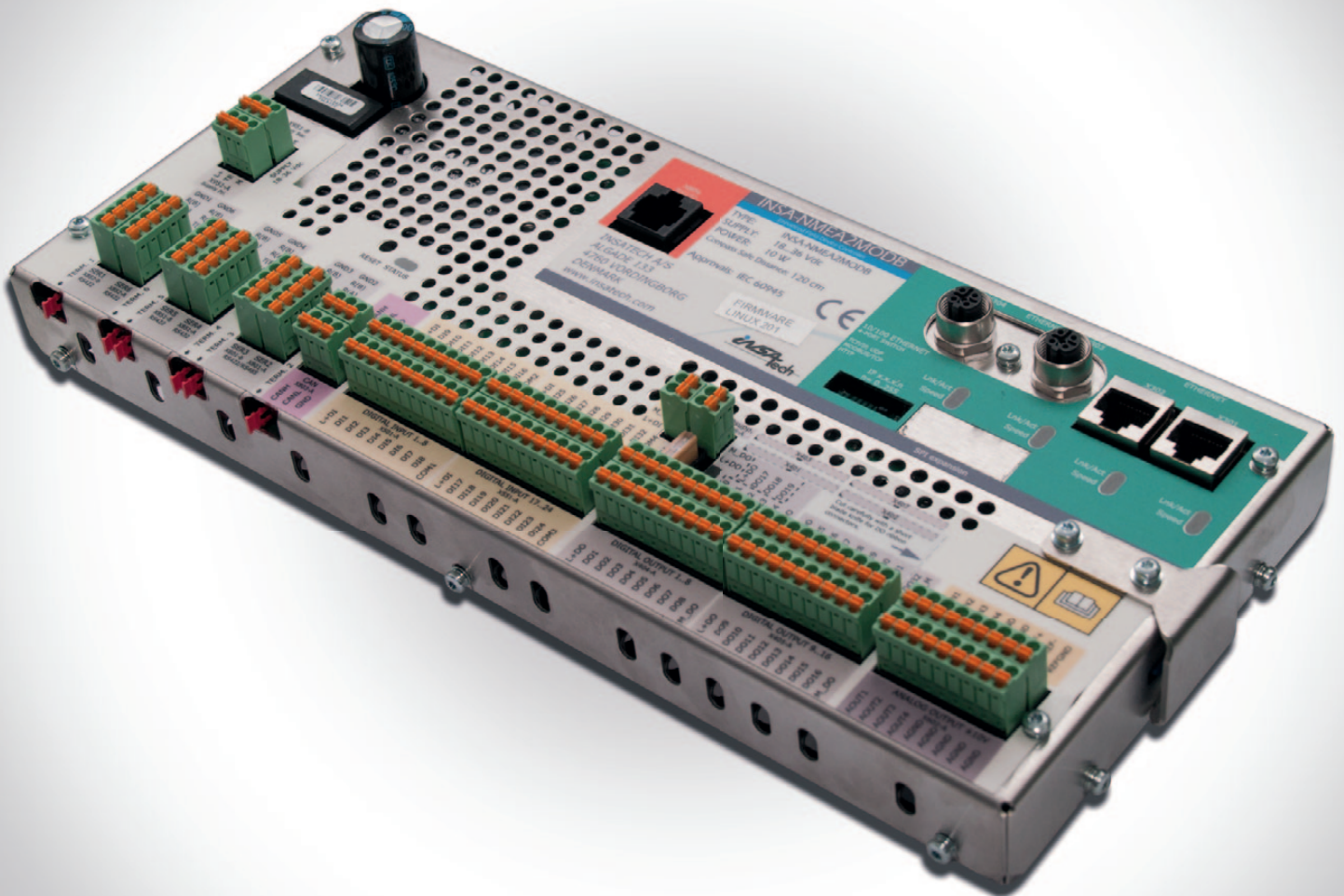


NMEA2 MODB



NMEA2MODB

Versatile Ethernet I/O unit

The **NMEA2MODB** is an Ethernet-based versatile I/O- unit, which can be used in various monitoring and control applications. The unit is designed to be particularly suitable for ship applications, such as Integrated Bridge Systems (IBS).

Get data from navigation equipment:

- GPS
- TORQUE
- SPEED LOG
- Etc.
- GYRO
- WIND
- DEPTH

The unit fulfils the IEC 60945:2002 EMC standard and respective environmental standards.

Properties

The **NMEA2MODB** consists of a general purpose I/O part, communication parts, and an ethernet interface. The unit has a built-in power supply unit with 18...36 VDC input range. Two separate power supply sources, with automatic change-over are provided. The power source and monitoring is included in the onboard software.

The I/O part contains 32 digital inputs and 32 digital outputs, 4 analog inputs and 4 analog outputs. The unit contains a reference-voltage source to supply external potentiometers or sensors.

The communication part contains six UART-type serial interface channels with galvanic isolated RS422/RS485 or RS422 drivers. One channel also has an alternative RS232 driver available. There is also one galvanic isolated CAN-Bus channel. The ethernet part integrates a 5- port 10/100 ethernet switch.

The **NMEA2MODB** units can be connected in a chain, without the need of an external ethernet switch (the onboard switch functions as a normal ethernet switch). The setting-up and parameterisation of the **NMEA2MODB** module is performed through the WEB-server, using a normal HTML-browser.

NMEA 0183 Configuration

INTRODUCTION

NMEA2MODB listens to user defined NMEA messages and writes the data into Modbus registers.

Messages are specified in a text file named nmea2mbus.txt, which is located in the sd-card of the EFDC. The text file can be edited with an ordinary text editor, for example Notepad. Each line in configuration file contain a single NMEA sentence that the application should listen to. Sentence specification can be seen as a two-level definition, where the first level specifies the message format and second level the mapping of the data fields to modbus registers.

EXAMPLE CONFIGURATION LINE

The message format notation follows closely the syntax used in IEC-61162-1 standard. As an example, to specify that a HDT sentence should be listened to, following line should be added into the configuration file: \$--HDT, x.x, T*

General purpose I/O (remote I/O Server)

Control of the TM-EFDC digital and analogue I/O- parts are available through MODBUS/TCP protocol. The onboard basic software application contains a MODBUS/TCP server and the user can read the digital and analogue input registers and write corresponding output registers through this MODBUS/TCP server function.

The digital outputs can be selected to operate as 0...100% PWM output for example the dimming of the panel pilot lights.

The software is compliant with the IEC 61162-1 standard.

Communication part (Serial Device server)

The **TM-EFDC** communication part operates as a serial data communication device server. With this server function, the traffic through the UART (RS422 and RS232) and CAN- ports can be transferred either by UDP or TCP- protocols into the Ethernet- network (LAN).

The UART and CAN- controlled transport parameters and the UDP and TCP server properties are set by the HTML browser.

The TM-EFDC unit has two RS422/485 and four RS422 galvanic isolated serial channels. There is also alternatively RS232 line driver available for one serial channel.

All RS422/RS485 and RS422 Serial channels fully conform to IEC61162-2 standard and also compatible with IEC61162-1 standard devices.

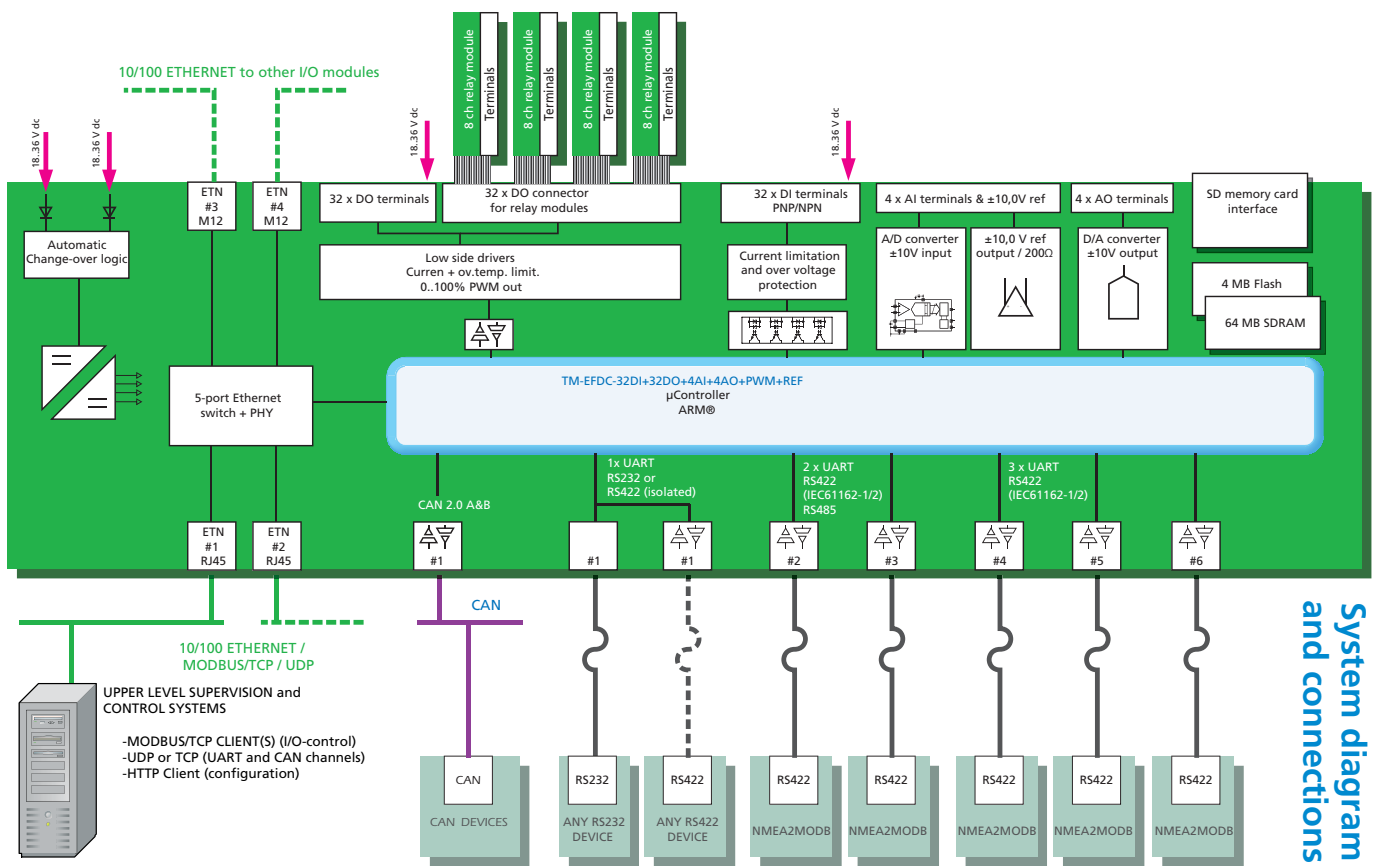
The preceding line states that:

- The sentence starts with "\$"
- The next two characters can be anything, "-" is a wildcard which can be used in sentence identifier
- Next three characters must be "HDT", which ends the sentence identifier. This implies that the next character must be ","
- After the "," comes a decimal number, containing optional fraction part. This is identified with field type code "x.x". The number is followed by ","
- Next character must be "T", otherwise the message is ruled out
- "*" at the end of the message states that the message contains NMEA checksum. If "*" is not specified as the last character, the checksum is not required.

To add modbus register mapping, register definitions are inserted into the format string. Register definitions are always bracketed with "[" and "]".

CONFIGURATION FILE EXAMPLE

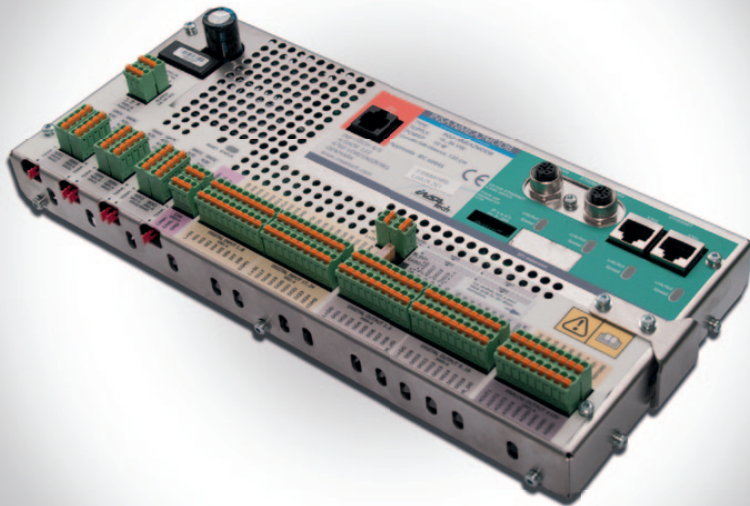
```
MAXNUMBEROFMSGDEFS 100
$--XDR[45057to3],G,x,x[45088*10v45078.1],a,001*
$--XDR[45058to3],G,x,x[45089*10v45079.1],a,002*
$--XDR[45059to3],G,x,x[45090*10v45080.1],a,003*
$--XDR[45060to3],G,x,x[45091*10v45081.1],a,004*
$--MWV[45061to3],x,x[45092*10v45077.1],a,x,x[45093*10v45077.2],a,A*
$--HDT[45062to3],x,x[45093*10v45075.1],T*
$--HDG[45063to3],x,x[45094*10v45076.1],x,x,a,x,x,a*
$--GGA[45064to3],hhmmss.ss,llll.ll[45095v45071.1],c[45096],yyyy.yy[45097v45071.2],c[45098],x,x,x,x,x,c,x,x,c,x,x,x*
$--VTG[45065to3],x,x[45100*10v45072.1],T,x,x[45101*10v45072.2],M,x,x[45099*10v45072.3],N,x,x,K,a*
$--VBW[45066to3],x,x[45102*10v45073.1],x,x,A,x,x,x,x,A,x,x,A,x,x,A*
$--DPT[45067to3],x,x[45103*10v45074.1],x,x,x,x*
```



System diagram and connections

General	
Power supply input	24 Vdc (18...36 Vdc) Power requirement 10W (typically 6W). Connections to two separate power sources. Power supply automatic switchover, if the primary input voltage drops below the permitted value. The power supply input state is indicated to the Remote I/O server register. Wiring to spring cage plug-in terminals
Operating temperature	-20...+55°C
Processor	32 bit, 200 or 400 MHz ARM processor
Memory	4 MB FLASH 64 MB SDRAM (32 bit) SD-interface for a memory card
Dimensions and weight	300x128x57 mm (lwxhd), approx.. 1000g
Approvals	IEC 60945:2002 / CE
Options	Fixing options (DIN-rail, direct mounting) / System cabling options, relay modules
Communication	
Ethernet Switch External ports: Protocol	Integrated 5-port 10/100 Ethernet-switch. 2pcs RJ45 and 2pcs M12 (D-coding) connectors Using the UDP or TCP -protocol
Serial UART Channels RS-422/RS-585 RS-422 RS-422/RS-232	Totally 6 channels. Wiring to spring cage plug-in terminals Fully conformity to IEC61162-2 standard and compatible with IEC61162-1 standard devices. 2pcs RS422/RS485 full or half duplex channels. Galvanic isolation in both channels 3pcs RS422 channels. Galvanic isolation in both channels One channel with RS-422/RS-232 alternative drivers. RS-422 driver with galvanic isolation. RS-232 available in RJ45 connector. TCP/IP Server and UDP modes to communicate over the Ethernet.
CAN	One CAN bus interface channel. CAN 2.0 A&B versions. With Galvanic isolation.
Remote I/O Server	
Protocol	MODBUS/TCP
Digital inputs Type Signal levels	32 of galvanic isolated digital input channels. Wiring to spring cage plug-in terminal Digital inputs are grouped in 8 inputs PNP/NPN Logic 0: 0 to 5 VDC, Logic 1: 10 to 32 VDC (DI COM to DI) Input resistance 5,6 kΩ
Digital outputs Type Protection	32 output channels. Galvanic isolation from the processor voltages. NPN (open drain FET), maximum load side supply voltage 36 VDC Outputs can also be operated as PWM outputs. Connections are either available as onboard spring cage plug connectors or as Flat cable connectors for connection to relay modules. Short circuit and over heating protection.
Analogue inputs Type Reference voltage output	4 (single ended) input channels. Wiring to spring cage plug-in terminal ±10 V signal range, 16-bit resolution, Input resistance 180 kΩ Buffered ±10 V (±3%) Reference output. Maximum 200 Ω load.
Analogue outputs Type	4 output channels ±10 V signal range 16-bit resolution ±10 mA output current

NMEA2 MODB



About us

Insatech A/S was established in 1989, and has, over the years, had a positive business development; today we are more than 50 employees, and are considered one of the market leaders. We are based in Vordingborg in the south of Zealand, Denmark in an old historic building. Since December 2005 we are part of the Addtech Group of companies – Addtech AB, Stockholm.

As a result of our longstanding partnership with some of the world's leading manufacturers within instrumentation and automation, we are able to provide a global service.

We supply quality products, solutions and services in the fields of measurement, control and calibration to nearly all industrial segments, as well as utilities, and we work as a professional partner for our suppliers and for our customers – we believe in long term relationships.

Our main markets are in the Pharmaceutical, Food, Energy, Marine/Oil & Gas Industry, which means we have a strong knowledge of the special applications, as well as the requirements for documentation in these areas.

Our main business areas:

- Process instrumentation and calibration equipment
- Automation, control and data acquisition
- System design, engineering and validation (DCS and Safety Systems)
- Service/maintenance and calibration (ISO 17025 accreditation)
- Site surveys and evaluation of process optimization based on better control practices
- Marine- and ship solutions, Cargo Management Systems
- Project Management
- Flow rigs / calibration rigs
- Special fittings
- Product enhancements
- Wireless solutions for monitoring and control
- Complete solutions including panels and commissioning
- Seminars and training.

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