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CE

BL-NET
Vers.1.28

BL-NET Bootloader and MD-GSM

Together with the software provided, this versatile device currently offers the following basic functions:

◆ Backup and restore of functional data (configuration) to/from a PC (data upload and download)

◆ Update of the operating system from devices connected to the CAN bus and update of the bootloader itself using the software provided on the homepage at www.ta.co.at

◆ Data logging of the temperature and output statuses of all UVR controllers and various other measurements, such as rotational speed or power

◆ Direct access via ethernet from a PC to devices in a CAN network

Available interfaces:

◆ CAN bus for direct communication with a UVR1611 system

◆ CAN infrared interface for quick and easy data backup

◆ Two data line inputs for recording measured values from up to two controllers

◆ USB interface for PC communication (via virtual COM port)

◆ Ethernet interface for communication over LAN networks

◆ GSM module (optional) for communication via SMS

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Hardware / General Information

Power supply

Power is provided via a connection between the controller and bootloader over a DL (Data Line) or CAN cable. Data retention is guaranteed, even without a power supply. A compartment for an industry-standard 9V battery is provided, allowing it to be used as a portable device without a cable connection to the controller. Alkaline batteries are recommended. They have a lower self-discharge and live four times longer than normal batteries. This allows an IR-CAN interface to a controller and a USB connection to a PC. After the data transfer, the device switches off automatically. This ensures years of use. When operating the **ethernet** interface or the **GSM module,** power must **always** be provided via the **CAN bus**.

Active interfaces / Power supply	USB	Ethernet	IR-CAN	Module (GSM)
Data line	X			
CAN bus	X	X		X
Battery	X		X	

If the bootloader is used as a hand device without a cable connection to a controller, it is advisable to remove the BL-NET from the PC after a successful data transfer to avoid unwanted activation of the bootloader from the PC and ensure long battery life.

Data line

Every UVR controller has a data line output DL (with the EEG30, TFM66 ⇨ D0) that, together with the (sensor) ground conductor, forms a two-conductor cable. The BL-NET has 2 data line inputs for simultaneously recording measured values from up to two controllers.
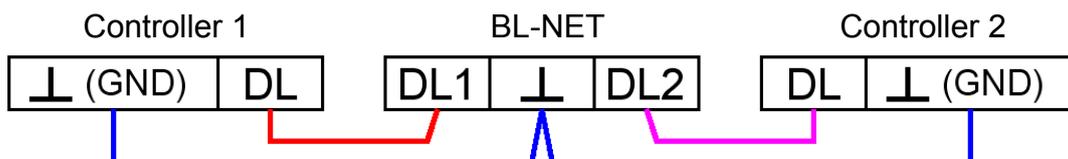
Any desired cable with a minimum cross-section of 0.35 mm² can be used as a data line cable (e.g. twisted pair), over a maximum distance of 100 m. If the data from two controllers is to be acquired by the bootloader, then separate shielded cables must be used to provide protection against crosstalk errors. The data conductors must never be in the same cable as the CAN bus.

If only the data line cable is connected to the BL-NET, then this is also used as the power supply for the bootloader.

When the DL is connected, the bootloader indicates that a device has been connected to the DL input by briefly flashing the green LED. The bootloader automatically recognises the number and type of the connected controller(s).

NOTE:

◆ With the UVR1611 controller, output 14 (DL) can be used as both a data connection and a control connection. For data logging, output 14 must therefore always be configured as a data connection via the "Outputs" menu.

◆ UVR1611 – Controllers from version A2.16 additionally allow network input variables to be logged (when output 14 is parameterised as a data connection: *NETZW.EG.=>DL.: ja (yes)*), which is then handled by the bootloader as a second virtual UVR1611. Logging of network variables is thus not possible when two physical controllers are connected to the bootloader.

◆ Only the UVR1611 and UVR61-3 devices can supply enough power for the bootloader via the data line. An optional power adaptor (CAN-NT) is available for other devices.

◆ Logged data is lost when the number of data connections or the controller type is changed!

◆ If power is removed from the bootloader then, at most, only data from the last hour is lost.

CAN bus and IR-CAN infrared interface

The IR-CAN interface (infrared CAN) offers a simple way of transferring functional data. It is located under the two buttons of the UVR1611 and on the lower side of the bootloader case. During the data transfer, the bootloader must lie in the correct position on the controller: Bootloader – upper edge = Controller display – lower edge, the sideways position of the display is marked on the bootloader.

For transferring the functional data the controller must be prepared via the *"Datenverwaltung"* (*"data administration"*) menu. This is only permitted in expert mode. The controller switches to data transfer mode when the "*Upload* bzw. *Download wirklich starten?*" ("*Really start upload or download?*") query is confirmed. After this, the bootloader is placed in the correct position on the controller (at the lower edge of the display and between the markings). As with the CAN cable, the data transfer is started by pressing the Start button on the bootloader. The green LED flashes during the transfer and the functional data takes about 15 seconds to transfer.

Since an operating system can take about 5 minutes to transfer, this should always be done via a CAN bus cable connection. If the loading of the operating system is interrupted then a renewed transfer is only possible via a cable connection!

In addition to data transfer, the ethernet interface of the CAN bus also allows direct access to the CAN network devices via a browser on the PC. Both LEDs flash briefly when the CAN cable is plugged in and after about 20 seconds, the green LED lights up to indicate that the BL-NET is ready to operate on the CAN bus.

When using the CAN bus to connect several devices with a total cable length above 5 m, correct termination of the bus is important. The network **terminators** must be connected at the **cable ends**. The lower side of every controller, and the bootloader, have a corresponding jumper bridge (***term***) for this. A CAN bus must never be connected from a node (terminal) to other devices in a star formation. The correct layout is a series cable from the first device (with terminator) to the second device, then the third, etc., and the last bus connection must also have a termination jumper.

Additional information on the correct layout of a CAN bus network (e.g.: cable selection, etc.) is provided in the UVR1611 controller handbook.
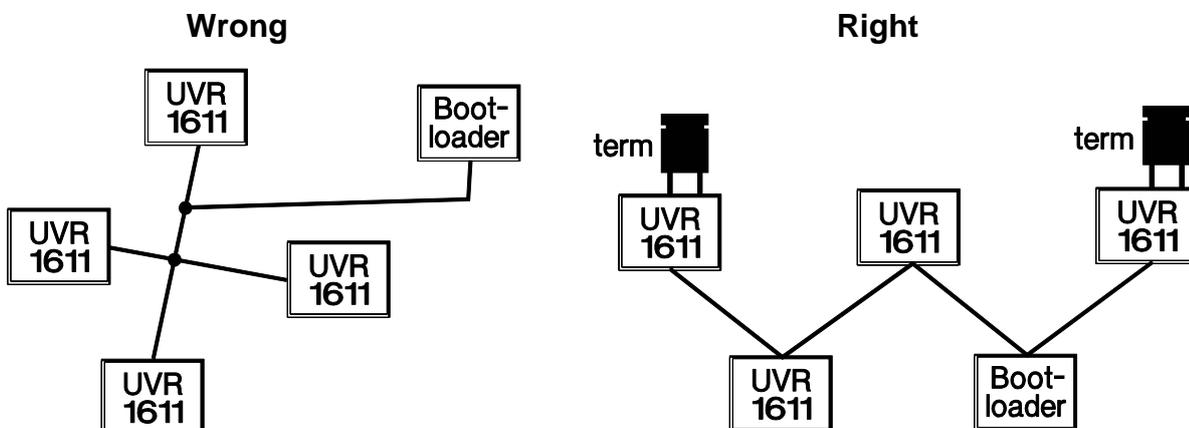
USB

The USB interface does not represent an electrical connection between the bootloader and PC. For reasons of safety, it is electrically isolated via optocouplers. The bootloader thus requires its own power supply, via the DL, CAN or a battery, when communicating via USB.

For communication between the PC and BL-NET via USB, a special driver is also required that creates a virtual COM interface in Windows, which is then used by the *Winsol* or *Memory Manager* programs to access the bootloader. **See also the section "*USB driver*".**

Ethernet

The ethernet interface is only active when a CAN connection is present. When operating with only a data cable or a battery, ethernet communication is not possible.

A crossed network cable must be used for direct connection with a PC. The PC must also be assigned a fixed IP address. The rear side of the BL-NET (the oval window) has a green LED that indicates an ethernet connection to another device, and a red LED that indicates data transfer.

The bootloader requires a fixed IP address because it does not support DHCP. **See also the section "*Connecting the BL-NET to a LAN network".*

GSM module (optional)

An optional GSM module is available for the BL-NET. This can be retrofitted by plugging it into a male socket inside the bootloader.

The SIM card PIN query must always be deactivated for operation! This can be done using a mobile phone.

Before commissioning the BL-NET with a GSM module, the SIM card must be inserted into the correct socket and the antenna must be connected. **The GSM module is only activated when the CAN bus is connected.** The red LED lights up after the module has successfully initialised. An error is indicated by a flashing red LED. If this flashing occurs for longer than five minutes, then initialisation has failed and all connections must be checked.

The GSM module is configured via the browser. These settings are described in the section ***"Accessing the BL-NET via a browser"***.

Software

Installation

The software on the CD provided (*Winsol*, *Memory Manager*, etc.) can be installed by selecting the desired menu option from the autostart menu that is automatically displayed when the CD is inserted.

The latest versions of the software are available for downloading at http://www.ta.co.at and they overwrite the existing software without losing any previously stored data. However, it is recommended to deinstall the existing versions of the software before installing new versions. This only then removes the application and all data created with the application is retained.

CAUTION! Newer software versions are not always compatible with the version of the bootloader operating system. The homepage provides information on this. It may be necessary to also upgrade the bootloader operating system (see *''Memory Manager''*).

Deinstallation

The programs can be deinstalled using the <Software Installieren/Deinstallieren (add/remove programs)> function in the Windows "Systemsteuerung" (control panel).

Windows 98, ME, 2000, XP: … ⇨ "Systemsteuerung" (control panel) ⇨ "Software" (add or remove programs)

Windows Vista: … ⇨ "Systemsteuerung" (control panel) ⇨ "Programme und Funktionen" (programs and functions)

USB driver

The USB driver is required for USB communication between the PC and the bootloader and it creates a virtual COM port on the PC for this purpose.

The driver must be installed on the PC for this (see *"Installation"*) and is automatically loaded when a bootloader is connected to the PC.
The necessary driver is located in the <\install\USB-Treiber> folder of the CD provided but it can also be downloaded from the homepage at http://www.ta.co.at.

Any existing driver must first be deinstalled (see *"Deinstallation")* before it can be replaced with a new version.

Installation

1. When a bootloader or D-LOGG<small>USB</small> is connected to the PC with a USB cable, the PC automatically recognises a new hardware component and automatically starts the "Hardware-Assistent" (Hardware Wizard) if a driver has not yet been installed for this device.

   If the Wizard does not start automatically, the installation can also be manually started. When the device is connected to the PC but the driver has not been installed, it is displayed in the Windows "**Geräte-Manager**" **(device manager)** with an exclamation mark in one of the <"*Andere Geräte*" (*other devices)*>, <"*Anschlüsse*" *(ports) (COM and LPT)*> or <*USB Controller*> lists. The driver installation can be manually started from here.
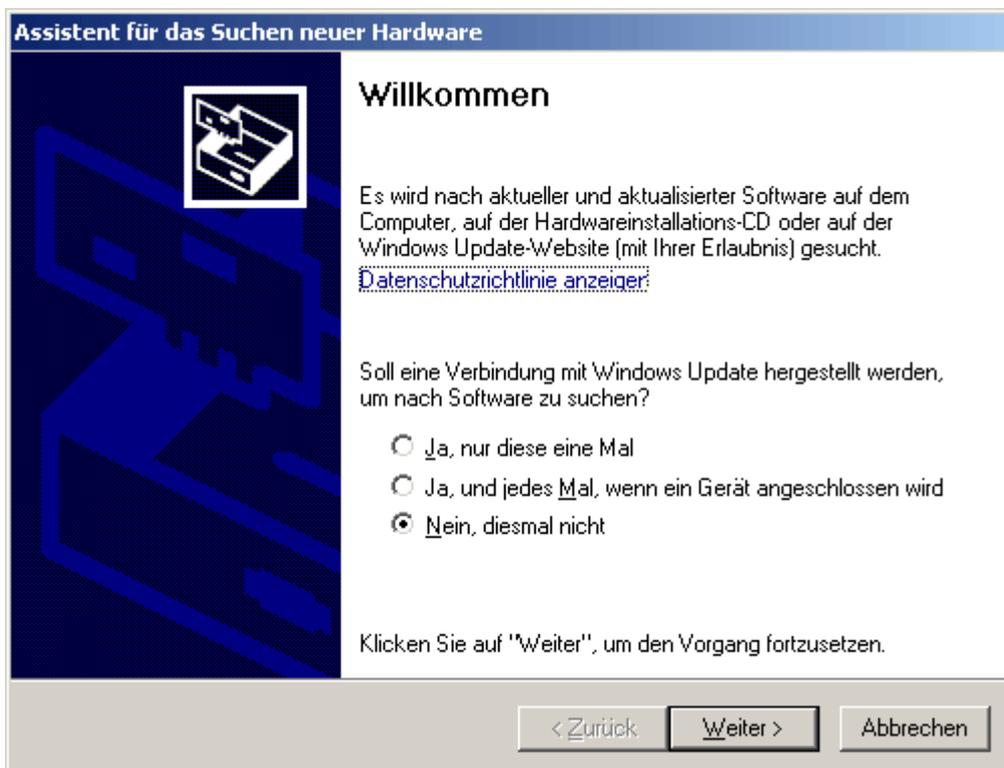
2. The necessary driver can be installed using the "Hardware-Assistent" (Hardware Wizard).

Windows 98, ME, 2000: <"*Nach einem passenden Treiber für das Gerät suchen*" *(search for a suitable driver for the device)>*

Windows XP: <"*Software von einer Liste oder bestimmten Quelle installieren*" *(install software from a list or other source)>*

Windows Vista: <"*Auf dem Computer nach Treibersoftware suchen*" *(search the computer for driver software)>*
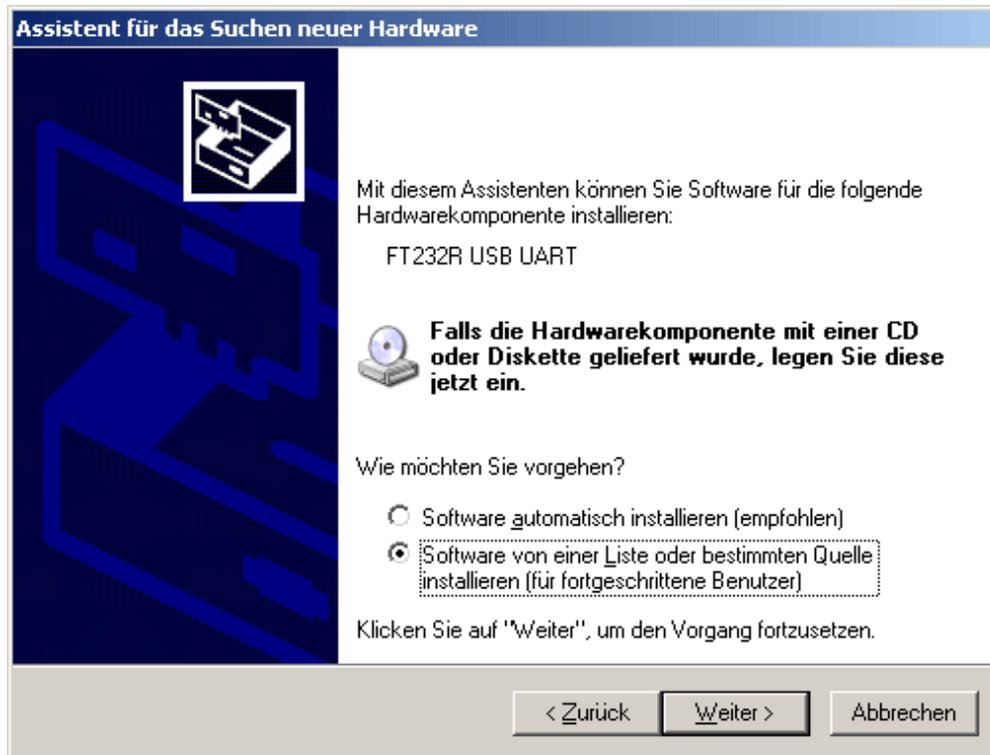
3. The next step is to enter the path to search for the driver files:

Windows 98, ME: <…\USB-Treiber\Win98Me>

Windows 2000, XP, Vista: <…\USB-Treiber\Win2kXp>

10
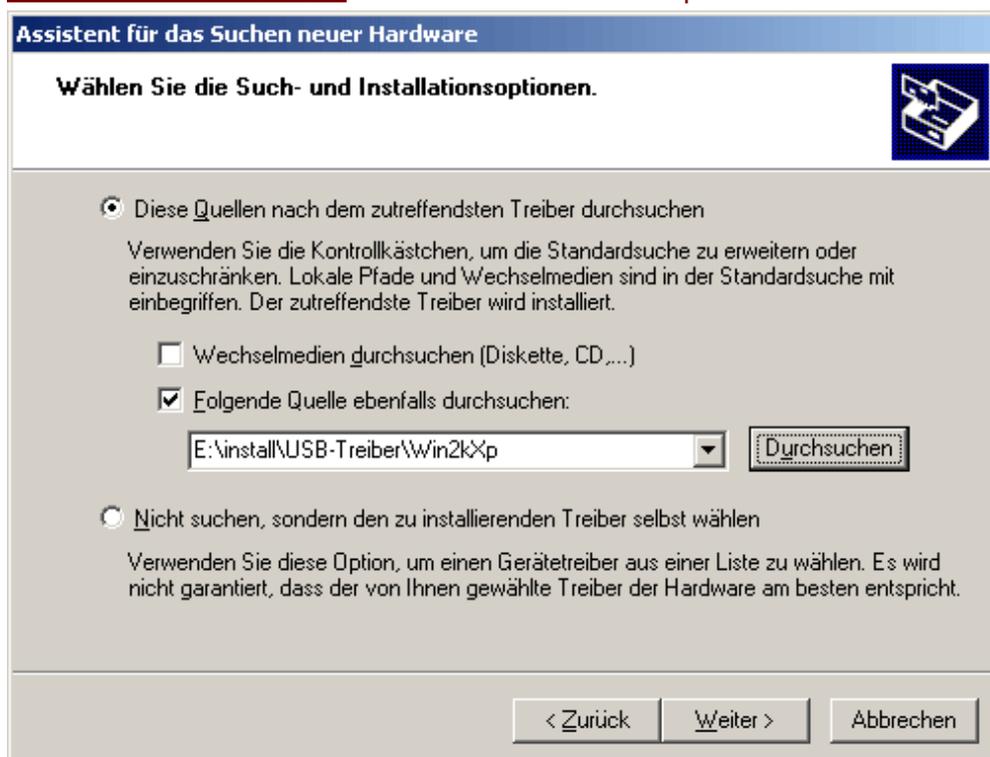
4. The driver found in the specified path is installed.
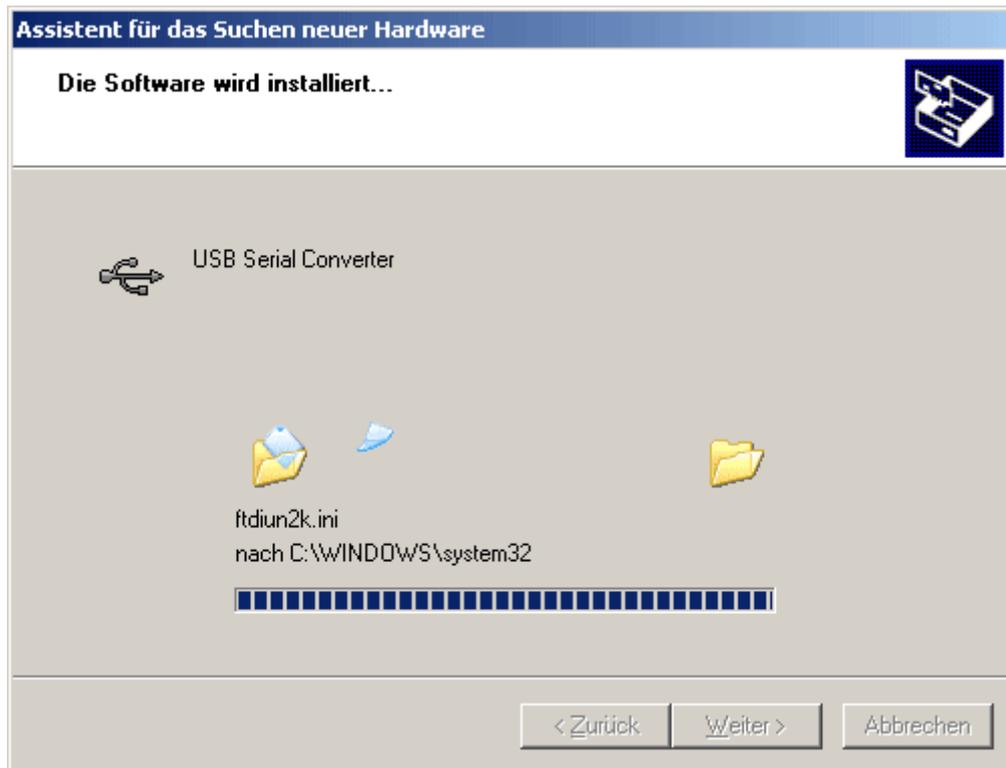
5. Clicking "Fertig stellen" ("finish") completes the installation of the USB controller driver.

6. The "Hardware-Assistent" (Hardware Wizard) proceeds with the installation of the virtual COM port driver. This driver is installed in the same way.

Configuring the virtual COM port

If the virtual COM port assigned to the driver on installation is not supported by the *Winsol* and *Memory Manager* programs, the driver can be manually assigned a different free port. For a PC with an internal modem, it should be noted that COM3 is usually used for this modem.

The bootloader must be connected to the PC in order to configure the virtual COM port in the Windows *"Geräte-Manager" (device manager)*.

Windows 98:

Start ⇨ "Einstellungen" (settings) ⇨ "Systemsteuerung" (control panel) ⇨ System ⇨ "Geräte-Manager" (device manager) ⇨ "Anschlüsse" (ports) (COM and LPT)

Windows 2000, XP (*classic view*):

Start ⇨ "Einstellungen" (settings) ⇨ "Systemsteuerung" (control panel) ⇨ System ⇨ Hardware ⇨ "Geräte-Manager" (device manager) ⇨ "Anschlüsse" (ports) (COM and LPT)
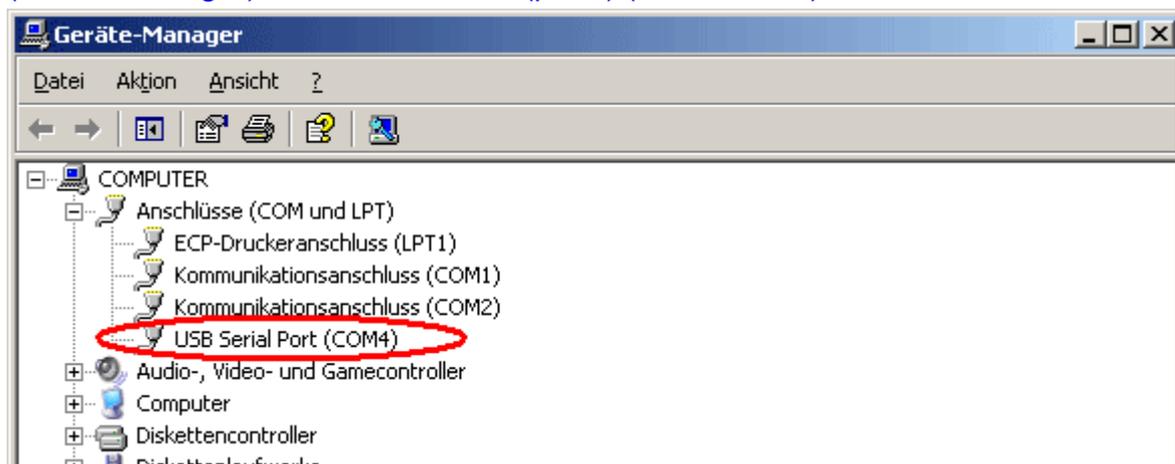
Windows Vista (*classic view*):

Start ⇨ "Einstellungen" (settings) ⇨ "Systemsteuerung" (control panel) ⇨ "Geräte-Manager" (device manager) ⇨ "Anschlüsse" (ports) (COM & LPT)

The driver can be assigned a different COM port in the properties of the <USB Serial Port>:
USB Serial Port ⇨ Properties ⇨ Port Settings ⇨ Advanced…

Deinstallation

The USB driver can be deinstalled using the <Software Installieren/Deinstallieren (add/remove programs)> function in the Windows "Systemsteuerung" (control panel).

- All bootloaders must be disconnected from the PC before the driver can be deinstalled.

- Select the driver software <FTDI USB Serial Converter Drivers> in the list of installed programs and then remove it.

  Windows 98, ME, 2000, XP: … ⇨ "Systemsteuerung" (control panel) ⇨ "Software" (add or remove programs)

  Windows Vista: … ⇨ "Systemsteuerung" (control panel) ⇨ "Programme und Funktionen" (programs and functions)
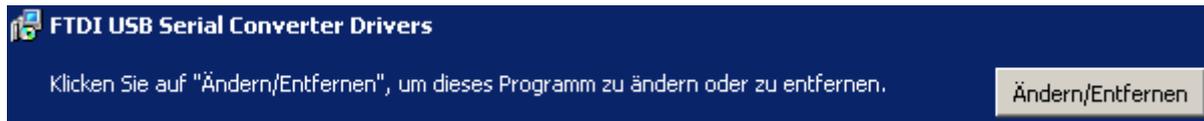
Winsol

The *Winsol* program allows the acquisition and analysis of measurements recorded by the bootloader.

Since *Winsol* can also be used as a visualisation program with other interface modules (data loggers), the setup menu allows a choice of different devices.

SETUP

The setup contains the settings required for correct communication between the PC and the bootloader.
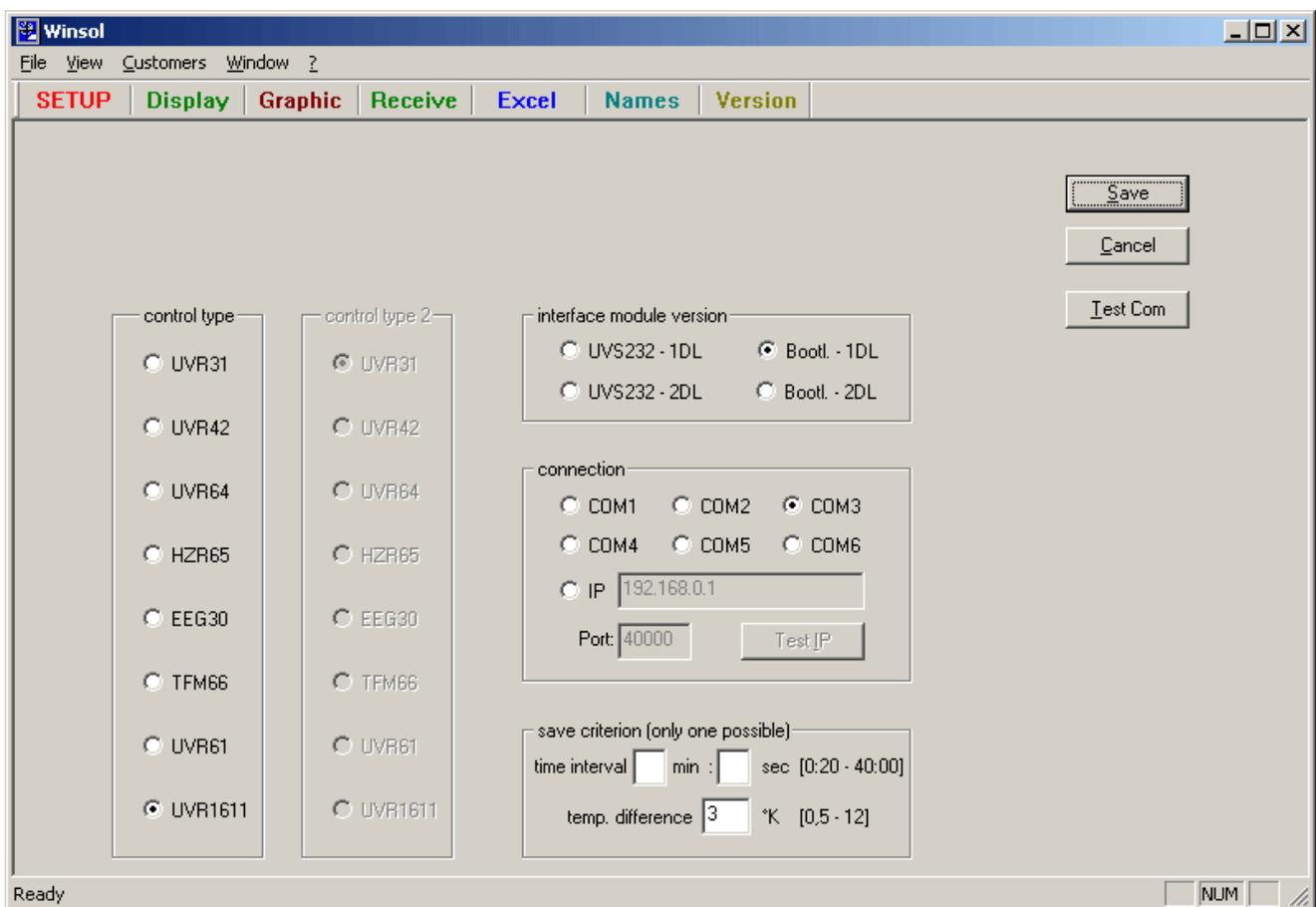
 The "Test Com" command allows an automatic search for the bootloader at the COM ports supported by *Winsol*, independently of any current setup settings.

The type and number of controllers to be acquired is automatically recognised by the bootloader. With "Test Com" the bootloader always shows the type of the last device acquired.
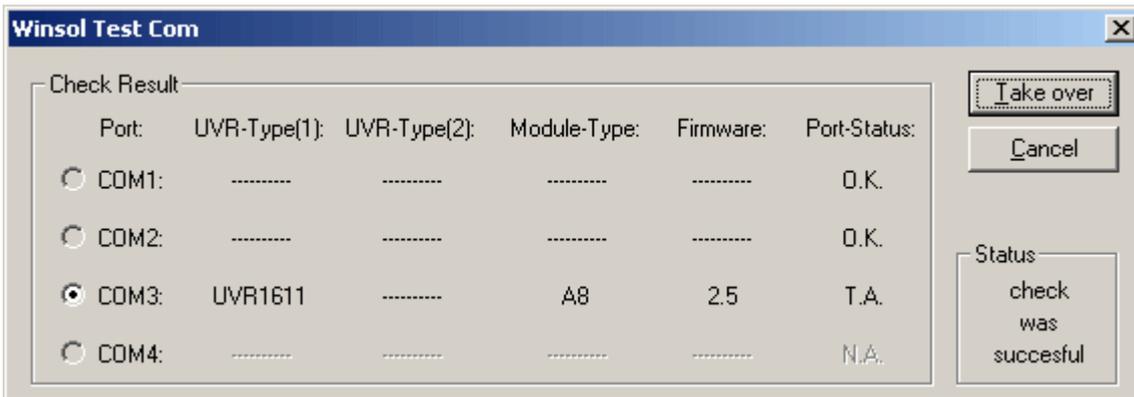
Clicking "Take over" transfers the determined parameters into the setup.
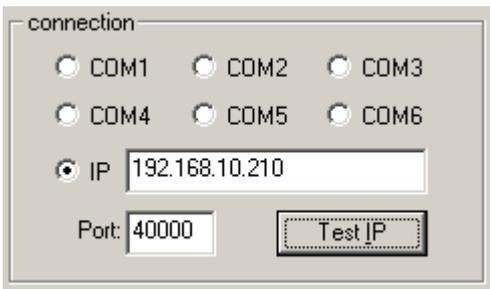
With BL-NET it is possible to communicate via ethernet (computer network). To do this, the "IP" connection must be selected. The IP address or domain name of the BL-NET and its TA port must also be set. The ethernet interface is only activated when power for the BL-NET is provided over the CAN bus!
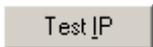
"Test IP" has the same function as "Test COM", but for the ethernet connection. "Test IP" only returns a valid result when the ethernet interface of the BL-NET has already been parameterised and the IP address and port of the bootloader have been correctly specified in the **Winsol** setup.
See also the section "Connecting the BL-NET to a LAN network"
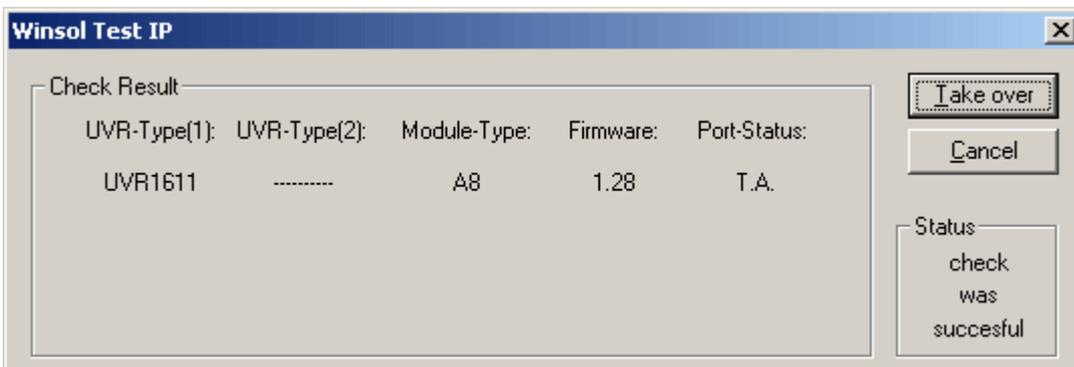
Clicking "Take over" transfers the determined parameters into the setup.

When first commissioning, or if problems occur with the ethernet interface, please follow the instructions in the section "**Connecting the BL-NET to a LAN Network**".

The **save criterion** defines when the bootloader should store a "data record" (all acquired measurements at a given time).

Two criteria are available:

- **Time interval**

  Any value may be entered for the time criterion but the system uses an internal resolution of 20-second steps. Values are always rounded down (e.g.: Entry = 50 sec ⇨ Criterion = 40 sec). A small time period leads to large data volumes and is only recommend for brief detailed examinations. In addition to this, with save criterion below one minute not all data records can be converted into an Excel table because Excel can only manage a maximum of 65536 rows per table.

- **Temperature difference**

  A save criterion of 3K is recommended for fault analysis purposes. A "data record" is saved every time a measured temperature changes by more than 3K or when an output state changes. The maximum time resolution is 10 seconds when doing this.

The maximum number of "data records" that the bootloader can store depends on the type and number of controllers to be acquired.

Number of data records by	controller type:	with 1xDL:	with 2xDL:
	UVR1611, UVR61-3	8000	4000
	all others	32000	16000

A storage overrun leads to overwriting of the oldest data.

The "**Save**" command transfers the selected save criterion to the bootloader and saves all setup settings on the PC.
Each time a command is executed from the menu bar, *Winsol* accesses the stored settings. This means that changes must always be saved before a different menu is accessed!

Display

This window shows a table of the current measurements of the controllers connected to the bootloader. The displayed time is that of the PC being used.

The "Display" function is the quickest and easiest way of checking the "controller → bootloader" data connection.

Names

This menu allows the definition of "Display", "Graphic" and "Excel" user-defined names for the acquired measurements.

Receive

The "Receive" command reads the measured data stored in the bootloader and saves it as a LOG file in the *Winsol* file system on the PC. A separate LOG file is created in the corresponding subdirectory ("…\log") for each month. When logging data from two controllers, *Winsol* saves the data in two separate "…\log1" and "…\log2" subdirectories. The filenames of LOG files contain year and month information of the data. For example, the file "Y200712.log" contains measurements from December 2007.

Note: When acquiring data from several systems, before reading the data it is essential to select the correct "customer" (see *customer mode)*!

The process of reading "own data" (customer: "own data") automatically deletes the data storage of the bootloader, but in the customer mode it is possible to specify that the data in the bootloader is retained.

If a power failure occurs when logging data from controllers that do not have an internal clock then only the data recorded by the bootloader after the power failure can be edited. A time-stamp can no longer be generated for earlier data.

The data can be automatically read when the PC starts up, via the options in the "Datei \ Autostart" ("file \ autostart") menu.

- "*AutoReceive*"

  If this option is activated then "own data" is automatically read from the data converter and stored when the PC is started up.

- *"AutoReceive + PC-Shutdown"*

  If this option is activated then "own data" is automatically read from the data converter when the PC is started up and the PC is then powered off after a countdown period.

  This function is intended for computers that are used exclusively for data acquisition. In this case the PC must be automatically powered up at specific times. This can be done with (e.g.) an external power timer that provides power to the PC at appropriate times and by making appropriate BIOS settings (power up when mains voltage is present).

Note: "*AutoReceive*" and "*AutoReceive + PC-Shutdown*" allow only the automated reading of "own data". This is <u>not</u> possible for customer data!

Graphic

This window shows a daily representation of the recorded data (LOG files). The "Help" menu item shows a list of the available key commands. For example, the cursor can be moved using the "←" and "→" buttons. All values at the cursor position (date, time, temperature, output states, etc.) are displayed at the edge of the picture. The "↑" and "↓" buttons allow navigation by one day forwards and backwards in the graphic.

The "Graphs / Select graphs" allows selection of the parameter to be displayed in the graphic.
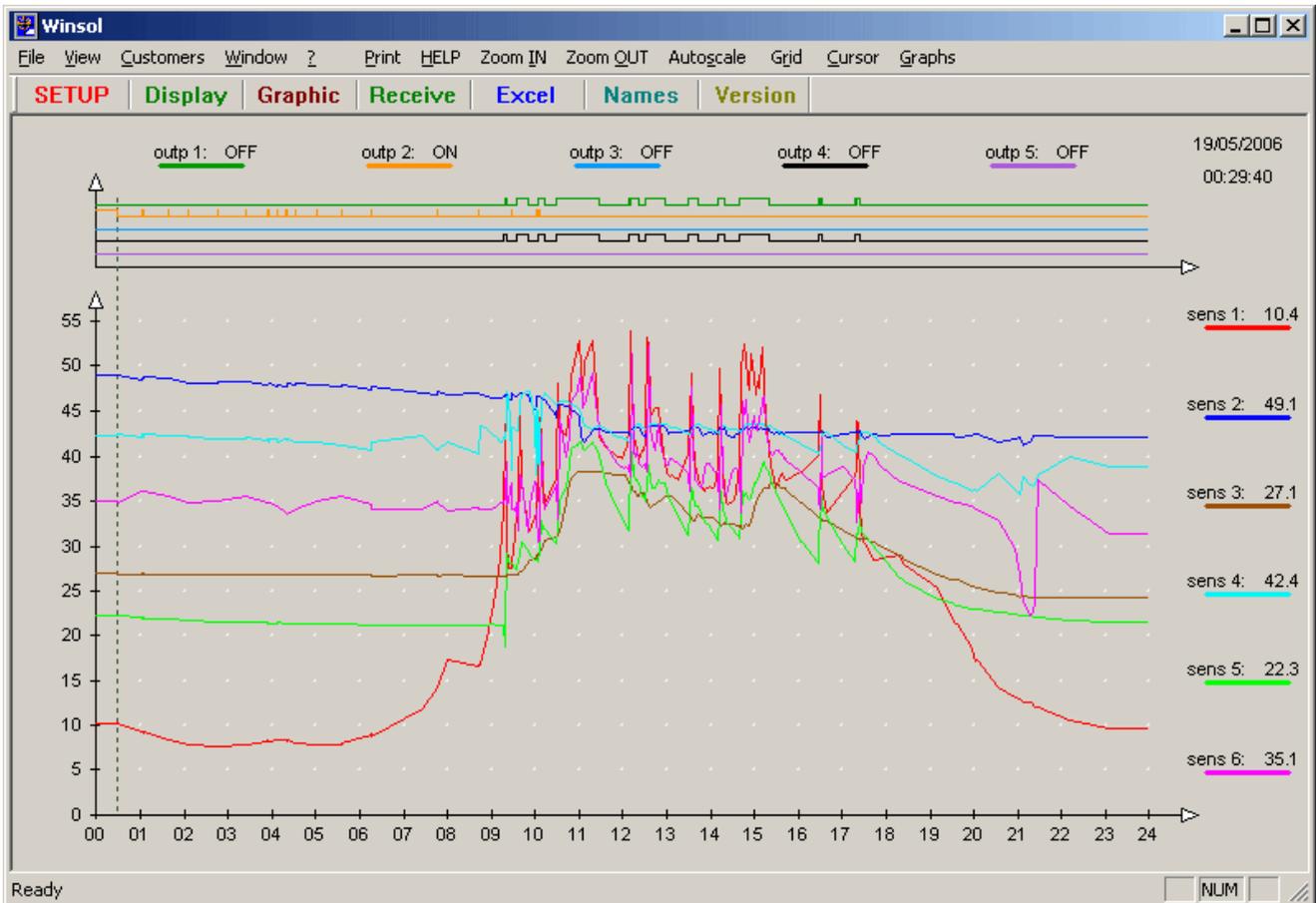
Excel

This menu allows conversion of the LOG files into the .xls or .csv format, for further processing in any desired spreadsheet program supporting these formats. This allows the creation of graphics and statistics using the recorded measurements. To adjust the generated table to suit the language-specific requirements, a comma or a full-stop can be specified as the decimal separator when generating the .csv file.

The created files are stored as daily or monthly data in the corresponding **Winsol** subdirectory ("...\Excel"). As with the LOG files, the name of the generated file contains information on the date of the measurements it contains. For example, the file "E071205.csv" contains measurements acquired on 05 December 2007. An existing file of the same name is overwritten. When logging data from two controllers, **Winsol** generates files in three directories ("...\Excel", "...\Excel1" and "...\Excel2") with a combined data record in one directory and the respective separate data records in the other two directories.

Customer mode

Winsol allows not only the management and analysis of "own data", it can also be used for analysing the data from other systems. For technical experts, this is an important tool for functional monitoring and troubleshooting customer systems.

Separate customer folders can be created and selected in the "Customers / Manage customers…" menu. A folder is created in the *Winsol* file system for each customer, in which the corresponding configuration and LOG files are stored. The "Infosol" directory in the *Winsol* program folder contains all these customer folders.

The currently selected customer is displayed in the *Winsol* title bar (e.g. "*Winsol* – Bloggs"). If no customer name is displayed in the title bar, then the "own files" are selected.

There are three ways of acquiring the measurements for a customer system:

- The bootloader is installed with the system and is regularly read on-site by a service technician using a notebook.

- If the customer acquires the system measurements, then he/she can email the LOG files to the technical expert.

- If the recorded data cannot be acquired on-site, then the measurements can be acquired as follows:

Preparation of the data logging:

1) Connect the bootloader to the PC without using a DL connection (power supply via CAN or battery).

2) Create and select a customer in *Winsol* for the data to be acquired.

3) Define the desired save criterion in setup (possibly after "Test Com") and transfer this to the bootloader via "Save".

Data acquisition at the customer site:

4) Connect the bootloader to the controller (ensure correct polarity!!). With a UVR1611, the data output must be activated (define output 14 as a data line).

5) As long as the bootloader is connected to the controller, the measurements are recorded according to the selected save criterion.

6) When the bootloader is disconnected from the controller, the time and date must be noted because *Winsol* requires this information in order to assign the correct time when reading the data. This is not necessary with the UVR1611 and UVR61-3.

Read the recorded data:

7) Connect the bootloader to the PC without using a DL connection (power supply via CAN or battery).

8) Select the appropriate customer in *Winsol*

9) The data stored in the bootloader can now be read by selecting "Receive" and specifying the noted time, then analysed as desired.

Troubleshooting

◆ | **The BL-NET bootloader is not recognized by the *Winsol* "Test IP" function.** |

1. For communication via ethernet, the bootloader must be connected to the CAN bus or supplied with power via a 12V power adaptor (special accessory CAN-NT).

2. Make sure that the bootloader is connected via ethernet to the PC or LAN network. An existing ethernet connection is indicated by a green LED in the oval window on the lower side of the bootloader. A crossed network cable must be used for direct connection with a PC.

3. With a direct ethernet connection between BL-NET and a PC, the PC must be assigned a fixed IP address.

4. Check the ethernet configuration of the BL-NET (see chapter "*Connecting the BL-NET to a LAN network*") and note the IP address and TA port of the bootloader.

5. Make sure that the same IP address and TA port of the bootloader are set in the *Winsol* setup.

6. Run "Test IP" again. Note the displayed port status.

    6.1. `C.N.A.`
    If the interface is already being used by another application, this must be ended in order to communicate with the bootloader. Multiple applications cannot access the interface at the same time.

◆ | **The bootloader is not recognised by the *Winsol* "Test Com" function.** |

1. Make sure that the bootloader is connected via USB to the PC.

2. In the Windows **"Geräte-Manager" (device manager)**, check that the USB driver was correctly installed ("Geräte-Manager" (device manager) ⇨ "Anschlüsse" (ports) (COM und LPT)). In this case the virtual COM port appears in the list as "USB Serial Port".

    2.1. If the driver is not correctly installed, then perform the installation again (see chapter "USB driver \ Installation").

    2.2. If the driver has been assigned a COM port that is not supported by *Winsol* or *Memory Manager* (e.g. "USB Serial Port (COM12)"), change this setting (see chapter "USB driver \ Configuring the virtual COM port").

3. Run "Test Com" again. Note the displayed status of the COM port assigned to the USB driver.

    3.1. `C.N.A.`
    If the interface is already being used by another application, this must be ended in order to communicate with the bootloader. Multiple applications cannot access the interface at the same time.

4. If no controller is connected to the BL-NET then a 9V battery must be used to provide power for the device.

5. If the bootloader is connected to at least one device, check the data transfer from the controller to the bootloader (*see next point*).

◆ | **The data transfer from the controller to the bootloader is not working.**
(No measurements are shown in the *Winsol* display.)

1. Make sure that the bootloader is connected to the controller via the DL data cable.

2. Check the wiring of the data cable and observe the correct polarity.

3. With a UVR1611, the data output must be activated (define output 14 as a data line).

4. If two controllers are to be acquired with the bootloader, check the data connection with each of them individually in order to isolate the problem. To do this, remove the data cable from each of the controllers one after another. It is important to disconnect the data cable directly at the controller and not at the data input of the BL-NET, otherwise you may get ambiguous results!

4.1. If the data transfer works with each of the two controllers individually, then the problem is caused by crosstalk errors between the two data cables. In this case the cables must be laid separately or at least one cable must be shielded.

5. To isolate data transfer problems with a single cable, test the link using a short cable (< 1 metre).

5.1. If the data transfer works with the short cable then the problem is caused by interference from an external source in the long cable. In this case, the cable must be laid using a different path or a shielded cable must be used.

6. If problems persist after all the above points have been checked then please consult your dealer or directly contact the manufacturer. The problem can only be solved with an **exact fault description!**

◆ | The data is recorded with the wrong timestamp (date, time).

1. When logging from an UVR1611 or UVR61-3, the timestamp is generated by the controller and, in this case, the time information at the controller must be corrected.

Note: To ensure a high time resolution, the bootloader synchronises its clock with the controller during commissioning, or once a day, and updates the timestamp internally. If the time in the controller is changed, the bootloader must therefore be briefly powered off for a few seconds (remove DL) so that it immediately synchronises after a restart.

2. When logging data from controllers without internal clocks, the time on the PC, or the time at which the bootloader was disconnected from the controller, is assigned to the recorded data.

Memory Manager

The *Memory Manager* program allows updating of the operating system of the bootloader, and other devices connected to the CAN bus (UVR1611, CAN monitor, etc.).
Functional data can also be copied in both directions (data upload and download).
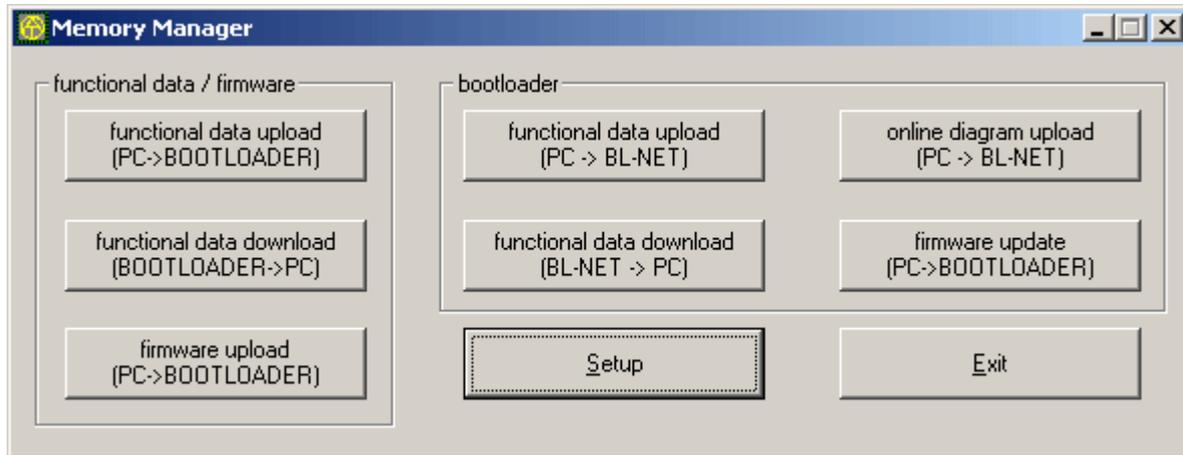
Setup

The setup contains the settings required for correct communication between the PC and the bootloader.
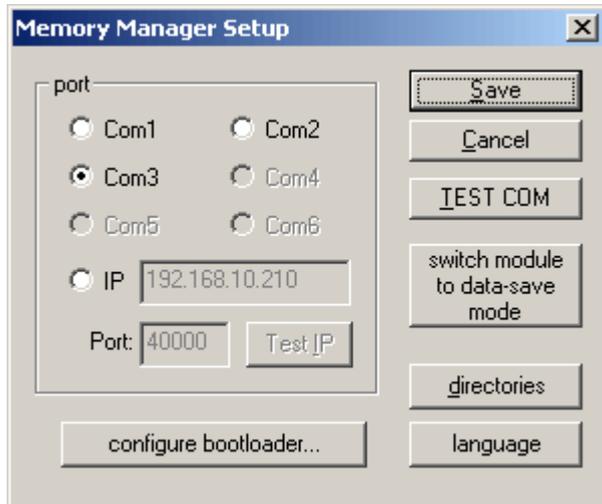
   Saves the set interface parameters

   The "Test Com" command allows an automatic search for the bootloader at the COM ports supported by *Memory Manager*, independently of any current setup settings.

| Test IP | "Test IP" has the same function as "Test COM", but for the ethernet connection. "Test IP" only returns a valid result when the ethernet interface of the BL-NET has already been parameterised and the IP address and port of the bootloader have been correctly specified. |

| switch module to data-save mode | This is only required for the BL232 bootloader, with the BL-NET the storage is large enough to save both the logged data and the system data at the same time. |

| directories | Selection of the standard directories |

| language | *Memory Manager* language selection |

| configure bootloader... | The menu is used for configuring the basic settings of the BL-NET: |

configure bootloader

CAN - bus

node-num.: 62

Node number of the BL-NET in the CAN network

Ethernet

IP-Address: 192 . 168 . 10 . 210

IP address of the BL-NET

Subnet-Mask: 255 . 255 . 255 . 0

Subnet mask of the BL-NET

Gateway: 192 . 168 . 0 . 1

Gateway of the BL-NET (not used)

BLD-Number: 210 (0 - 255)

Bootloader number (last position of the MAC address)

HTTP - Port: 80

HTTP port for web browser access

TA - Port: 40000

TA PORT for communication with *Memory Manager* and *Winsol*

OK   Cancel

Transfer of controller data

The bootloader has 7 memory positions for functional data and one memory position for the operating system. All memory positions can be used simultaneously!

Functional data upload (PC➔bootloader)

Transfers functional data (*.dat) from the PC to the bootloader. The bootloader has 7 memory positions for functional data, which allows the simultaneous storage of different sets of functional data.

The left column shows the data that is currently stored in the bootloader. Setting a tick in the "overwrite" column selects the functional data on the PC that will then be written to the corresponding memory position in the BL-NET.
Clicking **Start Transfer** loads the selected data into the bootloader.

Functional data download (bootloader→PC)

The functional data previously loaded from the controller into the bootloader is stored on the PC.

The data stored in the bootloader is shown in the left column. Setting a tick in the "save" field allows specification of the path and name of the file on the PC where the functional data is to be stored.

Clicking **Start Transfer** stores the selected data on the PC.

The functional data (*.dat) stored on the PC must be regarded as a backup copy and cannot be edited on the PC.

Operating system upload (PC→bootloader)

Transfer of an operating system (UVR1611, CAN monitor, CAN-I/O module) from the PC to the bootloader. Since a common memory position is used for the operating system, the transfer overwrites the existing operating system stored in the BL-NET.
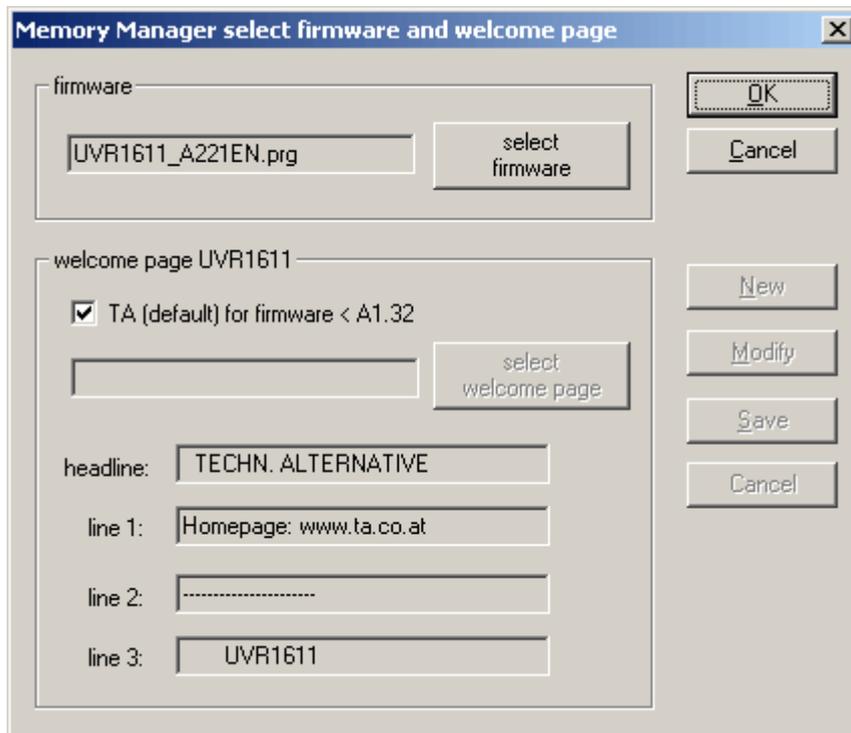
The desired operating system (*.prg) on the PC is selected with the **select firmware** button. When uploading an operating system for a UVR1611, a user-defined welcome page for the controller can also be defined. If a welcome page is already defined in the controller functional data then this is retained and the welcome page specified when transferring the operating system is not adopted by the UVR1611.

Clicking **OK** starts the data transfer and stores the selected operating system on the bootloader.

Transfer of bootloader data

Functional data upload (PC ⇨ BL-NET)

Transfer of BL-NET functional data from the PC to the bootloader.

Functional data download (BL-NET ⇨ PC)

The BL-NET bootloader functional data is stored on the PC. The functional data (*.dat) stored on the PC must be regarded as a backup copy and cannot be edited on the PC.

Online scheme upload (PC ⇨ BL-NET)

Transfer of the files for the BL.NET online scheme from the PC to the bootloader. After selecting the file type (.gif or .html), the corresponding file can be selected and loaded into the bootloader. The files must not exceed the maximum permitted size of 196 kilobytes each.

Operating system update (PC⇨bootloader)

The latest BL-NET operating system can be downloaded from http://www.ta.co.at.

CAUTION: Newer operating systems are not necessarily compatible with the software already present on the PC. The homepage provides information on this. The software on the PC should always be brought up to date before an operating system update.

It is advisable to backup the data stored in the bootloader before performing an operating system update.

If the update is started in the *Memory Manager*, the bootloader first loads the program into the internal memory (progress bar in *Memory Manager* is full) and then the processor is written with the new operating system. This procedure is indicated by alternate flashing of both LEDs on the bootloader.

This is followed by a restart and the bootloader is then ready for operation again.

Troubleshooting

◆ **The BL-NET bootloader is not recognised by the *Memory Manager* "Test IP" function.**

1. For communication via ethernet, the bootloader must be connected to the CAN bus or supplied with power via a 12V power adaptor (special accessory CAN-NT).

2. Make sure that the bootloader is connected via ethernet to the PC or LAN network. An existing ethernet connection is indicated by a green LED in the oval window on the lower side of the bootloader. A crossed network cable must be used for direct connection with a PC.

3. With a direct ethernet connection between BL-NET and a PC, the PC must be assigned a fixed IP address.

4. Check the ethernet configuration of the BL-NET (see chapter "*Connecting the BL-NET to a LAN network*") and note the IP address and TA port of the bootloader.

5. Make sure that the IP address and TA port of the bootloader are set in the *Memory Manager* setup.

6. Run "Test IP" again. Note the displayed port status.

   6.1. `C.N.A.`
   If the interface is already being used by another application, this must be ended in order to communicate with the bootloader. Multiple applications cannot access the interface at the same time.

◆ **The bootloader is not recognised by the *Memory Manager* "Test Com" function.**

1. Make sure that the bootloader is connected via USB to the PC.

2. In the Windows **"Geräte-Manager" (device manager)**, check that the USB driver was correctly installed ("Geräte-Manager" (device manager) ⇨ "Anschlüsse" (ports) (COM und LPT)). In this case the virtual COM port appears in the list as "USB Serial Port".

   2.1. If the driver is not correctly installed, then perform the installation again (see chapter "USB driver \ Installation").

   2.2. If the driver has been assigned a COM port that is not supported by *Winsol* or *Memory Manager* (e.g. "USB Serial Port (COM12)"), change this setting (see chapter "USB driver \ Configuring the virtual COM port").

3. Run "Test Com" again. Note the displayed status of the COM port assigned to the USB driver.

   3.1. `C.N.A.`
   If the interface is already being used by another application, this must be ended in order to communicate with the bootloader. Multiple applications cannot access the interface at the same time.

4. If no controller is connected to the BL-NET then a 9V battery must be used to provide power for the device.

Connecting the BL-NET to a LAN network

Before connecting a BL-NET to a LAN network, it must first be configured via the USB interface:

1. The *Winsol* and/or *Memory Manager* program(s) must be installed on the PC.

2. Connect the bootloader to the PC via USB. If the required USB driver is not installed on the PC, then this must be done now (see USB driver installation).

3. For configuration, the bootloader must be supplied with power via the CAN bus, a DL or a battery.

4. Start one of the abovementioned programs and click "TEST COM" in the setup area. The program searches for the bootloader at the (virtual) COM interfaces (COM 1 to COM 6).

5. If a BL-NET is found, the interface can be automatically adopted in the setup via "Take over" and the setting can be saved via "Save". If the software does not find a BL-NET then either the device does not have a power supply (see 3.) or the software of another USB device is preventing recognition. In this case, the software of the relevant device must be exited during the recognition process.

6. In Windows, start a command shell via Start → "Ausführen" (run) by entering "cmd".

7. Determine the network settings of the PC via the "ipconfig" command:
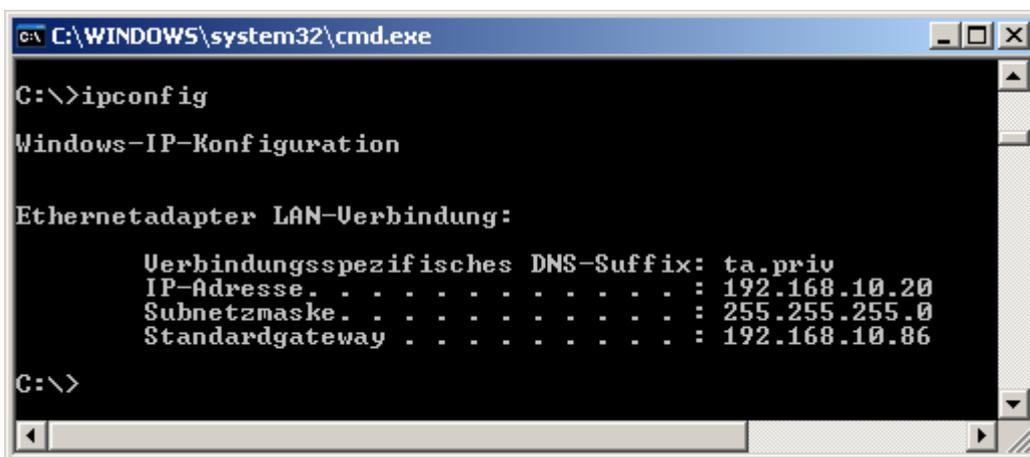
```
C:\WINDOWS\system32\cmd.exe                                    _ □ X

C:\>ipconfig

Windows-IP-Konfiguration


Ethernetadapter LAN-Verbindung:

        Verbindungsspezifisches DNS-Suffix: ta.priv
        IP-Adresse. . . . . . . . . . . . : 192.168.10.20
        Subnetzmaske. . . . . . . . . . . : 255.255.255.0
        Standardgateway . . . . . . . . . : 192.168.10.86

C:\>
```

Note the IP address of the PC (e.g. 192.168.10.20) and the subnet mask of the LAN network (e.g. 255.255.255.0).
From the subnet mask and the IP address of the PC, it can be seen that all IP addresses in this network must begin with 192.168.10.xxx.

8. The bootloader must be assigned an IP address that does not yet exist in the network. The "ping" command in the command shell can be used to check if (e.g.): the desired IP address 192.168.10.**200** is free**:**
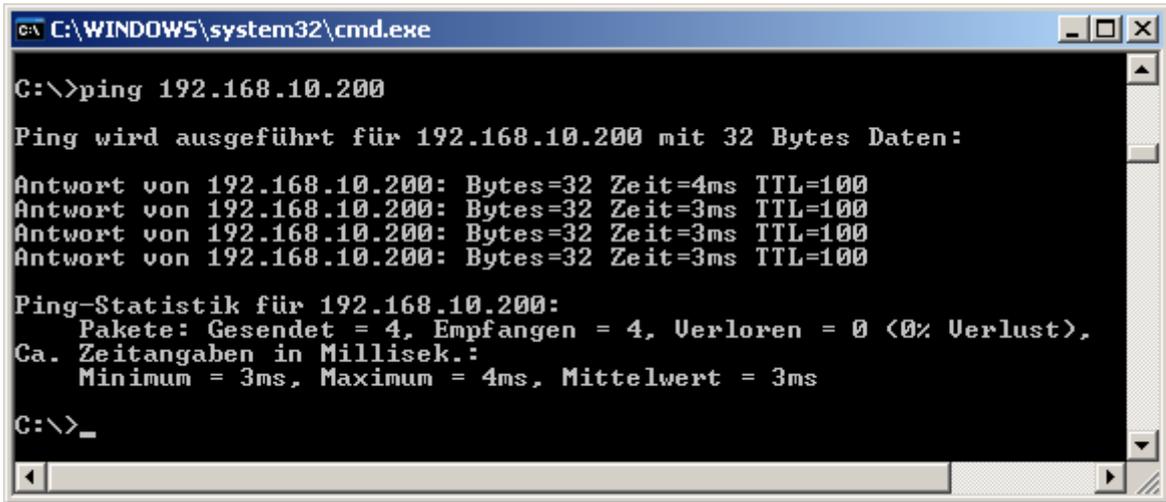
```
C:\WINDOWS\system32\cmd.exe                                    _ □ ×

C:\>ping 192.168.10.200

Ping wird ausgeführt für 192.168.10.200 mit 32 Bytes Daten:

Antwort von 192.168.10.200: Bytes=32 Zeit=4ms TTL=100
Antwort von 192.168.10.200: Bytes=32 Zeit=3ms TTL=100
Antwort von 192.168.10.200: Bytes=32 Zeit=3ms TTL=100
Antwort von 192.168.10.200: Bytes=32 Zeit=3ms TTL=100

Ping-Statistik für 192.168.10.200:
    Pakete: Gesendet = 4, Empfangen = 4, Verloren = 0 (0% Verlust),
Ca. Zeitangaben in Millisek.:
    Minimum = 3ms, Maximum = 4ms, Mittelwert = 3ms

C:\>_
```

Since the "ping" command above received an answer, the IP address 192.168.10.**200** is already assigned to a device in the network and cannot be used for the BL-NET. A new attempt with the IP address 192.168.10.**210** is therefore started:

```
C:\WINDOWS\system32\cmd.exe                                    _ □ ×

C:\>ping 192.168.10.210

Ping wird ausgeführt für 192.168.10.210 mit 32 Bytes Daten:

Zeitüberschreitung der Anforderung.
Zeitüberschreitung der Anforderung.
Zeitüberschreitung der Anforderung.
Zeitüberschreitung der Anforderung.

Ping-Statistik für 192.168.10.210:
    Pakete: Gesendet = 4, Empfangen = 0, Verloren = 4 (100% Verlust),

C:\>
```

The IP address 192.168.10.**210** is not yet used (no answer to the "ping") and can thus be assigned to the BL-NET.

9. In the *Memory Manager*, the configuration of the BL-NET ethernet interface is done in "SETUP" under "configure bootloader" and in *Winsol* this form is located under (file → module → configure bootloader):

IP address:	The BL-NET is assigned the free IP address determined via "ping".
Subnet mask:	The subnet mask of the network determined via "ipconfig".
Gateway:	The gateway is currently not used.
BLD number:	If several bootloaders are connected to the LAN network then each bootloader must be assigned a different BLD number!
HTTP port	The port used to access the bootloader via a browser can be set to any desired value (default is port 80)
TA port:	Communication between *Winsol* and *Memory Manager* with the BL-NET occurs via this port. It is recommended to leave this port at the factory setting of 40000.

Clicking "OK" transfers the settings to the bootloader and this restarts with the changed configuration (IP address, etc.).

10. The bootloader is now correctly configured for the network and can be integrated into the network. Note that the ethernet interface of the BL-NET is only active when a CAN bus connection exists!

11. After the bootloader has been prepared, the PC software must also be configured with the correct IP address and corresponding port. Point 9 describes configuration of the device only. Since several bootloaders can be connected in a LAN network, this information must be specified again in the software (*Winsol* or *Memory Manager)* in order to address the correct BL-NET.
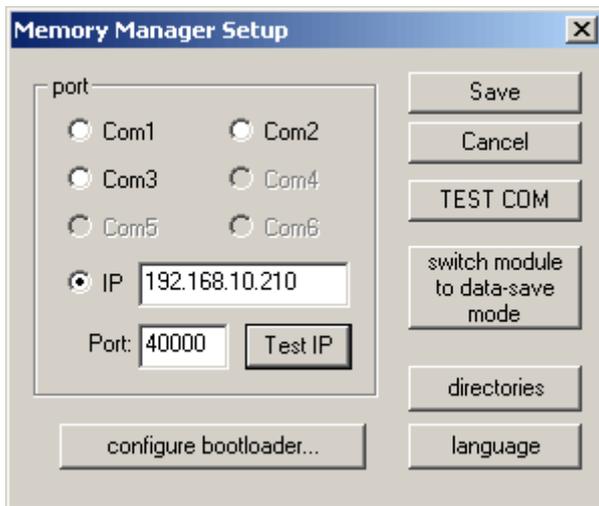

12. The ethernet connection can then be checked via "Test IP". Access to the BL-NET via a browser (Opera, Internet Explorer, etc.) using the IP address is now possible, and thus also to the CAN network (UVR1611).

Accessing the BL-NET via a browser

Any browser (Internet Explorer, Firefox, Opera, etc.) can be used to access the BL-NET. The wrong cache settings in the browser can lead to outdated pages being displayed (**deactivate cache**). For this reason, it is essential to check that the browser options are set correctly. This is the only way of ensuring that the latest version of the pages is always displayed.

Accessing "Hauptmenue" (main menu) page

Entering the IP address of the BL-NET into any browser will display the BL-NET main page.

Example: | Adresse 🛋 http://192.168.10.210 ▼|
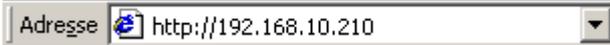
At present the BL-NET bootloader operating system is only available in German! In contrast to this, the language used to display the UVR1611 menus depends only on the language used in the controller operating system.
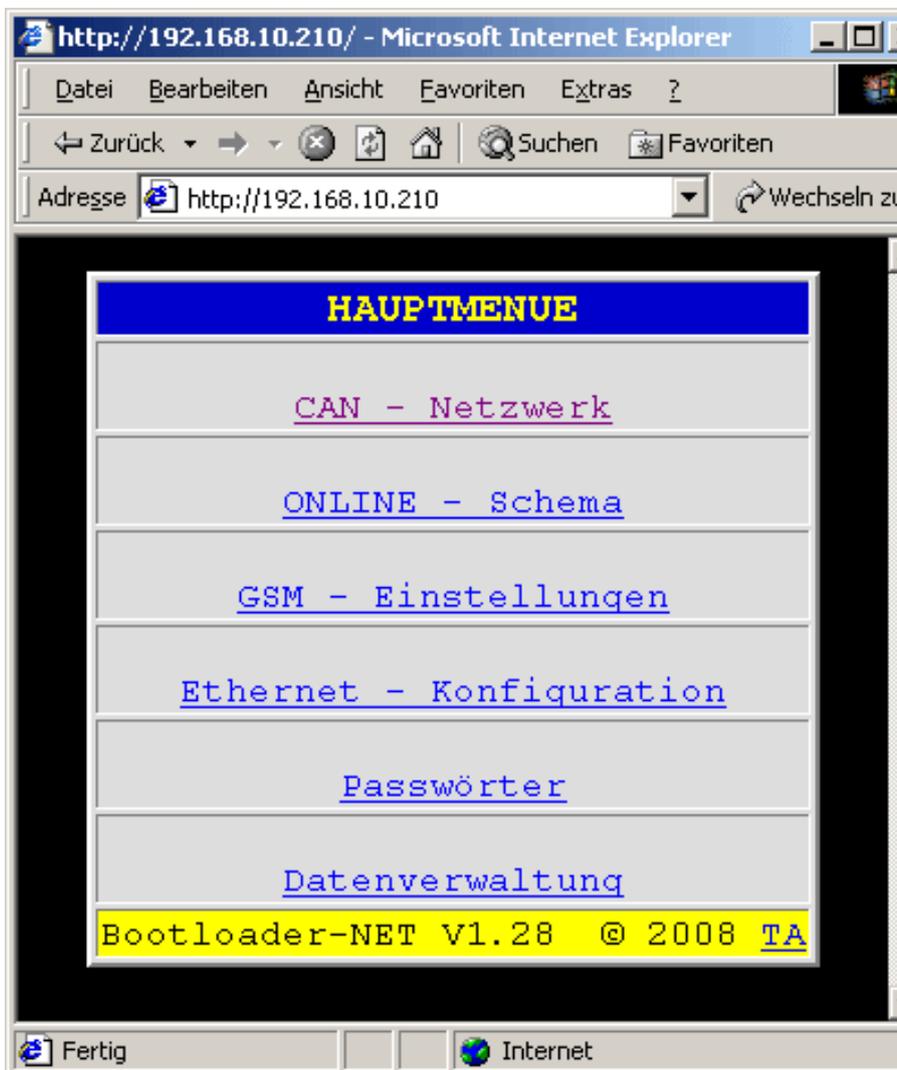
Every piece of underlined text is a link to another menu page that can be accessed by clicking the underlined text.

Menu overview:

"CAN – Netzwerk" (CAN network): The "CAN - Netzwerk" (CAN network) menu shows all active devices (nodes) connected to the bootloader via the CAN bus. Selecting a node allows direct access to the menu pages of the node.

"Online - Schema" (online scheme): The bootloader offers online visualisation, which provides a graphical representation of the current state of the system when viewed with a browser over the LAN or the Internet.

"GSM – Einstellungen" (GSM settings): The status of BL-NET network inputs can be queried and the values for network outputs can be set via SMS. The "GSM - Einstellungen" (GSM settings) menu allows configuration of each of 16 analogue and 16 digital CAN network inputs/outputs of the BL-NET. Events can also be defined that cause the bootloader to send an SMS when they occur. A GSM module is essential for all these functions.

"Ethernet – Konfiguration" (ethernet configuration): The ethernet settings can also be changed using a browser. However, since an ethernet connection to the bootloader must already exist, configuration of the ethernet settings during first-time commissioning via USB interface is recommended or even essential.

"Passwörter" (passwords): To prevent unauthorised external access (Internet, Intranet, etc.) the BL-NET has a password system. **To ensure protected and safe access via the Internet, additional safety precautions at the router are absolutely necessary.**

"Datenverwaltung" (data administration): The BL-NET bootloader allows the transfer of functional data or operating systems to devices in the CAN network (UVR1611, CAN monitor and CAN-I/O module) over ethernet using a browser.

Changing "Passwörter" (passwords)

Without passwords (factory setting) the system has no protection and anyone can access the BL-NET. As soon as at least one "Passwort" (password) is defined, a login is required each time the BL-NET is accessed via ethernet.

As with the UVR1611 controller, there are three possible "Anwender" (user groups) A, B and C, general "Experte" ("expert") access and "nur ansehen" ("read-only") access levels. All access levels are protected by their own "Passwort" (password). The password may contain a maximum of eight characters, with no special characters.

Password rules:

The passwords can only be changed after loading the factory settings or as an "Experte" ("expert") user!

The expert password can only be deleted after all other passwords have been deleted.

WARNING:
As long as no passwords have been defined, all persons knowing the IP address have unlimited access to the system, including all options for changing programs and settings!

Important: The first step must always be the definition of the expert password, since the system will not accept any other codes until this has been done. After entering the expert password, a user cannot access the system until a password has also been created for them.

Operating levels

"*nur ansehen*" ("read-only")*:*   The user has limited access to pages and cannot make any changes. Important data such as telephone numbers, ethernet settings or the password list cannot be viewed.

"Anwender A-C" ("user A-C"):   Users A to C can access function overviews created for them in the controller and can edit parameters in these. The time can also be changed by these users.

*"Experte" ("expert"):*Expert users can change all parameters and settings.

If passwords have been defined then a login page is displayed for each access.
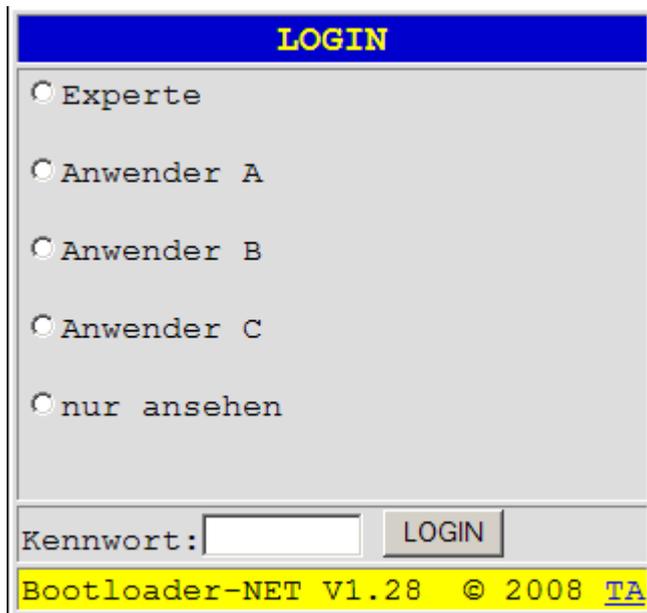
Login is done using cookies, so your browser must be configured to accept cookies!

The corresponding password can only be entered after the desired entry level has been selected. An incorrect password causes the login page to be redisplayed. After entry of the correct password, the "Hauptmenue" (main menu) page is displayed.

Only one user can work on the bootloader at any given time. If another user attempts to login at the same time the message *"Derzeit ist ein anderer Benutzer eingeloggt!" ("Another user is currently logged in!")* is displayed in their browser.
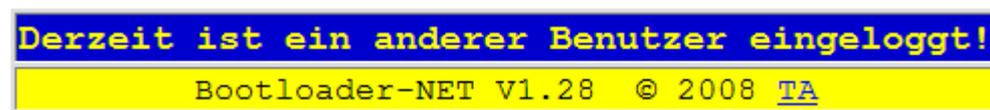
When work with the BL-NET is finished, it is recommended to end the session via the logout button. The session is automatically ended after five minutes without communication.

If the browser is closed without clicking the logout button, then no other login can occur for the next five minutes!

"CAN-Netzwerk" (CAN network)

The "CAN - Netzwerk" ("CAN network") menu shows all active devices (nodes) connected to the bootloader via the CAN bus. Selecting a "Knoten" (node) and then executing the "Menüseite laden" ("load menu page") command allows direct access to the menu pages of the node.
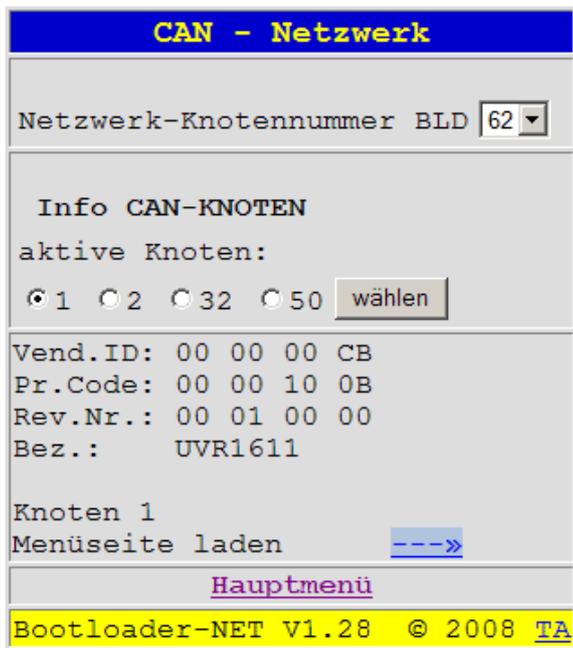

According to the illustration, the bootloader is node 62 of the "CAN-Netzwerk" (CAN network). Nodes 1, 2, 32 and 50 are also active in the network.
"Knoten" (node) 1 is selected, in this case an UVR1611.

Select: Select the desired "aktive Knoten" (active node) and click the

 button.

The link button "Menüseite laden" ("load menu page")

is used to access the nodes.

The menu page of the device is then displayed.

UVR1611 menu page

The controller pages displayed in the browser are directly loaded from the controller and translated into HTML by the bootloader. For larger pages, this can result in loading times of several seconds!
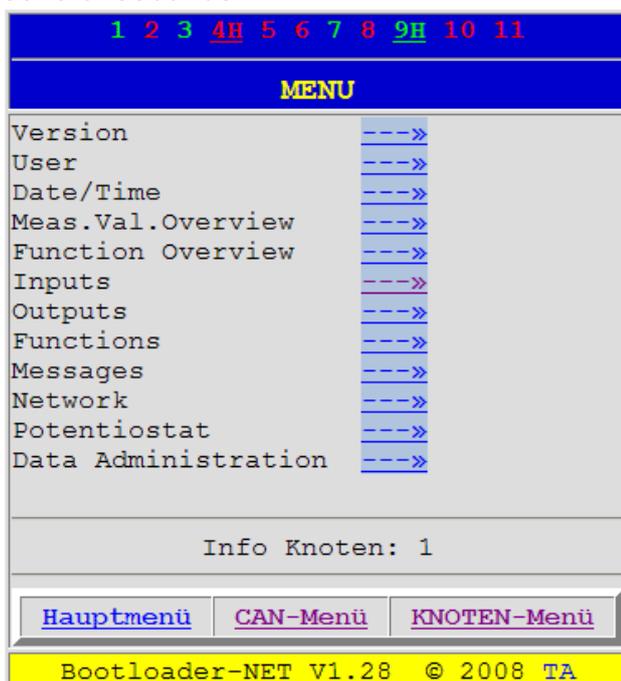
As with the controller, the top line shows the status of the outputs.

Green: Output on
Red: Output off
H means "Handbetrieb" (manual operation).

Further navigation is done by clicking the link symbols.

These buttons allow direct selection of the most important submenus.

Example: Parameterising input 1

```
    1  2  3  4H 5  6  7  8  9H 10 11
─────────────────────────────────────
              INPUT   1
─────────────────────────────────────
TYPE:      ANALOG       <>
MEAS VAR: Temperat.     <>

DESIGNATION
GROUP: General          <>
DES: T.Collector        <>

SENSOR:       KTY 10  │ KTY 10 ▾│
SENSOR CHECK: no      │ KTY 10  │
SENSOR CORR: 0,0   K  │ Pt 1000 │
                      │ RAS     │
MEAN VAL:     1,0 Sec   <>
─────────────────────────────────────
            Info Knoten: 1
─────────────────────────────────────
  Hauptmenü   CAN-Menü   KNOTEN-Menü
─────────────────────────────────────
   Bootloader-NET V1.28   © 2008 TA
```

Clicking the [<>] button displays a selection list with the currently available settings parameters.
After selecting a value, this is immediately transferred to the controller via the CAN bus. The controller stores the parameter and then returns the corrected information page, which is then redisplayed by the browser.

All editable parameters in the controller can be set using the method shown in the example.

BL-NET "Datenverwaltung" (data administration)

The BL-NET bootloader allows the transfer of functional data or operating systems to devices in the CAN network (UVR1611, CAN monitor and CAN-I/O module) over ethernet using a browser. In this case, additional preparation of the device for the data transfer is not necessary.

Page in browser:

Datenverwaltung	Selection process:
○1 ●2 ○32 ○50 wählen NODE 63 Vend.ID: 00 00 00 CB Pr.Code: 00 00 10 0B Rev.Nr.: 00 01 00 00 Bez.: UVR1611 Knoten 2 Menüseite laden ---»	Select the node with which the data transfer is to occur (NODE 63 is required for a new start if an operating system update was interrupted!)
Datentransfer: BL-NET --> Gerät ▾	Select the transfer direction of the functional data
Funktionsdaten : ○1: Funktionsdaten 08.02.2008 12_48 Daten für CAN-Knoten: 1 ●2: AB1234.dat Daten für CAN-Knoten: 2 ○3: Funktionsdaten I/O - Modul 44 Daten für CAN-Knoten: 32 ○4: Funktionsdaten CAN - Monitor Daten für CAN-Knoten: 50 ○5: keine gültigen Daten Daten für CAN-Knoten: 0 ○6: keine gültigen Daten Daten für CAN-Knoten: 0 ○7: keine gültigen Daten Daten für CAN-Knoten: 0	Select the memory position of the "Funktionsdaten" (functional data) or "Betriebssystem" (operating system) (the name of the data is displayed next to the memory position number; the next row also displays the nodes from the stored functional data)
○ Betriebssystem	
Transfer starten	"Transfer starten" (start the transfer)
Hauptmenü	
Bootloader-NET V1.28 © 2008 TA	

When the transfer is finished, the status of the transfer is automatically displayed in the browser ("erfolgreich" ("successful") or "nicht erfolgreich" ("unsuccessful")). Functional data takes about 45s to transfer and the operating system takes about 2min 40s.
Note that, after the transfer, the controller is restarted and the node is not visible at the BL-NET for about 20 seconds.

"GSM-Einstellungen" (GSM settings)

The status of the BL-NET network inputs can be queried via SMS. The values of the network outputs can also be set via SMS. The "GSM–Einstellungen" ("GSM–Settings") menu allows configuration of each of 16 analogue and 16 digital CAN network inputs/outputs of the BL-NET. Events can also be defined that cause the bootloader to send an SMS or email when they occur. A "Telefonnummern Filter" ("telephone numbers filter") can be used to ensure that the BL-NET only processes queries and commands from particular telephone numbers.

An integrated GSM module is required for all these functions and this module can be retrofitted if required.

All settings for the GSM module and SMS communication can be made here.

If a GSM module is recognised, the "Empfangsleistung" (reception strength) is displayed as a bar.

Each of the 16 digital and analogue CAN network inputs/outputs of the bootloader can be configured here for "Abfragen" (queries) or "Befehle" (commands) via SMS.

This button allows deletion of all SMS entries for the network inputs/outputs.

Appropriate warnings can be sent via SMS for particular events.

With an active number filter, only SMSs from numbers entered in the "Telefonnummern" ("telephone numbers") menu are processed.

"Telefon-Nummern" (telephone numbers)

Telefon-Nummern

Akzeptierte Telefonnummern:

mit Länderkennzahl beginnen z.B.: 0043...

1. Telefonnummer   `00431234567890`   [Speichern]

2. Telefonnummer   `                `   [Speichern]

3. Telefonnummer   `                `   [Speichern]

1. Telefonnummer wird auch für die Mitteilung von Ereignissen verwendet!

Hauptmenü

Zurück

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With active telephone number filters, only queries from the numbers entered here are proc-essed. In the example, one number ("1. Telefonnummer" (1st telephone number)) is entered. Events are sent only to the 1st telephone number.

"Abfragen" (queries) and "Meldungen" (messages) (analogue/digital)

The "Abfragen, Meldungen Analog" ("queries, messages analogue") and "Abfragen, Meldun-gen Digital" ("queries, messages digital") menus allow configuration of the CAN network inputs/outputs of the bootloader, whose status can be queried via SMS. An optional "Ereignis" (event) can be defined for every network input, for which the BL-NET automatically sends an SMS.

Every network input of the BL-NET can be assigned to a particular "Netzwerk-Ausgang" (network output) of a device in the CAN network.

In the following example an UVR1611 (CAN node 2) sends the value of the measured tank temperature to the network via its analogue "Netzwerk-Ausgang" (network output) 3. This value is then read from the network by the BL-NET bootloader via the analogue network input.

UVR1611 (CAN node: 2)

S 5   T.Storage → **Network - Output Variable**
N 19 **ANALOG3** NWN: 2 NWO: 3
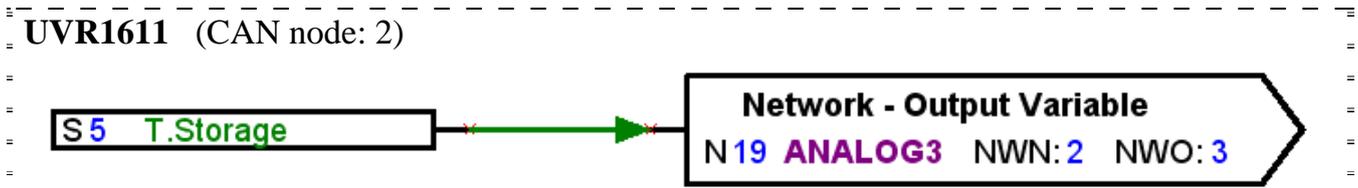
SMS for a query *"Bezeichnung?"* ("*designation?*")

Configuration of CAN "Analog Eingang" (analogue network input) 1:

"Bezeichnung Speicher" ("designation tank")
"Netzwerk-Knoten" (network node) and "Netzwerk-Ausgang" (network output)
"Ereignis" (event)

Confirm changes with the button [Speichern]

"aktueller Wert" (current value): 74.8 °C

The current value can be queried with an SMS containing "Speicher**?**" ("**tank?**"). An "Ereignis" (event) is also defined so that when the temperature drops below 20 °C an SMS containing **"Speicher ist kalt"** ("**tank is cold**") is sent to the first telephone number.

"Abfragen Gruppen" (group queries)

This menu allows the definition of groups in order to allow querying of entire blocks of data via a group designation, instead of just querying individual values.
When doing this, it is important to make sure that the 160 character limit of an SMS is not exceeded!

SMS for a group query: "Gruppenbezeichnung**?**" ("*group designation***?**")

Eight different groups can be defined.
Each group can contain a maximum of 8 values!

Definition is done in the entry line, with each respective number separated by a space.

In the example, the SMS "Solaranlage?" ("Solar system?") can be used to query the values of analogue network inputs 1, 2 and 3, and digital network input 1.
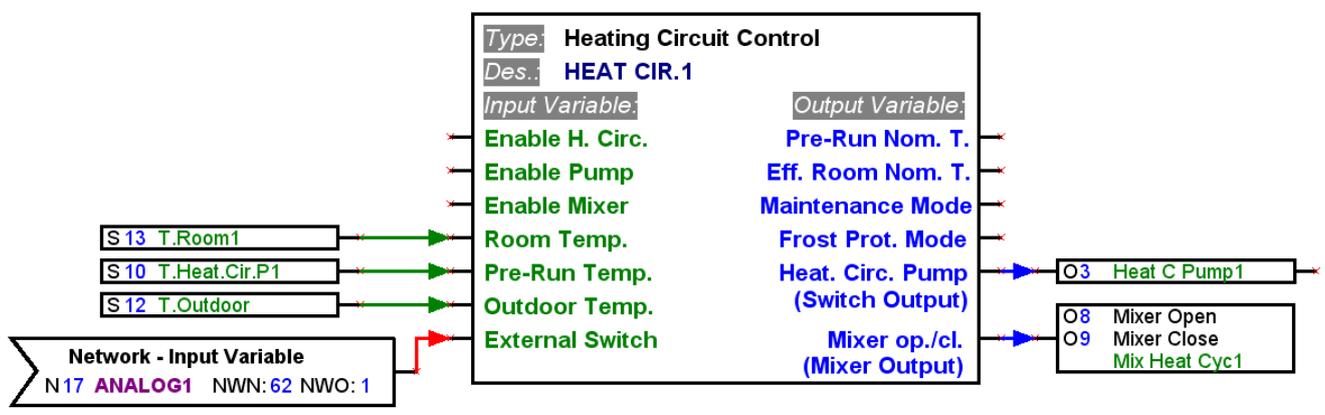
"Befehle" (commands) (analogue/digital)

The "Befehle Analog" ("analogue commands") and "Befehle Digital" ("digital commands") menus allow the configuration of bootloader CAN network outputs so that their values can be set via SMS.

A **digital network output** is set using the values "*EIN*" ("*ON*") or "*AUS*" ("*OFF*"), whereby upper/lower case makes no difference (e.g. SMS "Freigabe:ein!" ("Enable:on!")).

An **analogue network output** is set using a value without a decimal separator (e.g.: 253 for 25.3). In addition, the commands "**Standby**", "**Zeit**" ("**time**"), "**Normal**", "**Abgesenkt**" ("**reduced**") and "**intern**" ("**internal**") can be used to change the operating mode of a heating circuit via SMS. To do this, the corresponding parameterised analogue network input of the UVR1611 must be linked to the "External Switch" input of the heating circuit control function.

UVR1611

Type:	**Heating Circuit Control**
Des.:	**HEAT CIR.1**

Input Variable:	*Output Variable:*
Enable H. Circ.	Pre-Run Nom. T.
Enable Pump	Eff. Room Nom. T.
Enable Mixer	Maintenance Mode
Room Temp.	Frost Prot. Mode
Pre-Run Temp.	Heat. Circ. Pump
Outdoor Temp.	(Switch Output)
External Switch	Mixer op./cl.
	(Mixer Output)

S 13 T.Room1
S 10 T.Heat.Cir.P1
S 12 T.Outdoor

Network - Input Variable
N 17 **ANALOG1**   NWN: **62** NWO: **1**

O3   Heat C Pump1
O8   Mixer Open
O9   Mixer Close
Mix Heat Cyc1

SMS as a command: "*Bezeichnung:Wert*!" ("*designation:value*!")

BEFEHLE ANALOG

Analog Ausgang Nr.: 1

Bezeichnung   Heizung   (max. 15 Zeichen)

Speichern

SMS: Bezeichnung:250!

(entweder Wert ohne Komma, oder Standby, Zeit, Normal, Abgesenkt oder intern)

Hauptmenü

Zurück

Bootloader-NET V1.28 © 2008 TA

In the above example, the "Analog Ausgang" (analogue network output) 1 is assigned the designation "Heizung" ("heating"). With an SMS containing "**Heizung:Abgesenkt!**" ("**heating:reduced!**") the heating circuit switches to the reduction mode, whereas the SMS "**Heizung:intern!**" ("**heating:internal!**") causes the internal operating state of the controller to be used.

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"Ethernet – Konfiguration" (ethernet configuration)

The ethernet settings can also be changed using a browser. However, since an ethernet connection to the bootloader must already exist, configuration of the ethernet settings via the USB interface during first-time commissioning is recommended. **See also the section "*Connecting the BL-NET to a LAN network*"**

Changes do not take effect until the "Neustart" (restart) of the BL-NET!!!

NOTE: The commonly used subnet mask of 255.255.255.0 means that when an IP address is assigned where the first three numbers are not the same as the internal network (here 192.168.10.xxx) or the assigned IP address is already used by another device in the network, then the bootloader can no longer be accessed within this network. New parameterisation of the ethernet connection via a USB connection is required before normal ethernet access is possible once more.

Data transfer BL-NET ⇔ UVR1611

Selection of the interface for the data transfer

CAN bus

To transfer the data via CAN, all four CAN conductors
(H, L, +, ⊥) must be connected. The battery is unimportant here.

Key to CAN symbols: H..............CAN high
L...............CAN low
+...............+12 volt
⊥...............Mass

Infrared

A cable is not required for infrared transfer, only a 9V battery is required. The infrared interface is primarily intended for service purposes. It is recommended that this only be used for transferring functional data! An operating system download requires the bootloader to be held motionless on the controller for several minutes (**if this is not successful, transfers can then only be done using a cable**)!

Position of the BL-NET on the controller for infrared transfers:

* Upper edge of the BL-NET lies at the lower edge of the UVR display

* Display side edges are marked with
→│**DISPLAYPOSITION UVR1611**│←
on the BL-NET

NODE 63:

Data transfer of the operating system and functional data is always performed by the bootloader using node 63 of the CAN network.
This special node number is used exclusively for these data transfers and must not be assigned to any device in the CAN network.
The device waiting for data transfer with the bootloader automatically uses node number 63 for this period of time.

Data transfer procedure

The device that is to exchange data with the bootloader must be prepared for the data transfer. Once the device is ready for communication, the data transfer is started by pressing the START button on the BL-NET.
When the START button is pressed, the green LED on the front of the BL-NET begins to flash rapidly. This indicates that the BL-NET is attempting to establish communication with the controller (no data is transferred at this point!).

If the red LED lights up cyclically during an infrared transfer then the battery voltage has reached a critical level and the battery must be replaced as soon as possible.

Functional data download (BL ⇒ UVR1611)

The bootloader has 7 memory positions for functional data. These can be written with data from the controller or functional data from the PC (using the *Memory Manager* program). The functional data upload differs only in the selection of the transfer direction (CONTR. => BOOTLD.) and is not described here in detail.

Procedure:

Controller view	Comment
| ```
      MENU
-------------------
        :
Data Administration ◄
``` | Select Data Administration in the main menu of the UVR1611 controller |
| ```
 DATA ADMINISTRATION
-------------------
        :
DATA <=> BOOTLOADER:
Upload Data:
CONTR. => BOOTLD.
Download Data:
BOOTLD. => CONTR.   ◄
``` | Download Data: BOOTLD. => CONTR. select |
| ```
  BOOTLD. => CONTR.
---------------------
DATA SOURCE: Bootld.
Storage Point:  1  ◄
TARGET: Controller
Functional Data
Overwrite?      yes
Factory Settings
Overwrite?       no
        :
DOWNLOAD DATA
REALLY START?   yes ◄
``` | Select the desired storage point for the functional data at the BL-NET<br><br>Overwrite the controller functional data?<br><br>Adopt the functional data as the factory setting?<br><br>The controller switches to transfer mode |
| ```
     NODE: 63

 READY FOR DOWNLOAD
``` | The controller is ready for the data transfer. When the START button on the bootloader is pressed, the green LED begins flashing rapidly and the data transfer starts. |
| ```
     NODE: 63

1: Functional Data XXX


    PROGRAMMING
  000700 / 007FB0
``` | The transfer is running<br><br>Name of the functional data<br><br><br>Progress display |
| ```
     NODE: 63

 SUCCESSFUL DOWNLOAD
``` | The functional data was successfully loaded into the controller. |

Operating system download (BL ⇒ UVR1611)

The latest operating system versions can be downloaded from the homepage at www.ta.co.at. The bootloader can only manage one operating system. This download contains the boot sector and operating system for the controller. The boot sector can be compared with the BIOS on a PC. The boot sector can also change for technical reasons. In this case, when updating an operating system the boot sector is loaded first and the download of the actual operating system is then automatically started after this. If the boot sector is the same then only the new operating system is loaded.

Procedure:

Controller view	Comment
| ```
          MENU
--------------------
           :
Data Administration ◄
``` | Select Data Administration in the main menu of the UVR1611 controller |
| ```
 DATA ADMINISTRATION
--------------------
           :
OPER.SYSTEM<=BOOTLD.:
Download Oper.System:
BOOTLD. => CONTR.   ◄
``` | ```
Download Oper.System:
BOOTLD. => CONTR.
``` select |
| ```
  BOOTLD. => CONTR.
--------------------
DOWNL. OPERAT.SYSTEM
REALLY START?    yes ◄

WARNING: Use
Cable Wiring
``` | The controller switches to transfer mode<br><br>A cable connection should normally be used for transferring the operating system! |
| ```
       NODE: 63

  READY FOR DOWNLOAD
``` | The controller is ready for the data transfer. When the START button on the bootloader is pressed, the green LED begins flashing rapidly and the data transfer starts. |
| ```
       NODE: 63

     PROGRAMMING
    005400/ 020000
``` | The transfer is running.<br><br>Progress display |
| ```
       NODE: 63

 SUCCESSFUL DOWNLOAD
``` | The data was successfully transferred to the controller . |
| ```
  TECHN. ALTERNATIVE
--------------------
Homepage: www.ta.co.at
--------------------
        UVR1611
 Operat.Syst.: Ax.xx
   Bootsector: Bx.xx
``` | **Note:** if the boot sector and operating system are updated the steps 4 to 6 are repeated without the START button being pressed again<br><br>After the operating system update is finished, the start page is displayed on the controller. |

Data transfer via ethernet using a browser

With the BL-NET it is also possible to start the data transfer using any desired web browser. A precondition for this is that an ethernet connection has already been set up (see chapter "BL-NET data administration").
Procedure:

     a)   Select data administration in the BL-NET main menu
     b)   Select the node (the controller with which communication is to occur)
     c)   Select the transfer direction
     d)   Select the data (functional data or operating system)
     e)   Start the transfer

When the transfer is finished, an appropriate message is displayed in the browser ("erfolgreich" ("successful") or "nicht erfolgreich" ("unsuccessful")).

Troubleshooting data transfers

Operating system download (BL → UVR)
If an error occurs when transferring the operating system, after an automatic restart the controller continues to wait as "NODE 63" for the operating system data transfer to begin again ("READY FOR DOWNLOAD"). As long as the operating system has not been fully loaded into the UVR1611, the controller has no other functionality.
Pressing the START button on the bootloader starts the data transfer again.
If the data transfer is done via ethernet using a browser, the "NODE 63" button can be used to directly start the transfer with node 63.

Functional data download (BL → UVR)
If an error occurs when downloading functional data, the controller automatically performs a total reset of the configuration. The "Knoten-Nr." ("node No."), "Freigabe" ("enable") and "Autooperat." network settings are not changed.
The data transfer of the functional data must be performed again.

WARNING! If a transfer fault occurs in a network with multiple devices, a data transfer to a different device must not be started until the fault is fixed!

In general, an operating system should only be updated when functions that are only contained in the newer operating system are required (Never change a running system!). Similar to PC BIOS updates, an operating system update always represents a certain small risk.

"Online-Schema" (online scheme)

The bootloader offers online visualisation that provides a graphical representation of the current state of the system when viewed with a browser over the LAN or the Internet.

This online scheme consists of a graphic file (e.g. "Hydraulikschaltplan" (hydraulic schematic)) and the associated HTML file defining the parameters to be displayed.

The files (.gif and .html) can be stored in the Bootloader using the *Memory Manager* program (see chapter "Transfer of bootloader data").

Creating a graphic for the online scheme

The graphic can be created using any desired graphics or drawing program, whereby the following points should be observed:

1. The graphic must be provided to the BL-NET in .gif format.

2. The file must not exceed the maximum size of 196 kilobytes! To reduce the loading time when displaying the online scheme, the graphic file should be kept as small as possible.

Creating the HTML file

A HTML file containing all information defining the appearance of the page is required for displaying the online scheme.

The HTML file can be easily created using the *TAPPS* program. *TAPPS* creates the required HTML file based on graphical positioning and assignment of the values to be displayed. The exact procedure is described in the *TAPPS* operating manual.

The HTML file must not exceed the maximum size of 196 kilobytes and should be kept as small as possible to reduce the loading time!

Definition of display values

The syntax for defining a displayed value is as follows:

$d1e0

$...   Identifier for the definition of a displayed value
d1...   Data source of the displayed value
e0...   The parameter whose current value is to be displayed

The definition of a displayed value always begins with the "$" character, followed by the definition of the *data source* and the *parameter* whose current value is to be displayed.

The definitions are replaced with corresponding current measurements when BL-NET displays the online scheme.

If no measurements are available, "NO-DL" is displayed in the online scheme. An invalid definition causes "ERROR" to be displayed.

Data source:

d1   …   Data line 1
d2   …   Data line 2
n1   …   BL-NET CAN network inputs

Parameter:

Data line:

Depending on the device type of the controller to be acquired, the following parameters are available for visualisation:

Input: e0…ef   (Inputs 1…16)
Output: a0…af   (Outputs 1…16)
Speed setting: d1, d2, d6, d7 (Speed setting for output 1, 2, 6 or 7)
Power: l1, l2   (kW of heat meter 1 or 2)
kWh: k1, k2   (kWh of heat meter 1 or 2)
MWh: m1, m2   (MWh of heat meter 1 or 2)
Date: t1
Time: z1

BL-NET CAN network inputs:

The network inputs can be defined using a browser in the "**GSM-Einstellungen**" ("**GSM settings**") menu of the BL-NET (see the relevant chapter).

Analogue input: a0…af   (Analogue network inputs 1…16)
Digital input: d0…df   (Digital network inputs 1…16)

NOTE: The inputs and outputs are **numbered from zero in hexadecimal** (see hexadecimal table)!
This results in (e.g.) the definition "e0" for input 1 and "ef" for input 16.

Hexadecimal table:

dec	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
hex	0	1	2	3	4	5	6	7	8	9	a	b	c	d	e	f

Example:
$d1ef   …   Data line 1, input 16
$d2a0   …   Data line 2, output 1
$n1a1   …   Network, analogue network input 2

Factory settings

To load the BL-NET factory settings, the battery must first be removed and, when the CAN bus connection is plugged in, the START button on the bootloader must be pressed and held pressed until <u>only</u> the green LED lights up.

The factory settings include the following parameters:

CAN bus:

Node No.:   62

Ethernet:

IP address:	192.168.0.1
Subnet mask:	255.255.255.0
Gateway:	192.168.0.1
BLD - No.:	0
HTTP port:	80
TA port:	40000

Passwords:

Expert:	no password specified
User A:	no password specified
User B:	no password specified
User C:	no password specified
Read only:	no password specified