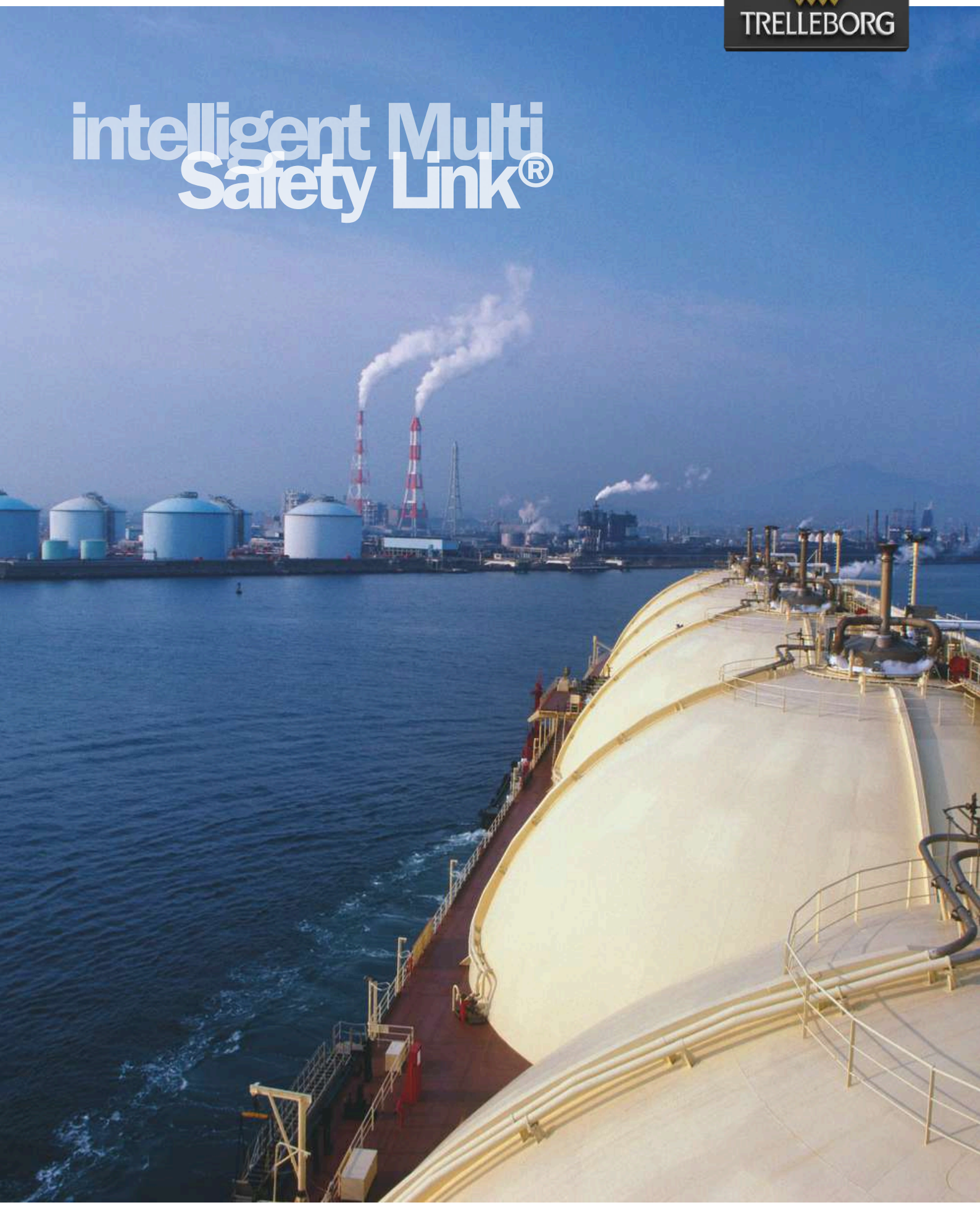
TRELLEBORG

intelligent Multi Safety Link®



Driving LNG safety through advanced communication technology and pre-berth testing capabilities.

SCAN FOR MORE INFO

Driving innovation through combined expertise

For over 120 years, Trelleborg Dordrecht (formerly Mampaey Offshore Industries) has been a trusted leader in advanced marine systems, specializing in innovative berthing, mooring, and towing solutions. Now, as part of the Trelleborg Group, we are building on that legacy to deliver even greater value, expertise and innovation to our customers worldwide. Trelleborg's global reach, advanced research and development capabilities, expanded engineering resources and global network enhances our ability to deliver seamless, reliable solutions tailored to your unique needs. Our expanded engineering resources, global network, and advanced research and development capabilities means a broader range of products, enhanced global support, and strengthened site service capabilities for every project.

As the global market leader in the design, engineering, manufacturing, and commissioning of marine systems, we pride ourselves on delivering solutions that ensure safety, reliability, and performance in the most challenging conditions. Our commitment to innovation has driven new standards in the towing, mooring, Ship-to-Shore, and Ship-to-Ship Safety Links industries, earning the trust of an ever-growing global customer base.

With our combined capabilities, you can count on expertise, innovation, and a commitment to delivering solutions that keep your operations safe and efficient.

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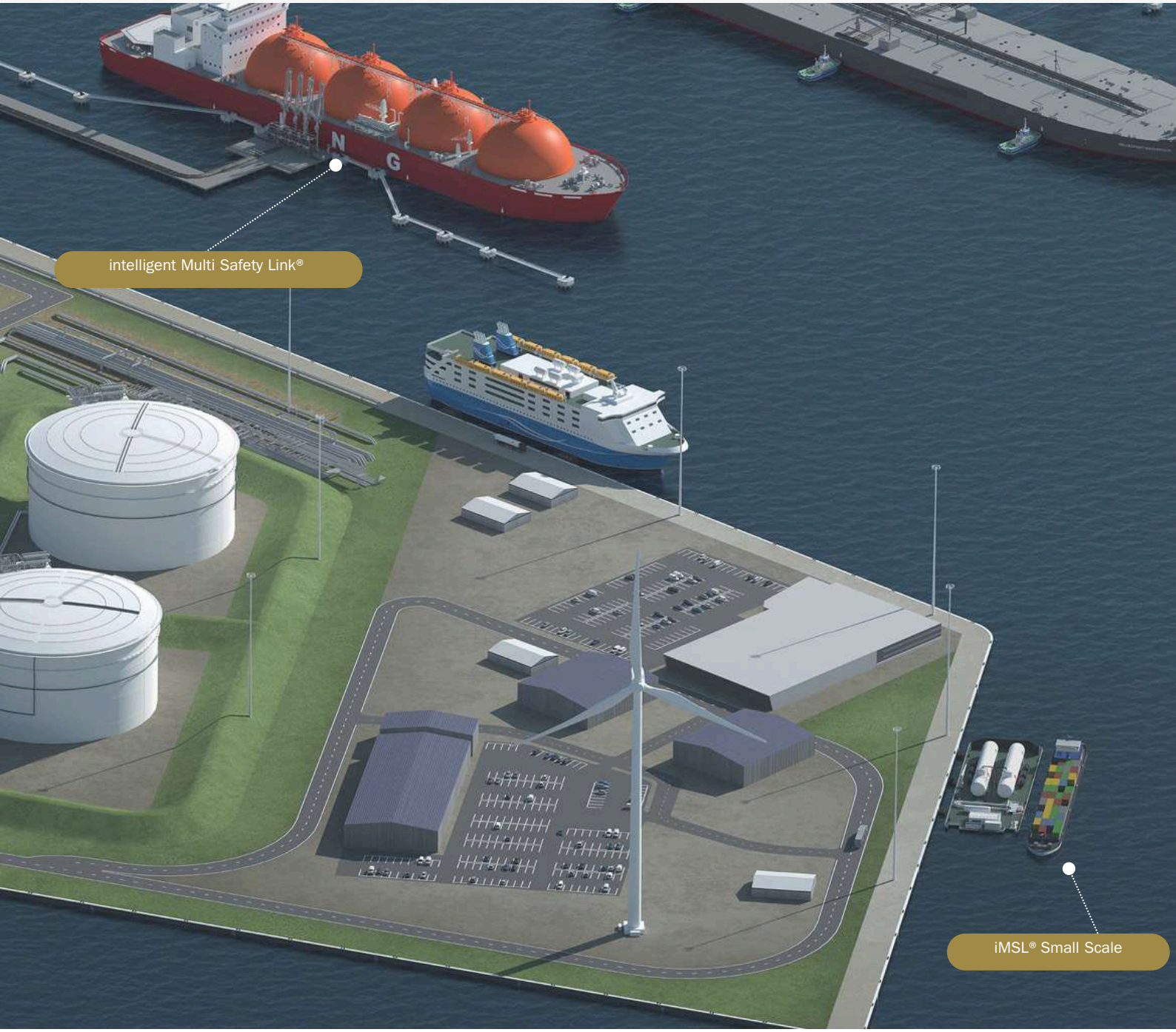
intelligent Multi Safety Link®

WE PROVIDE STATE-OF-THE ART TOWING, MOORING AND BERTHING AND INTEGRATED INFORMATION SYSTEMS TO ENHANCE THE SAFETY AND EFFICIENCY OF THE PORT, MARITIME AND OFFSHORE INDUSTRY.

intelligent Multi Safety Link®

The intelligent Multi Safety Link® (iMSL®), an advanced LNG safety communication technology designed specifically for the global LNG distribution network including LNG carriers, FSRUs, FLNGs, and regasification terminals, features intelligent Control Modules that facilitate multiple safety links with revolutionary pre-berth testing capabilities. The loopback connectivity enables comprehensive indoor end-to-end testing of ship and shore installations, providing advanced testing capabilities that exceed industry baseline standards.



Quality control & customer service

PROJECT MANAGEMENT

From the moment you place a purchase order with us, our professional project management team will be your point of contact. This concerns the processes of engineering, development, calculations, manufacturing, assembly, certification, documentation, testing, delivery and commissioning.

We have a dedicated team of technical sales engineers, project managers and electrical and mechanical engineers who are all specialized in mooring equipment processes and technology to assist all projects with the accurate know-how from beginning to end.

CUSTOM SOLUTIONS

The intelligent Multi Safety Link® is designed for a new generation of LNG assets. This allows us to customise and design for the most cost-effective solutions for your project. Our experience with LNG vessels, FSRU, LNG Bunker vessels, hybrid LNG ships and jetties can be readily applied to future requirements.

TESTING & CERTIFICATION

Trelleborg Dordrecht provides tests before delivery of all products, assuring that the product complies with the applicable specifications and standards. All tests are performed in close cooperation with our customers and witnessed by a third party surveyor if requested.

- Factory Acceptance Test (FAT)
- Site Acceptance Test (SAT)
- Certification ATEX/ IEC Ex/ UL
- Certified Production Process

Trelleborg Dordrecht is ISO 9001 and 14001 quality approved.

All our systems can be supplied suitable for hazardous area with explosion proof certificates according to the standards such as ATEX/ IEC Ex/ UL/CU TR, etc.

iMSL® Control Unit

The iMSL® is a high-end Ship-to-Shore and Ship-to-Ship Link system which is applicable for the global LNG distribution market e.g. LNG carriers, FSRU, FLNG, LNG regasification, chemical and liquefaction terminals. The Control Module contains all relevant functions and intelligence to facilitate multiple safety links. Connecting both Control Modules through a loopback provides pre-berth full functional indoor end-to-end testing on ship and shore installations.

This provides customers with advanced testing capabilities prior to LNG carrier berthing, far in advance of the industry base line testing. Testing of all critical ESD functions and voice communication systems can now be done entirely indoors with the iMSL® system. The test equipment is integrated in the iMSL® cabinet, reducing the risk of loss and defects and heavy mobile test equipment is no longer required to be carried to the jetty area, which is a proven operational time-saver.

The system is designed in full compliance with ISO28460, ISO20519, SIGTTO ESD and SGMF Guidelines and according to the IMO requirements (IGC and IGF).

MOORING LOAD MONITORING DATA

The intelligent Multi Safety Link® is fully compatible to transmit and receive MLM data poll-strings as industry standards require. The iMSL® is proven compatible to Yewmac and other party Mooring Load Monitoring data.

PREMIUM SYSTEM

Two control modules with full redundancy and loopback testing

- Multi Safety Link for up to five link types
- 100% functional Backup of all links
- User editable automatic wiring for electrical link
- Pre-configured terminal list
- Intuitive & modern graphical touchscreen or push button interface
- Event logger

Test Module

- Operator interface for full functional end-to-end testing
- ESD Tx / Rx as simulator of ship (or shore)
- Integrated Hotphone for testing
- Integrated PABX Telephony for testing

Power Module

- Redundant power supply, with no-break changeover function
- Main Power [AC]
- Backup Power [AC/DC]

Multiple Link Solutions

FIBRE OPTIC SAFETY LINK

The Fibre Optic (FO) Safety Link is a common used link for Shore-to-Ship and Ship-to-Ship situations. The FO Safety Link is used to communicate Emergency Shutdown (ESD) Signals, telecommunications, hotline and data transfer for Mooring Load Monitoring during mooring. This safe optical communication is a primary method for bidirectional exchange of ESD Signals and voice communication. The FO Safety Link in every iMSL® Control Module is proven fully compatible with Furukawa type Fibre Optic links and equivalent compatible Ship-to-Shore Link systems.

ELECTRICAL SAFETY LINK

The Electrical Safety Link is a standard integrated link in the intelligent Multi Safety Link® system. It establishes a physical connection to enable Shore-to-Ship and Ship-to-Ship communication and to provide Emergency Shutdown Signals (ESD) for cargo transfer operations. The Electrical Safety Link supports Hotphone, Private and Public Line voice communication and data communication for transmission of Mooring Load Monitoring data. The Electrical Safety Link is designed such that it is compatible with the original 37-way Pyle connectors, the Miyaki type connectors and 5 pin SIGTTO.

PNEUMATIC SAFETY LINK

The Pneumatic Safety Link and connection point comprises of a pneumatic module together with a pneumatic umbilical and reel. The pneumatic module is connected and controlled by the iMSL® Control Module. The Pneumatic Safety Link is designed according to SIGTTO recommendations and is fully compatible with all other SIGTTO compatible pneumatic Ship-to-Shore links which are available on most LNG terminals and LNG carriers.

- Emergency Shut Down only
- Pressurised air line between LNG Carrier & LNG Terminal (or Ship-to-Ship)
- Pressure monitoring & dump valve at ship side or shore side
- Numerous Ex'd/e and Non Hazardous Solutions for Air Interface Board
- Snap-tite male/female quick connector – coupler SVHN8-8F ½

ALL LINKS COMPLY WITH ISO 28460, SIGTTO GUIDELINES

Reels and Connector Boxes

Trelleborg Dordrecht has developed a common design storage reel that can be used in several link solutions including Electrical, Fibre Optic and Pneumatic.

BENEFITS OF THE JETTY REEL SOLUTION:

- Complete robust modern design of integrated frame and weather cover, fabricated in 316 stainless steel suitable for harsh marine environments.
- Compact sizes.
- All surfaces brushed, primed and paint powder coated to high attend industry standards.
- Cable systems not susceptible to excessive heat build-up within the enclosure.
- Access doors opening from available sides for ease of operation, cleaning, maintenance and test.
- External connector receptacle to reduce impact of damage due to vessel emergency break-away.
- Inbuilt Fibre Optic or Electrical loopback options for full testing.

Hotphone and Communication

The iMSL® facilitates the Hotphone, plant and public line voice communication for the Pyle / Miyaki Electrical link and Fibre Optic in special Iwatsu mode.

The Hotphone is a heavy-duty wall or desktop-mounted phone system. The dial-less Hotphone is used with LNG ship-to-shore links and is fully compatible with the now obsolete Iwatsu TS3 unit used on Furukawa ship-to-shore communications systems. It is dual mode for both private line mode and hotline (Iwatsu) mode.

VOICE COMMUNICATION RECORDING

The iMSL® Control Module is capable of recording all voice communications managed by the Control Module. These recordings can afterwards be used for reviewing, analysis or training purposes.

This includes:

- Fully automated voice communication recording function of each channel when off-hook.
- Telephone conversations are stored as common type audio files and separately identified.
- Voice recordings can be replayed with any standard audio player on a PC or device.

Innovative Features and Unique Elements

- One control module handling all links (Electric + Fibre Optic + Pneumatic).
- A single solution for operational, testing and backup purposes.
- Fully ISO28460 compliant LNGC ship-side boxes solution.
- Automated voice recording.
- Electrical pin configurator that allows LNG carriers to dynamically adapt to the many different electrical configurations found at LNG terminals.
- Ship-to-Ship Transfer can be achieved over Fibre Optic Link with 100% functionality.
- Full active testing for ESD, Telecoms and Mooring Load Monitoring as standard for Pyle Electric links and Fibre Optic links with standard architecture.
- Shipyard solution with minimized cable to supply and install.
- Standard iMSL® has 200% multiple link redundancy, with back-up of each link as standard with secondary module. More than offered by any other vendors known standard solution.

WITH COURTESY OF HÖEGH LNG AND ENGIE

iMSL® Benefits

High Compatibility:
Multi Link solution compatible with existing standards and existing SSL installations and is high customizable solution for FLNG and FSRU.

High Availability:
Multiple redundancy and back-up design, minimizing potential downtime.

High Reliability:
Functional active end-to-end operational testing and system testing.

Web-based manuals:
Content searchable format for precise fact finding and troubleshooting. Allows operator to use web translation services if required.

Voice Recording:
Control Module manages the recording off all voice communications.

iMSL® Small Scale

The bunkering of environmental or cryogenic liquids and gases from ships requires a linked Emergency Shut Down (ESD) system to ensure a controlled shutdown of the transfer operation, in the case of a detected emergency. Designed according the IMO requirements (IGF) and complying to the ISO20519.

The iMSL® Small Scale solution is practical and has backward compatibility to the existing LNG and bunkering market. The iMSL® Small Scale has a 5 pin 'SIGTTO type' primary Electric link and a Pneumatic back-up link that are failsafe and independent as reasonable practical with independent connection points for Ship-to-Shore link.

FEATURES

- Emergency shut-down shall be fail-safe and transmitted by an Electric or Pneumatic link.
- For bunkering above 150 m3/h, we offer both links in accordance with ISO20519.
- Robust 5-pin standard electrical umbilical plugs & sockets as of SIGTTO recommendations.
- Maintains fundamental electrical isolation between Ship-to-Shore and Ship-to-Ship.
- Ability to test the link for pre-berth checks operation.
- Certified Intrinsically safe for use within Zone 1 Hazardous Areas.
- Option 'Pendant' function for Manual Trip.
- Maintain compatible to old and new installations from 1986 onwards.
- Back-up link system, as independent as reasonably practical.
- Simplest retrofit solution of any vendor, and the system can be self-installed and self-commissioned.

WITH COURTESY OF ENGIE LNG SOLUTIONS

iMSL Small Scale ESD Link Solutions

The iMSL® Small Scale offers a common control panel suitable for LNG fueled vessels and LNG Bunkers including Ship-to-Ship installations, this is complimented by selectable options of ship-side or jetty-side connection points. We offer all types of industry standard connectors for ESD link including original Icore compatible 5 pin as defines in the SIGTTO guidelines.

ESD LINK SOLUTIONS

LINKS	FEATURES
5 pin SIGTTO Link	5 pin type link (Icore compatible) Supplier or receiver (ship or shore type installations) Pendant Option Connector box for each bunker station (e.g. Port & Starboard)
2 Pin Fibre Optic link	2 pin type link Master/Slave Select Connector box for each bunker station (e.g. Port & Starboard)
Pneumatic link	Pneumatic control module with adjustable trip pressure settings with 1/2" MIL-C-51234 connectors Connection assembly for each bunker station (e.g. Port & Starboard)

OPTIONALS

OPTIONS	FEATURES
Umbilical	Electric: Standard 25m (other lengths possible) with two plugs or plugs & pendant for manual ESD Pneumatic: Hose with 1/2" MIL-C-51234 standard couplers Fibre Optic: Standard Multi-mode cable with plugs Portable reel or carry-case options
Test Devices	5 pin SIGTTO loopback plug Test pendant (Electric and Pneumatic) for hazardous or safe areas Pneumatic test unit Fibre Optic loop back unit
Customized Solutions	5 pin to 6 pin umbilical Multiple failsafe connection points for pneumatic/ electric link Project specific and integration with other systems

Other links – Back-up:
Different vendors, parties and technical societies have commissioned studies into types of ESD link for Small Scale and bunkering of LNG. We have compatible solutions to the majority of alternative link types.

ACCORDING TO GUIDELINE ISO20519, SIGTTO ESD SYSTEM, SGMF GUIDELINES, OCIMF 2017 RECOMMENDATIONS AND IMO REQUIREMENTS (IGF CODE).

DISCLAIMER

Trelleborg AB has made every effort to ensure that the technical specifications and product descriptions in this brochure are correct.

The responsibility or liability for errors and omissions cannot be accepted for any reason whatsoever. Customers are advised to request a detailed specification and certified drawing prior to construction and manufacture. In the interests of improving the quality and performance of our products and systems, we reserve the right to make specification changes without prior notice. All dimensions, material properties and performance values quoted are subject to normal production and testing tolerances.
This brochure supersedes the information provided in all previous editions. If in doubt, please check with Trelleborg Marine and Infrastructure.

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At Trelleborg, sustainability isn’t an afterthought - it’s the foundation upon which we build our success and the promise we make to every customer and our environment. Through advanced solutions, we actively support the maritime industry’s transition to a low-carbon future - reducing emissions, improving efficiency, and creating lasting value for our customers.

SCAN FOR MORE INFO

TRELLEBORG

Trelleborg is a world leader in engineered polymer solutions that seal, damp, and protect critical applications in demanding environments. Its innovative solutions accelerate performance for customers in a sustainable way.

Trelleborg Marine and Infrastructure is a leading provider of premium solutions for critical marine, port, and built infrastructure applications. Its innovative polymer and smart technology solutions enhance operational efficiency, safety, and sustainability.

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