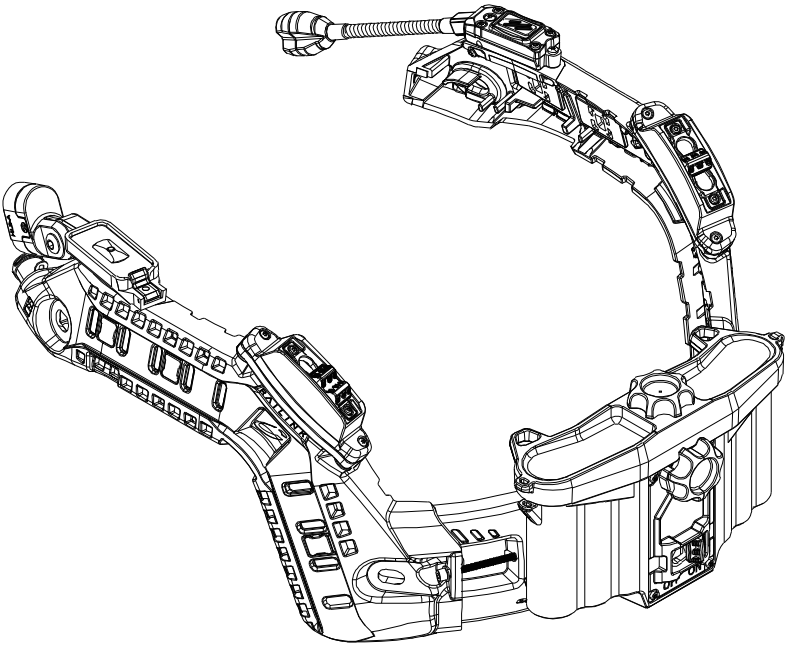
FMA®



LINK-RAIL

OPERATOR'S MANUAL

FMA® | INTRODUCTION

LINK-RAIL is an integrated power solution that forms the backbone of a rapidly developing, scalable headborne ecosystem. By integrating power distribution into a unified rail interface, LINK-RAIL delivers a higher level of system integration and modularity for modern headborne platforms.

With LINK-RAIL, users can seamlessly connect and power compatible accessories directly through the rail system, eliminating the need for additional batteries, external wiring, or complicated cable management. This streamlined architecture reduces overall system weight, improves reliability, and allows users to configure their equipment more efficiently based on mission or application requirements.

The LINK-RAIL platform was developed through extensive design iteration, validation, and testing, incorporating feedback from experienced end users and industry professionals across a wide range of operational and training environments. Emphasis was placed on durability, interface stability, ease of use, and long-term compatibility with future accessories.

As an open and scalable platform, LINK-RAIL is built to support an expanding ecosystem of next-generation accessories, enabling continuous capability growth of the headborne system without requiring fundamental hardware changes. LINK-RAIL represents a future-ready solution that enhances performance, adaptability, and system integration for professional users.

ABOUT LINK-RAIL

LINK-RAIL is a system that integrates mounting and power into a scalable headborne platform. It seamlessly integrates compatible, battery-free accessories through a centralized battery pack without the need for cable management.

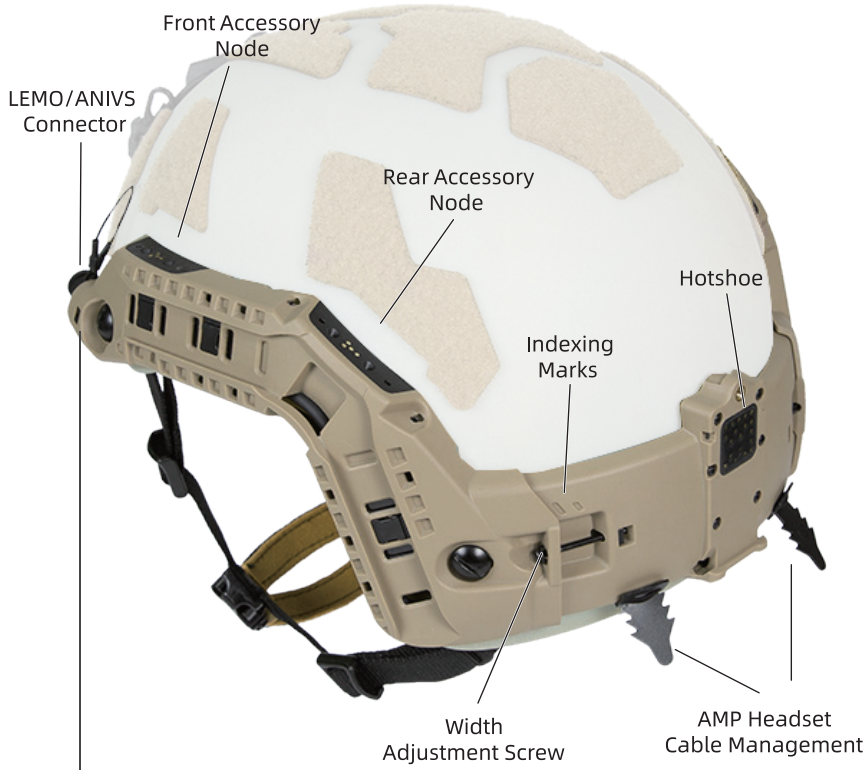
LINK-RAIL Rail

LINK-RAIL Battery Pack

Flashlight

Flexlight

Strobes



4-Pin LEMO / ANVIS Female Connector

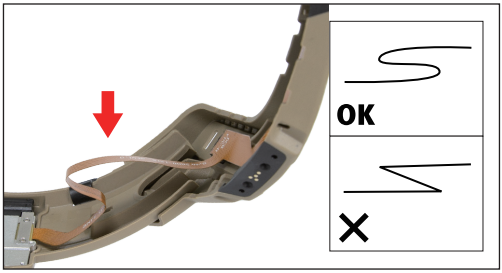
1 REMOVE EXISTING RAILS AND REAR VELCRO

Using a wide blade flat head screwdriver, unscrew and remove all four screws and t-nuts to remove the existing ARC Railsand shims (if present).This will also release the chinstrap anchors and rear fitband tabs. Remove the rear exterior loop from the helmet shell (recommended).

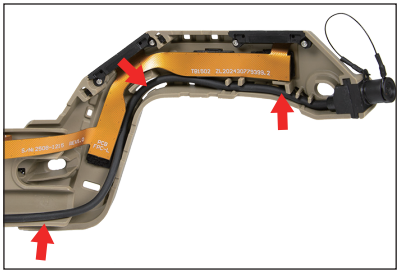
ENSURE PROPER INTERNAL COMPONENT ROUTING

Before assembling LINK-RAIL onto the helmet, gently compress the flat ribbon cable into a "S" shape. DO NOT put a sharp crease into the ribbon.Also,ensure the round cable is routed inside the interior channel of the rail.

RIBBON CABLE



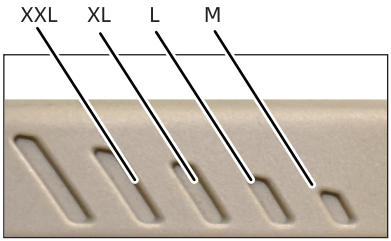
ROUND CABLE



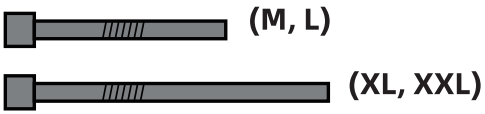
❷ ADJUST LINK-RAIL SIZING

Using a 3/32" ball end hex screwdriver, tighten or loosen the adjustment screws to slightly oversize the width of the LINK-RAIL assembly to the size of your helmet using the indexing marks as a reference.(For XL and XXL helmet sizes, usethe included longer adjustment screws).The width adjustment may vary for the same helmet size depending on modelof FAST helmet. Further adjustment may be needed when assembling LINK-RAIL onto the helmet.

INDEXING MARKS:

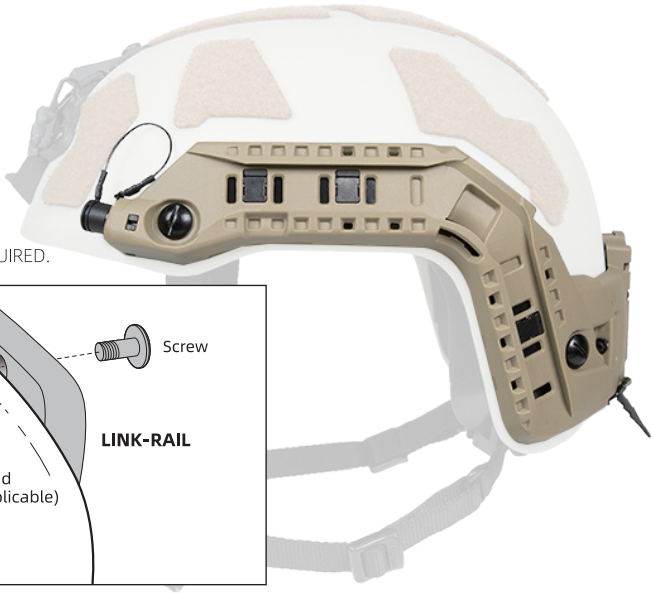


(approximates sizing, for reference only)

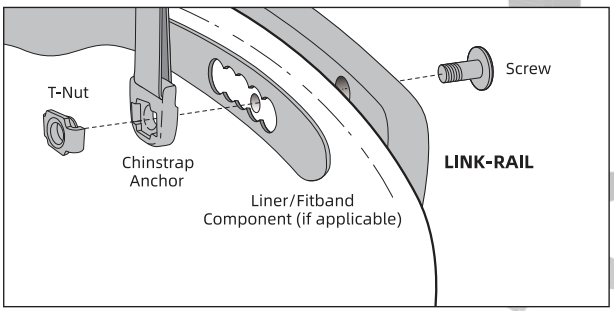


❸ Install the LINK-RAIL onto the helmet

Align LINK-RAIL with the existing chinstrap holes on the exterior of your helmet and **loosely assemble** the screws, chinstrap anchors, t-nuts and any liner/fitband components (if applicable) as they were before disassembling. Ensure screw passes through the opening for the appropriate size helmet on thefitband. Ensure flexible ribbon cable and round cable are not pinched by any part of the LINK-RAIL assembly.



NOTE:IN SOME INSTANCES,
ALTERNATE SCREW LENGTHS MAYBE REQUIRED.

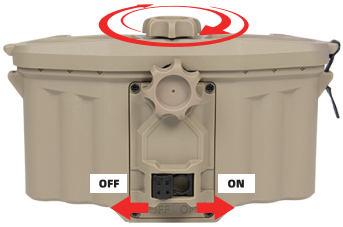


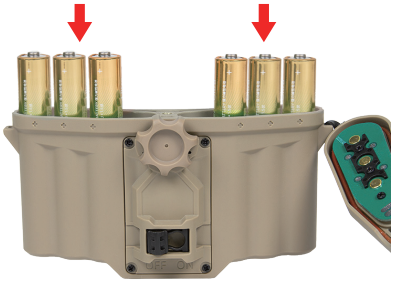
Tighten the front and rear screws, then alternately tighten the LINK-RAIL size adjustment screws, ensuring the hot shoe remains centered on the helmet at all times (refer to the index mark for alignment).

4 INSTALL BATTERIES (FOR AA BATTERY PACK)

Remove the top cover of the battery pack by loosening the screw and lifting it off. Install two, four, or six AA L91 Ultimate Lithium batteries as needed, ensuring all positive (+) terminals are facing upward. Reinstall the top cover onto the battery pack without fully tightening it at this stage.

NOTE: TIGHTENING THE TOP COVER COMPLETELY WILL PREVENT THE BATTERY PACK FROM ATTACHING PROPERLY TO THE HOTSHOE. OTHER BATTERY PACKS MAY HAVE DIFFERENT BATTERY INSTALLATION REQUIREMENTS. REFER TO THOSE INSTRUCTIONS SPECIFIC TO THE BATTERY IN USE FOR THIS STEP.

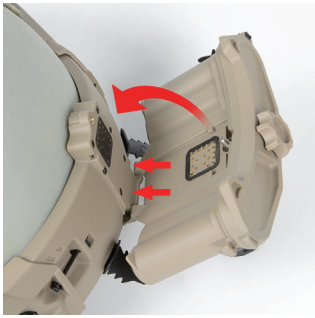


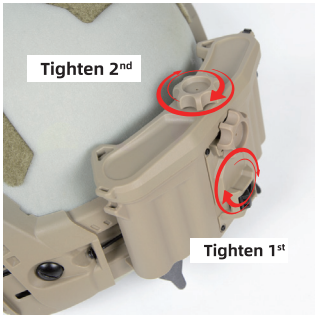


5 ATTACH BATTERY PACK TO LINK-RAIL HOTSHOE

Engage the lower battery pack mounting points into the hotshoe, tilt the battery pack into place and tighten the rear screw to affix the battery pack to the hotshoe. Then tighten the top cover screw to engage the secondary retention mechanism.

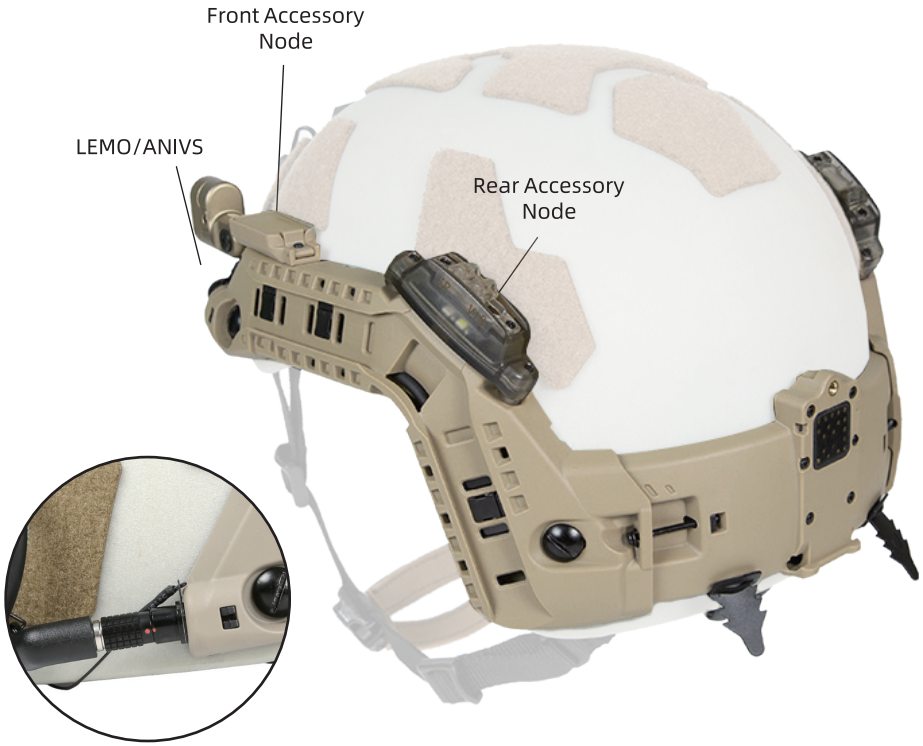
NOTE:FAILURE TO FOLLOW THIS SEQUENCE MAY RESULT IN AN IMPROPER SEAL, NONOPERATION OF THE BATTERY PACK OR DAMAGE TO THE BATTERY PACK AND/ OR HOTSHOE.





6 ATTACHING ACCESSORIES TO LINK-RAIL

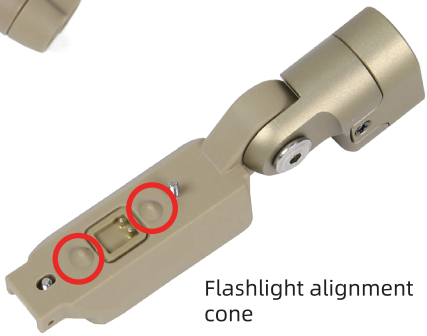
To connect the power cable to the LINK-RAIL interface, first remove the protective cap from the LINK-RAIL connector. Using the appropriate power cable for your system, align the index mark on the 4-pin LEMO connector with the corresponding index mark on the LINK-RAIL interface. Push the plug in until the contacts are fully seated, then rotate to lock the connector in position.



NOTE: PUSHING ON THE CONNECTOR WITH EXCESSIVE FORCE MAY RESULT IN DAMAGE TO THE LINK-RAIL CONNECTOR AND/OR THE POWER CABLE. ENSURE PROPER ORIENTATION OF THE CONNECTORS TO PREVENT PERMANENT DAMAGE TO THE LINK-RAIL CONNECTOR AND/OR POWER CABLE.

TO ATTACH FRONT OR REAR ACCESSORIES TO THE FRONT OR REAR ACCESSORY NODES, ALIGN THE ACCESSORY WITH THE CORRESPONDING NODE ON THE LINK-RAIL USING THE ALIGNMENT CONE, THEN TIGHTEN SECURELY.

Flexlight alignment cone



Flashlight alignment cone

Strobe alignment cone

Device

Parameter

Operating Temperature: -20℃~40℃
Electrical Box Input Voltage: 3.3V
Device Interface Output Voltage: 3.3V
Ingress Protection: IPX7
Support for NVG: Requires separate power cable
Weight: 215g（Excluding devices）
Size: M/L/XL/XXL FAST Helmet System
Colors: BK、TAN
Material: Nylon

The interior of the guide rail uses a flexible FPC ribbon cable with fully copper-clad shielding to protect the circuit. The electrical box connects to the guide rail via a contact interface, and the guide rail system's circuits are transmitted through the ribbon cable to various device interfaces on the rail, providing power and communication to the devices.

Operating Temperature: -20℃~40℃
Voltage: 3.3V
LED Strobe: 3mA (Low), 30mA (High)
IR Strobe: 3mA (Low), 30mA (High)
Ingress Protection: IPX7
Weight: 12g(Single unit)
Colors: Transparent Black
Material: ABS

1、Power Mode
Slide Switch: 0-1-2 (Off - Low - High)

2、Lighting Mode
Slide Switch: IR-VIS (IR Strobe - White Light Strobe)

Operating Temperature: -20℃~40℃
Voltage: 3.3V
LED Current: Low 60mA / High 300mA
LED Illumination: Low 10 LM / High 60 LM
IR Power: Low 10mW / High 40mW
IR Current: Low 60mA / High 300mA
Ingress Protection: IPX7
Weight: 29.5g
Colors: BK、TAN
Material: Housing Nylon / Lens Head AL6061

IR Mode
1.（<3s）Quick Press Low → High → Off
2.（≥3s）Turns the device off from any state
3. Switches to LED Low mode from any state

LED Lighting Mode
A Hold for Low → (<3s) Quick Press to High → Quick Press to Off
B From High → Hold to Low → (<3s) Quick Press to High
C(≥3s)：Turns the device off from any state

Device	Parameter
	Operating Temperature: -20℃~40℃ Voltage: 3.3V Red Light Current: Low 10mA / High 50mA Red Light Illumination: Low 1 LM / High 3.5 LM IR Current: Low 10mA / High 50mA IR Power: Low 5mW / High 20mW Ingress Protection: IPX7 Weight: 18g Colors: BK、TAN Material: Nylon

IR Mode
1.(<3s) Quick Press Cycles through: Low → High → Off
2.(≧3s) Instantly turns off from any state
3.Switches to Red Light (Low) mode from any state

2、Red Light Mode
A Hold for Low → (<3s) Quick Press to High → Quick Press to Off
B From High → Hold to Low → (<3s) Quick Press to High
C(≥3s): Turns the device off from any state

	Operating Temperature: -20℃~40℃ Output Voltage: 3.3V Power: 9W Battery: 1.5V AA/ 6pcs Runtime at Full Power: 8h Weight: 165g(excluding batteries) Ingress Protection: IPX7 Colors: BK、TAN Material: Nylon

Switch Operation: Slide Switch: Push to OFF (Power Off) - Push to ON (Power On)
*Note: After replacing the battery, the
switch needs to be slid back to the "ON" position to power on.

Compatibility: For power connection to NVG
Interface: 4-pin FISCHER male connector
Length:400mm (including connector)
Color: Black

4-pin FISCHER male connector, power usage for night vision devices and other external equipment

Compatibility: For power connection to NVG mount
Interface: 4-pin LEMO male connector
Length:300mm(including connector)
Color: Black

4-pin LEMO/ANIVS male connector, power usage for night vision devices and other external equipment