



GLIGHT

GLightOne Base Technical Manual

Official Product Documentation

Version 1.3 Draft

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01.0

Introduction



GLightOne is an automotive lighting-control platform designed for 12 V systems. It focuses on LED sequences, coordination between modules and intelligent response to real vehicle signals.

The product was developed as a compact intelligent unit capable of controlling lighting patterns, DRL behavior, turn indication, position, reverse and brake responses while keeping an adaptable architecture for custom automotive installations.

GLightOne Base operates autonomously through physical inputs and internal logic. TFT Lite may be added as an optional visualization and control layer, but it does not replace the base function of the module.

In paired or Full Kit installations, GLightOne can coordinate multiple modules through a Master / Slave architecture and a dedicated SYNC line. The goal is to combine intelligence, design, control and safety in a compact module that respects OEM signals such as STOP, REV, DIR and POS.

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Product Description



GLightOne Base converts real vehicle signals into coordinated lighting behavior without replacing the original low-beam or high-beam functions of the vehicle.

v1.3 - Distributed DIR context: in a compatible synchronized installation, MODE adopts DIR context when DIR is active locally or on any companion module detected through SYNC. This only selects what the button controls; it never activates DIR remotely. Each module executes the turn signal only from its own local DIR_IN.

Each module can control multiple independent LED channels through PWM for sequences, progressive turn-on, dimming, welcome effects, DRL, auxiliary lights, side markers, emergency lighting, underglow or other LED groups installed by the user.

The module reads automotive signals such as POS, DIR, DRL_SW, REV and STOP and turns them into programmed visual responses. The behavior depends on internal logic, mode priority and the installed firmware version.

POS is used as a vehicle state reference, DRL is used for daytime or presence lighting, DIR activates directional response, REV can trigger reverse-related behavior, and STOP provides brake-related response.

The main physical controls are DRL_SW and MODE. DRL_SW manages the DRL function. MODE changes modes and internal behavior. The module receiving these controls normally acts as the Master in a synchronized installation.

All modules use the same base hardware and firmware. There is no different PCB for Master or Slave; the role is defined by wiring and installation. SYNC coordinates the visual behavior between compatible modules.

02 · CONTINUED

Product Description

TFT Lite can be added as an optional interface, while GLightOne Base continues to operate through its physical inputs, LED outputs, MODE, DRL_SW and internal firmware logic.



03.0

Main Features

- Multiple independent PWM LED channels for sequences, dimming, progressive effects and customized visual behavior.
- 12 V automotive integration with protected power, correct polarity and reliable GND required.
- Reading of real vehicle signals: POS, DIR, DRL_SW, REV and STOP according to the installed configuration.
- Context-aware command routing for MODE, while STOP and REV remain local, fast physical safety layers.
- Integrated DRL control through DRL_SW and internal firmware behavior.
- MODE button with exclusive context routing: REV > DIR > STOP > NORMAL. This priority applies to button commands, not to the electrical existence of the lamps.
- Master / SYNC architecture for paired or multi-module installations. Full Kit configurations may coordinate up to four modules depending on the kit.
- Optional TFT Lite interface for visualization and technical control without making the base module dependent on the screen.
- Expandable GLight platform prepared for future versions, special configurations and approved integrations.

04.0

Kit Contents



The kit contents may vary depending on product version, vehicle configuration and installation type. GLightOne Base can be used in paired systems or wider synchronized installations.

GLightOne Base Pair

- Two GLightOne Base modules using the same hardware and base firmware.
- One main control point: the module where DRL_SW and MODE are connected acts as the Master.
- DRL_SW control, MODE button, input connections for vehicle signals, SYNC line and independent PWM LED outputs according to the kit.

GLightOne Full Kit

- Up to four GLightOne Base modules for larger vehicle zones such as front, rear, side areas, auxiliary lights, markers, underglow or visual effects.
- One module defined as Master and the remaining modules working as synchronized units through SYNC.

Optional or project-dependent elements

- TFT Lite interface, custom wiring, harness extensions, external connectors in the vehicle harness and mounting elements may vary by order.

Items not necessarily included by default

- External LED strips, complete headlights, load resistors, relays, external fuses, full vehicle wiring, installation tools, programmers, lab power supplies or OEM vehicle components, unless specifically stated.

05.0

Product Identification



GLightOne Base may be identified by product name, hardware revision, kit configuration and external security label. The commercial serial number is not necessarily printed directly on the PCB.

All modules use a common base PCB. Physical PCB markings identify the model, hardware revision or general board design, but not necessarily each individual commercial unit.

The commercial serial number is assigned through an external security or identification label. This label may be placed on packaging, protective bag, documentation, warranty card or another area defined by GLight.

The Master is not identified by a different serial number or different board. The Master is the module where DRL_SW and MODE are connected during installation.

Special units such as First Edition, internal reference units or validation units may be differentiated by serial number, documentation, security label or GLight internal record.

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Electrical Specifications



GLightOne Base is designed for 12 V automotive systems. The final electrical limits may vary by hardware revision, kit configuration and connected LED load.

6.1 Main power

The module must be powered from a 12 V line with correct polarity and a reliable GND. A suitable external fuse is recommended close to the power source. 24 V systems require external adaptation and are not a direct-use condition.

6.2 Internal regulation

The module uses internal regulated rails for logic and auxiliary circuits. These internal rails must not be used as general accessory power outputs unless specifically documented by GLight.

6.3 Inputs

POS, DIR, DRL_SW, REV and STOP are intended for compatible automotive 12 V signals according to the defined installation. SYNC is a system signal for compatible modules. MODE is a user input activated by connecting the button to GND.

6.4 Physical controls

DRL_SW is activated by 12 V. MODE is activated by GND. This difference is essential: DRL_SW = 12 V input; MODE = button to GND.

6.5 Outputs

LED outputs, DRL, OUT STOP, OUT REV, EXP and AUX / EMERGENCY are low-side outputs. They control the negative / GND side of the LED load and do not provide positive 12 V power.

6.6 Loads

06 · CONTINUED

Electrical Specifications

The positive side of each LED load must receive the correct power from the installation. The negative side of that load connects to the corresponding GLightOne output. Loads must be compatible with the driver, system and installed configuration.

6.7 SYNC

SYNC coordinates compatible GLightOne modules. It requires common GND between modules. SYNC must never receive +12 V and must not be connected to OEM high-current signals or external loads.

6.8 Important note

Before powering the system, verify +12V, GND, fuse, polarity, LED load wiring, DRL_SW as 12 V input and MODE as button to GND.

07.0

Connection Pads and Pinout



Official connection diagram. Check the silkscreen of the exact hardware revision before soldering or applying power.

07 · CONTINUED

Connection Pads and Pinout

v1.3 - SYNC may report DIR context between compatible modules, but it never replaces DIR_IN. The installation may use fewer LED channels; configured channels must be consecutive from LED1 through LEDn, with no gaps.

GLightOne Base uses connection pads identified by silkscreen marking. Use this section together with the annotated board diagram shown on this page and with the physical silkscreen of the exact hardware revision being installed.

7.1 Main power

+12V receives the positive 12 V supply for the module. GND is the main ground reference. In multi-module installations, all modules must share common GND.

7.2 Vehicle signal inputs

POS detects position or lighting state. DIR detects turn signal. DRL_SW receives 12 V for DRL control. REV detects reverse. STOP detects brake. These pads must not be used as outputs or power pads.

7.3 MODE

MODE is the main user button input. It is active to GND: one side of the button goes to MODE and the other side goes to GND. MODE must not receive +12 V.

7.4 SYNC

SYNC is a shared synchronization line between compatible GLightOne modules. Do not solder many wires directly onto one SYNC pad; use an external splice, connector, terminal, harness or distribution point outside the PCB when several modules are involved.

7.5 Main LED outputs

07 · CONTINUED

Connection Pads and Pinout



LED 1 to LED 11 are PWM outputs for sequences, chasers, dimming and custom behavior. They control the negative side of the LED load. The LED positive must be powered separately by the installation.

7.6 Special outputs

DRL, OUT STOP, OUT REV, EXP and AUX / EMERGENCY are functional outputs and also control the negative / GND side of their loads. They must not be treated as positive 12 V outputs.

7.7 Reserved or system pads

CFG and BUS are reserved or system-related pads depending on hardware and firmware version. They must not be connected to +12 V, GND, OEM signals or external devices without official GLight documentation. TFT Layer is reserved for compatible TFT Lite integration.

7.8 Quick summary

+12V = positive supply. GND = main ground. POS/DIR/DRL_SW/REV/STOP = 12 V signal inputs. MODE = button to GND. SYNC = synchronization line, not power. LED outputs and special outputs = negative / GND control.

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08.0

Basic Installation



Basic installation must follow the official pinout, electrical architecture and installation configuration. The vehicle must be off and power disconnected while wiring or soldering.

- Prepare the installation: check kit version, module positions, LED zones, signal points, wire routing and which module will act as Master.
- Define the system: a paired system normally uses two modules; a Full Kit may use up to four synchronized modules depending on the project.
- Define the Master: the module where DRL_SW and MODE are connected acts as the main control point. Only one main control point should exist in a standard installation.
- Connect +12V and GND: use protected 12 V power, reliable ground and common GND between modules.
- Connect LED loads: LED positive to the correct supply, LED negative to the corresponding GLightOne output.
- Connect controls: DRL_SW as 12 V input and MODE as button to GND.
- Connect OEM signals only after measuring and confirming POS, DIR, REV and STOP as required by the installation.
- Connect SYNC between compatible modules only, with common GND and no +12 V on the SYNC line.
- Perform an initial test before closing panels: power, MODE, DRL_SW, POS, DIR, REV, STOP, SYNC and LED loads according to the actual installation.

Before driving, confirm that STOP and DIR remain clear, visible and stable, and that no OEM critical function is compromised.

09.0

General Operation



After receiving 12 V power, GLightOne Base initializes its internal logic, restores compatible user selections from EEPROM and begins monitoring the installed physical inputs, MODE control and synchronization state.

The module is autonomous. It does not require TFT Lite, a computer, cloud service or remote controller to execute its base lighting functions.

GLightOne separates physical lamp behavior from MODE-button command routing. STOP and REV are read locally and their dedicated outputs are refreshed continuously, including while a directional sequence or another visual layer is running.

Important: REV > DIR > STOP > NORMAL is the exclusive priority used to interpret the MODE button. It is not a global lamp priority and it does not prevent STOP, REV and DIR from coexisting physically.

When DIR is active, the main sequence array is used for directional behavior. DRL may be paused or redirected, while the independent STOP and REV outputs remain available. POS may apply a reduced presence level to compatible outputs according to firmware.

In normal context, MODE can select DRL, EXP / Angel, Emergency and Welcome behavior. In REV, DIR or STOP context, the same button is reassigned only to the function that owns that context.

In synchronized installations, the Master transmits visual selections and timing information through SYNC. The physical activation of STOP and REV remains local to the module wired to the corresponding vehicle input.

TFT Lite, when present, is an optional interface. It may display or assist configuration, but it does not replace physical inputs, local safety behavior or the internal firmware logic.

10.0

Lighting Modes

A lighting mode is a firmware-defined visual profile. The available library may grow, be refined or be reordered in future firmware while the electrical installation and contextual control logic remain unchanged.

v1.3 - Central MODE rule: local REV > local DIR or DIR detected through SYNC > local STOP > NORMAL. The rule routes the button only; physical DIR, STOP and REV remain local and independent.

10.1 Context decides what MODE controls

MODE does not execute the same command in every condition. Before interpreting a press, firmware reads the active physical context in this order: REV, DIR, STOP and then NORMAL.

ACTIVE CONTEXT

REV active

MODE ACTION

One short press selects the next available REV profile.

PROTECTION RULE

REV owns the button even if DIR or STOP is also active. Held and multiple presses are ignored.

ACTIVE CONTEXT

REV off + DIR active

MODE ACTION

One short press selects the next directional sequence. A held press selects the next sequence-speed level.

PROTECTION RULE

DIR owns the button even if STOP is active. Auxiliary multi-click commands are ignored.

10 · CONTINUED

Lighting Modes

ACTIVE CONTEXT

REV and DIR off + STOP active

MODE ACTION

One short press selects the next available STOP profile.

PROTECTION RULE

Held and multiple presses are ignored so brake behavior cannot accidentally trigger another family.

ACTIVE CONTEXT

NORMAL

MODE ACTION

One press: DRL. Two: EXP / Angel. Three: Emergency cycle including OFF. Held press: Welcome.

PROTECTION RULE

Normal commands are available only when REV, DIR and STOP are not owning the button.

10.2 Current validated profile references

The validated firmware baseline includes named STOP references such as OEM Solid, Reactor Pressure and GLight Dual Core, and REV references such as OEM Solid, Reactor Guidance and Alien Horizon. These names document the validated baseline; they do not define a permanent maximum number of profiles.

10.3 Visual functions

Directional sequences, DRL, Welcome, EXP / Angel and AUX / EMERGENCY can create progressive fills, sweeps, breathing, presentation sequences, warning behavior or other approved visual responses according to firmware and installation.

10.4 Relationship with OEM signals

10 · CONTINUED

Lighting Modes

POS, DRL_SW, DIR, STOP and REV are real vehicle references. Visual profiles may be paused, dimmed, replaced or redirected so that the installed vehicle functions remain clear and understandable.

10.5 Synchronized selections

Compatible mode selections and sequence speed can be coordinated through SYNC. Synchronizing a selected profile does not turn SYNC into the source of the physical STOP or REV signal.

10.6 Future firmware growth

Adding a profile in a later firmware revision does not change the meaning of the button map. A short press still advances within the profile family assigned to the active context.

10.7 Important note

MODE may change visual behavior, but it must never make DIR, STOP or REV weak, delayed or ambiguous. The installer must validate the real lamps after every firmware or configuration change.

11.0

DRL / POS Function



DRL / POS allows GLightOne Base to manage daytime lighting, presence lighting and position-related behavior through real vehicle signals and internal logic.

DRL is an active visual function. POS is a reference for vehicle lighting state. They are related but not the same.

DRL_SW is the dedicated physical control for DRL and is activated by 12 V.

When DRL_SW is active, the module may enable or manage the DRL behavior configured in firmware.

When POS is active, the system may change brightness, presence behavior, night behavior or another state defined by firmware. POS does not necessarily replace the OEM position-light function.

DRL must not block priority signals. DIR must remain visible and dominant, STOP must remain clear, and REV may modify the visual response when installed.

In synchronized systems, DRL can be coordinated by SYNC while all modules share common GND.

Use DRL / POS to create clean presence lighting without compromising turn, brake or reverse signals.

12.0

DIR / Turn Signal Function



DIR allows GLightOne Base to respond to the vehicle turn signal and execute a directional visual behavior.

v1.3 - DIR can own MODE because it is active locally or because a compatible companion reports active DIR through SYNC. Remote detection changes sequence or speed selection only; it does not illuminate the local turn signal.

DIR is a priority signal. Its purpose is to keep the turn indication clear and visible over DRL, decorative effects or auxiliary modes.

When DIR is active, the module may run a directional sequence, sweep, flow pattern or firmware-defined response. DRL, EXP, AUX or other visual effects may be dimmed, paused or replaced temporarily.

With DIR active, MODE changes the directional sequence with a short press and changes sequence speed with a long press. Multiple auxiliary presses are not used during DIR active state.

In paired or synchronized installations, the installer must verify left/right assignment, sequence direction, SYNC behavior and return to normal state. SYNC must not create a wrong or confusing turn indication.

Before driving, verify that DIR activates the correct side, remains stable during blinking and is not hidden by any visual mode.

13.0

REV / Reverse Function



REV allows GLightOne Base to respond to the vehicle reverse signal through a dedicated local input and the OUT REV low-side output.

REV is a physical functional layer. It is read locally by the module controlling the reverse-related lamp and does not depend on a SYNC state packet, a running animation or a remote decision.

13.1 MODE behavior while REV is active

REV has the highest MODE-button context. One short press selects the next available REV visual profile, even if DIR or STOP is active at the same time. Held and multiple presses are ignored in this context.

13.2 Useful illumination

A REV profile must preserve useful reverse illumination. Animated profiles are designed around high-output levels and must not create long dark intervals that compromise the purpose of the lamp.

13.3 Validated baseline references

Current validated references include OEM Solid, Reactor Guidance and Alien Horizon. The firmware library may expand; these names are examples of the validated baseline and not a fixed product limit.

13.4 Synchronization and coexistence

The selected REV profile may be synchronized between compatible modules. The physical REV input remains local. REV can coexist with STOP and DIR; the final installation must remain visually understandable.

If REV is not part of the installation, the input and output may remain unused and this is not considered a module fault.

14.0

STOP Function - Safety First



STOP allows GLightOne Base to respond to the vehicle brake signal through a dedicated local input and the OUT STOP low-side output.

STOP is a safety-related physical layer. Its response is updated locally and continuously; it does not wait for a directional sequence to finish and does not depend on a remote SYNC state packet.

14.1 MODE behavior while STOP is active

STOP owns the MODE button only when REV and DIR are both inactive. In that context, one short press selects the next available STOP profile. Held and multiple presses are ignored.

14.2 Brake clarity

STOP profiles must remain clear, immediate and recognizable. They may use controlled compression or signature transitions, but they must not become a fast decorative strobe and must settle into a stable brake indication.

14.3 POS relationship

When configured by firmware, OUT STOP may retain a reduced position-light level while POS is active and return immediately to the selected brake response when STOP is asserted.

14.4 Validated baseline references

Current validated references include OEM Solid, Reactor Pressure and GLight Dual Core. Future firmware may add or refine profiles without changing the contextual button logic.

14.5 Synchronization and coexistence

14 · CONTINUED

STOP Function - Safety First

The selected STOP profile may be synchronized between compatible modules. The physical STOP input remains local. STOP can coexist with DIR and REV; no other visual layer may obscure brake clarity.

STOP must be tested on the real load before vehicle use, including activation, release, POS behavior, MODE selection, coexistence with DIR/REV and return to normal operation.



15.0

Master / Slave Synchronization

GLightOne Base supports paired and multi-module installations using a Master / Slave role defined by wiring. All standard modules use the same base PCB and main firmware.

v1.3 - SYNC shares compatible selections and a short collective DIR-context query. It does not generate DIR, STOP or REV. Every module still responds to its own physical safety inputs.

The Master normally receives MODE and DRL_SW and sends compatible visual selections through the dedicated SYNC line. Other modules apply the synchronized selection to their own outputs.

15.1 What SYNC can coordinate

- ◊ Directional sequence selection and sequence-speed level.
- ◊ DRL, EXP / Angel, Emergency and Welcome selections according to firmware.
- ◊ STOP and REV profile selection, so compatible modules use the same visual profile.

15.2 What remains local

The actual physical activation of STOP and REV remains local to the module wired to those vehicle inputs. Visual selections may sync; safety-related physical signals stay local and fast.

During reception of a SYNC packet, selected visual layers can hold their last physical PWM value so the packet does not reset or visibly disturb DRL, EXP or Emergency behavior.

15.3 Wiring rules

15 · CONTINUED

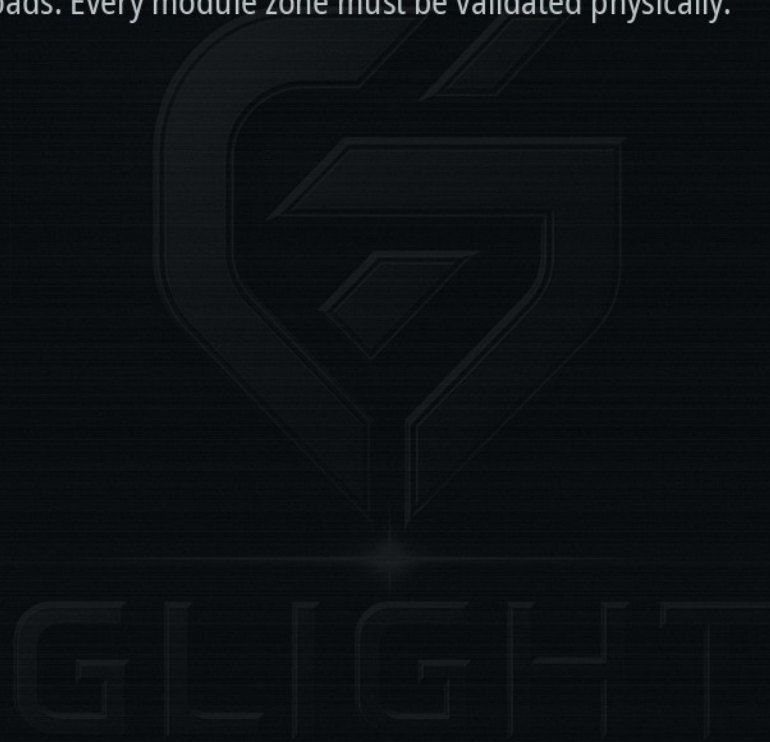
Master / Slave Synchronization



SYNC is a signal line, not power. Modules require common GND. Never apply +12 V to SYNC, and do not connect it to LED outputs, OEM high-current lines or external loads.

Only one main MODE/DRL_SW control point should exist in a standard installation unless a special configuration has been explicitly designed and validated.

SYNC cannot correct inverted left/right wiring, wrong lamp assignment or incompatible loads. Every module zone must be validated physically.



16.0

MODE Button



MODE is the main physical button for selecting visual behavior. It is not a power input and it is not a universal command independent of context.

v1.3 - MODE context is latched at the start of the gesture. A short press in DIR context selects the next sequence; a long press selects the next speed. DIR context may come from local DIR_IN or a synchronized companion, but each module executes DIR only from its own local DIR_IN.

16.1 Electrical connection

MODE is active to GND. Connect one side of a momentary push button to MODE and the other side to GND. Never apply +12 V to MODE and never connect it to an LED output or OEM power line.

16.2 Contextual command map

Button priority: REV > DIR > STOP > NORMAL. This priority routes MODE commands only. STOP, REV and DIR may continue to exist and operate at the same time.

CONDITION WHEN THE PRESS IS EVALUATED

REV active

SHORT PRESS

Next available REV profile.

HELD PRESS / MULTIPLE CLICKS

Ignored to prevent accidental changes outside REV.

16 · CONTINUED

MODE Button

CONDITION WHEN THE PRESS IS EVALUATED

REV off, DIR active

SHORT PRESS

Next directional sequence.

HELD PRESS / MULTIPLE CLICKS

Held press: next sequence-speed level. Multiple clicks ignored.

CONDITION WHEN THE PRESS IS EVALUATED

REV and DIR off, STOP active

SHORT PRESS

Next available STOP profile.

HELD PRESS / MULTIPLE CLICKS

Ignored to protect brake-related operation.

CONDITION WHEN THE PRESS IS EVALUATED

NORMAL

SHORT PRESS

1 click DRL; 2 clicks EXP / Angel; 3 clicks Emergency cycle including OFF.

HELD PRESS / MULTIPLE CLICKS

Held press: next Welcome profile. Unsupported click counts produce no command.

16.3 How to operate the button

Use deliberate presses. For a single click, press and release once, then allow the short multi-click recognition window to finish. For two or three clicks, use distinct presses within the recognition window. For a held command, keep the button pressed until the firmware recognizes the hold.

The exact number of profiles available in any family is firmware-defined. Reaching the last available profile returns selection to the beginning of that family.

16 · CONTINUED

MODE Button



16.4 Memory

Compatible selections are stored in EEPROM after the interaction has settled. Current firmware preserves sequence, sequence speed, Welcome, DRL, STOP and REV selections. Emergency and EXP behavior follow their defined firmware rules.

16.5 Master / Slave use

MODE is normally connected only to the Master. Compatible visual selections can be sent through SYNC, while the local physical STOP and REV inputs retain authority over their own lamp outputs.

16.6 Validation

- ◊ With REV active, confirm that one short press changes only the REV profile.
- ◊ With REV off and DIR active, confirm short-press sequence selection and held-press speed selection.
- ◊ With REV and DIR off and STOP active, confirm that one short press changes only the STOP profile.
- ◊ With REV, DIR and STOP inactive, confirm DRL, EXP / Angel, Emergency and Welcome commands.
- ◊ Confirm that held or multiple presses in STOP/REV context do not trigger unrelated functions.

If MODE behaves unexpectedly, verify the real state of REV, DIR and STOP before diagnosing the button. The active context determines the command.

17.0

Optional TFT Lite Interface



TFT Lite is an optional visualization and technical control layer for compatible GLightOne Base versions.

GLightOne Base remains an autonomous module. Its main operation is handled by physical inputs, OEM signals, MODE, LED outputs, SYNC and internal firmware logic.

TFT Lite may display system states, active modes, selected functions or touch controls depending on firmware. It can help during installation, validation, demonstration or advanced use.

TFT Lite must connect only to the pads or area identified as TFT Layer, following compatible orientation, wiring and GLight instructions. It must not be connected to unrelated pads or external devices.

In multi-module systems, TFT Lite is normally connected to the Master or main control point. It may coexist with MODE and with OEM signals; the firmware keeps priority signal response under control.

The screen must be installed safely, visible and protected, without blocking driver view, original controls, airbags or safety elements. It must not distract the driver.

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Firmware and Version Control

GLightOne Base uses dedicated GLight firmware to control physical inputs, PWM outputs, visual profiles, synchronization, EEPROM persistence and interaction with vehicle signals.

Firmware reference for this revision: G1_ANYDIR_P1.ino - GLightOne v6.34 ANY-DIR P1 / CLOCK PRESERVE, physically validated for distributed DIR context and preservation of DRL, EXP and EMG timing.

The documented firmware baseline for this revision is 6.31 PRODUCT - VISIBLE STOP/REV MODES, physically validated on the Golden Pair.

The standard commercial product is delivered with firmware installed, tested, registered and protected according to GLight production procedures. Source code is not supplied as an end-user editable file.

Compatible EEPROM data preserves selected sequence, sequence speed, Welcome, DRL, STOP and REV profiles. The firmware validates stored values against the available library before using them.

The profile library may expand or be refined in later firmware. Such growth does not change the electrical MODE connection or the contextual routing rule REV > DIR > STOP > NORMAL.

Commercial units may include readout protection, lock bits, security seals, serial identification and other anti-copy or traceability measures.

Unauthorized reading, modification or replacement may cause incorrect behavior, service requirement or warranty loss.

Special firmware variants for approved projects remain controlled product versions. Master / Slave role is defined by installation and not by a different PCB or a different basic firmware family.

18 · CONTINUED

Firmware and Version Control

Any programming, recovery or update procedure must be specifically authorized by GLight and linked to the correct hardware revision, serial record and configuration.



19.0

Validation Checklist



After installation, firmware update or authorized service, validate every installed function on the real loads before delivery or public-road use.

Validation required: test MODE with local DIR and with DIR active only on a synchronized companion. Confirm that the same DIR family is selected, that local turn-signal activation still depends on each module's own DIR_IN, and that DRL / EXP / EMG resume without phase disruption.

- Inspect PCB, pads, soldering, isolation, wire protection, mounting, polarity and possible shorts before applying power.
- Verify +12 V, GND, external fuse, stable supply and common GND between synchronized modules.
- Verify every low-side output: LED positive to the correct supply and LED negative to the assigned GLightOne output.
- Verify DRL_SW, POS and DIR if installed. DIR must activate the correct side and remain clear.
- Verify REV input and OUT REV if installed. Test every available REV profile and confirm useful illumination throughout each profile.
- Verify STOP input and OUT STOP if installed. Test every available STOP profile, POS base level if used, immediate activation and stable brake clarity.
- Validate MODE in all four contexts: REV, DIR, STOP and NORMAL. Confirm that the exclusive context map matches the documented behavior.
- Verify EXP / Angel, Emergency and Welcome selections if enabled in the configuration.

19 · CONTINUED

Validation Checklist

- In multi-module installations, verify synchronized visual selections, sequence speed, common GND and correct zone assignment.
- Confirm that removal or failure of SYNC does not prevent a locally wired STOP or REV lamp from responding.
- Verify TFT Lite only if included, while confirming that physical signals remain valid without the screen.
- After each signal is removed, verify a clean return to the expected previous or normal state.

No installation is complete until all connected functions are physically tested under realistic voltage, load and signal conditions.

20.0

Recommended Installation



Install GLightOne Base in a protected, dry, secure and accessible area. Avoid water, constant condensation, extreme heat, oil, chemicals, severe vibration, impacts and moving parts.

Use the silkscreen as the main connection reference. Every pad must be used only for its indicated function. Do not reuse unused pads for improvised signals or power.

Solder wires cleanly and firmly to the pads. Avoid solder bridges, cold joints, conductive residue and mechanical stress on pads. Use strain relief and wiring protection whenever necessary.

Power must respect polarity: +12V to the +12V pad and reliable GND to the GND pad. Use an appropriate external fuse close to the source and choose wire gauge according to load.

Keep wiring organized and protected from heat, friction, sharp edges and movement. Separate power lines, LED outputs and control signals when possible.

Connect POS, DIR, DRL_SW, REV and STOP only to verified compatible vehicle signals. Measure unknown OEM points before connection.

MODE must be installed as a button to GND. SYNC must be used only as synchronization between compatible modules and must never receive +12 V.

LED outputs, OUT STOP, OUT REV, EXP and AUX control the negative / GND side of their loads. They must not be used as positive supply or signal inputs.

TFT Lite, if installed, must connect only to the TFT Layer area and be placed safely without obstructing driving or safety systems.

20 · CONTINUED

Recommended Installation

External connectors may be used in the vehicle harness outside the module, but they do not change the electrical function of each soldered pad.

Before final closure of panels or covers, perform a functional test of power, GND, connected inputs, outputs, MODE, SYNC, TFT Lite and all installed functions.



21.0

Common Errors and Basic Diagnosis



Diagnosis should begin with power, ground, wiring, pads, real signal states and connected loads before assuming an internal module defect.

If MODE does not recognize DIR from the other module, check common GND, SYNC continuity, compatible firmware and active DIR_IN on at least one module. Do not diagnose this by applying +12 V to SYNC.

- ❖ Module does not power on: verify +12 V, GND, polarity, fuse, voltage drop, wire gauge and solder joints.
- ❖ Intermittent behavior: inspect weak ground, cold solder, loose splice, wire movement, vibration, humidity, corrosion and overload.
- ❖ Wrong pad or polarity: verify the physical silkscreen and official pinout before powering again.
- ❖ LED output used as positive: GLightOne outputs control the negative/GND side; the load requires its correct positive supply.
- ❖ MODE does not respond: verify button-to-GND wiring, Master location, clean release and the actual active context.
- ❖ MODE selects an unexpected family: check whether REV, DIR or STOP is physically active. The button follows REV > DIR > STOP > NORMAL.
- ❖ MODE does not change STOP or REV profile: confirm that the corresponding input is active and that higher-priority context is not owning the button.
- ❖ REV or STOP output appears delayed: inspect local input wiring and load. Physical activation does not require a SYNC state packet.

21 · CONTINUED

Common Errors and Basic Diagnosis

- ⚙ SYNC issue: verify common GND, continuity, correct role and no +12 V on the line. Remember that SYNC coordinates selections, not the local authority of STOP/REV.
- ⚙ TFT Lite issue: verify TFT Layer connection, compatibility, orientation, firmware and touch configuration if applicable.
- ⚙ Strange resets or memory behavior: verify supply stability, ground, load current, floating inputs, moisture and unauthorized programming.

Stop testing immediately if there is smoke, burning smell, abnormal heat, repeated fuse opening, severe voltage drop or visible damage.



22.0

Warranty, Support and Limitations



The warranty and support of GLightOne Base are intended to protect the user against verifiable product defects while protecting GLight from damage caused by incorrect installation, unauthorized handling, use outside specification or system intervention.

The warranty may cover manufacturing defects, verifiable internal failures or product-attributable problems under normal use and correct installation. GLight may evaluate each case before approving repair, replacement or warranty support.

For support, GLight may request serial number, security seal condition, model, kit type, purchase or delivery date, photos, video, +12V and GND measurements, connected load type and description of the used signals.

The warranty does not cover incorrect installation, bad soldering, lifted pads, reverse polarity, external short circuits, overload, moisture, water, oil, chemicals, extreme heat, vibration, impacts, physical modification, unauthorized tools or use outside specification.

It also does not cover damage caused by applying +12 V or wrong voltage to MODE, SYNC, LED outputs, OUT STOP, OUT REV, TFT Layer or any other non-power pad.

External LED loads, vehicle wiring, fuses, splices, external connectors, accessories, third-party installation and incompatible external components are outside the module warranty unless applicable law requires otherwise.

Firmware, internal memory and protected configuration are part of the product. Unauthorized attempts to read, extract, copy, modify, overwrite or replace firmware may limit or void warranty support.

The security seal and serial number support traceability. They must not be removed, altered, covered, forged, transferred or duplicated.

22 · CONTINUED

Warranty, Support and Limitations

GLightOne Base is part of the GLight technical platform. Hardware, firmware, architecture, functional behavior, documentation, visual identity, configurations, implementation methods and commercial protection elements are GLight intellectual property. Purchase grants product use within its intended purpose, not rights to firmware, source code, design, brand, methods, production tools or platform exploitation.

This warranty applies without prejudice to any mandatory user rights under the applicable laws of the country or region.



23.0

Safety and Use Warnings



GLightOne Base is a specialized automotive electronic module. It must be installed, powered, used and validated according to technical documentation, silkscreen marking, connection pads and purchased configuration.

Power must be disconnected during installation, soldering, pad inspection, wiring modification or load connection. Do not solder, cut or move wires while the system is powered.

+12V must only be applied to the +12V pad. GND must be reliable. Do not reverse polarity and do not apply +12 V to signal or output pads.

Each pad must be used only as indicated. MODE, SYNC, POS, DIR, DRL_SW, REV, STOP and TFT Layer must not be used as improvised power points.

LED outputs and special outputs control the negative / GND side of loads. Unknown, overloaded, short-circuited or out-of-spec loads must not be connected.

MODE must be a button or control to GND and must never receive +12 V. SYNC must be used only between compatible modules, with common GND, and must never receive +12 V.

REV, STOP, EXP, AUX, SYNC and TFT Lite are optional depending on the defined installation. If they are not used, do not connect them in improvised ways.

TFT Lite, if installed, must not block driving, driver visibility, original controls, airbags or safety elements, and must not distract the driver.

Protect the module from water, excessive humidity, corrosion, mud, oil, chemicals, extreme heat, severe vibration, impacts and moving parts. Use strain relief on soldered wires.

23 · CONTINUED

Safety and Use Warnings

Do not interfere with airbags, brakes, steering, ECU, sensors, ABS, fuel lines or other critical vehicle systems. Measure and confirm OEM signals before connection.

Visual functions must comply with local laws. Some colors, intensities, sequences or special modes may not be allowed on public roads.

Do not continue using the system if there is smoke, burning smell, abnormal heat, repeated fuse blowing, strong voltage drop, severe erratic behavior, damaged pads or shorted LED loads.

Do not connect programmers, reading tools or unauthorized external interfaces. Firmware is a protected part of the product.

The system should be installed by a person with basic knowledge of automotive electricity, soldering, polarity, signal measurement and wiring protection. Test all connected functions before driving.



GLIGHT

24.0

Final Specifications and Technical Summary

GLightOne Base is a 12 V automotive visual-control module that combines protected physical inputs, low-side LED outputs, contextual MODE control, synchronization and persistent firmware configuration.

Revision 1.3 adds distributed DIR-context recognition for MODE while preserving local physical authority of DIR, STOP and REV. It also formally supports consecutive LED channel configurations LED1...LEDn.

Commercial name: GLightOne Base. Platform: GLight. Primary application: coordinated automotive LED behavior, DRL, direction indication, position response, reverse response, brake response, synchronization and approved auxiliary functions.

Architecture: autonomous hardware and firmware. Master / Slave role is defined by installation. TFT Lite is optional and does not replace base operation.

MODE control: active to GND and interpreted by exclusive context REV > DIR > STOP > NORMAL. This is a button-command rule, not a global lamp-priority rule.

Physical safety layers: STOP and REV are local inputs with dedicated low-side outputs. Their activation remains local and fast; compatible profile selections may be synchronized.

Inputs may include POS, DIR, DRL_SW, REV, STOP, MODE, SYNC and optional system signals according to revision. Not every installation uses every input.

24 · CONTINUED

Final Specifications and Technical Summary

Outputs may include main sequence channels, DRL, OUT STOP, OUT REV, EXP and AUX / EMERGENCY. Outputs control the negative/GND side and are not positive 12 V supplies.

Firmware: GLight-developed, validated, version-controlled and protected. The visual profile library may evolve without changing the documented electrical connections or contextual button architecture.

Traceability: hardware revision, production record, serial number and security seal support service and authenticity.

Every installed function must be correctly wired, protected and physically validated before use. Operation remains subject to the product documentation, warranty conditions, applicable regulations and GLight intellectual-property protections.

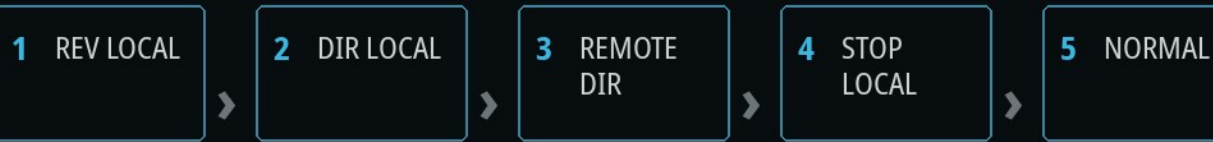
GLIGHT

MODE Button Interaction

CONTEXTUAL USER GUIDE



CONTEXT PRIORITY



Evaluated at gesture start: local REV > local or SYNC-detected DIR > local STOP > NORMAL

REV

- SHORT PRESS**
Next mode
- LONG PRESS**
No action

DIR

- SHORT PRESS**
Next sequence
- LONG PRESS**
Next speed

STOP

- SHORT PRESS**
Next mode
- LONG PRESS**
No action

NORMAL

- SHORT PRESS**
cycle DRL / 2 clicks: cycle EXP
- LONG PRESS**
cycle EMG / OFF / Hold: cycle Welcome

MODE Button Interaction

CONTINUED



CONDITION

The context is latched at the beginning of the gesture and does not change while the click or hold is being completed.

ANY-DIR

Remote DIR detection only selects what MODE controls. It never activates the turn signal remotely; each module executes DIR only from its own local DIR_IN.

NORMAL

- 1 click: cycle DRL
- 2 clicks: cycle EXP
- 3 clicks: cycle EMG / OFF
- Hold: cycle Welcome

GLIGHTONE – MODE BUTTON / USER INTERACTION GUIDE

GLT-ONE-BSE
DOC-UIR-01
REV 1.0 | MAY 2025

Button logic, context priority and user actions

THE MODE BUTTON

Used to cycle modes, sequences, speeds and Welcome behaviors based on the current context.



CONTEXT IS LATCHED

The button context is locked at the start of the gesture. If inputs change while holding or clicking, the action remains in the original context.

CONTEXT PRIORITY (evaluated at gesture start)



A REV CONTEXT

CONDITION
REV input active



1 CLICK
Cycle REV mode



LONG PRESS
(800 ms)
No action

B DIR CONTEXT

CONDITION
Local DIR active
OR any synced
remote DIR active



1 CLICK
Cycle sequence mode



LONG PRESS
(800 ms)
Cycle speed

C STOP CONTEXT

CONDITION
STOP active,
only when REV and DIR
are inactive



1 CLICK
Cycle STOP mode



LONG PRESS
(800 ms)
No action

D NORMAL CONTEXT

CONDITION
REV, DIR, and STOP
inactive



1 CLICK
Cycle DRL mode



2 CLICKS
Cycle EXP / Angel mode



3 CLICKS
Cycle EMG / Emergency
mode (includes OFF)



LONG PRESS
(800 ms)
Cycle Welcome mode



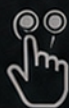
IMPORTANT NOTE

- Do not show fixed numbers of modes; always say "cycle mode" or "cycle through available modes".
- The logic stays valid even if more modes are added in firmware.

QUICK UNDERSTANDING — GESTURE REFERENCE



SINGLE CLICK
Press and release
quickly.



DOUBLE CLICK
Press twice
quickly.



TRIPLE CLICK
Press three times
quickly.



LONG PRESS
(800 ms)
Press and hold
for ~0.8 seconds.



Context priority is evaluated at press start. REV has highest priority. DIR can be local or synchronized from another GLightOne.

ENGINEERED BY GLIGHT