veratron LINK UP J1939 NMEA 2000 LinkUp Gateway User Manual

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veratron LINK UP J1939 NMEA 2000 LinkUp Gateway

Specifications

- Product Name: Link Up Gateways Series – Link Up J1939
- Model Number: B001030
- Languages: EN, DE, IT, FR, ES, PT

Product Information

Introduction

The LinkUp Gateway is a wireless configurable device that allows easy conversion of engine or vessel information to NMEA 2000. It can be set up using a smartphone and the LinkUp Configurator App

System Components

The LinkUp Gateway B000424 features a wireless configuration capability and can be easily set up using a smartphone.

The LinkUp Gateway Concept

The LinkUp J1939 provides a simple method to convert engine or vessel information to NMEA 2000. It allows data to be displayed on various NMEA 2000 display devices like VMH, OceanLink, AcquaLink, or any glass cockpit display.

Design and Function

The LinkUp gateway has a simple yet effective design with a potted housing suitable for installation in engine rooms, meeting ISO 8846:1990 standards.

Product Usage Instructions

Safety Information

- **Safety During Installation**
  Before installation, disconnect the negative terminal on the battery to avoid short circuits. Also, disconnect negative terminals on auxiliary batteries if present. Failure to do so can lead to fires, battery explosions, and damage to electronic systems. Remember to reprogram all volatile electronic memories after battery disconnection.
- **Safety After Installation**
  Ensure proper electrical connections following the Ingress Protection (IP) ratings (IEC 60529) to maintain safety and prevent damage.

System Installation

- **Before the Assembly**
  Prior to installation, disconnect the negative terminal on the battery and any auxiliary batteries to prevent short circuits and potential hazards. Reprogram any volatile electronic memories after reconnecting the batteries.
- **Connect to the NMEA 2000 Network**
  Follow the provided instructions to connect the LinkUp Gateway to the NMEA 2000 network for data transmission.
- **Connect to the J1939 Network**
  Connect the LinkUp Gateway to the J1939 network as per the installation guidelines to enable easy conversion of engine or vessel information to NMEA 2000.
- **Troubleshooting**
  Refer to the troubleshooting section in the user manual for assistance with any issues encountered during setup or operation.

LinkUp Gateway

B000424
This device will translate all your engine data, which is transmitted on a SAE J1939 CAN bus, to the NMEA2000® standard, making all the information available for any display.
Wireless configurable, the LinkUp gateway can be easily set up with your smartphone and the LinkUp Configurator App.

THE LINKUP GATEWAY CONCEPT

The LinkUp J1939 provides an easy method to convert engine or vessel information to NMEA 2000. The LinkUp installation is very easy and quickly done.
The data is then available for being displayed on any VMH, OceanLink, AcquaLink, or more in general on any glass cockpit NMEA 2000 display device.
Configuring LinkUp gateways is simple using a smartphone and the companion LinkUp Configurator App for Android or iOS.
Each device has a built-in, passive NFC antenna, so the parameters of the engine, such as engine instances or the alarm settings, are wirelessly configured on the mobile device which is then “tapped” against the LinkUp device for instant data download.

DESIGN AND FUNCTION

The LinkUp gateway has a simple but yet effective design.
The potted housing allows the unit to be installed in engine rooms, making it compliant to the ISO

8846:1990 as requested by the directive 2013-53(EC).
The standard NMEA 2000® M12 plug allows for a plug-and-play installation to the network backbone.
To interface the CAN J1939 connection a Deutsch DT04-6P 6-pole connector is provided.

SAFETY INFORMATION

No smoking! No open fire or heat sources!

- The product was developed, manufactured and inspected according to the basic safety requirements of EC Guidelines and state-of-the-art technology.
- The instrument is designed for use in grounded vehicles and machines as well as in pleasure boats, including non-classified commercial shipping.
- Use our product only as intended. Use of the product for reasons other than its intended use may lead to personal injury, property damage or environmental damage. Before installation, check the vehicle documentation for vehicle type and any possible special features!
- Use the assembly plan to learn the location of the fuel/hydraulic/compressed air and electrical lines!
- Note possible modifications to the vehicle, which must be considered during installation!
- To prevent personal injury, property damage or environmental damage, basic knowledge of motor vehicle/shipbuilding electronics and mechanics is required.
- Make sure that the engine cannot start unintentionally during installation!
- Modifications or manipulations to veratron products can affect safety. Consequently, you may not modify or manipulate the product!
- When removing/installing seats, covers, etc., ensure that lines are not damaged and plug-in connections are not loosened!
- Note all data from other installed instruments with volatile electronic memories

SAFETY DURING INSTALLATION

- During installation, ensure that the product’s components do not affect or limit vehicle functions. Avoid damaging these components!
- Only install undamaged parts in a vehicle!
- During installation, ensure that the product does not impair the field of vision and that it cannot impact the driver’s or passenger’s head!
- A specialized technician should install the product. If you install the product yourself, wear appropriate work clothing. Do not wear loose clothing, as it may get caught in moving parts. Protect long hair with a hair net.
- When working on the on-board electronics, do not wear metallic or conductive jewelry such as necklaces, bracelets, rings, etc.
- If work on a running engine is required, exercise extreme caution. Wear only appropriate work clothing as you are at risk of personal injury, resulting from being crushed or burned.
- Before beginning, disconnect the negative terminal on the battery, otherwise you risk a short circuit. If the vehicle is supplied by auxiliary batteries, you must also disconnect the negative terminals on these batteries! Short circuits can cause fires, battery explosions and damages to other electronic systems. Please note that when you disconnect the battery, all volatile electronic memories lose their input values and must be reprogrammed.
- If working on gasoline boat motors, let the motor compartment fan run before beginning work.

- Pay attention to how lines and cable harnesses are laid so that you do not drill or saw through them!
- Do not install the product in the mechanic l and electrical airbag area!
- Do not drill holes or ports in load-bearing or stabilizing stays or tie bars!
- When working underneath the vehicle, secure it according to the specifications from the vehicle manufacturer.
- Drill small ports; enlarge and complete them, if necessary, using taper milling tools, saber saws, keyhole saws or files. Deburr edges. Follow the safety instructions of the tool manufacturer.
- Use only insulated tools, if work is necessary on live parts.• Use only the multimeter or diode test lamps provided, to measure voltages and currents in the vehicle/machine or boat. Use of conventional test lamps can cause damage to control units or other electronic systems.

SAFETY AFTER INSTALLATION

- Connect the ground cable tightly to the negative terminal of the battery.
- Reenter/reprogram the volatile electronic memory values.
- Check all functions.
- Use only clean water to clean the components. Note the Ingress Protection (IP) ratings (IEC 60529)

ELECTRICAL CONNECTION

- Note cable cross-sectional area!
- Reducing the cable cross-sectional area leads to higher current density, which can cause the cable cross-sectional area in question to heat up!
- When installing electrical cables, use the provided cable ducts and harnesses; however, do not run cables parallel to ignition cables or to cables that lead to large electricity consumers.
- Fasten cables with cable ties or adhesive tape. Do not run cables over moving parts. Do not attach cables to the steering column!
- Ensure that cables are not subject to tensile, compressive or shearing forces.
- If cables are run through drill holes, protect them using rubber sleeves or the like.
- Use only one cable stripper to strip the cable. Adjust the stripper so that stranded wires are not damaged or separated.
- Use only a soft soldering process or commercially available crimp connector to solder new cable connections!
- Make crimp connections with cable crimping pliers only. Follow the safety instructions of the tool manufacturer.
- Insulate exposed stranded wires to prevent short circuits.
- Caution: Risk of short circuit if junctions are faulty or cables are damaged.
- Short circuits in the vehicle network can cause fires, battery explosions and damages to other electronic systems. Consequently, all power supply cable connections must be provided with weldable connectors and be sufficiently insulated.
- Ensure ground connections are sound.
- Faulty connections can cause short circuits. Only connect cables according to the electrical wiring diagram.
- If operating the instrument on power supply units, note that the power supply unit must be stabilized and it must comply with the following standard: DIN EN 61000, Parts 6-1 to 6-4.

SAFETY INFORMATION

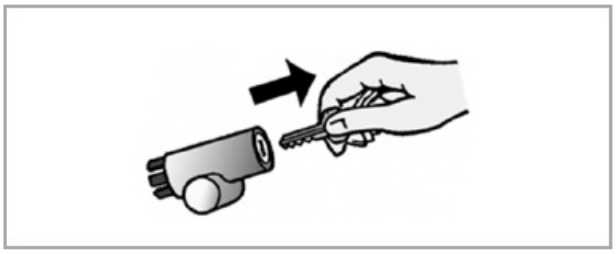
- The electrical indicator outputs and cables connected to them must be protected from direct contact and damage. The cables in use must have enough insulation and electric strength and the contact points must be safe from touch.
- Use appropriate measures to also protect the electrically conductive parts on the connected consumer from direct contact. Laying metallic, uninsulated cables and contacts is prohibited.

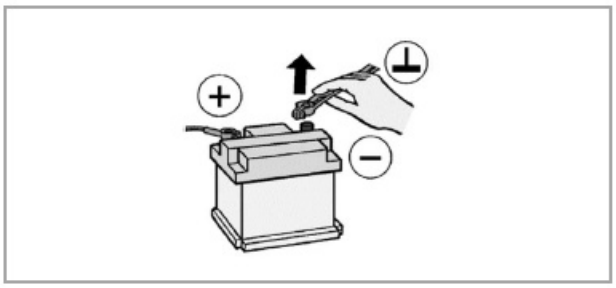
SYSTEM INSTALLATION

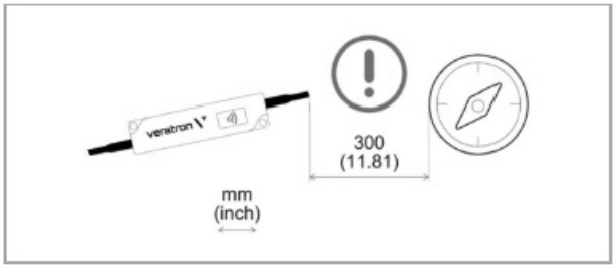
Before beginning, disconnect the negative terminal on the battery, otherwise you risk a short circuit. If the vehicle is supplied by auxiliary batteries, you must also disconnect the negative terminals on these batteries! Short circuits can cause fires, battery explosions and damage to other electronic systems. Please note that when you disconnect the battery, all volatile electronic memories lose their input values and must be reprogrammed.

BEFORE THE ASSEMBLY

1. Before beginning, turn off the ignition and remove the ignition key. If necessary, remove the main circuit switch
2. Disconnect the negative terminal on the battery. Make sure the battery cannot unintentionally restart.
3. Place the device at least 500 mm away from any magnetic compass







CONNECT TO THE NMEA 2000 NETWORK

Connect the LinkUp to the NMEA 2000 network using the round connector. Please ensure to tighten the M12 connector by screwing it onto its counterpart, so to preserve the water tightness.
Refer to the NMEA 2000® standard for a proper network design.
If power from the NMEA 2000® network is received, the green LED on the LinkUp housing will start flashing depending on the device's status. (See section "Troubleshooting" if LED is not constantly on).
Make sure the NMEA backbone is terminated with two resistors and the bus is powered by a 12V voltage source.

CONNECT TO THE J1939 NETWORK

The J1939 bus consists of four wires. Next to the two data transmission lines (CAN High and CAN Low) there are two power lines (V+ and ground).
The data transmission lines must be terminated by resistors.
It is required to power the LinkUp also from the J1939-side as the two sides of the LinkUp are completely galvanically separated. It is recommended to use the power lines provided by the J1939 bus to power the LinkUp Gateway.
If possible, use the provided Deutsch connector to interface the LinkUp Gateway to your vessel.
If the vessels engine is not equipped with the matching counterpart, it is possible to either crimp the fitting female connector on it (connector details in section “Technical Data”), or simply cut-off the plug on the LinkUp and manually connect the wires. For this, refer to the pinout description, provided in the section “Technical Data”.
Additional adapter cables can be purchased as accessories to interface the typical installations of Volvo Penta (B001027) and Yanmar (B001028) engines without the need to manually confection cables.

CONFIGURATION

LINKUP CONFIGURATOR APP

To configure your system, some parameters must be calibrated through the LinkUp gateway. These parameters are:

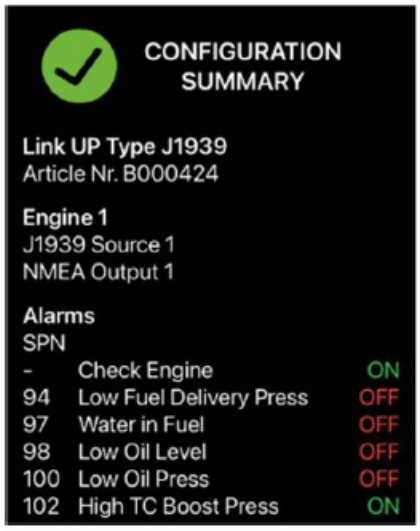
- number of engines, which should be analyzed through this gateway
- the engine instances of these engines
- which alarms you want to receive on your dashboard

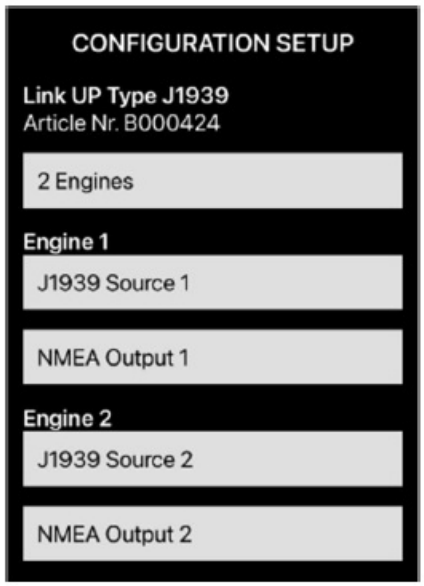
This is possible through the “LinkUp Configurator” smartphone App, which can be downloaded free of charge from the stores of both Android and iOS devices.
A simple and detailed explanation of the configuration process is also available as in-app instructions. Thanks to the passive embedded NFC receiver, the LinkUp gateway can be configured, as described below, without the need for a power supply.

GATEWAY CONFIGURATION

1. Launch the “Link Up Configurator” App and read the actual configuration of the LinkUp device by “tapping” the smartphone onto the LinkUp wireless area (indicated by the red arrow).
   NOTE: The antenna position on the smartphone depends on the model.
   Please refer to the smartphone manufacturer manual.

2. After the readout, the App will show the “Configuration Summary”, which displays all the current settings of the device.
   To modify the configuration, press the “Change Configuration” button.
3. Select whether you’ve got one or two engines on your vessel.
   Then choose for each engine its source number that is used in the J1939 system as well as the instance which should be used in the NMEA 2000 network.



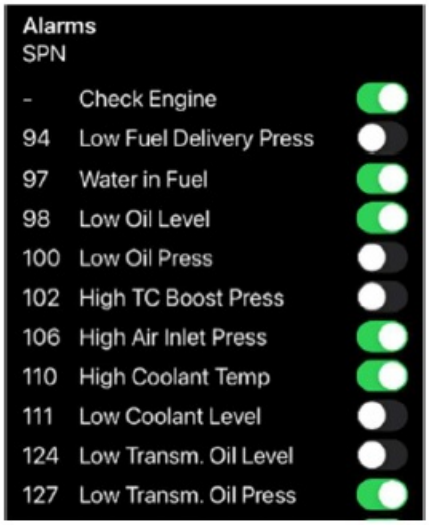


4. After that, you can choose, which alarms you want to show up on your dashboard.
   Once the settings are completed, press the “Write Configuration” button to prepare the download.

See the “Supported Alarms” section of this manual for the complete list of supported alarms.

5. To download the configuration, simply “tap” the smartphone again onto the LinkUp wireless area, as described on step 1.

   The configuration is instantaneously transferred to the device, and the new “Configuration Summary” is displayed.



SUPPORTED DATA

SAE J1939			NMEA 2000	
Data	**PGN**	**SPN**	**Data**	**PGN**
Engine Speed	EEC1	190	Engine Speed	127488
Engine Hours	HOURS	247	Total Engine Hours	127489
Engine Load	EEC2	92	Engine Percent Load	127489
Engine Oil Temp	ET1	175	Engine Oil Temp	127489
Engine Oil Press	EFL	100	Engine Oil Temp	127489
Coolant Temp	ET1	110	Engine Temp	127489
Coolant Press	EFL	109	Engine Coolant Pressure	127489
Boost Press	IC1	102	Engine Boost Pressure	127488
Trans Oil Press	TRF1	127	Transmission Oil Pressure	127493
Trans Oil Temp	TRF1	177	Transmission Oil Temperature	127493
Exhaust Temp	IC1	173	Exhaust Gas Temperature	130316
Fuel Level	DD	96	Fluid Level (Fuel)	127505
Fuel Press	EFL/P1	94	Fuel Pressure Fuel Pressure	130314 127489
Fuel Rate	LFE	183	Fuel Rate	127489
Inst Fuel Economy	65266	184	Instant Fuel Economy	127497
Alternator Current	65271	115	Battery Current	127508
Alternator Potential	65271	167	Alternator Potential	127489
Battery Potential	65271	168	Battery Voltage	127508
Transmission Gear	61445	523	Gear Position	127493
Percent Torque	61444	513	Percent Engine Torque	127489

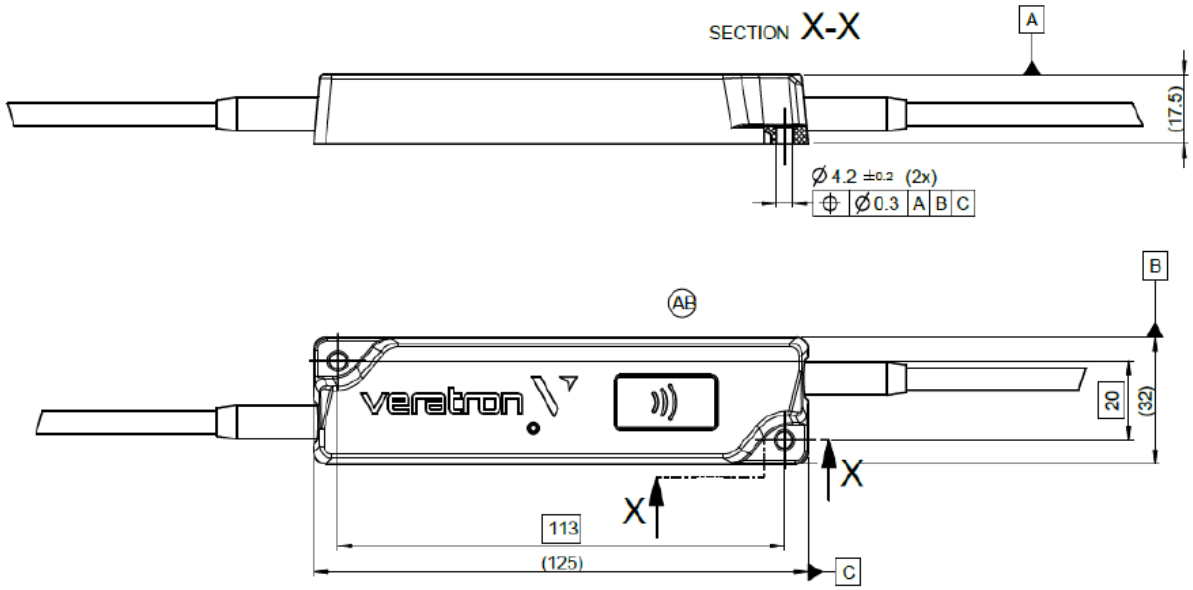
SUPPORTED ALARMS

Alarm	SPN	Alarm	SPN
Check Engine	-	Low Coolant Level	111
Low Fuel Delivery Pressure	94	Low Transmission Oil Level	124
Water in Fuel	97	Low Transmission Oil Pressure	127
Low Oil Level	98	Low Electrical Potential	168
Low Oil Pressure	100	High Exhaust Gas Temperature	173
High Tc Boost Pressure	102	High Oil Temperature	175
High Air Inlet Pressure	106	High Transmission Oil Temperature	177
High Coolant Temperature	110	Engine Overspeed	190

TECHNICAL DATA

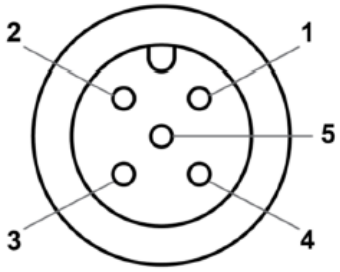
DATASHEET

Operating voltage	6 – 16.5 V
Nominal voltage	12 V (from NMEA 2000® network)
Power consumption	≤ 100 mA
NMEA 2000® LEN	2
Operating temperature	-30°C to 80°C
Sensor cable length	25 cm
NMEA 2000® cable length	25 cm
SAE J1939 network plug	Deutsch DT04-6P (Male)
Counterpart for J1939 network plug	Deutsch DT06-6S (Female)
NMEA 2000® plug	DeviceNet Micro-C M12 5 pins - Male
Protection class	IP X7 according to IEC60529 (when connected)
Flammability	UL94-HB
Compliance	CE, UKCA, Reach, RoHS



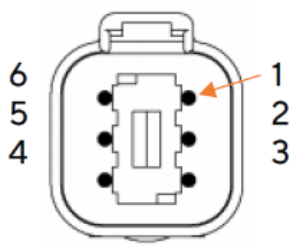
PINOUTS

Pin No.	Description
1	Shield
2	NET-S (V+)
3	NET-C (GND)
4	NET-H (CAN High)
5	NET-L (CAN Low)



Micro-C M12 5 poles plug
Male, product side view

Pin No.	Wire color	Description
1	Blue	CAN Low
2	-	-
3	White	CAN High
4	Black	GND
5	-	-
6	Red	Power (+12V)



Deutsch DT04-6P plug, front view

TROUBLESHOOTING

State	Cause	Solutions
LED on LinkUp is never on	LinkUp is not powered	Power the NMEA-Network with a 12V source.
		Check the connection to the NMEA backbone.
LED is blinking slowly (1 Hz)	LinkUp is not configured. (Factory settings)	Download the LinkUp Configurator App on your NFC-capable smartphone and proceed with the configuration, as described in the respective section of this manual.
LED is blinking fast (2.5 Hz)	LinkUp receives no valid data.	Make sure, the LinkUp is also connected to a 12V source on the J1939-side. (Galvanic isolation)
		Check terminating resistors on the J1939-net. (Resistance between wires should be 60-120Ohm)
		Is the plug connected correctly to the bus?
		Check the pinout on the connector. (See "J1939 – Check Pinout")
LED is constantly on / No data is transmitted	NMEA-side isn't working.	Check the two terminating resistors on the ends of the NMEA 2000 backbone.
		Make sure the displaying device is connected to the network correctly.
		Check whether the correct instances have been selected. (Engine 1, Engine 2, ...)
	No compatible data available.	Make sure, the SPN of the data you're expecting to see is listed in the table "Supported Data".
LED is constantly on / Other data can be received	The data is not compatible	Make sure, the SPN of the data you're expecting to see is listed in the table "Supported Data".

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FAQ

Q: How do I configure the LinkUp gateway?

A: Configuration of the LinkUp gateway is done wirelessly using a smartphone and the companion LinkUp Configurator App for Android or iOS.

Documents / Resources

	veratron LINK UP J1939 NMEA 2000 LinkUp Gateway [pdf] User Manual LINK UP J1939 NMEA 2000 LinkUp Gateway, LINK UP J1939, NMEA 2000 LinkUp Gateway, LinkUp Gateway, Gateway

References

- User Manual