FET Control Box

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**Interface Control Document**

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Interface Control Document

for

FET Control Box

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# Overview

This ICD—Interface Controls Document—will describe in detail: physical controls, thermal controls and electrical interfaces available to the user. Additionally, interfaces available to computers are also described in this document.

# References and Definitions

Provide any references (i.e., standards documents) and definitions. Examples are shown below.

## References

**IEEE 488.2**

**IEEE Standard Codes, Formats, Protocols, and Common Commands for Use With IEEE Std 488.1-1987, IEEE Standard Digital Interface for Programmable Instrumentation**

30 Nov 1992

**IEC 60320-1**

**IEC 60320 Appliance couplers for household and similar general purposes**

27 Jul 2021

## Definitions

FET Mosfet

USB Universal Serial Interface

LED Light Emitting Diode

kHz Kilohertz (1,000 Hz)

V Volt

VAC Volts Alternating Current

A Amp

OLED Organic Light Emitting Diode

PWM Pulse Width Modulation

SCPI Standard Commands for Programmable Instruments

USBTMC USB Test and Measurement Class

ICD Interface Control Document

GPIB General Purpose Interface Bus

ESD Electro-Static Discharge

kg Kilogram

# Physical Interface

The FET Control Box shall have the following physical specifications.

## Weight

The FET Control Box shall weigh no more than 15kg.

## Dimensions

The FET Control Box shall have an enclosure dimension of 12x10x8 inches.

### Dimensions of Physical User Interfaces

* Power mosfets, power diodes, “q”, and “D” BNC jacks shall have a dimension of 6x3.5x2cm.
* Frequency and duty ratio rotary encoders shall have a dimension of 11.5x14.5mm with a diameter of 6mm.

# Thermal Interface

The FET Control Box power mosfets and diodes will each be equipped with a heatsink to maintain operational temperature and prevent component damage due to overheating. Additionally, the FET Control Box enclosure will be vented to allow for airflow.

# Electrical Interface

## Primary Input Power

The FET Control Box will have one Universal IEC C13 receptacle for receiving 120VAC.

A green LED light will turn on, indicating that there is power being supplied to the unit.

## Signal Interfaces

The FET Control Box will have two 6mm BNC jack connectors equipped with ESD protection for an external switching signal and duty ratio modulation.

## Video Interfaces

The FET Control Box will have an OLED screen to display the following information:

* Switching frequency
* Duty ratio
* Internal or external switching signal in use
* Mosfet operation mode

## User Control Interface

The FET Control Box will have the following physical controls available:

* Two rotary encoder knobs to adjust frequency and duty ratio
* Two sets of 6mm BNC jack connectors leading to:
  + Power mosfet drain
  + Power mosfet source
  + Power diode cathode
  + Power diode anode

# Communications / Device Interface Protocols

## Host Device

The FET Control Box will have a USB-A port mounted on the front panel that is intended to be used for communication with a computer.

## SCPI (Standard Commands for Programmable Instruments)

1. The FET Control Box can be operated using SCPI commands as outlined in *IEEE 488.2*.