PIC®
WIRE & CABLE

EVOLVING INNOVATION

HOW A TAILORED SOLUTION BENEFITS AN ENTIRE INDUSTRY

Market trends continue to show demand for increased efficiency with a decrease in downtime and operational costs. One solution is to eliminate the need for safety wires using self-locking connectors.



November 2026

The Industry Standard

For decades, using safety wire (or lockwire) to secure critical connections on aircraft has been the standard method for Original Equipment Manufacturers (OEMs), federal agencies that support government and military, and business jet service centers. However, by utilizing safety wire, the current market faces these fundamental issues:

- High Labor Costs & Time Consumption
Safety wiring is a manual, labor-intensive process that adds significant time and cost to installation and maintenance.

- Risk of Foreign Object Debris (FOD)
Improperly secured or cut safety wire can become FOD, posing a critical safety hazard in sensitive aerospace environments.

- Reliability Concerns
While intended for reliability, human error in safety wire can lead to inconsistent application and potential connection failures.

- Maintenance Complexity
Removing and re-applying safety wire during routine checks or component replacement is cumbersome and time-consuming.

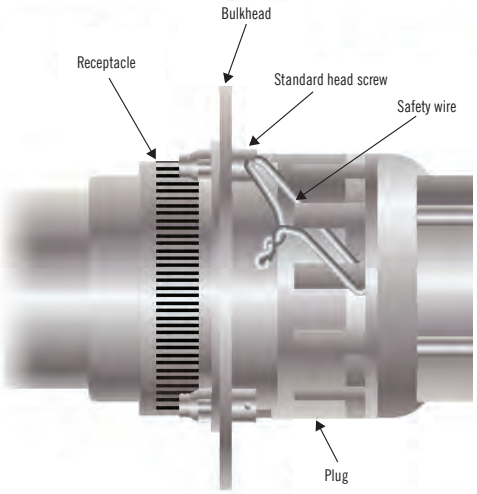
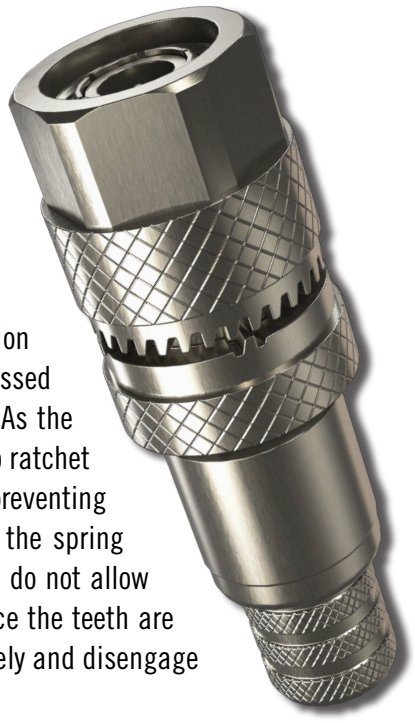


Figure - Safety wiring attachment for plug connector example (source: avstop.com)

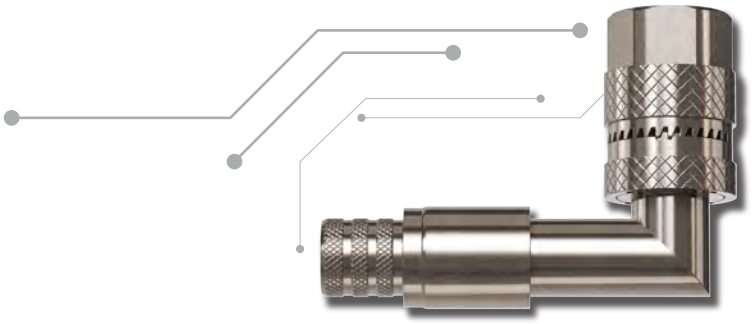
Market trends continue to show demand for increased efficiency with a decrease in downtime and operational costs, a focus on safety where reduction of FOD is paramount, and for pre-manufactured assemblies that have been terminated and tested before installation. This is where PIC's uniquely engineered self-locking connector solution—UltraLoc™—will reduce or even eliminate the pain points associated with connectors using traditional wiring.



UltraLoc: Self-Locking Solution

UltraLoc is a robust, tool-less locking mechanism that ensures a secure connection without the need for safety wiring. The locking nut remains engaged with the teeth pressed against the connector body because an internal spring applies constant pressure. As the connector is turned clockwise, the sloped edges of the teeth allow the locking nut to ratchet forward. This lets the connector advance and tighten until it is fully seated, while preventing backward movement. To disengage, the locking nut must be pulled back against the spring so that the teeth are no longer overlapping. Because the vertical faces of the teeth do not allow ratcheting, the mechanism will not move unless the locking nut is disengaged. Once the teeth are separated, turning the connector counterclockwise allows the connector to rotate freely and disengage from the mating component.





Work Smarter, Not Harder

Compared to traditional connectors using a safety wire for installation, our UltraLoc™ connectors deliver these key features and benefits:

- Tool-less Locking Mechanism
This simple, intuitive, and highly secure locking mechanism does not require specialized tools for engagement or disengagement and eliminates the need for traditional safety wiring. This significantly reduces the manual labor time required for installation and maintenance, directly lowering the total cost of ownership for operators and entirely removes the critical safety risk of Foreign Object Debris (FOD) caused by improperly secured safety wires.

- *M39012 Compatibility (Applicable Form, Fit & Function)
Designed to seamlessly integrate into current systems without major redesigns. The connectors maintain or exceed the strict high-frequency electrical performance characteristics (e.g., VSWR, insertion loss) of standard M39012 connectors for 50-ohm coaxial cables across specified frequency ranges.

- Positive Tactile Feedback
Provides a physical sensation that the connection is being locked into place as it is installed. This eliminates the chance of human error leading to an unlocked connection, which is especially important in poorly lit or hard-to-reach areas.

- Aerospace-Grade Materials / Durability
Constructed to withstand harsh military and aerospace environments, including extreme temperatures (-65°C to +165°C), vibration, shock and exposure to common aerospace fluids. They ensure highly repeatable electrical and mechanical performance over a minimum of 500 mating cycles.

- Single Gloved-Hand Operability
Allows for quick and easy hand-tightening without the need for specialized tools. This is highly advantageous for crowded avionics bays where access is restricted, enabling technicians to easily mate and unmate connections.

- Default Locked State
The mechanism is designed so that locking is ensured as the default state when the connector is not being actively interfaced by the user. It is impossible for an operator to leave the connector in an electrically connected but unlocked state, ensuring foolproof operational safety.



Todd Wilson
Global Product Manager
PIC Wire & Cable

"The combination of Ultralite and UltraLoc together deliver weight savings and reduce integration and maintenance time. This is especially beneficial not only for mil-aero rotorcraft, but for weight-sensitive applications like UAVs and drone groups 4 and 5."

Implementation Study – Rotary Aircraft

Since boxes are getting smaller and are requiring more RF ports than ever before, self-locking connectors make it easier to connect without using safety wire. And, in extreme high-vibe environments, safety wire can quite literally become a liability if pulled free from the connector.

UltraLoc connectors were initially engineered as a custom-built solution in response to a defense rotary aircraft manufacturer's request to solve their problem and help make their job easier. Wanting to eliminate safety wire, their goal was to eliminate FOD, save installation and inspection time, make termination easier in dense environments, increase the reliability in high-vibe environments and save weight on the aircraft.

In testing, it's estimated that by using UltraLoc connectors instead of ones that would have otherwise used safety wire, technicians could save up to five hours of integration time per aircraft. And, in this particular study, the total weight savings approached around 26lbs per aircraft. This weight savings was realized by switching out their existing cabling and replacing with PIC Wire & Cable's 50 Ohm Ultralite coaxial cable.

For this application, the weight savings meant that the aircraft can have a larger payload to carry more tactical and mission-critical assets, or more fuel can be brought on board to extend the flight range. Conversely, this chart estimates how much fuel savings could be realized over the life of the aircraft:

Timeframe	Est. Fuel Saved	Est. Dollars Saved
Per flight hour	~0.22 gal	~$0.82
Per year (300 flight hours)	~67 gal	~$250
Fleet of 1,000 aircraft (per year)	~67,000 gal	~$246,000

Fuel saving assumptions made: 26 lbs saved is 0.15% of the aircraft's weight, cutting fuel burn by about 0.22 gallons per flight hour using JP-8 pricing from the Defense Logistics Agency.

Because of the significant time and weight savings for each aircraft, the manufacturer will be installing UltraLoc connectors (using Ultralite cables) across their entire fleet. UltraLoc not only addressed all the pain points this manufacturer challenged us with, but it also solved a few others. There will be a reduction in the need for highly skilled technicians and the time it takes to train them to install UltraLoc connectors, plus, our team of experts is also available to provide technical data and support through education and additional training if required. Using UltraLoc self-locking connectors can also reduce the repetitive motions technicians face that could lead to carpal tunnel through wear and tear on the body over time.

Experience Freedom

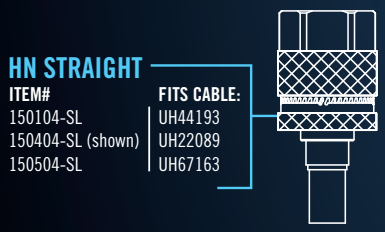
For those that have to utilize safety wire in avionics, it is hands down a common pain point across the industry. We listened to real people dealing with this every day and this is what they had to say:

"We'd rather use a self-locking connector than deal with lock wire. These prevent not only a time-consuming installation but will prevent the need for rework in the future."
—Electrical Engineer

"Getting safety wire onto some of these connections is a real challenge. Ultraloc will not only make the install easier but more secure."
—Engineering Professional

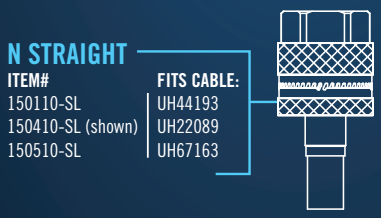
Find Your Fit Guide

Compatible with MIL-STD-348 standard jacks, UltraLoc connectors are available in bulk straight and 90° plugs for HN, N and TNC types and also as pre-manufactured and fully tested assemblies. These new self-locking connectors are designed to seamlessly replace current standard versions, and in combination with our Ultralite UH22089, UH67163 and UH44193 cables, provide ultimate time and weight savings.



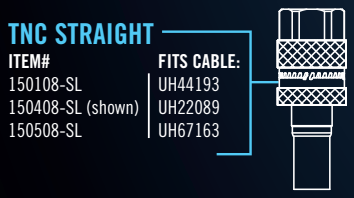
HN STRAIGHT

ITEM#	FITS CABLE:
150104-SL	UH44193
150404-SL (shown)	UH22089
150504-SL	UH67163



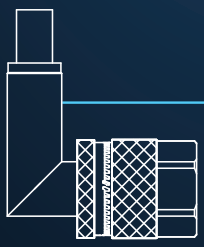
N STRAIGHT

ITEM#	FITS CABLE:
150110-SL	UH44193
150410-SL (shown)	UH22089
150510-SL	UH67163



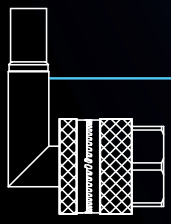
TNC STRAIGHT

ITEM#	FITS CABLE:
150108-SL	UH44193
150408-SL (shown)	UH22089
150508-SL	UH67163



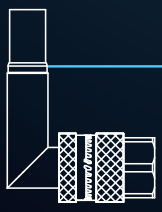
HN RIGHT-ANGLE

ITEM#	FITS CABLE:
150105-SL	UH44193
150405-SL (shown)	UH22089
150505-SL	UH67163



N RIGHT-ANGLE

ITEM#	FITS CABLE:
150111-SL	UH44193
150411-SL (shown)	UH22089
150511-SL	UH67163



TNC RIGHT-ANGLE

ITEM#	FITS CABLE:
150109-SL	UH44193
150409-SL (shown)	UH22089
150509-SL	UH67163



ULTRALOC™

2026 Military+Aerospace Electronics Innovators Awards GOLD HONOREE

Contact us today to see how we can help make your job easier with our UltraLoc technology and engineer a tailor-made solution that works for your application. Visit PICWIRE.COM/ULTRALOC-CONNECTORS

** Contact PIC Wire & Cable for available Form, Fit & Function information.*

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ABOUT PIC WIRE & CABLE

PIC Wire & Cable is your premier aerospace and defense connectivity expert, delivering comprehensive, innovative interconnect solutions engineered to enhance the performance of mission-critical avionics systems. For over 50 years, we've worked side-by-side with clients to solve challenging problems and integrate those engineered solutions into aircraft worldwide. This is what we do—we're here to make our customers' jobs easier. We are committed to providing high-quality service, premium products and superior solutions to the aerospace and defense industries. Make PIC your go-to for aerospace cabling solutions and you'll see why we've been trusted with some of the toughest jobs in the industry.

PIC® WIRE & CABLE