



Flex Lighting for PGC Flex Chambers

User Manual

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User Manual

PLEASE READ THESE INSTRUCTIONS
CAREFULLY AND COMPLETELY
BEFORE OPERATING.

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SERVICE & TECHNICAL SUPPORT

Before contacting Conviron, please check the following:

- Read this document, *Flex Lighting for PGC Flex Chambers User Manual*, and the accompanying control system manual in their entirety.
- If you are having a problem using your chamber(s), pay particular attention to the relevant section and the pertinent information in this manual, and use the information to diagnose and correct the problem.
- If the problem persists and/or you require additional assistance, please collect the following information prior to contacting Conviron:
 - The serial number of the chamber, located on the rating plate
 - The software version of the control system. Instructions for obtaining the software version of your control system are provided in the control system operator manual
 - A description of the problem
 - A description of what you were doing before the problem occurred

Head Office
Technical Services
Conviron
590 Berry St.
Winnipeg, Manitoba,
Canada R3H 0R9

Please visit www.conviron.com for global service contact information.

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1 PRECAUTIONS

The equipment is intended to be installed, operated, maintained, and serviced only by trained personnel, according to the instructions and precautions described in the manuals provided by Conviron.

The following precautions are intended to help guide users in the safe operation of Conviron chambers.

1.1 Hazard Identification Symbols

The following symbols in Table 1-1 are used throughout this manual, on the equipment, or both to draw your attention to important warnings, guidelines, and product information.

Table 1-1 Hazard Identification Symbols

Symbol	Description
	The “ HAZARD WARNING ” symbol is used whenever a hazard exists which could cause personal injury or potential equipment damage, and requires correct procedures/practices for prevention.
	The “ IMPORTANT INFORMATION ” symbol is used to identify operating procedures that must be followed to ensure smooth and efficient equipment operation.
	The “ ELECTRICAL SHOCK/ELECTROCUTION ” symbol is used to identify a source of potentially dangerous electrical current.
	The “ ELECTROSTATIC DISCHARGE ” symbol is used to identify equipment that is sensitive to electrostatic discharge.
	The “ SLIPPERY SURFACE ” symbol is used to identify a potential hazard caused by a slippery surface.
	The “ PROTECTIVE EARTH-GROUND-MANDATORY ACTION ” symbol is used to identify the protective earth connection.
	The “ PROTECTIVE EARTH-GROUND ” symbol is used to identify the protective earth connection.

Symbol	Description
	<p>The “WEAR EYE PROTECTION-MANDATORY ACTION” symbol is used to identify areas where eye protection is mandatory.</p>
	<p>The “OPTICAL RADIATION” symbol is used to identify areas where exposure to ultraviolet (UV) and infrared radiation may be possible.</p>
	<p>The “READ THE OPERATOR MANUAL” label is intended to remind the user to have a thorough understanding of the equipment <i>before</i> use.</p>

1.2 Precautions

These precautions should be read and understood before proceeding with installation, operation, and maintenance.

1.2.1 Installation

	<p>Only qualified trades-people, i.e. electricians, plumbers, refrigeration mechanics, etc. should perform installation work as required, according to local codes and regulations.</p>
	<p>Do <i>not</i> attempt to install or maintain this equipment without the appropriate knowledge and expertise.</p>
	<p>Inspect all connections in the top compartment <i>before</i> connecting the equipment to the building utilities.</p>
	<p>Shipping vibration can cause electrical and plumbing connections to loosen. Inspect all connections <i>before</i> connecting to main building services.</p>
	<p>Ensure that power to the chamber line is off, and locked out or tagged out, <i>before</i> making any electrical connections at the chamber.</p>
	<p>Ensure that the control panel and top-cover lids are properly closed and screwed shut, and that no one is in contact with the equipment <i>before</i> powering up.</p>

1.2.2 Operation



Conduct a visual inspection of the equipment and surrounding area by walking around the unit to ensure no debris or obstacles are present that could pose a safety hazard *before* operating the cabinet.

Operate your Conviron equipment for a minimum of five days *before* introducing any research material to ensure proper and stable operation.

Avoid direct contact with any broken fluorescent lamps. Fluorescent lamps are extremely fragile and may emit harmful vapors when broken.

Follow all applicable local environmental regulations and guidelines for disposal of hazardous material. If in doubt, contact local authorities for proper disposal procedures.

Ensure that there are no obstacles in the path of the canopy before moving it.



Do *not* allow water to come into contact with electrical components while watering. Water contacting live circuits will damage both high and low voltage circuits.



Do *not* touch the lamps. Fluorescent lamps operate at high temperatures and present a burn hazard.

Do *not* touch the lamp holders. The heated metal and glass presents a burn hazard.

Do *not* touch the heaters. The hot surface presents a burn hazard.



Alert service personnel immediately if a slip hazard is detected.



Do *not* look directly at the lamps while in operation.

Use adequate eye protection for the concerned wavelengths of Actinic UV, Blue Light, and Infrared. Wear protective clothes and gloves.

1.2.3 Maintenance



Disconnect and lock out the main power *before* servicing the equipment.

Take all appropriate safety precautions when using and maintaining this equipment – including wearing appropriate safety apparel, and using appropriate tools and fall protection equipment if working on elevated areas.

Use only original replacement parts when maintaining and servicing the equipment.

Convion recommends waiting at least 10 minutes after powering off the equipment before servicing the heater elements or related components.



Do *not* service the control panel without using proper ESD procedures, including the use of a grounding strap and/or anti-static mat.

2 OVERVIEW

The Flex Lighting option is available to any PGC Flex chamber and lets you manipulate the lighting level inside the chamber.

Depending on the number of canopies installed in the chamber, its built-in control system can activate all or only a particular number of lamps in the canopies, resulting in the following light setpoint values: 1000 μ Moles, 750 μ Moles, or 500 μ Moles.

2.1 Understanding Flex Lighting

When only the top-tier canopy is installed, all 36 lamps are active, resulting in a light setpoint of 1000 μ Moles.

However, if both the top-tier and middle-tier canopies are installed, the control system of the chamber uses the following setup to achieve a light setpoint of 750 μ Moles:

- Twelve lamps on each of the left side and right side of the top-tier canopy are activated.
- All twelve lamps on each of the left side and right side of the middle-tier canopies are activated.

If all three canopies are installed (top-tier, middle-tier, and bottom-tier canopies), the control system of the chamber uses the following setup to achieve a light setpoint of 500 μ Moles:

- Eight lamps on each of the left side and right side in the top-tier canopy are activated.
- Eight lamps on each of the left side and right side of the middle-tier canopies are activated.
- All eight lamps on each of the left side and right side of the bottom-tier canopies are activated.

To maintain equal distribution of light inside the chamber, its control system activates an equal number of lamps in both the left-side and right-side canopies.

The following tables (Table 2-1 and Table 2-2) illustrate the Flex Lighting configurations.

Table 2-1 Number of Lamps Activated for the Light Setpoints

Light Setpoint	Canopies Required	Number of Lamps Activated		
		Canopy	Left Side	Right Side
1000 μ Moles	Top-Tier only	Top-Tier	18	18
750 μ Moles	Top-Tier and Middle-Tier	Top-Tier	12	12
		Middle-Tier	12	12
500 μ Moles	Top-Tier, Middle-Tier, and Bottom-Tier	Top-Tier	8	8
		Middle-Tier	8	8
		Bottom-Tier	8	8

Table 2-2 Number of Incandescent Lamps Available for the Light Setpoints

Light Setpoint	Canopies Required	Number of Incandescent Lamps Available				
		Level 1	Level 2	Level 3	Level 4	Level 5
1000 μ Moles	Top-Tier only	2	4	6	10	14
750 μ Moles	Top-Tier and Middle-Tier	2	4	6	X	X
		1	2	3	X	X
500 μ Moles	Top-Tier, Middle-Tier, and Bottom-Tier	2	4	6	X	X
		1	2	3	X	X
		1	2	3	X	X

The following graphic (Figure 2-1) shows a chamber with all canopies installed.

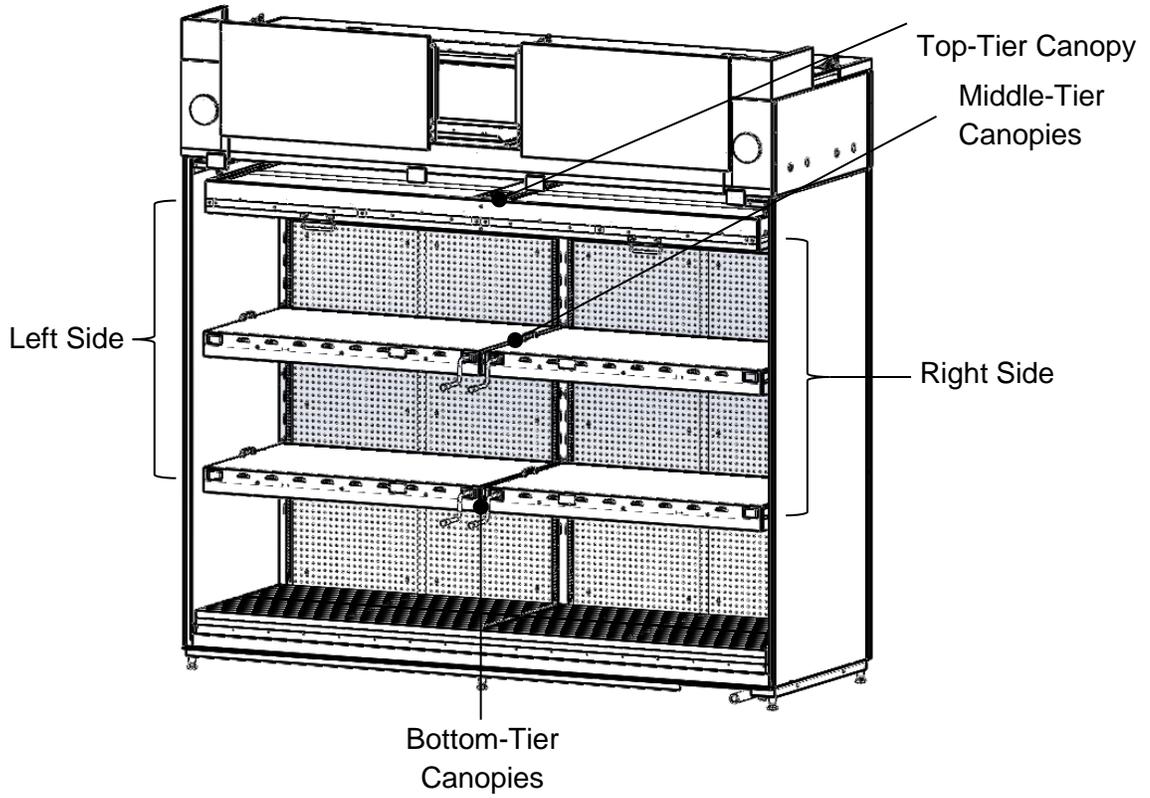


Figure 2-1 Canopies Installed in a Chamber

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3 WORKING WITH FLEX LIGHTING

Before using the chamber and starting an experiment, first do the following checks:

- Verify that the new lamps have been powered on for 100 hours at full light output. This preventive measure stabilizes the lamps and helps prevent the lamps from flickering and early blackening.
- Determine the lighting level the experiment requires: 1000 μ Moles, 750 μ Moles, or 500 μ Moles.

If the experiment requires 1000 μ Moles, then use only the top-tier canopy, and do not install any other canopies. Ensure that the inside of the chamber is free from any obstruction that can block the light emanating from the canopy.

3.1 Setting up the Chamber for Flex Lighting

If the experiment needs 750 μ Moles, then install the middle-tier canopies, which contain twelve lamps.

If the experiment needs 500 μ Moles, then install the middle-tier canopies, which contain twelve lamps, and the bottom-tier canopies, which contain eight lamps.

3.2 Activating Flex Lighting

If you installed the middle-tier canopies, bottom-tier canopies, or both middle-tier and bottom-tier canopies, then you also need to activate Flex Lighting:

1. On your computer, double-click the **Argus Titan** icon from the desktop.

The **Argus Session Manager** dialog appears (Figure 3-1).

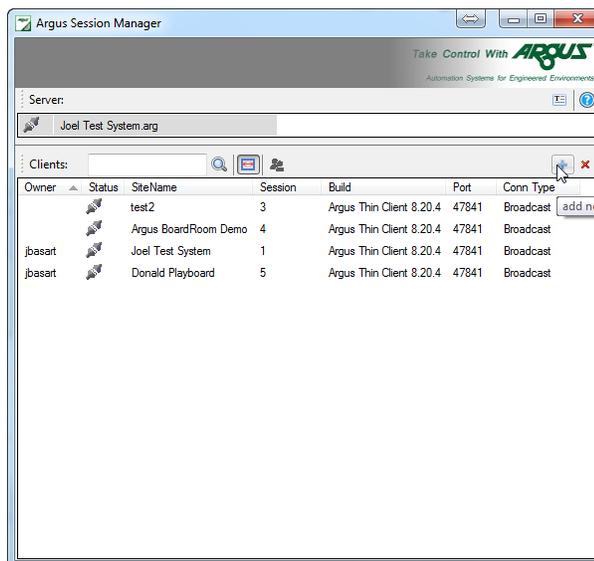


Figure 3-1 Argus Session Manager

- In the **Server** field, verify that the server is online.

A green icon  next to the server name indicates that the server is online, and a gray icon  indicates that the server is offline.

If the server is offline, then contact Argus or Conviron.

- In the **SiteName** column, double-click a session to launch the Argus client software.

The **Argus Homescreen** appears.

- On the **Argus Homescreen**, select the chamber where the canopies are installed.

The **Chamber Settings** page appears (Figure 3-2).

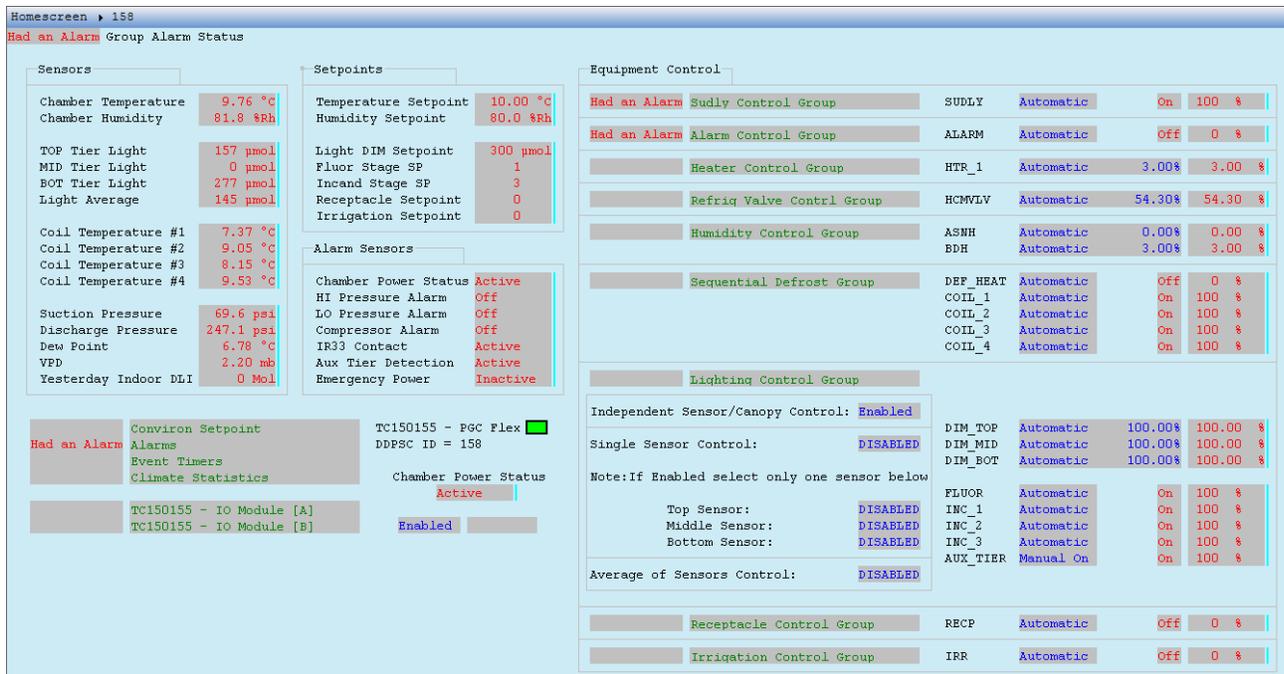


Figure 3-2 Chamber Settings Page

5. In the **Lighting Control Group** section, select the **AUX_TIER** field (Figure 3-3).

Lighting Control Group			
Independent Sensor/Canopy Control:	Enabled		
Single Sensor Control:	DISABLED		
Note: If Enabled select only one sensor below			
Top Sensor:	DISABLED		
Middle Sensor:	DISABLED		
Bottom Sensor:	DISABLED		
Average of Sensors Control:	DISABLED		
DIM_TOP	Automatic	100.00%	100.00 %
DIM_MID	Automatic	100.00%	100.00 %
DIM_BOT	Automatic	100.00%	100.00 %
FLUOR	Automatic		On 100 %
INC_1	Automatic		On 100 %
INC_2	Automatic		On 100 %
INC_3	Automatic		On 100 %
AUX_TIER	Manual	On	100 %
Receptacle Control Group			
RECP	Automatic		Off 0 %
Irrigation Control Group			
IRR	Automatic		Off 0 %

Figure 3-3 Lighting Control Group Section

6. Select **Manual On**, and then click **OK**.

3.3 Configuring the Flex Lighting Settings

Depending on the requirements of the experiment, choose the light sensor(s) to use for monitoring the lighting level inside the chamber:

In the **Lighting Control Group** section (Figure 3-3), enable only *one* of the following:

- **Independent Sensor/Canopy Control**—Monitor the lighting level using all three sensors independently from each other.
- **Single Sensor Control**—Monitor the lighting level using only one sensor.
 1. If this option is enabled, specify which sensor to use: **Top Sensor**, **Middle Sensor**, or **Bottom Sensor**.
 2. Select the field of the sensor you want to use, and then select **Enabled**.
 3. Click **OK**.
- **Average of Sensors Control**—Monitor the lighting level using the average output of all three sensors combined.

This option is recommended *only* for a three-tier mode configuration, because of the third-tier light sensor that will lower the average, unless the third-tier light sensor is moved to the same distance from the lamps as the first- or second-tier light sensor.

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4 TROUBLESHOOTING



Convicon Technical Support is available to all users at no charge, either to assist with troubleshooting or to order parts, for the life of the equipment.

Even if service is close by, a few troubleshooting steps significantly reduce the time to diagnose and correct a fault. Make careful notes of the faulty symptoms and the chamber and ambient conditions. This could help to determine the cause of the problem.

4.1 All the lamps in a canopy do not turn on

1. Check that the canopy plug is connected to the power receptacle on the wall inside the chamber.
2. Ensure that the chamber power cord is properly connected to the building electrical supply.
3. Check that the main power switch is set to ON.
4. If the middle-tier canopies, bottom-tier canopies, or both middle-tier and bottom-tier canopies are installed, check that Flex Lighting is activated.

For more information, see section 3.2, Activating Flex Lighting, on page 3-1.

Lamps still do not turn on Contact Convicon Service.

4.2 Unequal number of lighted lamps across the canopies

Check that any unlit lamps are not burnt out. If the lamps are burnt out, then replace the lamps.

New lamps still do not turn on Contact Convicon Service.



Conviron Head Office
Winnipeg, Canada
conviron.com

Conviron Europe Ltd.
Cambridgeshire, UK
conviron.co.uk

Conviron China
Shanghai, China
conviron.cn

Conviron US
Pembina, USA
conviron.com

Conviron Germany GmbH
Berlin, Germany
conviron.de

Conviron Australia
Melbourne, Australia
conviron.com.au

WWW.CONVIRON.COM
info@conviron.com

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