

Universal Safety Link

Universal Safety Link (USL) for Small Scale LNG Bunkering, Transfer and LNG Fuelling

- Meets all SGMF guidelines for bunkering safety link (BSL) technology
- Offers fiber optic, electric and pneumatic links in compliance with bunkering standard ISO 20519
- Provides main and back-up safety link systems for LNG transfer as recommended by ISO 28460
- Can allow single operator to monitor both sides of the transfer process
- Configurable system link for the transfer of other plant process data
- Streamlines operator and bunker checklist processes

Powered By
SmartPort



SmartPort by Trelleborg is a technology platform that connects disparate, data-driven assets, giving stakeholders a holistic view of operations to power communication and decision making.

Rise of LNG as a Fuel

With clean burning properties and lower operating costs for emission compliance, the marine transportation industry is turning to LNG as a fuel. The safe control and operation of small scale LNG transfers and fuelling (also known as bunkering) pose special challenges requiring innovative technical solutions. LNG’s deep cryogenic properties mean it requires careful handling in large and small quantities. Linked ship- shore Emergency Shut Down (ESD) systems for large scale LNG have underpinned an exemplary safety record for over 50 years.

Trelleborg Marine and Infrastructure is the acknowledged world leader providing this technology to the large scale LNG industry where its systems overcome inter-compatibility issues and support data and control requirements while assuring Safety Integrity to IEC 61508 SIL2.

The Trelleborg USL-8810 uses ISO 20519 compliant links for bunkering of LNG fuelled vessels and provides main and backup systems as per large scale LNG practice within ISO 28460:2010.

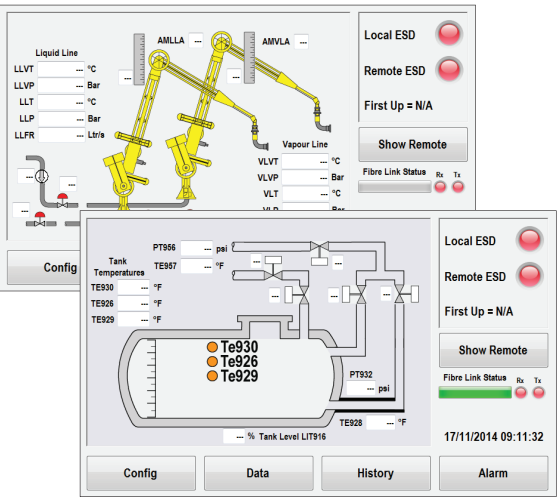
For LNG transfer and fuelling the link should:

- Enable a single operator to monitor and control both sides of the transfer process to ensure that measurements remain within safe criteria
- Shut down the process automatically and safely without risk of damaging surge pressures should these criteria be exceeded
- Operate safely and reliably in a gas-hazardous zone
- Overcome problems of inter-compatibility between LNG fuelled vessels and onshore LNG terminals

Enhanced Fiber Optic Link:

The fiber optic system uses standard digital SONET data transmission. Standard military-specification harsh-environment expanded beam connectors couple the USL system to its shore or ship counterpart; the connectors can transmit light signals without interruption despite contamination.

With the fiber optic system activated, the umbilical cable is connected to a counterpart system. The fiber optic system performs a data handshake and the counterpart LNG tank configurations are set for the operator to observe. The ESD trip signals are set to ‘healthy’ enabling the LNG transfer to begin. The principal operator can observe temperatures and pressures of both systems throughout the transfer process. Pre-set alarm limits enable the transfer to be monitored in order to manage and, where possible, avoid an ESD trip event.



Typical safety screen mimics

Following an ESD trip, a ‘first-up’ indication shows where the ESD was initiated. This facilitates quick identification of the cause of the ESD event, helping to minimize downtime in primary and back-up modes.

Fiber Optic System Supports:

- High integrity ESD signals
- The fibre optic link meets the requirements of SGMF ‘Type 3’ BSL
- Interconnection of custody transfer system
- Mooring line data
- CCTV signals
- Telephony
- Network interface (for up to 100BaseT)

Electric SIGTTO Link:

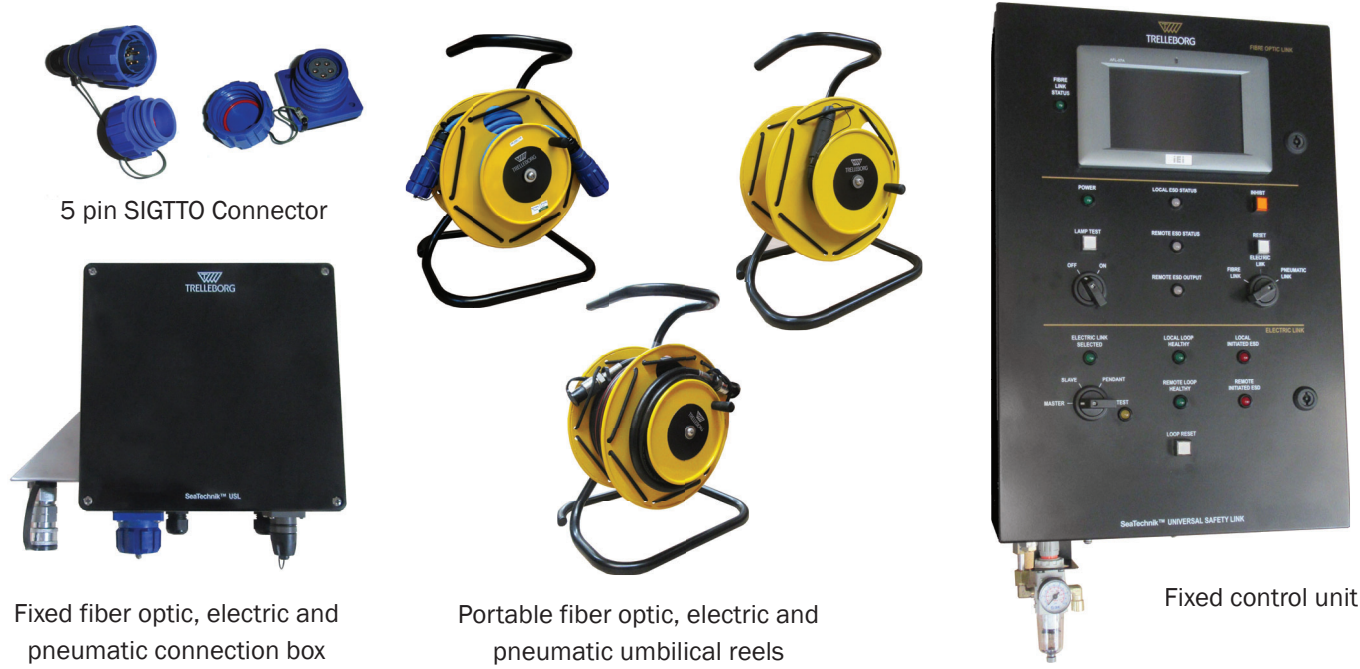
The electric system uses intrinsically safe circuitry and the industry standard 5 pin connector as defined in the SIGTTO guidelines and ISO 20519. The electric link is considered a backup for ESD signalling only. The Electric SIGTTO Link meets the requirements of SGMF ‘Type 2’ BSLs.

Pneumatic Link:

The pneumatic link offers further redundancy and compatibility with large and small scale applications. It is regarded as a backup for low volume, low flow rate applications (<150m³/hr), as specified in ISO 20519. The pneumatic link meets the requirements of SGMF ‘Type 1’ BSLs.

Typical Systems Comprise:

- Main Control Unit with colour data display monitor
- Transfer area/shipboard connection box with primary fiber optic socket and back-up electric and pneumatic socket for ESD only operation
- Hand portable cable reel including 25 metre umbilical cable with MIL-DTL-83526 military specification expanded beam plugs for primary (fiber optic) syste



Fixed fiber optic, electric and pneumatic connection box

Portable fiber optic, electric and pneumatic umbilical reels

Fixed control unit

- Hand portable reels including 25 metre umbilical cable with SIGTTO link plugs and 25 metre pneumatic hose for back-up systems

- Hotline communication telephone

Benefits:

- A primary system with high integrity digital transmission and robust signal path enables secure high band width data transfer
- A common system architecture and interface reducing work-load and training costs
- An intrinsically safe ESD back-up system
- Assured inter-compatibility of safety link systems throughout the small scale and fuelling supply chain
- Future-proof for new process data
- Assists safety and monitoring of simultaneous fuel oil bunkering if required
- In-built system test & diagnostics
- Option for breakaway coupling

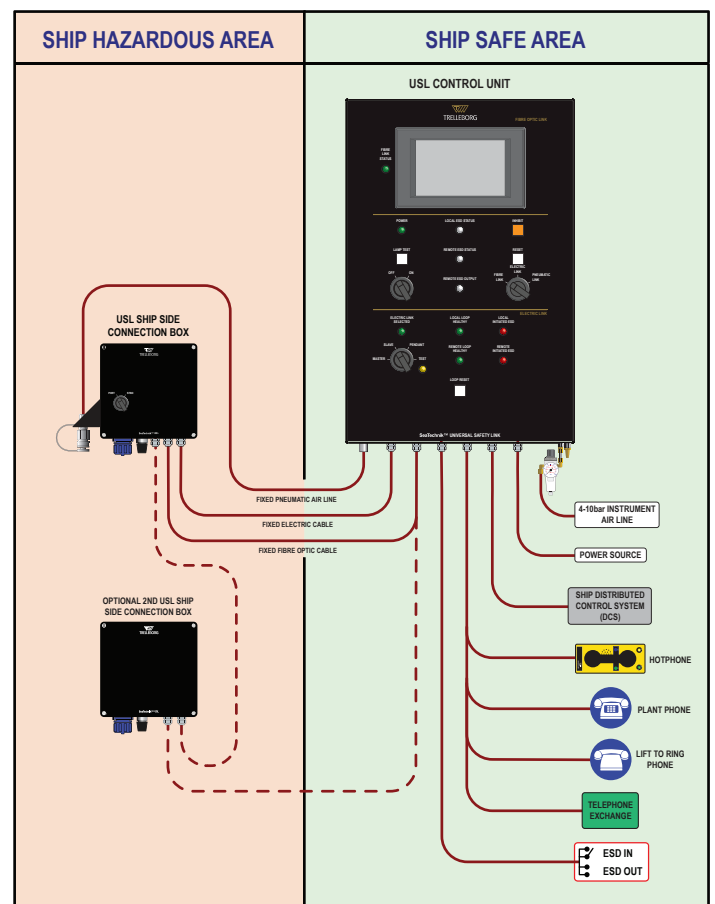
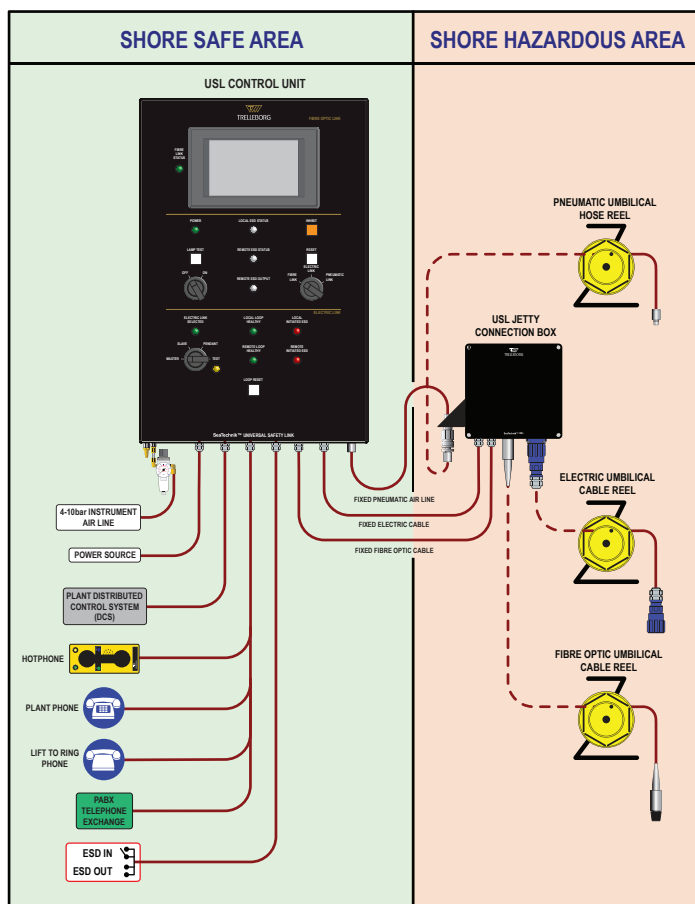
System Applications

LNG Fuel Transfer:

- LNG bunker vessel to LNG fuelled vessel
- Small scale shore LNG terminal to LNG fuelling vessel
- Small scale shore LNG terminal to LNG fuelled vessel
- Small scale LNG carrier transfer to LNG fuelling vessel

LNG Cargo Transfer:

- Small scale LNG carrier transfer to a small scale shore LNG terminal (and vice-versa)
- Small scale LNG carrier transfer to a shore-side LNG road tanker (and vice-versa)
- Shore LNG terminal or inshore road tanker filling location to LNG road tanker
- LNG road tanker to various fixed inshore user sites and industry



Service & Support

Trelleborg Marine and Infrastructure has been designing, manufacturing and supporting leading edge marine energy management and safety systems for over 20 years. With the head office located in Northwest UK, a team of experienced service engineers and performance analysts/specialists provides installation, commissioning and in-service support worldwide. The worldwide team includes dedicated staff in our Korea and Singapore offices.

A network of experienced sales/technical agents and associates worldwide provides further support, and ongoing technical training is offered to both customers' and associates' engineers worldwide.