

HungaroFLASH

HungaroFLASH USER MANUAL TLIGHT V5

THE FLASH PRODUCER

USER MANUAL

for

HungaroFLASH T-LIGHT DIGITAL CONTROLLER and LEGACY fixtures



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1. OVERVIEW

1.1 Product Description

The **T-LIGHT Controller** is a professional lighting controller developed for HungaroFLASH **T-LIGHT thunder-light-effect fixtures**.

It provides complete management of the unit's internal flash engine, allowing the operator to program, edit, and execute complex lighting sequences directly from the front-panel interface or via a DMX-512 remote link.

The controller contains:

- **20 factory-programmed flash curves** ("FLASH types") optimized for realistic lightning and explosion simulation.
- **10 user-programmable flash curves** for creating custom intensity profiles.
- **10 user sequences**, each with up to **30 steps**, defining flash type, brightness, delay, and chaser pattern.
- **1 factory programmed SEQUENCE**, built in **20 steps**, using 20 different **FLASH TYPES**.

Each sequence can run automatically or be triggered manually. The back-lit LCD and tactile keys give fast access to editing and playback functions.

1.2 Key Features

- Dedicated controller for T-LIGHT thunder-effect fixtures.
- Up to 30 steps per sequence.
- 20 factory + 10 user flash curves, stored in non-volatile memory.
- DMX-512 remote operation using four data channels.
- Built-in chaser editor for multi-fixture effects.
- Real-time keys for **Flash**, **Run**, **Pause**, and **Continue**.
- Retains all data after power loss.
- Rugged touring-grade design for film, concert, and industrial use.
- Fix DMX signal

✚ **Suggested English insertion for "Key Features" section**

DMX Signal Output Limitation

The T-LIGHT Controller transmits a DMX signal intended **exclusively for HungaroFLASH T-LIGHT fixtures**.

It cannot be used as a general-purpose DMX controller.

DMX addresses are **factory-fixed** and cannot be changed by the user.

The assignments are as follows:

- **T-LIGHT 1:** DMX Address 001
- **T-LIGHT 2:** DMX Address 003
- **T-LIGHT 3:** DMX Address 005
- ...
- **T-LIGHT 8:** DMX Address 015

The controller supports up to **8 individual T-LIGHT fixtures** operating simultaneously.

1.3 System Architecture

1.3 System Architecture

Internally, the **T-LIGHT Controller** is a high-speed digital signal processor that generates **flash-curve data** representing *voltage versus time*.

Each curve defines how the fixture's light output rises, peaks, and decays during a flash event.

The controller continuously calculates these waveforms using **precise microsecond timing**, ensuring that all connected T-LIGHT fixtures reproduce light bursts with identical phase and amplitude response.

This guarantees perfect synchronization even when multiple units are used at high frame rates for professional film and broadcast environments.

Every flash consists of several programmable parameters:

- **FLASH Curve:** Defines the waveform shape and timing.
- **LEVEL:** Adjusts global brightness amplitude for each step.
- **DELAY:** Inserts pauses or offsets between events.
- **CHASER:** Shifts phase or direction among multiple fixtures to simulate lightning propagation or directional effects.

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By combining these parameters, the controller can produce a wide range of **dynamic visual effects**, including:

- Natural thunder and storm lightning
- Paparazzi camera bursts
- Welding arcs and industrial sparks
- Explosion and muzzle-flash simulations
- Energy discharges and electrical surges

All **user data** — including *flash names*, *user curves*, and *sequences* — are stored in **non-volatile memory**, retaining complete configuration even when power is disconnected.

1.4 Extended Compatibility

Although originally designed for the **T-LIGHT series**, certain **Quasar 15 000 W PRO** and **RainPROOF Quasar 15 000 W PRO** units can also be operated by the T-LIGHT Controller. These versions were produced by **HungaroFLASH under special client orders** and include an **additional internal power-supply modification** that provides **+12 V support on Pin 5** of the DMX connector.

This auxiliary voltage enables proper communication and triggering with the controller's remote interface, making those customized Quasar devices fully compatible.

⚠ Only Quasar units equipped with this 12 V Pin-5 supply are suitable for use with the T-LIGHT Controller.

Standard production Quasar fixtures without this feature must not be connected directly.



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1.5 Applications

- Film and television thunder or explosion simulation
- Concert and stage special-effects lighting
- Studio and architectural strobe effects
- Exhibition and demonstration systems
- Synchronization with external DMX show control

1.6 Fixture Compatibility Summary

Fixture Type	Compatibility	Notes
T-LIGHT Pro / Pro Remote	✓ Full	Native operation
Quasar 15 000 W PRO (custom build)	✓ Full	Requires internal 12 V on Pin 5
RainPROOF Quasar 15 000 W PRO (custom build)	✓ Full	Requires internal 12 V on Pin 5
Standard Quasar models	⚠ Not supported	No 12 V Pin 5 supply. Must use external powersupply, yes
Other HungaroFLASH fixtures	Consult factory	Operation depends on DMX mapping

2. Safety & Handling

2.1 General Precautions

The **T-LIGHT Controller** is a professional control device intended for use in high-power lighting systems. Always follow these instructions to prevent injury, equipment damage, or electrical hazards:

- Operate only by **qualified lighting or electrical technicians** familiar with **DMX-512** systems.

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- Do not open the enclosure; there are **no user-serviceable parts** inside. Service must be performed only by HungaroFLASH or authorized personnel.
- Disconnect power before connecting or removing DMX or control cables.
- Keep the unit away from liquids, condensation, and conductive dust.
- Use only **properly grounded low-voltage power systems**.
- If the unit or any connected equipment shows signs of damage, isolate it from power immediately.

2.2 Power Requirements

The **T-LIGHT Controller** is powered **directly from the connected T-LIGHT fixture**. Inside every T-LIGHT unit, a regulated **12 V DC auxiliary supply** is provided and routed through **Pin 5 of the DMX connector** to feed the controller electronics. Therefore, **no external power adapter is required** under normal operation.

Parameter	Specification
Nominal Input Voltage	12 V DC supplied via DMX Pin 5 from T-LIGHT fixture
Operating Range	9 V DC – 12 V DC
Typical Current Draw	< 10 W
Power Path	Shared through DMX cable (Pin 5 = +12 V, Pin 1 = GND)
External Supply	Not required when used with T-LIGHT or compatible devices

The controller's internal regulation is engineered to **compensate voltage drop along long DMX-control cables**.

Even when connected through **up to 200 m of 5-pin DMX cable**, the controller remains fully functional, ensuring reliable operation in large-scale or outdoor installations without local powering.

As described in **Chapter 1**, any **HungaroFLASH fixture** equipped with a regulated 12 V supply correctly wired to **Pin 5 of the DMX output**—for example the **Quasar 15 000 W PRO** and **RainPROOF Quasar 15 000 W PRO (special versions)**—can operate the controller exactly as a T-LIGHT fixture does.

⚠ Use only with genuine **HungaroFLASH fixtures** designed to provide +12 V DC on Pin 5.

Standard DMX devices do **not** supply power and must not be connected directly. The controller is **not protected** against reversed polarity or AC voltage on the line.

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When ordering **Quasar** or **RainPROOF Quasar** models, clients must **request the special PSU modification** that enables the +12 V output on Pin 5 of the DMX connector. HungaroFLASH can perform this modification on request during production or service.

Use only **high-quality 110 Ω twisted-pair DMX cables** with full shielding. Terminate the last device with a **120 Ω resistor** between pins 2 and 3. Avoid Y-splitters or unbalanced adapters.

⚠ When operating customized **Quasar 15 000 W PRO** or **RainPROOF Quasar 15 000 W PRO** units, verify that **Pin 5 (+12 V)** is present and correctly isolated according to HungaroFLASH specifications.

Do not connect this modified DMX line to standard lighting desks or equipment that do not expect auxiliary 12 V power.

2.3 DMX and Signal Connections

The controller provides **DMX IN** (5-pin male XLR) and **DMX THRU** (5-pin female XLR) connectors using the standard DMX-512 (A) protocol.

Pin Function	Description
1 Shield (GND)	Cable screen / protective earth
2 Data (–)	Balanced signal negative
3 Data (+)	Balanced signal positive
4 Spare (–)	Reserved / not used
5 Spare (+) or +12 V (aux)	Used for remote power feed on certain Quasar models

2.4 Environmental Conditions

Parameter	Recommended Range
Operating Temperature	0 °C – 40 °C (32 °F – 104 °F)
Storage Temperature	–20 °C – 60 °C (–4 °F – 140 °F)
Relative Humidity	< 80 % (non-condensing)
Cooling Requirement	Free-air ventilation – no fan required
Ingress Protection	IP20 (indoor use only)

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Avoid installing the controller near lamp housings, power resistors, or other heat-emitting parts.

For outdoor operation, place it inside an **IP65 or higher sealed flight-case or rack**.

2.6 Handling and Transport

- Always disconnect all cables before moving the unit.
 - Protect the LCD and keypad from mechanical shock.
 - For touring use, mount in a **19" rack drawer or shock-absorbing case**.
 - Do not stack heavy modules or lamps on top of the controller.
-

2.7 Electrostatic and EMI Precautions

The controller contains sensitive microprocessor electronics. Before touching DMX connectors, discharge static electricity from your body. Keep DMX and power cables separated from mains lines or high-current LED driver wiring to minimize interference.

2.8 Service and Maintenance

Routine maintenance is limited to occasional dust removal.

If a fault occurs:

1. Disconnect power immediately.
2. Inspect all connectors for bent pins or shorts.
3. Verify the power supply polarity and voltage.
4. If the issue persists, contact **HungaroFLASH Technical Support**.

Do not attempt internal repair; unauthorized modification voids warranty and may compromise safety compliance.

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3. Front Panel and Display Layout

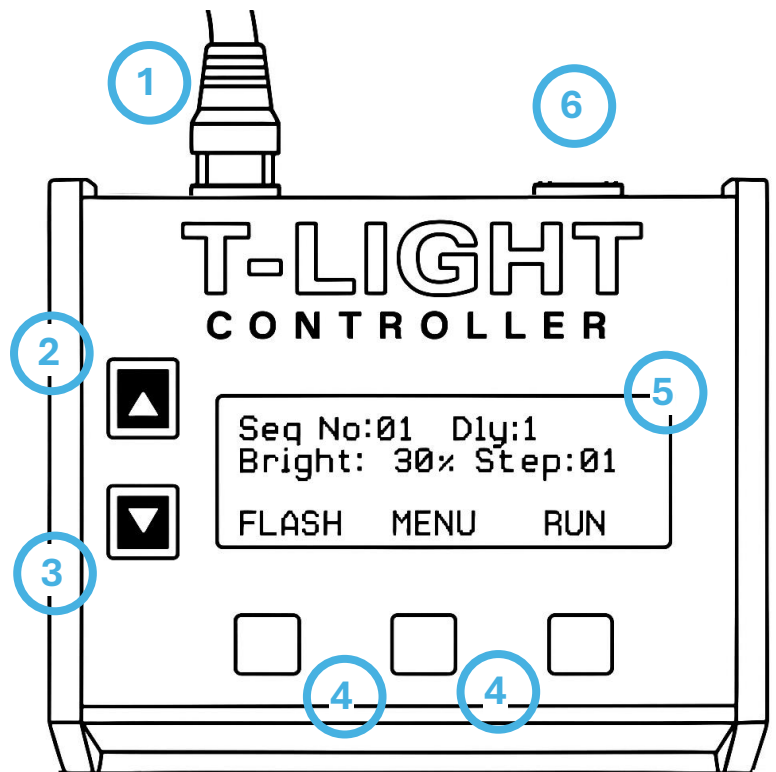
3.1 Front Panel Overview

The **T-LIGHT Controller** front panel provides a compact and intuitive control interface designed for both on-site operation and studio environments.

All programming, playback, and setup functions are accessed through a **three-button keypad** and a **back-lit LCD display**.

Typical front panel layout:

1. **DMX - OUTPUT**
2. **UP Button**
3. **Down Button**
4. **Multifunctions Buttons**
5. **Display**
6. **DMX - Input (REMOTE)**



Depending on **model version** or **production year**, the **button legends** may vary slightly, but their **functions remain identical** across all T-LIGHT Controller units. Likewise, the **LCD back-light color** may differ — early versions use **green**, later ones **blue** or **white** — without affecting operation or visibility.

3.2 Display Description

The LCD shows all operational information during standby, playback, and programming. A typical **main (idle) screen** after power-up appears as: See picture. On top of the Multifunction Buttons show the actual function. This screen let user select 1 out of 3 options. Flash or MENU enter or RUN a Sequence.



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Field	Description
Seq No	The currently selected sequence number (01–10). Determines which stored sequence will run when pressing RUN .
Dly	The active delay before the next flash within a running sequence.
Level	Global light level (0–100 %), acts as a master intensity for all flash curves.
Step	Indicates the current step of the running sequence (1–30).
Lower Line (buttons)	Shows which function each key currently performs: e.g., <i>FLASH</i> , <i>MENU</i> , <i>RUN</i> , or <i>STOP</i> .

The display brightness increases slightly while inside a menu, helping the operator identify when configuration mode is active.

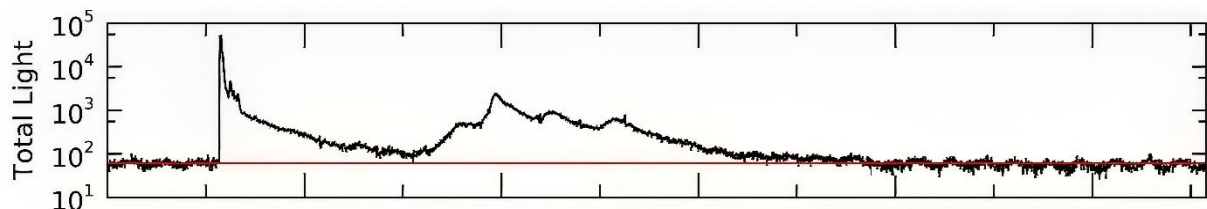
3.3 Description and Meanings

To understand how the **T-LIGHT Controller** operates, it is important to know the functional meaning of the parameters shown on the display.

These parameters describe how real thunder-light behavior is digitally modeled and reproduced inside the controller.

SEQUENCE

A **Sequence** is a complete lighting program that defines how a thunder-light event evolves over time — comparable to a **Lux-versus-Time** curve of a real lightning flash.



HungaroFLASH, in cooperation with several research institutes, conducted detailed optical studies of natural thunder events.

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From these results, a collection of authentic **thunder-light sequence curves** was created and integrated into the controller's memory.

- The controller provides **10 sequence memories (1–10)**.
- From the factory, only **Sequence 1** is pre-programmed.
- **Sequence 1** includes **20 steps**, each representing one thunder event.
- Every sequence can contain up to **30 steps** in total.
- Each step combines one **FLASH Curve**, one **DELAY**, and an intensity **LEVEL**.
- The **DELAY** following each flash is part of the same step, forming a continuous thunder-light flow.

Each sequence is executed with precise **microprocessor-based timing**, ensuring **millisecond-accurate playback** identical to the stored waveform.

Sequences can be triggered in two ways:

- By pressing the **RUN** button on the controller's front panel, or
- By a **DMX command** when the T-LIGHT Controller operates in **REMOTE mode** and receives control data via its **DMX INPUT**.

Users can freely create or modify their own sequences to form unique "light-creature" collections.

All user-created sequences are stored in **non-volatile memory** and remain available after power-off.

STEP

A **Step** is one building block within a sequence. Each colored segment below represents one **Step** using a different **FLASH TYPE and DELAY msec**.

The horizontal axis shows **time in milliseconds**, and the small gaps at the end of each colored sections represent the **Delay** between flashes. DELAY when no flash happens.

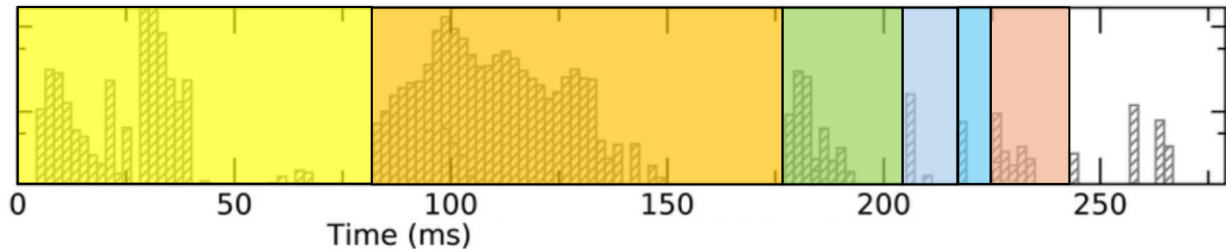
Explanation:

- The **yellow, orange, green, blue, and red** zones each correspond to one individual flash waveform (different FLASH TYPES).
- The gaps between them are **delays**, defining pause time before the next event.

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- Together, all these steps create a single **Sequence** that simulates a realistic thunderlight pattern.



It defines the **timing and brightness** of a single thunder or lightning event:

- The **FLASH Curve** determines how fast and how bright the lamp rises and fades.
- The **DELAY** defines how long the system waits before the next flash begins.

Each sequence may contain up to 30 steps, enabling complex or multi-burst thunder simulations.

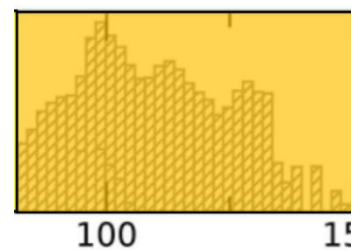
FLASH CURVES

A **FLASH Curve** defines the **waveform of a single light burst** — describing how intensity rises, peaks, and fades over time, typically within a few milliseconds.

Each curve represents the *shape* of a thunder flash, controlling the energy distribution and temporal profile of the emitted light.

The controller contains two FLASH Curve categories:

- **20 factory-programmed FLASH Curves** – each reproduces a different natural thunder-light profile, derived from real optical measurements and laboratory analysis.
- **10 user-programmable FLASH Curves** – available for operators to design and store custom light waveforms directly inside the controller.



These curves serve as the **building blocks of all sequences**, defining the visual character of each simulated lightning event. Example: show the diagram, after this a DELAY coming...

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LEVEL

The **Level** parameter sets the **output brightness** of the selected flash or sequence step.

It acts as a **master amplitude scale**, determining the maximum luminous energy produced during that flash.

DELAY

The **Delay** defines the time interval between the end of one flash and the start of the next.

It can be adjusted for rapid multi-burst sequences or long gaps that mimic distant thunder events. Example: The section after FLASH TYPE orange, before FLASHTYPE green.



CHASER

When multiple T-LIGHT fixtures share the same DMX line, the **Chaser** function introduces small timing offsets between lamps.

This produces a **traveling or expanding lightning effect**, enhancing realism for large-scale thunder simulations across multiple fixtures.

3.4 Button Functions

The **T-LIGHT Controller** uses a **three-button keypad** for all functions:

UP (▲), **DOWN (▼)**, and **ENTER (RED)**.

Their actions depend on the current operating mode — idle, playback, or menu — but the overall logic is consistent across all production versions.

3.4.1 Button Summary

Button	Primary Role	Typical Use in Idle Mode	Typical Use in Playback	Typical Use in Menus / Editing
▲ UP	Increase value	Increases global <i>LEVEL</i> (master intensity).	Adjusts brightness during running sequence.	Scrolls upward through options or increases numeric values.

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Button	Primary Role	Typical Use in Idle Mode	Typical Use in Playback	Typical Use in Menus / Editing
▼ DOWN	Decrease value	Decreases global <i>LEVEL</i> .	Adjusts brightness during running sequence.	Scrolls downward or decreases numeric values.
ENTER (RED)	Confirm / Menu / Run	Press once → opens Main Menu .	Press once → RUN : starts sequence playback.	Confirms selection or enters sub-menu.
ENTER hold ≈ 3 s	Cancel / Exit	Returns to main screen.	—	Cancels editing and returns to previous menu.

If no button is pressed for approximately **30 seconds**, the controller automatically returns to the **main status screen** to prevent unintended menu time-outs.

3.4.2 Context-Sensitive Soft Keys

During menu navigation or playback, the lower line of the LCD shows the **active soft-key labels** corresponding to each physical button.

Examples:

Displayed Soft-Key	Physical Button Function
FLASH MENU RUN	Left → manual flash, Center → menu access, Right → run sequence
STOP FLASH CONT	Left → stop / reset, Center → single flash trigger, Right → continue playback
BACK NEXT SAVE	Left → move to previous parameter, Center → next parameter, Right → save changes

This system allows quick, intuitive operation without additional switches.

3.4.3 Playback Control

When a sequence is running:

- **RUN (RED)** – starts playback from Step 1.
- **PAUSE / STOP (LEFT)** – halts the sequence; pressing again resets to Step 1.
- **FLASH (MIDDLE)** – fires one manual flash while playback is paused or during delay countdown.
- **CONTINUE (RIGHT)** – resumes sequence from current step after a pause.

All buttons remain active during delays, allowing manual override or brightness adjustments in real time.

3.4.4 Menu Navigation

1. Press **MENU (RED)** once to open the list of available functions.
 2. Use **▲ / ▼** to scroll through items.
 3. Press **ENTER (RED)** again to confirm selection.
 4. Use on-screen soft-keys (*BACK, NEXT, SAVE, ESC*) to move within sub-menus.
 5. Hold **ENTER (RED)** for ≈ 3 s to return to the main display at any time.
-

3.4.5 Real-Time Brightness Control

The **UP / DOWN** keys always adjust the master *LEVEL* parameter, even during playback.

Changes take effect immediately and are applied proportionally to all active lamps in the current step.

3.4.6 Firmware and Model Notes

Depending on production year or firmware revision:

- Button labeling may vary slightly (*RUN / ENTER / OK*), but behavior is identical.
- Newer LCDs (blue or white) show slightly faster display refresh; this does not affect timing accuracy.

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All timing and step control are handled by the internal **microprocessor clock**, ensuring deterministic playback even under continuous key activity.

4. Basic Operation

The **T-LIGHT Controller** is designed for straightforward, reliable operation in both studio and live environments.

Once connected to a compatible HungaroFLASH fixture (such as a T-LIGHT or modified Quasar model), all playback and editing actions are performed directly from the controller's front panel or via DMX remote input.

4.1 Power-Up Behavior

When power is applied (either through **Pin 5 DMX supply** or direct service connector), the controller performs a short self-test and displays the firmware version, for example:

T-LIGHT Controller V1.3.2p

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After a few seconds, it enters the **Main Screen**:

Seq No:01 Dly: -

Level:20% Step:01

FLASH MENU RUN

At this point, the controller is ready to operate.

The display brightness increases slightly when inside menus and returns to normal during idle or playback.



4.2 Running a Sequence

Each sequence contains up to 30 steps consisting of FLASH, DELAY, LEVEL, and CHASER parameters.

Playback reproduces these light events in real time with microprocessor precision.

To **run a stored sequence**:

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1. Verify that the connected fixture is powered and the DMX link is correctly established.
2. Ensure the desired **Sequence Number** is displayed on the main screen.
3. Adjust **LEVEL** (master brightness) with the ▲ / ▼ keys if required.
4. Press **RUN (RED)** to start playback.

The screen will show live progress, such as:

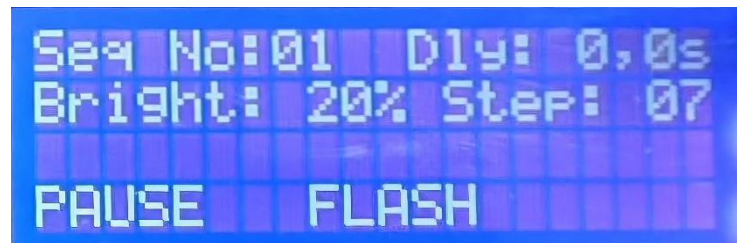
Sequ No:01 Dly:0.6s

Level:85% Step:04

STOP FLASH CONT

During operation:

- The **current step** and **remaining delay** are displayed in real time.
- The **FLASH** button may be pressed manually to add a single burst at any time.
- When the sequence completes, playback automatically returns to Step 1 and pauses.



4.3 Pausing and Continuing Playback

To temporarily pause a running sequence:

- Press the **left (STOP/PAUSE)** button once.
- The display will show the active step and a frozen delay timer.



To resume:

- Press the **right (CONT)** button — playback continues from the exact point paused.

Pressing **STOP** again resets playback to Step 1 and returns to the main screen.

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This allows precise timing control during demonstrations or synchronization with external sound or video cues.

4.4 Manual Flash Operation

The **FLASH** button (center key) allows instant manual triggering of the selected flash curve.

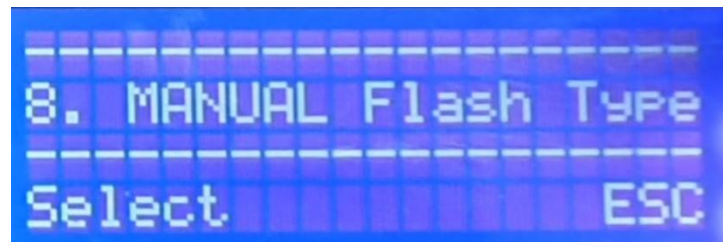
This feature is available:

- In **Idle Mode**, for testing or demonstration.
- During **Delay countdowns**, to fire additional light bursts between programmed steps.
- In **Pause Mode**, to preview output without continuing the sequence.

The flash output follows the currently selected **Manual Flash Type** (see Chapter 11 for available options: *ONE*, *RND1–3*, *CONT*).

Note: The manual flash always uses the current *Level* value.

It does not affect stored sequences or user data.



4.5 Adjusting Brightness in Real Time

While a sequence is running, pressing **▲ / ▼** changes the master **Level** instantly. This adjustment scales all programmed flash amplitudes proportionally without interrupting timing or step order.

Typical applications:

- Reducing intensity during indoor rehearsals.
- Increasing brightness for outdoor night scenes.

The *Level* value remains active until changed again or power is removed.

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4.6 Sequence Selection

Before playback, you can choose which stored sequence to run:

1. Press **MENU (RED)**.
2. Select **PLAY Sequence No.** using **▲ / ▼**.
3. Press **ENTER** to confirm.
4. Use **▲ / ▼** to choose a sequence number (1–10).
5. Press **SET** to store and exit.



The chosen sequence number appears on the main display and becomes active for the next **RUN** command.

4.7 Remote Operation via DMX

When the controller is used in **REMOTE mode**, a DMX lighting console or other DMX device can fully control its behavior.

DMX channels are mapped as follows (see Chapter 11 for details):

Channel Function		Description
1	Master Level	0–255 → 0–100 % brightness
2	Left Button (Flash / Stop)	0–127 = off , 128–255 = pressed
3	Right Button (Run / Continue)	0–127 = off , 128–255 = pressed
4	Flash Type	Selects ONE / RND1 / RND2 / RND3 / CONT

When remote control is enabled, pressing **ENTER (RED)** manually is not required; the DMX console commands trigger all functions directly.

All playback timing remains synchronized by the controller's internal microprocessor.

5. Menu System Overview

The **T-LIGHT Controller** uses a structured, menu-driven interface that allows the user to edit flash programs, rename or create custom curves, and configure DMX remote control parameters.

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All menus are displayed on the LCD screen and navigated using the three front-panel buttons (**▲ / ▼ / ENTER RED**).

5.1 Accessing the Menu

1. From the **Main Screen**, press the **RED ENTER** button once to open the main menu.
 2. Use the **▲** and **▼** buttons to scroll through the available menu items.
 3. Press **ENTER (RED)** to confirm a selection.
 4. Within a submenu, follow the soft-key labels shown on the display (*BACK / NEXT / SAVE / ESC*).
 5. To exit any submenu, hold **ENTER (RED)** for ≈ 3 seconds or select *ESC*.
 6. If no key is pressed for 30 seconds, the controller automatically returns to the **Main Screen**.
-

5.2 Main Menu Structure

No.	Menu Item	Function Summary
1	EDIT Sequence	Create or modify sequences by assigning FLASH Curve, LEVEL, DELAY, and CHASER for each step (up to 30 steps per sequence).
2	FLASH Names	Rename any FLASH Curve with a custom 5-character identifier (<i>F01–F20</i> factory, <i>U01–U10</i> user).
3	EDIT User FLASH	Design and store user-defined FLASH Curves (0–2.5 s waveform). Each point defines light level vs time.
4	PLAY Sequence No.	Select which stored sequence (1–10) will play when RUN is pressed or DMX triggered.
5	CHASER Edit	Program time offsets (T1–T3) for multi-fixture effects; up to 8 T-LIGHTs can be synchronized with staggered timing.

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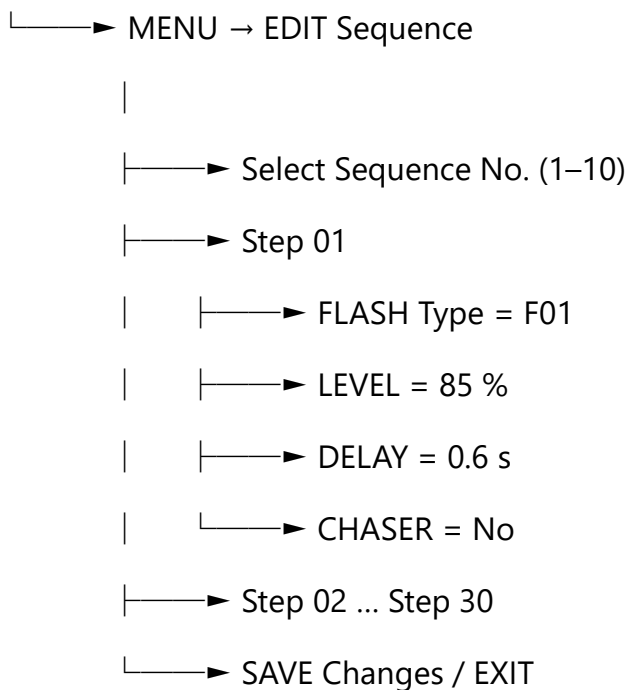
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No.	Menu Item	Function Summary
6	FOCUS Setting	for future reserved place
7	REMOTE Control	Enable DMX remote operation, set DMX start address, and verify data link status.
8	MANUAL Flash Type	Choose the flash type used by the front-panel <i>FLASH</i> button or DMX Channel 4 (ONE / RND1–3 / CONT).

5.3 Menu Navigation Example

Example: editing Sequence 1

Main Screen



Each submenu uses the same navigation style:

- **▲ / ▼** → Adjust or scroll values.
- **BACK / NEXT** → Move between parameters.

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- **SAVE / ESC** → Store or cancel modifications.

5.4 Menu Behavior

- The controller always returns to the last accessed menu item after power-on.
- Display brightness increases slightly while in menu mode for visibility.
- All settings are stored in non-volatile memory immediately after pressing **SAVE**.
- Editing operations do not interrupt ongoing DMX communication.
- During menu activity, pressing **FLASH** triggers a short test pulse for reference.

5.5 Quick Navigation Tips

- **Short press ENTER (RED)** → open or confirm.
- **Hold ENTER (≈ 3 s)** → exit to main display.
- **UP / DOWN** → scroll or adjust numeric values.
- **BACK / NEXT** → switch between editable parameters.
- **SAVE / ESC** → store or cancel changes.

Experienced users can edit or recall a sequence within seconds, even during a live session.

5.6 Factory-Default Settings

Parameter	Default Value	Note
Active Sequence	No. 1	20 steps pre-loaded by factory
Manual Flash Type	ONE	Single flash burst
DMX Remote Mode	Disabled	Enable manually via Menu 7
DMX Start Address	001	Adjustable 1–509
Focus	50 %	For motorized versions
Chaser Offset	Disabled	All lamps synchronous

6. Editing Sequences

The **EDIT Sequence** menu is the central function of the T-LIGHT Controller.

It allows the user to build or modify complete thunderlight programs consisting of multiple **steps**.

Each step defines the **FLASH Curve**, **brightness (LEVEL)**, **time delay (DELAY)**, and optional **Chaser** behavior for multi-fixture synchronization.

6.1 Accessing the Sequence Editor

1. From the **Main Screen**, press **MENU (RED)**.
2. Use **▲ / ▼** to select **EDIT Sequence**.
3. Press **ENTER (RED)** to confirm.
4. The display shows the sequence selection screen:

Select Sequence: 01

EDIT ESC

5. Use **▲ / ▼** to select the desired sequence (1–10).
 6. Press **EDIT** to open it for editing or **ESC** to return without changes.
-

6.2 Step Overview

Each sequence can contain up to **30 steps**, defining the timeline of a thunderlight simulation.

A single step can represent one or more lightning bursts followed by a defined delay period.

Each **Step** includes:

- **FLASH:** waveform type (factory or user-defined curve).
- **LEVEL:** brightness percentage (0–100 %).
- **DELAY:** pause before the next step begins.
- **CHASER:** timing pattern for multiple fixtures.

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Example display inside the Step Editor:

-----Step:01-----

FLASH: *F03* Chasr:No

DELAY: 0.50s LEV:100%

BACK NEXT SAVE

6.3 Editing a Step

1. Use **▲ / ▼** to modify the selected parameter.
2. Move between parameters using **BACK** and **NEXT** soft-keys.
3. Press **SAVE** to store modifications, or **ESC** to cancel.
4. After saving, the controller automatically advances to the next step.
5. Repeat until all steps are configured or until the sequence reaches the desired number of steps.

Parameter flow order when pressing **NEXT**:

STEP → FLASH → CHASER → DELAY → LEVEL → STEP

6.4 FLASH Parameter

Selects the waveform (intensity vs time) for that step.

Available options:

- **F01–F20:** Factory curves based on real thunderlight measurements.
- **U01–U10:** User-programmed custom curves.

Each FLASH defines the **shape** of the brightness pulse — whether it is a single sharp strike, a flickering multi-peak burst, or a smooth decay.

Tip: For maximum realism, alternate between different FLASH types across steps (e.g., F03 → F08 → F11).

6.5 LEVEL Parameter

Defines the brightness (amplitude) of the current step as a percentage of the maximum output.

All internal FLASH curves are scaled by this value.

For example:

- **LEVEL = 100 %** → full output from the fixture.
- **LEVEL = 50 %** → half intensity.
- **LEVEL = 10 %** → distant lightning simulation.

The controller applies level scaling digitally; timing and curve shape remain unchanged.

6.6 DELAY Parameter

Specifies how long the controller waits before executing the next step.

This delay simulates the time between thunder flashes or multiple discharges within a storm.

- Range: **0.00 s – 9.99 s**
- Resolution: **0.01 s (10 ms)**
- While delay is counting down, the LCD shows the live countdown timer.

The DELAY period is part of the same step and influences the perceived rhythm of the thunder sequence.

6.7 CHASER Parameter

The **Chaser** function introduces timing offsets among multiple T-LIGHT fixtures sharing the same DMX address.

Each FLASH type can have up to **three time segments (T1, T2, T3)** defined in the **CHASER Edit** menu (see Chapter 10).

When a Chaser is assigned to a step:

- Fixture #1 plays the flash immediately.

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- Other fixtures follow with pre-defined offsets (e.g., +0.1 s, +0.3 s, +0.5 s). This creates the illusion of lightning traveling across the sky.

CHASER options:

- **No** – all fixtures flash simultaneously.
 - **1 / 2 / 3** – apply the selected chaser pattern.
-

6.8 Saving the Sequence

After editing steps:

1. Press **SAVE** to store changes.
2. The controller displays:

Save the changes?

YES NO

3. Press **YES** to confirm or **NO** to discard.
4. The controller returns to the sequence selection screen.
5. Repeat for other sequences or press **ESC** to exit the editor.

All changes are written to **non-volatile memory**, preserved even when power is removed.

6.9 Sequence Playback Check

Once editing is complete, return to the **Main Screen** and press **RUN** to test the new sequence.

Observe the connected fixture(s) and confirm that:

- Timing and brightness match the intended effect.
- Step count and delays are consistent.
- Chaser and Level functions behave as programmed.

Adjust parameters as needed for fine tuning.

6.10 Recommended Editing Practice

- Begin with **short sequences (5–10 steps)** for easy preview.
 - Combine **short high-amplitude** and **long low-amplitude** flashes to mimic realistic thunder patterns.
 - Keep **LEVEL** $\leq 80\%$ during indoor editing to reduce glare.
 - Save often; changes take effect immediately after pressing **YES**.
 - Use different FLASH curves for variety — natural storms rarely repeat identical bursts.
-

7. Editing User Flash Curves

The **EDIT User Flash** menu allows the operator to create custom light waveforms that define how intensity changes over time during a flash event.

These custom curves are called **User Flash Curves (U01–U10)** and can be used in any sequence the same way as factory curves (F01–F20).

Each curve represents the complete light behavior of a single thunder burst.

7.1 Accessing the User Flash Editor

1. From the **Main Screen**, press **MENU (RED)**.
2. Use **▲ / ▼** to select **EDIT User FLASH**.
3. Press **ENTER (RED)** to confirm.
4. The LCD displays:

FLASH Name: *U01*

EDIT ESC

5. Use **▲ / ▼** to select which user flash curve (U01–U10) to edit.
6. Press **EDIT** to open the waveform editor or **ESC** to return without changes.

7.2 Flash Curve Overview

Each flash curve defines the **light intensity (LEVEL)** as a function of **time**. Internally, the controller stores the waveform as a sequence of level points sampled across a **2.5-second maximum duration**.

- **Time base:** 0.00 s – 2.50 s
- **Resolution:** 10 ms (0.01 s)
- **Level range:** 0–100 %, plus special “END” marker defining waveform termination.

By combining multiple rising and falling levels, the user can simulate realistic lightning forms — from single sharp bursts to multi-peak flashes.

7.3 Editing a Flash Curve

After selecting a user flash (U01–U10), the editor screen appears:

-----User Flash-----

Step:0.00s Lev:25%

SHIFT LAST ESC

- **Step:** current time position within the flash (0.00–2.50 s).
- **Lev:** light intensity at this time.
- **SHIFT:** toggles editing focus between *time position* and *level value*.
- **LAST:** recalls the previous level value for faster waveform building.
- **ESC:** exits to the previous menu.

Editing Procedure

1. Press **SHIFT** to select *time position* (cursor next to “Step”) or *level value* (cursor next to “Lev”).
2. Use ▲ / ▼ to adjust the value of the selected parameter.

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3. To store the new level, press **SHIFT** again — this writes the value into the temporary curve memory.
4. Repeat to build the full curve up to 2.50 s or until the desired shape is achieved.
5. To end the flash, move to the last time point and set *Lev* to **END** by decreasing below 0 % or increasing above 100 %.

The **END** statement tells the controller where the flash waveform stops.

7.4 Example Curve Creation

Example: creating a realistic two-peak thunder flash:

Time (s)	Level (%)	Description
----------	-----------	-------------

0.00	0	Start (dark)
0.10	100	Main burst
0.25	20	Drop
0.35	80	Secondary pulse
0.60	10	Fade down
0.90	END	End of flash

This curve simulates a double lightning strike with a bright main flash followed by a smaller secondary discharge.

7.5 Using the LAST Function

Pressing **LAST** copies the most recently stored level value to the current position. This makes it faster to build continuous plateaus or repetitive shapes without manually re-entering identical levels.

7.6 Saving the Curve

1. After the waveform is complete, press **ESC** to exit the editor.
2. The controller prompts:

Save the changes?

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YES NO

3. Press **YES** to store the new curve permanently, or **NO** to cancel.
4. The edited User Flash (U01–U10) becomes immediately available for use in sequences.

All User Flash Curves are stored in **non-volatile memory**, remaining safe through power cycles.

7.7 Testing a User Flash

To verify the created waveform:

1. Return to the **Main Screen**.
2. Set the **Manual Flash Type** (Menu 8) to **ONE**.
3. Select your edited **User Flash (Uxx)** in an existing sequence or create a test sequence using a single step.
4. Press **FLASH** or **RUN** to observe the result on the connected fixture.

Adjust level points if the visual appearance differs from expectations.

7.8 Practical Tips

- Use short, high-intensity peaks (100 %) followed by gradual fades for natural thunderlight simulation.
- Avoid more than 2–3 strong peaks per curve — real lightning typically decays quickly.
- Keep total flash time under 1.5 s for cinematic realism.
- Remember: **LEVEL scaling** in sequences multiplies these curve amplitudes, so design curves at full 100 % reference brightness.
- Store variations (U01–U05) for different moods — e.g., *single strike*, *double strike*, *flicker storm*, *distant horizon*.

8. Flash Names

Every FLASH curve stored inside the T-LIGHT Controller can be identified by a **five-character name**.

These names help operators recognize specific thunderlight patterns more easily during sequence programming or live operation.

The name is displayed on-screen whenever a FLASH is selected in any menu.

8.1 Flash Categories

The controller contains **30 FLASH curves** in total, divided into two groups:

Range	Type	Description
F01–F20	Factory FLASH Curves	Pre-programmed thunderlight waveforms created by HungaroFLASH using optical analysis of natural lightning. These curves cannot be deleted but may be renamed for easier reference.
U01–U10	User FLASH Curves	Custom-designed curves created in the EDIT User Flash menu (Chapter 7). These can be renamed, edited, or replaced at any time.

8.2 Accessing the Flash Name Editor

1. From the **Main Screen**, press **MENU (RED)**.
2. Use **▲ / ▼** to select **FLASH Names**.
3. Press **ENTER (RED)** to confirm.
4. The LCD displays:

FLASH Name: *F01*

EDIT ESC

5. Use **▲ / ▼** to choose the FLASH curve you wish to rename (F01–F20 or U01–U10).
 6. Press **EDIT** to open the character editor, or **ESC** to return without changes.
-

8.3 Editing Procedure

When in the editor, the screen appears as follows:

FLASH Name: *U08*

- - - - -

BACK NEXT SAVE

- A blinking cursor () indicates the editable character position.
- Use ▲ / ▼ to scroll through available characters (A–Z, 0–9, -, _).
- Use **BACK** / **NEXT** to move between positions.
- When finished, press **SAVE** to store the new name, or **ESC** to cancel.

The controller automatically capitalizes all characters for consistent readability.

8.4 Saving and Confirmation

After pressing **SAVE**, the controller asks for confirmation:

Save the new name?

YES NO

Press **YES** to confirm or **NO** to return without changes.

The new name becomes immediately visible in all menus (e.g., during Sequence Editing or Manual Flash selection).

All flash names are stored in **non-volatile memory** and remain preserved after power-off.

8.5 Practical Naming Examples

Flash ID Typical Use

F01	Sharp single thunderburst
F05	Two-pulse lightning
F08	Rapid flicker waveform

Flash ID Typical Use

U01	Long complex flash curve
U02	Faint, far-distant storm pattern
U05	Calibrated sequence for film use

Each name can be up to five characters, including letters, digits, or symbols.
Short, clear names make live operation faster and reduce programming errors.

8.6 Notes and Recommendations

- Factory curves (F01–F20) are permanently stored; only their **names** can be changed, not the waveform data.
- User curves (U01–U10) may be both renamed and reprogrammed.
- When multiple controllers are used on the same DMX network, maintaining **consistent naming conventions** across devices helps avoid confusion.
- Avoid using spaces — the LCD automatically pads unused characters with underscores.
- Keep names intuitive (e.g., *FAST*, *SLOW*, *TAIL*, *RAIN*, *CLOUD*, etc.) for quick identification on set.

9. Play Sequence Number

The **PLAY Sequence No.** menu defines which stored sequence (1–10) is currently active and will run when the **RUN** button is pressed or when a DMX trigger command is received in **REMOTE mode**.

Each sequence memory (No. 1–10) contains its own combination of steps, flash curves, delays, and levels.

Only one sequence can be active at a time.

9.1 Accessing the Play Sequence Menu

1. From the **Main Screen**, press **MENU (RED)**.
2. Use **▲ / ▼** to scroll to **PLAY Sequence No..**
3. Press **ENTER (RED)** to confirm.
4. The display shows:

Sequence No: 01

SET ESC

5. Use **▲ / ▼** to select a sequence number between **01** and **10**.
6. Press **SET** to store the selection or **ESC** to cancel.

The selected number appears immediately on the Main Screen and remains active until changed again.

9.2 Operation

Once the desired sequence number is selected:

- Press **RUN** to start playback of that sequence.
- The LCD will display the sequence number, step, and level in real time.
- When playback finishes, the controller returns automatically to Step 1 of the same sequence, ready for the next trigger.

The controller always recalls the **last active sequence** after power-up.

9.3 DMX Remote Compatibility

When the controller is used in **REMOTE mode**, sequence playback can also be triggered externally.

A DMX desk or show controller sends a "Run" command (via **DMX Channel 3**) to activate the currently selected sequence number.

The active sequence number is stored locally in the controller and does **not** change when DMX control is toggled on or off.

This ensures that once the correct sequence is chosen, the DMX trigger will always play that same program.

9.4 Quick-Access Workflow Example

For fast setup on site:

1. Power up the controller – Sequence 1 is selected by default.
2. To switch to another stored program (for example Sequence 5):
 - Press **MENU** → **PLAY Sequence No** → **▲▲** → **SET**.
3. Press **RUN** to start the selected thunderlight program.
4. Adjust **LEVEL** in real time using **▲ / ▼** as required.

The display shows:

Sequ No:05 Dly:0.4s

Level:100% Step:01

FLASH MENU RUN

9.5 Notes

- Sequence numbers **1–10** correspond directly to memory slots inside the controller.
- Sequence 1 is factory-programmed (20 steps). Sequences 2–10 are blank and available for custom programming.
- When editing a sequence in **Menu 1 (EDIT Sequence)**, make sure the same sequence number is active here before testing.
- Switching sequence numbers does **not** erase data; all 10 slots remain stored permanently in non-volatile memory.

10. Chaser Edit

The **CHASER Edit** menu allows the user to define and adjust **time offsets** between multiple T-LIGHT fixtures operating on the same DMX line.

This feature creates the illusion of **light traveling across the sky**, or expanding across large set pieces, by triggering each connected unit with a precisely timed delay.

📘 Chaser Mode – Application in Multi-Fixture Systems

The **Chaser Mode** is an *extended synchronization feature* designed for installations using **multiple T-LIGHT fixtures** on the same film or studio set.

Its goal is to make multi-angle illumination appear more **natural, cinematic, and spatially dynamic**.

Why Chaser Mode Exists

In earlier setups, several T-LIGHTs were often given the **same DMX address** (for example 001).

Although this caused them to execute the same Sequence in perfect sync, it also made the light look **flat and unrealistic on camera** — every fixture flashed identically from every direction.

The **CHASER** function solves this by giving each fixture a slightly **different trigger moment** or **segment of the flash**, creating realistic lightning travel, reflection, and sky-spread effects.

Operating Principle

Up to **eight T-LIGHT fixtures (Lamp1 – Lamp8)** can participate in one Chaser configuration.

- Each T-LIGHT must use its **own DMX address** (e.g., 001 → Lamp1, 003 → Lamp2, ... 015 → Lamp8).
- Each **FLASH TYPE** in the Sequence can be divided into **virtual time slices** called **A**, **B**, and **C**.
- These slices define *which fixture group* should react during each time zone of the same flash.

⚙ The slices are **logical timing zones**, not physical cuts.

They can **overlap freely**, allowing multiple fixtures to participate simultaneously with different parts of the waveform.

Example of Slice Assignment

Imagine one FLASH TYPE waveform split into three regions:

Slice Assigned Fixtures Action

A	Lamp1 + 5 + 7	Start of flash — front and side burst
B	Lamp4 + 5	Mid-flash reinforcement
C	Lamp7 + 8	After-glow and trailing reflections

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Each slice begins according to the global Sequence timing, but its **fixture group** and **relative delay** can be defined independently in **CHASER EDIT**.

Overlapping and Directional Effects

The slices (A → B → C) may partially **overlap**, so several fixtures light together for smooth transitions.

This overlap gives the perception of *movement* — light rolling across the horizon or spreading through clouds — while the overall Sequence timing remains intact.

Example playback flow:

Time →

A: ■■■■■■■■■■■■

B: ■■■■■■■■■■■

C: ■■■■■■■■■■■

→ Different groups illuminate at slightly shifted times, forming one continuous thunder event.

Programming Summary

Parameter	Description
Max Fixtures	8 × T-LIGHT units (Lamp1–Lamp8)
DMX Addressing	Each unit must use a unique DMX address
Slices (A–C)	Up to 3 virtual time zones per FLASH TYPE
Fixture Assignment	Any combination of fixtures per slice
Overlap Allowed	Yes — for blended, realistic results
Sequence Integrity	Overall timing and brightness unchanged

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Practical Example

FLASH TYPE	Assigned Fixtures	Resulting Effect
F03	Lamp1 → A, Lamp2 → B, Lamp3 → C	Lightning travels left → right
F05	Lamp4 + 5 parallel	Dual-direction sky flash
F07	Lamp6 → A, Lamp7 → B, Lamp8 → C	Expanding dome reflection
U01	Lamp1 + 8 overlap	Centralized strike with side echoes

Result

The visual shape and timing of the Sequence remain identical, but **light direction and spatial distribution** become programmable. This gives lighting designers the ability to sculpt thunderlight scenes — deciding exactly *which T-LIGHTs* participate in each flash segment.

The camera perceives it as a **rolling, evolving lightning storm**, far more lifelike than synchronized static bursts.

Analogy:

Think of the Chaser system like a **light orchestra**: every FLASH TYPE is a musical line, and each T-LIGHT is a musician entering slightly earlier or later to create a rich, realistic composition.

10.1 Chaser Function Principle

When several T-LIGHT or compatible HungaroFLASH fixtures receive the same DMX signal, they normally flash simultaneously.

By enabling a **Chaser pattern**, each unit fires slightly later than the previous one according to a programmed **offset table**.

Each **Chaser Pattern (1–3)** defines a series of timing offsets (T1, T2, T3 ...) that are internally referenced by the controller during playback.

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Example concept:

Fixture Offset Time Result

1	0.00 s	Initial flash
2	+0.10 s	Delayed by 100 ms
3	+0.25 s	Lightning travels sideways
4	+0.40 s	Final reflection

This produces a traveling "sky flash" effect commonly used in film and concert lighting.

10.2 Accessing the Chaser Editor

1. From the **Main Screen**, press **MENU (RED)**.
2. Use **▲ / ▼** to select **CHASER Edit**.
3. Press **ENTER (RED)** to confirm.
4. The LCD displays:

Chaser No: 1

EDIT ESC

5. Use **▲ / ▼** to choose **Chaser 1–3**.
 6. Press **EDIT** to open the selected pattern.
-

10.3 Editing Chaser Timing

The editing display appears as follows:

-----CHASER 1-----

T1: 0.10s T2: 0.25s

T3: 0.40s Fixtures:4

BACK NEXT SAVE

- **T1–T3:** Time offsets for the delayed fixtures.
- **Fixtures:** Number of active fixtures participating in the pattern (1–8).

Use **▲ / ▼** to adjust values, and **BACK / NEXT** to move between parameters.
Press **SAVE** to confirm or **ESC** to exit without saving.

Timing can be defined within **0.00 s – 1.00 s**, in **0.01 s** increments.

10.4 Assigning a Chaser to a Sequence Step

After a chaser is programmed, it can be applied to any step inside a sequence (see Chapter 6):

-----Step:05-----

FLASH: F09 Chasr: 2

DELAY: 0.60s LEV:90%

BACK NEXT SAVE

- **Chasr:No** → no timing offset (all fixtures synchronized).
- **Chasr:1 / 2 / 3** → apply the selected chaser pattern.

During playback, the T-LIGHT Controller automatically outputs the offset timing data according to the selected pattern, maintaining full waveform accuracy.

10.5 Practical Examples

Example 1 – Traveling Sky Lightning

A four-fixture setup, each assigned to Chaser 1:

- T1 = 0.00 s
- T2 = 0.15 s
- T3 = 0.30 s
- T4 = 0.45 s

Result: a fast lateral “rolling flash” effect from left to right.

Example 2 – Expanding Dome Reflection

Six fixtures surrounding a set:

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- $T1 = 0.00\text{ s}$
- $T2 = 0.05\text{ s}$
- $T3 = 0.10\text{ s}$
- $T4 = 0.15\text{ s}$
- $T5 = 0.20\text{ s}$
- $T6 = 0.25\text{ s}$

Result: a dome-like glow that expands outward, simulating distant lightning spreading across the sky.

10.6 Chaser Data Storage

- All three Chaser patterns are stored in **non-volatile memory**.
- They remain available for all sequences after power-off.
- Editing one Chaser pattern affects every sequence that uses that number.

⚠ **Note:** If a Chaser pattern is modified while a sequence is running, the change takes effect only after playback restarts.

10.7 Technical Recommendations

- Keep offsets within **0.50 s** for realistic thunder-light travel speed.
- Use smaller values (0.05–0.20 s) for close multi-fixture setups; longer for wide scenes.
- When using DMX splitters or wireless receivers, ensure equal signal latency on all channels to maintain pattern integrity.
- Assign fixture positions logically (Fixture 1 = leftmost, Fixture N = rightmost).
- For film shooting, Chaser 2 with alternating T delays gives the best perception of depth and lightning direction.

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11. Remote Control

The **REMOTE Control** function allows the **T-LIGHT Controller** to be operated from any standard **DMX512 controller**, show console, or lighting desk.

In this mode, all key functions—such as *RUN*, *FLASH*, *LEVEL*, and *FLASH TYPE*—can be triggered externally via DMX signal while maintaining the controller's internal timing



precision.

11.1 Principle of Remote Operation

When the controller is placed into **REMOTE mode**, it no longer responds to front-panel keypresses for *RUN* or *FLASH*.

Instead, it interprets incoming **DMX channel values** as virtual button commands and brightness controls.

All playback remains synchronized to the controller's **internal microprocessor clock**, ensuring millisecond-accurate reproduction of stored Sequences, even under continuous DMX data updates.

11.2 Accessing the Remote Control Menu

1. From the **Main Screen**, press **MENU (RED)**.
2. Use **▲ / ▼** to select **REMOTE Control**.
3. Press **ENTER (RED)** to confirm.
4. The LCD displays:

Remote Mode: OFF

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ENABLE ESC

- **Remote Mode:** shows current status (ON or OFF).
- **ADDR:** the starting DMX address (001–509).
- **ENABLE / ESC:** activates or exits without change.

Use ▲ / ▼ to adjust the DMX address.

Press **ENABLE** to turn the mode ON.

When active, the screen briefly flashes **REMOTE ENABLED** and returns to the main view.

11.3 DMX Channel Mapping

The following table shows the standard DMX channel assignments used by the controller when in Remote Mode.

DMX Channel	Function	Range	Description
1	Master Level	0–255 → 0–100 %	Controls overall brightness (same as Level parameter).
2	Left Button / STOP–FLASH	0–127 = OFF, 128–255 = Pressed	Simulates the front-panel left key.
3	Right Button / RUN–CONTINUE	0–127 = OFF, 128–255 = Pressed	Starts or resumes sequence playback.
4	Flash Type Select	0–51 = ONE, 52–102 = RND1, 103–153 = RND2, 154–204 = RND3, 205–255 = CONT	Selects manual flash mode.

DMX channels beyond 5 are ignored by the controller.

Note: All commands are **edge-triggered**.

A valid control change occurs only when the DMX value crosses above 128 (button press) or below 127 (button release).

This prevents repeated triggers when the DMX level is held constant.

11.4 Enabling and Disabling Remote Mode

- **Enable:** From the menu, select **Remote Mode: ON** and press **SAVE**.
 - **Disable:** Select **Remote Mode: OFF** or remove the DMX cable.
-

11.5 Signal and Status Indication

When Remote Mode is active:

- The **DMX LED** (if present) glows **solid green** when valid data is received.
- The display shows:

REMOTE MODE ACTIVE

DMX Signal OK

If the signal is lost or cable disconnected:

REMOTE MODE ACTIVE

DMX Signal Lost!

During this condition, the controller holds the current state and pauses playback until DMX returns.

11.6 Playback from DMX

Once Remote Mode is active, a standard lighting desk can start, pause, or manually flash the sequence using its assigned faders or cues:

Desk Control DMX Channel Value to Apply Effect

Master Intensity	1	0–255	Adjusts global output brightness.
Run / Continue	3	>128	Starts playback of active sequence.
Stop / Pause	2	>128	Stops or pauses playback.
Manual Flash	2	Pulsed >128	Fires one flash manually.

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11.7 Synchronization and Timing

All time-critical operations (flash waveform, delay, chaser offsets) remain internally synchronized.

DMX data is interpreted as **control triggers only** — not as live waveform shaping. This guarantees flicker-free operation, even under unstable DMX refresh rates.

For multi-controller or multi-fixture setups, ensure all units share the same **DMX universe** and grounding reference to maintain timing alignment.

11.8 Practical Applications

- **Film or FX synchronization:** Trigger the thunderlight directly from a master lighting console in sync with camera shutter or audio playback.
- **Concert shows:** Combine several controllers using the same DMX channel mapping for synchronized mass lightning effects.
- **Rental setups:** Allow full remote operation without physical access to each controller.

⚠ **Warning:** In remote mode, all safety limits (e.g., brightness, flash frequency) are user-controlled from the DMX desk. Ensure the connected power circuit can safely handle high-intensity bursts.

11.9 DMX Troubleshooting Guide

Symptom	Possible Cause	Solution
DMX LED off	No signal	Check cable or source address.
Controller not responding	Remote mode disabled	Enable via menu or reapply DMX signal.
Unwanted flash repetition	DMX fader held above 128	Move fader back below midpoint to reset trigger.

11.10 Remote Connection: DMX Cable Precautions and Power Options

The **T-LIGHT Controller** communicates with fixtures using the **DMX-512 (5-pin XLR)** standard.

Pins 1–3 carry the normal DMX signal, while **Pin 5** is reassigned in HungaroFLASH systems to carry **+12 V DC power** from the fixture to the controller.

⚠ Important Connection Notice

- Use **standard 3-wire DMX cables** (Pins 1–3 only) when linking the T-LIGHT Controller to any external DMX desk, splitter, or third-party lighting system.
- **Pin 5** carries **+12 V DC** in the HungaroFLASH configuration and **must not** be connected to equipment that does not expect power on that pin.
- **5-wire DMX cables** may be used **only between a T-LIGHT fixture and a T-LIGHT Controller** that are designed for this function.

Improper use of 5-wire cables with other gear can cause short-circuits or permanent damage.

Compatibility with Standard Quasar Fixtures

It is also possible to connect **regular Quasar** fixtures (without the internal 12 V Pin 5 PSU modification) to a **T-LIGHT Controller**, using **3-wire 5-pin DMX cables** (Pins 1–3 active).

In this configuration:

- The **controller will not receive 12 V DC** from the Quasar fixture.
- An **external 12 V DC power supply** must be used to power the controller.
- Connect this supply through the **REMOTE IN DMX 5-pin connector**, where:
 - **Pin 5 = +12 V DC**
 - **Pin 1 = GND (–12 V return)**

This allows safe operation of the controller while maintaining full DMX communication on Pins 1–3.

✅ **Note:** Use only isolated, regulated 12 V DC power supplies (1 A minimum). Always verify correct polarity before connection.

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Responsibility and Warranty

HungaroFLASH shall not be responsible for damage resulting from:

- 5-wire DMX cables connected between non-HungaroFLASH devices.
- Incorrect external power connection or reversed polarity.
- Improper wiring of third-party DMX systems.

✓ Safe Practice Guideline

Connection Type	Cable Type	Pins Active	+12 V on Pin 5	External PSU Required	Safe for Use
T-LIGHT → T-LIGHT Controller	5-pin / 5-wire	1–5	Yes (from fixture)	No	✓
Quasar → T-LIGHT Controller	5-pin / 3-wire	1–3	No	Yes (12 V DC to Pin 5)	✓
Controller → DMX Desk or Splitter	5-pin / 3-wire	1–3	No	No	✓
Any device → unknown DMX gear with 5 wires	—	1–5	Possible mismatch	—	✗ Not allowed

⚠ Warning:

Always label HungaroFLASH system cables clearly:

"Pin 5 = +12 V DC (Do not use with standard DMX gear)".

12. Manual Flash Type

The **Manual Flash Type** menu defines how the controller responds when the **FLASH** button is pressed or when a **DMX remote flash command** is received.

This function is primarily used for **testing, calibration, or demonstration** when a full sequence is not required.

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12.1 Accessing the Manual Flash Type Menu

1. From the **Main Screen**, press **MENU (RED)**.
2. Use **▲ / ▼** to select **MANUAL Flash Type**.
3. Press **ENTER (RED)** to confirm.
4. The LCD shows:

Manual Flash: ONE

SET ESC

5. Use **▲ / ▼** to scroll through available flash modes.
6. Press **SET** to confirm, or **ESC** to cancel and return to the main display.

The selected mode remains active until changed again, even after power-off.

12.2 Available Flash Types

Type	Behavior	Description / Application
ONE	Fires a single flash once per button press.	Standard manual operation for basic testing or scene verification.
RND1		
RND2		
RND3		
CONT	Continuous repetitive flashing at fixed rate.	Used for endurance testing, exhibitions, or steady visual effects.

Each mode can be used in either **Local** or **Remote (DMX)** operation.

12.3 Operation from Front Panel

When in Manual Flash mode:

- The **FLASH** button (center key) executes the selected flash type instantly.

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- The controller ignores sequence timing while in this mode.
- The **Level** setting (adjusted by ▲ / ▼) determines the output brightness of the flash.
- The LCD displays the current flash type during activation, e.g.:

MANUAL FLASH: RND2

Level: 80%

When **CONT** mode is active, press **FLASH** once to start continuous flashing and again to stop.

12.4 Operation from DMX Remote

When the controller is in **REMOTE Mode**, Manual Flash behavior is controlled via **DMX Channel 4** (see Chapter 11).

DMX Channel 4 Range Selected Flash Type

0–51	ONE
52–102	RND1
103–153	RND2
154–204	RND3
205–255	CONT

All other DMX behavior remains identical to local control — flash amplitude is determined by **DMX Channel 1 (Master Level)**.

12.5 Application Examples

Mode Typical Usage

ONE Verify cabling and fixture operation before a shoot.

RND1 Slower speed Random Level Brightness

RND2 Quicker speed Random Level Brightness

RND3 Brightness not lower than 30%!

CONT Demonstrate fixture output in showrooms or exhibitions.

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⚠ **Warning:** In CONT mode, the fixture may reach sustained high temperature during long operation.

Use only for demonstration with proper ventilation and power supply protection.

12.6 Quick Reference

Flash Type Trigger Source Stops Automatically			Adjustable Level
ONE	Button or DMX	Yes (after single flash)	Yes
RND1	Button or DMX	After short random pattern	Yes
RND2	Button or DMX	After random pattern	Yes
RND3	Button or DMX	After random pattern	Yes
CONT	Button or DMX	Only by pressing again	Yes

12.7 Additional Notes

- Manual Flash operation does not overwrite or modify stored Sequences.
- Flash Type selection is remembered even after power-off.
- When **REMOTE Mode** is active, the Flash Type can still be adjusted locally without disconnecting DMX.
- Continuous flashing can be interrupted instantly by pressing **STOP / LEFT** key or cutting DMX signal.

13. Test and Verification

The **T-LIGHT Controller** has no internal automatic *Self-Test* (SLF) or demo playback. Testing and verification are carried out manually through the **FLASH** and **RUN** functions, using a connected T-LIGHT or other compatible HungaroFLASH fixture. This method provides an accurate, real-load check of the entire system.

13.1 Functional Check Procedure

To verify that the controller and connected fixture are operating correctly:

1. **Connect** the controller to a compatible **T-LIGHT** or specially modified **Quasar** fixture using a standard DMX cable (5-pin or 3-pin).
2. Ensure the system is **powered on** and the display shows the normal main screen.
3. Press **FLASH** once.
 - The fixture should emit a single light burst according to the currently selected **Manual Flash Type**.
4. Press **RUN** to start **Sequence 1** (factory default).
 - Observe the thunderlight playback and verify step progression on the display.
5. Adjust **LEVEL** with ▲ / ▼ to confirm real-time brightness control.
6. Press **STOP** to end playback and return to the main screen.

If all steps behave as described, the controller, cabling, and fixture are functioning correctly.

13.2 Using Sequences for Demonstration

Although no built-in SLF exists, the controller can easily be used for demonstration purposes:

- **Sequence 1** is factory pre-programmed as a realistic thunderlight show and ideal for demonstration.
- The **LEVEL** parameter may be reduced for indoor testing or exhibition use.
- **Sequences 2–10** can be programmed by the user as custom demonstration loops.
- Playback can be started and stopped at any time using **RUN** and **STOP**.

Tip: For trade-show or rental-shop displays, create one sequence with 10–15 steps using various FLASH curves and delays to provide an endless, self-running storm simulation.

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13.3 Electrical and Load Precautions

- Avoid repeated rapid triggering at full brightness, as this may cause line voltage dips or breaker trips.
- Confirm that all DMX connectors are fully seated and properly terminated before operating.

13.4 Service Checkpoints

If unexpected behavior occurs:

Symptom	Possible Cause	Corrective Action
No flash on button press	DMX cable not connected / wrong polarity	Verify DMX wiring and pin 5 power feed.
Display active but no light	Fixture power supply off	Check T-LIGHT PSU or 12 V Pin 5 output.
Erratic triggering	Loose DMX line or missing terminator	Inspect connectors and install 120 Ω terminator.
Dim output	Level too low	Increase LEVEL using ▲ key.
Flicker or delay mismatch	Long cable run / interference	Use shielded cable, ensure proper grounding.

13.5 Recommended Test Environment

- Ambient temperature below **40 °C (104 °F)**.
- Non-flammable test surface.
- Ensure clear line of sight to observe flash timing and beam shape.

For large studio setups, HungaroFLASH **15. Safety and Maintenance**

The **T-LIGHT Controller** and its connected HungaroFLASH fixtures are high-energy lighting systems intended for professional use only.

Proper safety practices and periodic maintenance are essential for long-term reliability and to prevent electrical or optical hazards.

14 General Safety Rules

- Operate the controller **only by qualified lighting or electrical technicians** familiar with DMX systems and high-current circuits.
- Always **disconnect power** before connecting or removing DMX or power cables.
- Keep the controller and cables away from moisture, condensation, and conductive dust.
- Do not use the unit if housing, connectors, or cables show visible damage.
- Ensure the **fixture power supply and mains line** are rated for the expected surge current (C or D curve, ≥ 25 A).
- Maintain adequate ventilation on T-LIGHT during prolonged use.
- Avoid looking directly into the light source at full output — extreme brightness can cause temporary visual discomfort.
- Never bypass protective fuses or grounding connections.

14.1 Electrical Safety

- The T-LIGHT Controller operates from a **12 V DC** supply provided through **DMX Pin 5** or a dedicated low-voltage input.
 - Never connect AC voltage or reversed polarity to this input.
 - Use only **HungaroFLASH-approved fixtures** that include the correct 12 V regulator and isolation.
 - Verify proper grounding between controller and fixtures to eliminate potential differences and prevent data errors.
 - For outdoor setups, ensure all connectors are IP-rated and protected from rain or condensation.
-

14.2 Optical and Thermal Safety (T-LIGHT)

- During high-intensity operation, fixtures may reach elevated temperatures. Allow several minutes of cooling after long demonstration runs.
 - Keep combustible materials (cloth, paper, plastics) at least **0.5 m** away from front grid.
 - Avoid touching optical surfaces while hot.
 - Do not cover cooling vents or block airflow around fixtures.
-

14.3 Maintenance Schedule

Interval	Task	Description
Before each use	Visual inspection	Check cables, connectors, housing, and display for damage.
Monthly	DMX line check	Inspect connector pins and shielding continuity.
Quarterly	Cleaning	Gently remove dust from controller vents and display using dry air.
Every 12 months	Electrical service	Verify voltage levels, ground connections, and PSU output by qualified personnel.
As required	Firmware update	Contact HungaroFLASH support for the latest revisions if updates are available.

All maintenance must be performed with the power disconnected.

14.4 Storage and Transport

- Store the controller in a dry environment between **-20 °C and +60 °C**.
 - Use shock-absorbing flight cases during transport.
 - Disconnect all cables before packing.
 - Do not stack heavy modules or power units directly on top of the controller.
-

14.5 Service and Repair

- The T-LIGHT Controller contains **no user-serviceable internal parts**.
- In the event of malfunction:
 1. Disconnect power immediately.
 2. Inspect all external connections.
 3. If the fault persists, contact **HungaroFLASH Technical Support** or an authorized service center.
- Unauthorized opening or modification voids warranty and may compromise safety certification.

Note: HungaroFLASH service can provide replacement components, firmware updates, or calibration services upon request.

14.6 Disposal and Environmental Information

- Electronic devices and batteries must not be disposed of with household waste.
- Return defective or obsolete equipment to HungaroFLASH or an authorized recycling partner.
- Packaging materials are recyclable — dispose of responsibly according to local regulations.

H recommends performing system checks before each shooting day to confirm synchronization and thermal stability.

15. Technical Specifications and Revision Data

This section summarizes the main operating parameters of the **T-LIGHT Controller** and its compatibility with HungaroFLASH fixtures.

Values are nominal and may vary slightly depending on firmware version and production batch.

15.1 Electrical Characteristics

Parameter	Specification	Notes
Operating Voltage	12 V DC $\pm 20\%$	Supplied through DMX Pin 5 or service connector
Minimum Operating Voltage	9 V DC	Controller remains functional even with long cable voltage drop
Typical Current Consumption	< 1 A	At 12 V input
Power Connector	Supplied via DMX cable	Pin 5 = +12 V, Pin 1 = GND
Polarity Protection	None	Verify correct polarity before connection
DMX Input / Thru	5-pin XLR male / female	Compatible with DMX-512 (A)
DMX Data Rate	250 kbit/s	Standard DMX timing
Internal Protection	Transient and ESD filtering	On DMX lines

15.2 Functional Data

Function	Specification	Description
Sequences	10 memory slots (1–10)	Each up to 30 steps
Steps per Sequence	Max. 30	Each step = FLASH + LEVEL + DELAY + CHASER
Flash Curves (Factory)	20 $\times$ (F01–F20)	Pre-programmed, non-editable

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Function	Specification	Description
Flash Curves (User)	10 × (U01–U10)	Fully editable and nameable
Delay Resolution	0.01 s	10 ms timing accuracy
Max Flash Length	2.5 s	Per curve
Chaser Patterns	3 × (T1–T3)	Adjustable time offsets
Remote DMX Mode	5 channels	Channel 1–5 control Level, Run, Flash, Type, Focus
Display	2 × 16 character LCD	Backlight color = Blue / Green / White (model dependent)
Buttons	3 keys (▲ / ▼ / ENTER-RED)	Multi-function operation
Data Storage	Non-volatile Flash memory	Retains all sequences and names
Timing Source	Internal microprocessor clock	< 1 ms accuracy

15.3 Mechanical and Environmental Data

Parameter	Specification
Dimensions (W × H × D)	Approx. 150 × 80 × 40 mm
Weight	≈ 0.5 kg
Enclosure Material	Stainless-steel housing
Cooling	Passive, no fan required
Operating Temperature	0 °C – 40 °C
Storage Temperature	–20 °C – 60 °C
Humidity	< 80 % (non-condensing)
Ingress Protection	IP20 (indoor use)

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16.4 DMX Pin Assignments

Pin Signal	Description
1 GND	Signal ground and – 12 V return
2 Data (–)	DMX negative line
3 Data (+)	DMX positive line
4 Spare (–)	Not used
5 +12 V Aux Power feed to controller	

Note: The +12 V on Pin 5 must be supplied only from HungaroFLASH fixtures equipped with a regulated auxiliary PSU output.

15.5 Compatibility

Fixture Type	Compatibility	Notes
T-LIGHT Series	Full compatibility	Direct power + control over DMX Pin 5
Quasar 15000 W PRO (modified)	Compatible	Requires HungaroFLASH PSU modification with +12 V Pin 5
RainPROOF Quasar 15000 W PRO	Compatible	Same as above
Other DMX Fixtures	Not recommended	No Pin 5 power feed

15.6 Firmware and Documentation

Item	Version	Date
Firmware Version	V1.3.2p (typical)	May vary by production batch
DMX Protocol Map	Rev. 1.2	5-channel mapping standard
Manual Version	V1.0 – T-LIGHT Controller User Manual	November 2025
Manufacturer	HungaroFLASH Lighting Systems – Budapest, Hungary	—

For firmware or documentation updates, contact **HungaroFLASH Technical Support** or visit the authorized service network.

15.7 Warranty

All HungaroFLASH products are manufactured under strict quality control. The T-LIGHT Controller is covered by a **12-month limited warranty** against manufacturing defects.

This warranty excludes damage caused by misuse, incorrect connections, or unauthorized modifications.

For service inquiries, please contact:

HungaroFLASH Technical Support

Email: support@hungaroflash.com

Website: www.hungaroflash.com