MICROGROW

GREENHOUSE SYSTEMS, INC

26111 YNEZ RD., SUITE C-4, TEMECULA, CA 92591 PHONE (951)-296-3340 FAX (951)-296-3350

Rev. 1.0   10/7/04

Growstat Series
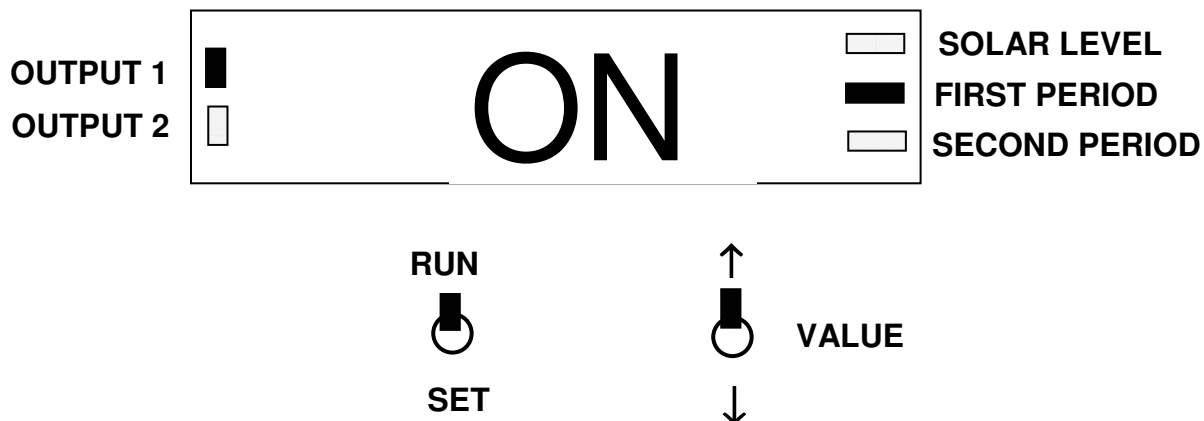Light-Stat

MICRO GROW

Greenhouse Systems Inc.

26111 Ynez Rd., Suite C-4 • Temecula, CA 92591
(909) 296-3340 FAX (909) 296-3350
www.microgrow.com

LIGHT-STAT

OUTPUT 1 ■	ON	▭ SOLAR LEVEL
OUTPUT 2 ▢		▬ FIRST PERIOD
		▭ SECOND PERIOD

RUN

SET

↑

VALUE

↓

Product Description:
Designed to control greenhouse crop lighting. Two separate and independent channels of operation are available. Control is based on time of day, and/or incoming solar levels.

Features:

1. Two independent channels of operation.

2. Two operational periods for each channel within each 24-hr period with independent times and solar light levels for each.

3. Solar monitor and readout in w/m^2.

4. Automatic detection and calculation of daily sunrise and sunset times.

5. Specified lighting periods may be turned on or off, for each channel, and for each of two operation periods within each channel. The timed periods may be defined as:

    A. At a specified time of day.
    B. At sunrise or sunset.
    C. At a specified time period before or after sunrise or sunset.

6. In addition to the above, lighting may also be turned on or off if desired by high or low solar levels throughout the specified lighting period.

2

Voltage:
24 VAC 50/60 hz.

Outputs:
Voltage Free, dry switched, rated at 2 amps.

Operation:
1. Set desired operational on and off times. This may be time of day, sunrise or sunset, hours before sunrise or sunset, or simply all times.

2. Set desired solar level. This will activate the lighting channel only if the solar level is below this setting. This feature may be bypassed if desired by selecting ALL.

3. Set delay times. This will be the time delay in minutes, both on or off to prevent rapid cycling of the lights when solar levels change quickly, as in the case of cloud cover.

4. Set differential. This will be the solar differential in w/m^2 of the control system.

Run Mode, Display Scroll:
While the control is in the run mode, these items will be displayed on the screen in the following order.

1. Current Solar Level
2. Channel Output Status for Both Channels (ON-OFF)
3. Time of Day
4. Highest Solar Level in past 24 hrs. (HIGH XX)

To Program Control:

A. Set The Solar Level:

1. Depress the SET switch until the SOLAR LEVEL BAR is illuminated along with the corresponding output and operational period bars.

2. Set Solar levels for both channels, and both operational periods for each channel, by holding down, or up the value ↑↓ switch. When finished with the first channel, first operation, depress the SET switch again for the second operation. Continue for the second channel (if used) by continuing to depress the SET switch.

   Notes:

   A. If the solar level is set to ALL, then the solar level reference will be bypassed from the control panel, thus allowing operation of time of day only.

   B. If the second operational period of channel 1, and/or the second channel in its entirety are not desired, they may be disabled in the DIP switch settings.

C. Solar levels will be in w/m^2

C. Set Time of Day Operations:

1. Continue to depress the SET switch to set the time of day for the desired channels and operational period of each channel. Set Time of Day Operations for On and Off, for both channels. Adjust the desired time by using the value ↑↓ switch. Select the hour first, followed by the minutes, then AM or PM. These parameters will be the time periods that the outputs will be activated.

    You may also select sunrise, sunset, or hours after or before sunrise and sunset (see below). To select a time of day, first select the hour by using the value ↑↓ switch, then depress the SET switch again for the minutes, again for AM or PM.

If Using Sunrise and Sunset Times:

1. If you are using sunrise (SriSE) or sunset (SnSEt) for your operational periods, you may also set the time in hours before or after sunrise or sunset. This is done after selecting the sunrise or sunset option by selecting either 0 (at sunrise or sunset, -1, -2, -3, -4 (hours before) or 1, 2, 3, 4, (hours after) by using the value ↑↓ switch.

D. Set Differential:

1. This will be the differential of the solar level. You may set any value by using the value ↑↓ switch here from 0-200 w/m^2. Example: If the solar level is set to turn on at 500 w/m^2, and the differential is set at 100, then the turn off solar level will be 600 w/m^2.

E. Set Time Delay:

1. This setting will be the delay in minutes, that the system needs to see, before changing operational state based on solar the level. You may set 2 sec (seconds) as a test time, or 1, 2, 5, 10, 15, 20, 25, or 30 minutes of delay.

Other Settings:

F. Calibrate the Solar Sensor:

The control comes calibrated at the factory. If you feel that some adjustments are necessary, follow these instructions:

1. Depress the SET switch until CALIB appears on the display. Then use the value ↑↓ switch to set the correct solar level in w/m^2.

G. Set the Time Clock:

1. Depress the SET switch until time of day is displayed. Make sure that it is not the operational time of day.   Use the value ↑↓ switch to enter the correct hour. Use the SET switch to advance to minutes, and set the minutes in the same manner. ALIB appears on the display. Then use the value ↑↓ switch to set the correct solar level in w/m^2.

H. Back to Run Mode:

1. The control panel will automatically return to the run mode if no switches have been depressed for a short while. You may also return the control to the run mode by advancing the SET switch through all of the settings.
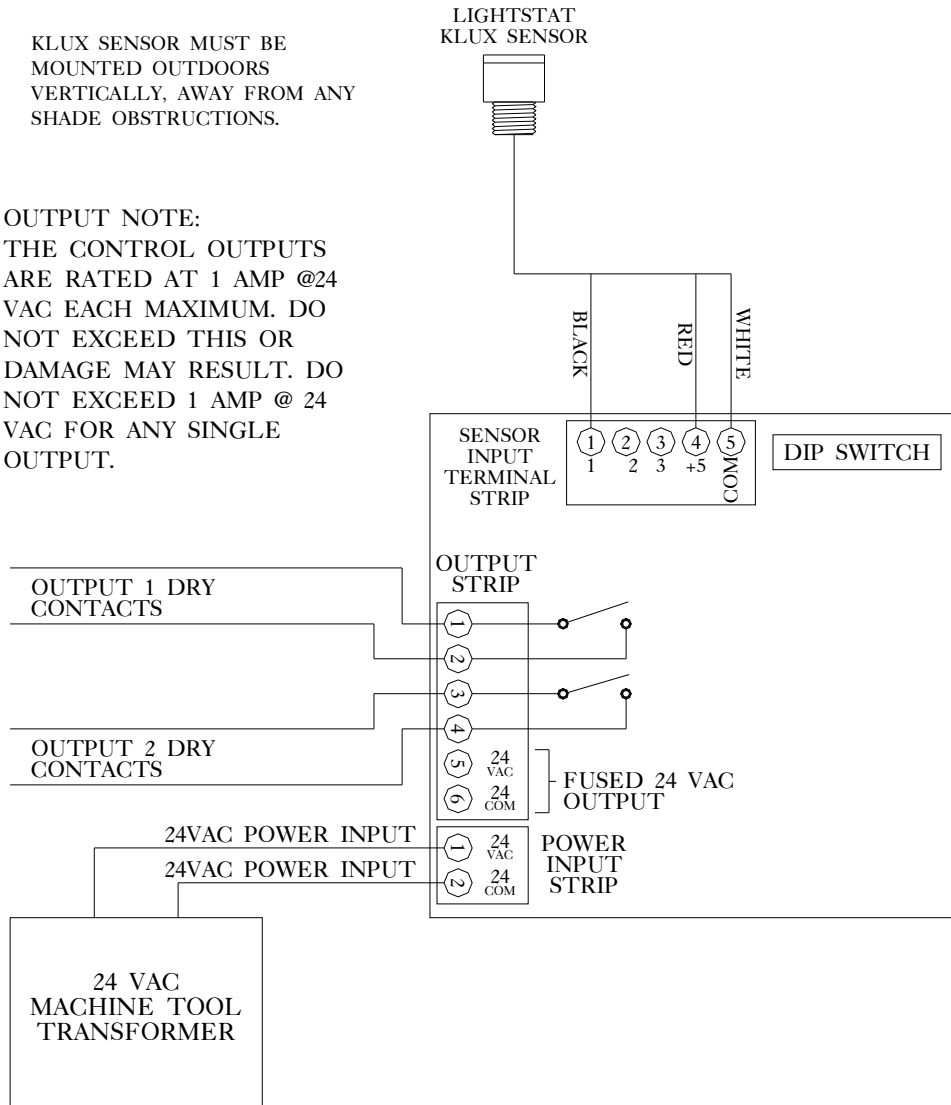
DIP SWITCH	ON	DESCRIPTION	COMMENTS
1	X	Channel 1 Second Operational Period in Use	Use if only a single operational period is desired for channel 1
2	X	Channel 2 Second Operational Period in Use	Use if only a single operational period is desired for channel 2
3	X	Channel 2 Not Used at All	Use if channel 2 operation is not desired at all.
4	X	Low Sunrise/Sunset Sensing Sensitivity	Use if desiring a delayed sunrise sunset detection, and an early sunset detection.
5	X	Test Mode	See test mode note below

Test mode does the following:
1. In run mode, sunrise and sunset times are displayed
2. When displaying the solar level, the right decimal point lights up if the photocell is detecting 'dark', otherwise it is not lit up.
3. The photocell responds in 2 seconds instead of 2 minutes.

KLUX SENSOR MUST BE
MOUNTED OUTDOORS
VERTICALLY, AWAY FROM ANY
SHADE OBSTRUCTIONS.

OUTPUT NOTE:
THE CONTROL OUTPUTS
ARE RATED AT 1 AMP @24
VAC EACH MAXIMUM. DO
NOT EXCEED THIS OR
DAMAGE MAY RESULT. DO
NOT EXCEED 1 AMP @ 24
VAC FOR ANY SINGLE
OUTPUT.

LIGHTSTAT
KLUX SENSOR

BLACK   RED   WHITE

SENSOR
INPUT
TERMINAL
STRIP

① ② ③ ④ ⑤
1 2 3 +5 COM

DIP SWITCH

OUTPUT
STRIP

OUTPUT 1 DRY
CONTACTS

① ② ③ ④

⑤ 24 VAC
⑥ 24 COM

FUSED 24 VAC
OUTPUT

OUTPUT 2 DRY
CONTACTS

24VAC POWER INPUT
24VAC POWER INPUT

① 24 VAC
② 24 COM

POWER
INPUT
STRIP

24 VAC
MACHINE TOOL
TRANSFORMER

DIP SWITCH SETTINGS

SWITCHES 6 THROUGH 12 ARE NOT USED.
LEAVE IN THE OFF POSITION

#1 CHANNEL 1 SECOND OPERATION PERIOD IN USE
    *USE IF ONLY A SINGLE OPERATIONAL PERIOD
     IS DESIRED FOR CHANNEL 1

#2 CHANNEL 2 SECOND OPERATION PERIOD IN USE
    *USE IF ONLY A SINGLE OPERATIONAL PERIOD
     IS DESIRED FOR CHANNEL 2

#3 CHANNEL 2 NOT USED AT ALL
    *USE IF CHANNEL 2 OPERATION IS NOT
     DESIRED AT ALL

#4 LOW SUNRISE/SUNSET SENSING SESITIVITY
    *USE IF DESIRING A DELAYED SUNRISE SUNSET
     DETECTION, AND AN EARLY SUNSET DETECTION

#5 TEST MODE
    1. IN RUN MODE, SUNRISE AND SUNSET TIMES
       ARE DISPLAYED.
    2. WHEN DISPLAYING THE SOLAR LEVEL, THE
       RIGHT DECIMAL POINT LIGHTS UP IF THE
       PHOTOCELL IS DETECTING 'DARK', OTHERWISE
       IT IS NOT LIT UP.
    3. THE PHOTOCELL RESPONDS IN 2 SECONDS
       INSTEAD OF 2 MINUTES.

LIGHTSTAT INPUTS AND OUTPUTS

LIMITED WARRANTY

Micro Grow Greenhouse Systems, Inc. warrants that all of the products Micro Grow Greenhouse Systems, Inc. manufactures are free from defects at the time of shipment by Micro Grow Greenhouse Systems, Inc. This warranty covers defects in workmanship and materials. No warranty is extended on any parts, materials, or components manufactured by others and purchased by Micro Grow Greenhouse Systems, Inc., and any warranty on these materials is limited to the warranty supplied by the original manufacturer or supplier of said products only. This warranty excludes any and all damages cause by installation by unqualified individuals, damage by misuse or neglect, shipment damage, alterations to original manufacturing, and improper installation or use for any reason than intended by manufacturer. This warranty may not be altered in any manner except with the written authorization of one the officers or owners of Micro Grow Greenhouse Systems, Inc. The only and sole liability of Micro Grow Greenhouse Systems, Inc. under this warranty is limited to repairing, replacing or the issuance of credit for any products returned to Micro Grow Greenhouse Systems, Inc., during the warranty period of twelve (12) months from date of shipment. This warranty is specifically conditioned upon Micro Grow Greenhouse Systems, Inc. being notified in writing promptly upon discovery of any product defects by the buyer or end user. The product must then be returned prepaid to Micro Grow Greenhouse Systems, Inc. within the twelve month warranty period for inspection by Micro Grow Greenhouse Systems, Inc. Upon inspection of said product, Micro Grow Greenhouse Systems, Inc. will notify buyer or end user of its findings. At Micro Grow Greenhouse Systems, Inc. sole discretion, the product will be replaced, repaired or a credit will be issued for the original sale price of the product, provided that damage has not occurred due to misuse, neglect, improper use or installation as outlined above, shipping damages or accident.

MICRO GROW GREENHOUSE SYSTEMS, INC. SHALL NOT BE LIABLE FOR ANY DAMAGES BEYOND THE ACTUAL ORIGINAL COST OF THEIR PRODUCT EITHER DIRECTLY OR INDIRECTLY ARISING FROM DEFECTIVE PRODUCTS OR WORKMANSHIP.