

**User instructions for the Low Voltage Crate  
of the CMS EE HV Distribution System  
[DEG 548]**

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## 1. Overview

The DEG548 low voltage crate is designed to form part of the CMS ECAL Endcap HV distribution system. The overall system is described in [Camanzi document].

The low voltage crate:

- Provides low voltage power for the DEG 547 HV distribution crates.
- Provides a control signal interface between the HV distribution crates and the CAEN HV power supply.

One low voltage crate is capable of supporting up to five HV distribution crates (enough for one endcap, allowing for a spare distribution crate).

## 2. Control interfaces

The connectors on the front panel (see figure 2.1) handle the distribution of the control signals between the CAEN power supply and the distribution crates.

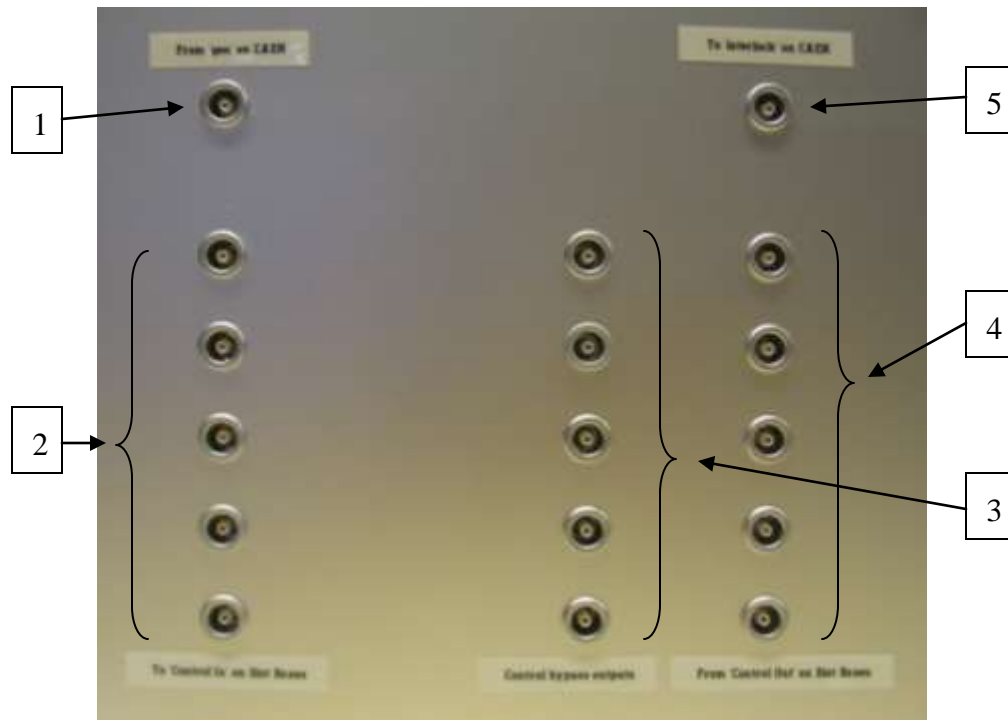


Figure 2.1: Front panel connectors.

### 2.1. Control signals from CAEN to distribution crates

In the HV distribution system, the control signal from the “gen” output on the CAEN supply needs to be fed into the “control in” inputs on the control cards of each HV distribution crate. To do this:

- The “gen” output on the CAEN supply should be connected to the input marked “1” in figure 2.1.
- The outputs marked “2” in figure 2.1 should be connected to the “control in” inputs on the control cards of the distribution crates. If using fewer than five distribution crates, the unwanted outputs may be left unconnected.

If operating the distribution crates without the CAEN supply, you may use one of the control bypass outputs (marked “3” in figure 2.1) as a dummy “gen” signal.

### 2.2. Control signals from distribution crates to CAEN

In the HV distribution system, the control signals from the “control out” outputs on the control cards of the HV distribution crates need to be combined to produce a single signal which is fed into the “interlock” input on the CAEN supply. To do this:

- The inputs marked “4” in figure 2.1 should be connected to the “control out” outputs on the control cards of the distribution crates. A signal must be present on

- all five inputs. If using fewer than five distribution crates, connect the unused inputs to some of the control bypass outputs (marked “3” in figure 2.1).
- The output marked “5” in figure 2.1 should be connected to the “interlock” input on the CAEN supply.

### **2.3. Control bypass outputs**

The outputs marked “3” in figure 2.1 provide fixed 5V logic signals. They are intended to be used as dummy control signals as described above.

### **2.4. CAEN supply setup**

To operate correctly with the low voltage and distribution crates, the CAEN supply control interfaces must be set up as follows:

- Set NIM/TTL switch to TTL.
- Set ENABLE switch to LOC ENABLED.
- Set INTERLOCK switch to OPEN.

### 3. Power supply

The rear panel (see figure 3.1) provides the mains power inlet, with on/off switch, and five low voltage outputs.

The mains supply fuse must be a 'T' type 1A fuse.

Each four-pin outlet provides the various power supplies needed by a single HV distribution crate. If using fewer than five distribution crates, the unwanted outputs may be left unconnected.



Figure 3.1: Rear panel connectors.

## **4. General safety matters**

This equipment has been designed to meet the requirements of safety standard EN 61010-1:2001 when used as part of the CMS EE HV distribution system or equivalent test rigs. Safety may be impaired if the equipment is used otherwise than as described in this document.

## 5. Technical details

### Main input

Mains supply voltage: 230 Vac.

Mains supply frequency: 50 Hz.

Maximum mains supply current: 0.5 A.

Mains supply fuse: 'T' type 1A.

### LV power supply ratings

The low voltage power supply ratings are as follows:

+5 V - 6 A

+15 V - 1.7 A

-15 V - 1.7 A

The current ratings apply to the total current drawn from the five LV outputs.

All outputs have overvoltage and current foldback protection.

### Control signals.

All control interface signals are standard TTL/CMOS logic levels.

### Connector types

Control interface connectors: LEMO 00.

Output power connectors: 4-pole LEMO 2B.

For the pin-outs of the power connectors, see the relevant circuit diagrams.