

USER MANUAL

Power Switching Module

Model : PSM1000

Version: 1.1 – 01/08/2014

English



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Errors and omissions excepted.

Thank you

Thank you for purchasing a Ratek product.

This User Manual will assist you in the correct installation and operation of the Power Switching Module, as well as explain the safety requirements for its use.

Important: Please read the contents of this User Manual before unpacking and operating the product.

Unpacking and Checking

Once you have read these instructions in full and understand the installation and safety requirements including those for unpacking the carton, please carefully open the packing and slowly remove the product. Carefully inspect the condition of the product to ensure it has not been damaged in transit. Any damage should be reported immediately to the responsible carrier. If the product is damaged in any way, re-pack the product into the supplied packaging and notify the responsible carrier immediately.

Important: Do not operate the equipment if it has been damaged in any way. Any failures resulting through the use of a damaged product will not be covered by the product warranty.

Carton Contents

Ensure that you have received all items outlined below before proceeding. If you have not received all components in the supplied carton, please re-pack the carton and notify a Ratek Service representative immediately. Contact details are provided in the section of this User Manual titled "Ratek Service Contact Information"

- **PSM1000 Ratek Power Switching Module**
- **Power cable**
- **Control cable**
- **User Manual**

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Intended Use

This Power Switching Module is intended for the purpose of switching mains powered devices on and off as required by a parent control device. It cannot operate independently of a parent control device. Suitable control devices include the Ratek TH8600 Process Control Immersion Heater Circulator.

Suitable Environments For The Power Switching Module

The Power Switching Module is intended for use in a clean laboratory environment only where adequate ventilation, a good power supply and provisions for routine cleaning are available. The Power Switching Module should not be used outdoors or in dirty, dusty, steamy, humid or windy environments. The acceptable operating conditions are outlined further in this User Manual.

General Operation

- The Power Switching Module is mounted in a suitable location, typically on a sturdy, clean and dry surface.
- Mains devices to be switched are plugged into the 3 output mains receptacles.
- The Power Switching Module is plugged into an appropriate power source. It is powered by an alternating current power supply with protective earth and with the appropriate receptacle, rated voltage and frequency for the country of its intended use. Further details on power requirements are outlined in this User Manual.
- The Power Switching Module is operated via a combination of front and rear panel buttons and switches consisting of a main power switch and individual auto/override switches for each output.
- The Power Switching Module should be operated strictly in accordance with the Operating Instructions outlined further in this User Manual.

Operator Responsibility – Safety Considerations

When operated in strict accordance with this User Manual, plus routine cleaning and maintenance being carried out, the product shall provide safe operation for the operator. The operator should be aware of the following before installing and operating the product :

Conditions of Operation

***Note:** The term “operator” referred to in this User Manual is the primary person who has been tasked to install, maintain and train in the usage of this equipment. Other personnel shall be referred to as “Users”.

- The operator shall be aware that the protection provided by the equipment may be impaired if the equipment is used with accessories not provided or recommended by the manufacturer, is modified in any way or is used in a manner not specified by the manufacturer.
- The operator is responsible for ensuring all users of the product are qualified to do so, and are well versed in common safety concepts. The product should only be operated by an adult who has read and understood this User Manual provided in the appropriate language in its entirety.
- Any user must be informed by the responsible operator of any potential hazards that may arise through the use of this equipment in the course of their work, including any local environmental hazards not related directly to the Power Switching Module. They should also be able to demonstrate that they understand any preventative safety measures in operation prior to operating the equipment.
- The operator shall agree to accept responsibility for the use of the equipment in accordance with this User Manual, and be fully aware that the equipment is designed for commercial use.
- It is assumed that the user and operator have had experience in a commercial environment, and had appropriate training in how to perform their work safely in accordance with any local operational health and safety regulations. The operator and all users should be well versed in local emergency procedures as per the workplace safety regulations in effect.
- Avoid any direct impact with any surface of the equipment, including the casing, cover panel or control panel.
- **Important:** Do not use any sharp or pointed metal objects anywhere near the equipment, in particular the control panel.
- Avoid using the equipment near any other vibrating equipment or source of excessive vibration.
- Ensure the equipment is cleaned and maintained in accordance with this User Manual.
- Ensure that all original safety warning labels are in an adequate, legible condition and are firmly affixed to the equipment before using the product.

- Plug the equipment directly into a wall power outlet. Do not plug the equipment into a multi-socket adapter of any kind.
- The equipment is intended for operation in a controlled electromagnetic environment. Avoid the use of transmitting devices (e.g. cellular or mobile telephones) near the equipment whilst operating. A minimum distance of 2 Metres from the product is recommended for any transmitting device.
- **Important:** The equipment must only be installed and operated in **well ventilated areas**. The unit is not intended for use in explosive atmospheres, in confined spaces or inside any other piece of laboratory equipment such as humidity cabinets or incubators.
- The allowed operating environment must be between 5° Celsius and 40° Celsius ambient air temperature.
- The maximum allowed relative humidity of the operating environment is 80%.
- The equipment should not be stored in direct sunlight, near chemicals, or other contaminants.
- If any of these safety recommendations cannot be achieved or the equipment has been damaged in any way, the equipment should not be installed or operated.
- **Important :** If you have any concerns or questions relating to operator or user safety, please contact the appropriate Ratek Customer Service department before installing and operating the unit. Contact details are provided in this User Manual.

Safety Labels And Markings

The equipment is provided with safety caution labels. An explanation of each caution label is provided below. It is the responsibility of the operator and user to fully understand the meaning of these warning labels prior to operating the equipment.

Very Important: The combined output current limit for the PSM1000 is 10 Amps across all 3 outputs.

A replaceable safety fuse will operate in case of overload. Check the power rating of the devices to be connected to ensure the combined load does not exceed 10 Amps.

Caution Labels



Colours: Black on a yellow background

Definition

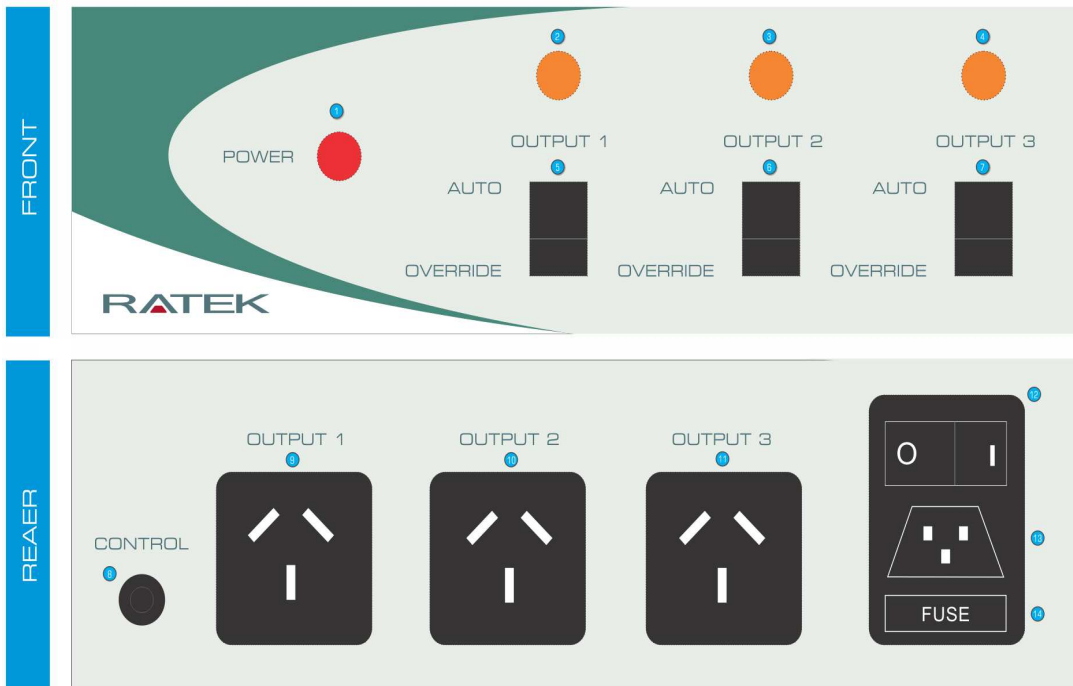
The Power Switching Module is powered by an alternating current power supply sufficient to cause harm if contact with the electrical supply is made. Under no circumstances should any part of the equipment be opened, un-screwed, loosened or disassembled whilst power is applied to the unit. Only authorized service agents are permitted to remove covers. This label is fitted by the manufacturer and must not be removed under any circumstances.

Preparation

You must take the time to familiarize yourself completely with the following operating procedures before installing or operating the Power Switching Module in order to achieve the best performance and maximum attainable user safety.

Identification of Controls & Functions

The figure below indicates all key controls and components of the Power Switching Module with their corresponding numerical element labeled.



CONTROLS & INDICATORS

Description	
1.	Main Power Indicator
2.	Output 1 Activity Indicator
3.	Output 2 Activity Indicator
4.	Output 3 Activity Indicator
5.	Output 1 Auto/Override Switch
6.	Output 2 Auto/Override Switch
7.	Output 3 Auto/Override Switch
8.	Input Control Socket
9.	Output 1 Mains Outlet
10.	Output 2 Mains Outlet
11.	Output 3 Mains Outlet
12.	Main Power ON/OFF Switch
13.	Main Power IEC Inlet
14.	Replaceable Fuse Tray

Figure 1

Safety Warnings

Throughout this User Manual, specific warnings will be supplied which relate to the current operation being referred to. These warnings are supplied in addition to the main warning labels affixed to the product and the key points outlined in the section of this User Manual titled 'Operator Responsibility – Safety Considerations'.

A graphical symbol as pictured below will be used next to each warning with accompanying text, the danger level for each is described below :



CAUTION

Indicates a possibly highly dangerous situation which may result in serious injury or threat to life as a result of electric shock if the situation is not avoided.



CAUTION

Indicates a possibly harmful situation which may result in injury or damage to product or property if the situation is not avoided.

Safety Recommendations

The following safety recommendations must be followed to prevent damage or injury. In addition to these safety recommendations, it is assumed that the user and operator have had experience in a commercial environment, and had appropriate training in how to perform their work safely in accordance with any local operational health and safety regulations. The operator and all users should be well versed in local emergency procedures as per the workplace safety regulations in effect.



CAUTION

If the equipment is used in a manner not specified by the manufacturer, the protection provided by the equipment may be impaired.



CAUTION

The equipment must only be used with a protective earth power socket. The earth contact provides protection to the user and the equipment. If you do not have a protective earth power socket, or you are unsure as to whether you have a protective earth power socket, **do not** connect the equipment. In such cases you should consult your workplace administrator or electrical maintenance staff to determine if a protective earth power socket is available.

A surge protected power outlet is strongly recommended as it provides some protection for the equipment in areas of poor electrical quality as well as providing some protection against lightning strikes. The equipment should be operated on a good, reliable supply of power at all times.

Note: The Power Switching Module should not be operated on the same electrical circuit as other high voltage household appliances such as fridges, clothes dryers, washing machines or other continuous operation high voltage devices. These types of devices can create power fluctuations that are undesirable for electrically sensitive equipment. Consult your workplace administrator or electrical maintenance staff if you are unsure.



- **ALWAYS** turn off the mains power switch when the unit is not in operation and turn off the mains power supply at the outlet.
- **ALWAYS** operate the Power Switching Module in a well ventilated area with adequate clearance around the Power Switching Module as indicated.
- **NEVER** operate the equipment if you believe it is damaged in any way.
- **NEVER** operate the Power Switching Module if the mains power supply cable is damaged in any way.
- **NEVER** use any sharp or metal objects near the Power Switching Module control panel.

Preparation & Installation

The Power Switching Module should be installed and operated in strict accordance with the following instructions.



CAUTION

The Power Switching Module is not for use in explosive atmospheres as there is a risk of fire, explosion, burns or scalding present under these conditions. Electrical switching can cause sparks in internal components.

Unpacking and Installing

- Carefully remove all packaging material from the Power Switching Module, as well as the supplied User Manual and any other supplied accessories.
- Carefully inspect the Power Switching Module, mains power lead and all packaging for any signs of damage. If any signs of damage are present, **do not** install or operate the equipment. Contact the supplier of your equipment if you have received a damaged product.
- Ensure that there is a minimum unobstructed distance of 300 millimetres between the left, right and rear panels of the Power Switching Module and any other object or wall.
- Ensure that there is a suitable mains power supply outlet within reach of the supplied mains power lead without placing any strain whatsoever on the lead, socket or plug. The Power Switching Module should not be plugged into any double-adaptor, power board, or power point splitter of any kind but instead directly into a correctly earthed wall mounted power socket rated to a minimum of 10 Amps.
- Ensure that there is a minimum unobstructed distance of 1 metre in front of the Power Switching Module to allow adequate room for the user to maintain a safe operating distance of 300 millimetres.

Connecting Power

IMPORTANT : Use of an incorrect power supply will void the product warranty. If you are unsure about the rating of your power supply, consult your workplace administrator or electrical maintenance staff to determine if your power supply is suitable for use with this product before connecting the power lead.



CAUTION

Regularly check the mains power lead condition over the life of the product, and do not operate the equipment if you suspect there is damage to any part of the equipment or the mains power lead.

Do not operate the equipment if you suspect the power lead has been stretched, over-extended or damaged in any way.

- Insert the mains plug end of the mains power supply lead firmly into a properly rated, protective earthed wall mounted power supply outlet.
- If there are double-adapters or oversized DC power packs causing obstruction of the mains power lead plug, these should first be removed.
- Insert the IEC plug of the mains power supply lead firmly into the IEC mains inlet on the rear of the PSM1000.
- For each switched output being used, lift the cover flap from the appropriate mains outlet on the rear of the PSM1000 and firmly insert the mains power lead for the device to be switched. Allow the cover flap to rest on the top of the plug once inserted.

*Note: Any combination of outputs can be used, outputs not being used should have their cover flap left closed to avoid dirt ingress into the outlet.

Connecting To A Controlling Device

The PSM1000 features a control jack on the rear panel which interfaces to a compatible controlling device. The controlling device is then able to activate any of the 3 power outlets when running in "Auto" mode.

These power outputs can be used to switch external devices for the purposes of automating temperature control processes. For example, when used with Ratek's TH8600 immersion circulator, up to 3 mains powered devices can be activated automatically during profile operation, these can be any device such as a refrigerated cooler, light, motor, fan, siren etc that run on mains supply.

Important: When the control interface cable is not attached, ensure the supplied blanking plug is fitted tightly to avoid moisture ingress into the control jack.

Carefully but firmly insert the supplied control cable to the jacks on the PSM1000 and the controlling device and tighten the retaining collars.

***Important:** Only approved external controllers such as the TH8600 should be used with the PSM1000 control jack. Incompatible devices could damage the PSM1000 and cause electrical shock.

Operating Instructions

Each power outlet on the PSM1000 features 2 operating modes, "Auto" and "Override". These modes are described below :

- **Auto** : The controlling device is responsible for activating the output using the control interface.
- **Override** : The controlling device is ignored, and the corresponding mains output is switched ON.

Ensuring your hands are dry, switch on the power using the main power ON/OFF switch on the rear of the PSM1000. The main power indicator will illuminate.

Set each of the 3 output auto/override switches accordingly as dictated by your application.

For any outputs set to "override", the corresponding output activity indicator will light orange and the power output to the corresponding device will be switched ON.

For any outputs set to "auto", the corresponding output activity indicator will light orange and the power output to the corresponding device will be switched ON only when the controlling device activates that output.

Switching Off The Power Switching Module

- Switch the main power ON/OFF switch to the position marked with a circle. The main power indicator will go dark.
- If output devices are to be unplugged, ensure first that the mains power is turned OFF at the wall.

Storing & Relocating

The Power Switching Module should be stored out of direct sunlight at an ambient temperature below 30° Celsius in a clean and dry location which meets the environmental conditions required as detailed in the technical specifications of this User Manual.

- Turn off the Mains Power Switch by setting it to the position marked with a circle.
- Unplug the equipment from the mains power supply outlet.
- Ensure all parts of the Power Switching Module are clean and dry to avoid the potential for corrosion.
- Ensure the Power Switching Module is stored in a clean and dry location away from potential damage by accidental knocks and bumps.

Routine Cleaning And Maintenance

To maintain the Power Switching Module in good, safe working order and ensure maximum product lifespan, intermittent cleaning is required. The Power Switching Module should be cleaned as and when dirt or grease becomes apparent, particularly around any switches or power outlets.

Cleaning



CAUTION

Do not use abrasive cleaners or solvents on the Power Switching Module as these may break down certain components of it's construction, reducing it's life and potentially creating a hazardous situation. Use only a mild household detergent or laboratory sterilization agent when cleaning the Power Switching Module.



CAUTION

When cleaning the unit, only use a damp sponge. **Do not use a sodden wet sponge.** Do not make any part of the control panel, any exposed control or receptacle or any part of the Power Switching Module excessively wet. If these receptacles and controls remain wet once electrical power is restored they can create a hazardous situation sufficient to cause serious injury or risk to life due to electrical shock. Always ensure the unit and in particular all controls and switches are completely dry before restoring electrical power.

- Turn off the Main Power ON/OFF Switch
- Unplug the equipment from the mains power supply outlet.
- Using a mild detergent and damp sponge, clean around all surfaces and receptacles.
- Once the Power Switching Module is clean, use a soft dry cloth to dry all surfaces of the Power Switching Module paying particular attention to any controls or switches.
- Once cleaning has been completed, it may be re-installed and operated in accordance with this User Manual.

Maintenance

- Turn off the Mains Power Switch
- Unplug the equipment from the mains power supply outlet.
- Under good light, carefully inspect the mains power lead and check for any signs of wear, over-extension or damage. If you believe the lead to be damaged in any way, contact your supplier to arrange for service.
- Carefully check to ensure all safety warning labels are affixed and in a good readable condition. Refer to the section in this User Manual titled "Safety Labels & Markings" for a table of factory-fitted warning labels. If any labels are missing, illegible or otherwise not functional, contact your supplier to obtain new replacement labels before operating the equipment.

- Ensure all controls and switches are fitted firmly and are in good condition. If any are found to be loose or in poor condition, have an authorized service technician repair the unit before operating it.



CAUTION

If any controls or switches are found to be loose or in poor condition, do not operate the equipment. Loose or damaged electrical controls and connections create a hazardous situation sufficient to cause serious injury or risk to life. Refer the equipment to an authorized service technician for repair.

Technical Specifications

Mains Power Connection	240V / 50 Hz
Safety	Replaceable over-current safety fuse
Replaceable Fuse Type	F250V/10AL, M205 miniature glass type.
Max Operating Wattage	2,400 Watts
Environmental Conditions	<p>Suitable for use according to IEC 61010-1 standard as follows :</p> <ul style="list-style-type: none"> - Indoor use - Altitude up to 2,000 Metres - Temperature 5° Celsius to 40° Celsius (Ambient temperature will limit the minimum achievable water temperature) - Maximum relative humidity 80 % for temperatures up to 31° Celsius decreasing linearly to 50 % relative humidity at 40° Celsius - MAINS supply voltage fluctuations up to ±10 % of the nominal voltage <p>Over-voltage Category – II Pollution Degree – 2</p>

Disposal

At end of life, this equipment should be disposed of in an environmentally friendly way. This equipment cannot be disposed of with other general waste, but instead taken to your local or regional waste collection facility for recycling and/or suitable treatment procedure.

For more information about where you can drop off your waste equipment for recycling, please contact your local government office, your household waste disposal service or your nearest commercial recycling centre.

EMC Conformity



AS/NZS CISPR 14.1:2010 Electromagnetic compatibility - Requirements for household appliances, electric tools and similar apparatus – Emission. This forms the basis of compliance to the requirements of the Electromagnetic Compatibility Framework ('C TICK').

Ratek Service Contact Information

Ratek are here to assist you in getting the most from your Power Switching Module. Our friendly staff can you assist you at any stage of the product lifecycle.

If you have any concerns or questions regarding the operation of your Power Switching Module, please contact us.

Contact Us

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Troubleshooting

The Power Switching Module provides a simple-to-operate user interface when used in conjunction with this User Manual.

If at any stage you experience abnormal operation (anything other than that described in this Operating Manual) this may indicate a fault condition. If the Power Switching Module fails to operate, this may also indicate a fault condition.

Fault conditions must be referred to an authorized service technician immediately and the equipment should be unplugged from the mains power supply socket.

Make a written note of any abnormal operation and contact Ratek using the contact details provided in the section of this User Manual titled "Ratek Service Contact Information" if you believe your equipment is exhibiting a fault condition.

Warranty Conditions

This Ratek product is covered by a 3 year parts and 12 months labour return-to-base warranty effective from the date of purchase. The product is manufactured in Melbourne, Australia.

The warranty is offered by Ratek Instruments Pty. Ltd. located at 60 Wadhurst Drive, Boronia, Victoria, Australia 3155, phone number +613 9887 2161.

- This warranty covers the repair or replacement of any parts or components found to be defective, subject to the service options listed below.
- The warranty is a return-to-base warranty, meaning the product must be returned to Ratek Instruments or an authorised Ratek agent for service at the discretion of Ratek Instruments. Where practical an on-site repair may be carried out at the discretion of Ratek Instruments.
- This warranty excludes any defect resulting from misuse, neglect, accidental damage, improper voltage, operation of the product outside the acceptable operating conditions as indicated in these operating instructions or any alteration which affects the performance of the equipment.
- It does not extend to any costs associated with delivery of the product to or from Ratek Instruments or an authorised Ratek agent, damage, or loss incurred during transport.
- This warranty is in addition to any Statutory regulations and provisions implied by the Trade Practices Act and any relevant State or Federal Government obligations, applicable only when purchased within Australia.
- The product may be replaced within the warranty period at the discretion of Ratek Instruments, however repair will be the normal course of action.

- For a period of 3 years from date of purchase, replacement parts will be supplied at no charge and the original components returned to the repairer. These replacement parts may be installed by an approved service agent with prior written agreement from Ratek Instruments.
- For a period of 12 months from date of purchase, service labour and repairs will be carried out at no charge by an approved repairer or Ratek Instruments at the discretion of Ratek Instruments.
- The limit of liability shall extend to the repair of the product only, all other compensation claims are excluded from this guarantee.
- The warranty does not extend to claims of suitability where the product does not deliver the intended function or fails to operate.
- No claims of suitability are made in relation to the product by Ratek Instruments. Any claim of suitability lies with the operator.
- The product is used at the risk of the operator. Any loss or damage caused to any item used with the product including but not limited to biological samples, tubes, racks, accessories, flasks, containers or the contents of such containers caused by the malfunction of the product or the failure of the product to function is not covered by this warranty.
- Proof of purchase is required for all warranty repairs.

DOA Product

Any claim under this warranty must be made within 7 days of the date of purchase of the product. To make a claim under the Warranty, you must present the product, together with proof of purchase or issue, to the store where you purchased the product from. If the product is defective and does meet the Warranty, you will be provided with a replacement product, or where that is not possible, a refund. Ratek Instruments will pay your reasonable, direct expenses of claiming under this Warranty. You may submit details and proof of your expense claim to Ratek Instruments for consideration.

This Warranty is provided in addition to other rights and remedies you have under law. Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

Return & Repair Procedures

The product is engineered from quality components designed to give long trouble-free operation. In the event that a technical problem has occurred that requires servicing by a Ratek Service agent, please follow these steps before returning the unit :

- Contact the supplier from where the equipment was purchased. If this is not possible, please contact Ratek Instruments either via email to service@ratek.com.au, or phone on +613 9887 2161 during business hours AEST. You may be referred to a local repair agent for service.
- Clean the unit thoroughly in accordance with this Operating Manual. If necessary, decontaminate the unit to ensure safety for the service technicians.
- Pack the unit into it's original packaging with the supplied mains power lead and use all original protective inserts. If the original packaging is not available, the unit must be packed with extreme care to ensure a safe journey. "Fragile" and "This Way Up" labels should be applied to the carton in a prominent location. No liability for a unit damaged in transit will be accepted. Use only reputable carrier services.
- Provide a full and complete fault description and your return contact details in the package and return the product as advised by the service representative.