Master / Slave configuration procedure
GMS-xx / GMSplus

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1. Introduction

This procedure describes how to setup the GMS–xx and GMSplus for Master / Slave configuration for time synchronisation.

2. IP address of the instrument

The master unit should have a fixed static IP address.

If this is set already before, but IP address is not known yet, read chapter 2.2.

If the instrument does not have a static IP address yet, read chapter 2.1, how to set an IP address.

If IP address is already known, jump to chapter 3.

2.1. Set IP Address of the Instrument

Network settings of the Instrument can be changed during startup of the instrument. By default the instrument has a dynamic IP.

- Switch on the instrument by press and hold the POWER button for 2 seconds.
- Press **<Ctr> +** '**Z**' as soon the following message appears on the console to enter the test mode.

```
GMSplus s/n 100582. Firmware in the Linux image: 21.07.00
################################################
###### Test and Initial Configuration Mode ######
################################################
Press Ctrl+Z to enter the test mode.....
```

The following menu will appear (see chapter **Error! Reference source not found.** for details):

```
Press Ctrl+Z to enter the test mode..............
Instrument serial number: 100582
Instrument MAC address: 00:50:C2:77:42:93

-------------------------------------------------------------------------------------------
Level           Shortcut   Password   Description
-------------------------------------------------------------------------------------------
User            Ctrl+U     None       Basic operations only
Powerful User   Ctrl+W     None       Also hardware options and pre-selected tests
Administrator   Ctrl+A     None       Also manual tests and altering the FLASH memory content
-------------------------------------------------------------------------------------------
Your level [U/W/A] or press B to boot now:
```

- By default, no any passwords are set, so press '**U**' to enter the User Mode, and then '**N**' to enter the menu *Network setting*s.

```
==== Network Settings ====

---- Primary network interface ----
Configure network interface (Y/N)? Y
Static IP address (1=YES, 0=AUTO)? (0 = 0x0):
```

- Select '***Y***' to change the settings and then select if the instrument should have a static or a dynamic IP by pressing '**1**' (Static) or '**0**' (dynamic). In case a dynamic IP is chosen, a DHCP server must be available in the network to provide the IP settings.
- In case a static IP is selected, an additional message will appear asking for the *Instrument IP address*, *Instrument network mask* and *Instrument gateway IP*. In case you don't know these parameters please ask your network administrator.

2.2. Get IP from Instrument

- To get the IP from the instrument please press ‘S’ in the main user menu

```
GMSplus s/n 100582 version 21.07.00
Main menu:
C - Configuration
M - Messages ->
S - Shell command
L - List firmware images
X - Display errors (0) and warnings (0)
W - Clear errors and warnings
F - View/reset RTC trim values
T - File statistics
G - View RTC status
P - View GPS information
H - Set RTC time
U - User request
R - Restart
Q - Quit
```

- Enter the linux command ***ifconfig*** and the following reply will be shown by the instrument
- Please see the IPs of the wired Ethernet (*eth0*) and the wireless Ethernet (*wlan0*) listed and marked here in **red**.

```
Linux Command: ifconfig
eth0      Link encap:Ethernet  HWaddr 00:50:C2:77:42:8E
          inet addr:192.168.10.133  Bcast:192.168.10.255  Mask:255.255.255.0
          inet6 addr: fe80::250:c2ff:fe77:428e/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:71 errors:0 dropped:1 overruns:0 frame:0
          TX packets:16 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:6538 (6.3 KiB)  TX bytes:1678 (1.6 KiB)
          Interrupt:21 Base address:0x4000

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          inet6 addr: ::1/128 Scope:Host
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:3 errors:0 dropped:0 overruns:0 frame:0
          TX packets:3 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:172 (172.0 B)  TX bytes:172 (172.0 B)

wlan0     Link encap:Ethernet  HWaddr 00:0D:F0:8E:05:DF
          inet addr:192.168.10.94  Bcast:192.168.10.255  Mask:255.255.255.0
          inet6 addr: fe80::20d:f0ff:fe8e:5df/64 Scope:Link
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:2333 errors:0 dropped:95 overruns:0 frame:0
          TX packets:636 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:271699 (265.3 KiB)  TX bytes:737148 (719.8 KiB)
```

3. Setup locally through serial console

3.1. Setup of the Master GMS-xx / GMSplus

Each unit can act as a NTP time server. It makes most sense, to use one which has a GPS connected.

The slaves can contact this unit and synchronise their internal RTC.

3.2. Set up of the Slave GMS-xx / GMSplus

- Press ‘O’ to enter the menu *Miscellaneous Parameters*

```
Main Menu
  A) Station description ............. Demo GMSplus
  B) Station code .................... DEMO
  C) Location description ............ Switzerland
  D) Seismic network code ............ CH
  E) Number of Channels .............. 3
  F) Number of Output Streams ........ 1
  G) Number of Trigger Sets .......... 1
  H) Number of Preset Triggers  ...... 1
  I) Channel Parameters .............. ->
  J) Stream Parameters ............... ->
  K) Trigger Parameters .............. ->
  L) Parameters of Preset Triggers ... ->
  M) File Storage and Policy ......... ->
  N) Communication Parameters ........ ->
  O) Miscellaneous Parameters ........ ->
```

*To do the settings in the Web Interface go to **Configuration → armdas Configuration → Time Synchronisation**. Then just do the steps described below in the GUI of the Web Interface*

- Press ‘I’ to enter menu *Time synchronization*

```
Main Menu | Miscellaneous
  A) Offset detection time, sec ..............  10 (0x0A)
  B) Offset correction time, sec ..............  0 (0x00)
  C) Offset correction counts .................  1 (0x01)
  D) MiniSEED record length ...................  512
  E) Extended MiniSEED format .................  Yes
  F) State of health ..........................  ->
  G) Test configuration .......................  ->
  H) Messaging and debugging ..................  ->
  I) Time synchronization .....................  ->
  J) Instrument configuration options .........  ->
  K) Time for sending daily logfile, hour .....  0 (0x00)
  L) Time for sending daily logfile, minute ...  0 (0x00)
  M) Keep external modem always powered .......  No
  N) Startup time for analog modem ............  2 (0x02)
  O) Startup time for cellular modem ..........  60 (0x3C)
  P) Connect time for analog modem ............  30 (0x1E)
  Q) Connect time for cellular modem ..........  60 (0x3C)
```

- Press “B” and set IP address of the master unit

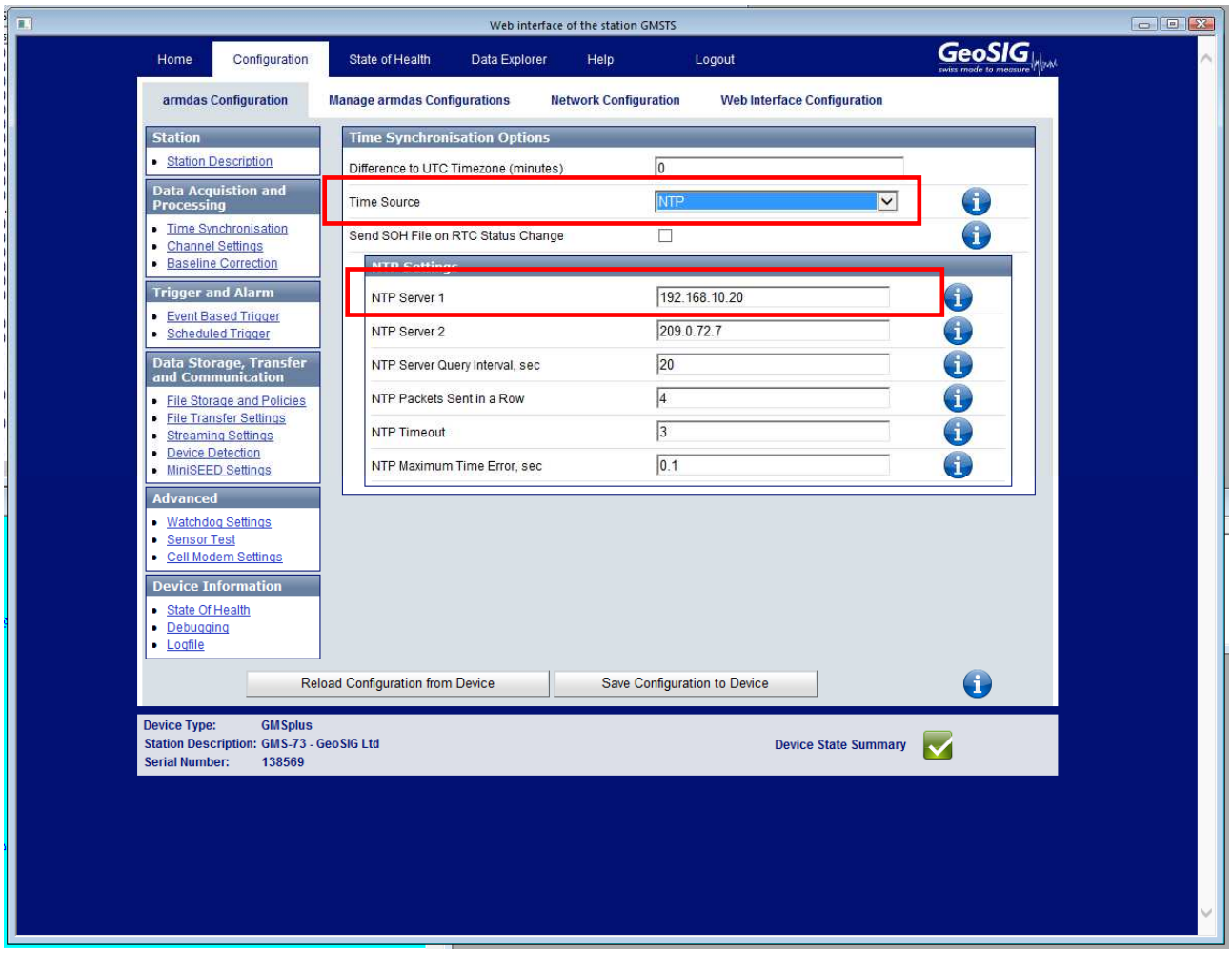
```
Main Menu | Miscellaneous | Time Synchronization
  A) Time source ............................ NTP
  B) NTP server 1 ........................... 192.168.30.52
  C) NTP server 2 ........................... 209.0.72.7
  D) NTP server query interval, sec ......... 20 (0x14)
  E) NTP requests in a row .................. 4 (0x04)
  F) NTP network timeout, sec ............... 3 (0x03)
  G) NTP maximum error, sec ................. 0.1
  K) RTC watchdog timeout, sec .............. 1200 (0x4B0)
  L) Send SOH upon RTC status change ........ No
  O) Offset to UTC, minutes ................. 0 (0x00)
```

4. Setup through webinterface (GeoDAS)

4.1. Setup Master see chapter 3.1.

4.2. Setup Slave GMS-xx / GMSplus

Slave instrument must be in the same local network.



- Open the webinterface either through GeoDAS or directly in a webbrowser
- Set "*Time Source"* to "*NTP*"
- Set "*NTP Server 1*" to the IP address of the Master GMS-xx / GMSplus (see chapter 2)
- Press "*Save configuration to Device"*. This will store the configuration and restart the GMS-xx/ GMSplus to load the changed configuration