

# **Sorensen**

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***M133 / M135 / M136  
Disconnect Polarity Relay  
Option***

*and*

***M9 / M130 Remote  
Programming***

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## 1.1 INTRODUCTION

This addendum covers the M133, M135 and M136 option operation, a M9 or M130 remote programming option for the DCS series power supply with an Isolation Relay and Reverse Polarity Relays PCB. The Isolation Relay PCB is an assembly which is attached to the DCS externally; when installed it adds 3" to the length (see Figure 1). This option allows the user to fully isolate the DCS output from its load as well as provide local or remote sense control.

## 1.2 FEATURES AND FUNCTIONS

All features remain as described in the DCS-E 1KW Series manual and Section 1 of the M9C GPIB (P/N M361667-01) or M130 Ethernet programming manual (P/N M362797-03). See section 2.2 of this document for sense connection differences from base model.

### 1.2.1 Additional Features and Functions

- Output voltage isolation from output load.
- Output local or remote sense operation.
- Relay hot-switch lock-out; ensures that the voltage across the relay contacts and the current through them is zero prior to changing relay states.
- Relay automatic disconnect; relays automatically latch open when a shutdown occurs.

## 1.3 PROGRAMMABLE FUNCTIONS

All programmable functions remain as described in Section 1 of the M9 or M130 manual.

### 1.3.1 Additional Programmable Functions

- Remote Isolation Relay control
- Remote Local/Remote Sense Relay control
- Remote Reverse Polarity Control

### 1.3.2 Readback Functions

All readback functions remain as described in Section 1 of the M9 or M130 manual.

## 2.1 CONFIGURATION

The M9 (GPIB) or M130 (LXI Ethernet) and the Relay PCB options are installed at the factory. Use the setup procedure described in the M9 or M130 programming manual section 2 to configure the M9 or M130 and Relay PCB for your system and application.

## 2.2 EXTERNAL SIGNAL CONTROL USER CONNECTOR

The control signals accessible at connector J5 are the M9 signals extended thru the relay PCB from the M9 external user control signals are as described in paragraph 2.3 of the M9 programming manual.

The control signals accessible at connector J3 are the DCS 1KW J3 signals extended thru the relay PCB from the DCS 1KW rear panel are as described in paragraph 2.4.2 – 2.4.3 of the DCS 1KW Operation Manual.

**Remote sense connections:**

**For DCS 1- 1.2 kW power supplies with M133 or M135 or M136 option, the remote sense connections must be made different from the standard models.**

**To use remote sense with M133 or M135 or M136 option, the external jumper wire between J3-12 and J3-13 must be removed. The sense connection must be made at the connector J9 Pins 1 and 2. The pin description of the connector J9 is provided in the Table 1 given below.**

A 6-pin Molex J9 provides access to the isolated remote sense signals J9-1 and J9-2. The mating receptacle for the 6-pin connector is Molex 43025-0600. Remote sense J9-1 connects to the +side of the load and J9-2 to the –side. Also accessible is the non-isolated DCS output voltage on J9-5 (+) and J9-6 (-).

| Molex Pin | Description                       |
|-----------|-----------------------------------|
| 1         | Isolated Remote Sense (+)         |
| 2         | Isolated Remote Sense (-)         |
| 3&4       | Not Used                          |
| 5         | Non-Isolated DCS output Voltage + |
| 6         | Non-Isolated DCS output Voltage - |

*Table 1 External User Connector J9*

### 3.1 IEEE 488.2 or Ethernet and SCPI COMMAND OPERATION

The M9 and Relay PCB operation by remote programming using the M9 IEEE-488.2 and SCPI command sets are as described in section 3 of the M9 programming manual.

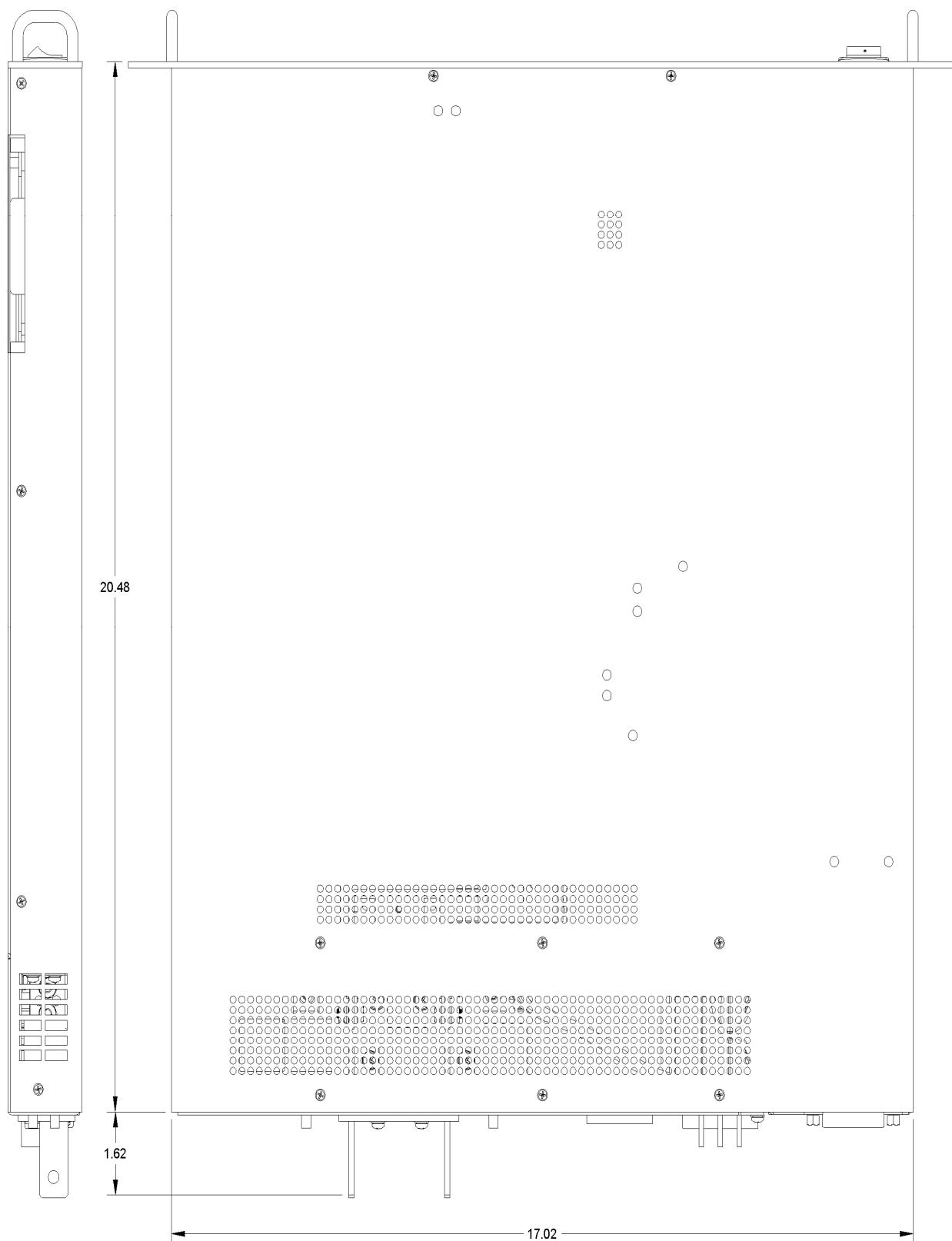
#### 3.1.1 Output SCPI Commands Relay PCB

##### 3.1.1.1 Calibration SCPI Commands

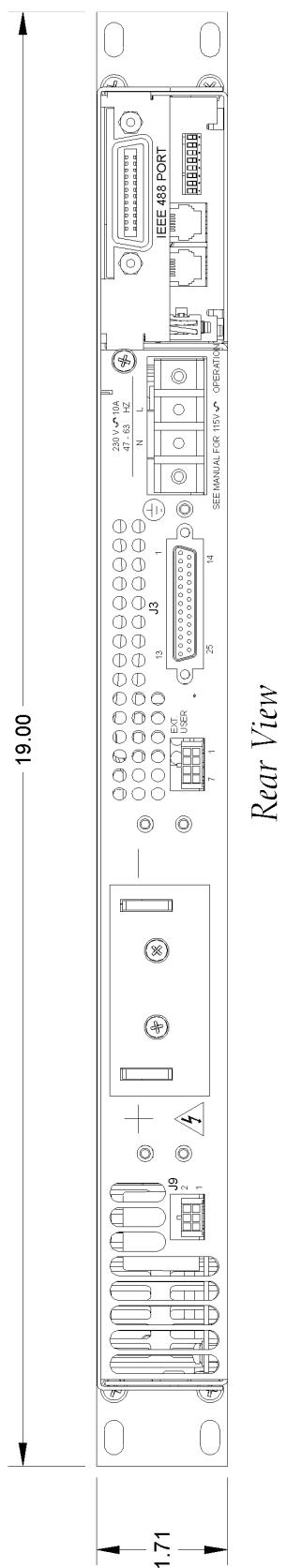
|                            |   |
|----------------------------|---|
| CAL:INIT:VOLT <VALUE>      | ; Stores fixed output voltage at power up |
| CAL:INIT:VOLT:PROT <VALUE> | ; Sets over voltage protection level      |
| CAL:INIT:CURR <VALUE>      | ; Stores fixed output current at power up |
| CAL:UNLOCK "6867"          | ; Security code store unlock              |
| CAL:STORE                  | ; Stores calibration parameters           |
| CAL:LOCK                   | ; Locks calibration parameters            |

##### 3.1.3.2 Output SCPI Commands

|               |   |
|---------------|---|
| OUTP:ISOL OFF | ; Sets the isolation relay control signal off |
| OUTP:POL NORM | ; Sets normal polarity                        |
| or            |   |
| OUTP:POL INV  | ; Reverses output polarity                    |
| OUTP:ISOL ON  | ; Sets the isolation relay control signal ON  |
| OUTP:SENS ON  | ; Sets the sense relay signal open or closed  |

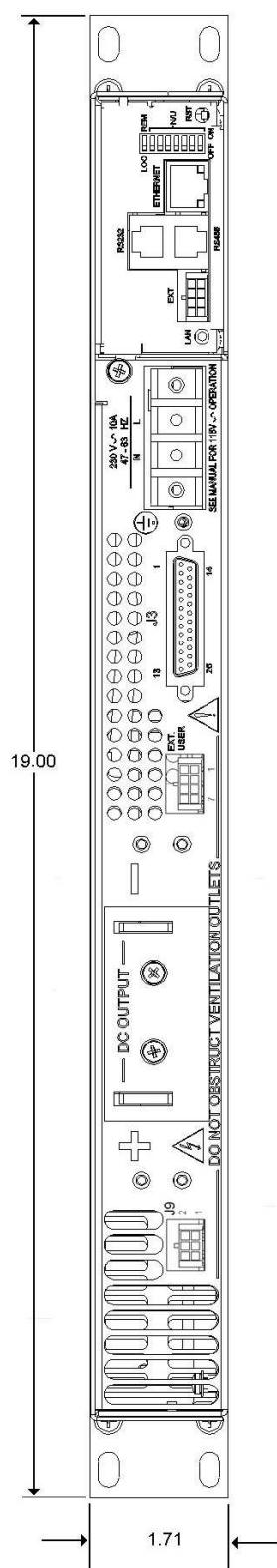


*Figure 1. Top and Side Views*



*Rear View*

**Figure 2. Rear View – GPIB**



**Figure 3. Rear View – Ethernet**