

Opti-Cal® Product Brief

For inclusion in Opti-Cal® enabled device manuals.
Model OPC-3 (Opti-Cal 3.2")

OVERVIEW

The OPC-3 system software (Fig. 1) displays measured RF power in a manner similar to an RF watt-meter. The measured power is displayed in kilowatts with a fine resolution of ten watts. The minimum displayed power is 1/10 of the load's rated maximum RF power or 1kW; whichever is greater. The maximum displayed power is 99.99 kW.

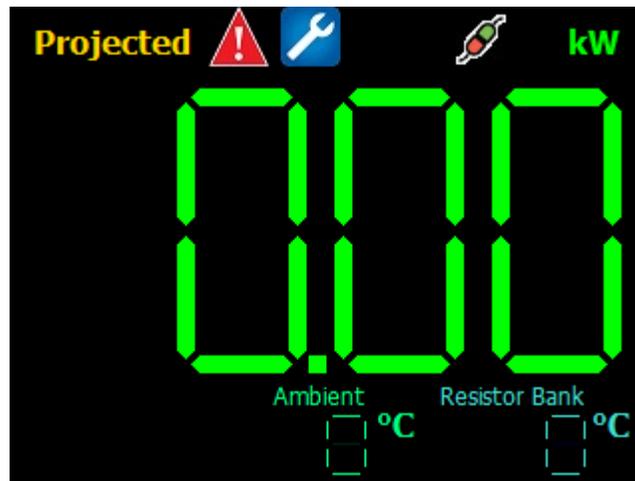


Fig. 1

The pseudo-LED digits will change from green to red (Fig. 2) when measured power meets or exceeds 1kW PLUS the maximum rated power of the load that the OPC-3 is installed in. For example the power-readout on an OPC-3 installed in a 3kW load will turn red to indicate over-power at 4kW.

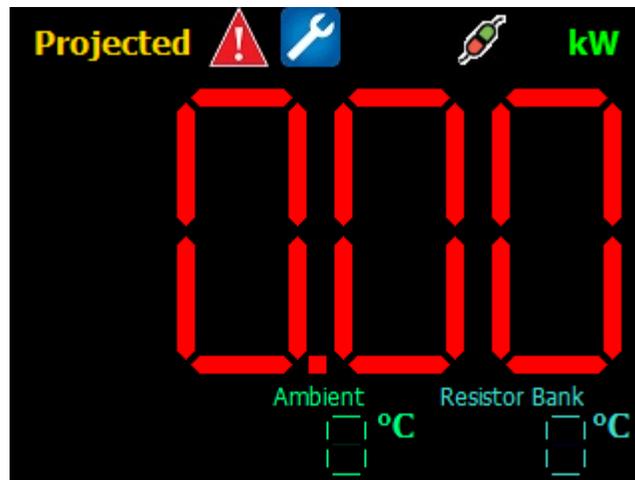


Fig. 2

All Opti-Cal[®] models utilize passive infrared measurement to indicate RF power. Because load elements heat up slowly a “look-ahead” feature has been implemented to give a highly accurate projection of RF power based on thermal rise-time. The power-projection feature is active before the load reaches thermal-equilibrium and is indicated by a yellow “Projected” label in the upper left corner of the display (Fig. 3). Testing (at 60Hz) indicates that projected power settles near 96% of actual power within a minute of power application.

Note: The unit will fluctuate with wide variability for several seconds upon power up if RF is being applied, i.e. when the unit is operated in standby mode. Please wait until this initial fluctuation is settled before making measurements.

After approximately seven minutes of continuous operation, under RF power, the load will reach a maximum temperature (thermal-equilibrium). At this point the yellow “Projected” label will disappear (Fig. 1). Measurements taken at thermal-equilibrium correlate closest to actual applied RF power and are assumed to be the most accurate readings. Testing (at 60Hz) indicates that the power displayed at thermal-equilibrium tends to be between 98% and 102% of actual power when the OPC-3 is properly calibrated.



Fig. 3

The following icons shown at the top of the screen (Fig.3) are touch-responsive:

-  Estimated, non-settled power. Nominally 96% of actual power after one minute of applied maximum rated RF power. When this label disappears the displayed power is nominally between 98% and 102% of actual at applied maximum rated RF power.¹
-  Alarms are active. Touch the icon or refer to the device webpage for descriptions of active alarms. Alarms can include: Over-Power, Coolant-Flow², Ambient Temperature, and Interlock Disengaged.
-  Settings. Touch to modify device settings. See Fig. 4
-  Ethernet plugged and carrier detected. Does not indicate proper network configuration. This device only supports DHCP configuration. All network settings are the user’s responsibility and there are no user-alterable network settings in the device. If you require an alternate configuration I will try to accommodate but these configurations are not officially supported or included in the standard device pricing.
-  Kilo-Watt. It’s camelCased because programmer != graphicDesigner;³ A green “K” permanent-decal can be provided if it becomes a source of contention.⁴

Note: The interlock connectors presented on the back of the load and the interlock alarm on the Opti-Cal[®] are separate, isolated systems.

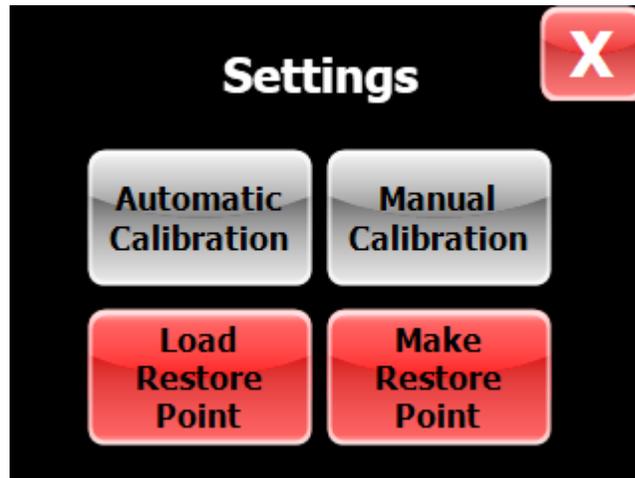


Fig. 4

Settings Menu

Note: The OPC-3 is calibrated at the factory for the full rated power of the load. If field calibration becomes necessary it may be accomplished as described below.

Automatic Calibration:

This device can be field calibrated with the aid of another power-meter or if the RF power level is known. To field calibrate access the settings menu as previously described and touch "Automatic Calibration." Follow the prompts on the screen. **Note: Field calibrating this device will require the actual RF power level in watts. To complete the automatic calibration you will need to either know what the RF power level is or refer to another calibrated power-meter. Attempting to calibrate the device without this information may cause the calibration to fail and the device to be inaccurate. (See Footnote 1)**

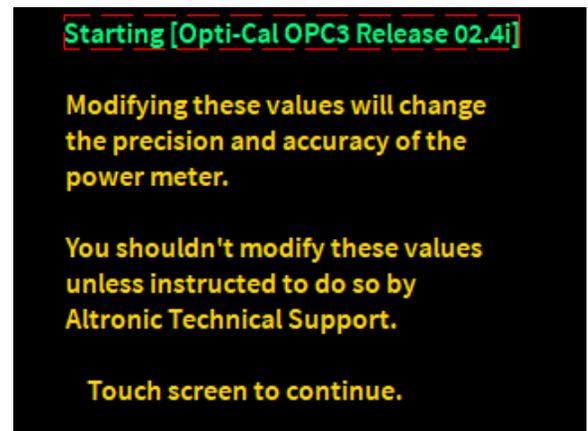


Fig. 5

Manual Calibration:

This button provides access to the calibration constants. This functionality is for fine tuning at the direction of Altronic technical support. (See Footnote 1.)



Fig. 6

Load Restore Point:

In the event that the device calibration fails you may reset to factory defaults using this button. The boot loader will then guide you through the rest of the restore process.

Make Restore Point:

This button can be used to set a system restore point. All software, updates and configuration data are saved to flash. Only one restore point may be saved at a time. The user is responsible for ensuring that the configuration state is appropriate for their purposes before setting a restore point as it overwrites the default factory state. However, the default settings and software for this device are archived and available upon request.

Device-Status web page



Fig. 7

The device serves a status page over HTTP port 80 and additionally port 8080. The page can be accessed via any modern browser at [HTTP://<device IP address>](http://<device IP address>). As an example, the above image was captured from Google Chrome at [HTTP://192.168.2.8](http://192.168.2.8). The status page displays the current power and any active alarms and is scaled to be easily readable on a mobile device.

Footnotes:

1. The device is calibrated at full rated RF power. If you are using a significantly smaller fraction of that power you will notice measurements that progressively differ from actual power. The solution to this is to modify the calibration constants. The simplest and most accurate method for doing this is via the Automatic Calibration method. This method requires the utilization of another calibrated power meter or otherwise trusted (for your purposes) measurement. The alternative is to find the power range you are using in the following chart and enter the corresponding calibration constants manually.

Power Range	IRM	SLM
5KW to 15 KW	24	39
15KW to 25KW	23	37
25KW +	22	35

2. Or in this case “Air”-Flow.

3. Also programmer != manualDesigner; Hence the voluminous and overly familiar Footnotes section.

Note to technicians:

If you require some alternate configuration or functionality I will try to work with you to meet your needs. This is not an official guarantee that any non-standard modification will be possible (or free) and will involve a group effort to implement. (That’s not meant to discourage; I’m quite happy to help if I can.) If that’s OK I’m jdyess426@gmail.com.

This is release edition 02.4i of the Opti-Cal[®] device. All prior testing has been done in a laboratory environment and the operation and error margins described in this document are representative of measurements taken there. Your experience of its operation may vary from those described herein.

The engineering team at Altronic Research welcome and greatly appreciate your questions, comments, or other feedback in regards to this device. Please do not hesitate to contact us anytime by any means you see fit. A copy of our complete contact information will accompany this manual.