Introduction

Thank you for choosing an O. Øverland UPC Serial Line Splitter, a robust and reliable solution for distributing NMEA or RS422 serial data in marine and industrial environments. This manual provides essential information for the installation and operation of two product variants:

- UPC 1-8: A compact splitter with 1 RS422 input and 8 RS422 outputs.
- UPC 2-15: An advanced version with 2 RS422 inputs and 15 RS422 outputs, featuring automatic input failover switching, redundant power supply and alarm functionality.

These devices are designed to simplify serial data distribution, ensuring reliable signal delivery to multiple endpoints such as navigation displays, autopilots, or monitoring systems.

Both models support standard RS422 signaling up to 115200 baud and are powered by a 24V DC supply, making them suitable for a wide range of maritime installations.

This manual is intended for installers, technicians, and end-users with a basic understanding of serial communication and electrical system integration. Please read it thoroughly before installation.

If you have any questions not addressed in this document, please refer to the support section at the end or contact your distributor directly.

Contents

Introduction 1
Safety First 1
Product Overview 2
  Øverland UPC 1-8 3
  Øverland UPC 2-15 4
Technical Specifications 5
  Mechanical 5
  Electrical 5
    RS422 Port Characteristics 6
    RS422 Signals 6
    RS232 Compatibility 6
    NMEA sentence compatibility 6
Installation 6
  Mounting 6
  Cables and Connectors 7
Alarm output (UPC 2-15 only) 8
Indicators / LEDs 8
Compliance and Certification 8
Product disposal 9
Contact and Support 9
  Document Revision 9
DNV Type Approval Certificate 10

Safety First

- Only qualified personnel should perform installation and maintenance.
- Ensure the power is disconnected before wiring.
- Follow proper grounding procedures to avoid electrical shock or equipment damage.
- Do not install or operate the equipment in hazardous or explosive environments.

Product Overview

The Øverland UPC series serial line splitters are purpose-built for distributing RS422 NMEA data in professional maritime and industrial environments. Designed with reliability, signal integrity, and system safety in mind, the UPC 1-8 and UPC 2-15 offer robust solutions for expanding serial communication networks while maintaining compliance with the IEC 61162-2 standard for high-speed data transmission.

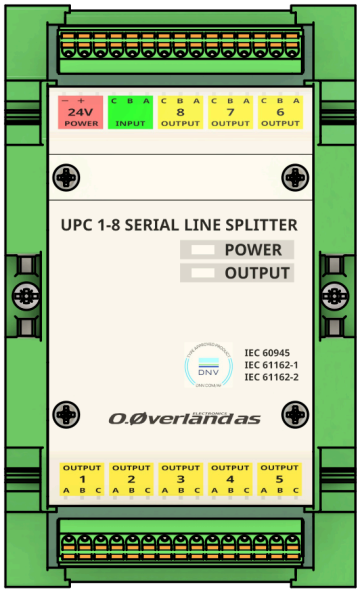
The UPC 1-8 model features a single isolated RS422 input and eight RS422 outputs. Data received on the input is simultaneously transmitted to all outputs, making it ideal for systems where a single data source needs to be shared with multiple receivers. The outputs are galvanically isolated, and each port includes a dedicated ground terminal to support shielded cabling and improve signal integrity in long cables. The compact form factor and DIN rail mounting make the UPC 1-8 easy to integrate into new or existing installations.

The UPC 2-15 extends this functionality with enhanced redundancy and monitoring features. UPC 2-15 includes two isolated RS422 inputs and fifteen outputs. The unit continuously monitors both inputs. When a signal is present on the main input, the data is forwarded to all outputs. If the data on the main input is lost, the unit automatically switches over to the standby input ensuring uninterrupted data distribution. This automatic failover capability makes the UPC 2-15 suitable for safety-critical applications where data availability is essential.

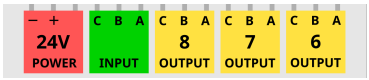
Both models are powered by a 24 Volt DC power supply, and the UPC 2-15 further supports a redundant power input to ensure operational continuity in the event of a power failure. In addition, the UPC 2-15 is equipped with an alarm output in the form of a solid state relay. This relay signals when the unit has lost all power, is running on standby power or the data on the main input is lost. This signal can be connected to external systems to monitor its operational status.

Built for harsh marine environments, both splitters are certified by DNV and tested to EMC standards up to 6 GHz, ensuring full compliance with IACS UR E10. Galvanic isolation is applied throughout the design, including all inputs, outputs, and power supplies, eliminating the risk of ground loops and improving overall signal integrity. With high port density, modern spring-loaded connectors for rapid installation, and industry-standard DIN rail mounting, the UPC series delivers dependable performance and long-term reliability for mission-critical data distribution tasks.

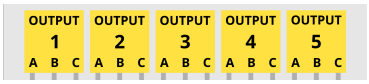
Øverland UPC 1-8



"UPC 1-8"



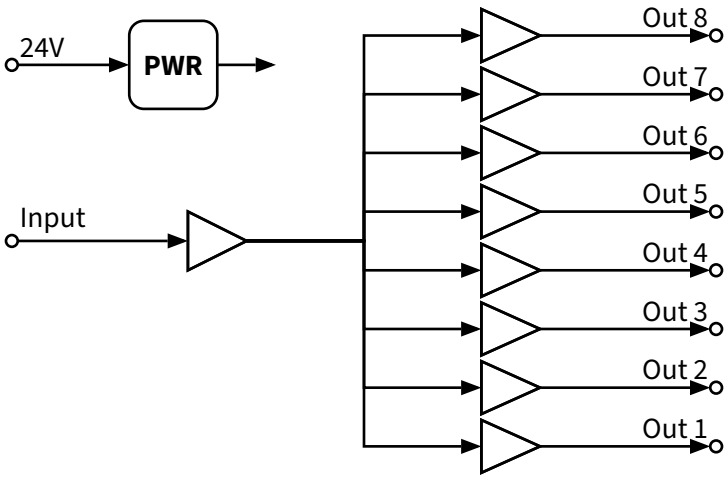
"Closeup of top connector UPC 1-8"



"Closeup of bottom connector UPC 1-8"

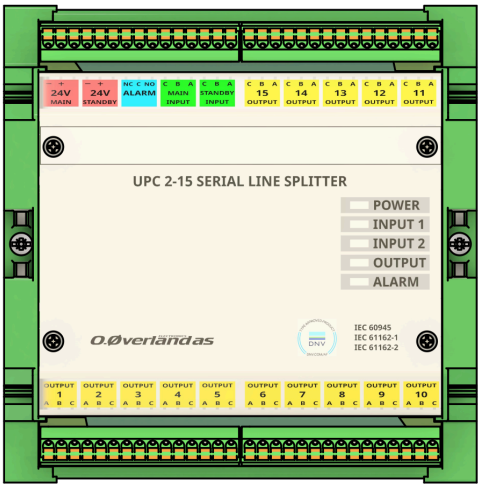
Key features:

- 1 RS422 input.
- 8 RS422 outputs.
- DIN rail mounting, width: 77.5 mm.
- Data received on the input is simultaneously transmitted to all 8 outputs
- Uses 2 pluggable 15-pin connectors

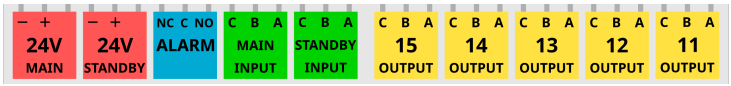


"UPC 1-8 Block Diagram"

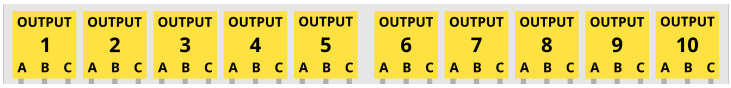
Øverland UPC 2-15



"UPC 2-15"



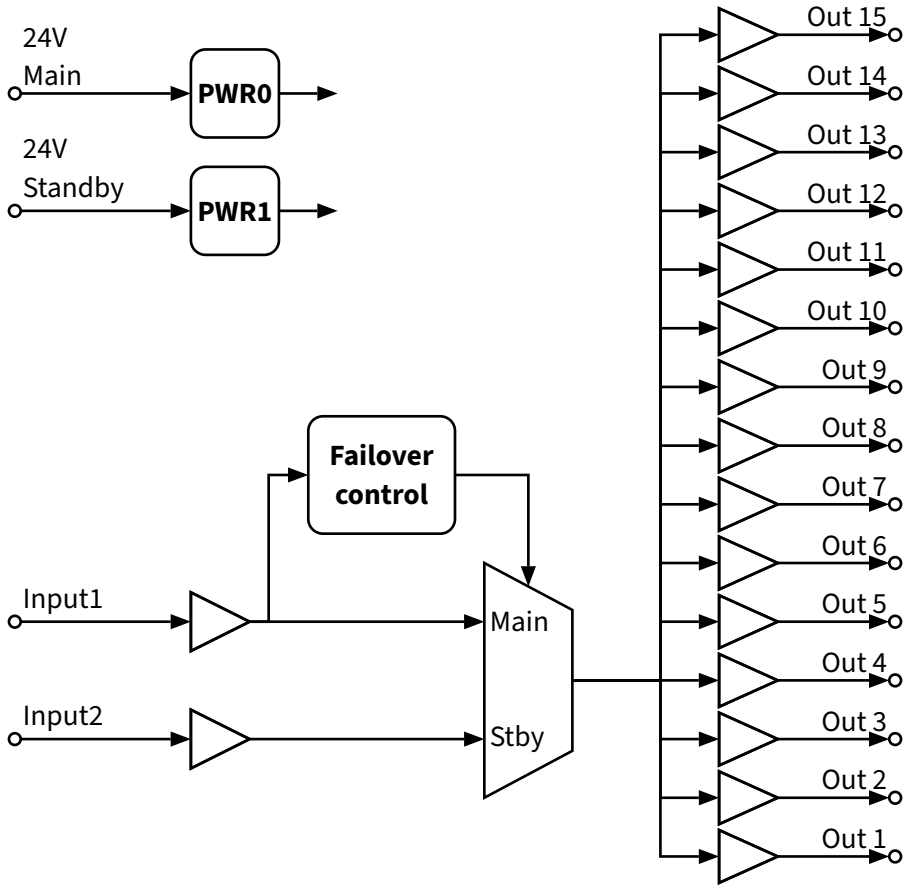
"Closeup of top connector UPC 2-15"



"Closeup of bottom connector UPC 2-15"

Key features:

- Redundant 24V DC power supply support.
- Two inputs ("main" and "standby") with automatic failover switching.
- 15 RS422 outputs.
- DIN rail mounting, width: 127.5 mm.
- Alarm output with a solid state relay triggered by data loss or power failures (NO/NC terminals).
- If data is present on the main input, the data is forwarded to all outputs.
- If data is lost on the main input, the outputs are automatically switched over to the standby input.
- Uses 4 pluggable 15-pin connectors.



"UPC 2-15 Block Diagram"

Technical Specifications

Mechanical

Parameter	UPC 1-8	UPC 2-15
Mounting system	35mm DIN rail (IEC/EN 60715)	
Height	128.0 mm	
Depth	53.0 mm	
Width	77.5 mm	127.5 mm
Weight with connectors	< 175 g	< 290.0 g
Compass safe distance	40 cm	

Electrical

Parameter	Value		
	Minimum	Nominal	Maximum
DC supply voltage (24V +/- 20%)	19.2V	24V	28.8V
Current consumption			400 mA
Alarm contacts voltage (UPC 2-15 only)			48V
Alarm contacts current (UPC 2-15 only)			100mA

RS422 Port Characteristics

Parameter	Value
Serial standards	IEC 61162-1 (NMEA 4800bit/s) IEC 61162-2 (NMEA 38400 bit/s) ITU V.11/X.27 (RS-422)
Baud rate	Max 115200 bit/s
Output drive capability	10 unit loads
Listener load requirements	1 unit load
Maximum cable length	Tested with cable lengths up to 100 m, but can typically support significantly longer runs when proper V.11 installation practices are applied.
Galvanic isolated inputs	Yes
Galvanic isolated outputs	Yes, but all outputs share a common ground

RS422 Signals

All RS-422 ports uses IEC 61162 naming:

IEC 61162 name	Signal		
	A	B	C
Polarity	Plus	Minus	Common
Idle voltage	Low	High	0V

If the connected equipment does not have a common terminal (C), the C terminal on the serial line splitter should be left unconnected.

When using shielded cables, select one with at least three conductors - one for each signal (A, B, and C). Connect the cable shield to chassis ground at the talker end, and leave it unconnected at the listener end.

All inputs are isolated from all other ports and power supplies. All outputs are isolated from all inputs and power supplies but share a common ground.

RS232 Compatibility

In most cases, it is possible to connect RS-232 signals to the UPC serial splitters without issues, although RS-232 is not 100% compatible with RS-422. Use terminal A for RXD/TXD and terminal C as ground. Terminal B should be left unconnected.

NMEA sentence compatibility

The serial splitters are 100% transparent and does not change the serial data in any way. It will pass all (valid or invalid) NMEA sentences, including all proprietary sentences unchanges. In the same manner, it will not recalculate any check sums. The devices are pure electrical buffers.

Installation

Mounting

Install the unit in a protected, dry location with adequate ventilation and unobstructed access to the connectors. The device is suitable for environments with moderate vibration, as typically found in maritime and industrial installations.

The serial line splitter is designed for installation on a standard 35mm DIN rail. Ensure the DIN rail is securely fastened to minimize mechanical stress.

The splitter is electrically isolated from the DIN rail, making it safe to mount the DIN rail directly to the vessel's hull if required. In addition, the splitters galvanic isolation reduces the risk of unwanted "stray currents" flowing trough the hull due to grounding errors elsewhere in the technical installation. This is critical for maritime safety, where currents flowing in the hull should be avoided.

Cables and Connectors

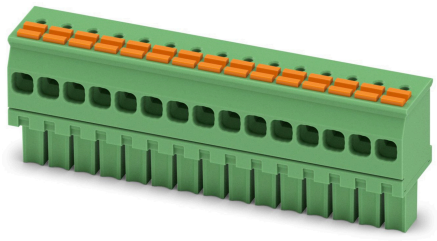
All connections to the serial splitter is done with pluggable connectors (terminal blocks) that can be removed for easy wiring or replacement.

The connectors will accept any cable up to 1,5 mm². For longer signal cables use shielded 0.50 mm² flexible cables (e.g. NEK PFSK series) or a shielded and multistranded CAT5 or better cable.

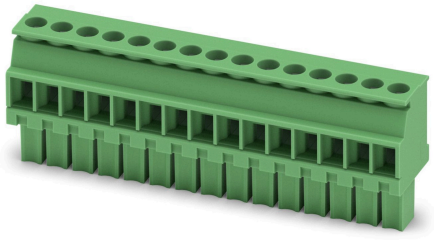


NEK PFSK shielded cable

The connectors are pluggable and compatible with traditional connectors with screws and modern "push-in spring" type connectors. Both connector types supports cables up to 1.5mm² cross section.



Phoenix Contact FMCOW 1,5/15-ST-3,5 push-in spring type connector



Phoenix Contact MCVW 1,5/15-ST-3,5 screw type connector

Alarm output (UPC 2-15 only)

The UPC 2-15 features an alarm output that signals the operational status of the unit. This output is implemented via a solid state relay with three terminals:

C — Common contact

NO — Normally Open contact

NC — Normally Closed contact

The alarm output is activated if the unit is missing main power or no RS-422 signal is detected on the main input.

Operating Condition	**C → NO**	**C → NC**
Power present on main power input and data on main input	Open	Closed
No power on main power input	Closed	Open
Signal lost on the main input	Closed	Open

Connect to “C” and “NC” if your monitoring system needs a closed circuit during normal operation. This is usually the case in traditional alarm systems[1]. Use “C” and “NO” if your system needs a closed contact to indicate an alarm condition.

The solid state alarm relay is designed for low-voltage signal switching. The contacts are polarity independent and rated for 48V and 0.1A. Do not use the alarm output directly to switch high-current or high-voltage loads.

Indicators / LEDs

As a rule of thumb, a green LED indicates a normal condition and a red LED indicates an error.

LED name	**Color**	**Function**
Power	Green	Indicates that the unit has power.
Input 1	Green	UPC 2-15 only. Flashes when data is present on the main input.[2]
Input 2	Green	UPC 2-15 only. Flashes when data is present on the standby input[2].
Output	Green	Flashes when data is present on the output[2].
Alarm	Red	UPC 2-15 only. Will be off in normal operation. Will be on if the unit is running on standby power or data is missing on the main input

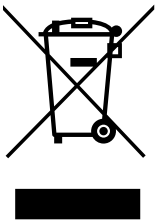
Compliance and Certification

- DNV certified for maritime use
- IACS UR
- IEC 60945 compliant
- IEC 61162-1
- IEC 61162-2
- EMC tested up to 6GHz

[1] It may seem illogical at first, but this “inverted” logic ensures that cutting or breaking the alarm wire activates the alarm.

[2] The LED lights up when data is present. When the serial line is saturated with data, the LED will be always on. With short bursts of data (a few bytes) the LED flash will be brief.

Product disposal



At the end of the working life, it is important to dispose of the equipment in a safe manner. To prevent possible harm to the environment from uncontrolled waste disposal, separate these items from other types of waste and recycle them responsibly.

The Waste Electrical and Electronic Equipment (WEEE) mark applies to countries within the European Union (EU), Canada, Norway, Switzerland and UK. For proper recycling in one of the WEEE countries, please take this product to designated collection points where it will be accepted free of charge.

Contact and Support

For technical support, contact:

O.Øverland AS Electronics
Nøisomhedvegen 36
NO-6419 Molde
Norway

Website: http://www.overland.no

Email: post@overland.no

Phone: (+47) 71 20 24 00

Document Revision

Version	Date	Description
0.99	2025-10-23	Released for review.
1.0	2025-11-11	Final release of the user manual.

DNV

Certificate no.:
TAA00003S7

TYPE APPROVAL CERTIFICATE

This is to certify:

that the Interface Unit

with type designation(s)
UPC 1-8, UPC 2-15

issued to
O Øverland AS
Molde, Norway

is found to comply with
IEC 60945 Ed. 4 (2002-08) Maritime navigation and radiocommunication equipment and systems – General requirements – Methods of testing and required test results
IEC 61162-1 Ed. 6.0 (2024-04) Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 1: Single talker and multiple listeners
IEC 61162-2 Ed. 2.0 (2024-04) Maritime navigation and radiocommunication equipment and systems – Digital interfaces – Part 2: Single talker and multiple listeners, high-speed transmission

Application:

See page 2

Issued at **Høvik** on **2025-11-12**

This Certificate is valid until **2030-11-11**.
DNV local unit: **Mid-North Norway CMC**

Approval Engineer: **Steinar Kristensen**

for **DNV**

This document has been digitally signed and will therefore not have handwritten signature

This Certificate is subject to terms and conditions overleaf. Any significant change in design or construction may render this Certificate invalid.
The validity date relates to the Type Approval Certificate and not to the approval of equipment/systems installed.

LEGAL DISCLAIMER: Unless otherwise stated in the applicable contract with the holder of this document, or following from mandatory law, the liability of DNV AS, its parent companies and their subsidiaries as well as their officers, directors and employees ("DNV") arising from or in connection with the services rendered for the purpose of the issuance of this document or reliance thereon, whether in contract or in tort (including negligence), shall be limited to direct losses and under any circumstance be limited to 300,000 USD.

Job ID: **262.1-043308-1**
Certificate no.: **TAA00003S7**

Product description

UPC-series Serial Line Splitters are available in the following models:

Model name	Interfaces	Location
UPC 1-8	24VDC power input 1x RS-422 inputs 8x RS-422 outputs	Protected
UPC 2-16	Dual 24DC power inputs (main/ standby) with automatic failover switching Dual RS-422 inputs (main/ standby) with automatic failover switching 15x RS-422 outputs 1x relay alarm output	Protected

Application/Limitation

- The equipment shall be installed according to manufacturer's instructions

Type Approval documentation

DNV No	Document ID	Rev.	Description
2	31758-2	0	Report: Applica, Environmental test report for UPC 1-8 and UPC 2-15
3	31758-1	0	Report: Applica, EMC test report for UPC 1-8 and UPC 2-15
5	EDES-20251111-02	1.0	Manual: Øverland, UPC Serial Line Splitter User Manual
8	EDES-20251111-01	2.0	Report: Elektronikkdesign, Testing of O.Øverland UPC 1-8 and UPC 2-15 Serial Line Splitters according to IEC 61162-1, IEC 61162-2 and ITU X.27/V.11.

Tests carried out

- Environmental testing: IEC 60945 (2002)
- Serial interface testing: IEC 61162-1 (2024)
- Serial interface testing: IEC 61162-2 (2024)

Marking of product

The Manufacturer and Type Designation to be applied to the equipment in a clearly visible location. In addition the equipment shall be marked with serial number, safe distance to magnetic compass, power consumption and/or supply voltage

Periodical assessment

Periodical assessment is to be performed after 2 years and after 3.5 years. A renewal assessment will be performed at renewal of the certificate.
The scope of the periodical/renewal assessment is to verify that the production quality conditions stipulated for the type approval are complied with and that no alterations are made to the product design or its components and/or materials without appraisal by the Society.

This certificate is only valid if required periodical assessments are carried out with satisfactory results. To check the validity of this certificate, please look it up in https://approvalfinder.dnv.com