



UNMANNED AERIAL SYSTEMS

FPV PLATFORMS FOR MULTIPLE MISSIONS

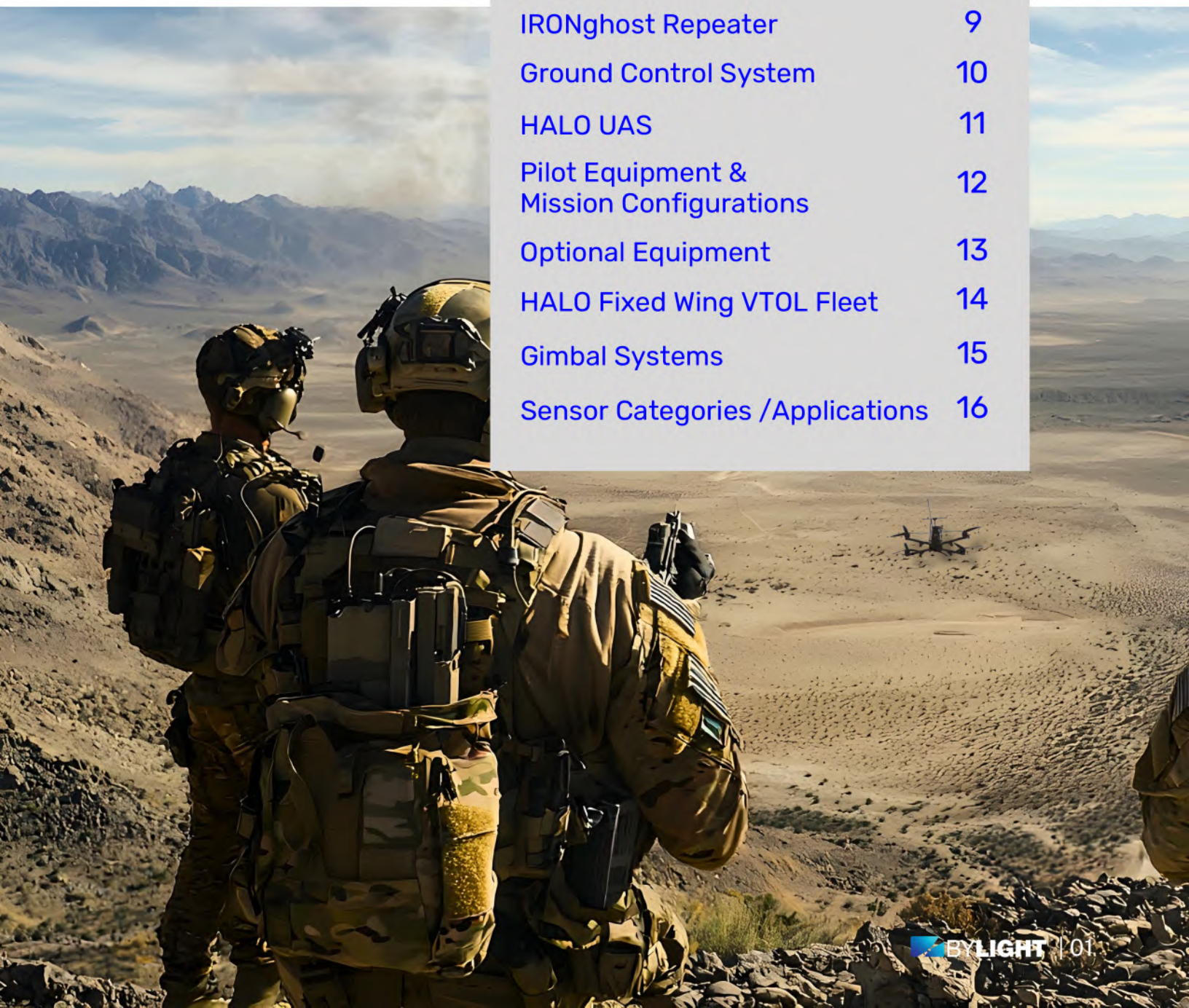



FOR INFORMATION

+1 (703) 224-1000 | info@bylight.com
8484 Westpark Dr., Ste. 600, McLean, VA 22102

TABLE OF CONTENTS

Overview	2
UAS Design & Engineering, Maintenance, Training	3
FPV Pilot Training Simulator	4
UAS Platforms & Specifications	5
MRM2-10	6
MRK1-8	7
MRM1-5	8
IRONghost Repeater	9
Ground Control System	10
HALO UAS	11
Pilot Equipment & Mission Configurations	12
Optional Equipment	13
HALO Fixed Wing VTOL Fleet	14
Gimbal Systems	15
Sensor Categories /Applications	16





BY LIGHT DELIVERS **INNOVATIVE UAS TO MILITARY WORLDWIDE**

By Light brings battlefield-relevant UAS designs, up-to-the-minute technology, rapid prototyping, and at-scale manufacturing to the marketplace. By Light offers unprecedented UAS expertise, mission performance in cutting-edge UAS design, proven ability to execute at scale, and compliance with Federal requirements. Our full-time, rapid prototype facilities at Virginia Beach, VA, and Fayetteville, NC, provide real-time direct support, onsite training, and customer collaborative design to the Department of Defense's (DoD) most demanding customers.

By Light understands the full spectrum of the military UAS mission: operational requirements; tactics; individual UAS pilot and unit collective training; maintenance and sustainment; and design and engineering. Our platforms reduce operational costs and increase mission effectiveness. We are changing the perception of the UAS industry with reliable platforms that feature long flight times and low acoustic signature while achieving multi-modal mission capability across air and water.



UAS DESIGN & ENGINEERING

By Light tailors proven designs to meet mission demands or integrates state-of-the-art technology to build wholly new Group 1, 2, or 3 platforms to your mission specifications.

Leveraging advanced manufacturing techniques, By Light's **Rapid Prototyping** capability provides mission-tailored solutions in hours instead of weeks.



MAINTENANCE & SUSTAINMENT

By Light platforms are engineered to be repairable by service members in austere environments.

These features are available on all By Light drones:

- Repair parts kits
- Tool-less assembly
- NDAA-compliant components
- Secure supply chain




TRAINING

Military training is a core By Light competency. By Light offers onsite, multi-level First Person View (FPV) Pilot Training as well as Maintenance and Repair courses.

The By Light FPV Pilot Training model features a 3-tier approach:

- By Light FPV simulator – Beginner
- Trainer 3-5" drones – Intermediate
- 8-10" mission drones – Advanced



FPV Pilot Training Simulator

- Multi-mission simulator supports basic, intermediate, and advanced pilot skill levels
- Realistic EW / jamming and other operational effects
- Terrain configurable to support more realistic training—including subterranean
- Suitable for mission rehearsal using actual objective terrain
- Train on all By Light UAS platforms
- Train with multiple munition types / weights
- Laptop-based

UAS PLATFORMS

By Light features an extensive catalog of military UAS platform solutions in wide use by US and European forces. All platforms are Vertical Take Off and Landing (VTOL) and can be flown from virtually any location –no airfield required. First Person View (FPV) piloting enables precision surveillance and strike operations.

- Autonomy and Autopilot enabled through common flight control software: ArduPilot, MAVLink, PX4, Betaflight, iNav as well as Tactical Assault Kit (TAK)
- Group 1 - 3 platforms optimized for over-ground, over-water, indoor, subterranean, and training applications
- State-of-the-art encrypted and Electronic Warfare (EW) resilient communications

By Light UAS Platforms Feature

- Mission-focused design
- First Person View or autonomous piloting
- Vertical Take-Off and Landing
- All carbon fiber, lightest weight construction
- Payload agnostic –integrating any kinetic or sensor payload
- Ultra low acoustic signature
- Tool-less assembly/Operator repairable
- EW-resilient, encrypted communications
- NDAA-compliant configurations available

IRONghost COMMAND & CONTROL RADIO

WAVEFORM	EW-resilient frequency-hopping, spread spectrum
FREQUENCIES	Dual sub-GHz (400 MHz/900 MHz bands) C2 link with 5.8 GHz analog video link (FPV video)
TRANSMISSION RANGE	Up to 30+ km LOS. Double operational range with IRONghost Repeater (see page 9)
STORAGE	Internal black box recorder, 32GB
ENCRYPTION	AES-128/256; secure pairing within 10 seconds
MISSION PLANNING	TAK integration

MRM2-10

10" MULTI-MISSION PLATFORM



MRM2-10 is a lightweight multi-role First Person View (FPV) multicopter UAV, designed and built for versatility, effectiveness, and cost efficiency. MRM2-10 comes equipped with an EW-resilient IRONghost control link radio operating on two sub-GHz bands and a 5.8 GHz analog video channel for FPV pilot video.

Built around a robust 10" prop airframe, the MRM2-10 provides an effective balance between vehicle form-factor, payload capacity, and range. Thanks to the IRONghost control link, the MRM2-10 can achieve unparalleled range with best-in-class EW performance.

- Robust carbon fiber body and arms
- 30x30 H743 FC with Betaflight, ArduPilot, iNav, and PX4 options
- 30x30 60A ESC with AM32 firmware
- Analog video transmitter operating on ISM 5.8GHz band
- Optional GPS, with integrated magnetometer and auxiliary barometric altimeter
- MAVLink support and ATAK integration with Tac.Ctrl tactical controller
- Foldable 5.8GHz video transmitter antenna, mounted clear of battery and payload

*** MRM2-10 comes in a foldable version



MRK1-8

8" MULTI-MISSION PLATFORM

MRK1-8 is a lightweight multi-role First Person View (FPV) multicopter UAV, designed for simplicity and cost efficiency, without compromising operational capabilities and effectiveness.

The MRK1-8 has been designed as a high-performance 8" quadcopter that can be easily and quickly assembled without any special tools, expert knowledge, or specific skills, while still ensuring professional-grade build yield and reliability.

- Quick operator assembly / disassembly
- Prop disc separated to clear larger payloads of up to 3kg, with correct center of gravity placement
- Three 30x30 stack mounts, allowing for companion computer and digital VTx mounting
- Camera: 4:3, 1200TVL, FOV-D 125°; low light camera suitable for night operations
- Motors: 2814, 880kV
- 100% conformally coated electronics for wet-weather operation
- Est. Range
 - >30km without payload, LOS
 - >22km with 1.5kg payload, LOS
 - >15km with 3kg payload, LOS

MRM1-5

5" MULTI-MISSION PLATFORM



The MRM1-5 is a robust multi-role platform designed to handle demanding scenarios where durability is essential. The MRM1-5 is available in two variants:

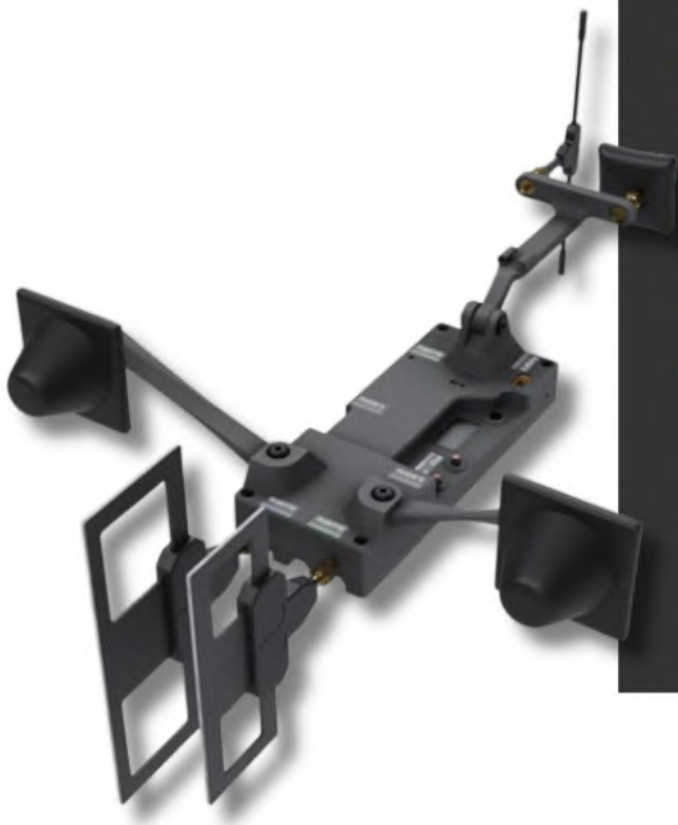
EW-RESILIENT IRONghost VARIANT

This version uses the IRONghost control link radio, operating on licensed sub-GHz bands, along with a 5.8 GHz analog video transmitter. Thanks to the IRONghost system, the MRM1-5 achieves exceptional range and best-in-class EW resilience.

GHOST PROTOCOL VARIANT

This variant employs a 2.4 GHz Ghost protocol for control, paired with a 5.8 GHz analog video transmitter, offering reliable performance in indoor and underground operating environments.

- Ideal for FPV Pilot training or Indoor operations
- 30x30 H743 FC with Betaflight, ArduPilot, iNav, and PX4 options
- 30x30 60A ESC with AM32 firmware
- GPS function
- MAVLink support and ATAK integration with Tac.Ctrl tactical controller
- Control link versions
 - EW-resilient dual sub-GHz IRONghost control link
 - Version with ISM 2.4 GHz control band



IRONghost REPEATER

The IRONghost Repeater is a fully integrated, easy-to-use control/telemetry and video repeater. Compatible with all IRONghost ground and air systems, doubles operational range, and enables beyond line of sight (LOS) missions.

GENERAL

- Power requirements: 2s-6s (7V -28V) via XT30 connector
- Total weight: 350g with 9xx and 4xx MHz Drone-Link antennas (without battery)

DRONE LINK

- Two control/telemetry radios, each with ~100MHz bandwidth, typically 850-950MHz and 400-500MHz
- 3W RF output power for control link
- EW-resilient IRONghost protocol
- 4.99 -6.02GHz frequency range-video link

GROUND LINK

- Extremely low harmonic content
- Integrated Dual-SubGHz Hybrid, with control/telemetry and video transmitter on board
- 25mW -1.5W video downlink

*** Ground based or air (drone) applications

GROUND CONTROL SYSTEM



A complete solution for tactical FPV UAS operations, our Ground Control System contains everything that is required for safe and reliable FPV mission deployments.

Displace radio modules up to 1 km from pilot for survivability.

All Pro-series equipment, ruggedized for military tactical operations.

- Tac.Ctrl Tactical Remote Controller
- IRONghost C2 radio 900/400 MHz
- IRONghost video link 5.8 GHz
- FPV.Pro goggles
- Tripod, cables, and tactical case



HALO PERSES FPV QUAD

Multi-Mission Fleet



- Modular/Serviceable system
- IRONghost C2 link
- Picatinny rail payload mount
- First Person View (FPV)
- Ultra light weight/All carbon fiber
- Foldable, waterproof
- Ready to fly in less than 1 minute
- Low acoustic signature

Perses Models & Payloads

3"	—	600g	10"	—	4.0kg
5"	—	900g	10" HL	—	5.5kg
8"	—	2.0kg	13"	—	6.0kg

HALO INDOOR TRAINER (HIT)



- Ideal for indoor & subterranean ops
- Multi-C2 band options available
- 700g payload for 4 minutes flight time
- LED flood/IR lighting

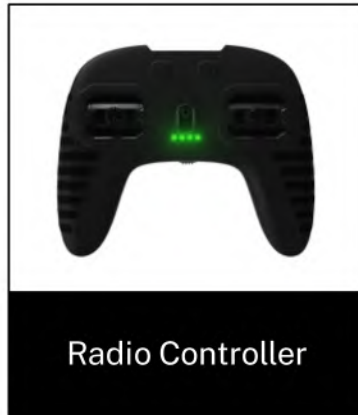
HALO-B1



- Fully autonomous capable
- Heavy duty motors/increased lift
- Extended loiter capability
- Ideal platform for:
 - ISR/Target ID
 - Retrans/Relay

PILOT EQUIPMENT

Every drone requires standard equipment for operation. Standard equipment is bundled with drones in ratios meeting customer requirements. Normal ratio is 1:5 – one set of pilot equipment with every 5 drones.

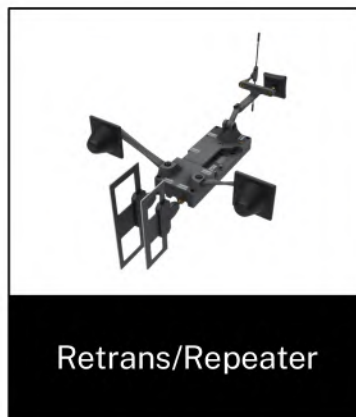


MISSION CONFIGURATIONS

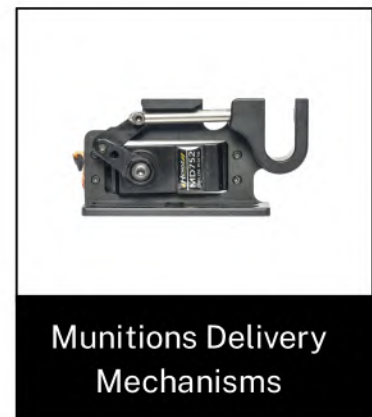
All Base model By Light UAS are useful for pilot training. Additional equipment must be added to enable specific tactical missions.



Multiple High-Definition (HD), Electro-Optical / Infra Red (EO/IR) Cameras available for observing enemy formations and target acquisition.



Repeater module doubles operational range and enables beyond-line-of-sight missions.



Multiple dropper, adapter, and triggering mechanisms are available to enable both one-way and drop-and-return kinetic strike missions.

OPTIONAL EQUIPMENT

Optional equipment enhances mission effectiveness in diverse environments.



Fiber Optic C2

Fiber Optic C2 solutions are for contested EW environments and underground operations. Available in lengths up to 20km.



Chest Mount Video Display

Chest mounted screens are preferred over FPV Goggles in many tactical situations. Chest displays come with flip-down adapter plates.



Repair Parts Kit

Parts kits contain highly expendable parts and enable soldiers to sustain operations without contractor support.



FIXED WING VTOL FLEET

Fixed-wing drones offer exceptional versatility and performance, featuring modular gimbals and payload bays that can be tailored to specific customer requirements. Their payload-agnostic design enables rapid integration of advanced sensor packages or kinetic payloads for multi-role missions, while superior range and fully autonomous operation allow for extended, persistent coverage with minimal operator input.

- Max flying time: 10hrs
- Cruise speed: 34m/s
- Max payload: 27kg
- Wingspan: 6.0m
- Electric lift motors
- Fuel injected cruise engine
- Starlink-enabled for beyond line-of-sight operations
- Multifunctional gimbal installable for advanced sensing

HALO-6 VTOL



- Max flying time: 3hrs
- Cruise speed: 21m/s
- Max payload: 3kg
- Wingspan: 3.5m
- All electric
- Low acoustic signature
- Starlink-enabled for beyond line-of-sight operations
- Multifunctional gimbal installable for advanced sensing

HALO-3.5 VTOL



- Max flying time: 1hr
- Cruise speed: 20m/s
- Max payload: 2kg
- Wingspan: 2.6m
- All electric

HALO-1 VTOL



GIMBAL SYSTEMS

Gimbal systems enhance a wide array of capabilities, including high-definition electro-optical (EO), infrared/thermal, multispectral, and LiDAR sensors. This enables advanced missions such as day/night ISR, mapping, target tracking, search and rescue, and environmental monitoring – all integrated for real-time, multi-sensor intelligence collection.



SENSOR CATEGORIES / TYPICAL APPLICATIONS

Many modern Group 2–4 UAS fuse multiple sensors in a multi-intelligence (Multi-INT) configuration — e.g., an EO/IR gimbal + LiDAR + SAR or an EO/IR + SIGINT pod. Data fusion enables AI-assisted ATR (Automatic Target Recognition) and real-time mission adaptation.

ELECTRO-OPTICAL (EO) SENSORS

- Daytime surveillance
- Mapping, object detection, and visual tracking
- Target recognition and post-strike assessment

INFRARED (IR) / THERMAL SENSORS

- Night operations
- Target detection through smoke/fog
- Search and rescue, fire detection
- Engine or human heat tracking

MULTISPECTRAL & HYPERSPECTRAL SENSORS

- Precision agriculture (NDVI, crop health)
- Mineral mapping
- Camouflage or concealment detection
- Environmental and oceanographic studies

LIDAR (LIGHT DETECTION AND RANGING)

- Terrain mapping and obstacle avoidance
- Vegetation canopy profiling
- Infrastructure inspection
- Autonomous navigation

RADAR SYSTEMS

- All-weather ISR
- Maritime surveillance
- Border security

GNSS & INERTIAL SENSORS

- Autopilot and waypoint navigation
- RTK/PPK precision mapping
- Attitude and heading reference systems (AHRS)

ENVIRONMENTAL & ATMOSPHERIC SENSORS

- Weather profiling
- Pollution monitoring
- Hazardous gas detection

ACOUSTIC & VIBRATION SENSORS

- Terrain mapping and obstacle avoidance
- Vegetation canopy profiling
- Infrastructure inspection
- Autonomous navigation

ELECTRONIC & SIGNAL SENSORS

- Electronic warfare (EW)
- Spectrum monitoring
- Emitter geolocation

SPECIALIZED / EMERGING SENSORS

- Counter-camouflage
- Material identification
- Urban reconnaissance

OUR CONTACT

Get in touch with us!



+1 703-224-1000



info@bylight.com



www.bylight.com

SILENT. SWIFT. SUPERIOR.

UNMANNED AERIAL SYSTEMS



8484 Westpark Drive
Suite 600
McLean, VA 22102

Copyright © 2025 By Light Professional IT Services LLC. All rights reserved.

CLT-159-01 | November 14, 2025



BYLIGHT