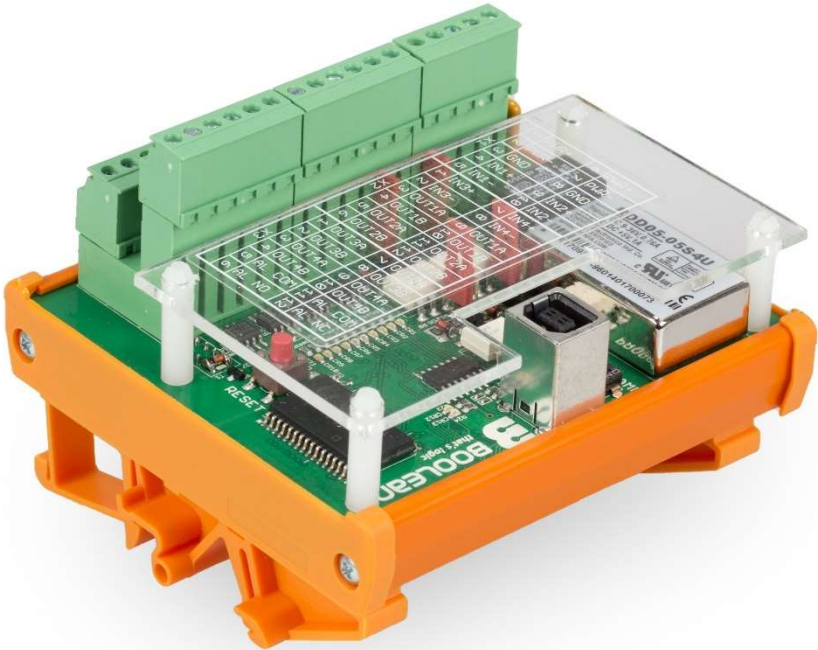


Heading Data Converter

Installation and user manual



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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.

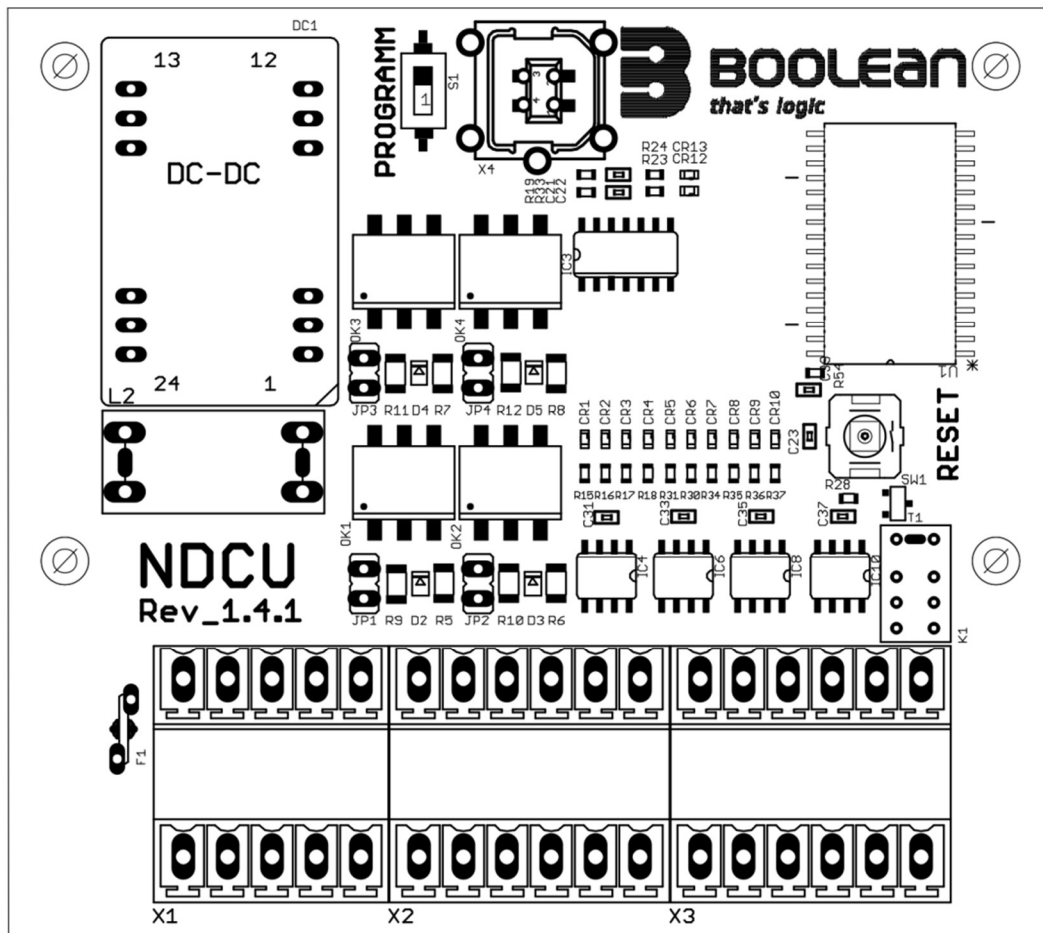
Connection to the wrong power supply can cause fire or equipment damage. The voltage rating appears on the last page of this manual.

Description

HDC - Heading Data Converter software based on NDCU - Navigation Data Computing Unit hardware has been designed to convert gyrocompass serial heading to other desired serial format. Software version 0.0.1 allows to convert Raytheon Anschutz Cursebus (STD20, STD22) data into IEC 61162-2 NMEA Superfast (50Hz) 38400 bps. Unit has preconfigured input/output baud rate and operates with power supply range from 9 to 36 VDC. NDCU transmits HEHDT and HEROT telegrams every time once Cursebus telegram has been received. With not interrupted Cursebus transmission NMEA telegrams are transferred 50 times per second, so exactly the same rate as Raytheon Anschutz telegrams.

NDCU is configured to receive **Cursebus data at input 4**

NMEA Superfast data is transferred on outputs 1 to 3



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:

PWR+	PWR-	GND	IN2+	IN2-	IN4+	IN4-	OUT1A	OUT1B	OUT2A	OUT2B	OUT3A	OUT3B	OUT4A	OUT4B	AL COM	AL NC
6	7	8	9	10	7	8	9	10	11	12	7	8	9	10	11	12
PWR+	PWR-	GND	IN1+	IN1-	IN3+	IN3-	OUT1A	OUT1B	OUT2A	OUT2B	OUT3A	OUT3B	OUT4A	OUT4B	AL COM	AL NO
1	2	3	4	5	1	2	3	4	5	6	1	2	3	4	5	6
X1				X2						X3						

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 – not used in this software version
5	IN1-	Input 1 data receiving – not used in this software version
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 2 data receiving – not used in this software version
2	IN3-	Input 2 data receiving – not used in this software version
3	OUT1A	NMEA Superfast Data Output 1 – buffered
4	OUT1B	NMEA Superfast Data Output 1 – buffered
5	OUT2A	NMEA Superfast Data Output 2 – buffered
6	OUT2B	NMEA Superfast Data Output 2 – buffered
7	IN4+	Raytheon Anschutz Cursebus input
8	IN4-	Raytheon Anschutz Cursebus input
9	OUT1A	NMEA Superfast Data Output 1 – buffered
10	OUT1B	NMEA Superfast Data Output 1 – buffered
11	OUT2A	NMEA Superfast Data Output 2 – buffered
12	OUT2B	NMEA Superfast Data Output 2 – buffered

X3 Terminal description.

X3 Terminal number:	Description:	Function:
1	OUT3A	NMEA Superfast Data Output 3 – buffered
2	OUT3B	NMEA Superfast Data Output 3 – buffered
3	OUT4A	Data Output 4 – buffered (not used)
4	OUT4B	Data Output 4 – buffered (not used)
5	AL COM	Alarm relay Common contact (not used)
6	AL NO	Alarm relay Normally Opened contact (not used)
7	OUT3A	NMEA Superfast Data Output 3 – buffered
8	OUT3B	NMEA Superfast Data Output 3 – buffered
9	OUT4A	Data Output 4 – buffered (not used)
10	OUT4B	Data Output 4 – buffered (not used)
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 HDC software version 0.0.1.

When no Cursebus data is available on Input #4 or input signal is too low, system will transfer it's ID and software version every 2 seconds on all 3 outputs:

```
Heading Data Converter version 0.0.1  
for NDCU hardware rev_1.4.x  
Copyright BOOLEAN 2017
```

When no HEHDT and HEROT data is transferred please make sure that:

- Cursebus data is connected to **NDCU input 4**
- Cursebus data has proper polarity – change polarity if necessary
- Close jumper JP4 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 2,5mm²
- 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:** Raytheon Anschutz Cursebus (STD20, STD22)
2. **Gyrocompass output:** \$HEHDT, \$HEROT, IEC 61162-2 (50Hz)

Warranty and after sales support

For warranty terms and conditions please refer to our website: <http://www.boolean.pl/>

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