Manual

pure.box 2
#50511, #50512, #50513, #50514, #50516

pure.box 3
#50517, #50518, #50519, #50520, #50521

W&T

W&T

W&T

This device contains software components which are subject to one or more Open Source licenses. Copies of these licenses are found in the Appendix to this document.

The associated source text can be downloaded at

http://www.wut.de/e-5wwww-60-inde-000.php

at no charge. You may also obtain the source text from us for a period of three years after the last shipment in the form of a data medium, also at no charge. Please contact us at

info@wut.de

This offer applies to any recipient of this information.

Execute PHP-scripts time- and event-triggered and develop quick solutions only with the knowledge of web-technics. Use the integrated web-server with its PHP-support for hosting your own sites.

You can also compile your own binaries from C- and C++- sources for the pure.box and execute them, as well as Shell-scripts.

Take the pure.box as a carrier for your application.

Access the filesystem via the FTP-, TFTP- and the SMB-protocol. Store data, which are generated by your software, to the MySQL-Database on the pure.box and access this data from within your application onto the box and via the MySQL-server over the network.

Depending on the design of the box you can expand its memory by using extra SD-storage or connect peripheral equipment to the available interfaces.

Content

1 Interfaces, Indicators and Installation

Describes the connection and installation options for the pure.box.

1.1 Power

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1.5 Installation

1.1 Power

The box can be powered either via PoE or from an external power supply.

1.1.1 Power via PoE

The pure.box is designed for use in PoE environments according to IEEE802.3af. Power is brought in here over the network infrastructure through the RJ45 terminal. The box supports both phantom power on data pairs 1/2 and 3/6 and power on the unused wire pairs 4/5 and 7/8.

To provide the supplied components with power management, the box identifies itself as a device in Power Class 2 (power consumption from 3.84W to 6.49W).

1.1.2 External power

Alternative to PoE the box can also be powered externally using the plug-in screw terminal on the underside of the housing. The DC voltage must be in a range of

24 ... 48V DC (+/-10%)

When applying the power please note the correct polarity. The 2-pin power plug is correspondingly labeled.

⚠️ *Reversing the polarity will not harm the hardware of the box.*

1.1.3 Disconnect from suppl voltage

When disconnecting the pure.box 3 from the supply voltage, the operating system gets shut down controlled. The energy for this process is taken from two capacitors. Especially the file system is protected from failure, which could lead to problems at the next start of the system.

The capacitors are charged while operating the box.

1.2 Network connection

The pure.box includes an IEEE 802.3 compatible network terminal. The physical connection is made using TP copper cable.

1.2.1 10/100BaseT on RJ45

The 10/100BaseT network interface uses a shielded RJ45 connector. The pin configuration and function corresponds to an Auto-MDI(X) interface. Connection to a hub, switch or other network device is made using a maxim 100m long shielded patch cable.

Because the send and receive lines on connected devices are automatically detected, use of any (straight and crossed) network cable is possible.

The network connection is galvanically isolated from the supply voltage for at least 500V.

The pure.box uses **autonegotiation**. To prevent communication problems, caused for example by a duplex mismatch, we recommend operating the port on the switch or hub in this mode as well. Here both the transmission speed and the duplex procedure is automatically negotiated and correspondingly set in the devices.

Managable switches often have special protocols (spanning tree protocol, port trunking, ...) as needed for example for uplinks to other switches or broadband connection of servers. These protocols are not generally needed for connecting normal terminal devices like the pure.box, and they may significantly slow down the opening of a connection after a restart. We recommend disabling these protocols and functions on the port used for the pure.box. Please consult your responsible network administrator.

1.2.2 Power-over-Ethernet (PoE)

The pure.box can obtain its power over the network interface according to IEEE802.3af (Power-over-Ethernet). The data pairs may be used or the wire pairs not used for 10/100BaseT (see section **Power**).

1.3 LEDs

Optical indication of the network status is provided by the pure.box in the form of two LEDs integrated into the RJ45 jack. The device status is displayed by a multi-color indicator also on the front of the unit.

1.3.1 Network status

Two LEDs in the lower corners of the RJ45 jack indicate the current network status of the pure.box. The green LED may assume the following states:

- Off: No link
- On: Link present
- Flashing: Active data communication

The yellow LED indicates the current data rate:

- Off: 10MBit
- On: 100MBit

1.3.2 Multi-color indicator

The multi-color indicator on the front of the pure.box is used to represent the current **system status**:

- Green: **Normal state** of the pure.box. All services are started and the system is fully ready. An underlaid cyclical flashing indicates the system load. The faster this flashes, the greater the process load.
- Blue: **Booting**. All services are being booted up. At this time no connections to the pure.box can be opened. When bootup is finished the LED changes shortly to red.
- Blue flashing: **Network traffic** to or from the pure.box.
- White pulsing: Ongoing **firmware update**
- Red flashing (approx. 1Hz): **No link**
- Red, solid on: Serious system error. The system can no longer be properly started.

1.4 Button

1.4.1 Hardware reset

The **mechanical button** inegrated into the multi-color display can be used for manual triggering a **hardware reset**. When the button is held down the multi-color display changes from green to yellow to red. This process takes around 5 seconds. Then all connections are closed and the system is restarted.

After startup is complete the indicator comes on green again, including the underlaid pulsing which indicates the processor load.

1.4.2 Eject external storage

A connected, external storage can be ejected by pushing the button twice.

When removing an external storage without ejecting it, stored data can be lost.

1.5 Seriel Port

The serial port of the pure.box (only #50513, #50516, #50517, #50520 and #50521) is designed as a combi-module and supports RS232, RS433 and RS485. The mode can be configured via DIL-switches, which are mounted directly on the module.

The module supports Baudrates up to **230.400 Baud**.

In individual programs the serial port can be opend by using the identifier **/dev/ttyS1**.

The next table shows the available operation modes of the module. The mode is configured by setting the DIL-switches on the module:

Operating mode	SW1	SW2	SW3	SW4	SW5	SW6	SW7	SW8
RS232	OFF	OFF	OFF	OFF	OFF	OFF	OFF	ON
RS422, RS485, 4-wire bus master DTR handshake	OFF	OFF	OFF	ON	OFF	*	*	OFF
RS422, RS485, 4-wire bus master RTS handshake	OFF	OFF	OFF	OFF	ON	*	*	OFF
RS485, 4-wire / 2-wire with echo DTR control	OFF	OFF	ON	ON	OFF	*	*	OFF
RS485, 2-wire without echo DTR control	ON	OFF	ON	ON	OFF	*	*	OFF
RS485, 4-wire / 2-wire with echo RTS control	OFF	OFF	ON	OFF	ON	*	*	OFF
RS485, 2-Draht without echo RTS control	ON	OFF	ON	OFF	ON	*	*	OFF
RS485, 4-wire / 2-wire with echo automatic control	OFF	ON	OFF	ON	OFF	*	*	OFF
RS485, 2-wire without echo automatic control	ON	ON	OFF	ON	OFF	*	*	OFF

All RS485 modes require termination of the bis system with a termination network, which is already integrated in the module and can be activated by setting the switches SW6 and SW7 to ON.

⚠ *The terminating DIL-switches SW6 and SW7 must never be in the ON position when using the module in RS232 mode. This will cause the RS232 driver to fail.*

In the following overview the left table shows the pinout for RS232 mode. The right table shows the pinout for RS422 and RS485 mode:

pin#	signal	function
1	DCD	input
2	RxD	input
3	TxD	output
4	DTR	output
5	GND	GND
6	DSR	input
7	RTS	output
8	CTS	input
9	RI	input

pin#	signal	function
1	TXD A	inputoutput
2	RxD A	input
3	DTR A	output
4	CTS A	input
5	GND	GND
6	TXD B	output
7	RxD B	input
8	DTR B	output
9	CTS B	input

1.6 USB-Interface

The USB-Interface ot the pure.box (only #50512, #50516, #50517, #50519 and #50521) is USB 2.0 compliant.

Using the default-firmware, there can be **HID-devices** connected to the pure.box. The signs, sent by the connected device, can be red from **/dev/kdump_cdev**. This file can only be red once, its content will be deleted after reading.

Further more USB-Serial-Interfaces from the Wiesemann & Theis GmbH can be connected (#38011 and #38211), to expand the box by one more serial port. This port can be addressed from your software by using **/dev/ttyUSB0**.

By connecting a USB-WLAN-Stick (look at the accessories of the pure.box) the box gets an extra wireless network-interface. The box then doesn't work as a router, which allows the access of the other network, but it allows to create an individual gateway. From each network there are only the services reachable, which are offered by the box, there is no direct access of the other network. The configuration of the wireless adapter can be reached over the menu.

Do you wish to connect other devices, which are not mentioned above, please contace the technical support.

1.7 SD-Slot

Using the SD-Slot the memory of the pure.box 2 SD (#50514) can be extended up to 32GB. Memory cards of the type SD HC must be used.

When extra memory is successfully mounted, the operating system creates the folder **sdmedia**, which is located in userfiles. This folder is used to link the memory to the file system.

All FAT-, NTFS or ext3-formatted storage can be used. The maximum available space on the storage is limited by the chosen file system. If the extra storage contains serveral partitions, only the first one is detected and can be accessed.

When connecting an extra storage it's file system is checked first. Errors are corrected automatically.

⚠️ *Repairing the file system allows the further use of the memory. Maybe some data get lost during repairing the file system.*

2 Navigation and Configuration Concept

If valid IP parameters are set in the pure.box, the complete configuration of the system is made using Web-Based Management (WBM). Any Web browser can be used for access.

2.1 Open configuration access

2.2 Logon, make and save changes

2.3 Navigation

2.1 Open configuration access

Address the pure.box by entering the IP address from any Web browser. this takes you to Web-Based Management.

If you have configured your own Web page as the start page which is shown when invoking the IP address, the configuration access is reached as follows:

```
<ip-address>/home
```

If the ports used for HTTP and HTTPS differ from the standard values (HTTP: 80, HTTPS: 443), the port number is required as a standard component of the address:

```
http://<ip-address>:<port>
```
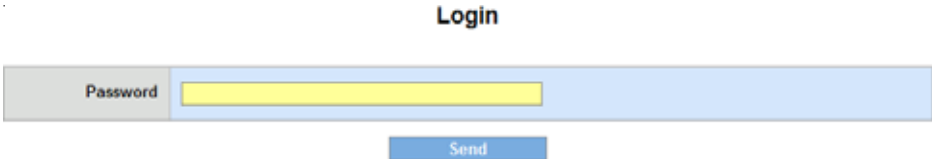
or

```
https://<ip-address>:<port>
```

After sending the request the start page for the pure.box will be shown in the browser.

2.2 Logon, changes, saving

Clicking on **Login** in the configuration tree takes you to the
Login dialog.

Login

Password	

Send

Login-Dialog

For access to the configuration, log in with the assigned
password. No password is assigned by factory default. After
that full access to the system is granted.

⚠️ *Changes on pages which are in the pure.box folder in
the configuration tree take effect only after logging out.
Changes on pages outside this folder take effect immediately.*

Use **Logout** to exit the system. The following options are
provided here:

- Save: Any changes made are saved in the non-volatile
  memory of the pure.box. The services affected by the
  configuration change are then restarted.
- Restart: The system is restarted and all active connections
  are closed. No configuration changes are saved.
- Factory defaults: Restores the factory default settings of the
  pure.box. All user-defined setting are lost.
- Logout: Logs out without changing the configuration.

2.3 Navigation

Navigation is accomplished mainly using the navigation tree on the left side of the page. It is always possible to jump back to higher level pages using the breadcrumb navigation in the upper screen area.

2.3.1 Configuration tree

The configuration tree at left allows you to reach all the changeable options for the pure.box. The individual configuration pages are sorted by topic and stored in a folder structure.

Clicking on the icon for a closed folder expands the corresponding directory. Clicking on the circled minus sign in front of an opened folder closes it again.

If you clock on a closed or opened folder, a table overview of all the options available in this folder appears in the right area of the browser window. The individual entries in the table are also associated with links, which enables jumping to the respective page by selecting the link.

2.3.2 Breadcrumb navigation

Breadcrumb navigation is shown in the upper section of each page. This shows the path of the root directory for the configuration tree, **Home**, up to the currently opened page. Clicking on one of the page titles takes yhou directly to the higher level page.

2.3.3 Navigation without JavaScript

It is recommended that you enable JavaScript for using the pure.box configuration pages. If for security reasons you still prefer not to use JavaScript, you can navigate through the

pure.box configuration using the breadcrumb navigation and
the table overviews on the folder pages.

3 Assigning and changing IP parameters

After hardware installation of the pure.box, the IP address needed for operation in a TCP/IP network as well as the subnet mask and gateway address must be entered. Please consult your responsible system administrator for the correct values of these parameters.

The IP address of the pure.box as shipped is 190.107.233.110.

3.1 WuTility

3.2 Managing network parameters

3.3 Automatic address assigning using DHCP

3.4 Static mode

3.1 WuTility

The Windows tool WuTility version 4.02 and higher supports inventorizing and management of the network basic parameters for the pure.box:

- IP address
- Subnet mask
- Gateway address
- 2 x DNS-server address
- Switching between DHCP and Static

To assign these the PC and pure.box must be in the same physical network, whereby the function is independent of the current address setting for the pure.box. This means even if the current IP parameters for the pure.box do not match the PC settings, you can always make a change using WuTility. Any system password set in the pure.box must be known.

The fastest way to install WuTility is using the Install button on the start page, using the product CD included with the pure.box.

Start WuTility then from

Start > Programs > W&T Software Toolkit > WuTility

The current version of WuTility can also be downloaded from our Web site:

`http://www.wut.de`

In addition to assigning parameters using WuTility, you can adjust the network configuration using the WBM in the pure.box as well.

3.2 Managing network parameters

The pure.box distinguishes between two modes with respect to its network-side basic parameters:

■ Static
■ DHCP

As shipped and after a factory default reset automatic address assignment per DHCP is enabled.

3.2.1 Static

The IP address, subnet mask and gateway are stored in the non-volatile setup of the pure.box and DHCP is enabled. The parameters set in this manner remain intact even after power interruptions and resets, until they are changed using the WuTility inventorizing tool or via WBM.

3.2.2 DHCP

If automatic address assignment using DHCP is enabled, the pure.box attempts to obtain its IP parameters from a DHCP server located in the network. If no DHCP server is in the network or if the attempt to obtain an IP address is rejected. the pure.box operates using the factory default IP address 190.107.233.110. When switching from Static to DHCP mode via WuTility or WBM, this default IP address is defaulted to until valid parameters are assigned.

3.3 Automatic assignment using DHCP

Many networks use DHCP (Dynamic Host Configuration Protocol) for centralized and dynamic assignment of the network parameters. As shipped and after a reset to the factory default settings DHCP mode is enabled, so that in network environments with dynamic IP parameter assignment all you need to do is connect the pure.box to the network. The following parameters can be assigned using DHCP:

- IP address
- Subnet mask
- Gateway address
- 2 x DNS-server address
- Lease time

After an unintended parameter assignment or a change via DHCP to an unknown address, the pure.box can be found and identified from its unique MAC address using the WuTility management and inventorizing tool. Changing the incorrect IP address as well as switching to Static mode while DHCP is deactivated can also be done via WuTility.

3.3.1 Enabling DHCP mode

DHCP protocol is enabled by switching from Static to DHCP mode using WuTility or the WBM on the pure.box. The previous static IP address is deleted when DHCP is enabled. The pure.box defaults to its IP address 190.107.233.110 until new parameters are assigned by a DHCP server.

To set a pure.box to DHCP mode from WuTility, highlight the unit in the device list and click on the **IP**-**Address** button. In the following dialog window select the radio button **DHCP** and then click on **Next**.

To configure this option using WBM, log in to the browser using the cnfiguration pages in the pure.box and navigate to

Home >> Configuration >> pure.box >> Network

Select the option **Enable DHCP** and then click on the **Apply** button. Use **Logout** and **Save** to save the new setting in the pure.box.

⚠️ *Switching from Static mode to DHCP causes the static set IP address to revert to the factory default setting 190.107.233.110. If the IP assignment using DHCP fails, for example because no DHCP server is available, the pure.box may no longer be accessible, especially in routed network environments. Re-enabling Static mode using WuTility is then only possible from a computer within the same physical network.*

3.3.2 Disabling DHCP mode

DHCP is disabled by switching from **DHCP** mode to **Static** mode using WuTility or WBM in the pure.box. In both cases the new values for IP address, subnet mask and gateway address must be manually set.

To disable DHCP using WuTility, select the corresponding device in the inventory list of the program and click on the **IP-Address** button. In the resulting dialog window select the radio button **Static**. After entering the new IP address, subnet mask and gateway address, click on **Next**.

In WBM and while logged in navigate to the configuration page for network setting, unselect **Enable DHCP** and enter valid values for IP address, subnet mask and gateway address. After clicking on **Apply** you can save the values by clicking on **Logout** and **Save**.

3.3.3 System name

To support any possible automated updating of the DNS system by the DHCP server, the pure.box identifies itself within the DHCP protocol with its system name. The system name of the pure.box can be changed using WBM.

3.3.4 Lease-Time

The lease time determined and transmitted by the DHCP server specifies the term of the assigned IP address. After half the lease time has expired the pure.box attempts to extend the term with the assigning DHCP server or to update the address. If this is not possible by the time the lease time has expired, for example because the DHCP server is no longer available, the pure.box deletes its IP address and reverts to the factory set default IP address 190.107.233.110. At the same time the cylical search for alternate DHCP servers is started in order to assign a new IP address.

After a reset of the pure.box both the assigned IP parameters as well as the lease time associated with the IP address are deleted. The pure.box starts up after a reboot with the default IP address and immediately begins DHCP requests.

In DHCP mode the remaining lease time together with the current IP address are displayed on the Web page

Home >> Properties.

If after expiration of the assigned lease time the DHCP server can no longer be reached, the pure.box deletes the current IP parameters, reverts to its factory default IP address and starts the cyclical search for alternate DHCP servers. All open connections are thereby closed. To prevent this problem we recommend configuring the lease time assigned in the DHCP server to infinite if possible.

3.3.5 Reserved IP addresses

The pure.box is designed as a TCP server and provides services which can be automatically made use of on the computer side. To open a connection these need of course the IP address of the pure.box, so that it makes sense to reserver a particular IP address for the pure.box on the DHCP server. This is generally done by linking the IP address to be assigned to the unique Ethernet address, which can be found on the housing sticker.

3.3.6 Dynamic IP addresses

Fully dynamic address assignment, whereby the pure.box gets a different IP address after every restart or after the lease time expires, is only practical in network environments with automated cross-linking between the DHCP and DNS services. This means that when a new IP address is assigned to the pure.box, the DHCP server then also automatically updates the DNS system. The new address is thereby associated with the respective domain name. For detailed information about your network environment, consult with your system administrator.

3.4 Static mode

In **Static** mode the pure.box uses **static network parameters**, and automatic address assignment via **DHCP is disabled**. To assign the static values for IP address, subnet mask and gateway address there are two options.

3.4.1 Assigning static parameters using WuTility

Be sure that both the pure.box and the computer you are using are connected to the same physical network. At startup **WuTility** automatically searches the local network for connected W&T network devices and generates an inventory list. This search process can be performed as often as desired by clicking on the **Scan** button:

From the inventory list you can identify the desired pure.box based on its MAC address. When first installing, the default address (190.107.233.110) is set.

Select the desired pure.box and click on the **IP Address** button:

In the resulting dialog window select the radio button Static and enter the desired values for IP address, subnet mask and gateway address.

IP parameter assignment using WuTility

 Every IP address must be unique within the network.

After clicking on the **Next** button you are prompted for the system password. Then the entered parameters are saved in the pure.box non-volatile memory.

All other settings are made using the Web Based Management of the pure.box and an Internet browser. Select the desired pure.box in the WuTility inventory list and click on the **Browser** button:

 Changing network parameters is protected by the system password. To prevent misuse, we recommend assigning a system password for active devices.

 If IP-Address, Subnetmask and Gateway doesn't match, these values will be replaced by the default-settings.

3.4.2 Assigning static IP parameters using WBM

As shipped and after a reset to the factory default settings, the pure.box is in DHCP mode. As long as no DHCP server assigns an address, the pure.box can also be reached at its default IP address 190.107.233.110. Switching to Static mode and assigning the new IP parameters can also be done from an Internet browser using WBM.

⚠ *Always clarify all changes to the network settings on your computer ahead of time with your network administrator.*

On the computer side the following conditions must be met:

■ The IP address of the computer used is in the subnet 190.107.0.0 or is temporarily changed to an appropriate value. To change the IP address of the computer you need Administrator rights. Always clarify such a change in advance with your network administrator.
■ On the computer used a fixed route is set which redirects the IP address 190.107.233.110 to the local network. To set up such a route you need Administrator rights on the system. The command line for creating a fixed route under Windows XP is:

```
route ADD 190.107.233.110 MASK 255.255.255.255 <IP-Address of the PC>
```

Then start your Internet browser and in the address line enter the target **http://190.107.233.110**. Log in to the pure.box using Administrator rights and on the configuration page

Home >> Configuration >> pure.box >> Network

change the network settings to the new values.

⚠ *If IP-Address, Subnetmask and Gateway doesn't match, these values will be replaced by the default-settings.*

4 Configuring System Parameters

In the following section the configuration of system parameters is described. Access to these configuration options is through the Web Based Management (WBM) on the unit after you have logged in.

4.1 Edit device information

4.2 Select standard language

4.3 Set internal clock

4.4 Change password

4.5 Configure services

4.6 Modify network parameters (LAN)

4.7 Modify network parameters (WLAN)

4.8 Change manufacturer data

4.1 Edit device information

From the menu tree of the pure.box navigate to

Home >> Config >> pure.box >> Info

and edit the following values:

- System name
- Description
- Device location
- Service contact

Home >> Config >> pure.box 2 >> Info

Info

System name	pure2-<wut1>	Systemname, relevant for DHCP and DNS
Description	Hutschienenwebserver inkl. Binarieausführung	Use-oriented function of the device
Device location		Location of installation
Service contact		Can be called in case of errors and problems

Configuration will take effect at logout

| Send | Reload | Logout |

Editing system name and information texts

The **system name** directly affects the DHCP and DNS behavior. It can be used for example if these systems are approriately configured to address the pure.box in the browser.

The items Description, Device location and Service contact are only explanatory and are intended to help clarify the pure.box

in the application, make the installation location transparent, and indicate whom to contact when service is needed.

Apply your changes before leaving the page by clicking on the **Send** button. The **Reload** button fills in any changed fields with their original values. **Logout** takes you to the Logout dialog.

⚠️ *The configuration changes copied to the buffer memory using the **Send** button only take effect when at the end of a configuration process you have stored them in the non-volatile setup of the pure.box by clicking on **Save** in the logout dialog. After any required restart of the pure.box all changes will be active.*

4.2 Select standard language

On the configuration page Language, which is reached from the menu tree at

Home >> Config >> pure.box >> Language

you can select the standard language for the pure.box. All Web pages are displayed in this language when opened by the pure.box.

Available language profiles:

■ German
■ English

Language

| Default-Language | ⊙ 🇩🇪 | Defines the default-language. |
| | ○ 🇺🇸 | |

Configuration will take effect at logout

| Send | Reload | Logout |

Configuring the standard language

Select the desired language by clicking on the corresponding flag and apply your change by clicking on the **Send** button to the buffer memory.

⚠️ *The configuration changes copied to the buffer memory using the **Send** button only take effect when at the end of a configuration process you have stored them in the non-volatile setup of the pure.box by clicking on **Save** in the logout dialog. After any required restart of the pure.box all changes will be active.*

In addition to the fixed language selection using the method described above, you can also change the language profile so that it takes effect immediately. This is done by clicking on the

flag symbols located below the menu tree. The grayed out flag shows here the currently active language profile. You can always switch to the language profile whose flag is not grayed out.

Quick selecting the system language

This method of selecting the language is however only valid for the current session. If the browser is closed or outside pages opened, this setting is lost. The next time the original page is opened the device reverts to the configured standard language.

4.3 Setting the device clock

Internal clock settings are made on the Configuration page

Home >> Config >> pure.box >> Device Clock

Device Clock

Time-Server Client	☑	Activates the time-synchronisation with a time-server
Time-Server 1	pool.ntp.org	A time-server's IP-address or hostname
Time-Server 2	europe.pool.ntp.org	IP-address or hostname of an alternative time-server
Time-Server	☑	Activates the time-server, which enables time-synchronisation for requesting clients
Set date/time	☐	Applies Date and Time (available when Time-Server Client is switched off)
Date	23 . 8 . 2010	Formatted date: MM.DD.YYYY
Time	08 : 22 : 29	Formatted time: hh:mm:ss
Timezone	Berlin	Current timezone

Configuration will take effect at logout

Send   Reload   Logout

Device clock settings

When you activate the option **Time-Server Client** the pure.box automatically retrieves the current date and time using Network Time Protocol (NTP). The time servers entered for **Time-Server 1** and **Time-Server 2** are contacted.

Time-Server 1 and **Time-Server 2** are contacted at the same time during a synchronization cycle. The name resolution of the host names entered there, should you be using a public time server, normally returns multiple IP addresses. The more

addresses are available to the process here, the faster the time will be calibrated.

The current status of the synchronization procedure can be seen on the Home page under the time and date information displayed there. The following status conditions are possible:

- Time synchronization disabled
- Deviceclock not synchronized!
- Synchronising...
- Deviceclock synchronized

Home

08:25:42

Mon, 23. August 2010
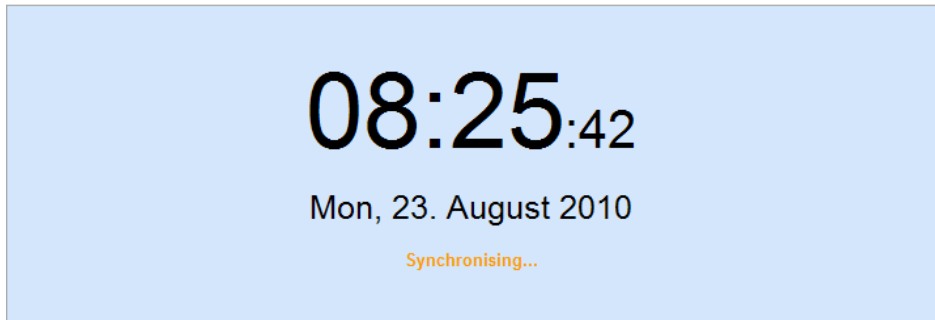
Synchronising...

Time and status information for the time server client on the homepage

After starting synchronization, second-accurate time information will be available after just a very short delay. The target accuracy of the time synchronization is in the microsecond range. To reach this accuracy, the process takes up to half an hour. The **Synchronising…** status displayed on **Home** is replaced by **Deviceclock synchronized** after full synchronization has been completed. If an error occurs during the procedure, the system is set to **System time not synchronized!**. There are then cyclical attempts to synchronize the time and date.

Once the next synchronization takes place automatially depending on the discrepancy with the internal clock.

In addition to its ability to obtain the system time from higher level systems, the pure.box itself can also function as a time server. This property is controlled by the option **Time-Server**. Network Time Protocol (NTP) and Simple Network TIme Protocol (SNTP) are replied.

The condition for turning on the **Time-Server** option is that the pure.box has automatic time synchronization with at least one higher level time server. Alternatively the option **Ignore sync state** can be set. Then each request is answered with a valid response.

When **Time-Server Client** is disabled, you can enable the option **Set date/time**. If this is active, transmitting the values with **Send** passes the time information set under **Date** and **Time** to the **Device Clock**. Regardless of whether using automatic or manual time setting, specify for **Timezone** the current location of the pure.box. This selection control the offset to UTC as well as automatic adjustment of the time when changing from daylight savings to standard time and vice-versa.

Apply your changes on this configuration page by sending them to the buffer memory of the device: Click **Send**.

⚠ *The configuration changes copied to the buffer memory only take effect when at the end of a configuration process you have stored them in the non-volatile setup of the pure.box by clicking on **Save** in the logout dialog. After any required restart of the pure.box all changes will be active*

The internal clock of the pure.box 2 is battery buffered. This means the set time information is not lost when disconnecting the unit from power. The battery used is a button cell with 3V and 125mAh. Due to the permissible ambient temperature of the pure.box 2, please use only types designed for an extended temperature range (-30 ... 80°C) when replacing the battery. The standard name for the battery is: BR1632. Please always properly dispose of used batteries.

The internal clock of the pure.box 3 is supplied by two capacitors, after disconnecting from its power supply. The capacitors get charged while operating the pure.box 3. They can run the clock up to one week.

4.4 Change password

Change the password for the administrator on

Home >> Config >> pure.box >> Password

Check the option **Change password** and enter the new one.
You have to repeat the password.

Change password

Change password	☐	Check here for modifying the password
Password		
Re-enter		

Configuration will take effect at logout

Send	Reload	Logout

Changing the administrator account

⚠️ *The configuration changes copied to the buffer memory only take effect when at the end of a configuration process you have stored them in the non-volatile setup of the pure.box by clicking on* **Save** *in the logout dialog. After any required restart of the pure.box all changes will be active.*

4.5 Configure services

Services, provided by the pure.box, can be configured at

Home >> Config >> pure.box >> Network

Using **activate Web-Access** you can disable the WBM. At disabled WBM the reset of the box to the default settings is the only way to reactivate the WBM. Furthermore you can activate **HTTPS** to make the configuration-process more secure. Also the ports can be changed here and your own **HTTP-certificate** can be uploaded here.

As shipped the FTP-server in the box is disabled. By selecting the option **FTP-Server** you can access the user area with any FTP client through the configured TCP port. Log in using the user name **admin** and the currently assigned password.

To activate the TFTP-server, select **TFTP-Server**.

The device also offers access to the internally stored user files using SMB protocol. If you want this memory to be accessible in an MS Windows environment for example, select **Enable SMB-Server**. The system will then be displayed in the network environment, below the specified **Workgroup**, with the **System name**. To access this resource username (admin) and the currently configured password are required. The standard enabled login procedure can be disabled by deselecting **Login required**. In this case neither the user name nor a password are prompted when accessing the subfolder **userfiles**. Direct access to the file system is possible using:

```
\\<IP-Address>[\userfiles]
```

For viewing error logs there can be a SSH-Server activated, using the option **SSH-Access**. Username admin and the assigned password is for login required.

If the option **Reset-Port** is enabled, the box carries out a warm start after opening **Reset-Port**. If an Administrator password has

been assigned, this must be sent to the system directly after opening the port.

The accessible management of the box can be controlled by **Allow Firmware-Update** and **activate WuTility-Management**.

⚠️ *The configuration changes copied to the buffer memory only take effect when at the end of a configuration process you have stored them in the non-volatile setup by clicking on* **Save** *in the logout dialog. After any required restart all changes will be active.*

4.6 Modify network parameters (LAN)

Change the network configuration for the pure.box under

Home >> Config >> pure.box >> LAN

To use automatic address assignment using DHCP, select the option **Enable DHCP**. Otherwise you can manually configure the parameters **IP address, subnet mask** and **gatewa**y in the text field provided. The two possible DNS servers are always editable, but are overwritten by addresses, delivered via DHCP.

Configuring the pure.box network parameters

⚠️ *The configuration changes copied to the buffer memory only take effect when at the end of a configuration process you have stored them in the non-volatile setup of the pure.box by clicking on **Save** in the logout dialog. After any required restart of the pure.box all changes will be active.*

4.7 Change manufacturer data

At

Home >> Config >> pure.box >> Manufacturer

you can change the data for manufacturer and product name or select an alternate logo. These options are especially interesting for systems integrators using the pure.box as part of a larger system..

Home >> Config >> pure.box 2 >> Manufacturer

Manufacturer

Name	Wiesemann & Theis GmbH	Manufacturer information, which are displayed on the "Properties"-page.
Address	Porschestr. 12 42279 Wuppertal Germany	
Phone-No.	+49 (0)202 / 2680-0	
Website	http://www.wut.de	
Product-name	pure.box 2	
Logo	○ No logo ◉ Wiesemann & Theis logo **W&T** www.WuT.de pure.box 2 ○ Upoad logo-file (max.100KB) [ ] Durchsuchen...	Logo displayed above the navigation.

Configuration will take effect at logout

Send	Reload	Logout

Modifying manufacturer data and logo

Under **Name**, **Address**, **Phone-No.**, **Website** and **Product-name** enter the information you want to be shown on the **Properties** page for viewing by all users.

If the protocol type is specified under **Website** (e.g. http:// or https://), addressing is absolute. In this case you can specify the Website which are on different Web servers. Omitting the protocol specification means addressing is relative to the root directory of the pure.box. Relative addressing is recommended for specifying sites which are on the pure.box itself.

Under the **Logo** optoin you can select the company or product logo that you want to appear in the header of the configuration tree. Here you can select from:

- No logo: No graphical company or product logo is shown in the configuration tree.
- Wiesemann & Theis logo: The company logo of the manufacturer of the pure.box is displayed (factory default setting)
- User-defined logo: Any graphics file with a maximum size of 100kB can be loaded into the pure.box and displayed above the configuration tree.

⚠️ *The configuration changes copied to the buffer memory only take effect when at the end of a configuration process you have stored them in the non-volatile setup of the pure.box by clicking on **Save** in the logout dialog. After any required restart of the pure.box all changes will be active.*

5 My Documents

Setting up a user-defined start page and handling the user files in the directory „userfiles", „programs" and „websites".

5.1 Accessible folders

5.2 Define individual start page

5.3 Time- and event-triggered file running

5.4 Open uploaded Web sites

5.1 Accessible folders

The **userfiles** folder on the pure.box can be accessed via FTP, TFTP or network sharing. This folder or any subfolder can be used to store any files.

By default there are two subfolders contained in **userfiles**:

■ websites
■ programs

The websites folder is linked to the Web server.

```
<protocol>://<ip-address>/websites/
```

The second subfolder, **programs**, is intended as a save location for PHP scripts, shell scripts and self compiled binaries, which can be run at startup, time- or event-triggered. Irrespective of this folder however all scripts and programs contained in **userfiles** can also be run according to the above criteria.

The complete approx. 750MB capacity is available for user files.

5.2 Define indivudal start page

The **Homepage** option at

Home >> Config >> My Documents

specifies what the browser will display when invoking the IP address.

5.2.1 Homepage

The deviceclock is shown in the right part of the browser window.

5.2.2 Website

All the sites viewable in the browser which are stored in the **websites** folder can be defined as an individual start page. An individual start page is shown in the browser if the pure.box is addressed only via the IP address.

To open a user start page when addressing the pure.box, first select the option **Website** under **Homepage**:

Save your changes by clicking on **Save**.

Then specifiy the start page by navigating on **My Documents** in the **websites** folder using the file browser, and click on the **Edit file properties** for the desired file.

Check the **Homepage** option in the following properties dialog:

Save the change directly to the non-volatile setup of the pure.box by clicking on **Save**.

If a start page is configured on the pure.box which differs from a standard page, the corresponding file is marked in the file browser on the **User files** page with the following icon:

If the folder with the specified start page is not opened in the file browser, the Start page icon is displayed in front of the closed folder symbol. Using this navigation aid you can always quickly find the set start page.

If you have defined your own start page but the option **Homepage** is set to **Homepage**, the start page icon is grayed out.

Since only one file can be defined as a start page, the option **Homepage** is automatically disabled for a previously selected file if you select a new start page.

5.3 Time- and event-triggered file running

C/C++-programs and PHP-scripts in the **userfiles** folder and its subfolders can be run:

- ... at system startup
- ... time-triggered
- ... event-triggered

This functionality allows you to implement smaller applications on the pure.box.

Thanks to the broad functionality of C/C++ and PHP, including file access, database access, network communication etc., simple solutions can be created very quickly.

Configure automatic running on the **Edit file properties page**, which you reach by clicking on the Edit icon for the respective file in the file browser under **userfiles.** Save your changes to the non-volatile setup of the device by clicking on **Save**.

Each program / script can be configured for several automatic executions. Each execution can have different parameters and initial events.

⚠️ *Please note that the maximum run time of a PHP script is 2 minutes. If the system requires longer to run it, the script is stopped after two minutes.*

5.3.1 Running at system startup

If you want a file to run once whenever the pure.box is started up, check the option **At system startup**. The process is ended after the file has fully run.

5.3.2 Time-triggered running

If you want to specify that a script- or a program-file run at certain times or certain intervals, check first the option Time controlled. The time is defined in the following fields:

- Seconds
- Minutes
- Hours
- Days of the month
- Months
- Days of the week

The values set here are directly entered in the CRON table. Valid characters are:

- *: Stands for all valid values in the respective field (e.g. all minutes or all hours).
- -: Indicates the range from ... to. Days of the week 2-4 for example stands for Tuesday to Thursday, whereas entering „*" triggers the script on every day of the week..
- /: Interval within the entered range, e.g. minute „0-45/2" triggers the script in the range between the 0th and 45th minute every two minutes (0, 2, 4, 6, ... 44).
- ,: Specifies the absolute value. For example minute „0,15,30" triggers the script every hour on the hour, every quarter hour and every half hour.

5.3.3 Event-triggered

A script or a binary is run when the pure.box receives data on the set TCP or UDP port. This is a way to implement simple server applications.

Check the option **Event-controlled**. Select the desired **protocol**, TCP or UDP, and the **port**. Save your changes to the non-volatile setup of the pure.box by clicking on **Save**.

⚠️ *Since port numbers smaller than 1024 are reserved for the system, you may only specify port numbers higher than 1023 for your application.*

If a script or program is invoked when data are received, it can read the data through the standard input. Writing to the standard output sends data over the network back to the source.

5.3.4 Transmitting parameters

Under the heading **Parameters** you can specify static parameters you wish to append when running a PHP script according to the syntax of a Get request, otherwise according to the syntax of a command line call.

The parameters are read out e.g. using PHP as follows:

```
$my_var = $_GET["x"];
```

After reading, the value is available for further processing.

5.3.5 Marking in the file browser

If one or more automatic runs are set up, you can see these directly in the file browser on the **My Documents** page. The files are then marked in the **Execution** column with one or more of the following icons:

- ■ ⬆: File is run at system startup
- ■ 🕐: File is run according to specified time profile
- ■ ⚡: Data receipt triggers run

5.4 Opening uploded Web sites

Websites stored on the pure.box in the **websites** folder can be opened and displayed directly from any browser. In addition to simple HTML pages PHP pages can also be opened. Interpretation of the PHP code takes place as is customary prior to sending to the browser.

The URL for addressing Web sites in the **websites** folder is constructed as follows:

```
<ip-address>/websites/<name of the site>
```

If the Web server on the pure.box is set to HTTPS, the prefix **https**:// is is also required. If the port for the protocol used (HTTP or HTTPS) is different from the standard value, it must be indicated after the IP address separated by a colon.

6 MySQL-database

Description of the MySQL-database, which keeps custom data.

6.1 Access the database

6.2 Permissions

6.1 Access the database

The pure.box administrator may access the database **userdb** as well from custom applications as from the network. For example it can be accessed from PHP, any C/C++-program or via network using a MySQL-client.

The database can be connected using the configured TCP-port (default: 3306). MySQL allows several users being connected at the same time. MySQL coordinates multiple read/write-requests by itself.

To log into the database use always the username **admin** and the current password. If you log into the database from a program or script running on the box, **127.0.0.1** or **localhost** can also be used to address the database.

6.2 Permissions

The user **admin** is allowed to execute the following SQL-
commands on the database **userdb**:

- CREATE
- DROP
- ALTER
- SELECT
- INSERT
- UPDATE
- DELETE

7 Appendix

7.1 Device reset

7.2 Restoring factory default settings

7.3 Firmware update

7.1 Device reset

In the following the methods for restarting the device are described. At a restart all active connections are closed. The current settings, as long as they have been actually saved, are not lost.

7.1.1 Reset using WBM

Logging in using WBM and Administrator rights offers you the option **Restart** in the navigation area under **Logout**. Click on this button and the system will perform a restart after brief confirmation dialog. This closes all active connections.

The following bootup procedure is indicated by blue pulsing of the Status LED.

7.1.2 Restart using the button

Use the button on the front panel to perform a restart by holding the button down for approx. 5 seconds. While the button is being pressed the color of the Status LED changes from green to yellow to red.

After approx. 5 seconds the blue pulsing of the Status LED indicates that the boot process is running.

7.1.3 Reset port

Alternately to resetting the device by clicking on the button in the logoff dialog or pressing the front panel button, the unit can also be restarted by addressing the Reset-Port (default: 8888). If no password is assigned, simply opening the port will trigger a warm start. If a password is set, this must be send to the unit as soon as the connection is opened.

The reset begins immediately, all active connections are closed or rejected. The device then begins to boot up, indicated by blue pulsing of the multi-color LED.

⚠ *An explicit enabling of this option in the network settings is required in order to force the unit in this way into a warm start. This option is enabled in the factory default settings.*

7.2 Restoring factory default settings

In some situations a reset of the pure.box to the factory default settings may be necessary. If the system is still capable of running and accessible through WBM, the factory default reset can be performed from the browser. If the pure.box is no longer accessible through software, the reset must be performed by closing jumpers inside the unit.

When resetting to the factory default condition the basic settings of the pure.box are restored. All user-configurations are deleted.

In addition, all files loaded by the user into the box are deleted.

7.2.1 Web Based Management

Log in to the pure.box using WBM and navigate to the logout dialog

Home >> Logout

Clicking on the **Factory defaults** button restores the device to its original factory default settings.

When this process is started the LED on the front panel begins to pulse blue. After the base configuration has been restored the system restarts. As soon as the LED turns green to indicate OK status, you can work with the pure.box again. The entire procedure may take up to a minute.

7.2.2 Inserting the jumper

To reset the system to its factory default settings when software access is not possible, you must first open the pure.box housing. To do this, first remove the housing panel which is latched into ther housing body on both long ends with two lugs each. Then you can remove the circuit board from the body.

⚠️ *You must first disconnect the device from any external power supply, since damage to the circuit board could otherwise occur.*

pure.box 2 SD (#50514): Behind the SD-card you will find four contact pins. Jumper both the pins closest to the middle of the boared using one of the jumpers provided and restore power.

pure.box 2 (not #50514): On the short side of the board where the network connector is also located you will find four contact pins. Jumper both the pins closest to the middle of the boared using one of the jumpers provided and restore power.

pure.box 3: On the short side of the board where the network connector is not located you will find four contact pins. Jumper both the pins closest to the edge of the boared using one of the jumpers provided and restore power.

As soon as you turn the unit on the system begins to restore its factory default settings. During this process the LED will pulse blue. As soon as the factory defaults are reconstructed, the LED will illuminate with a constant, weak blue. Now remove the jumper and place the circuit board back in the housing.

7.3 Firmware update

The operating software is being continuously improved. The following section describes the procedure for uploading the firmware.

7.3.1 Where is the latest firmware available?

The latest firmware including the update tools and a revision history are published on our Web site at

`http://www.wut.de`

From there the best way to navigate is to use the search function located on the left side. First enter the model number of your pure.box. From the associated selection box choose **Firmware** and then click on the **Go** button.

7.3.2 Firmware update under Windows

No special preparation of the pure.box is necessary for the firmware update.

The new firmware is transmitted to the pure.box using WuTility. In the inventory list select the desired pure.box and click on the **Firmware** button:

In the following dialog select only the firmware file you want to obtain (*.uhd) and then click on the **Next** button. After the file has been sent the pure.box automatically performs a restart and is then ready to use.

7.3.3 Update concept

To prevent a defect in the system caused by a failed firmware update, the loaded firmware is not installed on the current image but rather on an alternate image. Each time the unit is booted up the more current image is booted, which allows the last update to be used.

If an error occurs during the update process and the firmware cannot be completely installed, the device will still be operational due to the presence of the original and unmodified image.

7.3.4 Boot alternate image

If a firmware update cannot be successfully ended, for example due to an interrupted network connection, it can happen that the box will then no longer boot. In this case you can boot from the original image, which was active when the firmware load failed, by jumpering the two contact pins, which don't cause the factory-default-reset the next time the system is started. A new update of the firmware overwrites the inactive image containing the defective installation.

The jumper must be removed after you have successfully updated.

7.4 Declaration of conformity #50517

W&T
www.WuT.de

Declaration of conformity according to directives
2004/108/EG (EMC), 2006/95/EG (LVD),
1999/5/EG (R&TTE) and 2011/65/EU (RoHS)

We, Wiesemann & Theis GmbH, Porschestr. 12, 42279 Wuppertal, hereby declare that the product

Pure.box 3 seriall / USB / WLAN   **Model 50517**

to which this declaration relates is in conformity with the essential provisions of the EC Council
Directives

1.	2004/108/EG	Electromagnetic Compatibility Directive (EMC)
2.	2006/95/EG	Low Voltage Directive (LVD)
3.	1999/5/EG	Radio Equipment and Telecommunications Terminal Equipment Directive (R&TTE)
4.	2011/65/EU	Restriction of the use of certain hazardous substances

in compliance with the following standards:

1.) Emission according to EN301489-17/-1:

1.1.	EN 55022/2010	Conducted emissions
1.2.	EN 55022/2010	Electromagnetic field emission < 1GHz
1.3.	EN 301489-1	Electromagnetic field emission > 1GHz
1.4.	EN 61000-3-2/2006+A1,A2	Harmonic current emissions
1.5.	EN 61000-3-3/2008	Flicker

Immunity according to EN301489-17/-1 / EN61000-6-2:

1.6.	EN 61000-4-2/2009	ESD
1.7.	EN 61000-4-3/2006+A1, A2	Electromagnetic field immunity
1.8.	EN 61000-4-4/2004+A1	Burst
1.9.	EN 61000-4-5/2006	Surge
1.10.	EN 61000-4-6/2009	Conducted Immunity
1.11.	EN 61000-4-11/2004	Voltage dips

2.)	2.1.	EN 60950-1 (2011-01)	Safety, ITE

3.)	3.1.	EN 300328 V1.7.1	Electromagnetic compatibility and Radio spectrum Matters
	3.2.	EN 62479	human exposure to electromagnetic fields

4. Restriction of the use of certain hazardous substances in electrical and electronic equipment

The object of the declaration described above is in conformity with Directive 2011/65/EU
of the European Parliament and of the Council of 8 June 2011 on the restriction of the use
of certain hazardous substances in electrical and electronic equipment.

Wuppertal, 06/29/2013

Klaus Meyer, EMC / RoHS Representative

Dipl.-Ing. Rüdiger Theis, Managing Director

Wiesemann & Theis GmbH	Tel.: 0202/2680-0	Handelsregister:	Bankverbindung:
Porschestr. 12	Fax: 0202/2680-265	Amtsgericht Wuppertal HRB6377	Postbank Essen
42279 Wuppertal	info@WuT.de	USt-ID Nr.: DE121008340	Konto: 289397436
CF Dipl.-Ing. Rüdiger Theis	www.WuT.de	Steuer Nr.: 131/5937/014	BLZ: 36010043

⚠️ *At the moment there is no FCC-approval available for the pure.box with internal WLAN-interface, so that the operation of the device is only allowed within the EU.*