

1. Features:

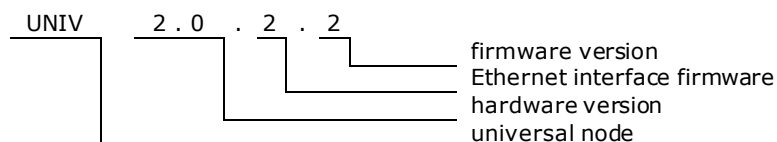
- Module is transparent for all messages sent from PC to HAPCAN bus, and vice versa.
- There are receive and transmit FIFO buffers

2. Compatibility:

- Firmware for **UNIV 2.0.2.0 application.**
- Firmware is compatible with previous versions.
- Firmware can be uploaded into devices with bootloader v version uart 1.1 or compatible (see warning 4.1)



3. Firmware version



4. Overview

This is an Ethernet <-> HAPCAN interface. The module is transparent for all messages sent from PC to HAPCAN bus, and vice versa. It is built using programmable Ethernet EM20X module made by Tibbo. This gives possibility to program and control HAPCAN system over LAN network, or even Internet. The EM20X module can also be programmed to work as a web server. The EM20X programming is not part of this document. More information can be found on Tibbo website (www.tibbo.com).

5. Firmware

Firmware can be uploaded by using HAPCAN Programmer, which can be downloaded from site <http://siwilo.com/hapcan/software>.

5.1. Frame building

HAPCAN frame is built when module receives TCP-IP frame with 12 bytes of data. First 4 bytes form the identifier of the HAPCAN frame. Next 8 are data bytes (D0 - D7). Every CAN frame is sent as 12 bytes through UART to Tibbo module and then Ethernet.

Table 1. ETHERNET INTERFACE FRAME

CAN	Frame type	Flags	Module	Group	D0	D1	D2	D3	D4	D5	D6	D7
UART	Byte 1	Byte 2	Byte 3	Byte 4	Byte 5	Byte 6	Byte 7	Byte 8	Byte 9	Byte 10	Byte 11	Byte 12

5.2. Status request

Module doesn't respond to status request.

5.3. Configuration

Parameters below can be configured with this version of application:

- Module identifier (module number and group number);
- Module description (16 chars);
- Ethernet port settings

Configuration process can be done using HAPCAN Programmer and Tibbo Software.

5.3.1. Module identifier

Every module on the network must have unique identifier. The identifier is made of two bytes, module number (1 byte) and group number (1 byte). Identifier of the Ethernet Interface can be changed in HAPCAN Programmer in software settings.

5.3.2. Module description

Every module can have 16 char description, which makes easier for user (programmer) to distinguish nodes. Example of node descriptions: main interface etc. Module description can be changed with HAPCAN Programmer software.

5.3.3. Ethernet port settings.

1. Download Tibbo Device Explorer (www.tibbo.com), which uploads serial-to-Ethernet firmware.
2. Download serial-to-Ethernet firmware file eg. EM_371D.BIN or newer.
3. Download Tibbo DS Manager (www.tibbo.com) to configure EM20X module with uploaded serial-to-Ethernet firmware.
4. Run Device Explorer. If EM20X does not appear on the list, try to disable Windows firewall.
5. In Device Explorer upload serial-to-Ethernet firmware. Since then the EM20X will behave as serial-to-Ethernet interface and should be visible in DS Manager software.
6. Run DS Manager and configure EM20X module according to hints below.

Ethernet port must be set up according to the local network configuration. The IP address, network mask and communication port have to be given.

The whole Ethernet port configuration process can be done with Tibbo DS Manager (www.tibbo.com). Figures below show parameters to assure correct device operation.

Because EM202 does not require password for normal operation, it is important to protect device from unauthorized access, by proper network firewall configuration.

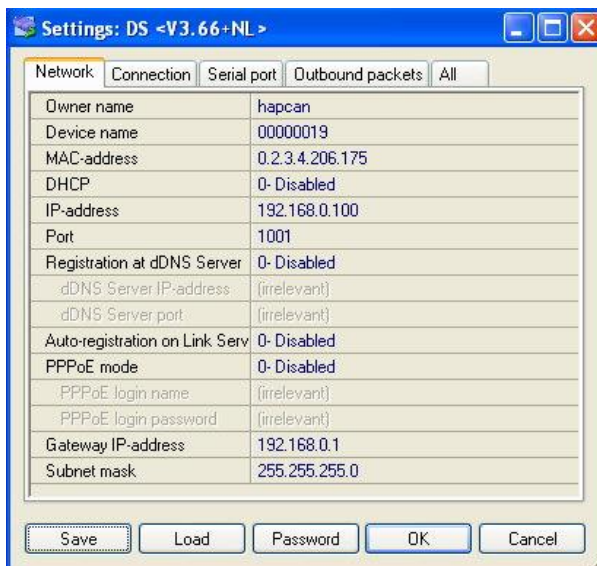


Figure 1. Network settings

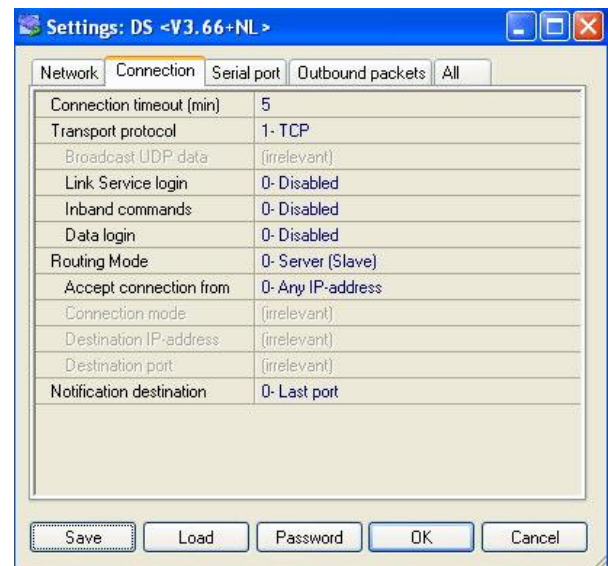


Figure 2. Connection settings

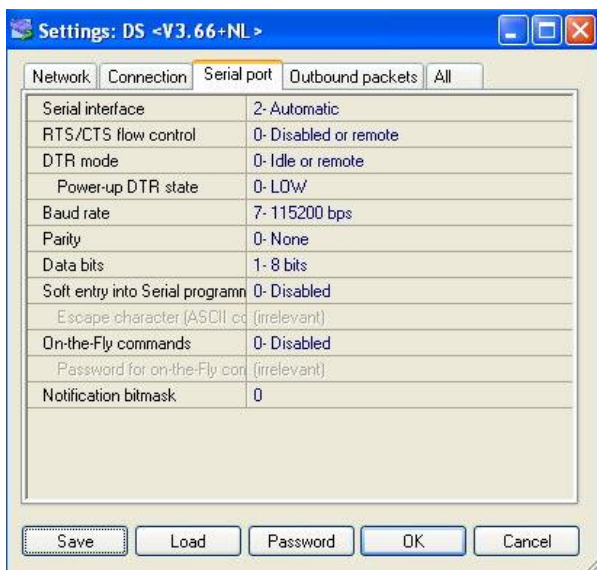


Figure 3. Serial port settings

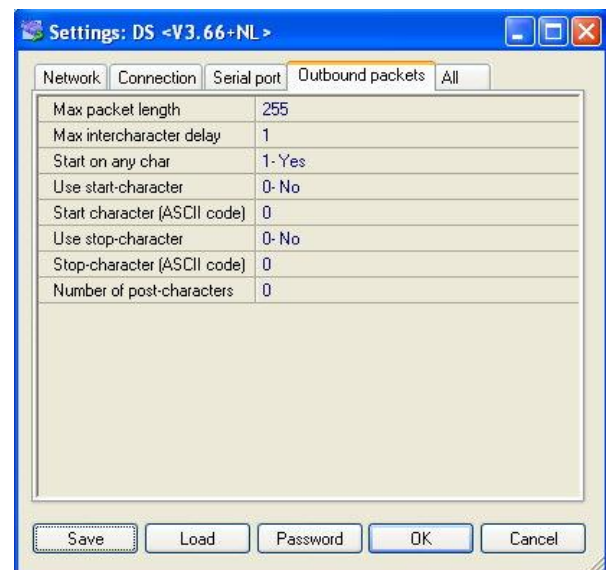


Figure 4. Outbound packets settings

5.3.4. Factory settings.

It is possible to reset all EM20X settings (including configuration access password).

Resetting procedure:

1. Turn power off
2. Short and hold jumper JP1
3. Turn power on and hold jumper shorted for at least 3 seconds
4. Remove jumper

Beginning of the resetting process is indicated by alternate blinking of red and green LED. After resetting all settings have to be entered again using Tibbo DS Manager.

6. Document version

File	Note	Date
univ_v2-0-2-2a.pdf	Original version	January 2012