

TAINY HMOD
TAINY EMOD

Product version
L3 / V3 / IO / DS / E5

Software Release Note



Dr. Neuhaus

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Content

1	INTRODUCTION	7
2	VERSION 2.615	8
2.1	Compatibility	8
2.2	Enhancements	8
2.2.1	<i>Network registration</i>	8
3	VERSION 2.614	9
3.1	Compatibility	9
3.2	Enhancements	9
3.2.1	<i>Firmware update reworked</i>	9
3.2.2	<i>Factory reset</i>	9
4	VERSION 2.612 / 2.613	10
4.1	Compatibility	10
4.2	Enhancements	10
4.2.1	<i>SNMP Adjustments</i>	10
5	VERSION 2.611	11
5.1	Compatibility	11
5.2	Enhancements	11
5.2.1	<i>SNMP Adjustments</i>	11
5.2.2	<i>New MIB</i>	11
6	VERSION 2.610	12
6.1	Compatibility	12
6.2	Enhancements	12
6.2.1	<i>Improved SIM-PIN behavior</i>	12
7	VERSION 2.609	13
7.1	Compatibility	13
7.2	Enhancements	13
7.2.1	<i>Error handling for not getting an IP-address from the mobile radio provider</i>	13
8	VERSION 2.608	14
8.1	Compatibility	14
8.1.1	<i>Kernel and Driver Versions</i>	14
8.2	Enhancements	14
8.2.1	<i>SNMP enhancement</i>	14
8.2.2	<i>SNMP / Macmon improvement</i>	14
8.2.3	<i>Open-VPN certificates</i>	14
8.2.4	<i>Stability</i>	14
9	VERSION 2.607	15
9.1	Compatibility	15
9.1.1	<i>Kernel and Driver Versions</i>	15
9.2	Enhancements	15
9.2.1	<i>Backup of the currently used configuration profile</i>	15
9.2.2	<i>MTU (Maximum Transmission Unit)</i>	15
9.2.3	<i>Stability</i>	15
10	VERSION 2.606	16
10.1	Compatibility	16
10.1.1	<i>Kernel and Driver Versions</i>	16
10.2	Enhancements	16
10.2.1	<i>Fall back to factory default</i>	16
10.2.2	<i>DHCP Relay Deamon</i>	16
10.2.3	<i>No SIM card</i>	16
10.2.4	<i>No WAN IP</i>	16

Introduction

10.2.5	Portrange	17
10.2.6	Note text	17
10.2.7	Firewall adjustment	17
11	VERSION 2.605	18
11.1	Compatibility	18
11.1.1	Kernel and Driver Versions	18
11.2	Enhancements.....	18
11.2.1	Firmware Update	18
12	VERSION 2.604	19
12.1	Compatibility	19
12.1.1	Kernel and Driver Versions	19
12.2	Enhancements.....	19
12.2.1	Connection Monitoring and Handling	19
12.2.2	Initial Profile after Reboot	19
12.2.3	Device Identification	19
12.2.4	System Time.....	19
12.2.5	NTP Synchronization.....	20
12.2.6	Clock Changes	20
13	VERSION 2.603	21
13.1	Compatibility	21
13.1.1	Kernel and Driver Versions	21
13.2	Enhancements.....	21
13.2.1	Access Technology	21
13.2.2	System Time.....	21
14	VERSION 2.601	22
14.1	Compatibility	22
14.1.1	Kernel and Driver Versions	22
14.2	Enhancements.....	22
14.2.1	Character Set for WAN Access Data.....	22
15	VERSION 2.600	23
15.1	Compatibility	23
15.2	New Features	23
15.2.1	System Update Function, new combined Kernel and Driver Update Package	23
15.2.2	TACACS+.....	23
15.2.3	SNMP	24
15.2.4	Parameterization of the switch ports.....	24
15.2.5	VLAN.....	24
15.2.6	WAN port data traffic prioritization.....	24
15.2.7	MAC address filter	24
15.2.8	DHCP Relay.....	25
15.3	Enhancements.....	25
15.3.1	Handling of invalid entries.....	25
15.3.2	SNMP: Transmission of the firmware version number	25
15.3.3	Displaying the UARFCN Value.....	25
15.3.4	RSCP Status Bar	25
15.3.5	Stability	25
15.3.6	File names of Configuration Profiles	25
15.3.7	LEDs.....	26
15.4	Known Bugs	26
15.4.1	Blank characters in file names of configuration profiles	26
16	VERSION 2.500	27
16.1	Compatibility	27
16.2	New Features	27
16.2.1	New Kernel Update Package	27

16.2.2	TACACS+.....	27
16.2.3	Logging out	28
16.2.4	TAINY Connect DeviceManager.....	28
16.3	Enhancements.....	28
16.3.1	Compatibility with old configuration profiles	28
16.3.2	PIN-Handling.....	28
16.3.3	Miscellaneous.....	28
16.4	Known Bugs	28
16.4.1	Displaying the UARFCN Value.....	28
17	VERSION 2.400	29
17.1	Compatibility	29
17.2	Important Notes.....	29
17.2.1	Kernel and Driver Packages	29
17.3	New Features	29
17.3.1	Connection Check	29
17.3.2	Roaming	29
17.3.3	OpenVPN	30
17.3.4	Activation of a configuration profile	30
17.3.5	Antenna Diversity.....	30
17.3.6	Logging	30
17.3.7	Execute Command.....	30
17.4	Enhancements.....	30
17.4.1	Web interface	30
17.4.2	SNMP	30
17.4.3	Network Status	31
17.4.4	Configuration Profiles.....	31
17.4.5	Logging	31
17.4.6	Miscellaneous.....	31
17.5	Known Bugs	32
17.5.1	Compatibility with old configuration profiles	32
18	VERSION 2.300	33
18.1	Compatibility	33
18.2	New Features	33
18.2.1	New Kernel and Driver Packages	33
18.2.2	Connection Check - Mode: Statistics	33
18.2.3	OpenVPN	34
18.2.4	Miscellaneous.....	34
18.3	Enhancements.....	35
18.3.1	Automatic Change of Profiles	35
18.3.2	DynDNS	35
18.3.3	Secure DynDNS.....	35
18.3.4	Volume Monitoring	35
18.3.5	Logging	35
18.3.6	Miscellaneous.....	35
18.4	Known Bugs	36
18.4.1	Automatic Change of Profiles	36
19	VERSION 2.116	37
19.1	Compatibility	37
19.2	Enhancements.....	37
19.2.1	Checking the Connection	37
19.3	Information.....	37
19.3.1	Kernel Update	37
20	VERSION 2.114	38
20.1	Compatibility	38
20.2	Enhancements.....	38
20.2.1	Kernel Update	38

21	VERSION 2.113	39
21.1	Compatibility	39
21.2	New Features	39
21.2.1	Kernel	39
21.2.2	5 Port Switch and Dual SIM	39
21.2.3	Profile Handling	39
21.2.4	Installation Mode	40
21.2.5	Web Interface	40
21.2.6	SNMP	40
21.2.7	Miscellaneous	40
21.3	Enhancements and Bug fixes	40
21.3.1	Configuration Profiles	40
21.3.2	Web Interface	41
21.3.3	SNMP	41
21.3.4	Logging	41
21.3.5	VPN	41
21.3.6	Miscellaneous	41
22	UPDATE OF FIRMWARE, KERNEL AND DRIVERS	42
22.1	Firmware does not support the Kernel Update Function	42
22.2	Firmware does support the Kernel Update Function	42
22.3	Firmware does not support the System Update Function (versions older than 2.600)	43

1 Introduction

This release note contains the major differences between the firmware version 2.609 and all former versions down to version 2.009 of the TAINY EMOD-V3-IO, TAINY EMOD-L3-IO, TAINY HMOD-V3-IO, TAINY HMOD-L3-IO and the product versions E5 (5 port Ethernet switch) and DS (Dual SIM). It lists new and improved functions.

This release note does not apply to former generation TAINY devices (e.g. TAINY EMOD-/HMOD-L1/V2-IO) or older.

In the interest of readability, the following collective terms are used

- TAINY xMOD-x3 (for all product variants mentioned above)
- TAINY xMOD-V3 (for the TAINY EMOD-V3-IO and TAINY HMOD-V3-IO including product version E5 and DS)
- TAINY HMOD-x3 (for the TAINY HMOD-L3-IO and TAINY HMOD-V3-IO including product version E5 and DS)

Unless otherwise noted this information applies to all variants of TAINY xMOD-x3.

First official release note version for TAINY xMOD-x3 is **Version 2.113**.

Configuration profiles created with a new version are incompatible to older releases.

The software update has to be executed incrementally. It is essential to use for every major release a specific update file. It can be necessary to perform the update in two or three steps.

2 Version 2.615

This chapter describes the major differences between version 2.615 and version 2.614. It lists new and improved functions.



The Version 2.615 is compatible to all devices of the TAINY xMOD-x3 series but the function enhancements are applicable to the following devices only:

TAINY-EMOD-L3-IO; TAINY-EMOD-L3-IO-DS;
TAINY-EMOD-V3-IO; TAINY-EMOD-V3-IO-DS;
TAINY-HMOD-L3-IO; TAINY-HMOD-L3-IO-DS;
TAINY-HMOD-V3-IO; TAINY-HMOD-V3-IO-DS;

2.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

2.2 Enhancements

2.2.1 Network registration

Improvement: In case of unsuccessful registrations in the network, the router will reboot after 1 hour. The register attempts are counted and written in the logfile.

3 Version 2.614

This chapter describes the major differences between version 2.614 and version 2.613. It lists new and improved functions.



The Version 2.614 is compatible to all devices of the TAINY xMOD-x3 series but the function enhancements are applicable to the following devices only:

TAINY-EMOD-L3-IO; TAINY-EMOD-L3-IO-DS;
TAINY-EMOD-V3-IO; TAINY-EMOD-V3-IO-DS;
TAINY-HMOD-L3-IO; TAINY-HMOD-L3-IO-DS;
TAINY-HMOD-V3-IO; TAINY-HMOD-V3-IO-DS;

3.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

3.2 Enhancements

3.2.1 Firmware update reworked

Improvement: firmware update no longer overwrite the default config

3.2.2 Factory reset

Improvement: the profiles as well as the Default-Configuration-SIM-1.tgz and Default-Configuration-SIM-2.tgz are no longer deleted during the factory reset.

4 Version 2.612 / 2.613

This chapter describes the major differences between version 2.613 and version 2.611. It lists new and improved functions.



The Version 2.613 is compatible to all devices of the TAINY xMOD-x3 series but the function enhancements are applicable to the following devices only:

TAINY-EMOD-L3-IO; TAINY-EMOD-L3-IO-DS;
TAINY-EMOD-V3-IO; TAINY-EMOD-V3-IO-DS;
TAINY-HMOD-L3-IO; TAINY-HMOD-L3-IO-DS;
TAINY-HMOD-V3-IO; TAINY-HMOD-V3-IO-DS;

4.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

4.2 Enhancements

4.2.1 SNMP Adjustments

Improvement:

2.612: name of the linux kernel is shortened to the buildnumber in the SNMP request

2.613: bugfix: wrong OID removed

5 Version 2.611

This chapter describes the major differences between version 2.611 and version 2.610. It lists new and improved functions.



The Version 2.611 is compatible to all devices of the TAINY xMOD-x3 series but the function enhancements are applicable to the following devices only:

TAINY-EMOD-L3-IO; TAINY-EMOD-L3-IO-DS;
TAINY-EMOD-V3-IO; TAINY-EMOD-V3-IO-DS;
TAINY-HMOD-L3-IO; TAINY-HMOD-L3-IO-DS;
TAINY-HMOD-V3-IO; TAINY-HMOD-V3-IO-DS;

5.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

5.2 Enhancements

5.2.1 SNMP Adjustments

Improvement: The SNMP Agent is further enhanced. Variables without function are removed. Added some variables.

5.2.2 New MIB

The DNT-GSM-MIB was newly generated and added

6 Version 2.610

This chapter describes the major differences between version 2.610 and version 2.609. It lists new and improved functions.



The Version 2.610 is compatible to all devices of the TAINY xMOD-x3 series but the function enhancements are applicable to the following devices only:

TAINY-EMOD-L3-IO; TAINY-EMOD-L3-IO-DS;
TAINY-EMOD-V3-IO; TAINY-EMOD-V3-IO-DS;
TAINY-HMOD-L3-IO; TAINY-HMOD-L3-IO-DS;
TAINY-HMOD-V3-IO; TAINY-HMOD-V3-IO-DS;

6.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

6.2 Enhancements

6.2.1 Improved SIM-PIN behavior

Improvement: Every attempt to unlock the SIM-card with the PIN is counted to prevent to have to enter the PUK when a wrong PIN is provided.

7 Version 2.609

This chapter describes the major differences between version 2.609 and version 2.608. It lists new and improved functions.



The Version 2.609 is compatible to all devices of the TAINY xMOD-x3 series but the function enhancements are applicable to the following devices only:

TAINY-EMOD-L3-IO; TAINY-EMOD-L3-IO-DS;
TAINY-EMOD-V3-IO; TAINY-EMOD-V3-IO-DS;
TAINY-HMOD-L3-IO; TAINY-HMOD-L3-IO-DS;
TAINY-HMOD-V3-IO; TAINY-HMOD-V3-IO-DS;

7.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

7.2 Enhancements

7.2.1 Error handling for not getting an IP-address from the mobile radio provider

Improvement: If no IP address is assigned during the dial-up on the mobile radio network in two hours, the device is rebooting.

8 Version 2.608

This chapter describes the major differences between version 2.608 and version 2.607. It lists new and improved functions.



The Version 2.608 is compatible to all devices of the TAINY xMOD-x3 series but the function enhancements are applicable to the following devices only:

TAINY-EMOD-L3-IO; TAINY-EMOD-L3-IO-DS;
TAINY-EMOD-V3-IO; TAINY-EMOD-V3-IO-DS;
TAINY-HMOD-L3-IO; TAINY-HMOD-L3-IO-DS;
TAINY-HMOD-V3-IO; TAINY-HMOD-V3-IO-DS;

8.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

8.1.1 Kernel and Driver Versions

Please note:

The update file **tainy_system_package_update_all_1.2.tgz** with the version 2.608 contains a Kernel-Update to version **Linux 2.6.35.3-dnt-0.56. #19 Mon Jan 11 17:56:29 CEST 2016 armv5tejl**.

A previous Kernel-Update is not necessary.

8.2 Enhancements

8.2.1 SNMP enhancement

Improvement: Added SNMP Bridge und Q-Bridge support as well as IF-MIB support.

LAN interfaces ETH0 and ETH1 can be switched on and off by SNMP Get/Set requests.

8.2.2 SNMP / Macmon improvement

Improvement: Some return values for SNMP queries have been improved.

8.2.3 Open-VPN certificates

Improvement: Possible issues arising at storing Open-VPN certificates in the profile have been fixed.

8.2.4 Stability

Improvement: Internal processes have been optimized for further stability of the device.

9 Version 2.607

This chapter describes the major differences between version 2.607 and version 2.606. It lists new and improved functions.

9.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

9.1.1 Kernel and Driver Versions

- Please note: The kernel included in the system update file **tainy_system_package_update_all_1.1.tgz** enhances the stability of the system and hence should be installed in any case.



Caution!

Use firmware version 2.607 only with the system update package:

- **tainy_system_package_update_all_1.1.tgz**

If you are unsure whether the system update package is installed already, preventively install it again.

To determine the installed kernel version open *Maintenance* -> *Firmware info* of the TAINY xMOD-x3's web interface.

After a successful system update it should read:

- **Linux 2.6.35.3-dnt-0.56.1338 #1 Fri May 2 11:01:51 CEST 2014 armv5tejl**

Using the firmware version 2.607 with any older kernel or driver version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

9.2 Enhancements

9.2.1 Backup of the currently used configuration profile

Bug fix: Redesign of the backup mechanism for the currently used device configuration. In case the device detects a defective configuration at start-up it switches to a copy of the configuration used previously instead of loading the default settings.

9.2.2 MTU (Maximum Transmission Unit)

Improvement: The MTU of the WAN interface is reduced from 1500 bytes to 1452 bytes.

9.2.3 Stability

Improvement: Internal processes have been optimized for further stability of the device.

10 Version 2.606

This chapter describes the major differences between version 2.606 and version 2.605. It lists new and improved functions.

10.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

10.1.1 Kernel and Driver Versions

- Please note: The kernel included in the system update file **tainy_system_package_update_all_1.1.tgz** enhances the stability of the system and hence should be installed in any case.



Caution!

Use firmware version 2.606 only with the system update package:

- **tainy_system_package_update_all_1.1.tgz**

If you are unsure whether the system update package is installed already, preventively install it again.

To determine the installed kernel version open *Maintenance* -> *Firmware info* of the TAINY xMOD-x3's web interface. After a successful system update it should read:

- **Linux 2.6.35.3-dnt-0.56.1338 #1 Fri May 2 11:01:51 CEST 2014 armv5tejl**

Using the firmware version 2.606 with any older kernel or driver version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

10.2 Enhancements

10.2.1 Fall back to factory default

Bug fix: Under certain circumstances older firmware versions restarted with factory default settings.

10.2.2 DHCP Relay Deamon

Improvement: Exchange of the DHCP relay daemon. New DHCP helper service works also with IPsec.

10.2.3 No SIM card

Improvement: Changed timeout until restart to 60min if no SIM card is inserted in the TAINY xMOD.

10.2.4 No WAN IP

Improvement: In case the TAINY xMOD does not get an IP from the provider within 60 minutes the device will do an automatic restart.

10.2.5 Portrange

Advanced configuration: It is now possible to configure port ranges in the traffic priority rules.

10.2.6 Note text

Applied new 'note' text on the following web pages: "DHCP" and "Traffic Priority"

10.2.7 Firewall adjustment

Adjustment: The automatically configured firewall, responsible for the LAN, has been enhanced. Devices in the local area network are accessible from the SSH management console of the TAINY xMOD via ports 22 and 23.

11 Version 2.605

This chapter describes the major differences between version 2.605 and version 2.604. It lists new and improved functions.

11.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

11.1.1 Kernel and Driver Versions

- Please note: The kernel included in the system update file **tainy_system_package_update_all_1.1.tgz** enhances the stability of the system and hence should be installed in any case.



Caution!

Use firmware version 2.605 only with the system update package:

- **tainy_system_package_update_all_1.1.tgz**

If you are unsure whether the system update package is installed already, preventively install it again.

To determine the installed kernel version open *Maintenance* -> *Firmware info* of the TAINY xMOD-x3's web interface. After a successful system update it should read:

- **Linux 2.6.35.3-dnt-0.56.1338 #1 Fri May 2 11:01:51 CEST 2014 armv5tejl**

Using the firmware version 2.605 with any older kernel or driver version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

11.2 Enhancements

11.2.1 Firmware Update

Bug fix: Under certain circumstances older firmware versions restarted with factory default settings after a firmware update.

12 Version 2.604

This chapter describes the major differences between version 2.604 and version 2.603. It lists new and improved functions.

12.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

12.1.1 Kernel and Driver Versions

- Please note: The kernel included in the system update file **tainy_system_package_update_all_1.1.tgz** enhances the stability of the system and hence should be installed in any case.



Caution!

Use firmware version 2.604 only with the system update package:

- **tainy_system_package_update_all_1.1.tgz**

If you are unsure whether the system update package is installed already, preventively install it again.

To determine the installed kernel version open *Maintenance* -> *Firmware info* of the TAINY xMOD-x3's web interface.

After a successful system update it should read:

- **Linux 2.6.35.3-dnt-0.56.1338 #1 Fri May 2 11:01:51 CEST 2014 armv5tejl**

Using the firmware version 2.604 with any older kernel or driver version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

12.2 Enhancements

12.2.1 Connection Monitoring and Handling

Enhanced handling at loss of the WAN IP address. The device reboots after approx. 20 minutes without IP address.

12.2.2 Initial Profile after Reboot

The activation of the *Initial profile after reboot* has been stabilized.

12.2.3 Device Identification

The BLANK character is added to the character set for the Device identification parameters *Line 1* to *Line 4*.

12.2.4 System Time

Bug fix: The multiple addition of the time zone at reboot still occurred with firmware version 2.603 under certain circumstances.

12.2.5 NTP Synchronization

Bug fix: Under certain circumstances the NTP synchronization could not start correctly in former firmware versions, when the time difference between system time and real time was too large, especially when NTP synchronization had been activated, before the device had been assigned a WAN IP address by the provider.

12.2.6 Clock Changes

Bug fix: In rare cases former TAINY xMOD firmware versions could enter a one-hour cyclic reboot at clock changes.

13 Version 2.603

This chapter describes the major differences between version 2.603 and version 2.601. It lists new and improved functions.

13.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

13.1.1 Kernel and Driver Versions

- Please note: The kernel included in the system update file **tainy_system_package_update_all_1.1.tgz** enhances the stability of the system and hence should be installed in any case.



Caution!

Use firmware version 2.603 only with the system update package:

- **tainy_system_package_update_all_1.1.tgz**

If you are unsure whether the system update package is installed already, preventively install it again.

To determine the installed kernel version open *Maintenance* -> *Firmware info* of the TAINY xMOD-x3's web interface.

After a successful system update it should read:

- **Linux 2.6.35.3-dnt-0.56.1338 #1 Fri May 2 11:01:51 CEST 2014 armv5tejl**

Using the firmware version 2.603 with any older kernel or driver version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

13.2 Enhancements

13.2.1 Access Technology

- Bug fix: In rare cases the command to switch the access technology (2G/3G) had not been executed by the device in former firmware versions. This bug is fixed in firmware version 2.603.

13.2.2 System Time

- Bug fix: In some former firmware versions, on each reboot the configured time zone had been added to the local time (UTC + time zone) not to the UTC, i.e. the time zone had been added more than once. This bug is fixed in firmware version 2.603.

14 Version 2.601

This chapter describes the major differences between version 2.601 and version 2.600. It lists new and improved functions.

14.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

14.1.1 Kernel and Driver Versions

- Please note: The kernel included in the system update file **tainy_system_package_update_all_1.1.tgz** enhances the stability of the system and hence should be installed in any case.



Caution!

Use firmware version 2.601 only with the system update package:

- **tainy_system_package_update_all_1.1.tgz**

If you are unsure whether the system update package is installed already, preventively install it again.

To determine the installed kernel version open *Maintenance* -> *Firmware info* of the TAINY xMOD-x3's web interface. After a successful system update it should read:

- **Linux 2.6.35.3-dnt-0.56.1338 #1 Fri May 2 11:01:51 CEST 2014 armv5tejl**

Using the firmware version 2.601 with any older kernel or driver version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

14.2 Enhancements

14.2.1 Character Set for WAN Access Data

- The character '#' is added to the character set for the WAN (EDGE/UMTS) access data parameters *User name* and *Password*. The character set comprises the following characters now:

```
#@~%$, *'=!+-\\/? () {} . : ; [ ] _ |  
0123456789  
ABCDEFGHIJKLMNOPQRSTUVWXYZ  
abcdefghijklmnopqrstuvwxyz
```

15 Version 2.600

This chapter describes the major differences between version 2.600 and version 2.500. It lists new and improved functions.

15.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

15.2 New Features

15.2.1 System Update Function, new combined Kernel and Driver Update Package

- Firmware version 2.600 introduces a new system update function. It allows the user to install the kernel and all important driver files in a single update process. It is an enhancement to the former kernel update function and replaces it.
- In addition a new system update package has been generated, that combines a new kernel file and all driver files needed for a complete update:

- **tainy_system_package_update_all_1.1.tgz**

- Please note: The kernel included in this system update file enhances the stability of the system and hence should be installed in any case.



Caution!

Use firmware version 2.600 only with the system update package:

- **tainy_system_package_update_all_1.1.tgz**

If you are unsure whether the system update package is installed already, preventively install it again.

To determine the installed kernel version open *Maintenance* -> *Firmware info* of the TAINY xMOD-x3's web interface. After a successful system update it should read:

- **Linux 2.6.35.3-dnt-0.56.1338 #1 Fri May 2 11:01:51 CEST 2014 armv5tej**

Using the firmware version 2.600 with any older kernel or driver version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

15.2.2 TACACS+

- From firmware version 2.600 on the TAINY xMOD-x3 supports the configuration of a secondary TACACS+ server. The secondary server can be used by the TAINY xMOD-x3 for authentication, if the primary TACACS+ server is not available or its use fails for some other reason.
- From firmware version 2.600 it is possible to change TACACS+ parameters while being logged on to the TAINY xMOD via TACACS+.

- The ordinary, direct log in can be deactivated from firmware version 2.600 on, so that you can access the device exclusively via TACACS+ authentication.

In this case SSH connections are also blocked.



Caution!

If the ordinary, direct log in is deactivated, the TAINY xMOD-x3 must be able to connect to at least one of the configured TACACS+ servers. Otherwise it would be impossible to get access to the device any more.

In this case use the front push button to reset the device to factory default.

15.2.3 SNMP

- From firmware version 2.600 on the TAINY xMOD-x3 supports the version 3 of the Simple Network Management Protocol (SNMPv3).

15.2.4 Parameterization of the switch ports

- The following options can be set individually for each port of the TAINY xMOD-x3:
 - Enabled: This parameter allows the user to switch the respective port on or off
 - Mode: This parameter contains the transmission settings of the respective port. The following modes are supported:
 - Automatic
 - 10M/Half Duplex
 - 10M/Full Duplex
 - 100M/Half Duplex
 - 100M/Full Duplex

15.2.5 VLAN

- A new VLAN (Virtual Local Area Network) function has been added to the TAINY xMOD-x3 in firmware version 2.600. With VLAN the user is able to divide the common network of the switch ports into various independent sub-networks.

15.2.6 WAN port data traffic prioritization

- The TAINY xMOD allows to set rules in order to prioritize different data streams.
- Data streams are defined by *Source Network*, *Destination Network*, *Protocol*, and *Destination Port*.
- There three prioritization levels: *High*, *Medium* und *Low*.
- A *Default priority* sets the priority for all non-defined data streams.

15.2.7 MAC address filter

- In order to enhance the protection against unauthorized access to the TAINY xMOD-x3 a new MAC address filter has been implemented. It enables the user to determine, which devices are allowed to get local access to the TAINY xMOD-x3. Enter here the MAC addresses of the

devices which may get access. Devices with any other MAC address will be rejected.

- If the MAC address filter is deactivated or the *List of allowed MAC Addresses* is empty, the MAC address will not be checked.



Caution!

It is possible to configure the device so incorrectly that you cannot get local access to the TAINY xMOD-x3 anymore. In this case use the front push button to reset the device to factory default.

15.2.8 DHCP Relay

- From firmware version 2.600 on the TAINY xMOD-x3 supports *DHCP relay*. If DHCP relay is enabled, DHCP requests from devices locally connected to the TAINY xMOD-x3 are not processed by the DHCP server of the TAINY xMOD but forwarded to an external DHCP server, which can be configured in the TAINY xMOD-x3. The TAINY xMOD-x3 only passes on the DHCP requests and answers between the external DHCP server and the locally connected DHCP client in this mode.

15.3 Enhancements

15.3.1 Handling of invalid entries

- With this firmware version, incorrect entries in the web-interface (entry not within range of values, invalid characters etc.) will not be replaced by the default value any more but the previous value will be maintained.

15.3.2 SNMP: Transmission of the firmware version number

- Bug fix: the firmware version number will be transmitted correctly via SNMP in this firmware version.

15.3.3 Displaying the UARFCN Value

- Bug fix: the UARFCN (UTRAN Absolute Radio Frequency Channel Number) of the current and the neighbouring wireless cell will be displayed correctly in this firmware version.

15.3.4 RSCP Status Bar

ONLY TAINY HMOD-x3

- Bug fix: If no RSCP value can be obtained it is indicated by an empty white status bar instead of the full green status bar of older firmware versions (Network Status, 3G mode).

15.3.5 Stability

- Internal processes have been optimized for further stability of the device.

15.3.6 File names of Configuration Profiles

- File names of configuration profiles may contain the blank character from firmware version 2.600 on.

15.3.7 LEDs

- ONLY TAINY xMOD-x3-E5
- The behaviour of the LINK and DATA LEDS of the Ethernet ports have been synchronised with this firmware version.

15.4 Known Bugs

15.4.1 Blank characters in file names of configuration profiles

- Under specific conditions the usage of configuration profiles with file names that contain blank characters may lead to malfunctioning of the device. Therefore we strongly recommend to use this firmware version only with configuration files without the blanks in the file or profile name.



Caution!

If possible use only configuration profiles without blank characters in the file or profile name with firmware version 2.600.

16 Version 2.500

This chapter describes the major differences between version 2.500 and version 2.400. It lists new and improved functions.

16.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

16.2 New Features

16.2.1 New Kernel Update Package

- Kernel: The new update package *kernel_2.6.35.3-1252_arm.ipk* contains some general enhancements and is necessary for the TACACS+ functionality.



Caution!

Use firmware version 2.500 only with the following kernel and driver versions or newer:

- kernel package *kernel_2.6.35.3-1252_arm.ipk*
(Linux 2.6.35.3-dnt-0.55.1252 #1 Mon Oct 7 15:03:01 CEST 2013 armv5tej)
- driver package *dnt3196_1.00-1252_arm.ipk*
- driver package *openvpn_2.2.2_arm.ipk*
- driver package *lighttpd_1.4.32_arm.ipk*

If you are unsure whether the driver packages are installed already, preventively install them again.

To determine the installed kernel version open *Maintenance* -> *Firmware info* of the TAINY xMOD-x3's web interface.

Using the firmware version 2.500 with any older kernel or driver version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

16.2.2 TACACS+

- In addition to the normal login procedure at which the user logs in directly to the TAINY xMOD-x3, firmware version 2.500 allows a login via TACACS+ (**T**erminal **A**ccess **C**ontroller **A**ccess **C**ontrol **S**ystem **P**lus). With TACACS+ user administration, authentication and authorisation are performed by a separate TACACS+ server which is connected to the local network of the TAINY xMOD-x3.
- By default the TACACS+ function is deactivated. The activation and configurations of TACACS+ is done via the web interface of the TAINY xMOD-x3.
- Users, logged on to the TAINY xMOD-x3 via TACACS+ have restricted access to certain configuration websites.

16.2.3 Logging out

- Manually: The new menu item *Log Out* allows the user to sign out of the TAINY xMOD-x3 manually.
- Automatically: If the configuration connection stays idle for at least 15 min, the device terminates the connection automatically.
- Once the user has been signed off automatically or manually, the connection must be re-established, before he can access the device's web interface again.
- The Log out functions (automatic and manual) work for TACACS+ connections as well as for direct (*local*) connections.

16.2.4 TAINY Connect DeviceManager

- From firmware version 2.500 on the TAINY xMOD-x3 supports the configuration tool *TAINY Connect DeviceManager*.

16.3 Enhancements

16.3.1 Compatibility with old configuration profiles

- Bug fix: Configuration profiles which were created with older firmware versions than 2.300 are no longer considered invalid when being activated by firmware version 2.500.

16.3.2 PIN-Handling

- Enhanced PIN handling in order to avoid the unintentional blocking of SIM card(s) (PIN ERROR state).
- Restoring the factory default of the TAINY xMOD-x3 via front button or web interface will reset the PIN ERROR state.

16.3.3 Miscellaneous

- Bug fix: Restoring the factory default of the TAINY xMOD-x3 via front button or web interface deletes all OpenVPN configuration files and the root server certificate.
- Enhanced switching between SIM card slots.

ONLY TAINY xMOD-x3-DS

16.4 Known Bugs

16.4.1 Displaying the UARFCN Value

- Under specific conditions the UARFCN (UTRAN Absolute Radio Frequency Channel Number) value of the current and the neighbouring wireless cells may not be displayed on the *Network Status* website.

ONLY TAINY HMOD-x3

17 Version 2.400

This chapter describes the major differences between version 2.400 and version 2.300. It lists new and improved functions.

17.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

17.2 Important Notes

17.2.1 Kernel and Driver Packages

**Caution!**

Use firmware version 2.400 only with the following kernel and driver versions or newer:

- kernel **Linux 2.6.35.3-dnt-0.53.945 #1 Thu Nov 8 11:48:50 CET 2012 armv5tejl**
- driver package **dnt3196_1.00_arm.ipk**
- driver package **openvpn_2_2_2_arm.ipk**

If you are unsure whether the driver packages are installed already, preventively install them again.

To determine the installed kernel version open *Maintenance* -> *Firmware info* of the TAINY xMOD-x3's web interface.

Using the firmware version 2.400 with any older kernel or driver version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

17.3 New Features

17.3.1 Connection Check

- From firmware version 2.400 onwards the parameter "interval for connection check" can also be defined in seconds. For this purpose, an additional drop down menu is implemented on the "Connection Check" webpage.

17.3.2 Roaming

- The newly implemented roaming mode "User" allows the user to define a specific network ID to which the device tries to connect exclusively. Any other available mobile network will be ignored by the TAINY.

17.3.3 OpenVPN

ONLY TAINY xMOD-V3

- Remote 1-to-1-NAT is added for the OpenVPN connection. The 1-to-1 NAT function in TAINY xMOD-V3 maps a locally defined address range on the address range of the remote network on the OpenVPN connection and hence allows access to the remote network using the locally defined address range.
- The new parameter "Fragment UDP packets" allows the user to determine whether or not the TAINY should send four additional bytes in the UDP header.

17.3.4 Activation of a configuration profile

- In addition to the activation of configuration profiles via web interface the user can activate a configuration profile manually by trigger file from firmware version 2.400 onwards. Use SSH to create an empty file with the name *<profile name>@now.trigger* in the directory */opt/dnt/webserver/profiles*.

17.3.5 Antenna Diversity

ONLY TAINY HMOD-x3

- From firmware version 2.400 onwards the antenna diversity can be switched on or off via the web interface.
- By default antenna diversity is deactivated.

17.3.6 Logging

- A live log output is added to the TAINY's "Logging" webpage. This live log outputs the 20 latest log messages.

17.3.7 Execute Command

- From firmware version 2.400 onwards the TAINY webserver provides a command line for LINUX commands. The command line is located at *Maintenance -> Execute Command*. Responses to LINUX commands are output on the same webpage.



Caution

This function should only be used for problem analysis. Careless use can reduce the stability and performance of the system. It is possible to configure the device so incorrectly with Linux commands that it has to be sent in to service. In this case, please contact your dealer or distributor.

17.4 Enhancements

17.4.1 Web interface

- Revision of the complete web interface in order to improve reliability and the detection of invalid parameter entries.

17.4.2 SNMP

- SNMP supports the new parameters ICCID (serial number of the SIM card in use) and Access Technology (2G/3G).
- An updated version of the TAINY's MIB (DNT-GSM-MIB.TXT) has been created.

17.4.3 Network Status

- Complete revision of the "Installation mode":
 - "Network Status" replaces "Installation mode".
 - Different functions and output for 2G and 3G operation (only TAINY HMOD-x3).
 - In contrast to former firmware versions "Network Status" is always "on". The parameter "Fast refresh of the network status for (minutes)" allows the activation of a shorter data retrieval interval, comparable to the activated "Installation mode" of former firmware versions. The webpage refreshes every 3s in any case.

17.4.4 Configuration Profiles

- Improved internal detection and handling of incorrect or invalid configuration profiles and profile files by the device.
- Improved detection and handling of incorrect or invalid configuration profiles and profile files by the webserver.

17.4.5 Logging

- Information about memory and CPU load is added to the logging (periodical entries). After a reboot, the information is written to the log file every 10 min for the first hour, after that once an hour.
- Information about the current temperature of the GSM/UMTS module is added to the logging (periodical entries).
- Information about the currently used network technology (2G/3G) is added to the logging.
- Information about all mobile networks visible to the device is added to logging (periodical entries).
- The content of the 'Preferred Operator List' is added to the logging (periodical entries). This list is determined by the SIM card's network provider and contains the mobile networks preferably used by the SIM card when it is operated abroad.
- The periodical output of information about the visible mobile networks and the 'Preferred Operator List' is deactivated 300 min after the last reboot of the TAINY.
- Revision of existing log entries.

17.4.6 Miscellaneous

- In order to improve stability the following items have been modified:
 - internal communication
 - internal detection and handling of errors
 - connecting process and connection monitoring
 - timing
 - data handling
- Bug fix: In rare cases former versions of the TAINY firmware started multiple instances of the OpenVPN service. This bug is fixed in firmware version 2.400.

17.5 Known Bugs

17.5.1 Compatibility with old configuration profiles

- Configuration profiles which were created with older firmware versions than 2.300 may be considered invalid when being activated by firmware version 2.400. As a workaround those configuration profiles can be uploaded to a TAINY with firmware version 2.300 and afterwards exported again. The resulting configuration profile will be accepted by firmware version 2.400.

18 Version 2.300

This chapter describes the major differences between version 2.300 and version 2.116. It lists new and improved functions.

18.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

18.2 New Features

18.2.1 New Kernel and Driver Packages

- Kernel: The new update package *kernel_2.6.35.3_arm_Nov08.ipk* contains some general enhancements and is necessary for the OpenVPN functionality (TAINY xMOD-V3 only).
- OpenVPN driver package: For OpenVPN support the driver package *openvpn_2.2.2_arm.ipk* is essential.



Caution!

Use firmware version 2.300 only with the kernel version **Linux 2.6.35.3-dnt-0.53.945 #1 Thu Nov 8 11:48:50 CET 2012 armv5tejl** or newer (you will find the currently installed firmware version on the webpage "Firmware Info"). Using the firmware 2.300 in conjunction with an older kernel version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.



Caution!

Before using the device install the driver package **openvpn_2_2_2_arm.ipk**. Using the TAINY xMOD-x3 without the drivers of this package may lead to malfunctioning of the device

Please follow the update instructions in chapter 22.



Caution!

Before using the device install the driver package **dnt3196_1.00_arm.ipk**. Using the TAINY xMOD-x3 without the drivers of this package may lead to malfunctioning of the device

Please follow the update instructions in chapter 22.

18.2.2 Connection Check - Mode: Statistics

- A new mode "Statistics" is added to the connection check function (including adapted webpage and new parameter set added to configuration):
 In "Statistics" mode the success of ICMP ping requests is monitored over a definable interval. After the interval has expired, the rate of successful ping requests (percentage ratio of number of received ping responses to number of submitted ping requests) is compared with the value of a definable success threshold. If the success rate falls below the threshold value the test failed and the respective pre-defined action will be taken.

18.2.3 OpenVPN

ONLY TAINY xMOD-V3

- A newly implemented function enables devices with IPsec VPN capability (TAINY xMOD-V3) to configure OpenVPN connections to a remote station.
- **Please Note:** The implementation of OpenVPN is currently restricted to the use of username and password in combination with a root server certificate.
- In addition to ordinary data transfer the following services and protocols are supported amongst others:
 - ICMP including connection check
 - SNMP
 - NTP time synchronization
 - FTP uploads
 - DynDNS
 - IPsec VPN
 - Secure DynDNS
 - remote access to the TAINY per SSH
 - remote access to the TAINY per HTTPS
- New websites are added for the configuration and monitoring of OpenVPN connections.
- The status of the OpenVPN connection is added to the website "Overview".
- A new kernel supporting OpenVPN has been built



Caution!

In order to use OpenVPN you need to install the kernel package **kernel_2.6.35.3_arm_Nov08.ipk** and the driver package **openvpn_2.2.2_arm.ipk** in conjunction with firmware version 2.300 or newer. In addition the driver package **dnt3196_1.00_arm.ipk** must be installed for stability reasons.

Please follow the update instructions in chapters 18.2.1 and 22.

18.2.4 Miscellaneous

ONLY product version DS

- MSS: The maximum segment size can be set via web interface
- Local NAT: The use of network address translation on the local interface can be enabled/disabled via web interface.
- UDP keep alive interval: The UDP keep-alive interval can be set via web interface (100s to 2000s). This parameter determines the interval used for sending UDP keep alive datagrams, in order to preserve UDP routing information inside the TAINY. This parameter is valid for all UDP 'connections' of the TAINY.
- Roaming mode "User": Via web interface the user can determine an exclusive roaming partner by setting the net ID of the respective provider.
- SIM card slot selection mode "Random". In addition to the direct selection of one of the two SIM card slots the new mode forces the TAINY to choose a random SIM card slot at start-up.

18.3 Enhancements

18.3.1 Automatic Change of Profiles

- For stability reasons an automatic fallback to another profile due to a system reboot of the TAINY (*Initial profile after reboot*) is delayed for 60s with this firmware version.

18.3.2 DynDNS

- Enhanced DynDNS implementation
- IP address update messages are submitted only at a change of the IP address or a parameter change.

18.3.3 Secure DynDNS

- Characteristics of the Secure DynDNS re-schedule timer fixed.

18.3.4 Volume Monitoring

- Reduced calculation cycle: With this firmware version the transferred data volume is calculated and updated every 30s.
- Enhanced input field: The input field "Maximum data volume in bytes per month" has been enhanced to 15 digits with this firmware version. Hence the maximum data volume is enhanced to a maximum of 999999999999999 bytes.
- The default messages for Warning and Alarm SMS have been altered to „Warning:Max Data Volume reached“ and „Alert:Max Data Volume reached“.
- The character set for Warning and Alarm SMS messages is determined more precisely and added to the website:

```
<Space>, * ' # % = < > ! & + - / ? ( ) . : ; 0 1 2 3 4 5 6 7 8 9
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
```

18.3.5 Logging

- Enhanced logging for
 - Reboot of the TAINY
 - Disconnect of the WAN
 - Shut down requests (internally or received from an external source)
- Seconds added to the timestamp of log entries
- Product name added to log entries

18.3.6 Miscellaneous

- Alarm SMS for event 1 and 2: The number of characters per SMS is enhanced from 50 to 160
- Character set for SMS messages is determined more precisely and added to the website:

```
<Space>, * ' # % = < > ! & + - / ? ( ) . : ; 0 1 2 3 4 5 6 7 8 9
ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
```

- The deactivation of the connection check is fixed

- SNMP trap characteristics fixed: When an enabled SNMP trap (“Event: Change to a configuration profile”) is disabled by the activation of a new profile (i.e. the respective SNMP trap function is disabled in the new profile), a final SNMP trap will be sent to notify the profile change, before the trap is disabled eventually.
- Enhanced start-up procedure of the application
- Stabilized handling of the internal memory
- Revision of several websites

18.4 Known Bugs

18.4.1 Automatic Change of Profiles

- During the activation of an invalid configuration profile the corresponding internal error message may not be processed, determined by the system.

This may lead to a reset of all parameters to factory default, while at the same time a false profile name is written to the configuration and output via the web interface.

19 Version 2.116

This chapter describes the major differences between version 2.116 and version 2.114. It lists new and improved functions.

19.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

19.2 Enhancements

19.2.1 Checking the Connection

- In previous firmware versions a failure of the connection check (i.e. the configured host does not answer) in conjunction with the parameter “Activity on faulty connection” set to “Renew connection” could prompt the device to stop reconnecting to the WAN. This behaviour has been corrected with the current firmware version.

19.3 Information

19.3.1 Kernel Update

**Caution!**

Use firmware version 2.116 only with the kernel version from **Linux 2.6.35.3-dnt-0.53.872 #1 Thu Aug 9 11:04:57 CEST 2012 armv5tejl** or newer. Using the firmware 2.116 in conjunction with an older kernel version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

**Caution!**

Before using the device install the driver package **dnt3196_1.00_arm.ipk**. Using the TAINY xMOD-x3 without the drivers of this package may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

20 Version 2.114

This chapter describes the major differences between version 2.114 and version 2.113. It lists new and improved functions.

20.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

20.2 Enhancements

20.2.1 Kernel Update

- Improved handling of the kernel update function implemented.



Caution!

Use firmware version 2.114 only with the kernel version from **Linux 2.6.35.3-dnt-0.53.872 #1 Thu Aug 9 11:04:57 CEST 2012 armv5tejl** or newer. Using the firmware 2.114 in conjunction with an older kernel version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.



Caution!

Before using the device install the driver package **dnt3196_1.00_arm.ipk**. Using the TAINY xMOD-x3 without the drivers of this package may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

21 Version 2.113

This chapter describes the major differences between version 2.113 and version 2.008. It lists new and improved functions.

21.1 Compatibility

The previous settings will remain active, after a firmware or kernel update.

21.2 New Features

21.2.1 Kernel

- Kernel update feature and scheduled kernel update mechanism added. To get access to this function, you must update the firmware of the device first, then use the kernel update feature to install the new kernel
- List of scheduled kernel updates added to web page "Firmware Info".
- Kernel version information added to web page "Firmware Info".
- Kernel ipk update packet built (Thu Aug 9 11:04:57 CEST 2012). This kernel version enables the additional Ethernet port (LAN 1) of the TAINY xMOD-x3 (product version E5 excluded).



Caution!

Use firmware version 2.113 only with the kernel version from **Linux 2.6.35.3-dnt-0.53.872 #1 Thu Aug 9 11:04:57 CEST 2012 armv5tejl** or newer. Using the firmware 2.113 in conjunction with an older kernel version may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.



Caution!

Before using the device install the driver package **dnt3196_1.00_arm.ipk**. Using the TAINY xMOD-x3 without the drivers of this package may lead to malfunctioning of the device.

Please follow the update instructions in chapter 22.

21.2.2 5 Port Switch and Dual SIM

- ONLY** product versions E5 and DS - 5 port Ethernet switch and dual SIM card support implemented.
- ONLY** product version DS - Drop-down list for the selection of the SIM card slot added to web page "EDGE/GPRS" (TAINY EMOD) and "UMTS/EDGE" (TAINY HMOD).

21.2.3 Profile Handling

- Information block "Last activated profile" added to web pages "Overview", "Configuration profiles", "EDGE/GPRS" (TAINY EMOD only), "UMTS/EDGE" (TAINY HMOD only) and "Connection Check".
- New feature 'Save changes to activated profile' added to web page "Configuration profiles". Using the "Save" button stores altered system parameters in the currently activated profile.

- New feature 'Fallback profile at connection error' added to web page "EDGE/GPRS" (TAINY EMOD only) and "UMTS/EDGE" (TAINY HMOD only). If a connection to the Wide Area Network cannot be established or an existing connection is cut, the device changes to the configuration profile selected here.
 - New feature 'Scheduled profile change' added to web page "Configuration profiles". Set time out (as minutes).and target profile for a change of profiles here
 - New feature 'Initial profile after reboot' added to web page "Configuration profiles". This parameter determines which configuration profile should be activated after the next reboot of the TAINY device.
 - New feature 'Change of profile due to unsuccessful connection check'. "Activate another profile" option added to "Activity on faulty connection" drop-down list on web page "Connection Check". If the connection check fails, the device activates the configuration profile selected here.
- ONLY product version DS
- Default profiles for SIM card slot 1 and 2 added each preconfigured with the corresponding SIM card slot. Both default profiles cannot be deleted.

21.2.4 Installation Mode

- Automatic fallback from Installation Mode to normal operation mode after a reboot of the device implemented.
- Automatic fallback from Installation Mode to normal operation mode after a selected timeout implemented.
- Predefined time out values from 15min., 30min., 60min., and 120min. added to "Installation mode" web page. After Timeout Installation mode will exit to normal operation mode. From this version on infinite installation mode is not supported any more.

21.2.5 Web Interface

- Time base for scheduled updates (web page "Update") changed from local PC time to internal system time of the TAINY device.

21.2.6 SNMP

- SysDecsr/SysName added according to product identification strings.
- SysDecsr/SysName/SysLocation/SysContact added to snmpd configuration file.

21.2.7 Miscellaneous

- New https Server certificates added.

21.3 Enhancements and Bug fixes

21.3.1 Configuration Profiles

- Valid characters for downloadable configuration profile names limited to:
() . - 0 1 2 3 4 5 6 7 8 9 A B C D E F G H I J K L M N
O P Q R S T U V W X Y Z [] _ a b c d e f g h i j k l m
n o p q r s t u v w x y z

- Bug fix: configuration profiles with invalid characters in their file names will not be saved to the TAINY's profile directory any more.
- Error web page for the event of invalid characters implemented.

21.3.2 Web Interface

- Drop-down list for the parameters Year, Month, Day, Hour, and Minute implemented on the web pages "System time/NTP" and "Update".
- Timestamp on "Firmware Info" web pages altered to a readable format (201209291927 to 2012-09-29,19:27).

21.3.3 SNMP

- Crashing of SNMPD in case of mass SNMP get-next or SNMP walk requests fixed.

21.3.4 Logging

- Dispensable SNMP log messages removed.
- Hardware ID and software ID information added to log book.
- New log book message in the event of the activation of a configuration profile added.

21.3.5 VPN

ONLY TAINY xMOD-V3

- Remote IP address and remote ID added to the IPsec-VPN tunnel configuration for pre shared key mode (psk.txt), in order to avoid tunnel connection problems.

21.3.6 Miscellaneous

- NTP server function: Enabling/disabling of NTP server function fixed.
- Firmware update problem fixed. Update Process will no longer be interrupted by the detection of incomplete configuration file and the corresponding reboot.
- Change of web server access password fixed. New passwords can be set for ssh and https access.
- Reboot delay in case of SIM card error enhanced from 3min. to 5min. in order to widen the time slot for configurations.
- Improved GSM network roaming.
- Backslash escape character added to DynDNS (ezipupdate) query string on username and password to avoid shell misinterpretation by special characters like '&'.

22 Update of Firmware, Kernel and Drivers

This chapter describes how to update firmware, kernel and driver packages. Depending on whether the current firmware version already supports the kernel update function or not, the procedure differs. Where applicable the kernel update function can be found via web interface under *Maintenance* -> *Update*.

In case the TAINY xMOD-x3 already contains the correct kernel version, the kernel update procedure can be skipped. To determine the installed kernel version open *Maintenance* -> *Firmware info* of the TAINY's web interface.

22.1 Firmware does not support the Kernel Update Function

If the current firmware version **does not support the kernel update function**, please proceed with the following steps:

1. **Update the firmware:** Along with the new firmware version the kernel update function will be installed.
2. **Update the kernel** via web interface
3. **Update the required driver package/packages** using the kernel update function. Using the firmware update function will lead to an error message. In this case the update of the driver package will be stopped



Caution!

Always use the latest firmware release version and the required kernel and driver packages. Disregarding this rule may lead to malfunctioning of the device.



Caution!

Never restart the TAINY xMOD-x3 manually during any update process. This may damage the device seriously.

22.2 Firmware does support the Kernel Update Function

If the current firmware version **supports the kernel update function** already, please proceed with the following steps:

1. **Update the kernel** via web interface
2. **Update the required driver package/packages** using the kernel update function. Using the firmware update function will lead to an error message. In this case the update of the driver package will be stopped
3. **Update the firmware** via web interface



Caution!

Always use the latest firmware release version and the required kernel and driver packages. Disregarding this rule may lead to malfunctioning of the device.



Caution!

Never restart the TAINY xMOD-x3 manually during any update process. This may damage the device seriously.

22.3 Firmware does not support the System Update Function (versions older than 2.600)

If the current firmware version **does not support the system update function** already, please proceed with the following steps

1. **Update the firmware** via web interface. After the firmware has been successfully updated, the device supports the system update function.
2. **Update the new system update package** via web interface. This installs a new kernel and all important drivers.



Caution!

Always use the latest firmware release version and the corresponding system update package. Disregarding this rule may lead to malfunctioning of the device.



Caution!

Never restart the TAINY xMOD-x3 manually during any update process. This may damage the device seriously.