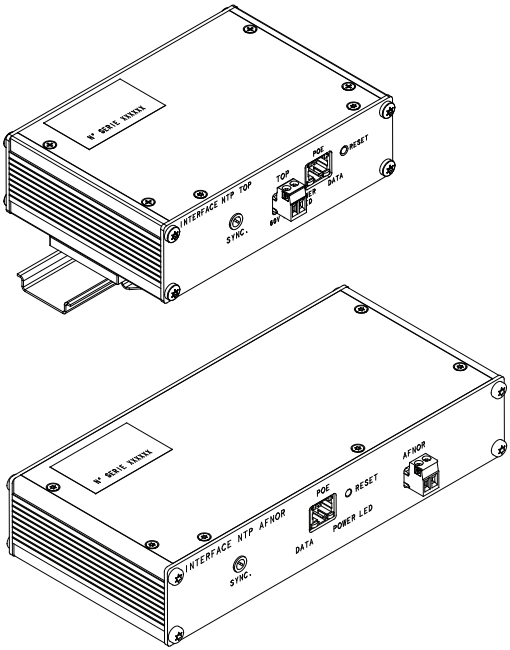
ENGLISH



NTP INTERFACE

USER GUIDE

GORGY TIMING

LA MARQUE DU TEMPS

IMPORTANT SAFETY INSTRUCTIONS

WARNING! Read the section that follows very carefully before installing your equipment. It gives the safety instructions to follow during installation.

To protect your equipment, connect power on UPS (Uninterruptible Power Supply).

The electrical installation to which the equipment is connected must comply with the NF C 15-100 standard.

This device does not have a primary power switch. A power protection system (circuit-breaker or disconnecting switch), that is easy to access must be built into the wiring installation. This device must support the nominal voltage and current values specified on the clock.

In Europe: to comply with European regulations on the protection of persons and the environment, you must dispose of this equipment in a collection site provided for this purpose (separately from household waste). Contact your reseller, collection site or the competent local authorities for more information.

Modifying or opening the product without the consent of the Customer service department will void the warranty.

All maintenance operation shall be conducted with power shut off, including systems connected on relay outputs if any.

Generally, the power cable (220V) and transmission cable (of time signal) shall not be very close to each other, so as to avoid interference (keep the distance of a few centimeters).

Gorgy Timing disclaims all responsibility in case of accident or damage caused by an improper use of the product.

GORGY TIMING products are compliant with the following standards: CE, EN 60950, EN 55022, EN 50024

NOTICE OF SAFETY SIGNS ON THE PRODUCT

Danger – risk of damage to equipment if the instructions are not followed.

Electrical Hazard – Failure to follow the instructions may result in electric shock and injury to persons.

The equipment is completely protected through double insulation.

Warning

Follow the precautions and instructions as indicated below in order to ensure your safety and that of your environment, and to prevent your device from any possible damage.

Warning: a Switch-Isolator compliant with EN60947 standards is used as disconnect device. It must be easily accessible and be installed close to the power. It shall disconnect all active polarities.

The **PRODUCT** is intended for use indoors only, at an altitude below 2000 meters.

Disposal of waste by users in private household in the countries of European Union.
This symbol on the product or on its packaging indicates that the product must not be disposed into household waste. Instead, it shall be your responsibility to bring the waste to a collecting station especially provided for recycling of electric and electronic components. The separate collection and recycling of your waste will contribute to conserve natural resources and to ensure a recycling that is safe, environmentally and health friendly.

Technical features

Power supply	Voltage	24VDC / 48VDC / PoE
	Consumption	3 W Max
Dimensions	Length	150mm (TOP, DCF, ASCII)
		220mm (AFNOR / IRIG B)
	Width	110mm
	Height	50mm
Operating conditions	Maximum Operating Temperature	50°C
	Humidity	0-90% (non condensing)

The product contains a non-replaceable lithium battery.

This product is intended for synchronization with systems equipped with a TOP, DCF77 or ASCII or AFNOR/IRIG-B input.

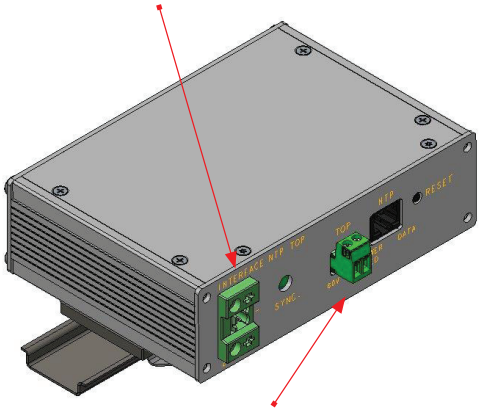
The NTP interface has an NTP/SNTP synchronization input distributed by one or more servers with an automatic detection function and a selection mode that contains the criteria of accuracy, stability of the received protocol. It is possible to manually force one of the servers.

Security level guaranteed by:

- Continuous checking of the integrity of NTP/SNTP time.
- Supervision by HTTP, HTTPS and SNMP, SSH.
- Supervision possible via SNMP software.

Configuration

- Configuration and remote setting via a web interface.
- Supervision information available via http, HTTPS, SNMP, SSH, “GT Network Manager”, “GT SCADA Supervision”. Windows® NT / XP / 2000/2003 / Vista (32-bit) / Windows 7 operation.
  - Firmware update via Ethernet
  - 2-point terminal block for power supply (except PoE version)



  - 2-point terminal block for TOP or DCF77 or AFNOR/IRIG-B output.

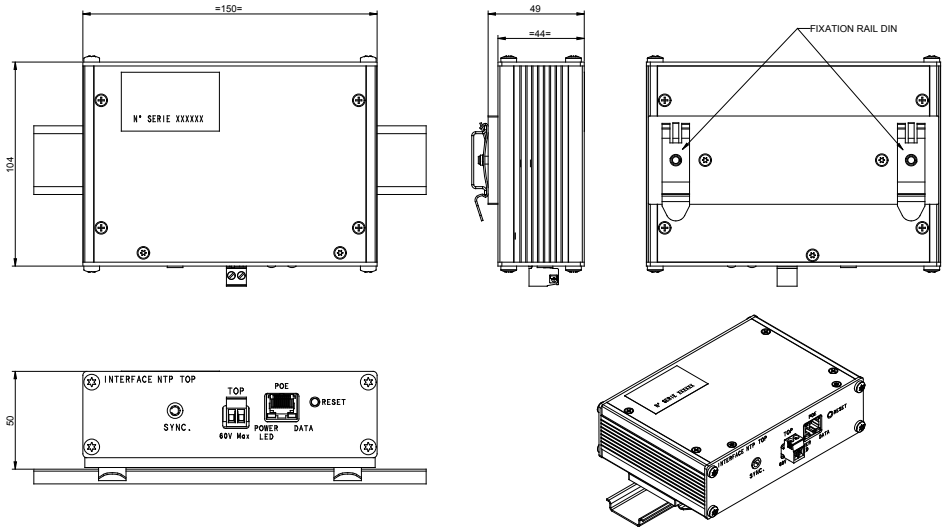
Synchronization input

- NTP on 10/100BaseT Ethernet network (RJ45 connector).

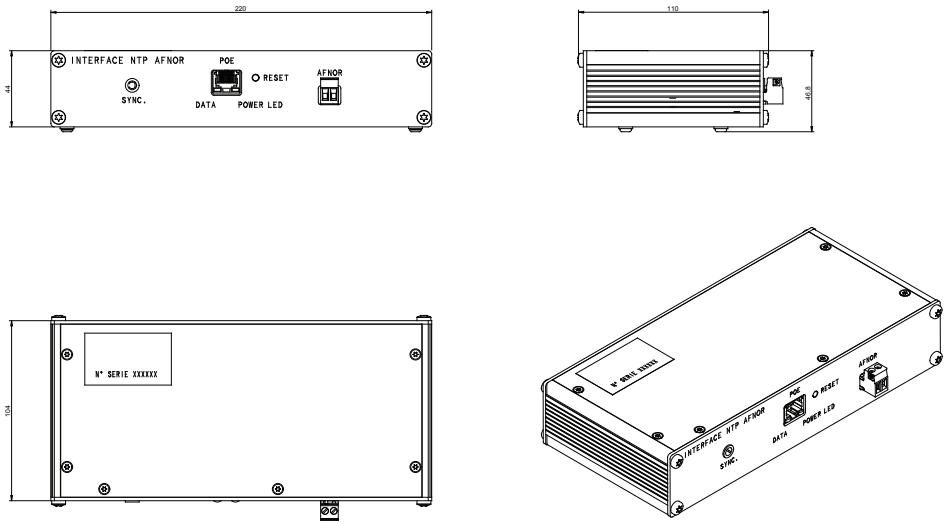
Synchronization outputs

- **Sortie TOP** on static relay (60V AC / DC, 200mA, 1500VAC galvanic isolation) or **Sortie DCF** on a solid state relay (60V AC / DC, 200mA, 1500VAC galvanic isolation) or **Sortie ASCII RS232 ou Sortie AFNOR/ IRIG-B output.**

► NTP Interface TOP / DCF / ASCII Dimensions



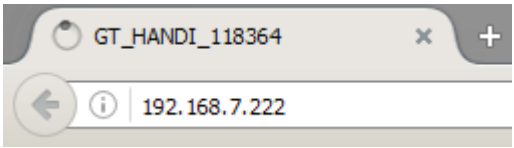
► NTP Interface AFNOR / IRIG B Dimensions



2.1. MAIN WEB PAGE

Many product settings can be adjusted through the product's built-in web interface. You can also use the dedicated GTNetConfig program to set up groups of clocks (for more information, see the User Manual in your GTNetConfig CD-ROM)

- To access the embedded web page, open your web browser (Firefox, Chrome, Internet Explorer...), and enter the product's IP address.



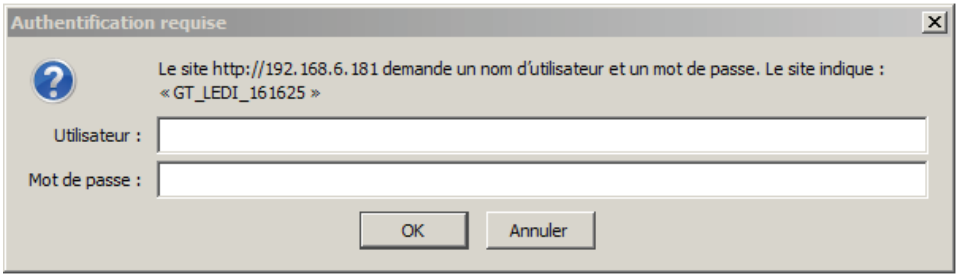
NB: By default, the product will request an IP address from a DHCP server. It always maintains an Auto-IP address (169.254.x.y/16) and an IPv6 Link-Local address (fe80::/64).

To easily detect GORGY TIMING products in your network, you can use the GTNetworkManager2 program (or the older version GT Network Manager).

- When you have entered the product's IP address in the web browser, you'll be prompted to enter a username and password.

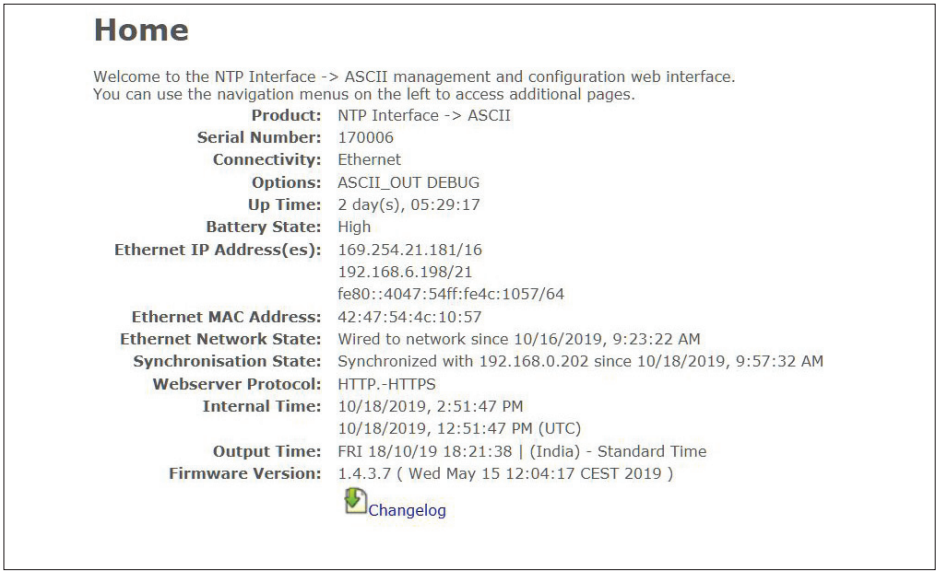
Default username and password (both case sensitive) are:

Username: root
Mot de passe: gtmt



ENGLISH

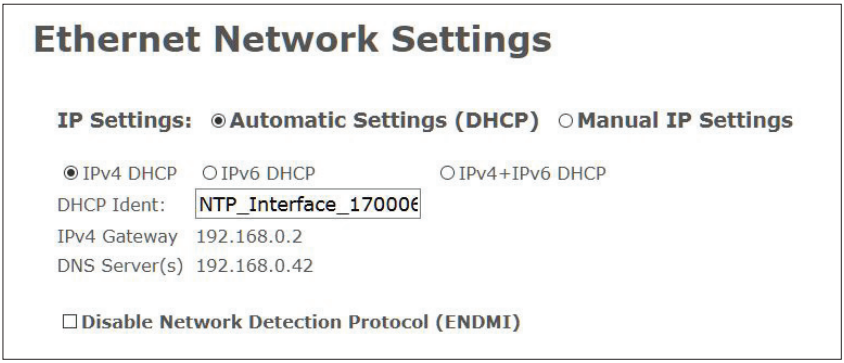
The main web page shows generic product information, including:



- **Product name and serial number:** to identify the GORGY TIMING product and its features..
- **Up time**: how long the product has been running for and its current time (UTC and local time (according to the web browser time zone))..
- **IP Adress (es)** : the product can have up to 4 IP addresses: 1 Auto-IP, 1 IPv4 (DHCP/ Static IP Statique), 1 IPv6 Link Local and 1 IPv6 Globale(DHCP/SLAAC/StaticIP Statique address) displayed with their subnet mask in CIDR notation.
- **MAC Adress**: the MAC address of the product's network interface.
- **Ethernet network state and Synchronisation state**: shows you how long the product has been connected and/or synchronized to the network for.
- **Firmware version**: the software version of the product and a background of changes and improvements of the software directly available from the product.

To configure the product, navigate using the tabs on the left side of the product. It is possible to change the language of the web interface at any time by clicking on the flag.

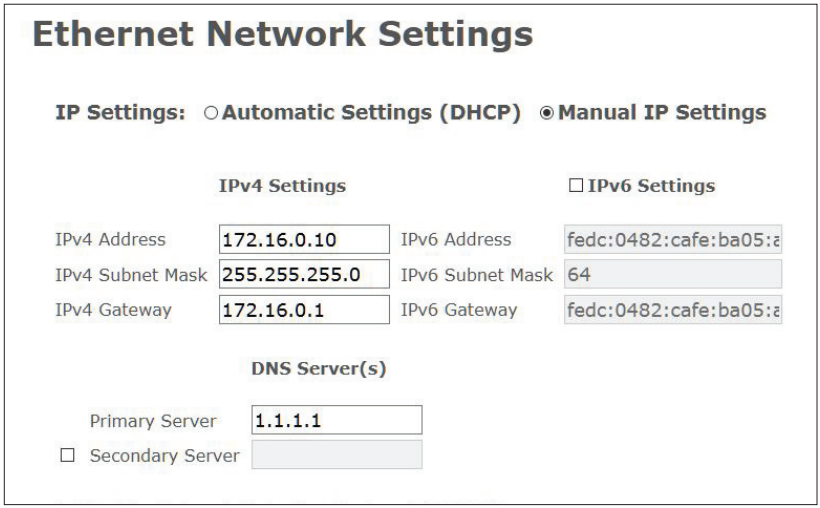
2.2. ETHERNET NETWORK WEB PAGE



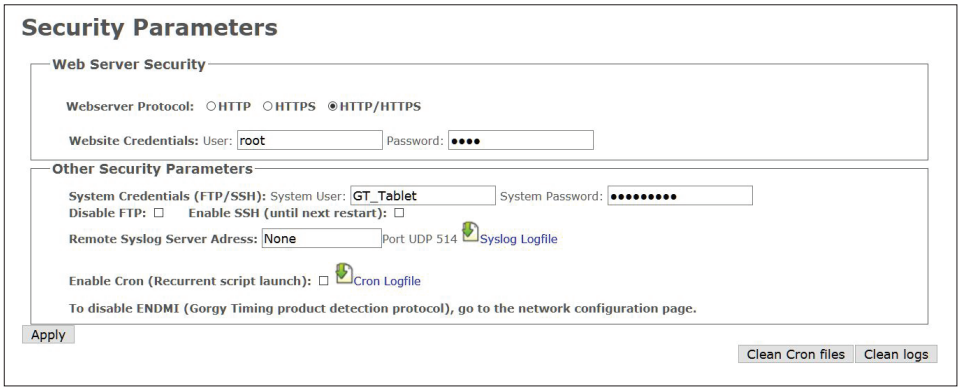
This page allows you to change the product's network configuration. Automatic DHCP configuration is used by default but you can also specify a static IP address ("paramètres IP manuels" option) with the sub-network mask and the gateway. In static mode, a gateway and a DNS server must be specified. If the network does not have these devices, you will be able to use the address of the main time server.

The product supports IPv4 and IPv6 addresses, or both at the same time.

The ENDMI protocol allows you to discover GORGY-TIMING clocks and time servers on the network. Protocol support can be disactivated on this page. The product will no longer be visible by the GTNetworkManager software.



2.3. SECURITY WEB PAGE



This page allows you to adjust the security level of your GORGY-TIMING product.

- You can choose to access the HTTPS protocol webpage, change the web or system IDs (FTP, SSH) or disable/enable FTP or SSH access.

- You can also set the Syslog information report to either save it to a Syslog server, or to just read the report saved in the product

.

2.3.1. Secure Shell (for proficient users)

A. SSH access

- To activate SSH access, check the corresponding box on the security web page.

> ☛ ***For security purposes, the SSH will only be active until the product restarts or until the user disables it in the security web page.***

- The default password is the same as the one for the FTP: GT_Tablet / gtandroid. This can also be changed on the security web page.

B. Main controls

The product is based on an optimized version of Linux kernel. It uses a wide range of tools which are classically present in a POSIX environment.

For more information about the orders and the available options, please turn to the POSIX order page of the manual or try to use the –help argument following the command.

- **busybox:** as in many embedded systems, in order to reduce memory usage, some basic applications are replaced by simplified versions of the features which are used the least. Busybox also makes it possible to provide the basic POSIX functions without using too much memory space.
- **date:** displays the system time (in UTC)..
- **get_sysv_info:** displays information about the configuration blocks used by the product and the status of write/read permissions on the blocks (mutex).
- **hostname:** displays the full name of the product: product type + serial number.
- **ip address:** command to display all IP address configurations present on the product.
- **ip route:** command to display all IP routing configurations present in the product including gateway information.
- **nslookup <nom DNS>:** allows you to test the DNS name resolution by the product.
- **ntpq:** allows communication with the NTP daemon used by the product. With the command ntpq -p, you can view the list of NTP servers currently configured in the product and information about the quality of synchronization. See ntpq –help for more information.
- **ping <adresse IP>:** allows you to perform a network communication test to check whether the clock can communicate with a device on the network.
- **ping6 <adresse IP>:** serves the same function as 'ping' but with the IPV6 protocol.
- **ps:** displays the list of current processes that the product is running.
- **top:** displays the system resource usage information (CPU, RAM) and processes currently running on the product.
- **uptime:** time passed since the start-up of the product.
- **users:** list of users who have logged onto the product.

Generally, the applications in the usr/bin folder (apart from the programs implemented by Busybox) are specific programs for the GORGY-TIMING product.

In order to avoid issues resulting from misuse of these programs that could lead to errors in certain features or in the worst case, system corruption, we strongly discourage using an application which is not stated above.

2.4. TIME INPUT WEB PAGE

This page allows you to configure the client NTP to receive time information from one to four NTP servers. IP addresses and server name (requires the use of a DNS server) can be used. MD5 authentication is also available to authenticate NTP packages.

A log file of NTP synchronization since the product was set up is available in text format.

Additionally, the NTP client can be disabled to manually adjust the time and date (autonomous operation).

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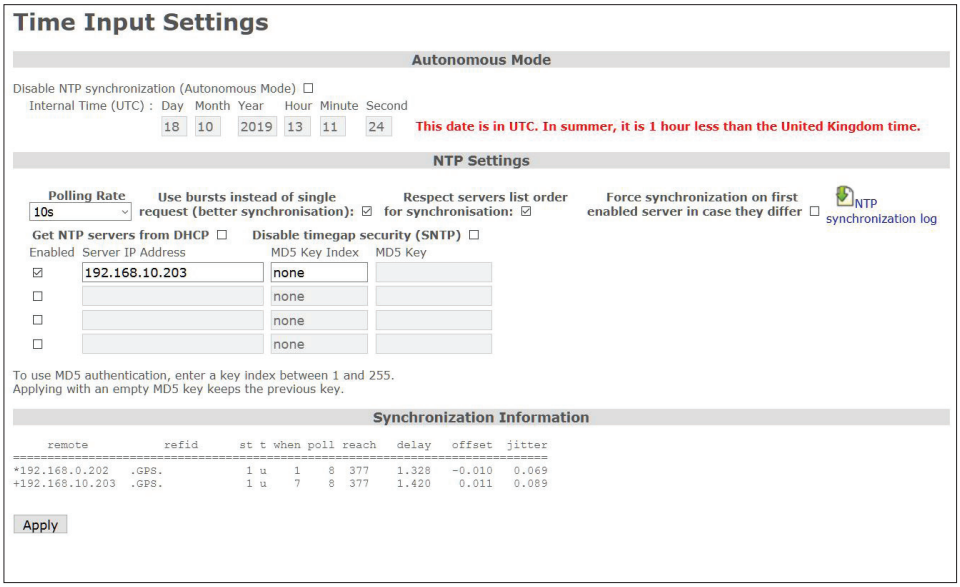
N.B: Warning, the product only deals with time in UTC (coordinated universal time). In France in summer time, legal time is 2 hours ahead of UTC time, and in winter time the legal time is 1 hour ahead of UTC time.



2.4.1. NTP configuration options

- **Frequency of requests:** automatic default value, the frequency of NTP requests is automatically calculated to ensure correct synchronization whilst limiting network traffic. It is possible to manually specify the speed at which requests are sent, from one per minute to one every 16 minutes.

- **Group requests (burst):** enabled by default, the product sends multiple packet at the same rime rather than one at a time, in order to improve tolerance to variations in network latency. This option allows you exclude extreme values of NTP packets. Leave this option enabled unless you have network congestion problems.

- **Respect of the list of servers:** enabled by default, the NTP client chooses the first server in the list to respond to its requests correctly. For that, the NTP client sends NTP packets to all servers in the list to monitor the integrity of the received time. If the option is disabled, the NTP client will automatically appoint a time server based on the Stratum, off-set, jitter and delay data. In this case, changes to the synchronization source may occur, each server can be appointed in turn.

- **Force synchronization on the first active server in case of divergence:** disabled by default. Enabling this option forces the first server on the list to synchronize, even if it offsets the other servers.
  In the case of there being two synchronization servers, if the received times are different, the NTP client cannot appoint a server. If the option is disabled, the product will reject both of the servers, preferring not to synchronize rather than recovering incorrect time information. If the option is enabled, the first server is appointed as the synchronization source. Only enable this option if the first server is a reliable time source.

- **Recover NTP servers via DHCP:** enabled by default. As well as providing basic network configuration (IP address, masque, gateway, DNS server…), the DHCP can also automatically provide the list of NTP servers in the site (IPv4, IPv6, or domain name). For that, it uses option 42, available on many DHCP servers (windows server, Linux dnsmasq or ISC DHCP…). Once this option is configured in the DHCP server, the DHCP clocks with this option enabled will be automatically configured and will synchronize themselves, thus facilitating the initial set-up as well as maintenance (only modify an NTP server on the DHCP server that will transmit information to the products).

When the NTP configuration is validated with this ticked option, the product will make a DHCP request to retrieve information from DHCP servers. Connection with the product may temporarily be lost as a result. This option only works if the DHCP option is enabled on the product in the ‘Réseau’ page.

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N.B: to manually enter the IP addresses of the NTP servers, you must disable this option, which will display the fields on the web page.

- **Disable time timegap security (SNTP):** disabled by default. The classic NTPv4 NTP client performs time corrections by gradual shift. Enabling this option changes the protocol used by the NTP client (this is no longer NTPv4 but SNTP). SNTP is less precise but more tolerant to NTP servers that are not very precise or that are subject to interferences (for example, Windows server or pool.ntp.org) or that only support SNTP protocol. This will force a 4-minute period between each request, without burst requests, and the order of servers will be followed correctly.

2.4.2. NTP synchronization information

At the bottom of the page, you'll find more detailed information about the NTP servers and the synchronization process.

Different symbols in front of the IP address indicate the status of a time server:

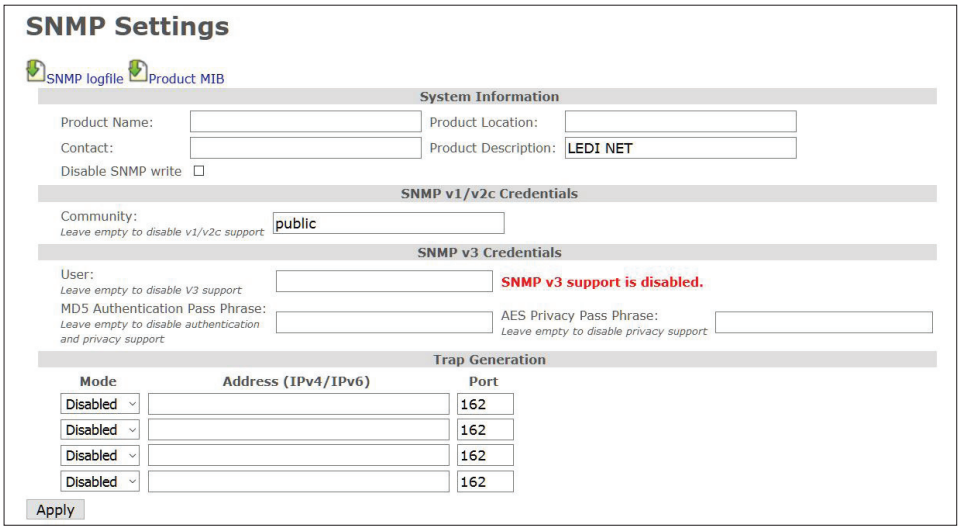
- *** :** an asterisk before the IP address indicates that the server has been chosen by the NTP client as the synchronization source.
- **x :** an 'x' before the IP address indicates that this server is excluded from the list of available servers.
- **+** : a '+' before the IP address indicates that the server has been chosen as a backup synchronization source by the NTP client and can therefore be used when the main source becomes inaccessible.
- **" " :** a space before the IP address indicates that the server is included in the list of available servers (so the NTP packets are sent to it) but the address has not been chosen as a synchronization source.
- **refid :** a 0-4 letter abbreviation means 'Reference Identifier'; it identifies the synchronization source of the time server (GPS, IP address of another NTP server, PPS, DCF…).
- **st :** "Stratum" is a ranking which indicates whether the time server is close to an automatic time source. The values vary from 1 (directly connected to an automatic clock) to 16. A value of 16 usually indicates that the server is not accessible or has synchronization issues.
- **t :** "Type" of NTP packages used by the product. GORGY-TIMING products use the unicast ('u') mode, the other modes are broadcast ('b') or multicast ('m').
- **when :** indicates the time in seconds since the last packets was sent.
- **poll :** means 'polling rate', which is the period between each NTP request.
- **reach :** status in octal notation with shift to the left indicating whether an NTP packets has been lost. When all packages have been successfully transmitted, the value is 377.

- **delay :** time taken in milliseconds for the back-and-forth exchange of an NTP pac-

kage between the server and the NTP client (similar to ping).

- **offset :** the difference in milliseconds between the internal system time and the NTP server time.
- **jitter :** variation of the time information delivered by the time server. A weak 'jitter' indicates a very stable and precise synchronization.

2.5. SNMP SETTINGS WEB PAGE



This page allows you to configure SNMP (Simple Network Management Protocol) server settings.

- **System information:**
  The fields "Product Name", "Contact" and "Product Location" are used to identify the product. N.B: the 'LEDI NET' value in the field "Product Description" is necessary for compatibility with GORGY-TIMING software. Do not modify it if you are using this software.

- **ISNMP v1/v2c identifiers:**
  You can specify the product's community name. This acts like a password (unencrypted). Only devices with this community name can communicate with the product using SNMPv1 or SNMPv2 protocols.

- **ISNMP v3 identifiers:**
  The product supports SNMPv3 protocol for authentication and/or encryption of SNMP packages. A username must then be specified (unencrypted).

- SNMPv3 package authentication is enabled by filling in the “MD5 Authentification Pas Phrase” field. An SNMPv3 client must then recognize this password to send authenticated requests.

  N.B: The authentication password must be at least 8 characters long.

- Encryption (AES-128) of SNMPv3 packages is activated by filling in the “AES Privacy Pass Phrase” field. This password allows you to make the SNMPv3 packages circulating on the network unread.

  N.B: The encryption password must be at least 8 characters long.

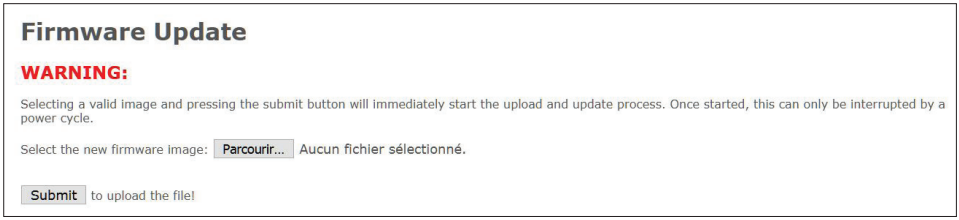
- **Trap generation:**
  The product can spontaneously send information to an SNMP Trap server to alert to events. The list of alerts is available by consulting the downloadable product MIB file from this page.

  The sending protocol, IPv4 or IPv6 addresses or host names (requires a DNS server), ports and protocols of the Trap servers must then be specified. N.B: The Traps use the identifiers configured above.

- **In the SNMP log, you will find information about the product SNMP server.**
  You can open a readable version with a text editor.

- **You can download the Management Information Base (MIB) file for the product by clicking on “MIB product” at the top of the page.**
  You can open a readable version with a text editor or an SNMP client.

2.6. UPDATE FIRMWARE WEB PAGE



- To update the product, click on the “Parcourir...” button and select the firmware file “GT_FW_xxxx.bin”, made available by the GORGY-TIMING SAV.

- Then click "Submit" to start the update.

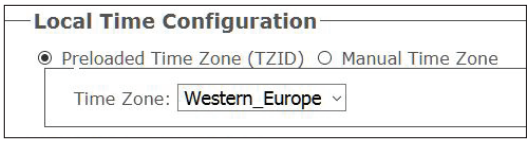
Please do not unplug the power supply or restart the product during the update. After a few minutes, the web page will indicate that the product has been updated and it will restart automatically. You can then check that the software version has changed on the main web page.

2.7. OUTPUT PARAMETERS

On this web page, you can configure the local time of the product as well as various other options. For additional information about the available options, please refer to the section on the type of output available to your product.

To set the local time, you can choose:

- A predefined time zone that includes time differences and time change policies
  For example, Western_Europe gives the time of all Western Europe (excluding United Kingdom, Ireland and Portugal) and the time automatically changes in April and October. If you want to add a time zone which isn’t already listed as an option, please contact our support team (support@gorgy-timing.fr) who will inform you how to add new time zones to your product.

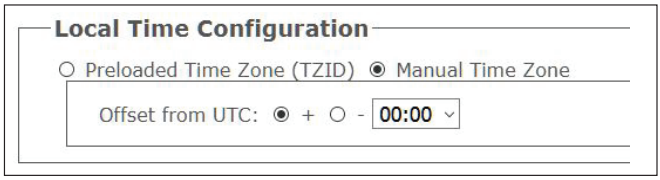


Here is a non-exhaustive list of the time zones already built into the product:

List of Time Zone Identifiers (TZID) and their significance

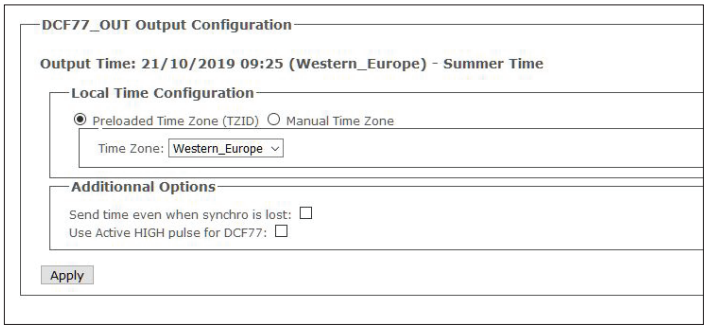
Time zone identifier	Time difference from UTC (excluding summer time)	Time change policy	Concerned countries/cities
Brazilian Coast	UTC-3h	Summer Time: Penultimate Sunday of October at 0:00 / Winter Time: Penultimate Sunday of March at 0:00	Brazil excluding the Amazon (Brasilia, Sao Paulo…)
China	UTC+8h	No time change	China, Taiwan, Mongolia
Eastern Europe	UTC+2h	Summer Time: Last Sunday of March at 1:00 (UTC) / Winter Time: Last Sunday of October at 1:00 (UTC)	Eastern Europe: Ukraine, Romania, Greece, Finland…
India	UTC+5h30	No time change	India
Iran	UTC+4h30	No time change	Iran
Japan	UTC+9	No time change	Japan, South Korea
Jordan	UTC+2	Summer Time: Last Friday of March at 0:00 (Local time) / Winter Time: Last Friday of October at 0:00 (Local time)	Jordan
Middle_East	UTC+2	No time change	Middle East: Saudi Arabia, Qatar, Yemen, United Arab Emirates (Dubai, Abu Dhabi…) (caution! Oman => UTC+4)
Singapore	UTC+8	No time change	Singapore, Indonesia, Malaysia, Philippines
Sydney	UTC+10	Summer Time: First Sunday of October at 2:00 (Local time) / Winter Time: First Sunday of March at 3:00 (Local time)	Australia (Eastern part: Sydney)
US_East_Coast	UTC-5	Summer Time: Penultimate Sunday of October at 3:00 (Local time) / Winter Time: Penultimate Sunday of March at 2:00 (Local time)	East Coast of the United States (New York, Boston, Miami, Washington D.C) + Canada (Montreal, Toronto, Ottawa)
US_West_Coast	UTC-8	Summer Time: Penultimate Sunday of October at 3:00 (Local time) Winter Time: Penultimate Sunday of March at 2:00 (Local time)	West Coast of the United States (Los Angeles, San Francisco, Seattle, Portland) + Canada (Vancouver)
UTC_GMT_ZULU	UTC+0	No time change	International time reference. Used especially in NTP.
United_Kingdom	UTC+0	Summer Time: Last Sunday of March at 1:00 (UTC) / Winter Time: Last Sunday of October at 1:00 (UTC)	United Kingdom, Ireland, Iceland, Portugal
Vladivostok	UTC+10	No time change	Vladivostok
Western_Europe	UTC+1	Summer Time: Last Sunday of March at 1:00 (UTC) / Winter Time: Last Sunday of October at 1:00 (UTC)	France, Spain, Germany, Italy, Poland, Sweden Norway…

- Or, by indicating the time difference with respect to the international time UTC. This setting means that an automatic time change will not be possible, unlike TZID.



2.8. OUTPUT PARAMETERS (OPTION DCF77_OUT)

On this web page, the output of the DCF77 signal can be configured, including to change the local time sent by the product as well as various other options.



The NTP interface DCF77 emits dips (falling edge) of 100 or 200 ms by default to replace the signal emitted by the TDF / DFC GORGY-TIMING antennas. However, this can be changed by inverting the signal to accommodate equipment using slots (rising edge).

Likewise, it is possible to choose whether to cut the output signal when the product is no longer synchronized or to keep it regardless.

N.B: Most DCF/TDF synchronized products expect to have 3 consistent consecutive frames before updating their timebase. In this case, it will take about 3 minutes for the product to synchronize as the DCF/TDF frame spreads over the minute.

2.8.1. Electrical characteristics of the Dcf/TDf output

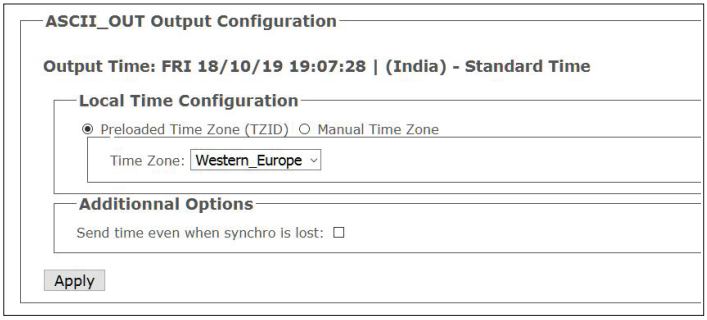
- No polarity
- Switching voltage max: 60 V AC/DC
- Switching current max.: 200 mA
- Insulation voltage: 1500 V AC
- Response time (ton/toff): 0,5 / 0,05 ms

The NTP interface can be connected directly to the CODE input of an LEDI clock or a GORGY-TIMING master clock in the same way as the DCF/TDG antenna. Since the signal supply comes directly from the clock, there is no need to provide external power (other than powering the NTP Interface).

If you want to connect the NTP Interface DCF to a product other than a GORGY-TIMING product (for example, a automaton), check its manual to verify the signal voltage necessary for the synchronization of this device in DCF/TDF, then connect the appropriate power supply to the device and the DCF connector of the NTP Interface.

2.9. OUTPUT PARAMETERS (OPTION ASCII_OUT)

You can configure the output of the ASCII signal in this web page, including changing the local time sent by the product as well as various other options.

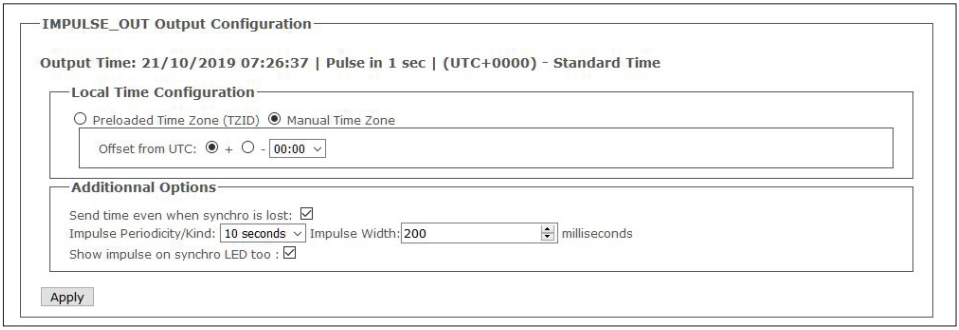


Likewise, it is possible to choose whether to cut the output signal when the product is no longer synchronized or to keep it regardless.

2.10. OUTPUT PARAMETERS (OPTION IMPULSE_OUT)

It is possible to configure the TOP output on this web page and change:

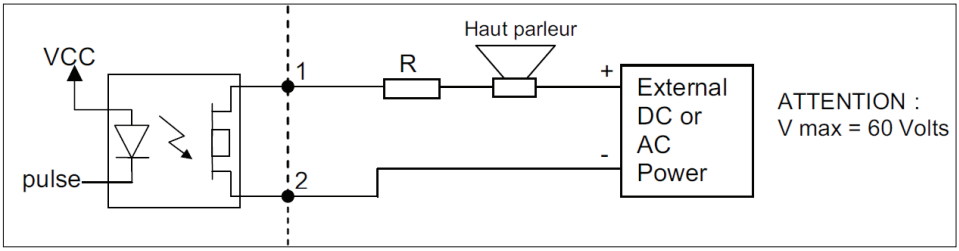
- the type of TOP => TOP second, TOP minute, DCF77…
- the width of the TOP (in milliseconds)
- the local time of the TOP output



For convenience, you can also choose to postpone the TOP to the synchronization LED in order to preview the pulses. If this box is unchecked, the LED remains lit as long as the product is synchronized.

Likewise, it is possible to choose whether to cut the output signal when the product is no longer synchronized or to keep it regardless.

2.10.1. NTP interface TOP electrical characteristics

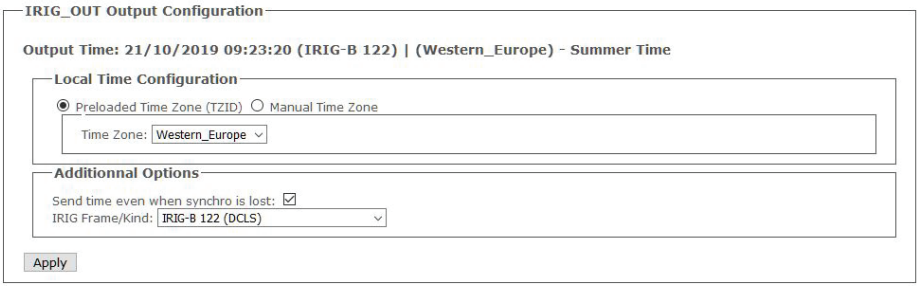


- **No polarity**
- **Switching voltage max.: 60 V ac/Dc**
- **Switching current max.: 200 ma**
- **Insulation voltage: 1500 V ac**
- **Response time (ton/toff) : 0,5 / 0,05 ms**

2.11. OUTPUT PARAMETERS (OPTION IRIG_OUT)

It is possible to configure the IRIG-B/AFNOR output in this webpage and change:

- the desired IRIG type => IRIG-B 122, AFNOR (IRIG-B 126)
- the local time of the IRIG output



2.12. SOFTWARE UPDATE VIA FTP

GORGY-TIMING products can also be updated by FTP.

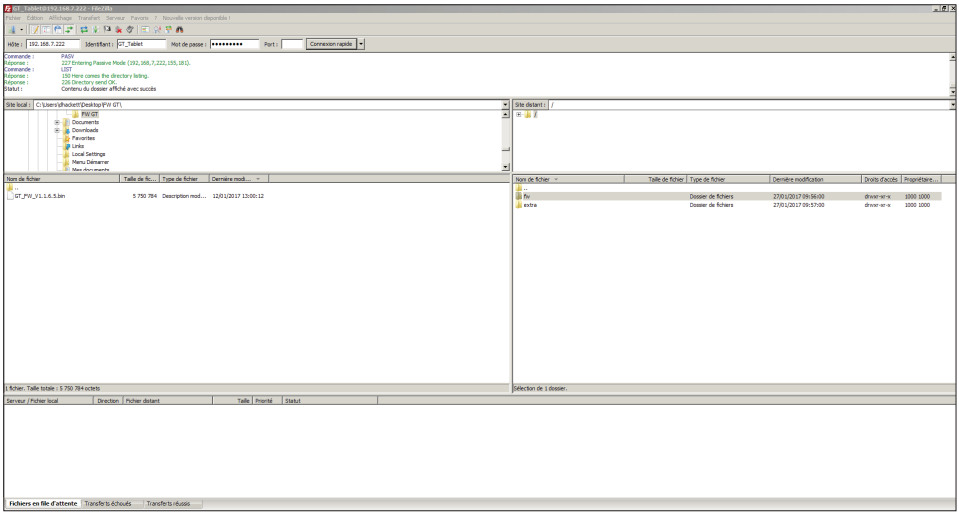
N.B: Check that FTP is enabled in the Security page and that you have the correct credentials (GT_Tablet / gtandroid by default).

2.12.1. with the Windows Command Prompt

- Open the windows command prompt and browse the folders (with “cd”) to the directory where the update is located. (GT_FW_Vx.y.z.bin).
- Check the contents of the folder with “dir”.
- Then enter:
- ftp <ip_address>
  - User: GT_Tablet
  - Password: gtandroid
- cd fw
- put GT_FW_Vx.y.z.bin
- quit

The update will be sent to the product after 1 to 2 minutes and wit will restart with the new version (check the home page).

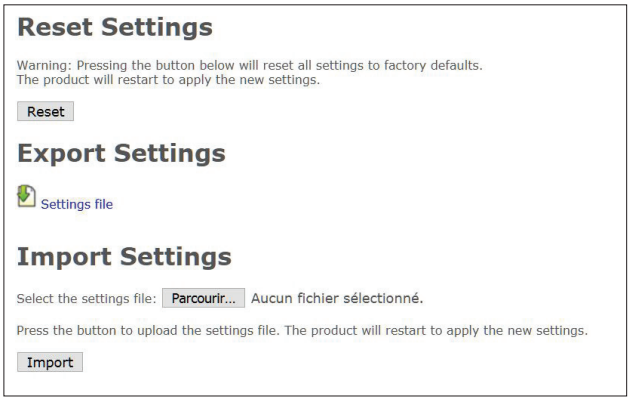
2.12.2. With Filezilla FTP client



- At the top of the Filezilla window, enter the product's IP address and the FTP identifiers (default: "GT_Tablet" as login and "gtandroid" as password). Then click Connect.
- Drag and drop the update file (GT_FW_Vx.y.z.bin) from the left side to the "fw" folder in the window on the right. The transfer should then begin.

> ***The update will be transmitted to the product and after 1 to 2 minutes, it will restart with the new version (check the home page).***

2.13. FACTORY CONFIGURATION WEB PAGE



- To restore the configuration to factory settings, click ‘Reset’. The product will restart after 2 minutes. It can be detected on the network and the web interface will be accessible.

Warning: the IP configuration and all the rest of the settings will be deleted. The product will restart IPv4 DHCP to retrieve an IP address.

On this web page, by clicking on the "Setting file" button, you can also export the product configuration for backup or send new settings to reconfigure a GORGY-TIMING product (the product will then reboot).

2.14. WEB PAGE TO RESTART PRODUCT

- To restart the product, click on "Reboot".

It takes around 2 minutes for the product to restart and be accessible on the network.

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