

NTP Server

Network Synchronisation

Supplement to the “Functional Description and Specifications Module IE”

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A1 Revision History

No.	Date	Subject
0.n	January 05, 2005	Preliminary documents, changes without notice.
1.0	March 22, 2006	First released document.

A2 Copyright

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A3 General Remarks

This manual is a supplement to the "Functional Description & Specifications Module IE" manual. It describes a special feature of the IE module realized by an optional firmware.

1 NTP Server

1.1 Description

With the NTP Server, the time signal, which is available at the internal bus (TC_link) of your *Alpermann+Velte* Rubidium system, can be made retrievable via the Ethernet.

This application requires that the Rubidium module acting as the time source (modules like **GT, GI, GPS 10 MHz**) gets the appropriate setup (see 1.3 Configuration for details).

Because the "Network Time Protocol" (NTP) is an open standard (Version 3 is defined in RFC 1305), there exist a lot of client-software packages for different operating systems. They make it possible to synchronize the computer's clock to an NTP Server. Some operating systems even have integrated NTP Clients by default.

To make use of the whole complexity of the protocol, it is recommended to use the reference implementation, which can be downloaded at „www.ntp.org“.

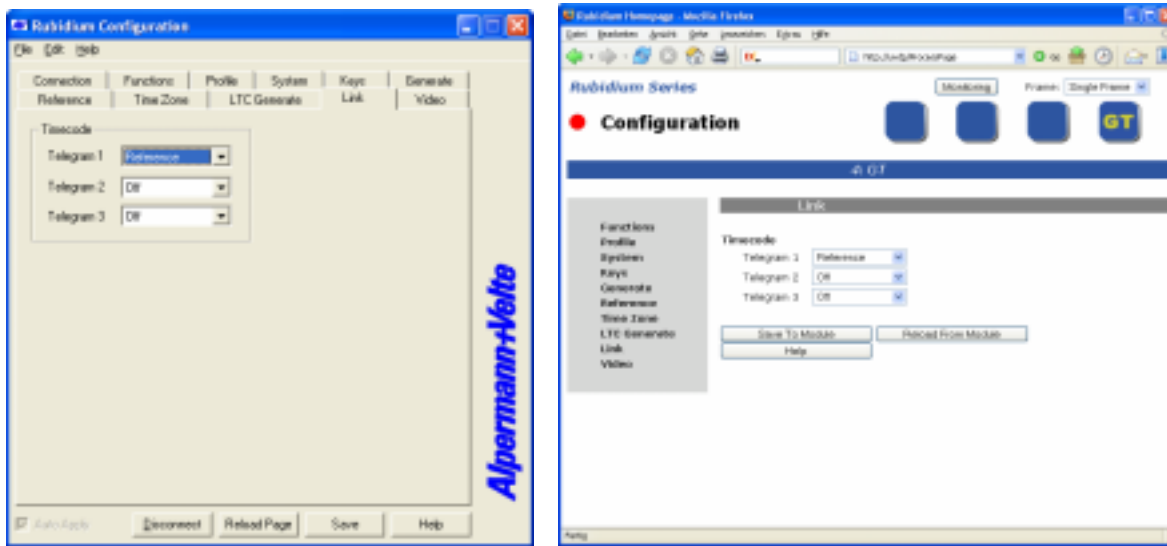
1.2 Specification

NTP version (server)	3
Supported NTP versions (as clients)	2, 3, 4
NTP mode	2 (symmetric passive) when request is 1 (symmetric active), else 4 (server)
Queries per second	est. 200
Measured sync precision (ntpd 4.2.0-nt)	< 10 ms

1.3 Configuration

The NTP Server delivers the time which is available at the internal bus by a periodical sent reference time telegram. To activate such a telegram, the desired module has to be configured to transmit this telegram. It is strongly recommended to take care that there is not more than one module which is configured to send a reference time telegram. Otherwise, telegrams overlap with unpredictable effects. Only in case of a redundant master time code system (2 x GT + SL or 2 x GI + SI) both time code generator modules may transmit the time reference, because the change-over unit allocates a master/slave priority.

1.3.1 Time telegram



These screenshots show how to configure the GT module using the Windows program and the web based Configuration Interface (you have to use one of these only). Within the “Link” submenu, set one of the three possible telegrams to “Reference”. The NTP Server automatically detects the telegram and makes time available to the Ethernet.

1.3.2 NTP Server

The NTP Server does its work automatically. No settings have to be made apart from those described in 1.3.1.

1.4 Troubleshooting

1.4.1 Checking the NTP Status

The NTP Server uses the NTP values "stratum" and "reference" to indicate its state of operation. Those values can be seen in the IE configuration menu of the web interface. The submenu "Version" looks like this:

Add User Modify User Delete User Version SNMP	Version
	Firmware: 2.0.58 Statusmonitor: yes Option SNMP: yes Option NTP: yes NTP Stratum: 1 NTP Reference: NVAL

Refer to the following table to interpret the given information:

Stratum	Reference	Possible reasons (module GT/GI as time source)
0	INIT	The IE module has never received a TC_link packet since power-on. Reasons could be: <ul style="list-style-type: none"> - Link Telegram not activated (check if Link → Telegram 1, 2 or 3 is set to "Reference") - No or wrong sync signal (See what's set at Generate → Sync) - External reference not connected or without valid data or cannot be found (See what's selected at Reference → Source/Format) and internal battery not present or empty
1	GPS	Normal operation. The internal clock has been synchronized by an external reference within the last 24 hours.
1	NVAL	GT/GI has not received a reliable time since power-on due to one of the following reasons: <ul style="list-style-type: none"> - Time of the external reference wasn't synced yet (no receive of GPS or DCF77 signal) - No or no valid data from an external reference could be received. GT/GI uses its internal buffered time.
1	NSYN	The internal clock was set by an external reference or manually by any configuration program. The internal clock is not synced to an external reference, because <ul style="list-style-type: none"> - it was set manually - during last synchronization, the external time did not indicate the "synchronous" or "locked" state. - the internal clock wasn't set by a synchronous external reference for more than 24 hours.

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10	0.0.0.0	The TC_link telegram could not be received for more than 5 seconds (check if Link → Telegram 1, 2 or 3 is set to "Reference")
11 ... 15	0.0.0.0	The TC_link telegram could not be received for more than 10 ... 50 minutes (check if Link → Telegram 1, 2 or 3 is set to "Reference")
0	LOST	The TC_link telegram could not be received for more than one hour (check if Link → Telegram 1, 2 or 3 is set to "Reference")

1.4.2 Checking the NTP connection

If you want to check the NTP connection you can download the Alpermann+Velte NTP-Tool from www.alpermann-velte.com/prod_e/erubidium/rub_ie.html. This tool runs on a windows machine and queries the NTP server.

Use NTP-Tool to check if the IE Module can be queried through the network.