
Installation and User Manual

AgriShift® Lighting Control Unit MASTER

Models LCL-0.2-120V / LCL-0.2-240V



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Installation and User Manual

AgriShift® Lighting Control Unit MASTER
Models LCL-0.2-120V / LCL-0.2-240V

Manual Edition V2.4
Software Version V1.14

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1 GENERAL

1.1 SYSTEM OVERVIEW

The programmable lighting controller units are specifically developed to modulate the intensity of lighting products.

Models LCL-0.2 and LEL-0.2 are dedicated to LED lighting products.

The master controller LCL-0.2 can be configured in master mode to define up to 20 lighting periods distributed throughout the production cycle, or in slave mode to provide a master controller with additional power outputs.



This controller is equipped with a graphical LCD display with white backlight and four navigation keys for programming LED lighting circuits. The controller provides two power outputs, configurable in automatic mode or in manual mode through the use of dedicated bypass switches and an intensity knob.

Equipped with an intelligent processor, the system offers simple and intuitive navigation. It is possible to easily enter up to 20 lighting periods that will automatically activate on certain production days. Each lighting period accommodates up to 12 lighting cycles, with or without a transition that simulates sunrise and sunset.

A companion slave unit, the LEL-0.2, comes without operator interface and is intended to control additional power outputs commanded from a master controller. It offers the same performance features as the master units with two independent bypass switches and an intensity adjustment knob in manual mode.

1.2 SYMBOLS USED

The following symbols are used in this manual:

| | |
|---|---------------------------------|
|  | Caution, risk of ELECTRIC SHOCK |
|  | Caution, risk of DANGER |




2 INSTALLATION, COMMISSIONING AND OPERATION

2.1 TECHNICAL ASSISTANCE

Technical assistance on the unit can be obtained from your distributor.

2.2 SAFETY

All technical staff performing operations on a controller must have read and understood this manual and accepted the recommendations herein.

| | |
|--|---|
|  | <p>Before controller commissioning, all connections must be checked. All electrical wiring and connections should be inspected for possible defects. The controller should not be operated if any of its components (whichever it is) appears defective. Repair or replacement of a defective component must only be carried out by technical personnel trained for this purpose. The competence of the technical personnel must first be confirmed and accepted by your distributor.</p> |
|  | <p>Placing manual switches in the "OFF" position does NOT disconnect the controller from its electrical network. It is important to install a main disconnect mechanism to cut power to the controller completely. Using this main disconnect, ensure to cut all power to the system before servicing the unit or any equipment connected to the unit. Another option is to cut the main power feeding the controller and all equipment connected to the controller.</p> |
|  | <p>The LCL-0.2-120V AgriShift® is intended for 120V, single phase operation only. The LCL-0.2-240V AgriShift® is intended for 240V, single phase operation only. Both A and B outputs must be on the same phase.</p> |

Failure to follow instructions may result in the full or partial cancellation of the warranty.

2.3 USAGE AND APPLICATION

The LCL-0.2-120V and LCL-0.2-240V controllers are designed to control dimmable lighting systems used in agricultural farm buildings. Any other use of these controllers can compromise the safety of the users as well as the integrity of the system itself. Therefore, such usage is prohibited.

2.4 INSTALLATION

It is essential to observe the following installation instructions and to abide by the applicable local electric codes:

1. The controller is designed for wall mounting and must be installed vertically.
2. The heat generated by the modulation circuit is released by the heat sink located on the back of the device. Therefore, it is important to ensure that there is no obstacle hindering or interfering with the free passage of air 20 cm (8 inches) above and 10 cm (4 inches) under the controller.
3. Moreover, the controller must never be installed over a heat source such as a radiator or other controller with a heat sink.
4. The controller must be installed in a location protected from harmful gases or excessive moisture. It should never be sprayed directly.
5. Temperature at the installation site of the controller must lie between 0 ° and 40 ° C (32 ° to 104 ° F) at all times.
6. Relative humidity at the installation site of the controller must lie between 5% and 90% at all times.
7. Low voltage wiring (control signals, sensors and potentiometers) must be isolated from high voltage ones.
8. It is absolutely mandatory to connect the ground wire to the space provided for this purpose. Improper grounding could lead to malfunction.
9. The installation wall of the controller must be even and able to withstand a temperature of 80 ° C (180 ° F). The controller should never be installed directly on a wall made of styrofoam, urethane or other heat-sensitive materials.
10. The controller must be checked regularly to ensure its proper operation. In case of failure, identify the fault symptoms and contact the product supplier.

2.5 POSITIONING

It is strongly recommended to install the controller in a location accessible and at eye level in order to facilitate its installation, use and maintenance.

2.6 ELECTRICAL CONNECTION

2.6.1 Electrical wiring and connections



TURN OFF THE POWER SOURCE BEFORE AND DURING THE CONNECTION WORK TO AVOID SHOCK HAZARD AND CONTROLLER DAMAGE.

The controller installation must comply with the wiring diagrams provided. These furnish all information required by a qualified electrician to perform wiring operations. In addition to all electrical regulations, the following conditions must be met:

1. All perforations in the chassis for routing electric cables must be made underneath the device.
2. All perforations for routing electrical cables should be sealed with mastic to prevent moisture condensation inside the controller.
3. Sufficient lengths of wire should be provided to allow the removal of all equipment during service operations.
4. Power cables must be made of copper with 600-volt insulation.
5. Sensor and communication cables must be at a minimum # 22AWG, shielded and twisted copper pair, and insulated with a PVC sheath.
6. Signal and communication cables must not follow an AC power cable for more than 60 cm (2 ft.) to prevent electrical noise affecting the signal.
7. To unsheathe a wire, remove 10 mm (0.4 inch) of insulation from the wire end.
8. An AWG #12 protective ground conductor (preferably stranded copper wire) must be provided and connected at the required location (MALT).

2.6.2 Wiring diagram

For input/output connection details, please refer to the wiring diagrams shown in Annex D.

2.7 STARTING THE SYSTEM

Before using the controller for production purposes, it is essential to observe the following configuration steps (see relevant sections below for details):

System configuration is the first step in starting a new system. Ensure the system has been connected and power supply is turned on to the unit per section 2.6.

SYSTEM SETUP

1. Review section 3.1 to become familiar with the front panel, the programming modes and the navigation/control screens.
2. From the Home Screen, go to the Configuration Menu and select Outputs. Enable outputs. You can now calibrate lighting intensity as a function of applied voltage or wait until a later time to do so. See Configuration-Outputs menu (section 5.1).
3. For safety reasons, all newly configured outputs are automatically set to MANUAL mode. Switch all outputs from MANUAL to AUTOMATIC mode. (See section 4.6 Output Control.)
4. Place the front panel control switches in Manual Mode (ON position per 3.1.4) and verify the LED lights operate and dim properly.

OPERATING SETUP


5. Using the navigation buttons and the LCD screen, select Configuration then Local Settings. Set the date and time of the system (24 hour mode recommended) to allow a consistent functioning of the lighting periods. Then set your display preferences.

(See Menu Configuration-Local Settings menu (section 5.3)).

6. Select Lighting from the Main Menu then select Curve. Configure lighting curves to determine the lighting periods throughout the production cycle. (Refer to section 4 - Operating Parameters.)
7. Return to the Configuration menu and select Advanced Parameters. Verify these are set properly to your particular situation. (section 5.2)

FINAL SETTINGS

8. For safety reasons, all newly configured outputs are automatically set to MANUAL mode. Once all setup has been completed, switch all outputs from MANUAL to AUTOMATIC mode. (See section 4.6 Output Control.)
9. **To apply the lighting curve, set the controller to Production mode.** (See section 4.5 Production.)

| | |
|--|---|
|  | Failure to complete the Final Settings can lead to unpredictable system behaviors. In fact, if one output remains in MANUAL mode, it will not perform according to the control strategy previously set in Operating Setup step. |
|--|---|


2.8 MAINTENANCE


BATTERY REPLACEMENT

The battery should be changed every 5 years. An error message is displayed whenever the battery level is too low. Please proceed to its immediate replacement to avoid data loss in case of power failure.

Follow these steps to replace the battery:

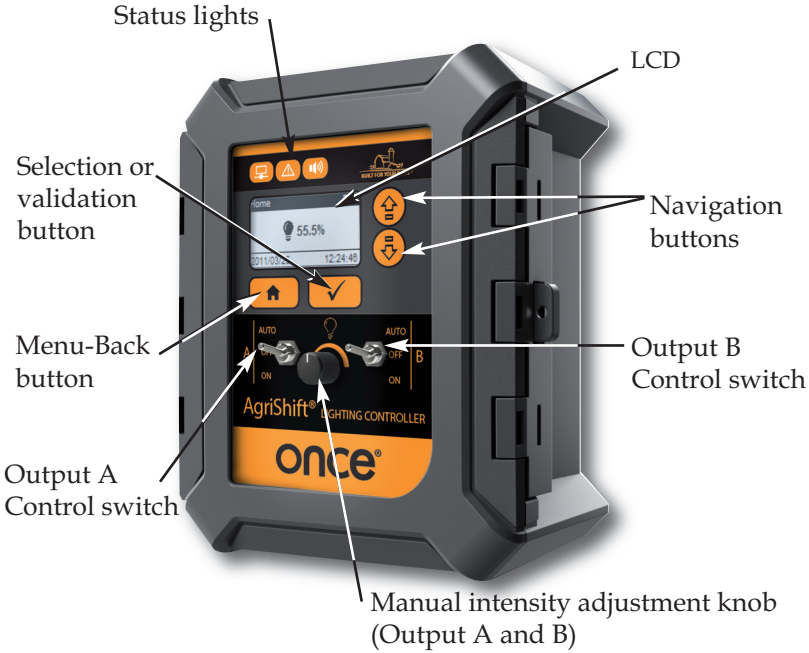
1. Open the case and locate the position of the battery (located under the LCD circuit).
2. Remove the battery and replace it with a new CR2032 lithium battery.
3. Close the case.

| | |
|--|---|
|  | <p>Please ensure that the unit remains on throughout the execution of this procedure.</p> <p>Battery replacement without main power would cause irreversible loss of system setup, operating parameter values, and historical data.</p> |
|--|---|

| | |
|--|---|
|  | <p>There is no danger of electric shock on battery replacement provided the operator follows the instructions in this procedure. All other manipulations could cause electric shock.</p> <p>If in doubt, seek help from a qualified technician.</p> |
|--|---|

3 OPERATOR INTERFACE

3.1 CONTROL LOCATION AND UTILIZATION



3.1.1 Status Lights



Communication

Blinks according to the flow of data exchanged over the communication bus.

The light remains off if a loss of communication is detected, or if the communication bus is inactive.



Warning

Lights up in the following cases:

- Blinking: if either the manual control or simulation option is activated.

The manual control mode is accessible through the software options (Output Control or Temporary Override) or manually (by using the control switches located on the front panel or an external dimmer).

- Steady: if an abnormality is detected by the controller (e.g., low battery, memory full, history data overflow, etc.)



Alarm

Non-operational

3.1.2 Navigation Controls



Menu-Back

Key to return to previous menu. From the main menu, this button allows accessing the summary page. It allows leaving a parameter-editing page without saving (cancellation).



OK

Selection or validation key. It allows saving changes when editing a parameter.



Up

Key to change your selection or increment a value.



Down




Key to change your selection or decrement a value.

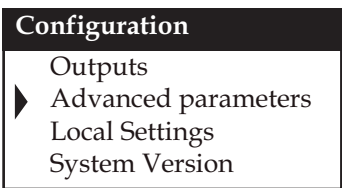
3.1.3 Interfaces / Screens

The following section provides general information on the screens of the AgriShift® system.

Menu




Menu pages present and provide access to a list of submenus. The left arrow indicates the selected item.

Use the keys  and  to select the desired submenu and press  to enter the submenu.

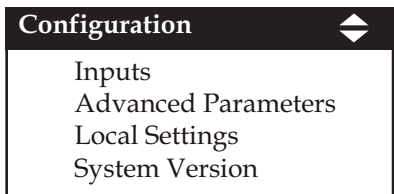
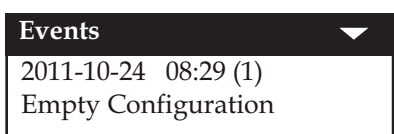


List

Pages with lists display one or more arrows on the top bar indicating the current position.








-  top of the list
-  middle of the list
-  bottom of the list

Use the keys  and  to navigate through the list.



Editing alphanumeric variables

To edit an alphanumeric parameter of the AgriShift® system:

1. Use the keys  and  to select and press . The parameter is then in editing mode (inverted color).
2. Select the value using the keys  and .
3. Press  to save the change or press  to cancel.

| Output A | |
|-------------|---------------------------------------|
| Enable | <input type="checkbox"/> |
| Dimmer | <input type="text" value="Dimmer 1"/> |
| Calibration | Edit |

Field selected

| Output A | |
|-------------|--------------------------|
| Enable | <input type="checkbox"/> |
| Dimmer | Dimmer 1 |
| Calibration | Edit |

Field selected in editing mode

Editing ON-OFF variables

To edit an ON-OFF (checkbox) parameter in the AgriShift® system:

1. Use the keys  and  to select and press .

The value is automatically reversed.

Press  again to return to the original value.

The symbol  indicates that the selection is enabled.

| Output A | |
|-------------|--------------------------|
| Enable | <input type="checkbox"/> |
| Dimmer | Dimmer 1 |
| Calibration | Edit |

Checkbox - set to OFF (False)

| Output A | |
|-------------|-------------------------------------|
| Enable | <input checked="" type="checkbox"/> |
| Dimmer | Dimmer 1 |
| Calibration | Edit |

Checkbox - set to ON (True)

3.1.4 Control Switches



Control Switch

Manual control switches offer three possible positions:

- AUTO** The output is automatically controlled according to the current program or a setting on the screen.
- OFF** The output is manually disabled.
- ON** The output is set on manual operating mode. The intensity is set by the Manual Intensity Adjustment Knob.



Manual Intensity Adjustment Knob

This button allows adjusting light intensity when one or more control switches are set into the ON position.

Note: The manual intensity adjustment knob adjusts both lighting outputs simultaneously if both are set on manual mode (Control Switches in the ON position).

3.2 CONTROLLER MENU AND OPTIONS

3.2.1 General - Lighting outputs state

Master controller LCL-0.2 allows controlling all lighting lines with a single operating setpoint. This controller operates as follows:

The setpoint is applied to all lighting lines (of the master controller and slave controllers) for which the switch is in the AUTO position. In the case of slave controllers, the lighting setpoint is provided through the expansion bus 0-10V.

The adjustment of the light intensity via the expansion bus 0-10 V is performed solely by the options Output control, Timed Manual Override, and Curve (defined in sections 4.6, 4.4.5 and 4.4.2 respectively).

4 OPERATING PARAMETERS

4.1 SUMMARY

The summary page shows the following information:

- Current lighting intensity
- Production day - whether the controller is in Non-Production mode.
- Controller time and date

| Home (D25) | |
|---|------------------|
|  | A. 0 % B. 0 % |
| 2013-11-20 | 09:12:45 |


If the system is in manual control or in temporary manual override mode, the summary page alternates with one of the two following warning pages:






| Home (D25) | |
|----------------|----------|
| Manual Control | |
| 2011-05-25 | 09:12:45 |


| Home (D25) | |
|---|----------|
| Temporary Override Time Left : 20:10 | |
| 2011-05-25 | 09:12:45 |

4.2 MAIN MENU

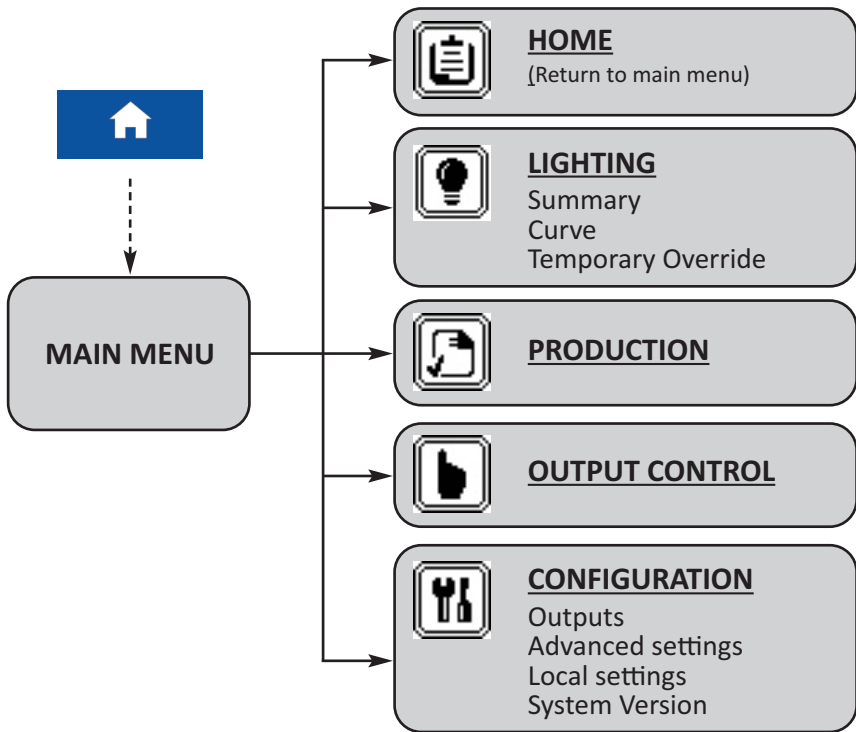
The controller provides the user with a simple menu to setup, diagnose, and monitor lighting outputs.

Press  to access the main menu.
(See navigation diagram on next page.)


| Main menu | | | | |
|--|--|--|--|--|
|  |  |  |  |  |
| ▲ Production | | | | |

Select the desired submenu and press .

4.3 NAVIGATION DIAGRAM




4.4 LIGHTING

Select the desired submenu and press  to view it.

Lighting

- ▶ Summary
- Curve
- Temporary Override



To manage both outputs on separate curves, the option "Independant" must be selected in Advanced Parameters (see section 5.2 - *Configuration - Advanced parameters*). The page will then display as shown here.

Lighting

- ▶ Summary
- Curve A
- Curve B
- Temporary Override

4.4.1 Summary

The Summary page displays the general lighting status:

Summary

| Setpoint (prod.) | 10% | | |
|------------------|--------|--------|----------|
| # | Status | Actual | Setpoint |
| A | Dim. | 27% | 27% |
| B | Dim. | 27% | 27% |

- Current lighting setpoint and its nature:

- **non-production:** the setpoint comes from the Production page (see section 4.5 for details).
- **production:** the setpoint comes from the Lighting - Curves page (see section 4.4.2 for details).
- **override:** the setpoint comes from the Lighting - Temporary Manual Override Control page (see section 4.4.5 for details).

- Current status and intensity of the lighting outputs:

- **AUTO:** the lighting output takes the setpoint defined above.
- **Switch:** the output is set on manual operating mode. The intensity is set by the Manual Intensity Adjustment Knob.
- **Dim.:** (for variable output only): the lighting output takes the setpoint of its external dimmer currently set to manual (0 to 100%). Set the dimmer to Auto so that the lighting output takes the setpoint of the AgriShift® system.
- **Manual:** The lighting output is under manual control (see section 4.6 for details).

4.4.2 Curve

All lighting outputs operate along a curve constituted of up to 20 lighting periods, including up to 12 cycles and 20 stimuli each.

The following page presents a lighting curve programming summary. To edit or view details, select a period and press



or select "---" to create a new period, then press



| Curve | | |
|--------|----------|----------|
| Period | Daylight | Duration |
| 0-4 | 95>>60% | 00 : 50 |
| 5-20 | 60% | 12 : 40 |
| 21-50 | 60>>45% | 10 : 50 |
| | --- | |



The system is capable of managing 1 or 2 lighting curves. To enable separate programming of 2 curves, see section 5.2 Configuration - Advanced Parameters - Lighting Control.

4.4.2.1 Editing a period

Each period can comprise up to 12 lighting cycles and 20 stimuli per day. Each lighting cycle is performed as shown in *Figure 1*. Transitions at the beginning and end of the cycle simulate the natural sunrise and sunset to reduce animal stress. Growth and weight gain are enhanced by the introduction of momentary light stimuli during a light cycle.

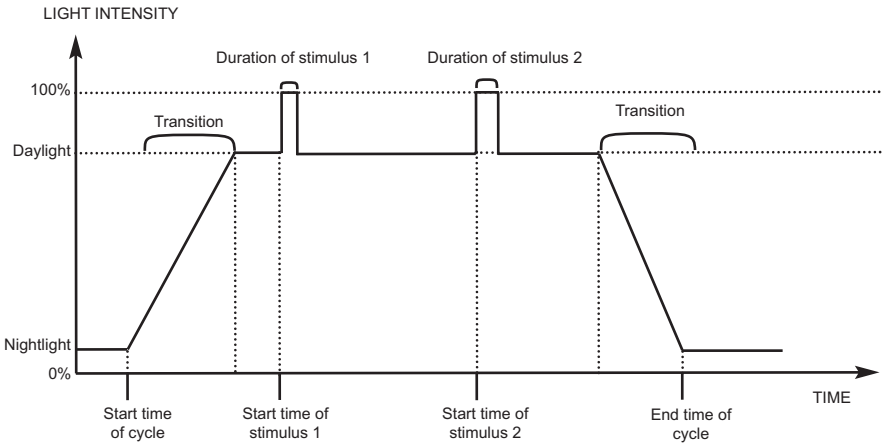


Figure 1: Lighting cycle - Variation of intensity versus time

Determine the following parameters for each lighting period:

Period start: (0 to 500 days)

Determines the start day for the period.

Nightlight: (0 to 100%)

Lighting intensity outside of lighting cycles.

Daylight Mode:

- **Constant:** The Daylight intensity remains steady over the period.

- **Gradual:** The Daylight intensity is automatically adjusted during the period. A linear regression is applied as shown in *Figure 2*.

| Parameters | |
|-------------------|--------------------------------------|
| --Period-- | |
| Period Start | <input type="text" value="0"/> |
| Nightlight | <input type="text" value="100 %"/> |
| Daylight Mode | <input type="text" value="Gradual"/> |
| Daylight Start | <input type="text" value="95%"/> |
| --Daily Cycles-- | |
| Transition | <input type="text" value="15 min"/> |
| Cycles | <input type="text" value="Edit"/> |
| --Daily Stimuli-- | |
| Stimuli | <input type="text" value="Edit"/> |

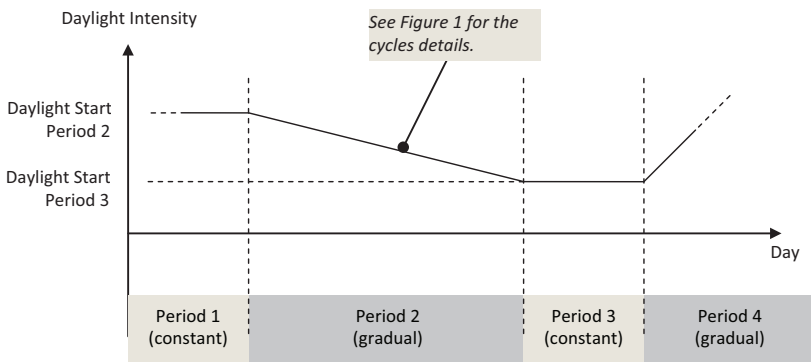


Figure 2 : Variation of daylight intensity over the periods

Daylight - Start: (0 to 100%)

- **Constant Daylight Mode:** lighting intensity within the lighting cycles once the transition is complete.
- **Gradual Daylight Mode:** lighting intensity used to calculate the current daylight value. Daylight intensity is applicable within the lighting cycles once the transition is complete.

For each gradual lighting period, Daylight Intensity - End corresponds to the Daylight Intensity - Start of the next period. For the last period defined, the Daylight Intensity remains steady throughout the period (even if the gradual mode is selected).

Transition: (1 to 100 min).

Transition time between the Nightlight and Daylight intensities at the beginning and end of each cycle to simulate sunrise and sunset.



Transition time of 0 causes the system to skip sunset and sunrise transitions, which could stress the birds. Zero should not be used as an entry.

4.4.2.2 Cycles Settings

Select the option Cycles *Edit* to bring up the following page:

Determine the following parameters for each cycle:

Enable: Select this option to activate the cycle.

Start: Starting time for lighting cycle (00:00 to 23:59).

Stop: End time for lighting cycle (00:00 to 23:59).

| Cycles | | | |
|--------|-------------------------------------|-------|-------|
| | Enable | Start | Stop |
| 1 | <input checked="" type="checkbox"/> | 08:00 | 12:00 |
| 2 | <input checked="" type="checkbox"/> | 14:00 | 18:00 |
| ... | ... | ... | ... |
| 12 | <input checked="" type="checkbox"/> | 00:00 | 00:00 |

4.4.2.3 Stimuli Settings

Select the option Stimuli - *Edit* to bring up the following page:

For each stimulus, set the following parameters:

Enable: Select this option to enable the stimulus.

Start: Starting time for stimulus (00:00 to 23:59). A stimulus will be performed only within a lighting cycle.

Length: Duration of the light stimulus (from 0m00s to 15m00s).

Note: stimuli will not be activated if defined outside of a lighting cycle.

| Stimuli | | | |
|---------|-------------------------------------|-------|--------|
| | Enable | Start | Length |
| 1 | <input checked="" type="checkbox"/> | 08:00 | 2m30s |
| 2 | <input checked="" type="checkbox"/> | 14:00 | 2m00s |
| 3 | <input checked="" type="checkbox"/> | 20:00 | 0m30s |
| ... | ... | ... | ... |
| 19 | <input checked="" type="checkbox"/> | 00:00 | 0m00s |
| 20 | <input checked="" type="checkbox"/> | 00:00 | 0m00s |

4.4.3 Timed Manual Override Control




The Manual control page allows overriding the setpoint temporarily without changing the current lighting curve. This prevents accidentally leaving the lights on when maintenance is finished.

| Temporary Override | |
|---------------------|-------------------------------------|
| Current Intensity | 55 % |
| Manual Control | <input type="checkbox"/> |
| Activation Duration | <input type="text" value="30 min"/> |
| Manual Intensity | <input type="text" value="0 %"/> |

To temporary override the current lighting setpoint, follow these steps:

1. Select the **Activation time** of the setpoint (1 to 120 min) and the desired **Manual Intensity** of lighting (0 to 100%).
2. Start the temporary override by checking the **Manual Control** checkbox.

The manual setpoint will be applied during the activation time; once this time has elapsed, the manual lighting control is automatically deactivated.

| | | |
|--|--|--|
|  | <p>The temporary manual override mode can be activated/deactivated in any program mode by simultaneously pressing on the up and down arrows on the controller.</p> |   |
|--|--|--|

4.5 PRODUCTION

The AgriShift® ensures the monitoring and management of production settings, as well as that of non-production times used for cleanup. This menu allows starting or stopping production as well as changing the production day.

4.5.1 Starting and Managing a Production

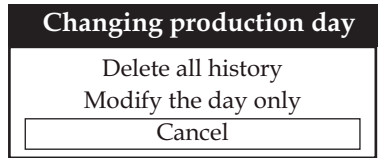
To start production, follow these steps:

1. Enable the **In Production** option; the Production page appears as follows:
2. Update the Production day (between 0 and 500). This day is used to determine which group(s) of lighting periods is applicable (refer to section 4.4.2 Lighting - Curve for details).

| Production | |
|---------------|-------------------------------------|
| In Production | <input checked="" type="checkbox"/> |
| Day | <input type="text" value="10"/> |

Note: After edition of the production day, the following options will be available:

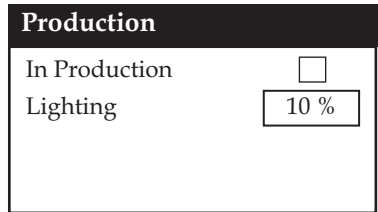
- **Delete all history** (water consumption): Select this option when starting a new production.
- **Modify the day only**: Allow to change the production day without deleting the water consumption history.



4.5.2 Non-Production

To operate in Non-Production mode, disable the **In Production** option; The Production page appears as follows:

Adjust the desired **lighting** intensity (0 to 100%) in the Non-Production mode. Lighting outputs will be automatically adjusted to this value.



4.6 OUTPUT CONTROL

The menu Output Control allows the user to manually control all active outputs of the AgriShift® controller.

#: Controller output identifier. Only the active outputs are listed.

| Output control | | |
|----------------|--------|-------|
| # | Status | Value |
| A | Manual | 0 % |
| B | Manual | 0 % |
| All Automatic | | |

Status: Controller mode status

AUTO: the output will be enabled or disabled according to the lighting curves.

ON: output enabled at all times.

OFF: output disabled at all times.

Value: Current lighting intensity.

To change the control mode of an output, select the desired output and press



The following page will appear:

| Control - Output A | |
|--------------------|--------|
| Mode | Manual |
| Value | 10 % |

MANUAL control

| Control - Output A | |
|--------------------|------|
| Mode | AUTO |

AUTO control

Select the desired **mode** and confirm by pressing



Select the desired **value** if the manual mode is selected. Confirm by pressing



. The output is automatically adjusted.

To rapidly set all available outputs to automatic mode, select the hotkey *All Automatic* located at the end of the page, and then press




If one or more outputs are not in AUTO control mode, the warning LED light flashes and a message appears on the summary page.



If the hotkey *All Automatic* is selected, the MANUAL CONTROL selection is automatically disabled in the *Output Control* page.

5 CONFIGURATION

The Configuration menu allows the user to configure all settings of the AgriShift® lighting system.


From the Configuration menu, select the desired submenu among the following and press .

Configuration

- ▶ Outputs
- Advanced Parameters
- Local Settings
- System Version

5.1 CONFIGURATION - OUTPUTS

This menu allows activating the variable outputs of the AgriShift® lighting controller.

Select the output you wish to setup and press .

Define the lighting output settings as follows:

Outputs

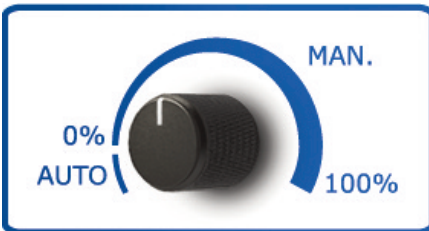
- ▶ Output A
- Output B

Output A

- Enable
- Dimmer
- Calibration

1. Check **Enable** to enable the output.
2. To associate an external dimmer to the light output, make sure that the dimmer was previously connected to the controller (refer to the wiring diagram in annex D-2) and then select the corresponding **Dimmer**. If the lighting output does not have a dimmer, indicate ---.

EXTERNAL DIMMER FUNCTIONING



External Dimmer Adjustment Knob


If the dimmer is fully turned to the left (AUTO), the lighting outputs associated with this dimmer are in automatic mode and vary in intensity depending on the lighting program setup in the AgriShift® lighting system. When turning the dimmer clockwise, the lighting outputs switch from automatic to

manual intensity (between 0 and 100%, depending on the position of the dimmer). It is important to note that the intensity selected in manual mode will be preserved indefinitely as long as the dimmer is not set into the AUTO position. If a potentiometer failed, disable it (in the configuration of the lighting output) during its replacement to preserve the automatic mode).

3. Calibrate the lighting output.
This adjustment procedure is normally required only once during the controller installation.

Select **Calibration Edit** and then press

 . The following page appears:

| Calibration - A Output  | |
|--|-----------------------------------|
| | <input type="text" value="Stop"/> |
| ON Threshold | 8 |
| Intensity 1 % | 1 |
| Intensity 25 % | 25 |
| Intensity 50 % | 50 |
| Intensity 75 % | 75 |
| Intensity 100 % | 100 |

- 3.1 Adjust the ON Threshold setpoint:

When turning on a LED lighting system, a start-up intensity is momentarily applied, then the intensity is adjusted to the current setpoint. It is necessary to properly calibrate the starting intensity to ensure proper functioning for low lighting intensities.

The default values of the curve presented here allow linear operation of the lighting output.

Set the **ON Threshold** value to adjust the minimum power that the controller must inject upon light activation.


- A value too high will result in an intensity peak upon light activation.
- A value too low will cause the lights to go out or flicker on low intensity levels.

- 3.2 Adjust the Minimum Intensity:

Since the main supply voltage may somewhat vary from one location to another, it is required to adjust the minimum lighting intensity. This feature is provided to avoid situations where the lights are either fully extinguished or flickering when operating at the 1% low intensity limit.

Adjust the **Intensity 1%** value in order to obtain the lowest lighting intensity possible without flickering. The output is automatically adjusted.

- 3.3 Finalize the calibration of the curve as follows:

- 3.3.1. Select **Intensity 25 %** and press  to enter edit mode. The output delivers intensity proportional to the input value.
- 3.3.2. Enter a number from 0 to 100 (this is a percentage of the power delivered by the variable output) and measure the corresponding output with a voltmeter.

- If this value is lower than desired for a **25% power**, enter a larger value.
- If this value is greater than that desired for a **25% power**, enter a smaller value.

Repeat as needed until the desired value is achieved.

3.4 Repeat step 3.3 for the following intensities (**Intensity50%**, **Intensity 75%**, and **Intensity 100%**). At any time, the output can be disabled by selecting *Stop*.

5.2 CONFIGURATION - ADVANCED PARAMETERS

The Advanced settings menu allows the user to configure advanced settings for additional operating parameters related to power expansion bus and lighting control.

As the controller starts, parameters are initialized to default values (shown below), thereby allowing the standard utilization of the AgriShift® system. The user can decide whether to customize these values to meet the specific needs of the production environment.

Advanced Parameters
▼

--Power Expansion--

Mode Master

Master Output Output A

--Lighting Control--

Curve Independ

MASTER mode

Advanced Parameters
▼

--Power Expansion--

Mode Slave

SLAVE mode

5.2.1 Power Expansion (Master/Slave Mode)

Mode: This option allows selecting the operating mode (master or slave) of the controller. Master mode indicates to the controller to apply the lighting program (depending on the period and lighting cycle defined for the production day and system time). The master controller also applies a low intensity signal (between 0 and 10 volts) to the power expansion bus, which is proportional to the current intensity required by the lighting setpoint. This signal is interpreted by all slave controllers to modulate their outputs connected to an intensity requested by the master controller.



Set switch SW4 to the master position while the controller is in Master mode. Otherwise, set the switch to Slave mode.

Master output (in master mode only):

Determines the output A or B - whose value will be followed by the slave controllers (and thus applied to the power expansion bus).

Note: Only applies when the curve is independent (see next section).

5.2 Lighting Control**Curve:**

Shared: Both outputs will follow the same lighting curve.

Independent: Each output will have its own lighting curve.

5.3 CONFIGURATION - LOCAL SETTINGS

This menu allows the user to enter the following local settings:

Language:

Language used in the control interface.

Date / Time:

Current date and time.

Format-Date:

Date display format. Three date formats are available: YYYY-MM-DD, DD-MM-YYYY, or MM-DD-YYYY

Format- Time:

Time display format. Two time formats are available: 24 hours or AM/PM.

| Local settings | |
|----------------|------------|
| Language | English |
| Date | 2012-02-15 |
| Time | 10:03:00 |
| Format - Date | AAAA-MM-JJ |
| Format - Time | 24 h |

5.4 CONFIGURATION - SYSTEM VERSION

This page displays the system version and model of the current load.

| System Version | |
|-----------------|-------------|
| Current Version | 1.12.00 |
| Model | LC 0.2 P123 |

ANNEX A: SPECIFICATIONS: LCL-0.2-120V

| Power | |
|---------------------------------|----------------------------------|
| Voltage and operating frequency | 120 AC, 50/60 Hz |
| Main fuse | 1A-250VAC, fast acting (5x20 mm) |

| Inputs | |
|------------------------------|--------------------------------|
| Analog input (in slave mode) | 0-10VDC, input resistance: 13k |

| Outputs | |
|---------------------------------|---|
| Variable output (A and B) | 10 A (resistive load) 1200 W @ 120 VAC |
| Fuse of variable outputs (x2) | 10A slow blow |
| Analog outputs (in master mode) | 0-10VDC, source, maximum load: 10mA |

The maximum load supported must be respected. Refer to the nameplate on the controller.

| Case | |
|-------------------|-------------------------------|
| Dimensions | 8.7'' X 10.6'' X 5.5'' |
| Temperature | 0° to 40° C (32° to 104°F) |
| Storage | -15° to 50° C (5° to 122°F) |
| Relative humidity | 5 to 90% without condensation |

| LED Fixtures | Max Number |
|--------------|-------------|
| MLL | 90 per leg |
| MLB | 90 per leg |
| MLGg | 90 per leg |
| EL | 360 per leg |
| JLL | 130 per leg |

ANNEX B: SPECIFICATIONS: LCL-0.2-240V

| Power | |
|---------------------------------|----------------------------------|
| Voltage and operating frequency | 240 AC, 50/60 Hz |
| Main fuse | 1A-250VAC, fast acting (5x20 mm) |

| Inputs | |
|------------------------------|--------------------------------|
| Analog input (in slave mode) | 0-10VDC, input resistance: 13k |

| Outputs | |
|---------------------------------|---|
| Variable output (A and B) | 10 A (resistive load) 2400 W @ 240 VAC |
| Fuse of variable outputs (x2) | 10A slow blow |
| Analog outputs (in master mode) | 0-10VDC, source, maximum load: 10mA |

The maximum load supported must be respected. Refer to the nameplate on the controller.

| Case | |
|-------------------|-------------------------------|
| Dimensions | 8.7" X 10.6" X 5.5" |
| Temperature | 0° to 40° C (32° to 104°F) |
| Storage | -15° to 50° C (5° to 122°F) |
| Relative humidity | 5 to 90% without condensation |

| LED Fixtures | Max Number |
|---------------------|-------------------|
| MLL | 90 per leg |
| MLB | 90 per leg |
| MLGg | 90 per leg |
| EL | 360 per leg |
| JLL | 130 per leg |

ANNEX C: QUICK TROUBLESHOOTING

1 - Control outputs do not seem to follow the instructions given.

- a) Make sure that the control switches of the relevant outputs (located on the front panel of the AgriShift® controller) are in the AUTO position.
- b) Ensure that the relevant outputs are configured in AUTO control mode (see section 4.6 Output control).
- c) If a dimmer is associated to the output, ensure that this dimmer is fully turned to the left (AUTO position).

2 - A "Low Battery" message appears on the summary page.

- a) Change the battery immediately to avoid data loss in case of power failure (see section 2.8 Maintenance for details).

3 - Dimming outputs are erratic or jump in large steps/jump instead of smoothly changing.

- a) For three-phase installations, be sure both A and B outputs are connected to the same phase of the main power.

4 - LED lights flicker or strobe at low dimming levels.

- a) Set master to transition to off (zero power) when 5 to 10% dimming is reached.

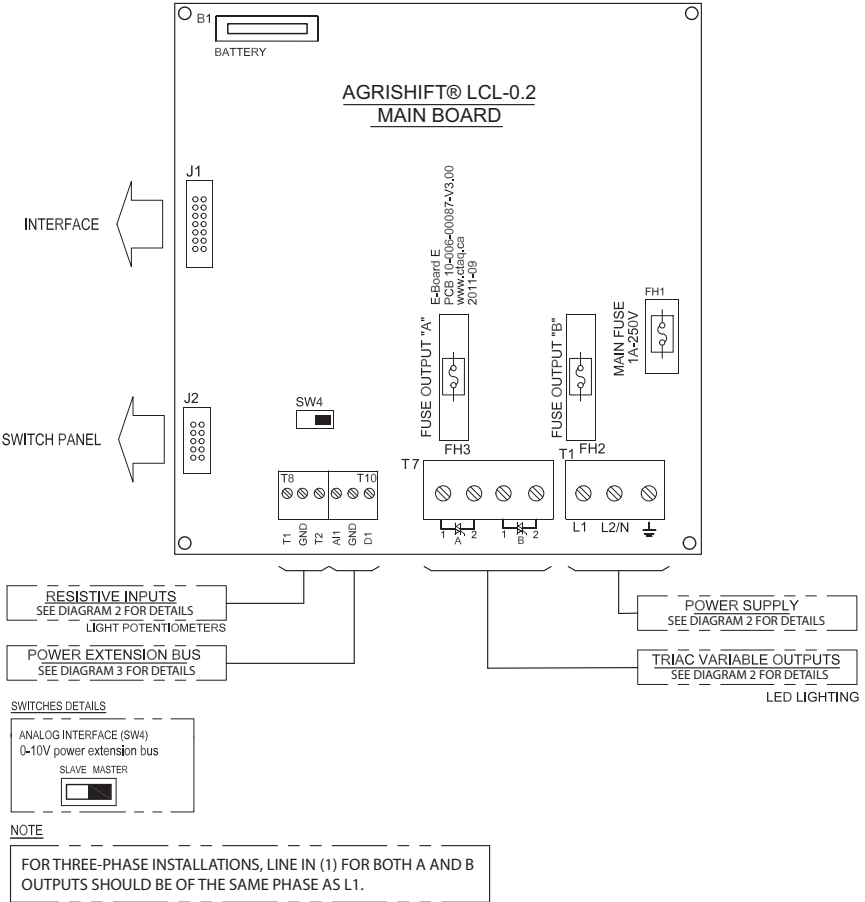
5 - LED lights flicker, flash, pop or behave erratically.

- a) Investigate mains power for noise, voltage spikes, or distortion caused by neighboring equipment or dirty power.
- b) Consider installing a power conditioner/filter.

ANNEX D : WIRING DIAGRAM - 1



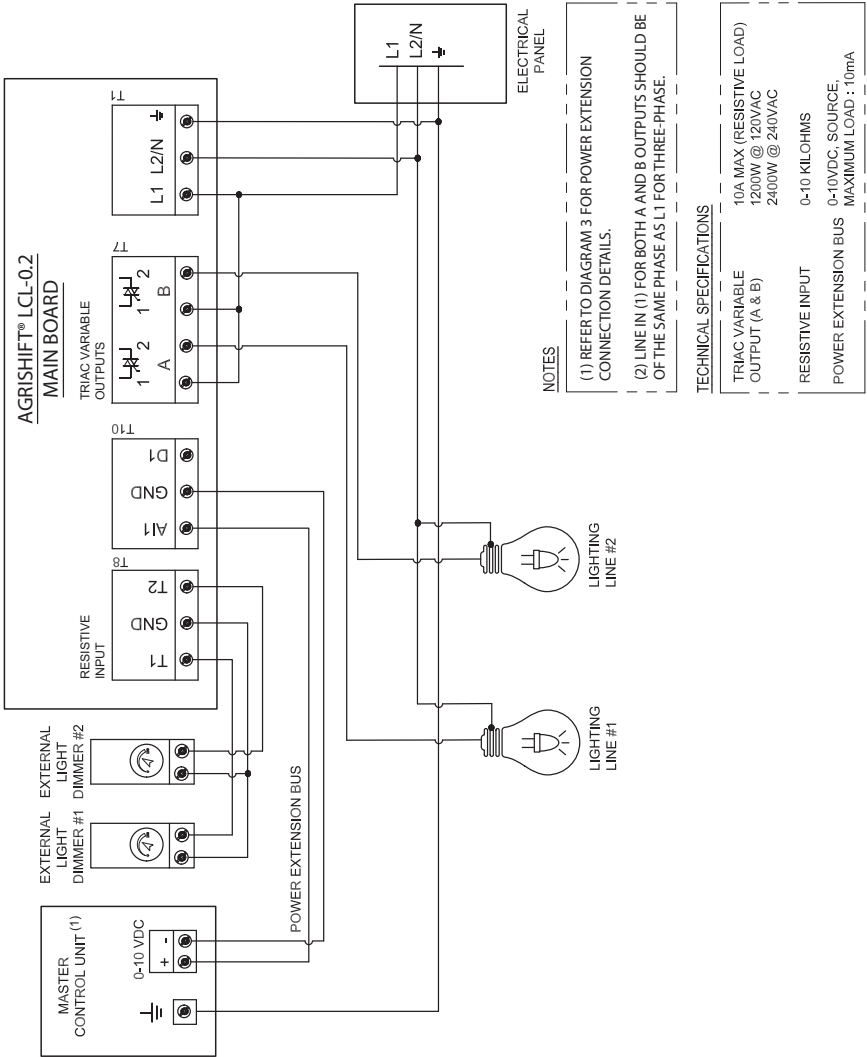
The electrical loads distribution must be determined by a qualified electrician and installed as prescribed by the applicable regulations of the electrical code.



ANNEX D : WIRING DIAGRAM - 2

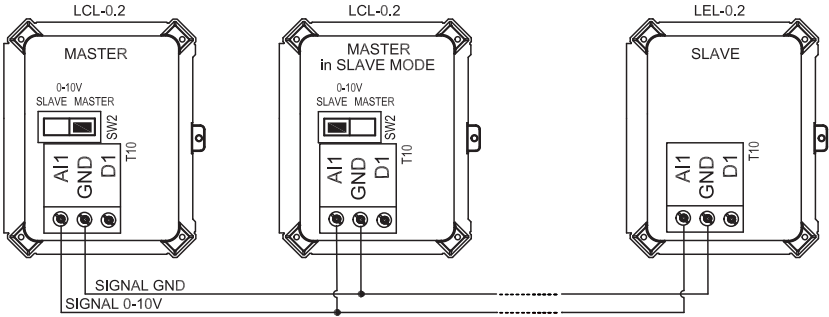


The electrical loads distribution must be determined by a qualified electrician and installed as prescribed by the applicable regulations of the electrical code.



ANNEX D : WIRING DIAGRAM - 3

BUS POWER EXTENSION BUS (1)
CONNEXION DETAILS



NOTES

(1) A MAXIMUM OF 10 UNITS CAN BE WIRED ON THE SAME NETWORK (1 MASTER AND 9 SLAVE MAX)

TECHNICAL SPECIFICATIONS

POWER EXTENSION BUS 0-10VDC, SOURCE,
MAXIMUM LOAD : 10mA

NOTES



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