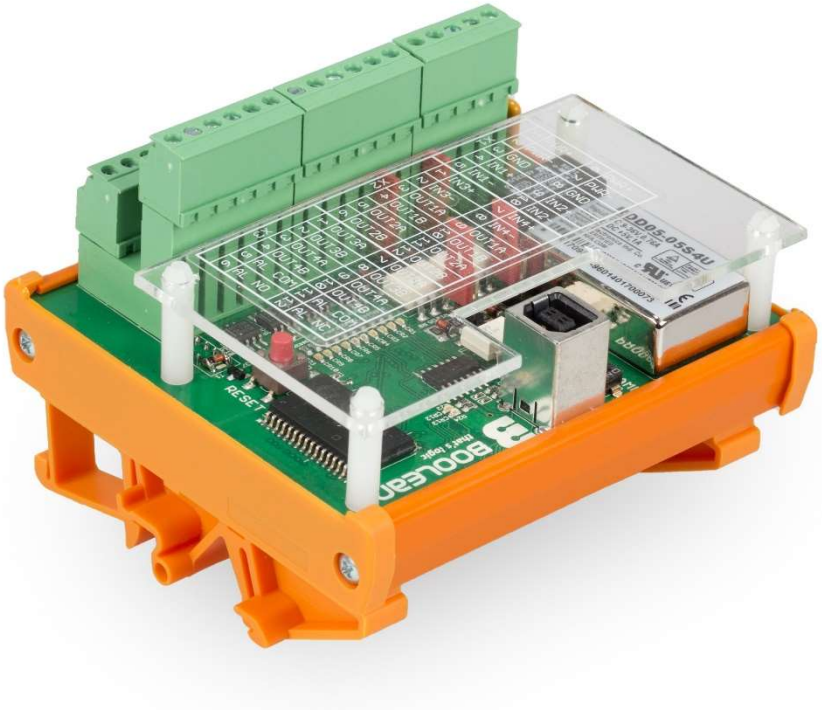
NMEA Superfast to Coursebus Converter

Installation and user manual



Content

Abbreviation

- **EEPROM** - Electrically Erasable Programmable Read-Only Memory.
- **GPS** - Global Positioning System.
- **LED** - Light-emitting diode.
- **NDCU** - Navigation Data Computing Unit. Universal hardware platform with 4 serial inputs and 4 serial outputs designed by Boolean. Hardware can be loaded with software with different functionality in example signal conversion, data calculation etc.
- **NMEA** - Electrical and data specification for communication between marine electronics instruments. It has been defined by, and is controlled by, the National Marine Electronics Association.

Safety information

 **Do not work inside the equipment unless totally familiar with electrical circuits.**

Hazardous voltage which can cause electrical shock, burn or serious injury exists inside the equipment.

 **Turn off the power at the mains switchboard before beginning the installation.**

Post a sign near the switch to indicate it should not be turned on while the equipment is being installed.

Fire, electrical shock or serious injury can result if the power is left on or is applied while the equipment is being installed.

 **Confirm that the power supply voltage is compatible with the voltage rating of the equipment.**

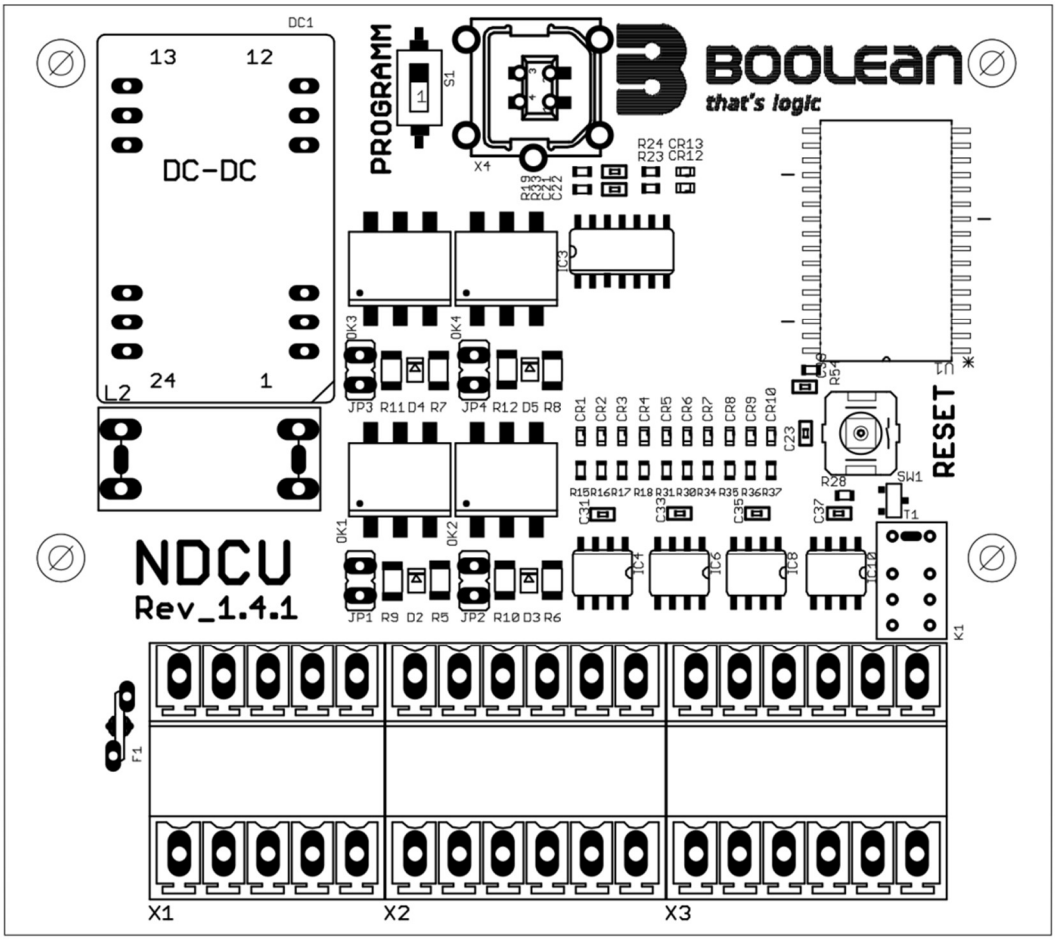
Connection to the wrong power supply can cause fire or equipment damage. The voltage rating appears on the last page of this manual.

Description

NMEA Superfast to Coursebus Converter software based on NDCU - Navigation Data Computing Unit hardware has been designed to convert gyrocompass NMEA Superfast (38400 bps, 50Hz) heading to Raytheon Anschutz Cursebus format. Unit has preconfigured input/output baud rate and operates with power supply range from 9 to 36 VDC. NDCU must receive HDT and ROT telegrams to convert signal to Cursebus. With not interrupted NMEA Superfast transmission Cursebus telegrams are transferred 50 times per second, so exactly the same rate as original Raytheon Anschutz telegrams.

NDCU is configured to receive **NMEA Superfast data at input 1**

Cursebus data is transferred on outputs 2 to 4



NDCU 1.4.x Component layout.

Terminal, jumper and switches description

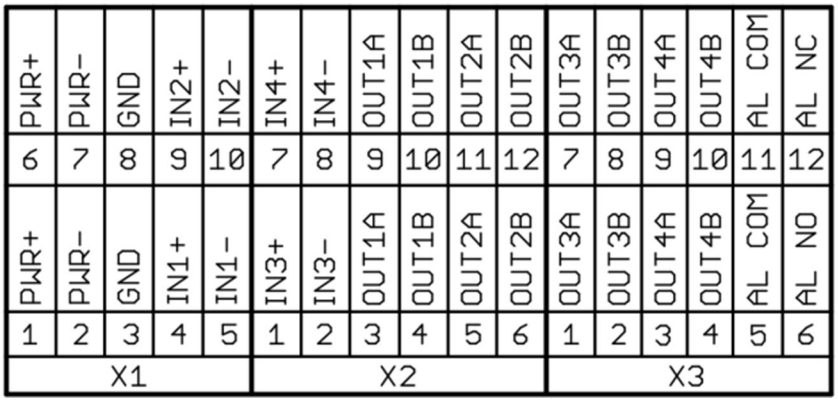
DIP Switch S1. Not used in this application

TACT Switch SW1. Reset button – it is possible to reset device by means of this button.

Jumpers JP1, JP2, JP3, JP4. Close jumper in case of weak input signal (no data). Normally leave opened. JP1 corresponds to input 1 and JP2 corresponds to input 2 and so on up to input 4.

Connector X4. Programming only!

X1 to X3. Power and signal connection for NDCU hardware rev_1.4.x. Refer to below tables:



NDCU 1.4.x Terminal description sticker

Note: Power terminals **1** and **6**, **2** and **7**, **3** and **8 are connected parallel!**

Note: Upper and Lower NMEA output terminals are NOT connected parallel. In example NMEA out 1 from lower terminal has separate output driver as NMEA out 1 from upper terminal. These work as 2 channel NMEA buffer on each output.

X1 Terminal description.

X1 Terminal number:	Description:	Function:
1	PWR+	Power input Positive (9-36VDC)
2	PWR-	Power input Negative
3	GND	Grounding point
4	IN1+	Input 1 data receiving – **NMEA Superfast (38400bps) input**
5	IN1-	Input 1 data receiving – **NMEA Superfast (38400bps) input**
6	PWR+	Power input Positive (9-36VDC)
7	PWR-	Power input Negative
8	GND	Grounding point
9	IN2+	Input 2 data receiving – **not used in this software version**
10	IN2-	Input 2 data receiving – **not used in this software version**

X2 Terminal description.

X2 Terminal number:	Description:	Function:
1	IN3+	Input 3 data receiving – **not used in this software version**
2	IN3-	Input 3 data receiving – **not used in this software version**
3	OUT1A	Output 1 – **not used in this software version**
4	OUT1B	Output 1 – **not used in this software version**
5	OUT2A	Raytheon Anschutz Cursebus Data Output 1 – buffered
6	OUT2B	Raytheon Anschutz Cursebus Data Output 1 – buffered
7	IN4+	Input 4 data receiving – **not used in this software version**
8	IN4-	Input 4 data receiving – **not used in this software version**
9	OUT1A	Output 1 – **not used in this software version**
10	OUT1B	Output 1 – **not used in this software version**
11	OUT2A	Raytheon Anschutz Cursebus Data Output 1 – buffered
12	OUT2B	Raytheon Anschutz Cursebus Data Output 1 – buffered

X3 Terminal description.

X3 Terminal number:	Description:	Function:
1	OUT3A	Raytheon Anschutz Cursebus Data Output 2 – buffered
2	OUT3B	Raytheon Anschutz Cursebus Data Output 2 – buffered
3	OUT4A	Raytheon Anschutz Cursebus Data Output 3 – buffered
4	OUT4B	Raytheon Anschutz Cursebus Data Output 3 – buffered
5	AL COM	Alarm relay Common contact **(not used)**
6	AL NO	Alarm relay Normally Opened contact **(not used)**
7	OUT3A	Raytheon Anschutz Cursebus Data Output 2 – buffered
8	OUT3B	Raytheon Anschutz Cursebus Data Output 2 – buffered
9	OUT4A	Raytheon Anschutz Cursebus Data Output 3 – buffered
10	OUT4B	Raytheon Anschutz Cursebus Data Output 3 – buffered
11	AL COM	Alarm relay Common contact **(not used)**
12	AL NC	Alarm relay Normally Closed contact **(not used)**

LED Description.

LED number:	Colour / state:	Function:
CR1	Green / blinking	Input 1 data receiving
CR2	Green / blinking	Input 2 data receiving
CR3	Green / blinking	Input 3 data receiving
CR4	Green / blinking	Input 4 data receiving
CR5	Red / lit constantly	Power ON when lit
CR6	Red / lit constantly	System alarm when lit
CR7	Blue / blinking	Output 1 data transmission
CR8	Blue / blinking	Output 2 data transmission
CR9	Blue / blinking	Output 3 data transmission
CR10	Blue / blinking	Output 4 data transmission

System configuration

There is no configuration available for this software version

System alarms and troubleshooting

There is no alarm function implemented at the moment for NMEA Superfast to Coursebus Converter software version 1.0.0.

When no NMEA Superfast (HDT and ROT) data is available on Input #1 or input signal is too low, system will transfer it's ID and software version every 2 seconds on output no 1:

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NMEA Superfast to Coursebus Data Converter version 1.0.0

for NDCU hardware rev_1.4

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When no Cursebus data is transferred please make sure that:

- NMEA Superfast data is connected to **NDCU input 1**
- NMEA Superfast data has proper polarity – change polarity if necessary
- NMEA baudrate is 38400 bps
- HDT and ROT telegrams are transferred at the same time
- PROGRAMM Switch is set to OFF
- Close jumper JP1 if above points are OK.
- Press RESET button or recycle NDCU power supply
- Contact Boolean if all above failed.

Technical data

- Power Supply: 24VDC (9 to 36VDC)
- Power consumption: maximum 7,5 W at 24VDC
- Number of inputs: 4, baudrate pre-configured
- Number of outputs: 4 the same baudrate as input
- Input/output signal baudrate: 9600 or 38400 bps compatible with IEC 61162-2
- Connection: cables diameter up to 2,5mm^2
- Dimensions: L 102mm x W 87mm x H 60mm
- Mounting: DIN Rail.
- Data retention: 20 years at 85 °C / 100 years at 25 °C
- Galvanic isolation: Power supply 1,5kVDC, signal input/output up to 5kV$_{RMS}$

Accepted signals:

1. **Gyrocompass input:** $xxHDT, $xxROT, IEC 61162-2 (50Hz)
2. **Gyrocompass output:** Raytheon Anschutz Cursebus (STD20, STD22)

Warranty and after sales support

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