USER MANUAL

CSDT8A1C

RNS Digital Dimming Controller TRIAC 1700W

1 output · IP65 · 5” touch screen



Intelligent dimming control for LED lighting in poultry and livestock production

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1 Technical specifications

This section lists the product's key technical parameters, such as rated voltage, rated current and rated power, together with the storage environment and temperature range.

Table 1-1 CSDT8A1C technical specifications

Parameter	Specification
Dimming technology	TriAC leading-edge phase-cut
Input voltage	100–240 V AC, 50/60 Hz, single-phase supply
Max. output load at 220 V AC	Max. 8 A / 1 760 W
Max. output load at 110 V AC	Max. 8 A / 880 W
0–10 V DC analogue input impedance	100 kΩ
Operating temperature range	0 °C to 50 °C
Operating humidity	≤ 85% RH (non-condensing)
Ingress protection rating	IP65 (dust- and water-resistant)
Enclosure material	Die-cast aluminium
Fuse	Dimming channel: 15 A / 250 V AC slow-blow fuse (6 × 30 mm), replaceable
Touch screen	5” IPS capacitive touch screen (480 × 854 resolution)
Dimensions	221 × 155 × 95 mm

2 Introduction

The CSDT8A1C is a high-precision, intelligent dimming controller with a built-in time table function. It has been developed specifically to control the brightness of LED luminaires in poultry and livestock production, such as broiler houses and pig barns.

The built-in time table automatically adjusts the brightness of the LED lighting according to a preset schedule, optimising control of the production cycle. In addition, the controller can be integrated with the 0–10 V signal from a master production controller, allowing the LED lighting to be governed by the supervisory system.

For greater flexibility, the CSDT8A1C also offers a manual control function, allowing the user to adjust the brightness directly as required.

This manual is intended for poultry producers and authorised farm managers, and provides clear guidance on the efficient operation and management of the dimming controller.

2.1 Description

The CSDT8A1C is a single-channel, stand-alone control unit designed for user-friendly operation and broad compatibility. It features an IPS capacitive touch screen for easy configuration and time table entry, uses TriAC leading-edge phase-cut dimming technology for compatibility with most LED luminaires, and allows the threshold value of the 0–10 V control signal to be configured in slave mode.

Key features:

Feature	Benefit
TriAC leading-edge phase-cut dimming	Flicker-free dimming from 0–100% across the entire range.
0–100% brightness dimming	Simulates sunrise and sunset, supporting animal welfare.
Built-in production time table	Includes ramp minutes for realistic sunrise and sunset simulation.
Slave mode support	Compatible with 0–10 V control signals, with configurable thresholds.
Manual dimming	Soft, smooth dimming for precise control.
Power-failure memory	Automatically resumes the original time table after a power failure and restart.
Manual-mode memory	Retains settings even through power interruptions.
5” 480 × 854 IPS capacitive touch LCD	Clear and responsive user interface.
Wall mounting	Simple, space-saving installation.
IP65 water resistance	Durable and reliable in demanding environments.

The CSDT8A1C combines advanced technology with user-friendly design, making it an ideal solution for precise lighting control in agriculture and livestock production.

2.2 Appearance and external connections



Figure 2-1 CSDT8A1C appearance and external connections

Table 2-1 Description of the CSDT8A1C's external components

#	Component	Description
1	Screen	480 × 854 IPS capacitive touch screen. Displays the dimming controller's brightness, operating status and parameter configuration.
2	Rotary knob	Used in manual mode for easy adjustment of the light level. Press and hold the knob (for more than 2 seconds) to switch to manual dimming mode. Turn clockwise to increase brightness, counter-clockwise to decrease it.
3	0–10 V input	0–10 V signal input. Connects to the 0–10 V signal from the master production controller.
4	RS485	RS485 connector. The upgrade tool can be connected here to update the firmware.
5	Dimming output line	AC phase-cut output line for connecting the luminaire. One L1 output is provided.
6	Power cable	Feed the power cable in and connect it to the mains supply circuit.

2.3 On-screen user interface

The CSDT8A1C uses an IPS colour LCD to display the operating status of the unit, allowing the user to configure working parameters and enter time tables directly on the touch screen. The interface consists of nine user pages; the most important pages are shown below.

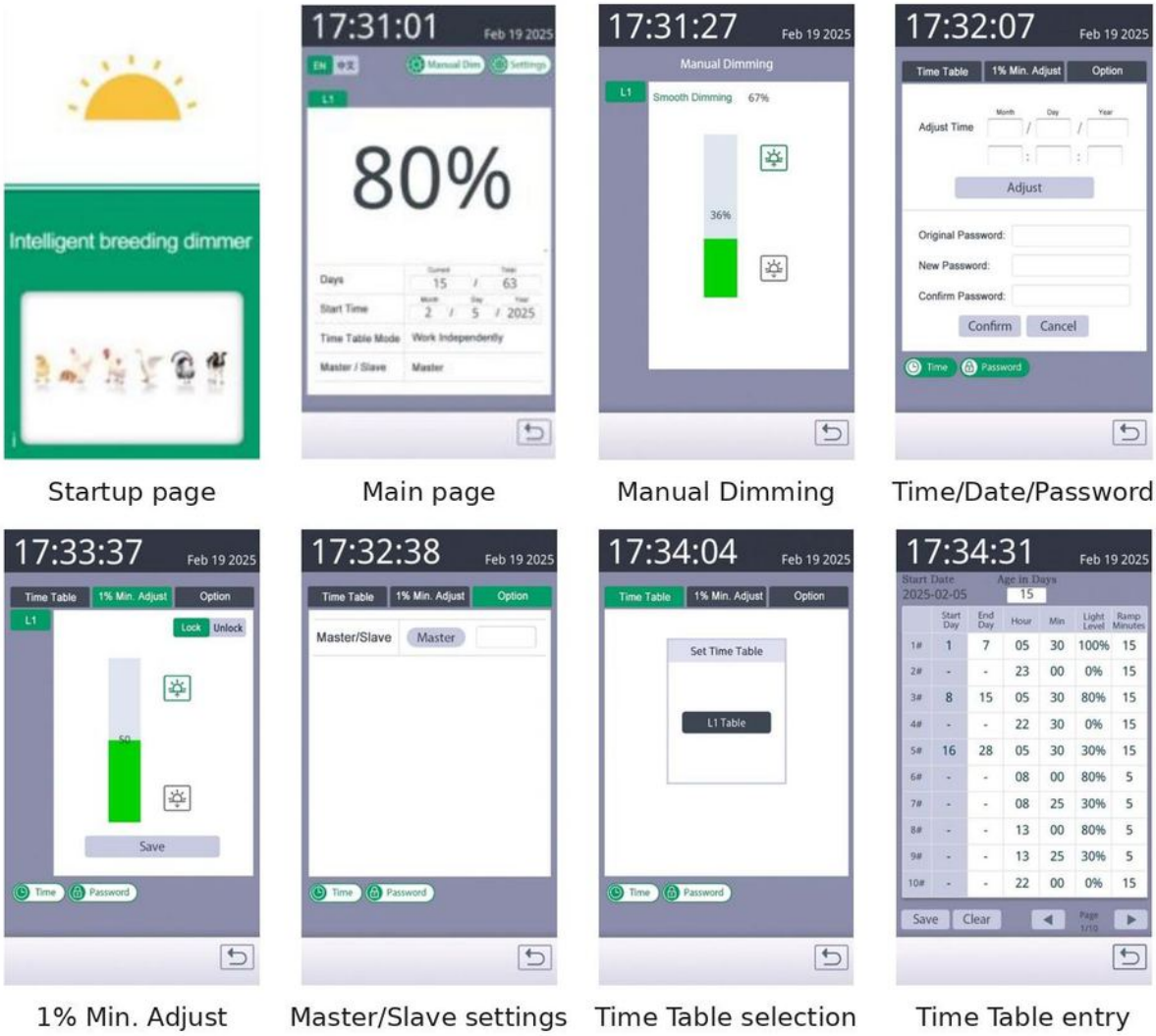


Figure 2-2 Overview of the controller's screen pages

The **Main page** shows key information about the unit's operating status, including brightness, current number of production days, production cycle, start date, time table working mode and master/slave control. The page also has touch buttons for quick navigation to the manual dimming and configuration pages.

The **Manual Dimming page** lets the user adjust the brightness manually using intuitive touch buttons and sliders.

The **Time/Date/Password page** is used to update the controller's time and date and to set the user password.

On the **1% Min. Adjust page**, the user can configure the controller's 1% minimum brightness using touch buttons and sliders.

The **Time Table page** lets the user select the time table working mode and enter the time table when the controller is running in master mode.

The **Master/Slave settings page** defines the controller's role. In master mode it follows the time table; in slave mode the brightness is governed by an external 0–10 V signal.

2.4 Changing the language

Tap the 

button on the **Main page**. A numeric keypad opens; once the password has been entered, the interface switches between English and Chinese. The default password is **9528**.

2.5 Factory reset

1. Tap “i” in the bottom left corner of the **Startup page** to open the **Version page**.
2. On the **Version page**, tap the 

button. A numeric keypad opens; enter **9173**. All configuration parameters and time tables are deleted and the factory settings are restored. Wait a few minutes; the controller then restarts automatically.

3 Operation

The CSDT8A1C is highly user-friendly: all functions and time tables are configured directly on the IPS capacitive touch screen, providing a simple and intuitive experience.

Operation of the CSDT8A1C is divided into five main parts: basic setup, master/slave mode configuration, time table configuration, manual dimming and adjustment of the production start date.

Once the parameters have been set, the dimmer runs automatically. In the event of a power failure or disconnection, all settings are saved automatically. When power returns, the controller resumes operation with the last saved parameters, so operation continues without interruption.

Table 3-1 Overview of the configuration parts

#	Part	Description
1	Basic setup	Set the password, set the time and date, and set the minimum brightness.
2	Master/slave configuration	Set master or slave mode (local time table or external 0–10 V).
3	Time table configuration	Select the time table working mode and enter the time table.
4	Manual dimming	Adjust the brightness manually, using either the on-screen buttons or the rotary knob.
5	Production start date	Adjust the current number of production days (Age in Days); the controller automatically calculates the start date from the current date.

3.1 Basic setup

Basic setup covers setting a new password, setting the time and date, and setting the 1% minimum brightness.

3.1.1 Setting a new password

1. Tap the Settings button on the **Main page** to open the numeric keypad. Enter the password (default: **9528**) to open the **Time/Date/Password page**.
2. On the **Time/Date/Password page**, enter the current password in the field provided, then enter the new password and confirm it in the *Confirm Password* field. The password must be in the range 1000–9999.
3. Tap the Confirm button to update and save the new password.
4. Tap the button in the bottom right corner to return to the **Main page**.



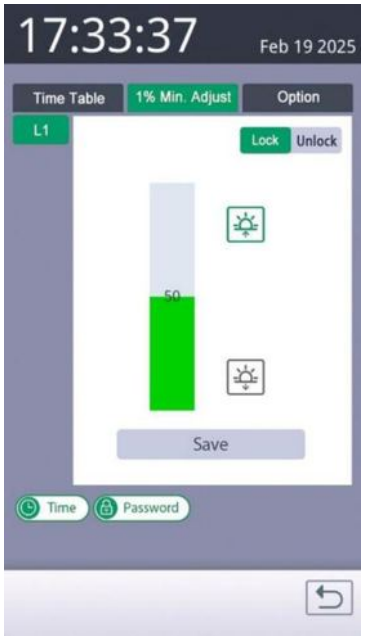
Time/Date/Password page

3.1.2 Setting the date and time

1. Tap the Settings button on the **Main page** to open the numeric keypad. Enter the password (default: **9528**) to open the **Time/Date/Password page**.
2. On the **Time/Date/Password page**, enter the new year, month and day in the corresponding fields, and enter hours, minutes and seconds in the time column.
3. When you have finished, tap the Adjust button to apply the new date and time settings.
4. Tap the button in the bottom right corner to return to the **Main page**.

3.1.3 Setting the 1% minimum brightness

1. **Open the Time/Date/Password page.** Tap the Settings button on the **Main page** and enter the password (default: **9528**).
2. **Open the 1% Min. Adjust page.** On the **Time/Date/Password page**, tap the 1% Min. Adjust button.
3. **Unlock the page.** The **1% Min. Adjust page** is locked by default. Tap the Lock Unlock button to open the numeric keypad, then enter the password to unlock the page.
4. **Set the 1% minimum brightness.** Press and hold the brightness bar and slide it up or down to the desired value.
5. **Fine-tune the value.** Use the and buttons to fine-tune the 1% minimum brightness.



6. **Save the adjustment.** When you have finished, tap the Save button to store the value in the internal memory.

7. **Return to the Main page.** Tap the button in the bottom right corner.

1% Min. Adjust page

NOTE While the dimming controller is performing smooth dimming, the message “Smooth Dimming” is shown on the screen. The message disappears when the smooth dimming has finished.

3.2 Configuring master/slave mode

1. Tap the Settings button on the **Main page** to open the numeric keypad. Enter the password (default: **9528**) to open the **Time/Date/Password page**.

2. On the **Time/Date/Password page**, tap the Option button to open the **Master/Slave settings page**.

3. In the *Master/Slave* row, tap the Master / Slave button to switch between master mode and slave mode (external 0–10 V).

4. In slave mode, the field to the right shows *1% xxx mV*. Tap the mV value to open the numeric keypad and enter the threshold voltage that corresponds to 1% of the 0–10 V signal.

5. Tap the button in the bottom right corner to return to the **Main page**.



Master/Slave settings page

NOTE In slave mode, connect a master controller with a 1–10 V output, and enter 1 000 mV as the minimum threshold in the *1% xxx mV* field.

3.3 Time table configuration

NOTE When the dimming controller runs in slave mode, the brightness is governed by the 0–10 V signal from the supervisory system, and this section can be skipped.

This section describes in detail how the time table is configured in master mode. The process is divided into selecting the time table working mode and entering the time table.

Below is an example of a lighting programme for poultry production.

Table 3-2 Example lighting programme

Days	Time	Action
Day 1–7	05:30	Lights on; brightness ramps up to 100% over 15 minutes (full brightness at 05:45).
	23:00	Lights ramp off over 15 minutes; 0% at 23:15.
Day 8–15	05:30	Lights on; brightness ramps up to 80% over 15 minutes.
	22:30	Lights ramp off over 15 minutes.
Day 16–28	05:30	Lights on; brightness ramps up to 30% over 15 minutes.
	08:00	Brightness increases to 80% over 5 minutes.
	08:25	Brightness dims to 30% over 5 minutes.
	13:00	Brightness increases to 80% over 5 minutes.
	13:25	Brightness dims to 30% over 5 minutes.
	22:00	Lights ramp off over 15 minutes.
Day 29–62	05:00	Lights on; brightness ramps up to 25% over 15 minutes.
	09:00	Brightness increases to 45% over 5 minutes.
	11:00	Brightness dims to 25% over 5 minutes.
	18:00	Brightness increases to 45% over 5 minutes.
	20:00	Brightness dims to 25% over 5 minutes.
	23:00	Lights ramp off over 15 minutes.
Day 63	03:00	Lights on; brightness ramps up to 15% over 15 minutes.
	07:00	Lights ramp off over 15 minutes.

This programme can be entered in the dimming controller's time table as shown below. Once entered, the controller runs the programme automatically, ensuring smooth and efficient operation.



	Start Day	End Day	Hour	Min	Light Level	Ramp Minutes
1#	1	7	05	30	100%	15
2#	-	-	23	00	0%	15
3#	8	15	05	30	80%	15
4#	-	-	22	30	0%	15
5#	16	28	05	30	30%	15
6#	-	-	08	00	80%	5
7#	-	-	08	25	30%	5
8#	-	-	13	00	80%	5
9#	-	-	13	25	30%	5
10#	-	-	22	00	0%	15

Save Clear ◀ Page 1/10 ▶

	Start Day	End Day	Hour	Min	Light Level	Ramp Minutes
11#	29	62	05	00	25%	15
12#	-	-	09	00	45%	5
13#	-	-	11	00	25%	5
14#	-	-	18	00	45%	5
15#	-	-	20	00	25%	5
16#	-	-	23	00	0%	15
17#	63	63	03	00	15%	15
18#	-	-	07	00	0%	15
19#						
20#						

Save Clear ◀ Page 2/10 ▶

Figure 3-1 Example lighting programme entered in the time table

3.3.1 Selecting the time table working mode

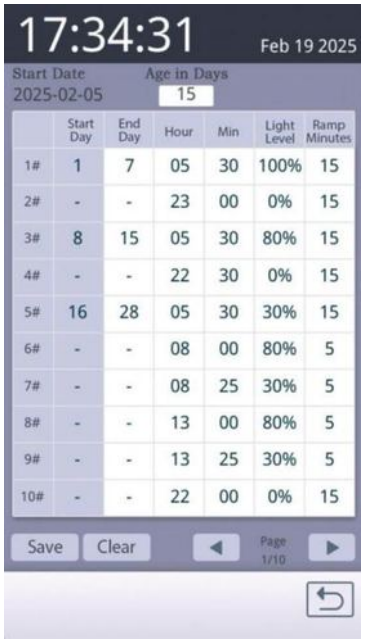
1. Tap the Settings button on the **Main page** to open the numeric keypad. Enter the password (default: **9528**) to open the **Time/Date/Password page**.
2. On the **Time/Date/Password page**, tap the Time Table button to open the time table selection page.
3. On the time table selection page, tap L1 Table to continue to time table entry.



Time Table selection page

3.3.2 Filling in the time table

1. Tap the Age in Days 15 field to open the numeric keypad. Enter the current **Age in Days** directly; the system automatically calculates and displays the start date on the screen.
2. In the middle columns of the table, enter the end day, hour, minute, light level and ramp minutes, in that order.
3. Use the ▶ button to go to the next page, or the ◀ button to go to the previous page.
4. Tap the Save button in the bottom left corner to save the time table to the internal memory.
5. To clear the table, tap the Clear button. A numeric keypad opens, and the table can be cleared once the password has been entered.
6. Tap the ⮌ button in the bottom right corner to return to the previous page (the time table selection page).



Time Table entry page

NOTE To enter a light level of 30%, simply type 30 on the keypad — the % sign is added automatically by the software. The start day does not need to be entered; the controller fills it in automatically when Save is tapped.

NOTE To delete a time table line, enter 0 for the end day, hour, minute, light level and ramp minutes, then tap Save to delete the line.

NOTE To insert a new time table line, enter the end day, hour, minute, light level and ramp minutes in the last blank line and tap Save. All lines in the time table are then re-sorted, and the new line is inserted automatically into the existing schedule.

3.4 Manual dimming

1. **Open the Manual Dimming page.** Tap the 

button on the **Main page** to open the numeric keypad, and enter the password (default: **9528**). Alternatively, press and hold the rotary knob for more than 2 seconds to skip the password and go directly to the **Manual Dimming page**.
2. **Adjust the brightness.** Press and hold the brightness bar and slide it up or down to the desired value. The brightness can also be adjusted with the rotary knob: turn clockwise to increase, counter-clockwise to decrease.
3. **Fine-tune the brightness.** Use the  and  buttons to fine-tune the brightness value.
4. **Return to the Main page.** Tap the  button in the bottom right corner, or press and hold the rotary knob for more than 2 seconds.



Manual Dimming page

> **NOTE** During smooth dimming, the message “Smooth Dimming” is shown on the screen and disappears when the process has finished.

3.5 Adjusting the production start date

1. Follow the instructions in section 3.3 (Time table configuration) to open the time table entry page.
2. Tap the 

field to open the numeric keypad and enter the new **Age in Days**. Based on the current date and the entered Age in Days, the controller automatically calculates and displays the start date on the screen.

4 Installation

4.1 Mounting the CSDT8A1C on the wall

The product packaging contains the dimming controller's main unit, a stainless-steel mounting bracket and M4 screws, so everything needed for easy wall mounting is included.

First use the four supplied M4 screws to fasten the mounting bracket securely to the main unit of the CSDT8A1C, as shown below. Then position the mounting bracket (with the CSDT8A1C attached) on the wall and secure it with four self-tapping screws.

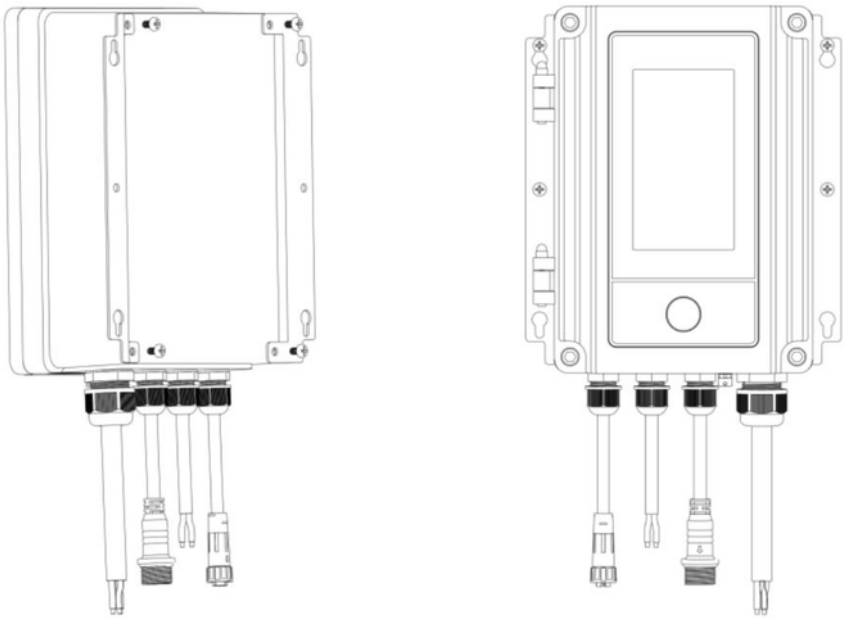


Figure 4-1 Wall mounting of the CSDT8A1C

4.2 AC supply wiring

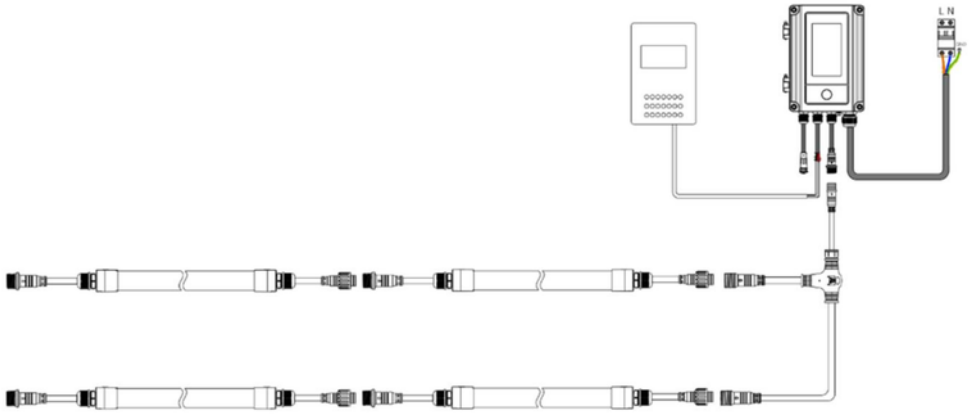


Figure 4-2 Connection of the CSDT8A1C's power supply, luminaires and other equipment

Follow these steps to configure the main supply circuit for the CSDT8A1C correctly:

1. **Install a separate circuit breaker.** Make sure the main supply circuit has a separate circuit breaker before the CSDT8A1C is connected. A 16 A circuit breaker is recommended.
2. **Connect the mains supply.**

   Brown wire: connect the brown wire of the CSDT8A1C's power cable to the L terminal (line) of the main supply circuit.

   Blue wire: connect the blue wire to the N terminal (neutral) of the main supply circuit.

   Yellow/green wire: connect the yellow/green wire to the PGND terminal (earth) of the main supply circuit.
3. **Secure the lighting cable.** Feed the required lighting cable through the cable gland at the bottom of the CSDT8A1C.

4. **Connect to the dimming output terminal block.** Follow the wiring diagram supplied with the CSDT8A1C to connect the lighting cable correctly to the dimming output terminal block. Make sure all connections are secure and locked in place to avoid loose connections.

4.3 Connecting the 0–10 V signal

Connect 0–10 V DC (+) and COM (−) from the master production controller to “0-10V+” and “0-10V−” on the CSDT8A1C, as shown in the previous section.

> **WARNING** The 0–10 V signal is a DC safety-voltage signal that may be touched by people. It must have adequate electrical clearance from, and insulation against, the AC circuit.

4.4 Final check

When the installation is complete, check the wiring connections again. Once it has been confirmed that the connections are correct, switch on the circuit breaker of the main supply. Let the CSDT8A1C run for a few hours to verify that it is working correctly.

4.5 Environmental protection



The materials are recyclable and must not be disposed of as ordinary household waste. Controllers, accessories and packaging should be sorted for recycling in accordance with local regulations. The plastic parts are marked for separate collection and recycling.

5 Troubleshooting

Table 5-1 Troubleshooting guide

#	Problem	Remedy
1	The LED lights do not come on when the power is switched on.	Check the mains supply. Check the brightness shown on the LCD screen. Check the connection of the output line, set the output brightness to 100%, and measure the voltage on the output line with a multimeter.
2	Power is on, but there is no output when “0–10 V” control is used.	Make sure the “0–10 V” cable is connected correctly. Set 5 V on the master controller and measure the value at the CSDT8A1C's connection.
3	The lights flicker at low light levels.	1. Make sure there are no inductive components (such as transformers and power inductors) in the electronic load circuit. 2. Contact technical support.
4	The lights are always at maximum brightness, or the brightness cannot be changed.	Contact technical support.

For technical support, please contact RN Solutions A/S · T +45 6049 9015 · rqn@rnsolutions.dk