5VDC signal for remote monitoring devices such as TASC System's Summit and siteCOMMANDER. It can be powered externally or from the common mode voltage applied to the +IN terminal of the sensor.

1.1   + IN / - IN

These two inputs connect to the current shunt or differential source with +IN connecting to the positive/source side and –IN connecting to the negative/load side. These inputs can handle up to 65VDC common mode voltage. A differential input of +125mV will produce an output voltage of 5VDC and -125mv will produce an output voltage of 0VDC. If the voltage at +IN is greater than or equal to 7VDC relative to Common (GND), it will be used to power the device as well.

1.2   AOUT

AOUT outputs 2.5VDC with 0VDC differential input. A linear output of 2.5-5VDC is produced from a 0 to +125mVDC differential input and a 0-2.5VDC linear output is produce from a -125mVDC to 0 differential input. This signal should be connected to an analog input of the Summit or siteCOMMANDER.

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1.3   VIN

The sensor powers itself from the source voltage applied to +IN if the voltage is equal or greater than 7VDC. If this is not the case, then the Differential Sensor must be powered via the VIN terminal using a voltage in the range of 7 – 20 VDC @ 2 mA max.

1.4   GND

The GND terminal should be connected to the system ground/common.

1.5   + V

This terminal is connected to the +IN terminal which should connect to positive side of the source. This output provides easy access to monitoring site/source voltage. This would connect to an analog input on the Summit or siteCOMMANDER.

1.6   PWR

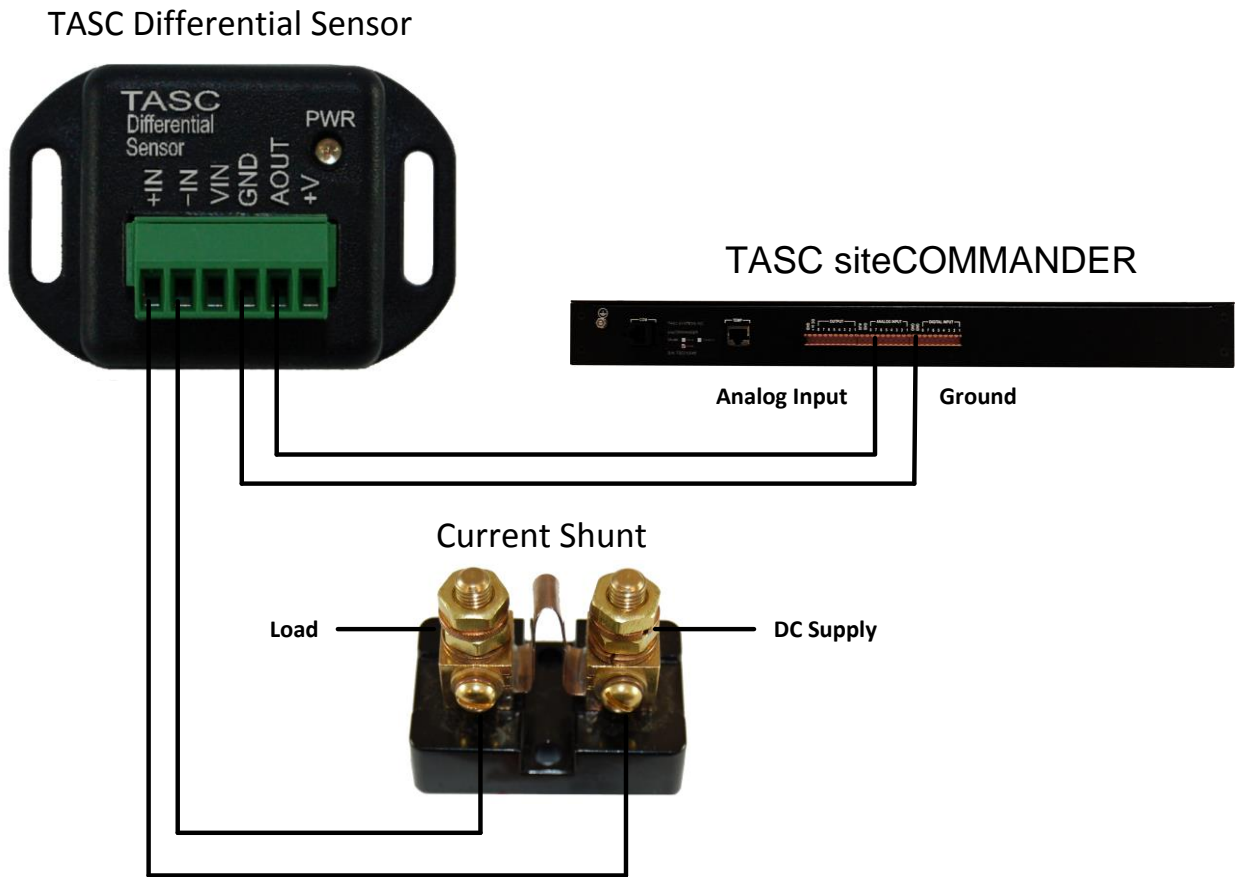The PWR LED illuminates when power is applied to the device and the internal regulator is functioning.

TASC Differential Sensor

TASC siteCOMMANDER

Analog Input   Ground

Current Shunt

Load   DC Supply

Figure 2 - Differential Sensor/Current Shunt connected to siteCOMMANDER

Summit

Digital I/O   Analog I/O

Chassis Ground (12 AWG)

Signal Ground (24 AWG solid)

Analog Input (Cat 5)

Loop for Ground Wires (Cat 5)

Punch Block

Analog Output (24 AWG solid)

Current Shunt

Differential Sensor

Load   DC Supply
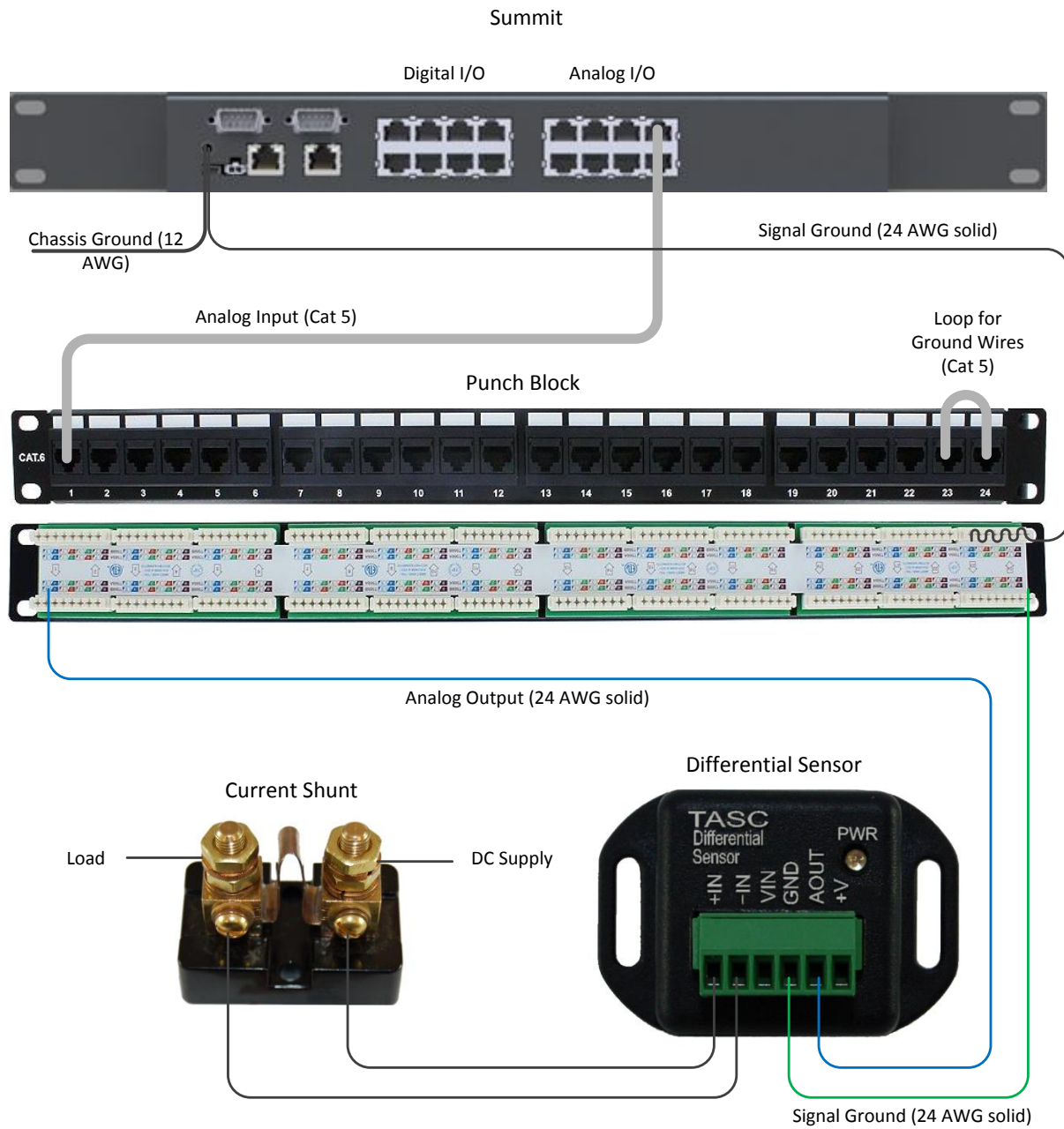
Signal Ground (24 AWG solid)

Figure 3 - Differential Sensor/Current Shunt connected to Summit

For more information, related to configuring the TASC System's Differential Sensor, please refer to the Related Documents section.

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2.0 SUMMIT FORMULA

A formula is required to convert the DC voltage from AOUT to the appropriate current in Amps. Enter the appropriate formula based on the Amp rating imprinted on the current shunt, at the Analog I/O, Formulas tab.

Shunt Rating (Amps)	Formula (VDC to Amps)
5	(x – 2.5) * 2.5
20	(x – 2.5) * 10
30	(x – 2.5) * 15
50	(x – 2.5) * 25

Table 1 - Summit Formula

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3.0   SPECIFICATIONS

Differential Sensor	
Input Voltage (VIN)	+7.0 to +20.0 VDC
Current	2 mA (max)
Operating Temperature	-40°C to +65°C
+ IN / - IN	Differential Input Voltage = +/- 125 mV Common Mode Voltage (CMV) = -2 - 65VDC Differential Input Impedance = 2 kΩ Common Mode Impedance = 5 MΩ (CMV > 5VDC)
AOUT	Output Voltage range = 0-5VDC Output Impedance = 2 Ω Output Drive = 5 mA
Module Size (L x W x H)	52mm x 36mm x 28mm
Weight	15 g

Table 2 - Differential Sensor Specifications

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