QUARK-ELEC

QK-AS01 Manual

NMEA 0183 to NMEA 2000 Mini Gateway

Compatible with most NMEA 0183 devices

Supports the majority of NMEA 0183 sentences

Designed in UK

Features

- Converts the most common NMEA 0183 sentences into NMEA 2000 PGNs
- Galvanic Opto-isolation on NMEA 2000 CAN bus connection
- Compatible with most NMEA 0183 devices
- Automatically detects and adjusts the NMEA 0183 input baud rate
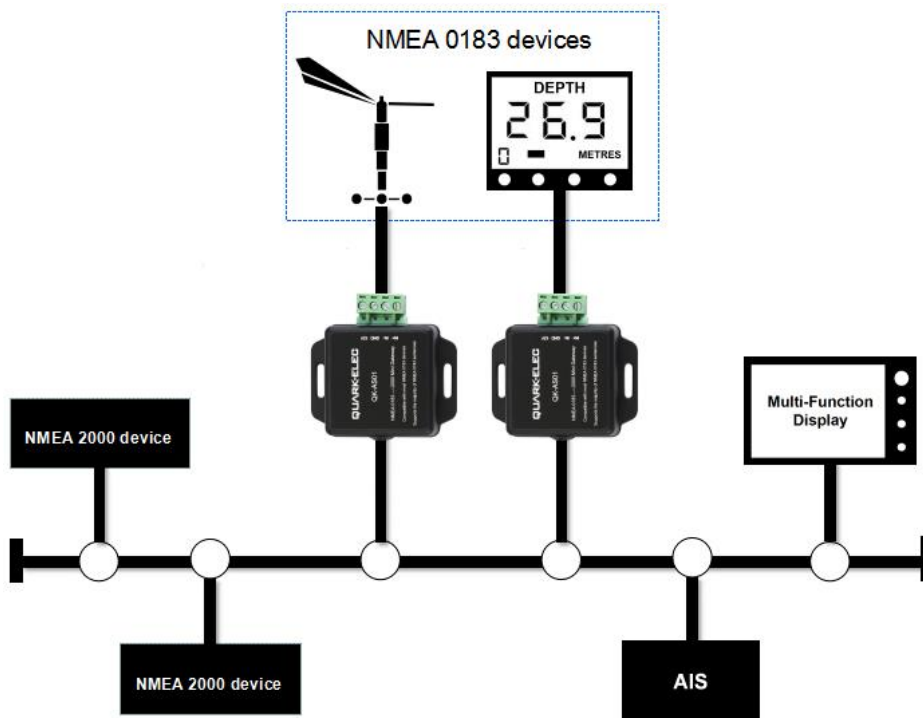- Pre-fitted N2K cable for a quick and easy installation

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Figure 1: Example setup

1. Introduction

The AS01 is intended for use in a marine environment. It provides an easy way to link older NMEA 0183 devices to a newer and faster NMEA 2000 marine network. It features an NMEA 0183 to NMEA 2000 converter with a wide support of message types.

The AS01 has an NMEA 0183 input port and an NMEA 2000 output. Its main feature is that the NMEA 0183 input doesn't require configuration, as input baud rate is detected and set automatically. The AS01 supports the conversion of most NMEA 0183 sentences and is compatible with most NMEA 0183 devices on the market. This includes devices using the RS422 (differential terminals) or RS232 (single terminal) communication protocol, as well as a wide range of GPS, AIS, wind, dept, speed, temperature and heading sensors.

Thanks to its small size it can be easily installed behind instrument panels. It is the ideal solution for vessels with limited available space for marine instruments or on boats where multiple converters are required.

Please refer to the Conversion List chapter for details of supported (and non-supported) conversions.

2. Mounting

The AS01 is aimed at the commercial, leisure, fishing boat and vessel monitoring markets.

It is not waterproof so should be mounted in a dry place such as behind the instrument panel on a flat surface.
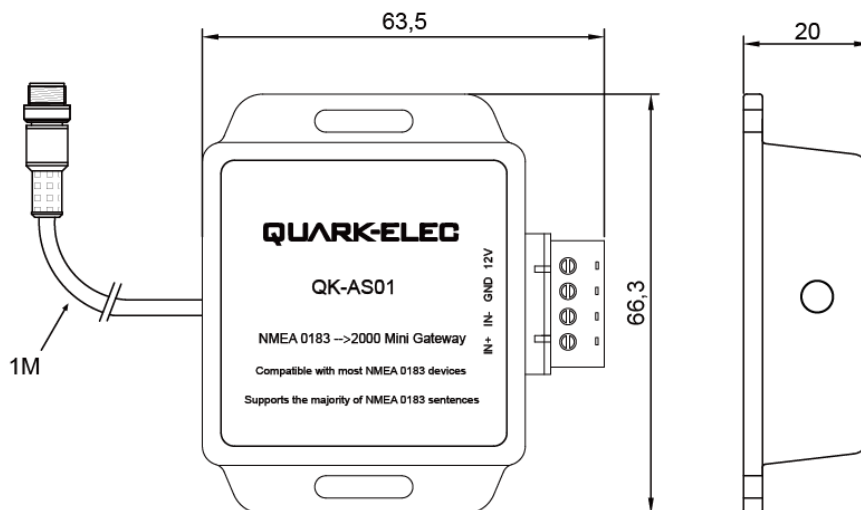

Figure 2: AS01 Dimension in mm

3. Connecting

⚠️ **Disconnect all power sources before connecting your equipment!**

3.1. Connecting to the NMEA 2000 network

The AS01 is pre-fitted with a five-core screened cable for the NMEA 2000 connection, fitted with a male micro-fit connector. Simply connect the cable to the network backbone or using a T-piece connector.

Figure 3: Pin NMEA 2000 male micro-fit connection

The main communication channel of an NMEA 2000 network is an NMEA 2000 backbone to which NMEA 2000 devices are connected. The NMEA 2000 backbone must be powered from a stable 12V DC power supply and always requires two termination resistors.

Please note the AS01 must be powered from a stable 12V DC power supply connected to its power supply terminals marked with '12V' and 'GND', it cannot be powered from the NMEA 2000 backbone.

3.2. Connecting to a NMEA 0183 Device

The AS01 comes with a 4-way terminal block. Two of these terminals, labelled as 'IN+' and 'IN-', represent the NMEA input port and can be used to connect the AS01 to an NMEA 0183 talker device (e.g., a sensor or a chart plotter's NMEA 0183 output). Please ensure both the power supply and the NMEA 0183 talker device are connected to the right terminals, as connecting these to the wrong terminals will damage both the AS01 and the other device.

After powering up the AS01, it will take up to 3 seconds for the AS01 to detect the talker device's output baud rate (either 4800 or 38400bps) and to automatically adjust the baud rate of its NMEA 0183 input port.

Although the AS01's NMEA 0183 interface is based on the RS422 communication protocol (differential ends), it also supports NMEA0183-RS232 interface devices (single end). The following tables provide the wiring information for each type.

	QK-AS01 terminal	RS422 device terminals
NMEA 0183 Input	NMEA IN+	NMEA output+ *[1]
	NMEA IN-	NMEA output-

*[1] Swap NMEA + and NMEA- wires if the connection does not work.

	QK-AS01 terminal	RS232 device terminals
NMEA 0183 Input	NMEA IN+	GND *[2]
	NMEA IN-	NMEA output

*[2] Swap NMEA input and GND / NMEA output and GND wires if the connection does not work.

4. Conversion Lists

The following tables list the supported NMEA 2000 PGN's (parameter group numbers) and NMEA 0183 sentences. It is important to check the table to confirm that the AS01 will convert the NMEA 0183 sentences to the required NMEA 2000 PGNs.

4.1. AS01 NMEA 0183 to NMEA 2000 conversions

The following NMEA 0183 to NMEA 2000 conversions are currently supported.

NMEA 0183 sentence	Function	Converted to NMEA 2000 PGNs
DBT	Depth Below Transducer	128267
DPT	Depth	128267
GGA	Global Positioning System Fix Data	126992, 129025, 129029
GLL	Geographic Position Latitude/Longitude	126992, 129025
GSA	GNSS DOP and Active Satellites	129539
GSV	GNSS Satellites in View	129540
HDG	Heading, Deviation & Variation	127250
HDM	Heading, Magnetic	127250
HDT	Heading, True	127250
MTW	Water Temperature	130311
MWD	Wind Direction & Speed	130306
MWV	Wind Speed and Angle (True or relative)	130306
RMB	Recommended Minimum Navigation Information	129283,129284
RMC*	Recommended Minimum Specific GNSS Data	126992, 127258, 129025, 12902
ROT	Rate Of Turn	127251
RPM	Revolutions	127488
RSA	Rudder Sensor Angle	127245
VHW	Water Speed and Heading	127250, 128259
VLW	Dual Ground/Water Distance	128275
VTG*	Course Over Ground and Ground Speed	129026
VWR	Relative (Apparent) Wind Speed and Angle	130306
XDR	Battery information (Voltage, current and status)	127506,127508
XTE	Cross Track Error, Measured	129283
ZDA	Time & Date, Local Time Offset	126992,129033
VDM/VDO	AIS Message 1,2,3	129038
VDM/VDO	AIS Message 4	129793
VDM/VDO	AIS Message 5	129794
VDM/VDO	AIS Message 9	129798
VDM/VDO	AIS Message 14	129802
VDM/VDO	AIS Message 18	129039
VDM/VDO	AIS Message 19	129040
VDM/VDO	AIS Message 21	129041
VDM/VDO	AIS Message 24	129809. 129810

*Please note: some PGN sentences that are received require additional data before being sent.

5. Specification

Item	Specification
DC supply	12.0V (+/-10%)
Average supply current	20mA
Maximum supply current	27mA
NMEA data format	ITU/ NMEA 2000 and 0183 format
NMEA 0183 port baud rate	4800bps,38400bps baud
NMEA 2000 port baud rate	250kbps
NMEA 2000 Compatibility	Fully NMEA 2000 certified
LEN	1
Cable Length NMEA 2000	1.0m
Operating Temperature	-20°C to +55°C
Storage Temperature	-30°C to +70°C
Recommended Humidity	0 - 93% RH

6. Limited Warranty and Notices

Quark-elec warrants this product to be free from defects in materials and manufacture for one year from the date of purchase. Quark-elec will, at its sole discretion, repair or replace any components that fail in normal use. Such repairs or replacement will be made at no charge to the customer for parts and labour. The customer is, however, responsible for any transportation costs incurred in returning the unit to Quark-elec. This warranty does not cover failures due to abuse, misuse, accident or unauthorized alteration or repairs. A returns number must be given before any unit is sent back for repair.

The above does not affect the statutory rights of the consumer.

Disclaimer

This product is designed to aid navigation and should be used to augment normal navigational procedures and practices. It is the user's responsibility to use this product prudently. Neither Quark-elec, nor their distributors or dealers accept responsibility or liability either to the products user or their estate for any accident, loss, injury, or damage whatsoever arising out of the use or of liability to use this product.

Quark- products may be upgraded from time to time and future versions may therefore not correspond exactly with this manual. The manufacturer of this product disclaims any liability for consequences arising from omissions or inaccuracies in this manual and any other documentation provided with this product.

Document history

Issue	Date	Changes / Comments
1.0	03-03-2022	Initial release
1.1	25-10-2022	Support ZDA -→ 129033. AS01 doesn't support upgrading firmware online. So any product purchased from us before this time, won't support this and further function.
1.2	22-03-2023	Support XDR(U,I,G) -→ 127508 and 127506 PGNs(battery information(Voltage, current, status)). AS01 doesn't support upgrading firmware online. So any product purchased from us before this time, won't support this and further function.

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